NORTECH

SUSTAINABLE ENVIRONMENT, ENERGY, HEALTH & SAFETY PROFESSIONAL SERVICES

***NORTECH*, Inc.**

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February 18, 2019

Transmitted via email:
shawn.tisdell@alaska.gov

State of Alaska
Department of Environmental Conservation
Attn: Shawn Tisdell
610 University Avenue
Fairbanks, Alaska 99709

RE: Groundwater Monitoring Report, Former Leaking HOT Site, 1282 Loon Lane, North Pole, Alaska; ADEC File No. 100.38.254

Dear Shawn:

NORTECH is pleased to submit this report summarizing the results of groundwater monitoring of a heating oil release from a former buried heating oil tank (HOT) at 1282 Loon Lane in North Pole, Alaska (Figure 1 and 2; Site). This monitoring is in response to a request from the Alaska Department of Environmental Conservation (ADEC) for additional groundwater data to quantify the impacts of the 2014 heating oil release to groundwater.

Background

The heating oil release was discovered in 2014 when petroleum odors were noticed in the house after fuel migrated into the crawl space during a high groundwater event. The buried HOT was replaced in July/August 2014 with a 300-gallon aboveground storage tank (Figure 3). The ADEC was notified of the spill in October 2014.

A vapor mitigation system was installed in the crawl space to vent fuel odors outside and reduce vapor intrusion into the residence. Air quality testing of the crawl space and indoor air in the house was conducted in 2017 by the ADEC; results are on file with ADEC.

ADEC sampled the water supply wells at the residence and a neighboring property to the west in 2015 and again in 2016 for volatile organic compounds (VOCs) and polycyclic aromatic hydrocarbons (PAHs). Results indicated estimated detections for some VOC and PAH compounds were less than ADEC groundwater cleanup levels. Analysis for fuels including diesel range organic (DRO) and gasoline range organic (GRO) compounds was not performed in 2016.

In early October 2017, ***NORTECH*** observed and sampled soil borings advanced by GeoTek Alaska (GeoTek). Thirteen soil borings were advanced and sampled down to groundwater. We collected soil headspace readings using a photoionization detector (PID). Laboratory samples collected at various depths from eight of the 13 soil borings were submitted to SGS North America, Inc. in Anchorage for analysis of GRO, DRO,

VOCs, and PAHs. Soil sample results indicated soil contamination remains on site beneath the residence and in soil to the east and south from 2 feet below ground to groundwater. Soil boring results were indicative of a release of heating oil into the shallow subsurface. Contaminants of concern for the site include DRO, VOCs including benzene, toluene, ethylbenzene, and xylenes (BTEX), and some PAH compounds detected above cleanup levels throughout the soil profile. Clean limits were documented in all directions.

Three groundwater monitoring wells were installed in boring locations to the east, west, and northwest of the source area, near the limits of the petroleum plume. Groundwater results from these locations indicated petroleum contamination is present below cleanup levels at these locations. (Figure 3). Results were presented in our March 15, 2018 report.

Objectives and Scope of Work

The objectives of this groundwater monitoring event were to obtain sufficient groundwater data to evaluate current site conditions related to the spill of heating oil and determine the need for additional groundwater monitoring.

ADEC requested a modification to our original scope of work on April 19, 2018. We prepared a revised proposal dated April 23, 2018 in response to the request. The following scope of work was performed to meet the project objectives:

- Sampled three groundwater monitoring wells
- Evaluated contaminant concentrations in groundwater
- Performed an elevation survey of the monitoring wells to determine groundwater gradient

Field Activities

The 2018 groundwater sampling was performed in accordance with our ADEC-approved September 29, 2017 work plan and our revised proposal dated April 23, 2018.

On October 12, 2018, ***NORTECH*** field personnel sampled the groundwater wells and performed a relative elevation survey. We used low-flow purging and sampling techniques in accordance with the ADEC FSG. Sampled with a decontaminated submersible pump and new, disposable discharge tubing. A minimum of three well volumes were purged from each well. A field duplicate sample was collected from the western well. Samples from the northwest well and west well were submitted to SGS for analysis of DRO, GRO, and BTEX. Samples from the east well were submitted for analysis of DRO, GRO, and VOCs. We also submitted a trip blank sample for analysis of GRO and VOCs. We measured the depth to groundwater from tops of well casings using a decontaminated water level meter. Water from the northwest well had a slight petroleum odor; the purge water from the wells did not exhibit a petroleum sheen. A copy of the field notes is attached to this report.

We also performed a relative elevation survey of the top of well casings in order to calculate groundwater gradient. A self-leveling laser level set up and used to measure the distance from a local datum to the top of the well casings.

About 80 gallons of investigation-derived waste (IDW) water were generated during well purging activities. The IDW was containerized and transported by ***NORTECH*** to NRC Alaska, LLC for off-site disposal. The IDW disposal manifest is attached.

There were no deviations from the work plan.

Results and Discussion

In response to a request by ADEC, ***NORTECH*** has completed groundwater monitoring at 1282 Loon Lane, North Pole, Alaska. A release of heating oil occurred in the crawl space in 2014 during an elevated groundwater event. Initial investigation and mitigation work by others included indoor and outdoor air quality screening, groundwater testing of the domestic supply well, and replacement of the underground HOT with an aboveground storage tank. ***NORTECH*** installed three groundwater monitoring wells to the east, west, and northwest of the source area, near the limits of the petroleum plume. The monitoring focused on determining the extent of groundwater contamination and its variation with time.

Groundwater Results

Groundwater sample results are summarized in Table 1 and are summarized below. Table 2 summarizes the quality control calculations. Groundwater cleanup levels are included in the analytical results summary tables in Attachment 2.

Naphthalene in the east monitoring well was the only analyte detected above its cleanup level; it was reported at about twice the cleanup level of 1.7 µg/L. GRO and DRO were not detected in this well. Benzene and six other VOCs were reported at less than their cleanup levels here.

GRO was detected in the west well at 0.152 milligrams per liter (mg/L) in the primary sample and 0.151 mg/L in the field duplicate sample. DRO was not detected in this well. Toluene was the only VOC analyte detected. None of the analyte concentrations exceeded their cleanup levels.

GRO and DRO were not detected in the northwest well. Benzene was the only detected VOC; it was reported at less than its cleanup level.

Comparison to Previous Results

Concentrations of VOC analytes except toluene increased from the 2017 to the 2018 sampling event. GRO and DRO concentrations decreased in the western well. This well was the only well with detected petroleum fractions in 2018. Comparison to previous groundwater monitoring results indicates increasing concentrations and the need for ongoing groundwater monitoring (Table 3).

Hydraulic Gradient

We completed the groundwater sampling effort in October 2018 during a period of high groundwater. Groundwater was measured at about four feet below ground surface in the monitoring wells. The groundwater elevation was higher in 2018 than 2017 by about 1.5 feet. The 2018 gradient was calculated at 0.0008 feet per foot at N21°W (Figure 4) and the 2017 groundwater gradient was calculated at 0.0009 feet per foot at N10°W (Figure 5). These results are consistent with the regional gradient and indicate a nearly flat water table. Survey measurements are summarized in Table 4.

Potential Off-Site Source

We reviewed the 2017 soil boring field screening results; PID results were greater than 1,000 parts per million (ppm) in the borings southwest, southeast, and east of the deck on the residence. PID results decreased to 21 ppm in the boring about 30 feet east of the deck, then increased to 506 ppm in the farthest east soil boring in which the east well was installed. The increase in PID results to the east suggest the possibility of a second source of soil

contamination east of the former HOT. Additional delineation of groundwater in this area is warranted.

Quality Control Summary

Data Quality Objectives

The data quality objectives for the project were to meet the requirements of the work plan. The goal was to produce data of adequate quality for comparison to the 18 AAC 75 cleanup levels. The ADEC Laboratory Data Review Checklist (LDRC) was completed for the laboratory work order and is attached to this report. Means for ensuring data quality control included the use of a field duplicate sample, trip blank, and temperature blank.

Laboratory data quality was satisfactory with an exception where the Limits of Quantification (LOQs) were greater than the ADEC cleanup level for the VOC 1,2,3-trichloropropane. The corresponding laboratory detection limits for this compound were less than ADEC cleanup level.

Field Duplicate Sample

Field duplicate pairs are the primary check on field sampling techniques and data precision. The relative percent difference (RPD) between the primary and duplicate results for each detected compound is summarized in Table 2. The quality assurance objective for the RPD is +/-30% for water samples. RPDs for GRO and toluene in sample duplicate pair *W-Well* and *W-Well 2* met this objective.

Trip Blank

Trip blanks are laboratory-prepared samples that are kept with the field samples and were analyzed for GRO and VOCs to evaluate sample handling for cross contamination. A laboratory supplied trip blank accompanied the sample cooler. Analytes were not reported above the LOQ in the trip blank sample.

Conclusions and Recommendations

NORTECH completed the assessment work in October 2018. The investigation focused on determining to what extent fuel had migrated through the soil into groundwater. Based on groundwater results from 2017 and 2018, ***NORTECH*** has developed the following conclusions and recommendations related to groundwater at this Site:

2018 sampling of the three groundwater monitoring wells installed near the perimeter of the petroleum plume indicated:

- Naphthalene was the only contaminant detected in any monitoring well at greater than its cleanup level
- All other VOC analyte concentrations are less than cleanup levels
- DRO was not detected in the monitoring wells, but was detected at elevated levels in source area soil in 2017
- Develop a groundwater monitoring plan that includes
    - long-term monitoring for DRO and VOCs in the monitoring wells
    - sampling the on-site residential well for DRO and VOC
- Install and sample monitoring wells
    - within the source area to determine contaminant concentrations and serve as a Point of Compliance

- at an intermediate location east of the source area to delineate groundwater contamination
- south of the source area to delineate groundwater contamination

NORTECH appreciates the opportunity to perform this monitoring and is available in the event there are questions regarding the contents of this report.

