December 30, 2019

RESTORATION
SCIENCE & ENGINEERING, LLC
911 W. 8TH AVENUE, SUITE 100
ANCHORAGE, AK 99501
VOICE: 907-278-1023
FAX: 907-277-5718
EMAIL: LKOENEMAN@RESTORSCI.COM

Russell Grandel
Alaska Railroad Corporation
327 W. Ship Creek Ave.
Anchorage, AK 99501-7500
(907) 982-4898
Grandelr@akrr.com

Subject: ARRC Healy Roundhouse Groundwater Assessment 2019, Healy, Alaska
ADEC File # 150.26.037

Mr. Grandel:

Restoration Science & Engineering, LLC (RSE) is providing the following letter report for groundwater sampling of six (6) monitoring wells located at the Alaska Railroad Corporation (ARRC) Healy Roundhouse located in Healy, Alaska (see Figure 1 in Attachment A for location). This site is listed under File # 150.26.037 in the Alaska Department of Environmental Conservation (ADEC) Contaminated Sites database.

SITE OVERVIEW

The ARRC Healy Roundhouse site is located at ARRC Milepost (MP) 359 in Healy, Alaska (Figure 1). The building was demolished and removed from the site in 2015. The building foundation, however, remains onsite and is situated on the south end of the Healy Siding. The siding is installed on an earthen bench with a steep hillside and the Nenana River to the east (FES 2015). The monitoring well locations are illustrated on Figure 2, excerpted from the attached FES 2015 groundwater monitoring report (FES 2015).

In 1990, Shannon & Wilson removed a 9,000-gallon underground storage tank (UST) that was adjacent to the Healy Roundhouse. The UST was reportedly a buried railroad tank car. The original excavation was limited to prevent undermining the Roundhouse and adjacent railroad tracks. Soil samples from the excavation indicated elevated total petroleum hydrocarbons (TPH) ranging from 2,500 parts per million (ppm) to 24,000 ppm (Shannon & Wilson 1990).

In 2009, four (4) soil borings were advanced around the former UST excavation area. In three (3) of the borings, soil at the groundwater interface exhibited gasoline range organics (GRO) and diesel range organics (DRO) at concentrations greater than ADEC Table C Groundwater cleanup levels (Clarus, 2010).

During a 2011 investigation, seven (7) additional soil borings (four of which met refusal) were installed and three (3) were converted to monitoring wells (RSE-1, RSE-2, and RSE-3) to further delineate hydrocarbon impacts. DRO concentrations in soil samples exceeded the ADEC Table C cleanup level of 250 mg/Kg in borings RSE-1 and RSE-3. Groundwater samples from all three (3) wells exceeded the ADEC Table C cleanup level of 1.5 mg/L for DRO (RSE 2012). An analysis of the groundwater gradient indicates that the groundwater flow is to the southeast.

Groundwater samples were collected from monitoring wells RSE-1, RSE-2, and RSE-3 during October 2012 and June 2013. In 2012, the DRO concentration in the sample from well RSE-2 exceeded the ADEC groundwater Table C cleanup level, but all other analytes (benzene, toluene, ethylbenzene, and xylenes [BTEX], GRO, and residual range organics [RRO]) were below ADEC Table C cleanup levels (FES 2012). In 2013, the DRO and RRO concentrations exceeded ADEC Table C cleanup levels in sample collected from RSE-1, and the DRO concentration exceeded the ADEC Table C cleanup level in the sample from RSE-2 (see Figure 1 in Attachment B). Inferred groundwater flow direction on the bench remained to the southeast.

Four (4) soil borings and three (3) new one (1)-inch wells (MW-4, MW-5, and MW-6) were installed by FES east and downhill of the Healy Roundhouse in October 2014 to evaluate the potential for offsite contaminant migration. The DRO concentration in the sample collected from soil boring SB-4 (8-9 feet below ground surface [bgs]), positioned furthest to the north of the borings, exceeded the ADEC Table B1 Method 2 Migration to Groundwater cleanup levels (FES 2015).

In September 2015, FES collected groundwater samples from the six (6) existing wells at the Healy Roundhouse site to assess petroleum hydrocarbon concentrations. DRO and RRO concentrations in the groundwater sample collected from well RSE-1, located closest to the former UST, exceeded ADEC Table C cleanup levels. All other sample results were below ADEC Table C cleanup levels. (FES 2015).

DRO and RRO levels in RSE-1 in general, have decreased since 2013, yielding results under ADEC Table C cleanup levels in 2017 (see Figure 1 in Attachment B). Contaminant concentrations in other wells have yielded concentrations below ADEC Table C cleanup levels during the last two annual monitoring events. Although DRO initially exceeded the ADEC Table C cleanup level in wells RSE-2 and RSE-3, DRO concentrations in these wells have exhibited decreasing trends and are below ADEC Table C cleanup levels.

DRO and GRO concentrations in wells at the base of the slope to the southeast of the site have generally been non-detect and indicate that groundwater contamination is likely not leaving the site. (FES 2015).

The 2017 sampling effort yielded concentrations of DRO, RRO, GRO, and polycyclic aromatic hydrocarbons (PAHs) below applicable standards. Monitoring well RSE-3 yielded the highest concentration of DRO with a value of 1.37 mg/L, nominally below ADEC Table C cleanup levels (RSE, 2018). Monitoring well samples collected from RSE-2 and RSE-3 yielded concentrations of trichloroethene above applicable standards. The 2017 sampling event was only the second monitoring event in which full-list volatile organic compounds (VOCs) were analyzed at the site. The first event occurred in 2011, wherein RSE-3 yielded a result of 1.1 ug/L trichloroethene (RSE 2012).

In September 2018, RSE collected groundwater samples from all six (6) monitoring wells located at the Healy Roundhouse site. DRO levels in RSE-1 and RSE-2 were 1.75 mg/L and 1.99 mg/L, respectively, above the ADEC Table C Groundwater cleanup level of 1.5 mg/L. Trichloroethene in monitoring well MW-6 was 3.9 ug/L, above the ADEC Table C Groundwater cleanup level of 2.8 ug/L. All other sample results were either non-detect or below their ADEC Table C Groundwater cleanup levels (RSE, 2018).

OBJECTIVES

The 2019 field efforts sought to provide additional data for the wells located at the Healy Roundhouse site to either support trends of natural attenuation or indicate whether additional monitoring actions are required.

GROUNDWATER SAMPLING

Based upon the results of previous investigations, RSE identified the following contaminants of potential concern (COPCs):

Table A. Contaminants of Potential Concern

COPC	Matrix	COPC Abbreviation	ADEC-Approved Lab Method	ADEC Table C Groundwater Cleanup Levels
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
Volatile Organic Compounds	Water	VOCs	EPA 8260C	Varies

Groundwater samples were collected in accordance with the ADEC-approved work plan, dated August 5, 2019. RSE qualified environmental personnel mobilized to the subject area on August 27, 2019. RSE first examined the condition of each well. RSE-2 was found to have an obstruction

that wouldn't allow sampling using a submersible pump. One of the tabs from the flush mount housing was directly above the polyvinyl chloride (PVC) well casing, making sampling with a submersible pump impossible. The ADEC was notified of this obstruction during RSE's sampling event in 2018, and approval was given for RSE-2 to be sampled using a peristaltic pump.

RSE measured the depth to the bottom of each well, and the depth to groundwater; groundwater was observed to be between approximately 12 and 24 feet below ground surface (bgs). Following this observation, RSE purged three (3) well volumes from each well using a peristaltic pump for RSE-2, and a submersible pump for RSE-1 and RSE-3. MW-4, MW-5, and MW-6 are 1-inch monitoring tubes, so a peristaltic pump was used for these wells. Water quality parameters were monitored using a YSI 556 meter for stabilization when readings were within the following parameters

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

RSE re-measured the depth to groundwater following purging and prior to sampling using a water level indicator. Water samples were collected using the peristaltic and submersible pumps both set to a low flow rate during sampling.

One (1) sample was collected from wells RSE-1, RSE-2, RSE-3, MW-4, MW-5, and MW-6. Two (2) samples were collected from RSE-3, one (1) as a blind duplicate (MW-X). The wells were sampled in the following order: MW-4, MW-5, MW-6, RSE-3, RSE-2 and then RSE-1, as per the ADEC-approved work plan, dated August 5, 2019. All monitoring wells were sampled for GRO, DRO, RRO and VOCs. SVOCs were listed in the work plan, however, the ADEC indicated that SVOCs were not necessary at this site. MW-X was submitted as a blind duplicate of RSE-3 to the laboratory for quality control purposes.

The water samples were collected using new, dedicated tubing. The water level indicator, submersible pump, and other equipment that was not disposable or dedicated was decontaminated with distilled water and Alconox in the field. As water samples were collected, care was taken to minimize volatile loss by excessive turbulence or air mixing. Water samples were placed directly into method specific containers and stored in a clean sample cooler transported under chain-of-custody to the ADEC-approved laboratory, SGS North America, located in Anchorage, Alaska.

The submersible pump was decontaminated using Alconox and distilled water between sampling at each well. The Investigative Derived Waste section, below, describes treatment of the decontamination and purge water.

RESULTS

A review of the 2019 laboratory results indicates that the DRO levels in RSE-1 and RSE-2, RRO in RSE-1, and Trichloroethene in RSE-3 and MW-6 are above ADEC Table C cleanup levels. Tabulated laboratory data can be found in Attachment B. The laboratory report can be found in Attachment C. Historic hydrocarbon and trichloroethene data can be found in Table 4 in Attachment B.

Samples RSE-1 and RSE-2 yielded DRO results of 2.87 mg/L and 1.53 mg/L, respectively, above the ADEC Table C cleanup level of 1.5 mg/L. RRO results for RSE-1 were 1.43, above the ADEC Table C Groundwater cleanup level of 1.1 mg/L. Additionally, trichloroethene results for RSE-3, the associated duplicate, MW-X and MW-6 were 4.32 ug/L, 4.33 ug/L and 4.5 ug/L, respectively, above the ADEC Table C Groundwater cleanup level of 2.8 ug/L. Tetrachloroethene was detected in RSE-1 at 5.54 ug/L, below the ADEC Table C Groundwater cleanup level. Additionally, chloroform was detected in RSE-2, MW-X, MW-4 and MW-6 below the ADEC Table C Groundwater cleanup level.

All other sample results were either non-detect or below their ADEC Table C Groundwater cleanup levels. Tabulated groundwater data can be found in Tables 2-4 of Attachment B.

INVESTIGATIVE DERIVED WASTE

Consumables such as tubing and gloves were placed into a trash receptacle for disposal. Non-consumables such water level indicator and submersible pump were decontaminated using Alconox and hot water between sampling at each well. Tubing for water samples was dedicated to each well and disposed of following use.

Purge water and water used in decontamination of the sampling equipment was passed through a granular activated carbon filter and discharged into a densely vegetated area onsite.

QUALITY ASSURANCE AND QUALITY CONTROL

RSE collected each groundwater sample in general accordance with applicable ADEC regulation and guidance documents and the ADEC-approved work plan dated August 5, 2019. A peristaltic pump was used to sample monitoring well RSE-2, due to an obstruction preventing usage of a submersible pump for sampling. The ADEC was contacted during RSE's 2018 sampling event and approval was given for monitoring well RSE-2 to be sampled using a peristaltic pump instead of a submersible pump. Use of a peristaltic pump verses a submersible pump may result in slightly low biased VOC results. However, based on lab results, the overall data usability does not seem to be affected. A single blind duplicate (MW-X, duplicate of RSE-3) was submitted to the laboratory for quality control for primary analytes.

A completed ADEC Laboratory Review checklist for SGS laboratory report 1195054 (Attachment C) is provided in Attachment D. Laboratory detection limits exceeded ADEC Table C Groundwater cleanup levels for the non-target analyte 1,2,3-trichloropropane. One deviation was made from the ADEC approved work plan; a peristaltic pump was used on RSE-2 due to an obstruction. Data usability does not appear to be affected by this deviation. All the data is usable for its intended purpose of comparison to ADEC Table C cleanup levels.

CONCLUSION

Results for the September 2019 sampling event yielded DRO results for RSE-1 and RSE-2 at 2.87 mg/L and 1.53 mg/L, slightly elevated above the ADEC Table C cleanup level of 1.5 mg/L. RRO in RSE-1 was measured at 1.43 mg/L, above the 1.1 mg/L cleanup level. Additionally, trichloroethene levels in RSE-3 and the associated duplicate, MW-X, and MW-6 were measured at 4.32 ug/L, 4.33 ug/L and 4.5 ug/L, respectively, all slightly above the 2.8 ug/L ADEC Table C cleanup level. All other results were found to be either non-detect or below ADEC Table C cleanup levels.

Seasonal variations in groundwater flow appear to impact contaminant concentrations measured at downgradient wells. In review of the 2018 and 2019 trichloroethene results for MW-6 (3.9 ug/L and 4.5 ug/L respectively) RSE notes that 2019 groundwater levels in wells MW-4, MW-5 and MW-6 were 2.75 to 3.0 feet higher in 2019 than in 2018.

Monitoring well MW-6 along with wells MW-4, MW-5 are located on ARRC property the base of a steep slope. The next downgradient property is an ADOT&PF road right-of-way. RSE did not identify any drinking water wells in this downgradient direction towards the Nenana River (WELTs 2019). Shallow groundwater is typically not developed for potable use and as such it appears that the residual impacts measured at MW-6 do not pose a threat to human health or the environment at this time.

RSE recommends ADEC consider reducing groundwater sampling for RSE-1, RSE-2, RSE-3, MW-4, MW-5 and MW-6 to a biennial frequency.

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

Lucus Gamble

Lisa Koeneman, QEP Lucus Gamble, QEP

RESTORATION SCIENCE & ENGINEERING, LLC

Attachments:

Attachment A – Figures
Attachment B – Tabulated Laboratory Results
Attachment C – SGS North America Laboratory Report
Attachment D – ADEC Laboratory Data Quality Review Checklist

References:

Clarus Technologies LLC (Clarus), 2010. Phase II Subsurface Soil Investigation, Healy Roundhouse, Healy, Alaska.

Fairbanks Environmental Services (FES), 2015. 2015 Groundwater Monitoring Report, Healy Roundhouse, Alaska Railroad Milepost 359, Alaska.

FES, 2013. Groundwater Monitoring Report, Healy Roundhouse, Alaska Railroad Milepost 359, Alaska.

FES, 2012. Groundwater Monitoring Report, Healy Roundhouse, Alaska Railroad Milepost 359, Alaska.

Restoration Science & Engineering, LLC (RSE) 2018. Letter Report for Groundwater Sampling at ARRC Healy Roundhouse Healy, Alaska ADEC File # 150.26.03

Restoration Science & Engineering, LLC (RSE) 2012. Site Characterization Report, ARRC UST Soil and Groundwater Investigation, ARRC Healy Roundhouse, ARRC Milepost 359, Healy, Alaska.

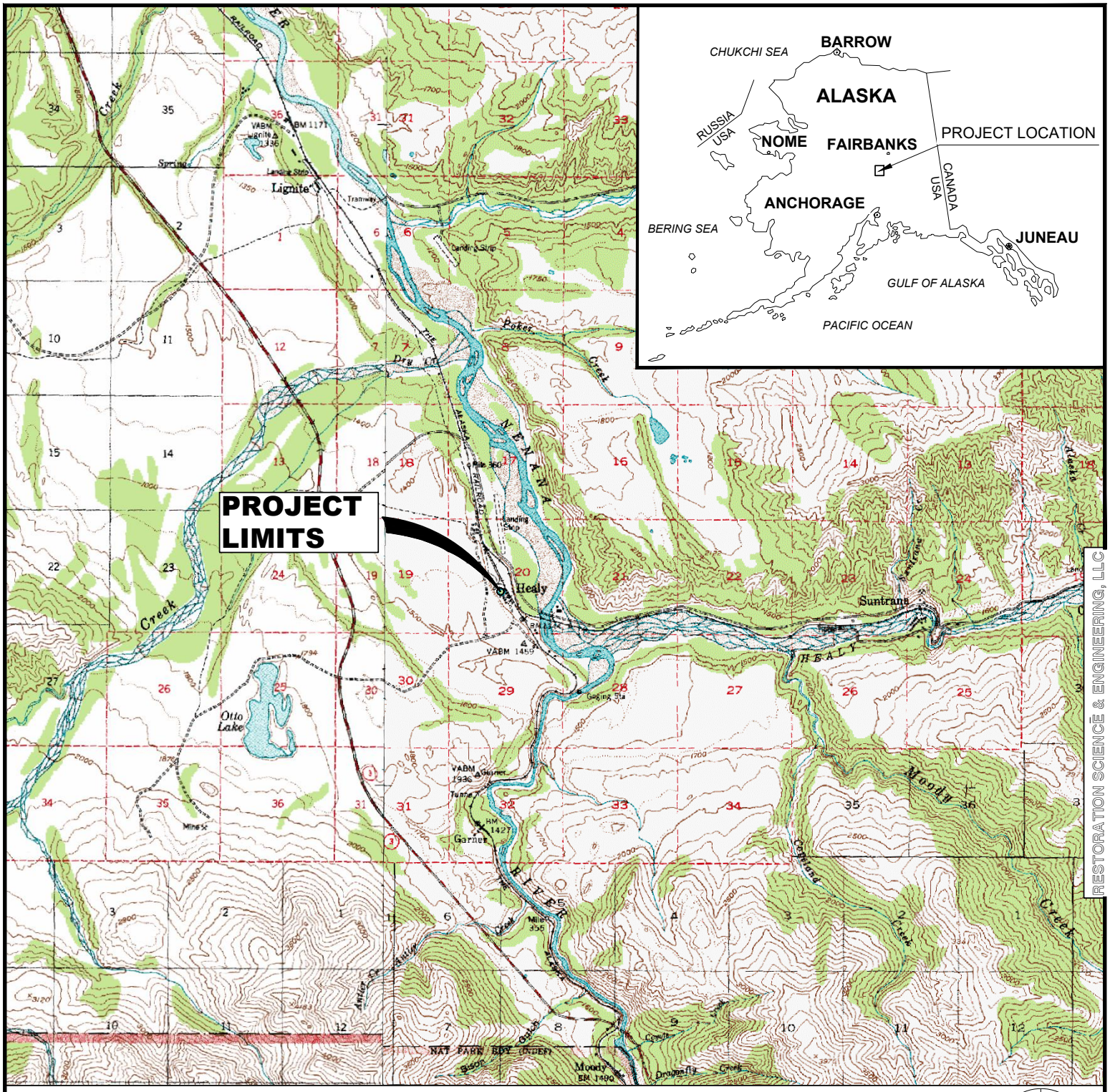
Shannon & Wilson Inc. (S&W) 1992. Monitoring Removal of Gasoline and Diesel Storage Tanks, Alaska Railroad Yard, Healy, Alaska.

Shannon & Wilson Inc. (S&W) 1990. Monitoring Removal of Waste Oil Storage Tank, Healy, Alaska.

Attachment A:

Figures

RESTORATION
Science & Engineering, LLC



N.T.S.

LOCATION COORDINATES
63.854108° N, -148.962835° W

ARRC HEALY ROUNDHOUSE MONITORING WELL LOCATIONS

VICINITY MAP

ANCHORAGE, ALASKA

JOB NO: 19-2040	DRAWN: MSB
DATE: 11.25.19	CHECKED: LK

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

FIGURE 1

RESTORATION SCIENCE & ENGINEERING, LLC

RESTORATION SCIENCE & ENGINEERING, LLC

100 0 200

GRAPHIC SCALE: 1" = 200'

LEGEND

EXISTING BUILDING

MONITORING WELL LOCATION

NOTE:

FIELD MEASUREMENTS ARE BASED ON EXISTING OBJECTS AND ARE APPROXIMATE.