Sincerely,
NORTECH

Julie Keener, PE
Project Manager

Peter Beardsley, PE
Principal, President

Attachments:

Attachment 1: Figures
- Figure 1 – Location Map
- Figure 2 – Vicinity Map
- Figure 3 – Monitoring Well Locations

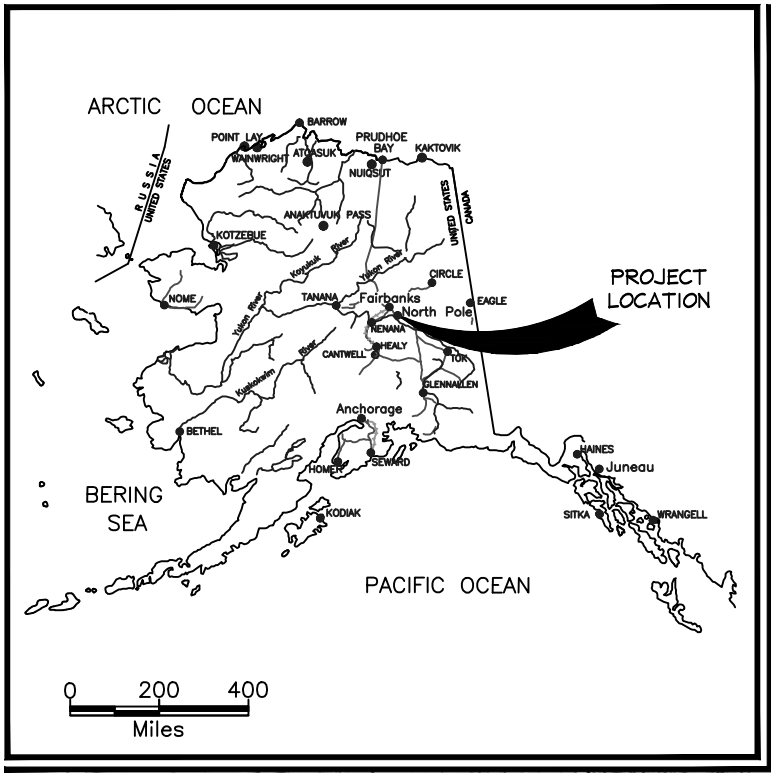
Attachment 2: Tables
- Table 1 – Summary of 2018 Monitoring Well Results
- Table 2 – Quality Control Results
- Table 3 – Summary of 2017 and 2018 Monitoring Well Results
- Table 4 – 2017 and 2018 Elevation Survey Results

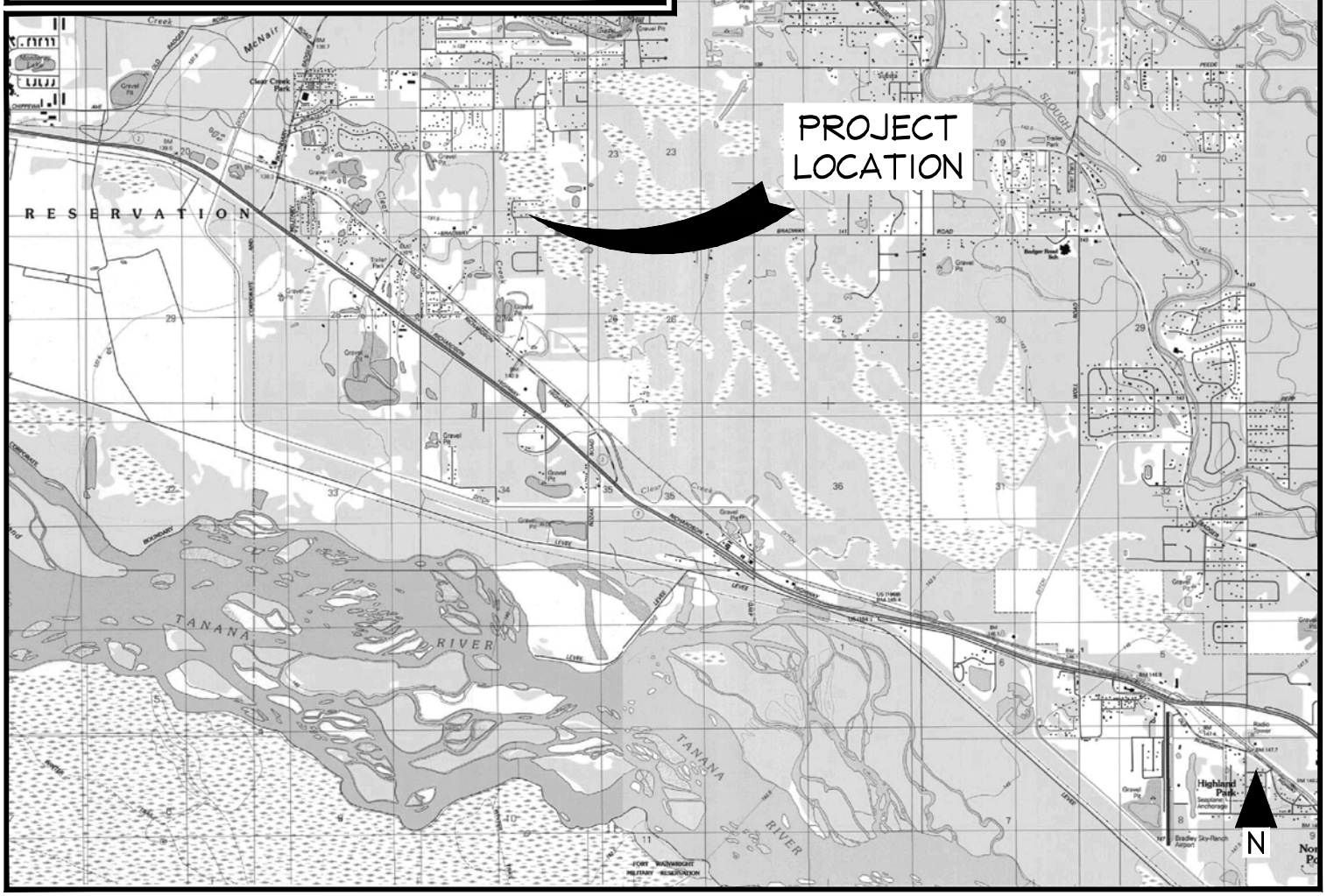
Attachment 3: Field Notes

Attachment 4: Laboratory Report and LDRC

Attachment 5: NRC IDW Disposal Documentation

Attachment 1





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Location Map

1282 Loon Lane Groundwater Monitoring

North Pole, Alaska

SCALE: 1" = 1 MILE	FIGURE: 1
DESIGN: JAK	
DRAWN: KAO	
PROJECT NO: 17-1071	
DWG: 171071c(01)	
DATE: 01/17/2019	

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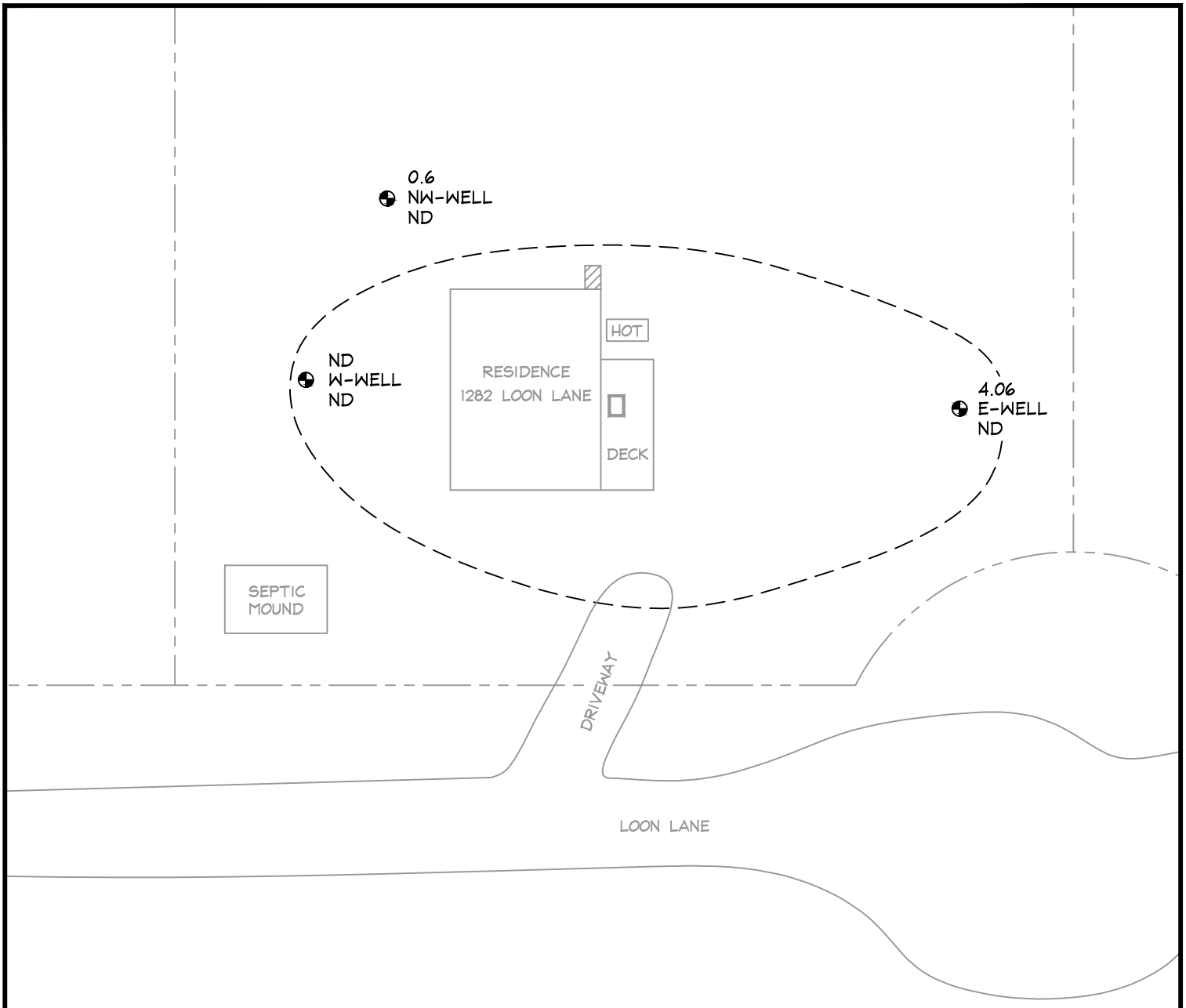
Vicinity Map
1282 Loon Lane Groundwater Monitoring
North Pole, Alaska

SCALE: 1" = 300'	FIGURE: 2
DESIGN: JAK	
DRAWN: KAO	
PROJECT NO: 17-1071	
DWG: 171071c(02)	
DATE: 01/17/2019	



LEGEND

⊕	Groundwater monitoring well location	HOT	Current aboveground heating oil tank
0.00 WELL 0.00	Benzene (µg/L) Well ID DRO (mg/L)	▯	Approximate location of former buried HOT
ND	Analyte not detected	▨	Well house
— — — —	Approximate plume boundary		
— — — —	Property boundary lines		

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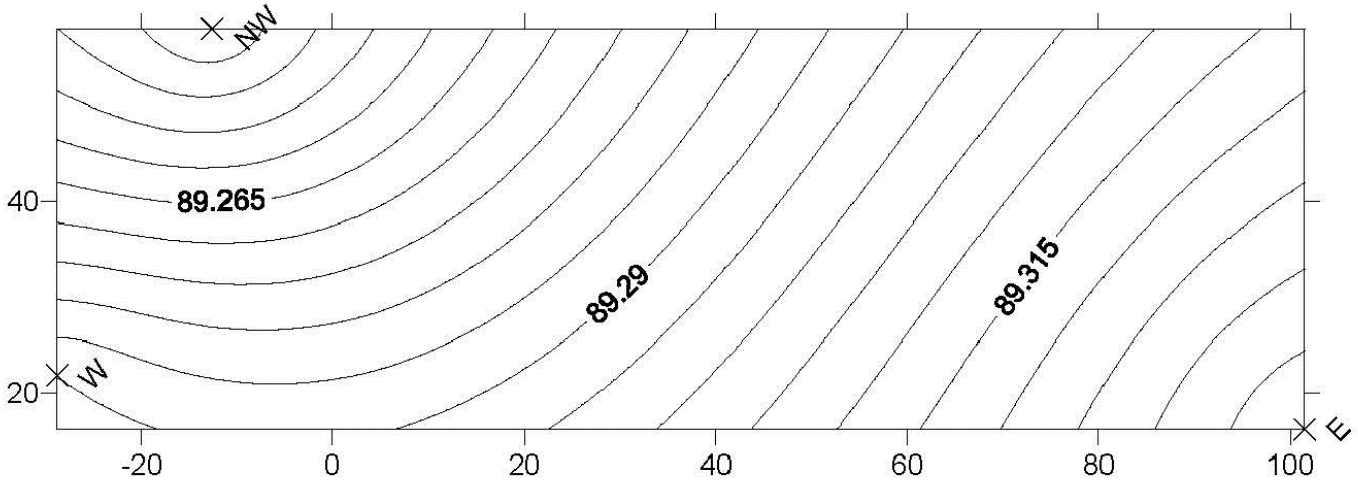
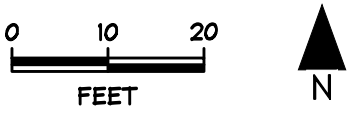
Monitoring Well Locations
1282 Loon Lane Groundwater Monitoring
North Pole, Alaska