ARRC HEALY ROUNDHOUSE MONITORING WELL LOCATIONS

MONITORING WELL LOCATION MAP

ANCHORAGE, ALASKA

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

JOB NO: 19-2040	DRAWN: MSB
DATE: 11.25.19	CHECKED: LK

FIGURE 2

Attachment B:

Tabulated Laboratory Results

RESTORATION
Science & Engineering, LLC

TABLE 1
ALASKA RAILROAD CORPORATION
HEALY ROUNDHOUSE GW ASSESSMENT 2019
GROUNDWATER QUALITY FIELD PARAMETERS

GROUNDWATER QUALITY FIELD PARAMETERS										
SAMPLE ID	DATE	DEPTH TO WATER (feet)	DEPTH TO BOTTOM (feet)	TEMP (°C)	pH (pH Units)	CONDUCTIVITY (mS/cm)	SPECIFIC CONDUCTANCE (µS/cm)	DISSOLVED OXYGEN (mg/L)	DISSOLVED OXYGEN (%)	OBSERVATIONS
RSE-1	8/27/2019	18.6	26.9	5.13	6.60	0.665	412	11.59	96.5	NO SHEEN OR ODOR
				4.55	6.48	0.593	360	9.38	76.2	
				4.6	6.44	0.582	355	11.8	93.3	
				4.46	6.47	0.558	342	12.16	95.7	
				4.37	5.92	0.570	345	10.44	82.4	
RSE-2	8/27/2019	17.46	24.25	5.53	6.31	0.606	381	3.44	27.7	NO SHEEN OR ODOR
				5.42	6.40	0.592	371	2.21	17.7	
				5.30	6.44	0.586	365	2.91	23.2	
				5.48	6.39	0.583	366	5.45	44.4	
				5.67	6.41	0.585	369	3.99	32.7	
RSE-3	8/27/2019	23.03	25.85	5.29	6.81	0.595	372	16.67	128.0	NO SHEEN OR ODOR
				4.48	6.61	0.594	361	15.36	120.0	
				4.46	6.61	0.594	361	15.29	119.1	
				4.37	6.63	0.593	359	14.85	115.2	
MW-4	8/27/2019	17.04	24.34	5.72	4.93	0.856	541	15.07	120.5	NO SHEEN OR ODOR
				5.43	5.40	0.843	529	14.62	116.3	
				5.48	5.96	0.830	521	11.32	90.6	
MW-5	8/27/2019	15.95	23.50	5.13	6.70	0.562	348	13.90	110.5	NO SHEEN OR ODOR
				4.69	6.61	0.562	344	14.19	111.3	
				4.66	6.40	0.561	343	12.40	96.3	
MW-6	8/27/2019	12.88	19.56	6.12	6.75	0.615	393	12.16	98.6	NO SHEEN OR ODOR
				6.08	6.70	0.617	394	10.69	86.4	
				5.98	6.72	0.618	394	10.84	87.0	

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 2
ALASKA RAILROAD CORPORATION
HEALY ROUNDHOUSE GW ASSESSMENT 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	8/27/2019	**2.87**	**1.43**	*0.0500 U*	1195054
RSE-2	8/27/2019	**1.53**	**0.585**	*0.0500 U*	
RSE-3	8/27/2019	**0.360 J**	**0.495 J**	*0.0500 U*	
MW-4	8/27/2019	**0.224 J**	**0.386 J**	*0.0500 U*	
MW-5	8/27/2019	**0.352 J**	**0.426 J**	*0.0500 U*	
MW-6	8/27/2019	**0.254 J**	**0.386 J**	*0.0500 U*	
MW-X	8/27/2019	**0.273 J**	**0.365 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) "mg/L" means "milligrams per liter".
3) **Bold** font indicates the analyte was detected above the detection limit (DL).
4) *Italicized* font with a U-flag indicates the analyte was not detected at the DL; the value presented is the limit of detection.
5) J flag indicates the result is an estimated value.
6) Yellow highlighting indicates the analyte was detected above the ADEC Table C Groundwater Cleanup Level.
7) MW-X is a blind duplicate of RSE-3.

TABLE 3
ALASKA RAILROAD CORPORATION
HEALY ROUNDHOUSE GW ASSESSMENT 2019
VOLATILE ORGANIC COMPOUND CONCENTRATIONS IN GROUNDWATER

VOLATILE ORGANIC COMPOUND CONCENTRATIONS IN GROUNDWATER								
SAMPLE ID	**RSE-1**	**RSE-2**	**RSE-3**	**MW-4**	**MW-5**	**MW-6**	**MW-X**	**ADEC TABLE C**
Date	8/27/2019	8/27/2019	8/27/2019	8/27/2019	8/27/2019	8/27/2019	8/27/2019	**GROUNDWATER**
SGS Work Order	1195054	1195054	1195054	1195054	1195054	1195054	1195054	**CLEANUP LEVELS**
Units	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	**(µg/L)**
1,1,1,2-Tetrachloroethane	*0.250 U*	*0.250 U*	*0.250 U*	*0.250 U*	*0.250 U*	*0.250 U*	*0.250 U*	5.7
1,1,1-Trichloroethane	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	8,000
1,1,2,2-Tetrachloroethane	*0.250 U*	*0.250 U*	*0.250 U*	*0.250 U*	*0.250 U*	*0.250 U*	*0.250 U*	0.76
1,1,2-Trichloroethane	*0.200 U*	*0.200 U*	*0.200 U*	*0.200 U*	*0.200 U*	*0.200 U*	*0.200 U*	0.41
1,1-Dichloroethane	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	28
1,1-Dichloroethene	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	280
1,1-Dichloropropene	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	--
1,2,3-Trichlorobenzene	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	7.0
1,2,3-Trichloropropane	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	0.0075
1,2,4-Trichlorobenzene	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	4.0
1,2,4-Trimethylbenzene	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	56
1,2-Dibromo-3-chloropropane	*5.00 U*	*5.00 U*	*5.00 U*	*5.00 U*	*5.00 U*	*5.00 U*	*5.00 U*	--
1,2-Dibromoethane	*0.0375 U*	*0.0375 U*	*0.0375 U*	*0.0375 U*	*0.0375 U*	*0.0375 U*	*0.0375 U*	0.075
1,2-Dichlorobenzene	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	300
1,2-Dichloroethane	*0.250 U*	*0.250 U*	*0.250 U*	*0.250 U*	*0.250 U*	*0.250 U*	*0.250 U*	1.7
1,2-Dichloropropane	*0.250 U*	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	8.2
1,3,5-Trimethylbenzene	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	60
1,3-Dichlorobenzene	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	300
1,3-Dichloropropane	*0.250 U*	*0.250 U*	*0.250 U*	*0.250 U*	*0.250 U*	*0.250 U*	*0.250 U*	4.4
1,4-Dichlorobenzene	*0.250 U*	*0.250 U*	*0.250 U*	*0.250 U*	*0.250 U*	*0.250 U*	*0.250 U*	4.8
2,2-Dichloropropane	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	--
2-Butanone (MEK)	*5.00 U*	*5.00 U*	*5.00 U*	*5.00 U*	*5.00 U*	*5.00 U*	*5.00 U*	5,600
2-Chlorotoluene	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	--
2-Hexanone	*5.00 U*	*5.00 U*	*5.00 U*	*5.00 U*	*5.00 U*	*5.00 U*	*5.00 U*	38
4-Chlorotoluene	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	--
4-Isopropyltoluene	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	--
4-Methyl-2-pentanone (MIBK)	*5.00 U*	*5.00 U*	*5.00 U*	*5.00 U*	*5.00 U*	*5.00 U*	*5.00 U*	6,300
Benzene	*0.200 U*	*0.200 U*	*0.200 U*	*0.200 U*	*0.200 U*	*0.200 U*	*0.200 U*	4.6
Bromobenzene	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	62
Bromochloromethane	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	--
Bromodichloromethane	*0.250 U*	*0.250 U*	*0.250 U*	*0.250 U*	*0.250 U*	*0.250 U*	*0.250 U*	1.3
Bromoform	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	33
Bromomethane	*2.50 U*	*2.50 U*	*2.50 U*	*2.50 U*	*2.50 U*	*2.50 U*	*2.50 U*	7.5
Carbon disulfide	*5.00 U*	*5.00 U*	*5.00 U*	*5.00 U*	*5.00 U*	*5.00 U*	*5.00 U*	810
Carbon tetrachloride	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	4.6
Chlorobenzene	*0.250 U*	*0.250 U*	*0.250 U*	*0.250 U*	*0.250 U*	*0.250 U*	*0.250 U*	78
Chloroethane	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	--
Chloroform	*0.500 U*	**0.450 J**	*0.500 U*	**0.460 J**	*0.500 U*	**0.520 J**	**0.380 J**	2.2
Chloromethane	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	190
cis-1,2-Dichloroethene	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	36
cis-1,3-Dichloropropene	*0.250 U*	*0.250 U*	*0.250 U*	*0.250 U*	*0.250 U*	*0.250 U*	*0.250 U*	--
Dibromochloromethane	*0.250 U*	*0.250 U*	*0.250 U*	*0.250 U*	*0.250 U*	*0.250 U*	*0.250 U*	8.7
Dibromomethane	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	8.3
Dichlorodifluoromethane	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	200
Ethylbenzene	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	15
Freon-113	*5.00 U*	*5.00 U*	*5.00 U*	*5.00 U*	*5.00 U*	*5.00 U*	*5.00 U*	55000
Hexachlorobutadiene	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	1.4
Isopropylbenzene (Cumene)	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	450
Methylene chloride	*2.50 U*	*2.50 U*	*2.50 U*	*2.50 U*	*2.50 U*	*2.50 U*	*2.50 U*	110
Methyl-t-butyl ether	*5.00 U*	*5.00 U*	*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*	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	1.7
n-Butylbenzene	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	1,000
n-Propylbenzene	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	660
o-Xylene	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	See Total Xylenes
P & M -Xylene	*1.00 U*	*1.00 U*	*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*	*0.500 U*	*0.500 U*	2,000
Styrene	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	1,200
tert-Butylbenzene	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	690
Tetrachloroethene	**5.54**	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	41
Toluene	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	1,100
trans-1,2-Dichloroethene	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	360
trans-1,3-Dichloropropene	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	4.7
Trichloroethene	*0.500 U*	*0.500 U*	**4.32**	*0.500 U*	*0.500 U*	**4.5**	**4.33**	2.8
Trichlorofluoromethane	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	5,200
Vinyl acetate	*5.00 U*	*5.00 U*	*5.00 U*	*5.00 U*	*5.00 U*	*5.00 U*	*5.00 U*	410
Vinyl chloride	*0.0750 U*	*0.0750 U*	*0.0750 U*	*0.0750 U*	*0.0750 U*	*0.0750 U*	*0.0750 U*	0.19
Xylenes (total)	*1.50 U*	*1.50 U*	*1.50 U*	*1.50 U*	*1.50 U*	*1.50 U*	*1.50 U*	190

NOTES:

1) Volatile organic compounds (VOC) analyses by Method EPA SW8260C.
2) "ug/L" means "micrograms per liter".
3) **Bold** font indicates the analyte was detected above the laboratory Detection Limit (DL).
4) *Italicized* font with a U-qualifier indicates the analyte was not detected above the DL; the value presented is the limit of detection.
5) J flag indicates the result is an estimated value.
6) Light blue highlighting indicates that the DL is elevated above the cleanup level.
7) Yellow highlighting indicates the analyte was detected above the ADEC Table C Groundwater Cleanup Level.
8) MW-X is a blind duplicate of RSE-3.

TABLE 4
ALASKA RAILROAD CORPORATION
HEALY ROUNDHOUSE GW ASSESSMENT 2019
HISTORIC HYDROCARBON CONCENTRATIONS IN GROUNDWATER

HISTORIC CONCENTRATIONS IN GROUNDWATER					
SAMPLE ID	**DATE**	**DIESEL RANGE ORGANICS (DRO) (mg/L)**	**RESIDUAL RANGE ORGANICS (RRO) (mg/L)**	**GASOLINE RANGE ORGANICS (GRO) (mg/L)**	**TRICHLOROETHENE (ug/L)**
RSE-1	9/29/2011	**1.92**	**0.528**	**0.0555 J**	*0.310 U*
RSE-1	10/5/2012	**1.16**	**0.351**	*0.062 U*	--
RSE-1	6/12/2013	**12.9**	**3.53**	--	--
RSE-1	10/24/2014	*Not sampled, well obstructed.*			
RSE-1	9/18/2015	**6.51**	**1.71**	**0.00529 J**	**--**
RSE-1	11/17/2017	**0.976**	**0.423 J**	*0.0500 U*	**29.3**
RSE-1	9/26/2018	**1.75**	**0.897**	*0.0500 U*	*0.500 U*
RSE-1	8/27/2019	**2.87**	**1.43**	*0.0500 U*	*0.500 U*
RSE-2	9/29/2011	**3.68**	**0.740**	**0.0477 J**	*0.410 J*
RSE-2	10/5/2012	**3.21**	**0.626 J**	*0.062 U*	--
RSE-2	6/12/2013	**1.52**	**0.951**	--	--
RSE-2	10/24/2014	**1.10**	**0.235 J**	--	--
RSE-2	9/18/2015	**1.01**	**0.259 J**	**0.0432 J**	**--**
RSE-2	11/17/2017	**1.07**	**0.347 J**	**0.0451 J**	*0.500 U*
RSE-2	9/26/2018	**1.99**	**0.385 J**	*0.0500 U*	*0.500 U*
RSE-2	8/27/2019	**1.53**	**0.585**	*0.0500 U*	*0.500 U*
RSE-3	9/29/2011	**5.14**	**0.751**	**0.425 J**	**1.10 J**
RSE-3	10/5/2012	*0.36 U*	*0.3 U*	*0.062 U*	--
RSE-3	6/12/2013	**0.228 J**	**0.346 J**	--	--
RSE-3	10/24/2014	*0.321 U*	*0.267 U*	--	--
RSE-3	9/18/2015	**0.203 J**	*0.279 U*	**0.0665 J**	**--**
RSE-3	11/17/2017	**1.37**	**0.605**	**0.0958 J**	**1.1**
RSE-3	9/26/2018	**0.813**	**0.229 J**	*0.0500 U*	**2.52**
RSE-3	8/27/2019	**0.360 J**	**0.495 J**	*0.0500 U*	**4.33**
MW-4	10/24/2014	*0.305 U*	*0.254 U*	*0.05 U*	--
MW-4	9/17/2015	*0.319 U*	*0.266 U*	*0.05 U*	--
MW-4	11/18/2017	*0.283 U*	*0.236 U*	**0.0434 J**	*0.500 U*
MW-4	9/26/2018	**0.234 J**	*0.263 U*	*0.0500 U*	*0.500 U*
MW-4	8/27/2019	**0.224 J**	**0.386 J**	*0.0500 U*	*0.500 U*
MW-5	10/24/2014	*0.310 U*	*0.254 U*	*0.05 U*	--
MW-5	9/17/2015	*0.318 U*	*0.266 U*	*0.05 U*	--
MW-5	11/18/2017	*0.288 U*	*0.240 U*	**0.0387 J**	*0.500 U*
MW-5	9/26/2018	**0.252 J**	*0.250 U*	*0.0500 U*	*0.500 U*
MW-5	8/27/2019	**0.352 J**	**0.426 J**	*0.0500 U*	*0.500 U*
MW-6	10/24/2014	*0.321 U*	*0.267 U*	*0.05 U*	--
MW-6	9/17/2015	*0.341 U*	*0.284 U*	**0.0421 J**	**--**
MW-6	11/18/2017	*0.288 U*	*0.240 U*	*0.0500 U*	*0.500 U*
MW-6	9/26/2018	**0.230 J**	*0.250 U*	*0.0500 U*	**3.9**
MW-6	8/27/2019	**0.273 J**	**0.365 J**	*0.0500 U*	**4.5**
ADEC TABLE C GROUNDWATER CLEANUP (18 AAC 75)		**1.5**	**1.1**	**2.2**	**2.8**

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; Trichloroethene samples analyzed by EPA Method 8260C.
2) "mg/L" means "milligrams per liter".
3) **Bold** font indicates the analyte was detected above the detection limit (DL).
4) *Italicized* font with a U-flag indicates the analyte was not detected at the DL; the value presented is the limit of detection.
5) J flag indicates the result is an estimated value.
6) Yellow highlighting indicates the analyte was detected above the ADEC Table C Groundwater Cleanup Level.
7) This table displays the highest result between RSE-3 and MW-X for 2019 data.

Attachment C:
SGS North America Laboratory Report

RESTORATION
Science & Engineering, LLC

Laboratory Report of Analysis

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

Report Number: **1195054**

Client Project: **ARRC Healy Roundhouse GW**

Dear Lucus Gamble,

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: **1195054**
Project Name/Site: **ARRC Healy Roundhouse GW**
Project Contact: **Lucus Gamble**

Refer to sample receipt form for information on sample condition.

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

Print Date: 09/19/2019 8:20:52AM

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.

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

Sample Summary

Client Sample ID	Lab Sample ID	Collected	Received	Matrix
RSE-1	1195054001	08/27/2019	08/30/2019	Water (Surface, Eff., Ground)
RSE-2	1195054002	08/27/2019	08/30/2019	Water (Surface, Eff., Ground)
RSE-3	1195054003	08/27/2019	08/30/2019	Water (Surface, Eff., Ground)
MW-4	1195054004	08/27/2019	08/30/2019	Water (Surface, Eff., Ground)
MW-5	1195054005	08/27/2019	08/30/2019	Water (Surface, Eff., Ground)
MW-6	1195054006	08/27/2019	08/30/2019	Water (Surface, Eff., Ground)
MW-X	1195054007	08/28/2019	08/30/2019	Water (Surface, Eff., Ground)
Trip Blank	1195054008	08/27/2019	08/30/2019	Water (Surface, Eff., Ground)

Method	Method Description
AK102	DRO/RRO Low Volume Water
AK103	DRO/RRO Low Volume Water
AK101	Gasoline Range Organics (W)
SW8260C	Volatile Organic Compounds (W) FULL

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

Detectable Results Summary

Client Sample ID: **RSE-1**
Lab Sample ID: 1195054001

	Parameter	Result	Units
Semivolatile Organic Fuels	Diesel Range Organics	2.87	mg/L
	Residual Range Organics	1.43	mg/L
Volatile GC/MS	Tetrachloroethene	5.54	ug/L

Client Sample ID: **RSE-2**
Lab Sample ID: 1195054002

	Parameter	Result	Units
Semivolatile Organic Fuels	Diesel Range Organics	1.53	mg/L
	Residual Range Organics	0.585	mg/L
Volatile GC/MS	Chloroform	0.450J	ug/L

Client Sample ID: **RSE-3**
Lab Sample ID: 1195054003

	Parameter	Result	Units
Semivolatile Organic Fuels	Diesel Range Organics	0.360J	mg/L
	Residual Range Organics	0.495J	mg/L
Volatile GC/MS	Trichloroethene	4.32	ug/L

Client Sample ID: **MW-4**
Lab Sample ID: 1195054004

	Parameter	Result	Units
Semivolatile Organic Fuels	Diesel Range Organics	0.224J	mg/L
	Residual Range Organics	0.386J	mg/L
Volatile GC/MS	Chloroform	0.460J	ug/L

Client Sample ID: **MW-5**
Lab Sample ID: 1195054005

	Parameter	Result	Units
Semivolatile Organic Fuels	Diesel Range Organics	0.352J	mg/L
	Residual Range Organics	0.426J	mg/L

Client Sample ID: **MW-6**
Lab Sample ID: 1195054006

	Parameter	Result	Units
Semivolatile Organic Fuels	Diesel Range Organics	0.254J	mg/L
	Residual Range Organics	0.386J	mg/L
Volatile GC/MS	Chloroform	0.520J	ug/L
	Trichloroethene	4.50	ug/L

Client Sample ID: **MW-X**
Lab Sample ID: 1195054007

	Parameter	Result	Units
Semivolatile Organic Fuels	Diesel Range Organics	0.273J	mg/L
	Residual Range Organics	0.365J	mg/L
Volatile GC/MS	Chloroform	0.380J	ug/L
	Trichloroethene	4.33	ug/L

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

Results of **RSE-1**

Client Sample ID: **RSE-1**
Client Project ID: **ARRC Healy Roundhouse GW**
Lab Sample ID: 1195054001
Lab Project ID: 1195054

Collection Date: 08/27/19 12:00
Received Date: 08/30/19 11:24
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	2.87		0.566	0.170	mg/L	1		09/11/19 16:29
Surrogates								
5a Androstane (surr)	82.4		50-150		%	1		09/11/19 16:29

Batch Information

Analytical Batch: XFC15315
Analytical Method: AK102
Analyst: CMS
Analytical Date/Time: 09/11/19 16:29
Container ID: 1195054001-G

Prep Batch: XXX42190
Prep Method: SW3520C
Prep Date/Time: 09/05/19 09:54
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	1.43		0.472	0.142	mg/L	1		09/11/19 16:29
Surrogates								
n-Triacontane-d62 (surr)	83.5		50-150		%	1		09/11/19 16:29

Batch Information

Analytical Batch: XFC15315
Analytical Method: AK103
Analyst: CMS
Analytical Date/Time: 09/11/19 16:29
Container ID: 1195054001-G

Prep Batch: XXX42190
Prep Method: SW3520C
Prep Date/Time: 09/05/19 09:54
Prep Initial Wt./Vol.: 265 mL
Prep Extract Vol: 1 mL

Print Date: 09/19/2019 8:21:03AM

J flagging is activated

Results of **RSE-1**

Client Sample ID: **RSE-1**
Client Project ID: **ARRC Healy Roundhouse GW**
Lab Sample ID: 1195054001
Lab Project ID: 1195054

Collection Date: 08/27/19 12:00
Received Date: 08/30/19 11:24
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		09/09/19 06:30
Surrogates								
4-Bromofluorobenzene (surr)	83.6		50-150		%	1		09/09/19 06:30

Batch Information

Analytical Batch: VFC14916
Analytical Method: AK101
Analyst: NRB
Analytical Date/Time: 09/09/19 06:30
Container ID: 1195054001-F

Prep Batch: VXX34822
Prep Method: SW5030B
Prep Date/Time: 09/08/19 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

J flagging is activated

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-1**

Client Sample ID: **RSE-1**
Client Project ID: **ARRC Healy Roundhouse GW**
Lab Sample ID: 1195054001
Lab Project ID: 1195054