SCALE: 1" = 30'	FIGURE: 3
DESIGN: JAK	
DRAWN: KAO	
PROJECT NO: 17-1071	
DWG: 171071c(03)	
DATE: 01/17/2019	





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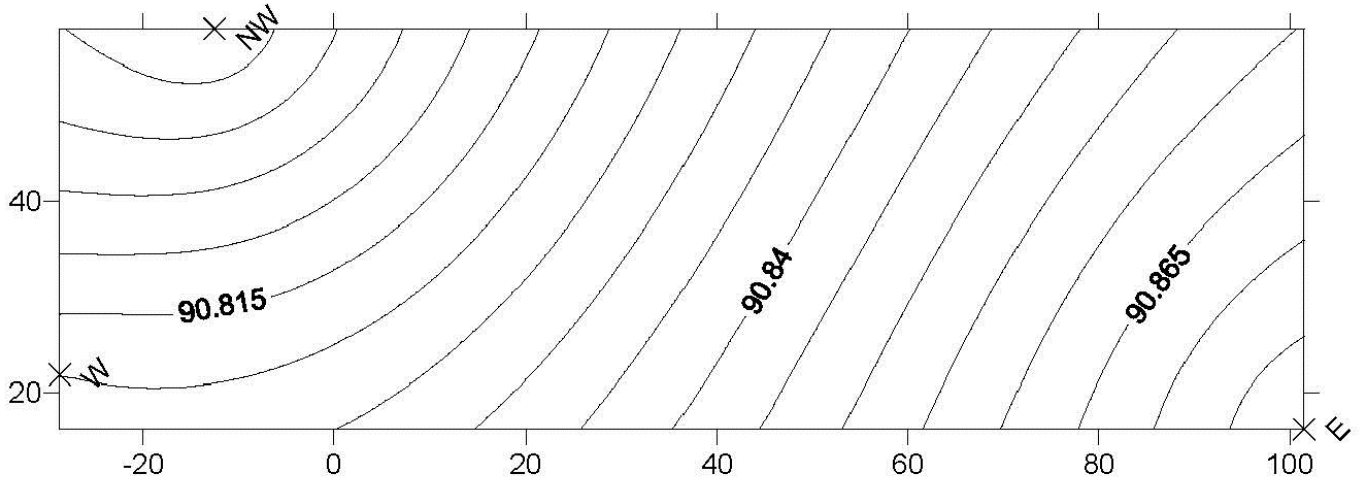
2018 Groundwater Contours
1282 Loon Lane Groundwater Monitoring
North Pole, Alaska

SCALE: 1" = 20'	FIGURE: 4
DESIGN: JAK	
DRAWN: KAO	
PROJECT NO: 17-1071	
DWG: 171071c(04)	
DATE: 01/17/2019	



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2017 Groundwater Contours
1282 Loon Lane Groundwater Monitoring
North Pole, Alaska

SCALE: 1" = 20'	FIGURE: 5
DESIGN: JAK	
DRAWN: KAO	
PROJECT NO: 17-1071	
DWG: 171071c(05)	
DATE: 01/17/2019	

Attachment 2

Table 1

Summary of 2018 Monitoring Well Results

Sample ID	ADEC Groundwater Cleanup Level	*E-Well*	*NW-Well*	*W-Well*	*W-Well 2*
Petroleum Fractions (mg/L)					
Gasoline Range Organics	2.2	ND(0.100)	ND(0.100)	0.152	0.151
Diesel Range Organics	1.5	ND(0.600)	ND(0.600)	ND(0.600)	ND(0.600)
Volatile Organic Compounds (µg/L)					
Benzene	4.6	4.06	0.6	ND(0.400)	ND(0.400)
Toluene	1,100	ND(1.00)	ND(1.00)	82.0	82.0
Ethylbenzene	15	8.08	ND(1.00)	ND(1.00)	ND(1.00)
Xylenes (total)	190	17.1	ND(3.00)	ND(3.00)	ND(3.00)
Isopropylbenzene	450	3.39	—	—	—
Naphthalene	1.7	**4.0**	—	—	—
n-Propylbenzene	660	4.83	—	—	—
1,2,4-Trimethylbenzene	15	5.93	—	—	—
1,3,5-Trimethylbenzene	120	6.37	—	—	—

Notes:	Only detected VOC analytes are tabulated.
ND(X.XX)	Analyte not detected above given limit of quantitation
XX.X	Analyte detected below ADEC groundwater cleanup level
X.XX	Analyte detected above ADEC groundwater cleanup level
—	Analysis not requested

Table 2

Quality Control Results

Sample ID	*W-Well*	*W-Well 2*	Difference	Average	RPD (%)
Gasoline Range Organics (mg/L)	0.152	0.151	0.001	0.1515	0.7
Toluene (µg/L)	82.0	82.0	0	82.0	0

Table 3

Summary of 2017 and 2018 Monitoring Well Results

Sample Location	ADEC Groundwater Cleanup Level	2017 East Well	2017 East Well duplicate	2018 East Well	2017 Northwest Well	2018 Northwest Well	2017 West Well	2018 West Well	2018 West Well duplicate
Petroleum Fractions (mg/L)									
Gasoline Range Organics	2.2	ND(0.100)	ND(0.100)	ND(0.100)	ND(1.00)	ND(0.100)	0.245	0.152	0.151
Diesel Range Organics	1.5	ND(0.588)	ND(0.545)	ND(0.600)	ND(0.556)	ND(0.600)	0.672	ND(0.600)	ND(0.600)
Volatile Organic Compounds (µg/L)									
Benzene	4.6	1.29	1.29	4.06	ND(0.400)	0.6	ND(0.400)	ND(0.400)	ND(0.400)
Toluene	1,100	ND(1.00)	ND(1.00)	ND(1.00)	ND(1.00)	ND(1.00)	145	82.0	82.0
Ethylbenzene	15	3.62	3.45	8.08	ND(1.00)	ND(1.00)	ND(1.00)	ND(1.00)	ND(1.00)
Xylenes (total)	190	5.44	5.19	17.1	ND(3.00)	ND(3.00)	ND(3.00)	ND(3.00)	ND(3.00)
4-Isopropyltoluene	—	ND(1.00)	ND(1.00)	ND(1.00)	ND(1.00)	—	ND(1.00)	—	—
Isopropylbenzene	450	1.44	1.40	3.39	ND(1.00)	—	ND(1.00)	—	—
Naphthalene	1.7	ND(1.00)	ND(1.00)	**4.0**	ND(1.00)	—	ND(1.00)	—	—
n-Propylbenzene	660	1.73	1.66	4.83	ND(1.00)	—	ND(1.00)	—	—
sec-Butylbenzene	190	ND(1.00)	ND(1.00)	ND(1.00)	ND(1.00)	—	ND(1.00)	—	—
Trichlorofluoromethane	5,200	ND(1.00)	ND(1.00)	ND(1.00)	ND(1.00)	—	4.39	—	—
1,2,4-Trimethylbenzene	15	3.07	2.92	5.93	ND(1.00)	—	ND(1.00)	—	—
1,3,5-Trimethylbenzene	120	2.89	2.76	6.37	ND(1.00)	—	ND(1.00)	—	—
Polycylic Aromatic Hydrocarbons (µg/L)									
Acenaphthene	530	ND(0.0481)	ND(0.0481)	—	ND(0.0472)	—	0.0884	—	—
1-Methylnaphthalene	11	0.912	0.869	—	ND(0.0472)	—	ND(0.0490)	—	—
2-Methylnaphthalene	36	1.11	1.05	—	ND(0.0472)	—	0.0523	—	—
Fluorene	290	0.0636	0.0608	—	ND(0.0472)	—	ND(0.0490)	—	—
Naphthalene	1.7	0.607	0.563	—	ND(0.0943)	—	0.194	—	—
Phenanthrene	170	0.0751	0.0716	—	ND(0.0472)	—	ND(0.0490)	—	—

Notes: Only detected VOC and PAH analytes are tabulated.

ND(X.XX) Analyte not detected above given limit of quantitation

X.XX Analyte detected below ADEC groundwater cleanup level

X.XX Analyte detected above ADEC groundwater cleanup level

— Analysis not requested or cleanup level not established

Table 4
2017 and 2018 Elevation Survey Results

2017 Survey Data (11/10/2017)				
Location	Datum to Top of Casing (ft)	Top of Casing Elevation (ft)	Top of Casing to Groundwater (ft)	Groundwater Elevation (ft)
Front Porch	3.03	96.97	—	—
East Well	6.06	93.94	5.2	89.34
West Well	2.03	97.97	8.68	89.29
Northwest Well	3.37	96.63	7.39	89.24
2018 Survey Data (10/12/2018)				
Location	Datum to Top of Casing (ft)	Top of Casing Elevation (ft)	Top of Casing to Groundwater (ft)	Groundwater Elevation (ft)
Front Porch	2.78	97.22	—	—
East Well	5.7	94.3	3.42	90.88
West Well	1.63	98.37	7.55	90.82
Northwest Well	2.78	97.22	6.43	90.79

Notes: "Local" Datum (ft) 100
All elevations are relative to the established Local Datum

Attachment 3

11/10/2017 Loop Survey

Front of House (=100) = 3.03 (100')
W-well = 2.03 top of well
NW-well = 3.37
E-well = 6.06

10/12/18 GW Event - High Water Sunny

0930 calibrate YSI pro DSS, pcas and pack truck. Contact Surveyors Exchange for survey loop equipment - pickup equipment, extra batteries.

1200 arrive onsite setup survey loop
- Front of house ("zero") - 100'
- TOC - survey plane. 5.70'
- Left of Front Door 2.78' - Deck at building.

Survey location setup in the road in approximate line with 'NW-well' and the eastern base of septic mound.

Well ID	'survey plane'
E-well	5.70'
W-well	1.63'
~~NA~~ NW-well	2.78'
Front Door	2.78' (100')

- From road surface 'plane' is measured to be 4.78'

Well measurements

time	Well ID	TOM-GS	TOC-TOM	DTW	TD
1249	NW-well	3.86'	0.20	6.43	17.42
13:51	W-well	3.85'	0.55	7.55	17.40
1448	E-well	flush	0.60	3.42	13.25

1545 depart site

Groundwater Sample Form

Project: ADEC Loon Ln | Site Location: 1282 Loon Ln, NP, AK
Project #: 17-1071 | Well Number: E-well

Water Column (Pre-Purge / Post-Purge: *(only need to be collected if field staff have sufficient belief these measurements have changed)*

	Pre-Purge	Post-Purge
Total Depth of Well (ft):	13.25	
Depth to Product from TOC (ft):	N/A	
Depth to Water from TOC (ft):	3.42	
Column of Water in Well (ft):	9.83	

Water Level Measurement Date: 10/12/18
Water Level Measurement Time: 1448
WL Instrument & S/N: Int. Probe 1033
Depth Pump Deployed At (ft): ~5 | Tubing Used (ft): 15

Purge Information

		Well Diameter (in)	Volume (gal/ft)
Gallons/foot of Well Casing:	0.17	1 3/4"	0.08
Column of Water in Well (ft):	X 9.83	2"	0.17
Vol. of Water in Well (gal):	= 1.67	4"	0.66

TOM-GS (ft): flush | TOC-TOM (ft): 0.60
Purge Method: sub. pump w/ controller
Est. Flow Rate (gal/min): ~1 | Development Tot. Vol (gal): 15
Purge Water Disposal: Drop-off @ NRC Alaska

Field Parameters Purge Start Time: 1459 | Purge End time: 1515 | Total Volume Removed (gal): 25

Time (24-hr)	Temperature [±0.5 °C]	Dissolved O_2 [± 0.1 mg/L]	Conductivity [± 3% µS/cm]	pH [± 0.1 pH units]	ORP [±10 mV]	Visual Clarity (observed)	Odor (Y/N)	Sheen (Y/N)	Removed Vol (gal)
1502	2.5	0.15	190.9	7.10	-107.8	sl. turbid	—	—	
1505	2.4	0.12	190.2	7.09	-103.6	" "	N	N	
1508	2.4	0.06	189.4	7.08	-99.0	" "	N	N	
1511	2.3	0.06	189.2	7.07	-96.7	clear-ish	N	N	
1514	2.3	0.05	189.4	7.06	-95.2	"	N	N	
1516	Sample time					clear/sl. turbid	N	N	

Water Quality Meter & S/N: YSI pro DSS 17E101936 | Purge Notes: v. turbid to clear

Sample Information

Sample Criteria (circle one): (Stable parameters) or > 3 Well Vol. Purged

Sample Date: 10/12/18 | Sample ID: E-well | Time: 1516
Sampler(s): SWH | Field Dup ID: N/A | Time: —
Sample Method: Sub. pump w/ controller | Equip Blank ID: N/A | Time: —

Laboratory Analyses: ☐ ~~DRO/RRO (AK102/103)~~; ☑ GRO/BTEX (AK101 / ~~EPA 8021B~~); ☐ PAH (EPA 8270D SIM); ☑ VOC EPA 8260; ☐

Well Condition Notes: Flushmount!
Casing Notes: good
Monument Notes: good

Notes & Comments:

Groundwater Sample Form

Project: ADEC Loon Ln **Site Location:** 1282 Loon Ln, NP, AK

Project #: 17-1071 **Well Number:** W-Well

Water Column

	Pre-Purge	Post-Purge: *(only need to be collected if field staff have sufficient belief these measurements have changed)*
Total Depth of Well (ft):	17.40	
Depth to Product from TOC (ft):	—	
Depth to Water from TOC (ft):	7.55	
Column of Water in Well (ft):	9.85	

Water Level Measurement Date: 10/12/18

Water Level Measurement Time: 13:51

WL Instrument & S/N: Int. probe 1033

Depth Pump Deployed At (ft): ~9 Tubing Used (ft): 25

Purge Information

	Well Diameter (in)	Volume (gal/ft)
	1 3/4"	0.08
	2"	0.17
	4"	0.66

Gallons/foot of Well Casing: 0.17

Column of Water in Well (ft): X 9.85

Vol. of Water in Well (gal): = 1.67

TOM-GS (ft): 3.85 TOC-TOM (ft): 0.55

Purge Method: Sub pump w/ controller

Est. Flow Rate (gal/min): ~1 Development Tot. Vol (gal): 10

Purge Water Disposal: NRC Alaska, Drum-off

Field Parameters Purge Start Time: 1400 Purge End time: 1417 Total Volume Removed (gal): 15

Time (24-hr)	Temperature [±0.5 °C]	Dissolved O_2 [± 0.1 mg/L]	Conductivity [± 3% µS/cm]	pH [± 0.1 pH units]	ORP [±10 mV]	Visual Clarity (observed)	Odor (Y / N)	Sheen (Y / N)	Removed Vol (gal)
1403	4.1	0.12	801	6.93	-55.1	sl. turbid	Y	N	
1406	4.1	0.11	796	6.94	-64.7	sl. turbid	faint Y	N	
1409	4.1	0.11	798	6.94	-70.7	sl. turbid			
1412	4.0	0.10	779	6.95	-75.5	sl. turbid			
1415	4.0	0.09	781	6.95	-78.3	sl. turbid			
1418	sample time					clear/sl. turbid	"	N	
1424	Dup sample time					" "	"	N	

Water Quality Meter & S/N: YSI proDSS 17F101936 Purge Notes: turbid to clear / sl. turbid.

Sample Information

Sample Criteria (circle one): (Stable parameters) or > 3 Well Vol. Purged

Sample Date: 10/12/18 **Sample ID:** W-well Time: 1418

Sampler(s): SWM **Field Dup ID:** W-well 2 Time: 1424

Sample Method: Sub pump w/ cont. **Equip Blank ID:** — Time: —

Laboratory Analyses: ☑ DRO/~~RRO~~ (AK102/~~103~~); ☑ GRO/~~BTEX~~ (AK101 / ~~EPA 8021~~B); ☐ PAH (EPA 8270D SIM); ☑ ~~VOC~~ BTEX EPA 8260; ☐ _____

Well Condition Notes:

Casing Notes: good

Monument Notes: good

Notes & Comments:

Groundwater Sample Form

Project: ADEC Loon Lane **Site Location:** 1282 Loon Lane, NP, AK

Project #: 17-1071 **Well Number:** NW-Well

Water Column Pre-Purge Post-Purge: *(only need to be collected if field staff have sufficient belief these measurements have changed)*

	Pre-Purge	Post-Purge
Total Depth of Well (ft):	17.42	
Depth to Product from TOC (ft):	–	
Depth to Water from TOC (ft):	6.43	
Column of Water in Well (ft):	10.99	

Water Level Measurement Date: 10/12/18

Water Level Measurement Time: 1249

WL Instrument & S/N: Int. Probe 1033

Depth Pump Deployed At (ft): ~8 Tubing Used (ft): 25

Purge Information

		Well Diameter (in)	Volume (gal/ft)
Gallons/foot of Well Casing:	0.17	1 3/4"	0.08
Column of Water in Well (ft):	X 10.99	2"	0.17
Vol. of Water in Well (gal):	= 1.87	4"	0.66

TOM-GS (ft): 3.86 TOC-TOM (ft): 0.20

Purge Method: Sub pump w/ controller

Est. Flow Rate (gal/min): ~1 Development Tot. Vol (gal): 25

Purge Water Disposal: NRC Alaska Drop-off

Field Parameters Purge Start Time: 13:10 Purge End time: 1326 Total Volume Removed (gal): 40

Time (24-hr)	Temperature [±0.5 °C]	Dissolved O_2 [± 0.1 mg/L]	Conductivity [± 3% µS/cm]	pH [± 0.1 pH units]	ORP [±10 mV]	Visual Clarity (observed)	Odor (Y/N)	Sheen (Y/N)	Removed Vol (gal)
13:13	2.8	0.46	191.9	7.09	21.9	sl. turbid	N	N	
13:16	2.7	0.32	192.0	7.09	2.6	clear	↓	↓	
13:19	2.7	0.25	192.0	7.09	-11.1	sl. turbid	↓	↓	
13:22	2.7	0.20	192.3	7.09	-23.1	" "	slight	N	
13:25	2.7	0.18	192.4	7.09	-30.5	" "	↓	N	
13:27	Sample time					clear	↓	N	

Water Quality Meter & S/N: YSI ProDSS 17E101936 Purge Notes: v. turbid to clear

Sample Information

Sample Criteria (circle one): Stable parameters or ≥ 3 Well Vol. Purged

Sample Date: 10/12/18 Sample ID: NW-Well Time: 1327

Sampler(s): SWH Field Dup ID: N/A Time: –

Sample Method: sub. pump w/ controller Equip Blank ID: N/A Time: –

Laboratory Analyses: ☒ ~~DRO/RRO~~ (AK102/~~103~~); ☒ ~~GRO/BTEX~~ (AK101 / ~~EPA 8021B~~); ☐ PAH (EPA 8270D SIM); ☐ ~~VOC~~ EPA 8260; ☒ BTEX

Well Condition Notes:

Casing Notes: good

Monument Notes: good

Notes & Comments:

Attachment 4

Laboratory Report of Analysis

To: Nortech
2450 College Road
Fairbanks, AK 99709
(907)452-5688

Report Number: **1189864**

Client Project: **Loon Lane GW 2018**

Dear Scott Hummel,

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 Jennifer 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.

Alaska Division Technical Director

Stephen Ede
2018.10.23
11:32:31 -08'00'

Jennifer Dawkins Date
Project Manager
Jennifer.Dawkins@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: **Nortech**
SGS Project: **1189864**
Project Name/Site: **Loon Lane GW 2018**
Project Contact: **Scott Hummel**

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.

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Report of Manual Integrations

Laboratory ID	Client Sample ID	Analytical Batch	Analyte	Reason
SW8260C				
1189864004	E-Well	VMS18448	4-Isopropyltoluene	SP

Manual Integration Reason Code Descriptions

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

All DRO/RRO analysis are integrated per SOP.

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Laboratory Qualifiers

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

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

SGS maintains a formal Quality Assurance/Quality Control (QA/QC) program. A copy of our Quality Assurance Plan (QAP), which outlines this program, is available at your request. The laboratory certification numbers are AK00971 (DW Chemistry & Microbiology) & 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). Except as specifically noted, all statements and data in this report are in conformance to the provisions set forth by the SGS QAP and, when applicable, other regulatory authorities.