Collection Date: 08/27/19 12:00
Received Date: 08/30/19 11:24
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1,1,1,2-Tetrachloroethane	0.250	U	0.500	0.150	ug/L	1		09/08/19 16:15
1,1,1-Trichloroethane	0.500	U	1.00	0.310	ug/L	1		09/08/19 16:15
1,1,2,2-Tetrachloroethane	0.250	U	0.500	0.150	ug/L	1		09/08/19 16:15
1,1,2-Trichloroethane	0.200	U	0.400	0.120	ug/L	1		09/08/19 16:15
1,1-Dichloroethane	0.500	U	1.00	0.310	ug/L	1		09/08/19 16:15
1,1-Dichloroethene	0.500	U	1.00	0.310	ug/L	1		09/08/19 16:15
1,1-Dichloropropene	0.500	U	1.00	0.310	ug/L	1		09/08/19 16:15
1,2,3-Trichlorobenzene	0.500	U	1.00	0.310	ug/L	1		09/08/19 16:15
1,2,3-Trichloropropane	0.500	U	1.00	0.310	ug/L	1		09/08/19 16:15
1,2,4-Trichlorobenzene	0.500	U	1.00	0.310	ug/L	1		09/08/19 16:15
1,2,4-Trimethylbenzene	0.500	U	1.00	0.310	ug/L	1		09/08/19 16:15
1,2-Dibromo-3-chloropropane	5.00	U	10.0	3.10	ug/L	1		09/08/19 16:15
1,2-Dibromoethane	0.0375	U	0.0750	0.0180	ug/L	1		09/08/19 16:15
1,2-Dichlorobenzene	0.500	U	1.00	0.310	ug/L	1		09/08/19 16:15
1,2-Dichloroethane	0.250	U	0.500	0.150	ug/L	1		09/08/19 16:15
1,2-Dichloropropane	0.500	U	1.00	0.310	ug/L	1		09/08/19 16:15
1,3,5-Trimethylbenzene	0.500	U	1.00	0.310	ug/L	1		09/08/19 16:15
1,3-Dichlorobenzene	0.500	U	1.00	0.310	ug/L	1		09/08/19 16:15
1,3-Dichloropropane	0.250	U	0.500	0.150	ug/L	1		09/08/19 16:15
1,4-Dichlorobenzene	0.250	U	0.500	0.150	ug/L	1		09/08/19 16:15
2,2-Dichloropropane	0.500	U	1.00	0.310	ug/L	1		09/08/19 16:15
2-Butanone (MEK)	5.00	U	10.0	3.10	ug/L	1		09/08/19 16:15
2-Chlorotoluene	0.500	U	1.00	0.310	ug/L	1		09/08/19 16:15
2-Hexanone	5.00	U	10.0	3.10	ug/L	1		09/08/19 16:15
4-Chlorotoluene	0.500	U	1.00	0.310	ug/L	1		09/08/19 16:15
4-Isopropyltoluene	0.500	U	1.00	0.310	ug/L	1		09/08/19 16:15
4-Methyl-2-pentanone (MIBK)	5.00	U	10.0	3.10	ug/L	1		09/08/19 16:15
Benzene	0.200	U	0.400	0.120	ug/L	1		09/08/19 16:15
Bromobenzene	0.500	U	1.00	0.310	ug/L	1		09/08/19 16:15
Bromochloromethane	0.500	U	1.00	0.310	ug/L	1		09/08/19 16:15
Bromodichloromethane	0.250	U	0.500	0.150	ug/L	1		09/08/19 16:15
Bromoform	0.500	U	1.00	0.310	ug/L	1		09/08/19 16:15
Bromomethane	2.50	U	5.00	1.50	ug/L	1		09/08/19 16:15
Carbon disulfide	5.00	U	10.0	3.10	ug/L	1		09/08/19 16:15
Carbon tetrachloride	0.500	U	1.00	0.310	ug/L	1		09/08/19 16:15
Chlorobenzene	0.250	U	0.500	0.150	ug/L	1		09/08/19 16:15

J flagging is activated

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-1**

Client Sample ID: **RSE-1**
Client Project ID: **ARRC Healy Roundhouse GW**
Lab Sample ID: 1195054001
Lab Project ID: 1195054

Collection Date: 08/27/19 12:00
Received Date: 08/30/19 11:24
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Chloroethane	0.500	U	1.00	0.310	ug/L	1		09/08/19 16:15
Chloroform	0.500	U	1.00	0.310	ug/L	1		09/08/19 16:15
Chloromethane	0.500	U	1.00	0.310	ug/L	1		09/08/19 16:15
cis-1,2-Dichloroethene	0.500	U	1.00	0.310	ug/L	1		09/08/19 16:15
cis-1,3-Dichloropropene	0.250	U	0.500	0.150	ug/L	1		09/08/19 16:15
Dibromochloromethane	0.250	U	0.500	0.150	ug/L	1		09/08/19 16:15
Dibromomethane	0.500	U	1.00	0.310	ug/L	1		09/08/19 16:15
Dichlorodifluoromethane	0.500	U	1.00	0.310	ug/L	1		09/08/19 16:15
Ethylbenzene	0.500	U	1.00	0.310	ug/L	1		09/08/19 16:15
Freon-113	5.00	U	10.0	3.10	ug/L	1		09/08/19 16:15
Hexachlorobutadiene	0.500	U	1.00	0.310	ug/L	1		09/08/19 16:15
Isopropylbenzene (Cumene)	0.500	U	1.00	0.310	ug/L	1		09/08/19 16:15
Methylene chloride	2.50	U	5.00	1.00	ug/L	1		09/08/19 16:15
Methyl-t-butyl ether	5.00	U	10.0	3.10	ug/L	1		09/08/19 16:15
Naphthalene	0.500	U	1.00	0.310	ug/L	1		09/09/19 14:38
n-Butylbenzene	0.500	U	1.00	0.310	ug/L	1		09/08/19 16:15
n-Propylbenzene	0.500	U	1.00	0.310	ug/L	1		09/08/19 16:15
o-Xylene	0.500	U	1.00	0.310	ug/L	1		09/08/19 16:15
P & M -Xylene	1.00	U	2.00	0.620	ug/L	1		09/08/19 16:15
sec-Butylbenzene	0.500	U	1.00	0.310	ug/L	1		09/08/19 16:15
Styrene	0.500	U	1.00	0.310	ug/L	1		09/08/19 16:15
tert-Butylbenzene	0.500	U	1.00	0.310	ug/L	1		09/08/19 16:15
Tetrachloroethene	5.54		1.00	0.310	ug/L	1		09/08/19 16:15
Toluene	0.500	U	1.00	0.310	ug/L	1		09/08/19 16:15
trans-1,2-Dichloroethene	0.500	U	1.00	0.310	ug/L	1		09/08/19 16:15
trans-1,3-Dichloropropene	0.500	U	1.00	0.310	ug/L	1		09/08/19 16:15
Trichloroethene	0.500	U	1.00	0.310	ug/L	1		09/08/19 16:15
Trichlorofluoromethane	0.500	U	1.00	0.310	ug/L	1		09/08/19 16:15
Vinyl acetate	5.00	U	10.0	3.10	ug/L	1		09/08/19 16:15
Vinyl chloride	0.0750	U	0.150	0.0500	ug/L	1		09/08/19 16:15
Xylenes (total)	1.50	U	3.00	1.00	ug/L	1		09/08/19 16:15
Surrogates								
1,2-Dichloroethane-D4 (surr)	101		81-118		%	1		09/08/19 16:15
4-Bromofluorobenzene (surr)	98.1		85-114		%	1		09/08/19 16:15
Toluene-d8 (surr)	101		89-112		%	1		09/08/19 16:15

Print Date: 09/19/2019 8:21:03AM

J flagging is activated

Results of **RSE-1**

Client Sample ID: **RSE-1**
Client Project ID: **ARRC Healy Roundhouse GW**
Lab Sample ID: 1195054001
Lab Project ID: 1195054

Collection Date: 08/27/19 12:00
Received Date: 08/30/19 11:24
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS**

Batch Information

Analytical Batch: VMS19420
Analytical Method: SW8260C
Analyst: CMC
Analytical Date/Time: 09/09/19 14:38
Container ID: 1195054001-C

Prep Batch: VXX34836
Prep Method: SW5030B
Prep Date/Time: 09/09/19 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Analytical Batch: VMS19419
Analytical Method: SW8260C
Analyst: CMC
Analytical Date/Time: 09/08/19 16:15
Container ID: 1195054001-D

Prep Batch: VXX34833
Prep Method: SW5030B
Prep Date/Time: 09/08/19 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

J flagging is activated

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-2**

Client Sample ID: **RSE-2**
Client Project ID: **ARRC Healy Roundhouse GW**
Lab Sample ID: 1195054002
Lab Project ID: 1195054

Collection Date: 08/27/19 12:01
Received Date: 08/30/19 11:24
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	1.53		0.545	0.164	mg/L	1		09/11/19 16:39
Surrogates								
5a Androstane (surr)	85.3		50-150		%	1		09/11/19 16:39

Batch Information

Analytical Batch: XFC15315
Analytical Method: AK102
Analyst: CMS
Analytical Date/Time: 09/11/19 16:39
Container ID: 1195054002-G

Prep Batch: XXX42190
Prep Method: SW3520C
Prep Date/Time: 09/05/19 09:54
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	0.585		0.455	0.136	mg/L	1		09/11/19 16:39
Surrogates								
n-Triacontane-d62 (surr)	84.3		50-150		%	1		09/11/19 16:39

Batch Information

Analytical Batch: XFC15315
Analytical Method: AK103
Analyst: CMS
Analytical Date/Time: 09/11/19 16:39
Container ID: 1195054002-G

Prep Batch: XXX42190
Prep Method: SW3520C
Prep Date/Time: 09/05/19 09:54
Prep Initial Wt./Vol.: 275 mL
Prep Extract Vol: 1 mL

J flagging is activated

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-2**

Client Sample ID: **RSE-2**
Client Project ID: **ARRC Healy Roundhouse GW**
Lab Sample ID: 1195054002
Lab Project ID: 1195054

Collection Date: 08/27/19 12:01
Received Date: 08/30/19 11:24
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		09/09/19 06:48
Surrogates								
4-Bromofluorobenzene (surr)	87.9		50-150		%	1		09/09/19 06:48

Batch Information

Analytical Batch: VFC14916
Analytical Method: AK101
Analyst: NRB
Analytical Date/Time: 09/09/19 06:48
Container ID: 1195054002-F

Prep Batch: VXX34822
Prep Method: SW5030B
Prep Date/Time: 09/08/19 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Print Date: 09/19/2019 8:21:03AM

J flagging is activated

Results of **RSE-2**

Client Sample ID: **RSE-2**
Client Project ID: **ARRC Healy Roundhouse GW**
Lab Sample ID: 1195054002
Lab Project ID: 1195054

Collection Date: 08/27/19 12:01
Received Date: 08/30/19 11:24
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1,1,1,2-Tetrachloroethane	0.250	U	0.500	0.150	ug/L	1		09/08/19 16:30
1,1,1-Trichloroethane	0.500	U	1.00	0.310	ug/L	1		09/08/19 16:30
1,1,2,2-Tetrachloroethane	0.250	U	0.500	0.150	ug/L	1		09/08/19 16:30
1,1,2-Trichloroethane	0.200	U	0.400	0.120	ug/L	1		09/08/19 16:30
1,1-Dichloroethane	0.500	U	1.00	0.310	ug/L	1		09/08/19 16:30
1,1-Dichloroethene	0.500	U	1.00	0.310	ug/L	1		09/08/19 16:30
1,1-Dichloropropene	0.500	U	1.00	0.310	ug/L	1		09/08/19 16:30
1,2,3-Trichlorobenzene	0.500	U	1.00	0.310	ug/L	1		09/08/19 16:30
1,2,3-Trichloropropane	0.500	U	1.00	0.310	ug/L	1		09/08/19 16:30
1,2,4-Trichlorobenzene	0.500	U	1.00	0.310	ug/L	1		09/08/19 16:30
1,2,4-Trimethylbenzene	0.500	U	1.00	0.310	ug/L	1		09/08/19 16:30
1,2-Dibromo-3-chloropropane	5.00	U	10.0	3.10	ug/L	1		09/08/19 16:30
1,2-Dibromoethane	0.0375	U	0.0750	0.0180	ug/L	1		09/08/19 16:30
1,2-Dichlorobenzene	0.500	U	1.00	0.310	ug/L	1		09/08/19 16:30
1,2-Dichloroethane	0.250	U	0.500	0.150	ug/L	1		09/08/19 16:30
1,2-Dichloropropane	0.500	U	1.00	0.310	ug/L	1		09/08/19 16:30
1,3,5-Trimethylbenzene	0.500	U	1.00	0.310	ug/L	1		09/08/19 16:30
1,3-Dichlorobenzene	0.500	U	1.00	0.310	ug/L	1		09/08/19 16:30
1,3-Dichloropropane	0.250	U	0.500	0.150	ug/L	1		09/08/19 16:30
1,4-Dichlorobenzene	0.250	U	0.500	0.150	ug/L	1		09/08/19 16:30
2,2-Dichloropropane	0.500	U	1.00	0.310	ug/L	1		09/08/19 16:30
2-Butanone (MEK)	5.00	U	10.0	3.10	ug/L	1		09/08/19 16:30
2-Chlorotoluene	0.500	U	1.00	0.310	ug/L	1		09/08/19 16:30
2-Hexanone	5.00	U	10.0	3.10	ug/L	1		09/08/19 16:30
4-Chlorotoluene	0.500	U	1.00	0.310	ug/L	1		09/08/19 16:30
4-Isopropyltoluene	0.500	U	1.00	0.310	ug/L	1		09/08/19 16:30
4-Methyl-2-pentanone (MIBK)	5.00	U	10.0	3.10	ug/L	1		09/08/19 16:30
Benzene	0.200	U	0.400	0.120	ug/L	1		09/08/19 16:30
Bromobenzene	0.500	U	1.00	0.310	ug/L	1		09/08/19 16:30
Bromochloromethane	0.500	U	1.00	0.310	ug/L	1		09/08/19 16:30
Bromodichloromethane	0.250	U	0.500	0.150	ug/L	1		09/08/19 16:30
Bromoform	0.500	U	1.00	0.310	ug/L	1		09/08/19 16:30
Bromomethane	2.50	U	5.00	1.50	ug/L	1		09/08/19 16:30
Carbon disulfide	5.00	U	10.0	3.10	ug/L	1		09/08/19 16:30
Carbon tetrachloride	0.500	U	1.00	0.310	ug/L	1		09/08/19 16:30
Chlorobenzene	0.250	U	0.500	0.150	ug/L	1		09/08/19 16:30

J flagging is activated

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-2**

Client Sample ID: **RSE-2**
Client Project ID: **ARRC Healy Roundhouse GW**
Lab Sample ID: 1195054002
Lab Project ID: 1195054

Collection Date: 08/27/19 12:01
Received Date: 08/30/19 11:24
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Chloroethane	0.500	U	1.00	0.310	ug/L	1		09/08/19 16:30
Chloroform	0.450	J	1.00	0.310	ug/L	1		09/08/19 16:30
Chloromethane	0.500	U	1.00	0.310	ug/L	1		09/08/19 16:30
cis-1,2-Dichloroethene	0.500	U	1.00	0.310	ug/L	1		09/08/19 16:30
cis-1,3-Dichloropropene	0.250	U	0.500	0.150	ug/L	1		09/08/19 16:30
Dibromochloromethane	0.250	U	0.500	0.150	ug/L	1		09/08/19 16:30
Dibromomethane	0.500	U	1.00	0.310	ug/L	1		09/08/19 16:30
Dichlorodifluoromethane	0.500	U	1.00	0.310	ug/L	1		09/08/19 16:30
Ethylbenzene	0.500	U	1.00	0.310	ug/L	1		09/08/19 16:30
Freon-113	5.00	U	10.0	3.10	ug/L	1		09/08/19 16:30
Hexachlorobutadiene	0.500	U	1.00	0.310	ug/L	1		09/08/19 16:30
Isopropylbenzene (Cumene)	0.500	U	1.00	0.310	ug/L	1		09/08/19 16:30
Methylene chloride	2.50	U	5.00	1.00	ug/L	1		09/08/19 16:30
Methyl-t-butyl ether	5.00	U	10.0	3.10	ug/L	1		09/08/19 16:30
Naphthalene	0.500	U	1.00	0.310	ug/L	1		09/09/19 14:52
n-Butylbenzene	0.500	U	1.00	0.310	ug/L	1		09/08/19 16:30
n-Propylbenzene	0.500	U	1.00	0.310	ug/L	1		09/08/19 16:30
o-Xylene	0.500	U	1.00	0.310	ug/L	1		09/08/19 16:30
P & M -Xylene	1.00	U	2.00	0.620	ug/L	1		09/08/19 16:30
sec-Butylbenzene	0.500	U	1.00	0.310	ug/L	1		09/08/19 16:30
Styrene	0.500	U	1.00	0.310	ug/L	1		09/08/19 16:30
tert-Butylbenzene	0.500	U	1.00	0.310	ug/L	1		09/08/19 16:30
Tetrachloroethene	0.500	U	1.00	0.310	ug/L	1		09/08/19 16:30
Toluene	0.500	U	1.00	0.310	ug/L	1		09/08/19 16:30
trans-1,2-Dichloroethene	0.500	U	1.00	0.310	ug/L	1		09/08/19 16:30
trans-1,3-Dichloropropene	0.500	U	1.00	0.310	ug/L	1		09/08/19 16:30
Trichloroethene	0.500	U	1.00	0.310	ug/L	1		09/08/19 16:30
Trichlorofluoromethane	0.500	U	1.00	0.310	ug/L	1		09/08/19 16:30
Vinyl acetate	5.00	U	10.0	3.10	ug/L	1		09/08/19 16:30
Vinyl chloride	0.0750	U	0.150	0.0500	ug/L	1		09/08/19 16:30
Xylenes (total)	1.50	U	3.00	1.00	ug/L	1		09/08/19 16:30
Surrogates								
1,2-Dichloroethane-D4 (surr)	104		81-118		%	1		09/08/19 16:30
4-Bromofluorobenzene (surr)	99.3		85-114		%	1		09/08/19 16:30
Toluene-d8 (surr)	99.8		89-112		%	1		09/08/19 16:30

Print Date: 09/19/2019 8:21:03AM

J flagging is activated

Results of **RSE-2**

Client Sample ID: **RSE-2**
Client Project ID: **ARRC Healy Roundhouse GW**
Lab Sample ID: 1195054002
Lab Project ID: 1195054

Collection Date: 08/27/19 12:01
Received Date: 08/30/19 11:24
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS**

Batch Information

Analytical Batch: VMS19420
Analytical Method: SW8260C
Analyst: CMC
Analytical Date/Time: 09/09/19 14:52
Container ID: 1195054002-C

Prep Batch: VXX34836
Prep Method: SW5030B
Prep Date/Time: 09/09/19 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Analytical Batch: VMS19419
Analytical Method: SW8260C
Analyst: CMC
Analytical Date/Time: 09/08/19 16:30
Container ID: 1195054002-D

Prep Batch: VXX34833
Prep Method: SW5030B
Prep Date/Time: 09/08/19 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

J flagging is activated

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-3**

Client Sample ID: **RSE-3**
Client Project ID: **ARRC Healy Roundhouse GW**
Lab Sample ID: 1195054003
Lab Project ID: 1195054

Collection Date: 08/27/19 12:02
Received Date: 08/30/19 11:24
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	0.360	J	0.600	0.180	mg/L	1		09/11/19 16:49
Surrogates								
5a Androstane (surr)	92.7		50-150		%	1		09/11/19 16:49

Batch Information

Analytical Batch: XFC15315
Analytical Method: AK102
Analyst: CMS
Analytical Date/Time: 09/11/19 16:49
Container ID: 1195054003-G

Prep Batch: XXX42190
Prep Method: SW3520C
Prep Date/Time: 09/05/19 09:54
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	0.495	J	0.500	0.150	mg/L	1		09/11/19 16:49
Surrogates								
n-Triacontane-d62 (surr)	92.4		50-150		%	1		09/11/19 16:49

Batch Information

Analytical Batch: XFC15315
Analytical Method: AK103
Analyst: CMS
Analytical Date/Time: 09/11/19 16:49
Container ID: 1195054003-G

Prep Batch: XXX42190
Prep Method: SW3520C
Prep Date/Time: 09/05/19 09:54
Prep Initial Wt./Vol.: 250 mL
Prep Extract Vol: 1 mL

Print Date: 09/19/2019 8:21:03AM

J flagging is activated

Results of **RSE-3**

Client Sample ID: **RSE-3**
Client Project ID: **ARRC Healy Roundhouse GW**
Lab Sample ID: 1195054003
Lab Project ID: 1195054

Collection Date: 08/27/19 12:02
Received Date: 08/30/19 11:24
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		09/09/19 07:06
Surrogates								
4-Bromofluorobenzene (surr)	89.5		50-150		%	1		09/09/19 07:06

Batch Information

Analytical Batch: VFC14916
Analytical Method: AK101
Analyst: NRB
Analytical Date/Time: 09/09/19 07:06
Container ID: 1195054003-F

Prep Batch: VXX34822
Prep Method: SW5030B
Prep Date/Time: 09/08/19 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

J flagging is activated

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-3**

Client Sample ID: **RSE-3**
Client Project ID: **ARRC Healy Roundhouse GW**
Lab Sample ID: 1195054003
Lab Project ID: 1195054

Collection Date: 08/27/19 12:02
Received Date: 08/30/19 11:24
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1,1,1,2-Tetrachloroethane	0.250	U	0.500	0.150	ug/L	1		09/08/19 16:45
1,1,1-Trichloroethane	0.500	U	1.00	0.310	ug/L	1		09/08/19 16:45
1,1,2,2-Tetrachloroethane	0.250	U	0.500	0.150	ug/L	1		09/08/19 16:45
1,1,2-Trichloroethane	0.200	U	0.400	0.120	ug/L	1		09/08/19 16:45
1,1-Dichloroethane	0.500	U	1.00	0.310	ug/L	1		09/08/19 16:45
1,1-Dichloroethene	0.500	U	1.00	0.310	ug/L	1		09/08/19 16:45
1,1-Dichloropropene	0.500	U	1.00	0.310	ug/L	1		09/08/19 16:45
1,2,3-Trichlorobenzene	0.500	U	1.00	0.310	ug/L	1		09/08/19 16:45
1,2,3-Trichloropropane	0.500	U	1.00	0.310	ug/L	1		09/08/19 16:45
1,2,4-Trichlorobenzene	0.500	U	1.00	0.310	ug/L	1		09/08/19 16:45
1,2,4-Trimethylbenzene	0.500	U	1.00	0.310	ug/L	1		09/08/19 16:45
1,2-Dibromo-3-chloropropane	5.00	U	10.0	3.10	ug/L	1		09/08/19 16:45
1,2-Dibromoethane	0.0375	U	0.0750	0.0180	ug/L	1		09/08/19 16:45
1,2-Dichlorobenzene	0.500	U	1.00	0.310	ug/L	1		09/08/19 16:45
1,2-Dichloroethane	0.250	U	0.500	0.150	ug/L	1		09/08/19 16:45
1,2-Dichloropropane	0.500	U	1.00	0.310	ug/L	1		09/08/19 16:45
1,3,5-Trimethylbenzene	0.500	U	1.00	0.310	ug/L	1		09/08/19 16:45
1,3-Dichlorobenzene	0.500	U	1.00	0.310	ug/L	1		09/08/19 16:45
1,3-Dichloropropane	0.250	U	0.500	0.150	ug/L	1		09/08/19 16:45
1,4-Dichlorobenzene	0.250	U	0.500	0.150	ug/L	1		09/08/19 16:45
2,2-Dichloropropane	0.500	U	1.00	0.310	ug/L	1		09/08/19 16:45
2-Butanone (MEK)	5.00	U	10.0	3.10	ug/L	1		09/08/19 16:45
2-Chlorotoluene	0.500	U	1.00	0.310	ug/L	1		09/08/19 16:45
2-Hexanone	5.00	U	10.0	3.10	ug/L	1		09/08/19 16:45
4-Chlorotoluene	0.500	U	1.00	0.310	ug/L	1		09/08/19 16:45
4-Isopropyltoluene	0.500	U	1.00	0.310	ug/L	1		09/08/19 16:45
4-Methyl-2-pentanone (MIBK)	5.00	U	10.0	3.10	ug/L	1		09/08/19 16:45
Benzene	0.200	U	0.400	0.120	ug/L	1		09/08/19 16:45
Bromobenzene	0.500	U	1.00	0.310	ug/L	1		09/08/19 16:45
Bromochloromethane	0.500	U	1.00	0.310	ug/L	1		09/08/19 16:45
Bromodichloromethane	0.250	U	0.500	0.150	ug/L	1		09/08/19 16:45
Bromoform	0.500	U	1.00	0.310	ug/L	1		09/08/19 16:45
Bromomethane	2.50	U	5.00	1.50	ug/L	1		09/08/19 16:45
Carbon disulfide	5.00	U	10.0	3.10	ug/L	1		09/08/19 16:45
Carbon tetrachloride	0.500	U	1.00	0.310	ug/L	1		09/08/19 16:45
Chlorobenzene	0.250	U	0.500	0.150	ug/L	1		09/08/19 16:45

J flagging is activated

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-3**

Client Sample ID: **RSE-3**
Client Project ID: **ARRC Healy Roundhouse GW**
Lab Sample ID: 1195054003
Lab Project ID: 1195054

Collection Date: 08/27/19 12:02
Received Date: 08/30/19 11:24
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Chloroethane	0.500	U	1.00	0.310	ug/L	1		09/08/19 16:45
Chloroform	0.500	U	1.00	0.310	ug/L	1		09/08/19 16:45
Chloromethane	0.500	U	1.00	0.310	ug/L	1		09/08/19 16:45
cis-1,2-Dichloroethene	0.500	U	1.00	0.310	ug/L	1		09/08/19 16:45
cis-1,3-Dichloropropene	0.250	U	0.500	0.150	ug/L	1		09/08/19 16:45
Dibromochloromethane	0.250	U	0.500	0.150	ug/L	1		09/08/19 16:45
Dibromomethane	0.500	U	1.00	0.310	ug/L	1		09/08/19 16:45
Dichlorodifluoromethane	0.500	U	1.00	0.310	ug/L	1		09/08/19 16:45
Ethylbenzene	0.500	U	1.00	0.310	ug/L	1		09/08/19 16:45
Freon-113	5.00	U	10.0	3.10	ug/L	1		09/08/19 16:45
Hexachlorobutadiene	0.500	U	1.00	0.310	ug/L	1		09/08/19 16:45
Isopropylbenzene (Cumene)	0.500	U	1.00	0.310	ug/L	1		09/08/19 16:45
Methylene chloride	2.50	U	5.00	1.00	ug/L	1		09/08/19 16:45
Methyl-t-butyl ether	5.00	U	10.0	3.10	ug/L	1		09/08/19 16:45
Naphthalene	0.500	U	1.00	0.310	ug/L	1		09/09/19 15:07
n-Butylbenzene	0.500	U	1.00	0.310	ug/L	1		09/08/19 16:45
n-Propylbenzene	0.500	U	1.00	0.310	ug/L	1		09/08/19 16:45
o-Xylene	0.500	U	1.00	0.310	ug/L	1		09/08/19 16:45
P & M -Xylene	1.00	U	2.00	0.620	ug/L	1		09/08/19 16:45
sec-Butylbenzene	0.500	U	1.00	0.310	ug/L	1		09/08/19 16:45
Styrene	0.500	U	1.00	0.310	ug/L	1		09/08/19 16:45
tert-Butylbenzene	0.500	U	1.00	0.310	ug/L	1		09/08/19 16:45
Tetrachloroethene	0.500	U	1.00	0.310	ug/L	1		09/08/19 16:45
Toluene	0.500	U	1.00	0.310	ug/L	1		09/08/19 16:45
trans-1,2-Dichloroethene	0.500	U	1.00	0.310	ug/L	1		09/08/19 16:45
trans-1,3-Dichloropropene	0.500	U	1.00	0.310	ug/L	1		09/08/19 16:45
Trichloroethene	4.32		1.00	0.310	ug/L	1		09/08/19 16:45
Trichlorofluoromethane	0.500	U	1.00	0.310	ug/L	1		09/08/19 16:45
Vinyl acetate	5.00	U	10.0	3.10	ug/L	1		09/08/19 16:45
Vinyl chloride	0.0750	U	0.150	0.0500	ug/L	1		09/08/19 16:45
Xylenes (total)	1.50	U	3.00	1.00	ug/L	1		09/08/19 16:45
Surrogates								
1,2-Dichloroethane-D4 (surr)	103		81-118		%	1		09/08/19 16:45
4-Bromofluorobenzene (surr)	98.6		85-114		%	1		09/08/19 16:45
Toluene-d8 (surr)	101		89-112		%	1		09/08/19 16:45

Print Date: 09/19/2019 8:21:03AM

J flagging is activated

Results of **RSE-3**

Client Sample ID: **RSE-3**
Client Project ID: **ARRC Healy Roundhouse GW**
Lab Sample ID: 1195054003
Lab Project ID: 1195054

Collection Date: 08/27/19 12:02
Received Date: 08/30/19 11:24
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS**

Batch Information

Analytical Batch: VMS19420
Analytical Method: SW8260C
Analyst: CMC
Analytical Date/Time: 09/09/19 15:07
Container ID: 1195054003-C

Prep Batch: VXX34836
Prep Method: SW5030B
Prep Date/Time: 09/09/19 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Analytical Batch: VMS19419
Analytical Method: SW8260C
Analyst: CMC
Analytical Date/Time: 09/08/19 16:45
Container ID: 1195054003-D

Prep Batch: VXX34833
Prep Method: SW5030B
Prep Date/Time: 09/08/19 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

J flagging is activated

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 **MW-4**

Client Sample ID: **MW-4**
Client Project ID: **ARRC Healy Roundhouse GW**
Lab Sample ID: 1195054004
Lab Project ID: 1195054

Collection Date: 08/27/19 10:45
Received Date: 08/30/19 11:24
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	0.224	J	0.577	0.173	mg/L	1		09/11/19 16:59
Surrogates								
5a Androstane (surr)	92.3		50-150		%	1		09/11/19 16:59

Batch Information

Analytical Batch: XFC15315
Analytical Method: AK102
Analyst: CMS
Analytical Date/Time: 09/11/19 16:59
Container ID: 1195054004-G

Prep Batch: XXX42190
Prep Method: SW3520C
Prep Date/Time: 09/05/19 09:54
Prep Initial Wt./Vol.: 260 mL
Prep Extract Vol: 1 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Residual Range Organics	0.386	J	0.481	0.144	mg/L	1		09/11/19 16:59
Surrogates								
n-Triacontane-d62 (surr)	92.3		50-150		%	1		09/11/19 16:59

Batch Information

Analytical Batch: XFC15315
Analytical Method: AK103
Analyst: CMS
Analytical Date/Time: 09/11/19 16:59
Container ID: 1195054004-G

Prep Batch: XXX42190
Prep Method: SW3520C
Prep Date/Time: 09/05/19 09:54
Prep Initial Wt./Vol.: 260 mL
Prep Extract Vol: 1 mL

Print Date: 09/19/2019 8:21:03AM

J flagging is activated

Results of **MW-4**

Client Sample ID: **MW-4**
Client Project ID: **ARRC Healy Roundhouse GW**
Lab Sample ID: 1195054004
Lab Project ID: 1195054

Collection Date: 08/27/19 10:45
Received Date: 08/30/19 11:24
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		09/09/19 07:23
Surrogates								
4-Bromofluorobenzene (surr)	89.7		50-150		%	1		09/09/19 07:23

Batch Information

Analytical Batch: VFC14916
Analytical Method: AK101
Analyst: NRB
Analytical Date/Time: 09/09/19 07:23
Container ID: 1195054004-F

Prep Batch: VXX34822
Prep Method: SW5030B
Prep Date/Time: 09/08/19 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

J flagging is activated

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 **MW-4**

Client Sample ID: **MW-4**
Client Project ID: **ARRC Healy Roundhouse GW**
Lab Sample ID: 1195054004
Lab Project ID: 1195054

Collection Date: 08/27/19 10:45
Received Date: 08/30/19 11:24
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1,1,1,2-Tetrachloroethane	0.250	U	0.500	0.150	ug/L	1		09/08/19 16:59
1,1,1-Trichloroethane	0.500	U	1.00	0.310	ug/L	1		09/08/19 16:59
1,1,2,2-Tetrachloroethane	0.250	U	0.500	0.150	ug/L	1		09/08/19 16:59
1,1,2-Trichloroethane	0.200	U	0.400	0.120	ug/L	1		09/08/19 16:59
1,1-Dichloroethane	0.500	U	1.00	0.310	ug/L	1		09/08/19 16:59
1,1-Dichloroethene	0.500	U	1.00	0.310	ug/L	1		09/08/19 16:59
1,1-Dichloropropene	0.500	U	1.00	0.310	ug/L	1		09/08/19 16:59
1,2,3-Trichlorobenzene	0.500	U	1.00	0.310	ug/L	1		09/08/19 16:59
1,2,3-Trichloropropane	0.500	U	1.00	0.310	ug/L	1		09/08/19 16:59
1,2,4-Trichlorobenzene	0.500	U	1.00	0.310	ug/L	1		09/08/19 16:59
1,2,4-Trimethylbenzene	0.500	U	1.00	0.310	ug/L	1		09/08/19 16:59
1,2-Dibromo-3-chloropropane	5.00	U	10.0	3.10	ug/L	1		09/08/19 16:59
1,2-Dibromoethane	0.0375	U	0.0750	0.0180	ug/L	1		09/08/19 16:59
1,2-Dichlorobenzene	0.500	U	1.00	0.310	ug/L	1		09/08/19 16:59
1,2-Dichloroethane	0.250	U	0.500	0.150	ug/L	1		09/08/19 16:59
1,2-Dichloropropane	0.500	U	1.00	0.310	ug/L	1		09/08/19 16:59
1,3,5-Trimethylbenzene	0.500	U	1.00	0.310	ug/L	1		09/08/19 16:59
1,3-Dichlorobenzene	0.500	U	1.00	0.310	ug/L	1		09/08/19 16:59
1,3-Dichloropropane	0.250	U	0.500	0.150	ug/L	1		09/08/19 16:59
1,4-Dichlorobenzene	0.250	U	0.500	0.150	ug/L	1		09/08/19 16:59
2,2-Dichloropropane	0.500	U	1.00	0.310	ug/L	1		09/08/19 16:59
2-Butanone (MEK)	5.00	U	10.0	3.10	ug/L	1		09/08/19 16:59
2-Chlorotoluene	0.500	U	1.00	0.310	ug/L	1		09/08/19 16:59
2-Hexanone	5.00	U	10.0	3.10	ug/L	1		09/08/19 16:59
4-Chlorotoluene	0.500	U	1.00	0.310	ug/L	1		09/08/19 16:59
4-Isopropyltoluene	0.500	U	1.00	0.310	ug/L	1		09/08/19 16:59
4-Methyl-2-pentanone (MIBK)	5.00	U	10.0	3.10	ug/L	1		09/08/19 16:59
Benzene	0.200	U	0.400	0.120	ug/L	1		09/08/19 16:59
Bromobenzene	0.500	U	1.00	0.310	ug/L	1		09/08/19 16:59
Bromochloromethane	0.500	U	1.00	0.310	ug/L	1		09/08/19 16:59
Bromodichloromethane	0.250	U	0.500	0.150	ug/L	1		09/08/19 16:59
Bromoform	0.500	U	1.00	0.310	ug/L	1		09/08/19 16:59
Bromomethane	2.50	U	5.00	1.50	ug/L	1		09/08/19 16:59
Carbon disulfide	5.00	U	10.0	3.10	ug/L	1		09/08/19 16:59
Carbon tetrachloride	0.500	U	1.00	0.310	ug/L	1		09/08/19 16:59
Chlorobenzene	0.250	U	0.500	0.150	ug/L	1		09/08/19 16:59

J flagging is activated

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 **MW-4**

Client Sample ID: **MW-4**
Client Project ID: **ARRC Healy Roundhouse GW**
Lab Sample ID: 1195054004
Lab Project ID: 1195054

Collection Date: 08/27/19 10:45
Received Date: 08/30/19 11:24
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Chloroethane	0.500	U	1.00	0.310	ug/L	1		09/08/19 16:59
Chloroform	0.460	J	1.00	0.310	ug/L	1		09/08/19 16:59
Chloromethane	0.500	U	1.00	0.310	ug/L	1		09/08/19 16:59
cis-1,2-Dichloroethene	0.500	U	1.00	0.310	ug/L	1		09/08/19 16:59
cis-1,3-Dichloropropene	0.250	U	0.500	0.150	ug/L	1		09/08/19 16:59
Dibromochloromethane	0.250	U	0.500	0.150	ug/L	1		09/08/19 16:59
Dibromomethane	0.500	U	1.00	0.310	ug/L	1		09/08/19 16:59
Dichlorodifluoromethane	0.500	U	1.00	0.310	ug/L	1		09/08/19 16:59
Ethylbenzene	0.500	U	1.00	0.310	ug/L	1		09/08/19 16:59
Freon-113	5.00	U	10.0	3.10	ug/L	1		09/08/19 16:59
Hexachlorobutadiene	0.500	U	1.00	0.310	ug/L	1		09/08/19 16:59
Isopropylbenzene (Cumene)	0.500	U	1.00	0.310	ug/L	1		09/08/19 16:59
Methylene chloride	2.50	U	5.00	1.00	ug/L	1		09/08/19 16:59
Methyl-t-butyl ether	5.00	U	10.0	3.10	ug/L	1		09/08/19 16:59
Naphthalene	0.500	U	1.00	0.310	ug/L	1		09/09/19 15:22
n-Butylbenzene	0.500	U	1.00	0.310	ug/L	1		09/08/19 16:59
n-Propylbenzene	0.500	U	1.00	0.310	ug/L	1		09/08/19 16:59
o-Xylene	0.500	U	1.00	0.310	ug/L	1		09/08/19 16:59
P & M -Xylene	1.00	U	2.00	0.620	ug/L	1		09/08/19 16:59
sec-Butylbenzene	0.500	U	1.00	0.310	ug/L	1		09/08/19 16:59
Styrene	0.500	U	1.00	0.310	ug/L	1		09/08/19 16:59
tert-Butylbenzene	0.500	U	1.00	0.310	ug/L	1		09/08/19 16:59
Tetrachloroethene	0.500	U	1.00	0.310	ug/L	1		09/08/19 16:59
Toluene	0.500	U	1.00	0.310	ug/L	1		09/08/19 16:59
trans-1,2-Dichloroethene	0.500	U	1.00	0.310	ug/L	1		09/08/19 16:59
trans-1,3-Dichloropropene	0.500	U	1.00	0.310	ug/L	1		09/08/19 16:59
Trichloroethene	0.500	U	1.00	0.310	ug/L	1		09/08/19 16:59
Trichlorofluoromethane	0.500	U	1.00	0.310	ug/L	1		09/08/19 16:59
Vinyl acetate	5.00	U	10.0	3.10	ug/L	1		09/08/19 16:59
Vinyl chloride	0.0750	U	0.150	0.0500	ug/L	1		09/08/19 16:59
Xylenes (total)	1.50	U	3.00	1.00	ug/L	1		09/08/19 16:59
Surrogates								
1,2-Dichloroethane-D4 (surr)	104		81-118		%	1		09/08/19 16:59
4-Bromofluorobenzene (surr)	97.5		85-114		%	1		09/08/19 16:59
Toluene-d8 (surr)	101		89-112		%	1		09/08/19 16:59

Print Date: 09/19/2019 8:21:03AM

J flagging is activated

Results of **MW-4**

Client Sample ID: **MW-4**
Client Project ID: **ARRC Healy Roundhouse GW**
Lab Sample ID: 1195054004
Lab Project ID: 1195054

Collection Date: 08/27/19 10:45
Received Date: 08/30/19 11:24
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS**

Batch Information

Analytical Batch: VMS19420
Analytical Method: SW8260C
Analyst: CMC
Analytical Date/Time: 09/09/19 15:22
Container ID: 1195054004-C

Prep Batch: VXX34836
Prep Method: SW5030B
Prep Date/Time: 09/09/19 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Analytical Batch: VMS19419
Analytical Method: SW8260C
Analyst: CMC
Analytical Date/Time: 09/08/19 16:59
Container ID: 1195054004-D

Prep Batch: VXX34833
Prep Method: SW5030B
Prep Date/Time: 09/08/19 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

J flagging is activated

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 **MW-5**

Client Sample ID: **MW-5**
Client Project ID: **ARRC Healy Roundhouse GW**
Lab Sample ID: 1195054005
Lab Project ID: 1195054

Collection Date: 08/27/19 11:24
Received Date: 08/30/19 11:24
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	0.352	J	0.577	0.173	mg/L	1		09/11/19 17:09
Surrogates								
5a Androstane (surr)	83.3		50-150		%	1		09/11/19 17:09

Batch Information

Analytical Batch: XFC15315
Analytical Method: AK102
Analyst: CMS
Analytical Date/Time: 09/11/19 17:09
Container ID: 1195054005-G

Prep Batch: XXX42190
Prep Method: SW3520C
Prep Date/Time: 09/05/19 09:54
Prep Initial Wt./Vol.: 260 mL
Prep Extract Vol: 1 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Residual Range Organics	0.426	J	0.481	0.144	mg/L	1		09/11/19 17:09
Surrogates								
n-Triacontane-d62 (surr)	84.3		50-150		%	1		09/11/19 17:09

Batch Information

Analytical Batch: XFC15315
Analytical Method: AK103
Analyst: CMS
Analytical Date/Time: 09/11/19 17:09
Container ID: 1195054005-G

Prep Batch: XXX42190
Prep Method: SW3520C
Prep Date/Time: 09/05/19 09:54
Prep Initial Wt./Vol.: 260 mL
Prep Extract Vol: 1 mL

Print Date: 09/19/2019 8:21:03AM

J flagging is activated

Results of **MW-5**

Client Sample ID: **MW-5**
Client Project ID: **ARRC Healy Roundhouse GW**
Lab Sample ID: 1195054005
Lab Project ID: 1195054

Collection Date: 08/27/19 11:24
Received Date: 08/30/19 11:24
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		09/09/19 07:41
Surrogates								
4-Bromofluorobenzene (surr)	87.4		50-150		%	1		09/09/19 07:41

Batch Information

Analytical Batch: VFC14916
Analytical Method: AK101
Analyst: NRB
Analytical Date/Time: 09/09/19 07:41
Container ID: 1195054005-F

Prep Batch: VXX34822
Prep Method: SW5030B
Prep Date/Time: 09/08/19 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