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

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

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

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Sample Summary

Client Sample ID	Lab Sample ID	Collected	Received	Matrix
NW-Well	1189864001	10/12/2018	10/13/2018	Water (Surface, Eff., Ground)
W-Well	1189864002	10/12/2018	10/13/2018	Water (Surface, Eff., Ground)
W-Well 2	1189864003	10/12/2018	10/13/2018	Water (Surface, Eff., Ground)
E-Well	1189864004	10/12/2018	10/13/2018	Water (Surface, Eff., Ground)
TB- Loom Ln	1189864005	10/12/2018	10/13/2018	Water (Surface, Eff., Ground)

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

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Detectable Results Summary

Client Sample ID: **NW-Well**
Lab Sample ID: 1189864001
Volatile GC/MS

Parameter	Result	Units
Benzene	0.600	ug/L

Client Sample ID: **W-Well**
Lab Sample ID: 1189864002
Volatile Fuels
Volatile GC/MS

Parameter	Result	Units
Gasoline Range Organics	0.152	mg/L
Toluene	82.0	ug/L

Client Sample ID: **W-Well 2**
Lab Sample ID: 1189864003
Volatile Fuels
Volatile GC/MS

Parameter	Result	Units
Gasoline Range Organics	0.151	mg/L
Toluene	82.0	ug/L

Client Sample ID: **E-Well**
Lab Sample ID: 1189864004
Volatile GC/MS

Parameter	Result	Units
1,2,4-Trimethylbenzene	5.93	ug/L
1,3,5-Trimethylbenzene	6.37	ug/L
Benzene	4.06	ug/L
Ethylbenzene	8.08	ug/L
Isopropylbenzene (Cumene)	3.39	ug/L
Naphthalene	4.00	ug/L
n-Propylbenzene	4.83	ug/L
o-Xylene	6.20	ug/L
P & M -Xylene	10.9	ug/L
Xylenes (total)	17.1	ug/L

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Results of **NW-Well**

Client Sample ID: **NW-Well**
Client Project ID: **Loon Lane GW 2018**
Lab Sample ID: 1189864001
Lab Project ID: 1189864

Collection Date: 10/12/18 13:27
Received Date: 10/13/18 10:45
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	0.600	U	0.600	0.180	mg/L	1		10/22/18 11:53
Surrogates								
5a Androstane (surr)	98		50-150		%	1		10/22/18 11:53

Batch Information

Analytical Batch: XFC14740
Analytical Method: AK102
Analyst: VDL
Analytical Date/Time: 10/22/18 11:53
Container ID: 1189864001-G

Prep Batch: XXX40759
Prep Method: SW3520C
Prep Date/Time: 10/19/18 08:06
Prep Initial Wt./Vol.: 250 mL
Prep Extract Vol: 1 mL

Print Date: 10/23/2018 11:22:19AM

Results of **NW-Well**

Client Sample ID: **NW-Well**
Client Project ID: **Loon Lane GW 2018**
Lab Sample ID: 1189864001
Lab Project ID: 1189864

Collection Date: 10/12/18 13:27
Received Date: 10/13/18 10:45
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	0.100	U	0.100	0.0310	mg/L	1		10/13/18 20:25
Surrogates								
4-Bromofluorobenzene (surr)	92.8		50-150		%	1		10/13/18 20:25

Batch Information

Analytical Batch: VFC14500
Analytical Method: AK101
Analyst: ACL
Analytical Date/Time: 10/13/18 20:25
Container ID: 1189864001-A

Prep Batch: VXX33333
Prep Method: SW5030B
Prep Date/Time: 10/13/18 08:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Print Date: 10/23/2018 11:22:19AM

Results of **NW-Well**

Client Sample ID: **NW-Well**
Client Project ID: **Loon Lane GW 2018**
Lab Sample ID: 1189864001
Lab Project ID: 1189864

Collection Date: 10/12/18 13:27
Received Date: 10/13/18 10:45
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	0.600		0.400	0.120	ug/L	1		10/15/18 14:05
Ethylbenzene	1.00	U	1.00	0.310	ug/L	1		10/15/18 14:05
o-Xylene	1.00	U	1.00	0.310	ug/L	1		10/15/18 14:05
P & M -Xylene	2.00	U	2.00	0.620	ug/L	1		10/15/18 14:05
Toluene	1.00	U	1.00	0.310	ug/L	1		10/15/18 14:05
Xylenes (total)	3.00	U	3.00	1.00	ug/L	1		10/15/18 14:05
Surrogates								
1,2-Dichloroethane-D4 (surr)	107		81-118		%	1		10/15/18 14:05
4-Bromofluorobenzene (surr)	103		85-114		%	1		10/15/18 14:05
Toluene-d8 (surr)	102		89-112		%	1		10/15/18 14:05

Batch Information

Analytical Batch: VMS18448
Analytical Method: SW8260C
Analyst: FDR
Analytical Date/Time: 10/15/18 14:05
Container ID: 1189864001-D

Prep Batch: VXX33345
Prep Method: SW5030B
Prep Date/Time: 10/15/18 00:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

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Results of **W-Well**

Client Sample ID: **W-Well**
Client Project ID: **Loon Lane GW 2018**
Lab Sample ID: 1189864002
Lab Project ID: 1189864

Collection Date: 10/12/18 14:18
Received Date: 10/13/18 10:45
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	0.600	U	0.600	0.180	mg/L	1		10/22/18 12:03
Surrogates								
5a Androstane (surr)	86.3		50-150		%	1		10/22/18 12:03

Batch Information

Analytical Batch: XFC14740
Analytical Method: AK102
Analyst: VDL
Analytical Date/Time: 10/22/18 12:03
Container ID: 1189864002-G

Prep Batch: XXX40759
Prep Method: SW3520C
Prep Date/Time: 10/19/18 08:06
Prep Initial Wt./Vol.: 250 mL
Prep Extract Vol: 1 mL

Print Date: 10/23/2018 11:22:19AM

Results of **W-Well**

Client Sample ID: **W-Well**
Client Project ID: **Loon Lane GW 2018**
Lab Sample ID: 1189864002
Lab Project ID: 1189864

Collection Date: 10/12/18 14:18
Received Date: 10/13/18 10:45
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	0.152		0.100	0.0310	mg/L	1		10/13/18 20:43
Surrogates								
4-Bromofluorobenzene (surr)	99.7		50-150		%	1		10/13/18 20:43

Batch Information

Analytical Batch: VFC14500
Analytical Method: AK101
Analyst: ACL
Analytical Date/Time: 10/13/18 20:43
Container ID: 1189864002-A

Prep Batch: VXX33333
Prep Method: SW5030B
Prep Date/Time: 10/13/18 08:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Print Date: 10/23/2018 11:22:19AM

Results of **W-Well**

Client Sample ID: **W-Well**
Client Project ID: **Loon Lane GW 2018**
Lab Sample ID: 1189864002
Lab Project ID: 1189864

Collection Date: 10/12/18 14:18
Received Date: 10/13/18 10:45
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	0.400	U	0.400	0.120	ug/L	1		10/15/18 14:20
Ethylbenzene	1.00	U	1.00	0.310	ug/L	1		10/15/18 14:20
o-Xylene	1.00	U	1.00	0.310	ug/L	1		10/15/18 14:20
P & M -Xylene	2.00	U	2.00	0.620	ug/L	1		10/15/18 14:20
Toluene	82.0		1.00	0.310	ug/L	1		10/15/18 14:20
Xylenes (total)	3.00	U	3.00	1.00	ug/L	1		10/15/18 14:20
Surrogates								
1,2-Dichloroethane-D4 (surr)	102		81-118		%	1		10/15/18 14:20
4-Bromofluorobenzene (surr)	102		85-114		%	1		10/15/18 14:20
Toluene-d8 (surr)	103		89-112		%	1		10/15/18 14:20

Batch Information

Analytical Batch: VMS18448
Analytical Method: SW8260C
Analyst: FDR
Analytical Date/Time: 10/15/18 14:20
Container ID: 1189864002-D

Prep Batch: VXX33345
Prep Method: SW5030B
Prep Date/Time: 10/15/18 00:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Print Date: 10/23/2018 11:22:19AM

Results of **W-Well 2**

Client Sample ID: **W-Well 2**
Client Project ID: **Loon Lane GW 2018**
Lab Sample ID: 1189864003
Lab Project ID: 1189864

Collection Date: 10/12/18 14:24
Received Date: 10/13/18 10:45
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	0.600	U	0.600	0.180	mg/L	1		10/22/18 12:14
Surrogates								
5a Androstane (surr)	94		50-150		%	1		10/22/18 12:14

Batch Information

Analytical Batch: XFC14740
Analytical Method: AK102
Analyst: VDL
Analytical Date/Time: 10/22/18 12:14
Container ID: 1189864003-G

Prep Batch: XXX40759
Prep Method: SW3520C
Prep Date/Time: 10/19/18 08:06
Prep Initial Wt./Vol.: 250 mL
Prep Extract Vol: 1 mL

Print Date: 10/23/2018 11:22:19AM

Results of **W-Well 2**

Client Sample ID: **W-Well 2**
Client Project ID: **Loon Lane GW 2018**
Lab Sample ID: 1189864003
Lab Project ID: 1189864

Collection Date: 10/12/18 14:24
Received Date: 10/13/18 10:45
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	0.151		0.100	0.0310	mg/L	1		10/13/18 21:02
Surrogates								
4-Bromofluorobenzene (surr)	102		50-150		%	1		10/13/18 21:02

Batch Information

Analytical Batch: VFC14500
Analytical Method: AK101
Analyst: ACL
Analytical Date/Time: 10/13/18 21:02
Container ID: 1189864003-A

Prep Batch: VXX33333
Prep Method: SW5030B
Prep Date/Time: 10/13/18 08:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Print Date: 10/23/2018 11:22:19AM

Results of **W-Well 2**

Client Sample ID: **W-Well 2**
Client Project ID: **Loon Lane GW 2018**
Lab Sample ID: 1189864003
Lab Project ID: 1189864

Collection Date: 10/12/18 14:24
Received Date: 10/13/18 10:45
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	0.400	U	0.400	0.120	ug/L	1		10/15/18 14:35
Ethylbenzene	1.00	U	1.00	0.310	ug/L	1		10/15/18 14:35
o-Xylene	1.00	U	1.00	0.310	ug/L	1		10/15/18 14:35
P & M -Xylene	2.00	U	2.00	0.620	ug/L	1		10/15/18 14:35
Toluene	82.0		1.00	0.310	ug/L	1		10/15/18 14:35
Xylenes (total)	3.00	U	3.00	1.00	ug/L	1		10/15/18 14:35
Surrogates								
1,2-Dichloroethane-D4 (surr)	105		81-118		%	1		10/15/18 14:35
4-Bromofluorobenzene (surr)	102		85-114		%	1		10/15/18 14:35
Toluene-d8 (surr)	104		89-112		%	1		10/15/18 14:35

Batch Information

Analytical Batch: VMS18448
Analytical Method: SW8260C
Analyst: FDR
Analytical Date/Time: 10/15/18 14:35
Container ID: 1189864003-D

Prep Batch: VXX33345
Prep Method: SW5030B
Prep Date/Time: 10/15/18 00:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Print Date: 10/23/2018 11:22:19AM

Results of **E-Well**

Client Sample ID: **E-Well**
Client Project ID: **Loon Lane GW 2018**
Lab Sample ID: 1189864004
Lab Project ID: 1189864

Collection Date: 10/12/18 15:16
Received Date: 10/13/18 10:45
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	0.600	U	0.600	0.180	mg/L	1		10/22/18 12:24
Surrogates								
5a Androstane (surr)	88.4		50-150		%	1		10/22/18 12:24

Batch Information

Analytical Batch: XFC14740
Analytical Method: AK102
Analyst: VDL
Analytical Date/Time: 10/22/18 12:24
Container ID: 1189864004-G

Prep Batch: XXX40759
Prep Method: SW3520C
Prep Date/Time: 10/19/18 08:06
Prep Initial Wt./Vol.: 250 mL
Prep Extract Vol: 1 mL

Print Date: 10/23/2018 11:22:19AM

Results of **E-Well**

Client Sample ID: **E-Well**
Client Project ID: **Loon Lane GW 2018**
Lab Sample ID: 1189864004
Lab Project ID: 1189864