J flagging is activated

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 **MW-5**

Client Sample ID: **MW-5**
Client Project ID: **ARRC Healy Roundhouse GW**
Lab Sample ID: 1195054005
Lab Project ID: 1195054

Collection Date: 08/27/19 11:24
Received Date: 08/30/19 11:24
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1,1,1,2-Tetrachloroethane	0.250	U	0.500	0.150	ug/L	1		09/08/19 17:14
1,1,1-Trichloroethane	0.500	U	1.00	0.310	ug/L	1		09/08/19 17:14
1,1,2,2-Tetrachloroethane	0.250	U	0.500	0.150	ug/L	1		09/08/19 17:14
1,1,2-Trichloroethane	0.200	U	0.400	0.120	ug/L	1		09/08/19 17:14
1,1-Dichloroethane	0.500	U	1.00	0.310	ug/L	1		09/08/19 17:14
1,1-Dichloroethene	0.500	U	1.00	0.310	ug/L	1		09/08/19 17:14
1,1-Dichloropropene	0.500	U	1.00	0.310	ug/L	1		09/08/19 17:14
1,2,3-Trichlorobenzene	0.500	U	1.00	0.310	ug/L	1		09/08/19 17:14
1,2,3-Trichloropropane	0.500	U	1.00	0.310	ug/L	1		09/08/19 17:14
1,2,4-Trichlorobenzene	0.500	U	1.00	0.310	ug/L	1		09/08/19 17:14
1,2,4-Trimethylbenzene	0.500	U	1.00	0.310	ug/L	1		09/08/19 17:14
1,2-Dibromo-3-chloropropane	5.00	U	10.0	3.10	ug/L	1		09/08/19 17:14
1,2-Dibromoethane	0.0375	U	0.0750	0.0180	ug/L	1		09/08/19 17:14
1,2-Dichlorobenzene	0.500	U	1.00	0.310	ug/L	1		09/08/19 17:14
1,2-Dichloroethane	0.250	U	0.500	0.150	ug/L	1		09/08/19 17:14
1,2-Dichloropropane	0.500	U	1.00	0.310	ug/L	1		09/08/19 17:14
1,3,5-Trimethylbenzene	0.500	U	1.00	0.310	ug/L	1		09/08/19 17:14
1,3-Dichlorobenzene	0.500	U	1.00	0.310	ug/L	1		09/08/19 17:14
1,3-Dichloropropane	0.250	U	0.500	0.150	ug/L	1		09/08/19 17:14
1,4-Dichlorobenzene	0.250	U	0.500	0.150	ug/L	1		09/08/19 17:14
2,2-Dichloropropane	0.500	U	1.00	0.310	ug/L	1		09/08/19 17:14
2-Butanone (MEK)	5.00	U	10.0	3.10	ug/L	1		09/08/19 17:14
2-Chlorotoluene	0.500	U	1.00	0.310	ug/L	1		09/08/19 17:14
2-Hexanone	5.00	U	10.0	3.10	ug/L	1		09/08/19 17:14
4-Chlorotoluene	0.500	U	1.00	0.310	ug/L	1		09/08/19 17:14
4-Isopropyltoluene	0.500	U	1.00	0.310	ug/L	1		09/08/19 17:14
4-Methyl-2-pentanone (MIBK)	5.00	U	10.0	3.10	ug/L	1		09/08/19 17:14
Benzene	0.200	U	0.400	0.120	ug/L	1		09/08/19 17:14
Bromobenzene	0.500	U	1.00	0.310	ug/L	1		09/08/19 17:14
Bromochloromethane	0.500	U	1.00	0.310	ug/L	1		09/08/19 17:14
Bromodichloromethane	0.250	U	0.500	0.150	ug/L	1		09/08/19 17:14
Bromoform	0.500	U	1.00	0.310	ug/L	1		09/08/19 17:14
Bromomethane	2.50	U	5.00	1.50	ug/L	1		09/08/19 17:14
Carbon disulfide	5.00	U	10.0	3.10	ug/L	1		09/08/19 17:14
Carbon tetrachloride	0.500	U	1.00	0.310	ug/L	1		09/08/19 17:14
Chlorobenzene	0.250	U	0.500	0.150	ug/L	1		09/08/19 17:14

J flagging is activated

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 **MW-5**

Client Sample ID: **MW-5**
Client Project ID: **ARRC Healy Roundhouse GW**
Lab Sample ID: 1195054005
Lab Project ID: 1195054

Collection Date: 08/27/19 11:24
Received Date: 08/30/19 11:24
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Chloroethane	0.500	U	1.00	0.310	ug/L	1		09/08/19 17:14
Chloroform	0.500	U	1.00	0.310	ug/L	1		09/08/19 17:14
Chloromethane	0.500	U	1.00	0.310	ug/L	1		09/08/19 17:14
cis-1,2-Dichloroethene	0.500	U	1.00	0.310	ug/L	1		09/08/19 17:14
cis-1,3-Dichloropropene	0.250	U	0.500	0.150	ug/L	1		09/08/19 17:14
Dibromochloromethane	0.250	U	0.500	0.150	ug/L	1		09/08/19 17:14
Dibromomethane	0.500	U	1.00	0.310	ug/L	1		09/08/19 17:14
Dichlorodifluoromethane	0.500	U	1.00	0.310	ug/L	1		09/08/19 17:14
Ethylbenzene	0.500	U	1.00	0.310	ug/L	1		09/08/19 17:14
Freon-113	5.00	U	10.0	3.10	ug/L	1		09/08/19 17:14
Hexachlorobutadiene	0.500	U	1.00	0.310	ug/L	1		09/08/19 17:14
Isopropylbenzene (Cumene)	0.500	U	1.00	0.310	ug/L	1		09/08/19 17:14
Methylene chloride	2.50	U	5.00	1.00	ug/L	1		09/08/19 17:14
Methyl-t-butyl ether	5.00	U	10.0	3.10	ug/L	1		09/08/19 17:14
Naphthalene	0.500	U	1.00	0.310	ug/L	1		09/08/19 17:14
n-Butylbenzene	0.500	U	1.00	0.310	ug/L	1		09/08/19 17:14
n-Propylbenzene	0.500	U	1.00	0.310	ug/L	1		09/08/19 17:14
o-Xylene	0.500	U	1.00	0.310	ug/L	1		09/08/19 17:14
P & M -Xylene	1.00	U	2.00	0.620	ug/L	1		09/08/19 17:14
sec-Butylbenzene	0.500	U	1.00	0.310	ug/L	1		09/08/19 17:14
Styrene	0.500	U	1.00	0.310	ug/L	1		09/08/19 17:14
tert-Butylbenzene	0.500	U	1.00	0.310	ug/L	1		09/08/19 17:14
Tetrachloroethene	0.500	U	1.00	0.310	ug/L	1		09/08/19 17:14
Toluene	0.500	U	1.00	0.310	ug/L	1		09/08/19 17:14
trans-1,2-Dichloroethene	0.500	U	1.00	0.310	ug/L	1		09/08/19 17:14
trans-1,3-Dichloropropene	0.500	U	1.00	0.310	ug/L	1		09/08/19 17:14
Trichloroethene	0.500	U	1.00	0.310	ug/L	1		09/08/19 17:14
Trichlorofluoromethane	0.500	U	1.00	0.310	ug/L	1		09/08/19 17:14
Vinyl acetate	5.00	U	10.0	3.10	ug/L	1		09/08/19 17:14
Vinyl chloride	0.0750	U	0.150	0.0500	ug/L	1		09/08/19 17:14
Xylenes (total)	1.50	U	3.00	1.00	ug/L	1		09/08/19 17:14
Surrogates								
1,2-Dichloroethane-D4 (surr)	107		81-118		%	1		09/08/19 17:14
4-Bromofluorobenzene (surr)	100		85-114		%	1		09/08/19 17:14
Toluene-d8 (surr)	101		89-112		%	1		09/08/19 17:14

Print Date: 09/19/2019 8:21:03AM

J flagging is activated

Results of **MW-5**

Client Sample ID: **MW-5**
Client Project ID: **ARRC Healy Roundhouse GW**
Lab Sample ID: 1195054005
Lab Project ID: 1195054

Collection Date: 08/27/19 11:24
Received Date: 08/30/19 11:24
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS**

Batch Information

Analytical Batch: VMS19419
Analytical Method: SW8260C
Analyst: CMC
Analytical Date/Time: 09/08/19 17:14
Container ID: 1195054005-D

Prep Batch: VXX34833
Prep Method: SW5030B
Prep Date/Time: 09/08/19 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Print Date: 09/19/2019 8:21:03AM

J flagging is activated

Results of **MW-6**

Client Sample ID: **MW-6**
Client Project ID: **ARRC Healy Roundhouse GW**
Lab Sample ID: 1195054006
Lab Project ID: 1195054

Collection Date: 08/27/19 12:00
Received Date: 08/30/19 11:24
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	0.254	J	0.577	0.173	mg/L	1		09/11/19 17:19
Surrogates								
5a Androstane (surr)	84.6		50-150		%	1		09/11/19 17:19

Batch Information

Analytical Batch: XFC15315
Analytical Method: AK102
Analyst: CMS
Analytical Date/Time: 09/11/19 17:19
Container ID: 1195054006-G

Prep Batch: XXX42190
Prep Method: SW3520C
Prep Date/Time: 09/05/19 09:54
Prep Initial Wt./Vol.: 260 mL
Prep Extract Vol: 1 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Residual Range Organics	0.386	J	0.481	0.144	mg/L	1		09/11/19 17:19
Surrogates								
n-Triacontane-d62 (surr)	85.2		50-150		%	1		09/11/19 17:19

Batch Information

Analytical Batch: XFC15315
Analytical Method: AK103
Analyst: CMS
Analytical Date/Time: 09/11/19 17:19
Container ID: 1195054006-G

Prep Batch: XXX42190
Prep Method: SW3520C
Prep Date/Time: 09/05/19 09:54
Prep Initial Wt./Vol.: 260 mL
Prep Extract Vol: 1 mL

Print Date: 09/19/2019 8:21:03AM

J flagging is activated

Results of **MW-6**

Client Sample ID: **MW-6**
Client Project ID: **ARRC Healy Roundhouse GW**
Lab Sample ID: 1195054006
Lab Project ID: 1195054

Collection Date: 08/27/19 12:00
Received Date: 08/30/19 11:24
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		09/09/19 07:59
Surrogates								
4-Bromofluorobenzene (surr)	84.4		50-150		%	1		09/09/19 07:59

Batch Information

Analytical Batch: VFC14916
Analytical Method: AK101
Analyst: NRB
Analytical Date/Time: 09/09/19 07:59
Container ID: 1195054006-F

Prep Batch: VXX34822
Prep Method: SW5030B
Prep Date/Time: 09/08/19 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

J flagging is activated

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 **MW-6**

Client Sample ID: **MW-6**
Client Project ID: **ARRC Healy Roundhouse GW**
Lab Sample ID: 1195054006
Lab Project ID: 1195054

Collection Date: 08/27/19 12:00
Received Date: 08/30/19 11:24
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1,1,1,2-Tetrachloroethane	0.250	U	0.500	0.150	ug/L	1		09/08/19 17:29
1,1,1-Trichloroethane	0.500	U	1.00	0.310	ug/L	1		09/08/19 17:29
1,1,2,2-Tetrachloroethane	0.250	U	0.500	0.150	ug/L	1		09/08/19 17:29
1,1,2-Trichloroethane	0.200	U	0.400	0.120	ug/L	1		09/08/19 17:29
1,1-Dichloroethane	0.500	U	1.00	0.310	ug/L	1		09/08/19 17:29
1,1-Dichloroethene	0.500	U	1.00	0.310	ug/L	1		09/08/19 17:29
1,1-Dichloropropene	0.500	U	1.00	0.310	ug/L	1		09/08/19 17:29
1,2,3-Trichlorobenzene	0.500	U	1.00	0.310	ug/L	1		09/08/19 17:29
1,2,3-Trichloropropane	0.500	U	1.00	0.310	ug/L	1		09/08/19 17:29
1,2,4-Trichlorobenzene	0.500	U	1.00	0.310	ug/L	1		09/08/19 17:29
1,2,4-Trimethylbenzene	0.500	U	1.00	0.310	ug/L	1		09/08/19 17:29
1,2-Dibromo-3-chloropropane	5.00	U	10.0	3.10	ug/L	1		09/08/19 17:29
1,2-Dibromoethane	0.0375	U	0.0750	0.0180	ug/L	1		09/08/19 17:29
1,2-Dichlorobenzene	0.500	U	1.00	0.310	ug/L	1		09/08/19 17:29
1,2-Dichloroethane	0.250	U	0.500	0.150	ug/L	1		09/08/19 17:29
1,2-Dichloropropane	0.500	U	1.00	0.310	ug/L	1		09/08/19 17:29
1,3,5-Trimethylbenzene	0.500	U	1.00	0.310	ug/L	1		09/08/19 17:29
1,3-Dichlorobenzene	0.500	U	1.00	0.310	ug/L	1		09/08/19 17:29
1,3-Dichloropropane	0.250	U	0.500	0.150	ug/L	1		09/08/19 17:29
1,4-Dichlorobenzene	0.250	U	0.500	0.150	ug/L	1		09/08/19 17:29
2,2-Dichloropropane	0.500	U	1.00	0.310	ug/L	1		09/08/19 17:29
2-Butanone (MEK)	5.00	U	10.0	3.10	ug/L	1		09/08/19 17:29
2-Chlorotoluene	0.500	U	1.00	0.310	ug/L	1		09/08/19 17:29
2-Hexanone	5.00	U	10.0	3.10	ug/L	1		09/08/19 17:29
4-Chlorotoluene	0.500	U	1.00	0.310	ug/L	1		09/08/19 17:29
4-Isopropyltoluene	0.500	U	1.00	0.310	ug/L	1		09/08/19 17:29
4-Methyl-2-pentanone (MIBK)	5.00	U	10.0	3.10	ug/L	1		09/08/19 17:29
Benzene	0.200	U	0.400	0.120	ug/L	1		09/08/19 17:29
Bromobenzene	0.500	U	1.00	0.310	ug/L	1		09/08/19 17:29
Bromochloromethane	0.500	U	1.00	0.310	ug/L	1		09/08/19 17:29
Bromodichloromethane	0.250	U	0.500	0.150	ug/L	1		09/08/19 17:29
Bromoform	0.500	U	1.00	0.310	ug/L	1		09/08/19 17:29
Bromomethane	2.50	U	5.00	1.50	ug/L	1		09/08/19 17:29
Carbon disulfide	5.00	U	10.0	3.10	ug/L	1		09/08/19 17:29
Carbon tetrachloride	0.500	U	1.00	0.310	ug/L	1		09/08/19 17:29
Chlorobenzene	0.250	U	0.500	0.150	ug/L	1		09/08/19 17:29

J flagging is activated

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 **MW-6**

Client Sample ID: **MW-6**
Client Project ID: **ARRC Healy Roundhouse GW**
Lab Sample ID: 1195054006
Lab Project ID: 1195054

Collection Date: 08/27/19 12:00
Received Date: 08/30/19 11:24
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Chloroethane	0.500	U	1.00	0.310	ug/L	1		09/08/19 17:29
Chloroform	0.520	J	1.00	0.310	ug/L	1		09/08/19 17:29
Chloromethane	0.500	U	1.00	0.310	ug/L	1		09/08/19 17:29
cis-1,2-Dichloroethene	0.500	U	1.00	0.310	ug/L	1		09/08/19 17:29
cis-1,3-Dichloropropene	0.250	U	0.500	0.150	ug/L	1		09/08/19 17:29
Dibromochloromethane	0.250	U	0.500	0.150	ug/L	1		09/08/19 17:29
Dibromomethane	0.500	U	1.00	0.310	ug/L	1		09/08/19 17:29
Dichlorodifluoromethane	0.500	U	1.00	0.310	ug/L	1		09/08/19 17:29
Ethylbenzene	0.500	U	1.00	0.310	ug/L	1		09/08/19 17:29
Freon-113	5.00	U	10.0	3.10	ug/L	1		09/08/19 17:29
Hexachlorobutadiene	0.500	U	1.00	0.310	ug/L	1		09/08/19 17:29
Isopropylbenzene (Cumene)	0.500	U	1.00	0.310	ug/L	1		09/08/19 17:29
Methylene chloride	2.50	U	5.00	1.00	ug/L	1		09/08/19 17:29
Methyl-t-butyl ether	5.00	U	10.0	3.10	ug/L	1		09/08/19 17:29
Naphthalene	0.500	U	1.00	0.310	ug/L	1		09/08/19 17:29
n-Butylbenzene	0.500	U	1.00	0.310	ug/L	1		09/08/19 17:29
n-Propylbenzene	0.500	U	1.00	0.310	ug/L	1		09/08/19 17:29
o-Xylene	0.500	U	1.00	0.310	ug/L	1		09/08/19 17:29
P & M -Xylene	1.00	U	2.00	0.620	ug/L	1		09/08/19 17:29
sec-Butylbenzene	0.500	U	1.00	0.310	ug/L	1		09/08/19 17:29
Styrene	0.500	U	1.00	0.310	ug/L	1		09/08/19 17:29
tert-Butylbenzene	0.500	U	1.00	0.310	ug/L	1		09/08/19 17:29
Tetrachloroethene	0.500	U	1.00	0.310	ug/L	1		09/08/19 17:29
Toluene	0.500	U	1.00	0.310	ug/L	1		09/08/19 17:29
trans-1,2-Dichloroethene	0.500	U	1.00	0.310	ug/L	1		09/08/19 17:29
trans-1,3-Dichloropropene	0.500	U	1.00	0.310	ug/L	1		09/08/19 17:29
Trichloroethene	4.50		1.00	0.310	ug/L	1		09/08/19 17:29
Trichlorofluoromethane	0.500	U	1.00	0.310	ug/L	1		09/08/19 17:29
Vinyl acetate	5.00	U	10.0	3.10	ug/L	1		09/08/19 17:29
Vinyl chloride	0.0750	U	0.150	0.0500	ug/L	1		09/08/19 17:29
Xylenes (total)	1.50	U	3.00	1.00	ug/L	1		09/08/19 17:29
Surrogates								
1,2-Dichloroethane-D4 (surr)	101		81-118		%	1		09/08/19 17:29
4-Bromofluorobenzene (surr)	100		85-114		%	1		09/08/19 17:29
Toluene-d8 (surr)	99.6		89-112		%	1		09/08/19 17:29

Print Date: 09/19/2019 8:21:03AM

J flagging is activated

Results of **MW-6**

Client Sample ID: **MW-6**
Client Project ID: **ARRC Healy Roundhouse GW**
Lab Sample ID: 1195054006
Lab Project ID: 1195054

Collection Date: 08/27/19 12:00
Received Date: 08/30/19 11:24
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS**

Batch Information

Analytical Batch: VMS19419
Analytical Method: SW8260C
Analyst: CMC
Analytical Date/Time: 09/08/19 17:29
Container ID: 1195054006-D

Prep Batch: VXX34833
Prep Method: SW5030B
Prep Date/Time: 09/08/19 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Print Date: 09/19/2019 8:21:03AM

J flagging is activated

Results of **MW-X**

Client Sample ID: **MW-X**
Client Project ID: **ARRC Healy Roundhouse GW**
Lab Sample ID: 1195054007
Lab Project ID: 1195054

Collection Date: 08/28/19 00:00
Received Date: 08/30/19 11:24
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	0.273	J	0.577	0.173	mg/L	1		09/11/19 17:29
Surrogates								
5a Androstane (surr)	90.9		50-150		%	1		09/11/19 17:29

Batch Information

Analytical Batch: XFC15315
Analytical Method: AK102
Analyst: CMS
Analytical Date/Time: 09/11/19 17:29
Container ID: 1195054007-G

Prep Batch: XXX42190
Prep Method: SW3520C
Prep Date/Time: 09/05/19 09:54
Prep Initial Wt./Vol.: 260 mL
Prep Extract Vol: 1 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Residual Range Organics	0.365	J	0.481	0.144	mg/L	1		09/11/19 17:29
Surrogates								
n-Triacontane-d62 (surr)	92		50-150		%	1		09/11/19 17:29

Batch Information

Analytical Batch: XFC15315
Analytical Method: AK103
Analyst: CMS
Analytical Date/Time: 09/11/19 17:29
Container ID: 1195054007-G

Prep Batch: XXX42190
Prep Method: SW3520C
Prep Date/Time: 09/05/19 09:54
Prep Initial Wt./Vol.: 260 mL
Prep Extract Vol: 1 mL

Print Date: 09/19/2019 8:21:03AM

J flagging is activated

Results of **MW-X**

Client Sample ID: **MW-X**
Client Project ID: **ARRC Healy Roundhouse GW**
Lab Sample ID: 1195054007
Lab Project ID: 1195054

Collection Date: 08/28/19 00:00
Received Date: 08/30/19 11:24
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		09/09/19 08:17
Surrogates								
4-Bromofluorobenzene (surr)	84.7		50-150		%	1		09/09/19 08:17

Batch Information

Analytical Batch: VFC14916
Analytical Method: AK101
Analyst: NRB
Analytical Date/Time: 09/09/19 08:17
Container ID: 1195054007-F

Prep Batch: VXX34822
Prep Method: SW5030B
Prep Date/Time: 09/08/19 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

J flagging is activated

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 **MW-X**

Client Sample ID: **MW-X**
Client Project ID: **ARRC Healy Roundhouse GW**
Lab Sample ID: 1195054007
Lab Project ID: 1195054

Collection Date: 08/28/19 00:00
Received Date: 08/30/19 11:24
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1,1,1,2-Tetrachloroethane	0.250	U	0.500	0.150	ug/L	1		09/08/19 17:44
1,1,1-Trichloroethane	0.500	U	1.00	0.310	ug/L	1		09/08/19 17:44
1,1,2,2-Tetrachloroethane	0.250	U	0.500	0.150	ug/L	1		09/08/19 17:44
1,1,2-Trichloroethane	0.200	U	0.400	0.120	ug/L	1		09/08/19 17:44
1,1-Dichloroethane	0.500	U	1.00	0.310	ug/L	1		09/08/19 17:44
1,1-Dichloroethene	0.500	U	1.00	0.310	ug/L	1		09/08/19 17:44
1,1-Dichloropropene	0.500	U	1.00	0.310	ug/L	1		09/08/19 17:44
1,2,3-Trichlorobenzene	0.500	U	1.00	0.310	ug/L	1		09/08/19 17:44
1,2,3-Trichloropropane	0.500	U	1.00	0.310	ug/L	1		09/08/19 17:44
1,2,4-Trichlorobenzene	0.500	U	1.00	0.310	ug/L	1		09/08/19 17:44
1,2,4-Trimethylbenzene	0.500	U	1.00	0.310	ug/L	1		09/08/19 17:44
1,2-Dibromo-3-chloropropane	5.00	U	10.0	3.10	ug/L	1		09/08/19 17:44
1,2-Dibromoethane	0.0375	U	0.0750	0.0180	ug/L	1		09/08/19 17:44
1,2-Dichlorobenzene	0.500	U	1.00	0.310	ug/L	1		09/08/19 17:44
1,2-Dichloroethane	0.250	U	0.500	0.150	ug/L	1		09/08/19 17:44
1,2-Dichloropropane	0.500	U	1.00	0.310	ug/L	1		09/08/19 17:44
1,3,5-Trimethylbenzene	0.500	U	1.00	0.310	ug/L	1		09/08/19 17:44
1,3-Dichlorobenzene	0.500	U	1.00	0.310	ug/L	1		09/08/19 17:44
1,3-Dichloropropane	0.250	U	0.500	0.150	ug/L	1		09/08/19 17:44
1,4-Dichlorobenzene	0.250	U	0.500	0.150	ug/L	1		09/08/19 17:44
2,2-Dichloropropane	0.500	U	1.00	0.310	ug/L	1		09/08/19 17:44
2-Butanone (MEK)	5.00	U	10.0	3.10	ug/L	1		09/08/19 17:44
2-Chlorotoluene	0.500	U	1.00	0.310	ug/L	1		09/08/19 17:44
2-Hexanone	5.00	U	10.0	3.10	ug/L	1		09/08/19 17:44
4-Chlorotoluene	0.500	U	1.00	0.310	ug/L	1		09/08/19 17:44
4-Isopropyltoluene	0.500	U	1.00	0.310	ug/L	1		09/08/19 17:44
4-Methyl-2-pentanone (MIBK)	5.00	U	10.0	3.10	ug/L	1		09/08/19 17:44
Benzene	0.200	U	0.400	0.120	ug/L	1		09/08/19 17:44
Bromobenzene	0.500	U	1.00	0.310	ug/L	1		09/08/19 17:44
Bromochloromethane	0.500	U	1.00	0.310	ug/L	1		09/08/19 17:44
Bromodichloromethane	0.250	U	0.500	0.150	ug/L	1		09/08/19 17:44
Bromoform	0.500	U	1.00	0.310	ug/L	1		09/08/19 17:44
Bromomethane	2.50	U	5.00	1.50	ug/L	1		09/08/19 17:44
Carbon disulfide	5.00	U	10.0	3.10	ug/L	1		09/08/19 17:44
Carbon tetrachloride	0.500	U	1.00	0.310	ug/L	1		09/08/19 17:44
Chlorobenzene	0.250	U	0.500	0.150	ug/L	1		09/08/19 17:44

J flagging is activated

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 **MW-X**

Client Sample ID: **MW-X**
Client Project ID: **ARRC Healy Roundhouse GW**
Lab Sample ID: 1195054007
Lab Project ID: 1195054

Collection Date: 08/28/19 00:00
Received Date: 08/30/19 11:24
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Chloroethane	0.500	U	1.00	0.310	ug/L	1		09/08/19 17:44
Chloroform	0.380	J	1.00	0.310	ug/L	1		09/08/19 17:44
Chloromethane	0.500	U	1.00	0.310	ug/L	1		09/08/19 17:44
cis-1,2-Dichloroethene	0.500	U	1.00	0.310	ug/L	1		09/08/19 17:44
cis-1,3-Dichloropropene	0.250	U	0.500	0.150	ug/L	1		09/08/19 17:44
Dibromochloromethane	0.250	U	0.500	0.150	ug/L	1		09/08/19 17:44
Dibromomethane	0.500	U	1.00	0.310	ug/L	1		09/08/19 17:44
Dichlorodifluoromethane	0.500	U	1.00	0.310	ug/L	1		09/08/19 17:44
Ethylbenzene	0.500	U	1.00	0.310	ug/L	1		09/08/19 17:44
Freon-113	5.00	U	10.0	3.10	ug/L	1		09/08/19 17:44
Hexachlorobutadiene	0.500	U	1.00	0.310	ug/L	1		09/08/19 17:44
Isopropylbenzene (Cumene)	0.500	U	1.00	0.310	ug/L	1		09/08/19 17:44
Methylene chloride	2.50	U	5.00	1.00	ug/L	1		09/08/19 17:44
Methyl-t-butyl ether	5.00	U	10.0	3.10	ug/L	1		09/08/19 17:44
Naphthalene	0.500	U	1.00	0.310	ug/L	1		09/08/19 17:44
n-Butylbenzene	0.500	U	1.00	0.310	ug/L	1		09/08/19 17:44
n-Propylbenzene	0.500	U	1.00	0.310	ug/L	1		09/08/19 17:44
o-Xylene	0.500	U	1.00	0.310	ug/L	1		09/08/19 17:44
P & M -Xylene	1.00	U	2.00	0.620	ug/L	1		09/08/19 17:44
sec-Butylbenzene	0.500	U	1.00	0.310	ug/L	1		09/08/19 17:44
Styrene	0.500	U	1.00	0.310	ug/L	1		09/08/19 17:44
tert-Butylbenzene	0.500	U	1.00	0.310	ug/L	1		09/08/19 17:44
Tetrachloroethene	0.500	U	1.00	0.310	ug/L	1		09/08/19 17:44
Toluene	0.500	U	1.00	0.310	ug/L	1		09/08/19 17:44
trans-1,2-Dichloroethene	0.500	U	1.00	0.310	ug/L	1		09/08/19 17:44
trans-1,3-Dichloropropene	0.500	U	1.00	0.310	ug/L	1		09/08/19 17:44
Trichloroethene	4.33		1.00	0.310	ug/L	1		09/08/19 17:44
Trichlorofluoromethane	0.500	U	1.00	0.310	ug/L	1		09/08/19 17:44
Vinyl acetate	5.00	U	10.0	3.10	ug/L	1		09/08/19 17:44
Vinyl chloride	0.0750	U	0.150	0.0500	ug/L	1		09/08/19 17:44
Xylenes (total)	1.50	U	3.00	1.00	ug/L	1		09/08/19 17:44
Surrogates								
1,2-Dichloroethane-D4 (surr)	105		81-118		%	1		09/08/19 17:44
4-Bromofluorobenzene (surr)	98.8		85-114		%	1		09/08/19 17:44
Toluene-d8 (surr)	101		89-112		%	1		09/08/19 17:44

Print Date: 09/19/2019 8:21:03AM

J flagging is activated

Results of **MW-X**

Client Sample ID: **MW-X**
Client Project ID: **ARRC Healy Roundhouse GW**
Lab Sample ID: 1195054007
Lab Project ID: 1195054

Collection Date: 08/28/19 00:00
Received Date: 08/30/19 11:24
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS**

Batch Information

Analytical Batch: VMS19419
Analytical Method: SW8260C
Analyst: CMC
Analytical Date/Time: 09/08/19 17:44
Container ID: 1195054007-D

Prep Batch: VXX34833
Prep Method: SW5030B
Prep Date/Time: 09/08/19 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

J flagging is activated

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 **Trip Blank**

Client Sample ID: **Trip Blank**
Client Project ID: **ARRC Healy Roundhouse GW**
Lab Sample ID: 1195054008
Lab Project ID: 1195054

Collection Date: 08/27/19 00:00
Received Date: 08/30/19 11:24
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		09/09/19 06:12
Surrogates								
4-Bromofluorobenzene (surr)	87.7		50-150		%	1		09/09/19 06:12

Batch Information

Analytical Batch: VFC14916
Analytical Method: AK101
Analyst: NRB
Analytical Date/Time: 09/09/19 06:12
Container ID: 1195054008-F

Prep Batch: VXX34822
Prep Method: SW5030B
Prep Date/Time: 09/08/19 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

J flagging is activated

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 **Trip Blank**

Client Sample ID: **Trip Blank**
Client Project ID: **ARRC Healy Roundhouse GW**
Lab Sample ID: 1195054008
Lab Project ID: 1195054

Collection Date: 08/27/19 00:00
Received Date: 08/30/19 11:24
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1,1,1,2-Tetrachloroethane	0.250	U	0.500	0.150	ug/L	1		09/09/19 13:39
1,1,1-Trichloroethane	0.500	U	1.00	0.310	ug/L	1		09/09/19 13:39
1,1,2,2-Tetrachloroethane	0.250	U	0.500	0.150	ug/L	1		09/09/19 13:39
1,1,2-Trichloroethane	0.200	U	0.400	0.120	ug/L	1		09/09/19 13:39
1,1-Dichloroethane	0.500	U	1.00	0.310	ug/L	1		09/09/19 13:39
1,1-Dichloroethene	0.500	U	1.00	0.310	ug/L	1		09/09/19 13:39
1,1-Dichloropropene	0.500	U	1.00	0.310	ug/L	1		09/09/19 13:39
1,2,3-Trichlorobenzene	0.500	U	1.00	0.310	ug/L	1		09/09/19 13:39
1,2,3-Trichloropropane	0.500	U	1.00	0.310	ug/L	1		09/09/19 13:39
1,2,4-Trichlorobenzene	0.500	U	1.00	0.310	ug/L	1		09/09/19 13:39
1,2,4-Trimethylbenzene	0.500	U	1.00	0.310	ug/L	1		09/09/19 13:39
1,2-Dibromo-3-chloropropane	5.00	U	10.0	3.10	ug/L	1		09/09/19 13:39
1,2-Dibromoethane	0.0375	U	0.0750	0.0180	ug/L	1		09/09/19 13:39
1,2-Dichlorobenzene	0.500	U	1.00	0.310	ug/L	1		09/09/19 13:39
1,2-Dichloroethane	0.250	U	0.500	0.150	ug/L	1		09/09/19 13:39
1,2-Dichloropropane	0.500	U	1.00	0.310	ug/L	1		09/09/19 13:39
1,3,5-Trimethylbenzene	0.500	U	1.00	0.310	ug/L	1		09/09/19 13:39
1,3-Dichlorobenzene	0.500	U	1.00	0.310	ug/L	1		09/09/19 13:39
1,3-Dichloropropane	0.250	U	0.500	0.150	ug/L	1		09/09/19 13:39
1,4-Dichlorobenzene	0.250	U	0.500	0.150	ug/L	1		09/09/19 13:39
2,2-Dichloropropane	0.500	U	1.00	0.310	ug/L	1		09/09/19 13:39
2-Butanone (MEK)	5.00	U	10.0	3.10	ug/L	1		09/09/19 13:39
2-Chlorotoluene	0.500	U	1.00	0.310	ug/L	1		09/09/19 13:39
2-Hexanone	5.00	U	10.0	3.10	ug/L	1		09/09/19 13:39
4-Chlorotoluene	0.500	U	1.00	0.310	ug/L	1		09/09/19 13:39
4-Isopropyltoluene	0.500	U	1.00	0.310	ug/L	1		09/09/19 13:39
4-Methyl-2-pentanone (MIBK)	5.00	U	10.0	3.10	ug/L	1		09/09/19 13:39
Benzene	0.200	U	0.400	0.120	ug/L	1		09/09/19 13:39
Bromobenzene	0.500	U	1.00	0.310	ug/L	1		09/09/19 13:39
Bromochloromethane	0.500	U	1.00	0.310	ug/L	1		09/09/19 13:39
Bromodichloromethane	0.250	U	0.500	0.150	ug/L	1		09/09/19 13:39
Bromoform	0.500	U	1.00	0.310	ug/L	1		09/09/19 13:39
Bromomethane	2.50	U	5.00	1.50	ug/L	1		09/09/19 13:39
Carbon disulfide	5.00	U	10.0	3.10	ug/L	1		09/09/19 13:39
Carbon tetrachloride	0.500	U	1.00	0.310	ug/L	1		09/09/19 13:39
Chlorobenzene	0.250	U	0.500	0.150	ug/L	1		09/09/19 13:39

J flagging is activated

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 **Trip Blank**

Client Sample ID: **Trip Blank**
Client Project ID: **ARRC Healy Roundhouse GW**
Lab Sample ID: 1195054008
Lab Project ID: 1195054

Collection Date: 08/27/19 00:00
Received Date: 08/30/19 11:24
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Chloroethane	0.500	U	1.00	0.310	ug/L	1		09/09/19 13:39
Chloroform	0.500	U	1.00	0.310	ug/L	1		09/09/19 13:39
Chloromethane	0.500	U	1.00	0.310	ug/L	1		09/09/19 13:39
cis-1,2-Dichloroethene	0.500	U	1.00	0.310	ug/L	1		09/09/19 13:39
cis-1,3-Dichloropropene	0.250	U	0.500	0.150	ug/L	1		09/09/19 13:39
Dibromochloromethane	0.250	U	0.500	0.150	ug/L	1		09/09/19 13:39
Dibromomethane	0.500	U	1.00	0.310	ug/L	1		09/09/19 13:39
Dichlorodifluoromethane	0.500	U	1.00	0.310	ug/L	1		09/09/19 13:39
Ethylbenzene	0.500	U	1.00	0.310	ug/L	1		09/09/19 13:39
Freon-113	5.00	U	10.0	3.10	ug/L	1		09/09/19 13:39
Hexachlorobutadiene	0.500	U	1.00	0.310	ug/L	1		09/09/19 13:39
Isopropylbenzene (Cumene)	0.500	U	1.00	0.310	ug/L	1		09/09/19 13:39
Methylene chloride	2.50	U	5.00	1.00	ug/L	1		09/09/19 13:39
Methyl-t-butyl ether	5.00	U	10.0	3.10	ug/L	1		09/09/19 13:39
Naphthalene	0.500	U	1.00	0.310	ug/L	1		09/09/19 13:39
n-Butylbenzene	0.500	U	1.00	0.310	ug/L	1		09/09/19 13:39
n-Propylbenzene	0.500	U	1.00	0.310	ug/L	1		09/09/19 13:39
o-Xylene	0.500	U	1.00	0.310	ug/L	1		09/09/19 13:39
P & M -Xylene	1.00	U	2.00	0.620	ug/L	1		09/09/19 13:39
sec-Butylbenzene	0.500	U	1.00	0.310	ug/L	1		09/09/19 13:39
Styrene	0.500	U	1.00	0.310	ug/L	1		09/09/19 13:39
tert-Butylbenzene	0.500	U	1.00	0.310	ug/L	1		09/09/19 13:39
Tetrachloroethene	0.500	U	1.00	0.310	ug/L	1		09/09/19 13:39
Toluene	0.500	U	1.00	0.310	ug/L	1		09/09/19 13:39
trans-1,2-Dichloroethene	0.500	U	1.00	0.310	ug/L	1		09/09/19 13:39
trans-1,3-Dichloropropene	0.500	U	1.00	0.310	ug/L	1		09/09/19 13:39
Trichloroethene	0.500	U	1.00	0.310	ug/L	1		09/09/19 13:39
Trichlorofluoromethane	0.500	U	1.00	0.310	ug/L	1		09/09/19 13:39
Vinyl acetate	5.00	U	10.0	3.10	ug/L	1		09/09/19 13:39
Vinyl chloride	0.0750	U	0.150	0.0500	ug/L	1		09/09/19 13:39
Xylenes (total)	1.50	U	3.00	1.00	ug/L	1		09/09/19 13:39
Surrogates								
1,2-Dichloroethane-D4 (surr)	101		81-118		%	1		09/09/19 13:39
4-Bromofluorobenzene (surr)	99.7		85-114		%	1		09/09/19 13:39
Toluene-d8 (surr)	99.9		89-112		%	1		09/09/19 13:39

Print Date: 09/19/2019 8:21:03AM

J flagging is activated

Results of **Trip Blank**

Client Sample ID: **Trip Blank**
Client Project ID: **ARRC Healy Roundhouse GW**
Lab Sample ID: 1195054008
Lab Project ID: 1195054

Collection Date: 08/27/19 00:00
Received Date: 08/30/19 11:24
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS**

Batch Information

Analytical Batch: VMS19420
Analytical Method: SW8260C
Analyst: CMC
Analytical Date/Time: 09/09/19 13:39
Container ID: 1195054008-D

Prep Batch: VXX34836
Prep Method: SW5030B
Prep Date/Time: 09/09/19 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

J flagging is activated

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

Method Blank

Blank ID: MB for HBN 1799131 [VXX/34822]
Blank Lab ID: 1530540

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1195054001, 1195054002, 1195054003, 1195054004, 1195054005, 1195054006, 1195054007, 1195054008

Results by **AK101**

Parameter	Results	LOQ/CL	DL	Units
Gasoline Range Organics	0.0500U	0.100	0.0310	mg/L
Surrogates				
4-Bromofluorobenzene (surr)	87.4	50-150		%

Batch Information

Analytical Batch: VFC14916
Analytical Method: AK101
Instrument: Agilent 7890A PID/FID
Analyst: NRB
Analytical Date/Time: 9/9/2019 5:54:00AM

Prep Batch: VXX34822
Prep Method: SW5030B
Prep Date/Time: 9/8/2019 6:00:00AM
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

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

Blank Spike Summary

Blank Spike ID: LCS for HBN 1195054 [VXX34822]
Blank Spike Lab ID: 1530541
Date Analyzed: 09/09/2019 11:34

Spike Duplicate ID: LCSD for HBN 1195054 [VXX34822]
Spike Duplicate Lab ID: 1530542
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1195054001, 1195054002, 1195054003, 1195054004, 1195054005, 1195054006, 1195054007, 1195054008

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	1.05	105	1.00	1.01	101	(60-120)	3.90	(< 20)
Surrogates									
4-Bromofluorobenzene (surr)	0.0500	95	95	0.0500	91.1	91	(50-150)	4.10	

Batch Information

Analytical Batch: **VFC14916**
Analytical Method: **AK101**
Instrument: **Agilent 7890A PID/FID**
Analyst: **NRB**

Prep Batch: **VXX34822**
Prep Method: **SW5030B**
Prep Date/Time: **09/08/2019 06:00**
Spike Init Wt./Vol.: 1.00 mg/L Extract Vol: 5 mL
Dupe Init Wt./Vol.: 1.00 mg/L Extract Vol: 5 mL

Print Date: 09/19/2019 8:21:08AM

Matrix Spike Summary

Original Sample ID: 1530543
MS Sample ID: 1530544 MS
MSD Sample ID: 1530545 MSD

Analysis Date: 09/09/2019 9:47
Analysis Date: 09/09/2019 10:05
Analysis Date: 09/09/2019 10:22
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1195054001, 1195054002, 1195054003, 1195054004, 1195054005, 1195054006, 1195054007, 1195054008

Results by **AK101**

		Matrix Spike (mg/L)			Spike Duplicate (mg/L)					
Parameter	Sample	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Gasoline Range Organics	0.0500U	0.500	0.527	105	0.500	0.535	107	60-120	1.60	(< 20)
Surrogates										
4-Bromofluorobenzene (surr)		0.0500	0.0443	89	0.0500	0.0451	90	50-150	1.80	

Batch Information

Analytical Batch: VFC14916
Analytical Method: AK101
Instrument: Agilent 7890A PID/FID
Analyst: NRB
Analytical Date/Time: 9/9/2019 10:05:00AM

Prep Batch: VXX34822
Prep Method: Volatile Fuels Extraction (W)
Prep Date/Time: 9/8/2019 6:00:00AM
Prep Initial Wt./Vol.: 5.00mL
Prep Extract Vol: 5.00mL

Print Date: 09/19/2019 8:21:10AM

Method Blank

Blank ID: MB for HBN 1799190 [VXX/34833]
Blank Lab ID: 1530810

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1195054001, 1195054002, 1195054003, 1195054004, 1195054005, 1195054006, 1195054007

Results by **SW8260C**

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

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

Method Blank

Blank ID: MB for HBN 1799190 [VXX/34833]
Blank Lab ID: 1530810

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1195054001, 1195054002, 1195054003, 1195054004, 1195054005, 1195054006, 1195054007