Collection Date: 10/12/18 15:16
Received Date: 10/13/18 10:45
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	0.100	U	0.100	0.0310	mg/L	1		10/19/18 16:31
Surrogates								
4-Bromofluorobenzene (surr)	117		50-150		%	1		10/19/18 16:31

Batch Information

Analytical Batch: VFC14517
Analytical Method: AK101
Analyst: ACL
Analytical Date/Time: 10/19/18 16:31
Container ID: 1189864004-A

Prep Batch: VXX33385
Prep Method: SW5030B
Prep Date/Time: 10/19/18 11:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Print Date: 10/23/2018 11:22:19AM

Results of **E-Well**

Client Sample ID: **E-Well**
Client Project ID: **Loon Lane GW 2018**
Lab Sample ID: 1189864004
Lab Project ID: 1189864

Collection Date: 10/12/18 15:16
Received Date: 10/13/18 10:45
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	0.500	U	0.500	0.150	ug/L	1		10/15/18 13:50
1,1,1-Trichloroethane	1.00	U	1.00	0.310	ug/L	1		10/15/18 13:50
1,1,2,2-Tetrachloroethane	0.500	U	0.500	0.150	ug/L	1		10/15/18 13:50
1,1,2-Trichloroethane	0.400	U	0.400	0.120	ug/L	1		10/15/18 13:50
1,1-Dichloroethane	1.00	U	1.00	0.310	ug/L	1		10/15/18 13:50
1,1-Dichloroethene	1.00	U	1.00	0.310	ug/L	1		10/15/18 13:50
1,1-Dichloropropene	1.00	U	1.00	0.310	ug/L	1		10/15/18 13:50
1,2,3-Trichlorobenzene	1.00	U	1.00	0.310	ug/L	1		10/15/18 13:50
1,2,3-Trichloropropane	1.00	U	1.00	0.310	ug/L	1		10/15/18 13:50
1,2,4-Trichlorobenzene	1.00	U	1.00	0.310	ug/L	1		10/15/18 13:50
1,2,4-Trimethylbenzene	5.93		1.00	0.310	ug/L	1		10/15/18 13:50
1,2-Dibromo-3-chloropropane	10.0	U	10.0	3.10	ug/L	1		10/15/18 13:50
1,2-Dibromoethane	0.0750	U	0.0750	0.0180	ug/L	1		10/15/18 13:50
1,2-Dichlorobenzene	1.00	U	1.00	0.310	ug/L	1		10/15/18 13:50
1,2-Dichloroethane	0.500	U	0.500	0.150	ug/L	1		10/15/18 13:50
1,2-Dichloropropane	1.00	U	1.00	0.310	ug/L	1		10/15/18 13:50
1,3,5-Trimethylbenzene	6.37		1.00	0.310	ug/L	1		10/15/18 13:50
1,3-Dichlorobenzene	1.00	U	1.00	0.310	ug/L	1		10/15/18 13:50
1,3-Dichloropropane	0.500	U	0.500	0.150	ug/L	1		10/15/18 13:50
1,4-Dichlorobenzene	0.500	U	0.500	0.150	ug/L	1		10/15/18 13:50
2,2-Dichloropropane	1.00	U	1.00	0.310	ug/L	1		10/15/18 13:50
2-Butanone (MEK)	10.0	U	10.0	3.10	ug/L	1		10/15/18 13:50
2-Chlorotoluene	1.00	U	1.00	0.310	ug/L	1		10/15/18 13:50
2-Hexanone	10.0	U	10.0	3.10	ug/L	1		10/15/18 13:50
4-Chlorotoluene	1.00	U	1.00	0.310	ug/L	1		10/15/18 13:50
4-Isopropyltoluene	1.00	U	1.00	0.310	ug/L	1		10/15/18 13:50
4-Methyl-2-pentanone (MIBK)	10.0	U	10.0	3.10	ug/L	1		10/15/18 13:50
Benzene	4.06		0.400	0.120	ug/L	1		10/15/18 13:50
Bromobenzene	1.00	U	1.00	0.310	ug/L	1		10/15/18 13:50
Bromochloromethane	1.00	U	1.00	0.310	ug/L	1		10/15/18 13:50
Bromodichloromethane	0.500	U	0.500	0.150	ug/L	1		10/15/18 13:50
Bromoform	1.00	U	1.00	0.310	ug/L	1		10/15/18 13:50
Bromomethane	5.00	U	5.00	1.50	ug/L	1		10/15/18 13:50
Carbon disulfide	10.0	U	10.0	3.10	ug/L	1		10/15/18 13:50
Carbon tetrachloride	1.00	U	1.00	0.310	ug/L	1		10/15/18 13:50
Chlorobenzene	0.500	U	0.500	0.150	ug/L	1		10/15/18 13:50
Chloroethane	1.00	U	1.00	0.310	ug/L	1		10/15/18 13:50

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Results of **E-Well**

Client Sample ID: **E-Well**
Client Project ID: **Loon Lane GW 2018**
Lab Sample ID: 1189864004
Lab Project ID: 1189864

Collection Date: 10/12/18 15:16
Received Date: 10/13/18 10:45
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Chloroform	1.00	U	1.00	0.310	ug/L	1		10/15/18 13:50
Chloromethane	1.00	U	1.00	0.310	ug/L	1		10/15/18 13:50
cis-1,2-Dichloroethene	1.00	U	1.00	0.310	ug/L	1		10/15/18 13:50
cis-1,3-Dichloropropene	0.500	U	0.500	0.150	ug/L	1		10/15/18 13:50
Dibromochloromethane	0.500	U	0.500	0.150	ug/L	1		10/15/18 13:50
Dibromomethane	1.00	U	1.00	0.310	ug/L	1		10/15/18 13:50
Dichlorodifluoromethane	1.00	U	1.00	0.310	ug/L	1		10/15/18 13:50
Ethylbenzene	8.08		1.00	0.310	ug/L	1		10/15/18 13:50
Freon-113	10.0	U	10.0	3.10	ug/L	1		10/15/18 13:50
Hexachlorobutadiene	1.00	U	1.00	0.310	ug/L	1		10/15/18 13:50
Isopropylbenzene (Cumene)	3.39		1.00	0.310	ug/L	1		10/15/18 13:50
Methylene chloride	5.00	U	5.00	1.00	ug/L	1		10/15/18 13:50
Methyl-t-butyl ether	10.0	U	10.0	3.10	ug/L	1		10/15/18 13:50
Naphthalene	4.00		1.00	0.310	ug/L	1		10/15/18 13:50
n-Butylbenzene	1.00	U	1.00	0.310	ug/L	1		10/15/18 13:50
n-Propylbenzene	4.83		1.00	0.310	ug/L	1		10/15/18 13:50
o-Xylene	6.20		1.00	0.310	ug/L	1		10/15/18 13:50
P & M -Xylene	10.9		2.00	0.620	ug/L	1		10/15/18 13:50
sec-Butylbenzene	1.00	U	1.00	0.310	ug/L	1		10/15/18 13:50
Styrene	1.00	U	1.00	0.310	ug/L	1		10/15/18 13:50
tert-Butylbenzene	1.00	U	1.00	0.310	ug/L	1		10/15/18 13:50
Tetrachloroethene	1.00	U	1.00	0.310	ug/L	1		10/15/18 13:50
Toluene	1.00	U	1.00	0.310	ug/L	1		10/15/18 13:50
trans-1,2-Dichloroethene	1.00	U	1.00	0.310	ug/L	1		10/15/18 13:50
trans-1,3-Dichloropropene	1.00	U	1.00	0.310	ug/L	1		10/15/18 13:50
Trichloroethene	1.00	U	1.00	0.310	ug/L	1		10/15/18 13:50
Trichlorofluoromethane	1.00	U	1.00	0.310	ug/L	1		10/15/18 13:50
Vinyl acetate	10.0	U	10.0	3.10	ug/L	1		10/15/18 13:50
Vinyl chloride	0.150	U	0.150	0.0500	ug/L	1		10/15/18 13:50
Xylenes (total)	17.1		3.00	1.00	ug/L	1		10/15/18 13:50
Surrogates								
1,2-Dichloroethane-D4 (surr)	104		81-118		%	1		10/15/18 13:50
4-Bromofluorobenzene (surr)	102		85-114		%	1		10/15/18 13:50
Toluene-d8 (surr)	101		89-112		%	1		10/15/18 13:50

Print Date: 10/23/2018 11:22:19AM

Results of **E-Well**

Client Sample ID: **E-Well**
Client Project ID: **Loon Lane GW 2018**
Lab Sample ID: 1189864004
Lab Project ID: 1189864

Collection Date: 10/12/18 15:16
Received Date: 10/13/18 10:45
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS**

Batch Information

Analytical Batch: VMS18448
Analytical Method: SW8260C
Analyst: FDR
Analytical Date/Time: 10/15/18 13:50
Container ID: 1189864004-D

Prep Batch: VXX33345
Prep Method: SW5030B
Prep Date/Time: 10/15/18 00:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Print Date: 10/23/2018 11:22:19AM

Results of **TB- Loom Ln**

Client Sample ID: **TB- Loom Ln**
Client Project ID: **Loon Lane GW 2018**
Lab Sample ID: 1189864005
Lab Project ID: 1189864

Collection Date: 10/12/18 13:00
Received Date: 10/13/18 10:45
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	0.100	U	0.100	0.0310	mg/L	1		10/13/18 15:37
Surrogates								
4-Bromofluorobenzene (surr)	95.6		50-150		%	1		10/13/18 15:37

Batch Information

Analytical Batch: VFC14500
Analytical Method: AK101
Analyst: ACL
Analytical Date/Time: 10/13/18 15:37
Container ID: 1189864005-A

Prep Batch: VXX33333
Prep Method: SW5030B
Prep Date/Time: 10/13/18 08:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Print Date: 10/23/2018 11:22:19AM

Results of **TB- Loom Ln**

Client Sample ID: **TB- Loom Ln**
Client Project ID: **Loon Lane GW 2018**
Lab Sample ID: 1189864005
Lab Project ID: 1189864