Results by **SW8260C**

Parameter	Results	LOQ/CL	DL	Units
Chloromethane	0.500U	1.00	0.310	ug/L
cis-1,2-Dichloroethene	0.500U	1.00	0.310	ug/L
cis-1,3-Dichloropropene	0.250U	0.500	0.150	ug/L
Dibromochloromethane	0.250U	0.500	0.150	ug/L
Dibromomethane	0.500U	1.00	0.310	ug/L
Dichlorodifluoromethane	0.500U	1.00	0.310	ug/L
Ethylbenzene	0.500U	1.00	0.310	ug/L
Freon-113	5.00U	10.0	3.10	ug/L
Hexachlorobutadiene	0.500U	1.00	0.310	ug/L
Isopropylbenzene (Cumene)	0.500U	1.00	0.310	ug/L
Methylene chloride	2.50U	5.00	1.00	ug/L
Methyl-t-butyl ether	5.00U	10.0	3.10	ug/L
Naphthalene	0.320J	1.00	0.310	ug/L
n-Butylbenzene	0.500U	1.00	0.310	ug/L
n-Propylbenzene	0.500U	1.00	0.310	ug/L
o-Xylene	0.500U	1.00	0.310	ug/L
P & M -Xylene	1.00U	2.00	0.620	ug/L
sec-Butylbenzene	0.500U	1.00	0.310	ug/L
Styrene	0.500U	1.00	0.310	ug/L
tert-Butylbenzene	0.500U	1.00	0.310	ug/L
Tetrachloroethene	0.500U	1.00	0.310	ug/L
Toluene	0.500U	1.00	0.310	ug/L
trans-1,2-Dichloroethene	0.500U	1.00	0.310	ug/L
trans-1,3-Dichloropropene	0.500U	1.00	0.310	ug/L
Trichloroethene	0.500U	1.00	0.310	ug/L
Trichlorofluoromethane	0.500U	1.00	0.310	ug/L
Vinyl acetate	5.00U	10.0	3.10	ug/L
Vinyl chloride	0.0750U	0.150	0.0500	ug/L
Xylenes (total)	1.50U	3.00	1.00	ug/L
Surrogates				
1,2-Dichloroethane-D4 (surr)	106	81-118		%
4-Bromofluorobenzene (surr)	101	85-114		%
Toluene-d8 (surr)	101	89-112		%

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

Method Blank

Blank ID: MB for HBN 1799190 [VXX/34833]
Blank Lab ID: 1530810

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1195054001, 1195054002, 1195054003, 1195054004, 1195054005, 1195054006, 1195054007

Results by **SW8260C**

Parameter	Results	LOQ/CL	DL	Units

Batch Information

Analytical Batch: VMS19419
Analytical Method: SW8260C
Instrument: VPA 780/5975 GC/MS
Analyst: CMC
Analytical Date/Time: 9/8/2019 12:20:00PM

Prep Batch: VXX34833
Prep Method: SW5030B
Prep Date/Time: 9/8/2019 6:00:00AM
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Print Date: 09/19/2019 8:21:11AM

Blank Spike Summary

Blank Spike ID: LCS for HBN 1195054 [VXX34833]
Blank Spike Lab ID: 1530811
Date Analyzed: 09/08/2019 12:35

Spike Duplicate ID: LCSD for HBN 1195054 [VXX34833]
Spike Duplicate Lab ID: 1530812
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1195054001, 1195054002, 1195054003, 1195054004, 1195054005, 1195054006, 1195054007

Results by **SW8260C**

	Blank Spike (ug/L)			Spike Duplicate (ug/L)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
1,1,1,2-Tetrachloroethane	30	32.3	108	30	32.4	108	(78-124)	0.40	(< 20)
1,1,1-Trichloroethane	30	30.5	102	30	30.5	102	(74-131)	0.16	(< 20)
1,1,2,2-Tetrachloroethane	30	29.2	97	30	29.4	98	(71-121)	0.61	(< 20)
1,1,2-Trichloroethane	30	29.4	98	30	30.2	101	(80-119)	2.90	(< 20)
1,1-Dichloroethane	30	29.7	99	30	29.4	98	(77-125)	0.74	(< 20)
1,1-Dichloroethene	30	29.9	100	30	29.6	99	(71-131)	1.00	(< 20)
1,1-Dichloropropene	30	30.9	103	30	30.9	103	(79-125)	0.03	(< 20)
1,2,3-Trichlorobenzene	30	28.6	95	30	31.0	103	(69-129)	7.80	(< 20)
1,2,3-Trichloropropane	30	29.2	97	30	29.0	97	(73-122)	0.48	(< 20)
1,2,4-Trichlorobenzene	30	29.7	99	30	30.8	103	(69-130)	3.40	(< 20)
1,2,4-Trimethylbenzene	30	31.6	105	30	31.5	105	(79-124)	0.35	(< 20)
1,2-Dibromo-3-chloropropane	30	29.0	97	30	29.2	97	(62-128)	0.69	(< 20)
1,2-Dibromoethane	30	30.6	102	30	31.5	105	(77-121)	3.10	(< 20)
1,2-Dichlorobenzene	30	29.3	98	30	30.1	100	(80-119)	2.80	(< 20)
1,2-Dichloroethane	30	28.3	95	30	28.7	96	(73-128)	1.40	(< 20)
1,2-Dichloropropane	30	29.8	99	30	30.3	101	(78-122)	1.70	(< 20)
1,3,5-Trimethylbenzene	30	31.3	104	30	31.6	105	(75-124)	0.95	(< 20)
1,3-Dichlorobenzene	30	31.2	104	30	31.2	104	(80-119)	0.19	(< 20)
1,3-Dichloropropane	30	29.9	100	30	30.7	102	(80-119)	2.70	(< 20)
1,4-Dichlorobenzene	30	30.8	103	30	31.0	103	(79-118)	0.81	(< 20)
2,2-Dichloropropane	30	33.6	112	30	33.2	111	(60-139)	1.40	(< 20)
2-Butanone (MEK)	90	86.1	96	90	86.0	96	(56-143)	0.13	(< 20)
2-Chlorotoluene	30	29.8	99	30	29.8	99	(79-122)	0.17	(< 20)
2-Hexanone	90	84.9	94	90	85.5	95	(57-139)	0.70	(< 20)
4-Chlorotoluene	30	31.0	103	30	31.1	104	(78-122)	0.45	(< 20)
4-Isopropyltoluene	30	30.5	102	30	30.4	101	(77-127)	0.39	(< 20)
4-Methyl-2-pentanone (MIBK)	90	86.1	96	90	85.5	95	(67-130)	0.62	(< 20)
Benzene	30	29.9	100	30	29.9	100	(79-120)	0.17	(< 20)
Bromobenzene	30	29.7	99	30	29.8	99	(80-120)	0.34	(< 20)
Bromochloromethane	30	28.5	95	30	28.9	96	(78-123)	1.20	(< 20)
Bromodichloromethane	30	30.8	103	30	31.0	103	(79-125)	0.55	(< 20)
Bromoform	30	31.4	105	30	31.7	106	(66-130)	1.10	(< 20)
Bromomethane	30	29.4	98	30	30.0	100	(53-141)	2.20	(< 20)

Print Date: 09/19/2019 8:21:14AM

Blank Spike Summary

Blank Spike ID: LCS for HBN 1195054 [VXX34833]
Blank Spike Lab ID: 1530811
Date Analyzed: 09/08/2019 12:35

Spike Duplicate ID: LCSD for HBN 1195054 [VXX34833]
Spike Duplicate Lab ID: 1530812
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1195054001, 1195054002, 1195054003, 1195054004, 1195054005, 1195054006, 1195054007

Results by **SW8260C**

	Blank Spike (ug/L)			Spike Duplicate (ug/L)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Carbon disulfide	45	43.9	98	45	43.7	97	(64-133)	0.41	(< 20)
Carbon tetrachloride	30	31.5	105	30	31.7	106	(72-136)	0.38	(< 20)
Chlorobenzene	30	28.8	96	30	29.6	99	(82-118)	2.60	(< 20)
Chloroethane	30	29.7	99	30	26.9	90	(60-138)	9.80	(< 20)
Chloroform	30	29.4	98	30	29.7	99	(79-124)	0.95	(< 20)
Chloromethane	30	30.5	102	30	30.9	103	(50-139)	1.40	(< 20)
cis-1,2-Dichloroethene	30	28.9	96	30	29.4	98	(78-123)	1.70	(< 20)
cis-1,3-Dichloropropene	30	31.5	105	30	31.8	106	(75-124)	0.76	(< 20)
Dibromochloromethane	30	31.1	104	30	32.0	107	(74-126)	2.70	(< 20)
Dibromomethane	30	29.3	98	30	29.6	99	(79-123)	0.82	(< 20)
Dichlorodifluoromethane	30	26.8	89	30	26.6	89	(32-152)	0.75	(< 20)
Ethylbenzene	30	30.3	101	30	31.0	103	(79-121)	2.10	(< 20)
Freon-113	45	47.0	104	45	46.8	104	(70-136)	0.30	(< 20)
Hexachlorobutadiene	30	31.8	106	30	32.4	108	(66-134)	1.80	(< 20)
Isopropylbenzene (Cumene)	30	29.5	98	30	29.9	100	(72-131)	1.30	(< 20)
Methylene chloride	30	28.1	94	30	28.1	94	(74-124)	0.11	(< 20)
Methyl-t-butyl ether	45	43.9	98	45	44.3	99	(71-124)	0.95	(< 20)
Naphthalene	30	27.3	91	30	29.8	99	(61-128)	8.80	(< 20)
n-Butylbenzene	30	30.9	103	30	30.8	103	(75-128)	0.16	(< 20)
n-Propylbenzene	30	30.0	100	30	29.5	98	(76-126)	1.70	(< 20)
o-Xylene	30	30.1	100	30	30.8	103	(78-122)	2.40	(< 20)
P & M -Xylene	60	59.0	98	60	60.4	101	(80-121)	2.40	(< 20)
sec-Butylbenzene	30	29.8	99	30	30.1	100	(77-126)	1.30	(< 20)
Styrene	30	29.1	97	30	29.8	99	(78-123)	2.30	(< 20)
tert-Butylbenzene	30	29.7	99	30	29.1	97	(78-124)	2.20	(< 20)
Tetrachloroethene	30	32.0	107	30	32.4	108	(74-129)	1.10	(< 20)
Toluene	30	29.5	98	30	29.9	100	(80-121)	1.40	(< 20)
trans-1,2-Dichloroethene	30	28.4	95	30	28.3	95	(75-124)	0.07	(< 20)
trans-1,3-Dichloropropene	30	30.1	100	30	31.3	104	(73-127)	4.10	(< 20)
Trichloroethene	30	30.3	101	30	30.3	101	(79-123)	0.10	(< 20)
Trichlorofluoromethane	30	30.6	102	30	29.0	97	(65-141)	5.20	(< 20)
Vinyl acetate	30	31.1	104	30	31.2	104	(54-146)	0.19	(< 20)
Vinyl chloride	30	28.7	96	30	28.4	95	(58-137)	1.20	(< 20)

Print Date: 09/19/2019 8:21:14AM

Blank Spike Summary

Blank Spike ID: LCS for HBN 1195054 [VXX34833]
Blank Spike Lab ID: 1530811
Date Analyzed: 09/08/2019 12:35

Spike Duplicate ID: LCSD for HBN 1195054 [VXX34833]
Spike Duplicate Lab ID: 1530812
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1195054001, 1195054002, 1195054003, 1195054004, 1195054005, 1195054006, 1195054007

Results by **SW8260C**

	Blank Spike (ug/L)			Spike Duplicate (ug/L)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Xylenes (total)	90	89.1	99	90	91.2	101	(79-121)	2.40	(< 20)
Surrogates									
1,2-Dichloroethane-D4 (surr)	30	96.4	96	30	95.6	96	(81-118)	0.80	
4-Bromofluorobenzene (surr)	30	99.1	99	30	97.1	97	(85-114)	2.10	
Toluene-d8 (surr)	30	101	101	30	102	102	(89-112)	1.30	

Batch Information

Analytical Batch: **VMS19419**
Analytical Method: **SW8260C**
Instrument: **VPA 780/5975 GC/MS**
Analyst: **CMC**

Prep Batch: **VXX34833**
Prep Method: **SW5030B**
Prep Date/Time: **09/08/2019 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: 09/19/2019 8:21:14AM

Method Blank

Blank ID: MB for HBN 1799218 [VXX/34836]
Blank Lab ID: 1530933

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1195054001, 1195054002, 1195054003, 1195054004, 1195054008

Results by **SW8260C**

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

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

Method Blank

Blank ID: MB for HBN 1799218 [VXX/34836]
Blank Lab ID: 1530933

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1195054001, 1195054002, 1195054003, 1195054004, 1195054008

Results by **SW8260C**

Parameter	Results	LOQ/CL	DL	Units
Chloromethane	0.500U	1.00	0.310	ug/L
cis-1,2-Dichloroethene	0.500U	1.00	0.310	ug/L
cis-1,3-Dichloropropene	0.250U	0.500	0.150	ug/L
Dibromochloromethane	0.250U	0.500	0.150	ug/L
Dibromomethane	0.500U	1.00	0.310	ug/L
Dichlorodifluoromethane	0.500U	1.00	0.310	ug/L
Ethylbenzene	0.500U	1.00	0.310	ug/L
Freon-113	5.00U	10.0	3.10	ug/L
Hexachlorobutadiene	0.500U	1.00	0.310	ug/L
Isopropylbenzene (Cumene)	0.500U	1.00	0.310	ug/L
Methylene chloride	2.50U	5.00	1.00	ug/L
Methyl-t-butyl ether	5.00U	10.0	3.10	ug/L
Naphthalene	0.500U	1.00	0.310	ug/L
n-Butylbenzene	0.500U	1.00	0.310	ug/L
n-Propylbenzene	0.500U	1.00	0.310	ug/L
o-Xylene	0.500U	1.00	0.310	ug/L
P & M -Xylene	1.00U	2.00	0.620	ug/L
sec-Butylbenzene	0.500U	1.00	0.310	ug/L
Styrene	0.500U	1.00	0.310	ug/L
tert-Butylbenzene	0.500U	1.00	0.310	ug/L
Tetrachloroethene	0.500U	1.00	0.310	ug/L
Toluene	0.500U	1.00	0.310	ug/L
trans-1,2-Dichloroethene	0.500U	1.00	0.310	ug/L
trans-1,3-Dichloropropene	0.500U	1.00	0.310	ug/L
Trichloroethene	0.500U	1.00	0.310	ug/L
Trichlorofluoromethane	0.500U	1.00	0.310	ug/L
Vinyl acetate	5.00U	10.0	3.10	ug/L
Vinyl chloride	0.0750U	0.150	0.0500	ug/L
Xylenes (total)	1.50U	3.00	1.00	ug/L
Surrogates				
1,2-Dichloroethane-D4 (surr)	106	81-118		%
4-Bromofluorobenzene (surr)	99.3	85-114		%
Toluene-d8 (surr)	101	89-112		%

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

Method Blank

Blank ID: MB for HBN 1799218 [VXX/34836]
Blank Lab ID: 1530933

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1195054001, 1195054002, 1195054003, 1195054004, 1195054008

Results by **SW8260C**

Parameter	Results	LOQ/CL	DL	Units

Batch Information

Analytical Batch: VMS19420
Analytical Method: SW8260C
Instrument: VPA 780/5975 GC/MS
Analyst: CMC
Analytical Date/Time: 9/9/2019 11:24:00AM

Prep Batch: VXX34836
Prep Method: SW5030B
Prep Date/Time: 9/9/2019 6:00:00AM
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Print Date: 09/19/2019 8:21:16AM

Blank Spike Summary

Blank Spike ID: LCS for HBN 1195054 [VXX34836]
Blank Spike Lab ID: 1530934
Date Analyzed: 09/09/2019 11:39

Spike Duplicate ID: LCSD for HBN 1195054 [VXX34836]
Spike Duplicate Lab ID: 1530935
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1195054001, 1195054002, 1195054003, 1195054004, 1195054008

Results by **SW8260C**

	Blank Spike (ug/L)			Spike Duplicate (ug/L)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
1,1,1,2-Tetrachloroethane	30	31.7	106	30	32.2	107	(78-124)	1.50	(< 20)
1,1,1-Trichloroethane	30	31.4	105	30	30.4	101	(74-131)	3.10	(< 20)
1,1,2,2-Tetrachloroethane	30	29.7	99	30	29.4	98	(71-121)	1.10	(< 20)
1,1,2-Trichloroethane	30	30.2	101	30	30.3	101	(80-119)	0.40	(< 20)
1,1-Dichloroethane	30	30.5	102	30	29.7	99	(77-125)	2.50	(< 20)
1,1-Dichloroethene	30	31.0	103	30	30.2	101	(71-131)	2.70	(< 20)
1,1-Dichloropropene	30	31.5	105	30	30.8	103	(79-125)	2.30	(< 20)
1,2,3-Trichlorobenzene	30	28.9	96	30	29.7	99	(69-129)	2.60	(< 20)
1,2,3-Trichloropropane	30	30.1	100	30	29.1	97	(73-122)	3.50	(< 20)
1,2,4-Trichlorobenzene	30	30.6	102	30	30.1	100	(69-130)	1.60	(< 20)
1,2,4-Trimethylbenzene	30	32.5	108	30	31.5	105	(79-124)	2.90	(< 20)
1,2-Dibromo-3-chloropropane	30	29.4	98	30	29.2	97	(62-128)	0.51	(< 20)
1,2-Dibromoethane	30	31.3	104	30	31.4	105	(77-121)	0.48	(< 20)
1,2-Dichlorobenzene	30	30.6	102	30	29.8	99	(80-119)	2.60	(< 20)
1,2-Dichloroethane	30	29.5	98	30	28.8	96	(73-128)	2.40	(< 20)
1,2-Dichloropropane	30	30.8	103	30	30.1	100	(78-122)	2.30	(< 20)
1,3,5-Trimethylbenzene	30	32.2	107	30	30.7	102	(75-124)	5.00	(< 20)
1,3-Dichlorobenzene	30	31.5	105	30	31.0	103	(80-119)	1.50	(< 20)
1,3-Dichloropropane	30	30.7	102	30	30.7	102	(80-119)	0.07	(< 20)
1,4-Dichlorobenzene	30	31.6	105	30	31.2	104	(79-118)	1.10	(< 20)
2,2-Dichloropropane	30	33.8	113	30	32.8	109	(60-139)	2.70	(< 20)
2-Butanone (MEK)	90	91.0	101	90	89.3	99	(56-143)	1.90	(< 20)
2-Chlorotoluene	30	30.7	102	30	29.3	98	(79-122)	4.50	(< 20)
2-Hexanone	90	88.7	99	90	86.2	96	(57-139)	3.00	(< 20)
4-Chlorotoluene	30	32.1	107	30	31.1	104	(78-122)	2.90	(< 20)
4-Isopropyltoluene	30	31.2	104	30	29.9	100	(77-127)	4.20	(< 20)
4-Methyl-2-pentanone (MIBK)	90	87.9	98	90	87.4	97	(67-130)	0.58	(< 20)
Benzene	30	30.5	102	30	29.9	100	(79-120)	2.00	(< 20)
Bromobenzene	30	31.1	104	30	29.7	99	(80-120)	4.90	(< 20)
Bromochloromethane	30	29.5	98	30	29.3	98	(78-123)	0.44	(< 20)
Bromodichloromethane	30	31.6	105	30	30.8	103	(79-125)	2.50	(< 20)
Bromoform	30	31.7	106	30	31.9	106	(66-130)	0.53	(< 20)
Bromomethane	30	28.0	93	30	27.9	93	(53-141)	0.11	(< 20)

Print Date: 09/19/2019 8:21:18AM

Blank Spike Summary

Blank Spike ID: LCS for HBN 1195054 [VXX34836]
Blank Spike Lab ID: 1530934
Date Analyzed: 09/09/2019 11:39

Spike Duplicate ID: LCSD for HBN 1195054 [VXX34836]
Spike Duplicate Lab ID: 1530935
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1195054001, 1195054002, 1195054003, 1195054004, 1195054008

Results by **SW8260C**

	Blank Spike (ug/L)			Spike Duplicate (ug/L)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Carbon disulfide	45	46.7	104	45	45.2	100	(64-133)	3.20	(< 20)
Carbon tetrachloride	30	32.2	107	30	31.3	104	(72-136)	2.70	(< 20)
Chlorobenzene	30	29.6	99	30	29.4	98	(82-118)	0.64	(< 20)
Chloroethane	30	30.0	100	30	26.0	87	(60-138)	14.30	(< 20)
Chloroform	30	30.2	101	30	29.4	98	(79-124)	2.70	(< 20)
Chloromethane	30	29.8	99	30	31.1	104	(50-139)	4.40	(< 20)
cis-1,2-Dichloroethene	30	29.4	98	30	29.2	97	(78-123)	0.68	(< 20)
cis-1,3-Dichloropropene	30	32.1	107	30	31.5	105	(75-124)	1.90	(< 20)
Dibromochloromethane	30	31.8	106	30	31.3	104	(74-126)	1.50	(< 20)
Dibromomethane	30	29.8	99	30	29.3	98	(79-123)	1.70	(< 20)
Dichlorodifluoromethane	30	26.8	89	30	25.5	85	(32-152)	5.10	(< 20)
Ethylbenzene	30	31.2	104	30	30.3	101	(79-121)	2.80	(< 20)
Freon-113	45	49.0	109	45	47.6	106	(70-136)	2.80	(< 20)
Hexachlorobutadiene	30	31.1	104	30	30.8	103	(66-134)	0.87	(< 20)
Isopropylbenzene (Cumene)	30	30.2	101	30	29.4	98	(72-131)	2.80	(< 20)
Methylene chloride	30	29.4	98	30	28.6	95	(74-124)	2.60	(< 20)
Methyl-t-butyl ether	45	45.7	102	45	45.0	100	(71-124)	1.50	(< 20)
Naphthalene	30	28.1	94	30	29.5	98	(61-128)	4.90	(< 20)
n-Butylbenzene	30	32.0	107	30	30.4	101	(75-128)	5.10	(< 20)
n-Propylbenzene	30	30.7	102	30	29.6	99	(76-126)	3.70	(< 20)
o-Xylene	30	31.0	103	30	30.3	101	(78-122)	2.40	(< 20)
P & M -Xylene	60	60.6	101	60	59.4	99	(80-121)	1.90	(< 20)
sec-Butylbenzene	30	30.5	102	30	29.3	98	(77-126)	4.00	(< 20)
Styrene	30	29.8	99	30	29.3	98	(78-123)	1.70	(< 20)
tert-Butylbenzene	30	31.1	104	30	29.1	97	(78-124)	6.80	(< 20)
Tetrachloroethene	30	32.1	107	30	32.1	107	(74-129)	0.12	(< 20)
Toluene	30	29.5	99	30	29.5	98	(80-121)	0.07	(< 20)
trans-1,2-Dichloroethene	30	29.5	99	30	28.6	95	(75-124)	3.20	(< 20)
trans-1,3-Dichloropropene	30	31.0	103	30	30.9	103	(73-127)	0.39	(< 20)
Trichloroethene	30	31.0	103	30	30.2	101	(79-123)	2.60	(< 20)
Trichlorofluoromethane	30	31.3	104	30	28.5	95	(65-141)	9.30	(< 20)
Vinyl acetate	30	32.5	108	30	31.6	105	(54-146)	2.70	(< 20)
Vinyl chloride	30	29.4	98	30	28.3	94	(58-137)	4.00	(< 20)

Print Date: 09/19/2019 8:21:18AM

Blank Spike Summary

Blank Spike ID: LCS for HBN 1195054 [VXX34836]
Blank Spike Lab ID: 1530934
Date Analyzed: 09/09/2019 11:39

Spike Duplicate ID: LCSD for HBN 1195054 [VXX34836]
Spike Duplicate Lab ID: 1530935
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1195054001, 1195054002, 1195054003, 1195054004, 1195054008

Results by **SW8260C**

	Blank Spike (ug/L)			Spike Duplicate (ug/L)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Xylenes (total)	90	91.6	102	90	89.7	100	(79-121)	2.10	(< 20)
Surrogates									
1,2-Dichloroethane-D4 (surr)	30	98.1	98	30	96.5	97	(81-118)	1.60	
4-Bromofluorobenzene (surr)	30	102	102	30	97.9	98	(85-114)	4.00	
Toluene-d8 (surr)	30	101	101	30	101	101	(89-112)	0.89	

Batch Information

Analytical Batch: **VMS19420**
Analytical Method: **SW8260C**
Instrument: **VPA 780/5975 GC/MS**
Analyst: **CMC**

Prep Batch: **VXX34836**
Prep Method: **SW5030B**
Prep Date/Time: **09/09/2019 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: 09/19/2019 8:21:18AM

Method Blank

Blank ID: MB for HBN 1798960 [XXX/42190]
Blank Lab ID: 1529794

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1195054001, 1195054002, 1195054003, 1195054004, 1195054005, 1195054006, 1195054007

Results by **AK102**

Parameter	Results	LOQ/CL	DL	Units
Diesel Range Organics	0.300U	0.600	0.180	mg/L
Surrogates				
5a Androstane (surr)	86.3	60-120		%

Batch Information

Analytical Batch: XFC15314
Analytical Method: AK102
Instrument: Agilent 7890B R
Analyst: CMS
Analytical Date/Time: 9/11/2019 11:13:00AM

Prep Batch: XXX42190
Prep Method: SW3520C
Prep Date/Time: 9/5/2019 9:54:48AM
Prep Initial Wt./Vol.: 250 mL
Prep Extract Vol: 1 mL

Print Date: 09/19/2019 8:21:21AM

Blank Spike Summary

Blank Spike ID: LCS for HBN 1195054 [XXX42190]
Blank Spike Lab ID: 1529795
Date Analyzed: 09/11/2019 11:53

Spike Duplicate ID: LCSD for HBN 1195054 [XXX42190]
Spike Duplicate Lab ID: 1529796
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1195054001, 1195054002, 1195054003, 1195054004, 1195054005, 1195054006, 1195054007

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	19.2	96	20	21.4	107	(75-125)	10.90	(< 20)
Surrogates									
5a Androstane (surr)	0.4	96.3	96	0.4	108	108	(60-120)	11.10	

Batch Information

Analytical Batch: **XFC15314**
Analytical Method: **AK102**
Instrument: **Agilent 7890B R**
Analyst: **CMS**

Prep Batch: **XXX42190**
Prep Method: **SW3520C**
Prep Date/Time: **09/05/2019 09:54**
Spike Init Wt./Vol.: 20 mg/L Extract Vol: 1 mL
Dupe Init Wt./Vol.: 20 mg/L Extract Vol: 1 mL

Print Date: 09/19/2019 8:21:24AM

Method Blank

Blank ID: MB for HBN 1798960 [XXX/42190]
Blank Lab ID: 1529794

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1195054001, 1195054002, 1195054003, 1195054004, 1195054005, 1195054006, 1195054007

Results by **AK103**

Parameter	Results	LOQ/CL	DL	Units
Residual Range Organics	0.239J	0.500	0.150	mg/L
Surrogates				
n-Triacontane-d62 (surr)	83	60-120		%

Batch Information

Analytical Batch: XFC15314
Analytical Method: AK103
Instrument: Agilent 7890B R
Analyst: CMS
Analytical Date/Time: 9/11/2019 11:13:00AM

Prep Batch: XXX42190
Prep Method: SW3520C
Prep Date/Time: 9/5/2019 9:54:48AM
Prep Initial Wt./Vol.: 250 mL
Prep Extract Vol: 1 mL

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

Blank Spike Summary

Blank Spike ID: LCS for HBN 1195054 [XXX42190]
Blank Spike Lab ID: 1529795
Date Analyzed: 09/11/2019 11:53

Spike Duplicate ID: LCSD for HBN 1195054 [XXX42190]
Spike Duplicate Lab ID: 1529796
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1195054001, 1195054002, 1195054003, 1195054004, 1195054005, 1195054006, 1195054007

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	19.2	96	20	22.1	111	(60-120)	14.30	(< 20)
Surrogates									
n-Triacontane-d62 (surr)	0.4	89.9	90	0.4	99.6	100	(60-120)	10.30	

Batch Information

Analytical Batch: **XFC15314**
Analytical Method: **AK103**
Instrument: **Agilent 7890B R**
Analyst: **CMS**

Prep Batch: **XXX42190**
Prep Method: **SW3520C**
Prep Date/Time: **09/05/2019 09:54**
Spike Init Wt./Vol.: 20 mg/L Extract Vol: 1 mL
Dupe Init Wt./Vol.: 20 mg/L Extract Vol: 1 mL

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

SGS 1195054

SGS North America Inc.
CHAIN OF CUSTODY RECORD

Locations Nationwide
Alaska, Maryland, New Jersey, New York, North Carolina, Indiana, West Virgina, Kentucky
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 & ENGINEERING, LLC
CONTACT: LUCAS LANDLE
PHONE NO: 907-278-6023
PROJECT NAME: ARRC HEALY ROUNDHOUSE GW
PROJECT/ PWSID/ PERMIT#:
REPORTS TO: RSE & ARRC
E-MAIL: LLANDLE@RESTORSCI.COM
INVOICE TO: RSE
QUOTE #:
P.O. #: 19-2040

Section 2

RESERVED for lab use	SAMPLE IDENTIFICATION	DATE mm/dd/yy	TIME HH:MM	MATRIX/ MATRIX CODE	# CONTAINERS	Type C = COMP G = GRAB MI = Multi Incre-mental Soils	Preservative: HCl DRO/RRO AK102/103	HCl GRO AK101	HCl VOC 8260								REMARKS/ LOC ID
1 AH	RSE-1	08/27/19		H_2O	8	C	X	X	X								
2 AH	RSE-2			H_2O	8	C	X	X	X								
3 AH	RSE-3			H_2O	8	C	X	X	X								
4 AH	MW-4		10:45	H_2O	8	C	X	X	X								
5 AH	MW-5		11:24	H_2O	8	C	X	X	X								
6 AH	MW-6	08/27/19	12:00	H_2O	8	C	X	X	X								
7 AH	RSE-X	08/27/19	24:00	H_2O	8	C	X	X	X								
8 AF																	

Section 5

Relinquished By: (1)	Date	Time	Received By:
	8/30/19	11:31	
Relinquished By: (2)	Date	Time	Received By:
Relinquished By: (3)	Date	Time	Received By:
Relinquished By: (4)	Date 8.30.19	Time 11:24	Received For Laboratory By:

Section 4

DOD Project? Yes No

Data Deliverable Requirements:

Cooler ID:

Requested Turnaround Time and/or Special Instructions:

Profile #336370M

Temp Blank °C: 3.0 D21
or Ambient [ ]
(See attached Sample Receipt Form)

Chain of Custody Seal: (Circle)
INTACT BROKEN ABSENT
(See attached Sample Receipt Form)

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

1195054

SGS North America Inc.
200 W. Potter Dr., Anchorage, AK 99518 (ph) 907-562-2343, (fax) 907-561-5301
3180 Peger Rd., Fairbanks, AK 99701 (ph) 907-474-8656, (fax) 907-474-9685

Sample Kit Request

Client Code: RESTOR **Does a Profile exist in LIMS?** ☐ Yes ☐ No
Client Name: Restoration Science
Ordered By: Lucus Gamble **Phone #:** 278-1023
Email: lgamble@restorsci.com;mboas@restorsci.com
Project Name: ARRC Healy Roundhouse GW Mont. **Project/Permit#:** 19-2040
Quote #: **Deliverables:**
Delivery:

Client pickup Date: 8/23/2019 **Time:** 15:00
Be sure to ask if client will ship by ground (DOT) or air carrier (IATA)
☐ **Deliver to client:**
☐ **Ship by/Air Carrier:**
Airbill Number:
Date to ship by:
Notes:
Kit request taken by: CGH **Date:** August 21, 2019
Kit prepared by: RF **Date:** 8/23/19
Kit *(including lid tightness for pres'd bottles)* checked by: A.L **Date:**
Kit packed & shipped by: RF **Date:**

Filename: SKIT_Restoration Science_ARRC Healy Roundhouse GW *Required Items

No. Samples	Matrix	Analysis	Container Size & Type		Pres.			Hold Time	# QC Bottles	Total Bottles
9	water	GRO	3 x 40-mL	VOA vials	HCl			14D		27
9	water	VOC	3 x 40-mL	VOA vials	HCl			14D		27
9	water	SVOC	2 x 1-L	amber glass	4C			7D		18
9	water	DRO/RRO	2 x 250-ml	amber glass	HCl			14D		18

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

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

Other Notes/Reminders for Kit Prep:

Attention Client/Sampler:

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

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

e-Sample Receipt Form

SGS Workorder #: **1195054**

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	HD
COC accompanied samples?	Yes	
DOD: Were samples received in COC corresponding coolers?		
		**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 @ 3.0 °C Therm. ID: D21
		Cooler ID: @ °C Therm. ID:
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)? **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	No	**No time of collection for samples 1 to 3**
Were analytical requests clear? (i.e., method is specified for analyses with multiple option for analysis (Ex: BTEX, Metals)	Yes	
		***Exemption permitted for metals (e.g,200.8/6020A).
Were proper containers (type/mass/volume/preservative***)used?	Yes	
Volatile / LL-Hg Requirements		
Were Trip Blanks (i.e., VOAs, LL-Hg) in cooler with samples?	Yes	
Were all water VOA vials free of headspace (i.e., bubbles ≤ 6mm)?	Yes	
Were all soil VOAs field extracted with MeOH+BFB?	N/A	

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

Additional notes (if applicable):

Sample Containers and Preservatives

Container Id	Preservative	Container Condition	Container Id	Preservative	Container Condition
1195054001-A	HCL to pH < 2	OK			
1195054001-B	HCL to pH < 2	OK			
1195054001-C	HCL to pH < 2	OK			
1195054001-D	HCL to pH < 2	OK			
1195054001-E	HCL to pH < 2	OK			
1195054001-F	HCL to pH < 2	OK			
1195054001-G	HCL to pH < 2	OK			
1195054001-H	HCL to pH < 2	OK			
1195054002-A	HCL to pH < 2	OK			
1195054002-B	HCL to pH < 2	OK			
1195054002-C	HCL to pH < 2	OK			
1195054002-D	HCL to pH < 2	OK			
1195054002-E	HCL to pH < 2	OK			
1195054002-F	HCL to pH < 2	OK			
1195054002-G	HCL to pH < 2	OK			
1195054002-H	HCL to pH < 2	OK			
1195054003-A	HCL to pH < 2	OK			
1195054003-B	HCL to pH < 2	OK			
1195054003-C	HCL to pH < 2	OK			
1195054003-D	HCL to pH < 2	OK			
1195054003-E	HCL to pH < 2	OK			
1195054003-F	HCL to pH < 2	OK			
1195054003-G	HCL to pH < 2	OK			
1195054003-H	HCL to pH < 2	OK			
1195054004-A	HCL to pH < 2	OK			
1195054004-B	HCL to pH < 2	OK			
1195054004-C	HCL to pH < 2	OK			
1195054004-D	HCL to pH < 2	OK			
1195054004-E	HCL to pH < 2	OK			
1195054004-F	HCL to pH < 2	OK			
1195054004-G	HCL to pH < 2	OK			
1195054004-H	HCL to pH < 2	OK			
1195054005-A	HCL to pH < 2	OK			
1195054005-B	HCL to pH < 2	OK			
1195054005-C	HCL to pH < 2	OK			
1195054005-D	HCL to pH < 2	OK			
1195054005-E	HCL to pH < 2	OK			
1195054005-F	HCL to pH < 2	OK			
1195054005-G	HCL to pH < 2	OK			
1195054005-H	HCL to pH < 2	OK			
1195054006-A	HCL to pH < 2	OK			
1195054006-B	HCL to pH < 2	OK			
1195054006-C	HCL to pH < 2	OK			
1195054006-D	HCL to pH < 2	OK			
1195054006-E	HCL to pH < 2	OK			
1195054006-F	HCL to pH < 2	OK			
1195054006-G	HCL to pH < 2	OK			
1195054006-H	HCL to pH < 2	OK			

Container Id	Preservative	Container Condition	Container Id	Preservative	Container Condition
1195054007-A	HCL to pH < 2	OK			
1195054007-B	HCL to pH < 2	OK			
1195054007-C	HCL to pH < 2	OK			
1195054007-D	HCL to pH < 2	OK			
1195054007-E	HCL to pH < 2	OK			
1195054007-F	HCL to pH < 2	OK			
1195054007-G	HCL to pH < 2	OK			
1195054007-H	HCL to pH < 2	OK			
1195054008-A	HCL to pH < 2	OK			
1195054008-B	HCL to pH < 2	OK			
1195054008-C	HCL to pH < 2	OK			
1195054008-D	HCL to pH < 2	OK			
1195054008-E	HCL to pH < 2	OK			
1195054008-F	HCL to pH < 2	OK			

Container Condition Glossary

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

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

RESTORATION
Science & Engineering, LLC

Laboratory Data Review Checklist

Completed By:

Lisa Koeneman

Title:

Qualified Environmental Professional

Date:

12/3/2019

Consultant Firm:

Restoration Science & Engineering, LLC

Laboratory Name:

SGS North America Inc.

Laboratory Report Number:

1195054

Laboratory Report Date:

9/19/2019

CS Site Name:

ARRC Healy Roundhouse

ADEC File Number:

150.26.037

Hazard Identification Number:

25414

1195054

Laboratory Report Date:

9/19/2019

CS Site Name:

ARRC Healy Roundhouse

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 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, VOCs 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 cooler was delivered at 3.0°C.

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

   Yes☒ No☐ N/A☐ Comments:

   All sample preservation methods were acceptable.

1195054

Laboratory Report Date:

9/19/2019

CS Site Name:

ARRC Healy Roundhouse

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

Yes☒ No☐ N/A☐ Comments:

All samples were found to be in good condition.

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:

All samples were found to be in good condition. However, samples 1-3 did not have a collection time listed on their labels.

e. Data quality or usability affected?

Comments:

The samples were in good condition and delivered within the acceptable temperature range, so the data quality and usability are not affected. The collection times not being listed on the sample jars has no affect on the data results.

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:

No discrepancies were noted in the case narrative. The case narrative directs you to the sample receipt form for sample condition, but nothing else.

c. Were all corrective actions documented?

Yes☐ No☐ N/A☒ Comments:

No corrective actions were taken, as no discrepancies were reported.

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

Comments:

The case narrative does not indicate that the data would be affected.

1195054

Laboratory Report Date:

9/19/2019

CS Site Name:

ARRC Healy Roundhouse

5. Samples Results

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

Yes☒ No☐ N/A☐ Comments:

DRO, GRO, RRO and VOC analyses were performed, as requested.

b. All applicable holding times met?

Yes☒ No☐ N/A☐ Comments:

All samples were delivered and extracted within applicable holding times.

c. All soils reported on a dry weight basis?

Yes☐ No☐ N/A☒ Comments:

The samples in this report are all water samples.

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

Yes☐ No☒ N/A☐ Comments:

The LOQ for 1,2,3-trichloropropane is above the ADEC action level. This VOC analyte is highlighted light blue in the Tabulated Data Tables in Attachment B of this report.

e. Data quality or usability affected?

1,2,3-trichloropropane is not a COPC at this site. Additionally, the results are non-detect. For these reasons, the data quality and usability are not affected. If the LOQ for a COPC was above the ADEC action level, then the data might be affected. This is not the case in this report.

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 7 water samples for all analyses.

1195054

Laboratory Report Date:

9/19/2019

CS Site Name:

ARRC Healy Roundhouse

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 associated LOQs.

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

Comments:

N/A - All Method Blank results are less than their associated LOQs.

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 associated LOQs.

v. Data quality or usability affected?

Comments:

All Method Blank results are found to have results less than their LOQs, so the data quality and usability are not affected.

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 7 water 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 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:

All percent recoveries for the LCS and LCSD are within lab limits.

1195054

Laboratory Report Date:

9/19/2019

CS Site Name:

ARRC Healy Roundhouse

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:

All RPDs for the LCS and LCSD are within lab limits.

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

Comments:

N/A – All percent recoveries and RPDs are within lab limits.

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

Yes☐ No☐ N/A☒ Comments:

No samples are affected.

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

Comments:

The LCS and LCSD results are within lab limits, so the data quality and usability are not affected.

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 organic analyses in 7 water samples.

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.

1195054

Laboratory Report Date:

9/19/2019

CS Site Name:

ARRC Healy Roundhouse

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 and MSD were 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 were within lab limits.

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

Comments:

N/A – All percent recoveries and RPDs were within lab limits.

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

Yes☐ No☐ N/A☒ Comments:

No samples were affected.

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

Comments:

The MS and MSD results do not indicate that the data quality or usability would be affected.

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 all organic analyses in all 7 water samples.

1195054

Laboratory Report Date:

9/19/2019

CS Site Name:

ARRC Healy Roundhouse

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:

All percent recoveries are within lab limits.

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:

No surrogates failed the QC criteria.

iv. Data quality or usability affected?

Comments:

All surrogates were found to have percent recoveries within lab limits, therefore the data quality and usability are not affected.

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 is reported for one cooler and 7 water samples.

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 cooler is clearly indicated on the COC.

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

Yes☒ No☐ N/A☐ Comments:

All trip blank sample results are less than their associated LOQs.

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

Comments:

N/A – All trip blank results are less than their LOQs.

1195054

Laboratory Report Date:

9/19/2019

CS Site Name:

ARRC Healy Roundhouse

v. Data quality or usability affected?

Comments:

The 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:

MW-X, a blind duplicate of RSE-3 was submitted for a total of 7 water samples.

ii. Submitted blind to lab?

Yes☒ No☐ N/A☐ Comments:

MW-X was 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)

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

Where R_1 = Sample Concentration
R_2 = Field Duplicate Concentration

Yes☒ No☐ N/A☐ Comments:

RPDs for the COPCs are within the 30% limit for water samples between RSE-3 and MW-X.

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

Comments:

The RPDs between the duplicate and parent sample are found to be within the 30% limit for water samples for COPCs. Therefore, the data quality and usability are not affected.

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. When possible, RSE used new, dedicated sampling equipment to collect each sample. The non-dedicated sampling equipment used was thoroughly decontaminated using a distilled water and Alcanox wash in between collecting each sample.

1195054

Laboratory Report Date:

9/19/2019

CS Site Name:

ARRC Healy Roundhouse

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:

No decontamination or equipment blank was submitted, however, this has no effect on the data, as RSE either used new, dedicated sampling equipment, or thoroughly cleaned the sampling equipment in between collecting each sample.

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.