Collection Date: 10/12/18 13:00
Received Date: 10/13/18 10:45
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	0.500	U	0.500	0.150	ug/L	1		10/15/18 13:19
1,1,1-Trichloroethane	1.00	U	1.00	0.310	ug/L	1		10/15/18 13:19
1,1,2,2-Tetrachloroethane	0.500	U	0.500	0.150	ug/L	1		10/15/18 13:19
1,1,2-Trichloroethane	0.400	U	0.400	0.120	ug/L	1		10/15/18 13:19
1,1-Dichloroethane	1.00	U	1.00	0.310	ug/L	1		10/15/18 13:19
1,1-Dichloroethene	1.00	U	1.00	0.310	ug/L	1		10/15/18 13:19
1,1-Dichloropropene	1.00	U	1.00	0.310	ug/L	1		10/15/18 13:19
1,2,3-Trichlorobenzene	1.00	U	1.00	0.310	ug/L	1		10/15/18 13:19
1,2,3-Trichloropropane	1.00	U	1.00	0.310	ug/L	1		10/15/18 13:19
1,2,4-Trichlorobenzene	1.00	U	1.00	0.310	ug/L	1		10/15/18 13:19
1,2,4-Trimethylbenzene	1.00	U	1.00	0.310	ug/L	1		10/15/18 13:19
1,2-Dibromo-3-chloropropane	10.0	U	10.0	3.10	ug/L	1		10/15/18 13:19
1,2-Dibromoethane	0.0750	U	0.0750	0.0180	ug/L	1		10/15/18 13:19
1,2-Dichlorobenzene	1.00	U	1.00	0.310	ug/L	1		10/15/18 13:19
1,2-Dichloroethane	0.500	U	0.500	0.150	ug/L	1		10/15/18 13:19
1,2-Dichloropropane	1.00	U	1.00	0.310	ug/L	1		10/15/18 13:19
1,3,5-Trimethylbenzene	1.00	U	1.00	0.310	ug/L	1		10/15/18 13:19
1,3-Dichlorobenzene	1.00	U	1.00	0.310	ug/L	1		10/15/18 13:19
1,3-Dichloropropane	0.500	U	0.500	0.150	ug/L	1		10/15/18 13:19
1,4-Dichlorobenzene	0.500	U	0.500	0.150	ug/L	1		10/15/18 13:19
2,2-Dichloropropane	1.00	U	1.00	0.310	ug/L	1		10/15/18 13:19
2-Butanone (MEK)	10.0	U	10.0	3.10	ug/L	1		10/15/18 13:19
2-Chlorotoluene	1.00	U	1.00	0.310	ug/L	1		10/15/18 13:19
2-Hexanone	10.0	U	10.0	3.10	ug/L	1		10/15/18 13:19
4-Chlorotoluene	1.00	U	1.00	0.310	ug/L	1		10/15/18 13:19
4-Isopropyltoluene	1.00	U	1.00	0.310	ug/L	1		10/15/18 13:19
4-Methyl-2-pentanone (MIBK)	10.0	U	10.0	3.10	ug/L	1		10/15/18 13:19
Benzene	0.400	U	0.400	0.120	ug/L	1		10/15/18 13:19
Bromobenzene	1.00	U	1.00	0.310	ug/L	1		10/15/18 13:19
Bromochloromethane	1.00	U	1.00	0.310	ug/L	1		10/15/18 13:19
Bromodichloromethane	0.500	U	0.500	0.150	ug/L	1		10/15/18 13:19
Bromoform	1.00	U	1.00	0.310	ug/L	1		10/15/18 13:19
Bromomethane	5.00	U	5.00	1.50	ug/L	1		10/15/18 13:19
Carbon disulfide	10.0	U	10.0	3.10	ug/L	1		10/15/18 13:19
Carbon tetrachloride	1.00	U	1.00	0.310	ug/L	1		10/15/18 13:19
Chlorobenzene	0.500	U	0.500	0.150	ug/L	1		10/15/18 13:19
Chloroethane	1.00	U	1.00	0.310	ug/L	1		10/15/18 13:19

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Results of **TB- Loom Ln**

Client Sample ID: **TB- Loom Ln**
Client Project ID: **Loon Lane GW 2018**
Lab Sample ID: 1189864005
Lab Project ID: 1189864

Collection Date: 10/12/18 13:00
Received Date: 10/13/18 10:45
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Chloroform	1.00 U		1.00	0.310	ug/L	1		10/15/18 13:19
Chloromethane	1.00 U		1.00	0.310	ug/L	1		10/15/18 13:19
cis-1,2-Dichloroethene	1.00 U		1.00	0.310	ug/L	1		10/15/18 13:19
cis-1,3-Dichloropropene	0.500 U		0.500	0.150	ug/L	1		10/15/18 13:19
Dibromochloromethane	0.500 U		0.500	0.150	ug/L	1		10/15/18 13:19
Dibromomethane	1.00 U		1.00	0.310	ug/L	1		10/15/18 13:19
Dichlorodifluoromethane	1.00 U		1.00	0.310	ug/L	1		10/15/18 13:19
Ethylbenzene	1.00 U		1.00	0.310	ug/L	1		10/15/18 13:19
Freon-113	10.0 U		10.0	3.10	ug/L	1		10/15/18 13:19
Hexachlorobutadiene	1.00 U		1.00	0.310	ug/L	1		10/15/18 13:19
Isopropylbenzene (Cumene)	1.00 U		1.00	0.310	ug/L	1		10/15/18 13:19
Methylene chloride	5.00 U		5.00	1.00	ug/L	1		10/15/18 13:19
Methyl-t-butyl ether	10.0 U		10.0	3.10	ug/L	1		10/15/18 13:19
Naphthalene	1.00 U		1.00	0.310	ug/L	1		10/15/18 13:19
n-Butylbenzene	1.00 U		1.00	0.310	ug/L	1		10/15/18 13:19
n-Propylbenzene	1.00 U		1.00	0.310	ug/L	1		10/15/18 13:19
o-Xylene	1.00 U		1.00	0.310	ug/L	1		10/15/18 13:19
P & M -Xylene	2.00 U		2.00	0.620	ug/L	1		10/15/18 13:19
sec-Butylbenzene	1.00 U		1.00	0.310	ug/L	1		10/15/18 13:19
Styrene	1.00 U		1.00	0.310	ug/L	1		10/15/18 13:19
tert-Butylbenzene	1.00 U		1.00	0.310	ug/L	1		10/15/18 13:19
Tetrachloroethene	1.00 U		1.00	0.310	ug/L	1		10/15/18 13:19
Toluene	1.00 U		1.00	0.310	ug/L	1		10/15/18 13:19
trans-1,2-Dichloroethene	1.00 U		1.00	0.310	ug/L	1		10/15/18 13:19
trans-1,3-Dichloropropene	1.00 U		1.00	0.310	ug/L	1		10/15/18 13:19
Trichloroethene	1.00 U		1.00	0.310	ug/L	1		10/15/18 13:19
Trichlorofluoromethane	1.00 U		1.00	0.310	ug/L	1		10/15/18 13:19
Vinyl acetate	10.0 U		10.0	3.10	ug/L	1		10/15/18 13:19
Vinyl chloride	0.150 U		0.150	0.0500	ug/L	1		10/15/18 13:19
Xylenes (total)	3.00 U		3.00	1.00	ug/L	1		10/15/18 13:19
Surrogates								
1,2-Dichloroethane-D4 (surr)	106		81-118		%	1		10/15/18 13:19
4-Bromofluorobenzene (surr)	103		85-114		%	1		10/15/18 13:19
Toluene-d8 (surr)	103		89-112		%	1		10/15/18 13:19

Print Date: 10/23/2018 11:22:19AM

Results of **TB- Loom Ln**

Client Sample ID: **TB- Loom Ln**
Client Project ID: **Loon Lane GW 2018**
Lab Sample ID: 1189864005
Lab Project ID: 1189864

Collection Date: 10/12/18 13:00
Received Date: 10/13/18 10:45
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS**

Batch Information

Analytical Batch: VMS18448
Analytical Method: SW8260C
Analyst: FDR
Analytical Date/Time: 10/15/18 13:19
Container ID: 1189864005-D

Prep Batch: VXX33345
Prep Method: SW5030B
Prep Date/Time: 10/15/18 00:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Print Date: 10/23/2018 11:22:19AM

Method Blank

Blank ID: MB for HBN 1787698 [VXX/33333]
Blank Lab ID: 1482634

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1189864001, 1189864002, 1189864003, 1189864005

Results by **AK101**

Parameter	Results	LOQ/CL	DL	Units
Gasoline Range Organics	0.0500U	0.100	0.0310	mg/L
Surrogates				
4-Bromofluorobenzene (surr)	95.5	50-150		%

Batch Information

Analytical Batch: VFC14500
Analytical Method: AK101
Instrument: Agilent 7890 PID/FID
Analyst: ACL
Analytical Date/Time: 10/13/2018 2:24:00PM

Prep Batch: VXX33333
Prep Method: SW5030B
Prep Date/Time: 10/13/2018 8:00:00AM
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

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Blank Spike Summary

Blank Spike ID: LCS for HBN 1189864 [VXX33333]
Blank Spike Lab ID: 1482635
Date Analyzed: 10/13/2018 15:01

Spike Duplicate ID: LCSD for HBN 1189864 [VXX33333]
Spike Duplicate Lab ID: 1482636
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1189864001, 1189864002, 1189864003, 1189864005

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	1.02	102	(60-120)	3.00	(< 20)
Surrogates									
4-Bromofluorobenzene (surr)	0.0500	111	111	0.0500	108	108	(50-150)	3.30	

Batch Information

Analytical Batch: **VFC14500**
Analytical Method: **AK101**
Instrument: **Agilent 7890 PID/FID**
Analyst: **ACL**

Prep Batch: **VXX33333**
Prep Method: **SW5030B**
Prep Date/Time: **10/13/2018 08:00**
Spike Init Wt./Vol.: 1.00 mg/L Extract Vol: 5 mL
Dupe Init Wt./Vol.: 1.00 mg/L Extract Vol: 5 mL

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Method Blank

Blank ID: MB for HBN 1787765 [VXX/33345]
Blank Lab ID: 1482890

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1189864001, 1189864002, 1189864003, 1189864004, 1189864005

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

Method Blank

Blank ID: MB for HBN 1787765 [VXX/33345]
Blank Lab ID: 1482890

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1189864001, 1189864002, 1189864003, 1189864004, 1189864005

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)	104	81-118		%
4-Bromofluorobenzene (surr)	104	85-114		%
Toluene-d8 (surr)	101	89-112		%

Method Blank

Blank ID: MB for HBN 1787765 [VXX/33345]
Blank Lab ID: 1482890

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1189864001, 1189864002, 1189864003, 1189864004, 1189864005

Results by **SW8260C**

Parameter	Results	LOQ/CL	DL	Units

Batch Information

Analytical Batch: VMS18448
Analytical Method: SW8260C
Instrument: Agilent 7890-75MS
Analyst: FDR
Analytical Date/Time: 10/15/2018 11:23:00AM

Prep Batch: VXX33345
Prep Method: SW5030B
Prep Date/Time: 10/15/2018 12:00:00AM
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Blank Spike Summary

Blank Spike ID: LCS for HBN 1189864 [VXX33345]
Blank Spike Lab ID: 1482891
Date Analyzed: 10/15/2018 11:38

Spike Duplicate ID: LCSD for HBN 1189864 [VXX33345]
Spike Duplicate Lab ID: 1482892
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1189864001, 1189864002, 1189864003, 1189864004, 1189864005

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	31.1	104	30	31.0	103	(78-124)	0.61	(< 20)
1,1,1-Trichloroethane	30	31.1	104	30	32.1	107	(74-131)	2.90	(< 20)
1,1,2,2-Tetrachloroethane	30	32.0	107	30	32.5	108	(71-121)	1.40	(< 20)
1,1,2-Trichloroethane	30	31.2	104	30	30.6	102	(80-119)	2.00	(< 20)
1,1-Dichloroethane	30	30.4	101	30	31.8	106	(77-125)	4.60	(< 20)
1,1-Dichloroethene	30	30.8	103	30	32.0	107	(71-131)	4.00	(< 20)
1,1-Dichloropropene	30	31.4	105	30	32.0	107	(79-125)	1.60	(< 20)
1,2,3-Trichlorobenzene	30	30.6	102	30	30.6	102	(69-129)	0.03	(< 20)
1,2,3-Trichloropropane	30	31.3	104	30	31.5	105	(73-122)	0.51	(< 20)
1,2,4-Trichlorobenzene	30	31.3	104	30	32.2	107	(69-130)	2.90	(< 20)
1,2,4-Trimethylbenzene	30	31.7	106	30	32.3	108	(79-124)	1.70	(< 20)
1,2-Dibromo-3-chloropropane	30	34.1	114	30	32.3	108	(62-128)	5.50	(< 20)
1,2-Dibromoethane	30	30.6	102	30	30.0	100	(77-121)	2.00	(< 20)
1,2-Dichlorobenzene	30	30.7	102	30	31.6	105	(80-119)	3.00	(< 20)
1,2-Dichloroethane	30	30.7	102	30	31.6	105	(73-128)	2.70	(< 20)
1,2-Dichloropropane	30	30.8	103	30	31.6	105	(78-122)	2.80	(< 20)
1,3,5-Trimethylbenzene	30	31.1	104	30	31.7	106	(75-124)	1.80	(< 20)
1,3-Dichlorobenzene	30	30.6	102	30	31.7	106	(80-119)	3.50	(< 20)
1,3-Dichloropropane	30	31.6	105	30	30.9	103	(80-119)	2.00	(< 20)
1,4-Dichlorobenzene	30	31.2	104	30	32.4	108	(79-118)	3.70	(< 20)
2,2-Dichloropropane	30	34.1	114	30	35.1	117	(60-139)	2.80	(< 20)
2-Butanone (MEK)	90	96.2	107	90	82.6	92	(56-143)	15.20	(< 20)
2-Chlorotoluene	30	31.7	106	30	32.4	108	(79-122)	2.30	(< 20)
2-Hexanone	90	100	111	90	92.4	103	(57-139)	8.10	(< 20)
4-Chlorotoluene	30	32.1	107	30	32.8	109	(78-122)	2.00	(< 20)
4-Isopropyltoluene	30	31.0	103	30	31.8	106	(77-127)	2.50	(< 20)
4-Methyl-2-pentanone (MIBK)	90	96.4	107	90	94.3	105	(67-130)	2.20	(< 20)
Benzene	30	29.9	100	30	30.4	101	(79-120)	1.70	(< 20)
Bromobenzene	30	30.6	102	30	31.4	105	(80-120)	2.70	(< 20)
Bromochloromethane	30	29.2	97	30	30.8	103	(78-123)	5.30	(< 20)
Bromodichloromethane	30	31.1	104	30	32.2	107	(79-125)	3.80	(< 20)
Bromoform	30	31.5	105	30	31.5	105	(66-130)	0.22	(< 20)
Bromomethane	30	31.4	105	30	35.7	119	(53-141)	12.90	(< 20)
Carbon disulfide	45	48.0	107	45	49.9	111	(64-133)	3.80	(< 20)

Blank Spike Summary

Blank Spike ID: LCS for HBN 1189864 [VXX33345]
Blank Spike Lab ID: 1482891
Date Analyzed: 10/15/2018 11:38

Spike Duplicate ID: LCSD for HBN 1189864 [VXX33345]
Spike Duplicate Lab ID: 1482892
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1189864001, 1189864002, 1189864003, 1189864004, 1189864005

Results by **SW8260C**

	Blank Spike (ug/L)			Spike Duplicate (ug/L)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Carbon tetrachloride	30	31.8	106	30	32.6	109	(72-136)	2.50	(< 20)
Chlorobenzene	30	29.2	97	30	29.3	98	(82-118)	0.31	(< 20)
Chloroethane	30	27.1	90	30	27.8	93	(60-138)	2.50	(< 20)
Chloroform	30	29.0	97	30	30.1	100	(79-124)	3.60	(< 20)
Chloromethane	30	34.1	114	30	36.1	120	(50-139)	5.80	(< 20)
cis-1,2-Dichloroethene	30	29.8	99	30	31.2	104	(78-123)	4.70	(< 20)
cis-1,3-Dichloropropene	30	32.1	107	30	33.1	110	(75-124)	3.10	(< 20)
Dibromochloromethane	30	31.6	105	30	31.5	105	(74-126)	0.32	(< 20)
Dibromomethane	30	30.3	101	30	31.4	105	(79-123)	3.50	(< 20)
Dichlorodifluoromethane	30	31.8	106	30	34.4	115	(32-152)	7.90	(< 20)
Ethylbenzene	30	30.9	103	30	30.7	102	(79-121)	0.45	(< 20)
Freon-113	45	48.0	107	45	49.4	110	(70-136)	2.90	(< 20)
Hexachlorobutadiene	30	30.5	102	30	31.9	106	(66-134)	4.60	(< 20)
Isopropylbenzene (Cumene)	30	30.9	103	30	31.3	104	(72-131)	1.30	(< 20)
Methylene chloride	30	29.8	99	30	32.1	107	(74-124)	7.40	(< 20)
Methyl-t-butyl ether	45	46.6	104	45	47.5	105	(71-124)	1.80	(< 20)
Naphthalene	30	32.6	109	30	32.2	107	(61-128)	1.10	(< 20)
n-Butylbenzene	30	32.0	107	30	32.4	108	(75-128)	1.10	(< 20)
n-Propylbenzene	30	31.3	104	30	32.4	108	(76-126)	3.60	(< 20)
o-Xylene	30	30.6	102	30	30.9	103	(78-122)	0.88	(< 20)
P & M -Xylene	60	61.9	103	60	60.8	101	(80-121)	1.70	(< 20)
sec-Butylbenzene	30	31.9	106	30	32.4	108	(77-126)	1.70	(< 20)
Styrene	30	31.2	104	30	31.4	105	(78-123)	0.83	(< 20)
tert-Butylbenzene	30	30.8	103	30	31.8	106	(78-124)	3.30	(< 20)
Tetrachloroethene	30	30.3	101	30	29.9	100	(74-129)	1.30	(< 20)
Toluene	30	29.4	98	30	29.0	97	(80-121)	1.50	(< 20)
trans-1,2-Dichloroethene	30	29.6	99	30	31.4	105	(75-124)	6.10	(< 20)
trans-1,3-Dichloropropene	30	33.8	113	30	33.3	111	(73-127)	1.60	(< 20)
Trichloroethene	30	29.5	98	30	29.8	100	(79-123)	1.00	(< 20)
Trichlorofluoromethane	30	29.8	99	30	31.2	104	(65-141)	4.60	(< 20)
Vinyl acetate	30	34.6	115	30	34.7	116	(54-146)	0.43	(< 20)
Vinyl chloride	30	30.8	103	30	32.8	109	(58-137)	6.40	(< 20)
Xylenes (total)	90	92.5	103	90	91.7	102	(79-121)	0.87	(< 20)

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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 1189864 [VXX33345]
Blank Spike Lab ID: 1482891
Date Analyzed: 10/15/2018 11:38

Spike Duplicate ID: LCSD for HBN 1189864 [VXX33345]
Spike Duplicate Lab ID: 1482892
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1189864001, 1189864002, 1189864003, 1189864004, 1189864005

Results by **SW8260C**

	Blank Spike (%)			Spike Duplicate (%)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Surrogates									
1,2-Dichloroethane-D4 (surr)	30	100	100	30	103	103	(81-118)	2.30	
4-Bromofluorobenzene (surr)	30	101	101	30	104	104	(85-114)	2.10	
Toluene-d8 (surr)	30	101	101	30	100	100	(89-112)	0.40	

Batch Information

Analytical Batch: **VMS18448**
Analytical Method: **SW8260C**
Instrument: **Agilent 7890-75MS**
Analyst: **FDR**

Prep Batch: **VXX33345**
Prep Method: **SW5030B**
Prep Date/Time: **10/15/2018 00:00**
Spike Init Wt./Vol.: 30 ug/L Extract Vol: 5 mL
Dupe Init Wt./Vol.: 30 ug/L Extract Vol: 5 mL

Method Blank

Blank ID: MB for HBN 1788027 [VXX/33385]
Blank Lab ID: 1484099

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1189864004

Results by **AK101**

Parameter	Results	LOQ/CL	DL	Units
Gasoline Range Organics	0.0500U	0.100	0.0310	mg/L
Surrogates				
4-Bromofluorobenzene (surr)	99.6	50-150		%

Batch Information

Analytical Batch: VFC14517
Analytical Method: AK101
Instrument: Agilent 7890 PID/FID
Analyst: ACL
Analytical Date/Time: 10/19/2018 1:09:00PM

Prep Batch: VXX33385
Prep Method: SW5030B
Prep Date/Time: 10/19/2018 11:00:00AM
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Blank Spike Summary

Blank Spike ID: LCS for HBN 1189864 [VXX33385]
Blank Spike Lab ID: 1484100
Date Analyzed: 10/19/2018 13:46

Spike Duplicate ID: LCSD for HBN 1189864 [VXX33385]
Spike Duplicate Lab ID: 1484101
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1189864004

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	1.01	101	1.00	1.15	115	(60-120)	13.20	(< 20)
Surrogates									
4-Bromofluorobenzene (surr)	0.0500	107	107	0.0500	108	108	(50-150)	1.50	

Batch Information

Analytical Batch: **VFC14517**
Analytical Method: **AK101**
Instrument: **Agilent 7890 PID/FID**
Analyst: **ACL**

Prep Batch: **VXX33385**
Prep Method: **SW5030B**
Prep Date/Time: **10/19/2018 11:00**
Spike Init Wt./Vol.: 1.00 mg/L Extract Vol: 5 mL
Dupe Init Wt./Vol.: 1.00 mg/L Extract Vol: 5 mL

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Method Blank

Blank ID: MB for HBN 1787951 [XXX/40759]
Blank Lab ID: 1483740

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1189864001, 1189864002, 1189864003, 1189864004

Results by **AK102**

Parameter	Results	LOQ/CL	DL	Units
Diesel Range Organics	0.300U	0.600	0.180	mg/L
Surrogates				
5a Androstane (surr)	98.6	60-120		%

Batch Information

Analytical Batch: XFC14740
Analytical Method: AK102
Instrument: Agilent 7890B F
Analyst: VDL
Analytical Date/Time: 10/22/2018 9:16:00AM

Prep Batch: XXX40759
Prep Method: SW3520C
Prep Date/Time: 10/19/2018 8:06:54AM
Prep Initial Wt./Vol.: 250 mL
Prep Extract Vol: 1 mL

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Blank Spike Summary

Blank Spike ID: LCS for HBN 1189864 [XXX40759]
Blank Spike Lab ID: 1483741
Date Analyzed: 10/22/2018 09:27

Spike Duplicate ID: LCSD for HBN 1189864 [XXX40759]
Spike Duplicate Lab ID: 1483742
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1189864001, 1189864002, 1189864003, 1189864004

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	19.9	100	20	19.7	99	(75-125)	1.10	(< 20)
Surrogates									
5a Androstane (surr)	0.4	111	111	0.4	111	111	(60-120)	0.54	

Batch Information

Analytical Batch: **XFC14740**
Analytical Method: **AK102**
Instrument: **Agilent 7890B F**
Analyst: **VDL**

Prep Batch: **XXX40759**
Prep Method: **SW3520C**
Prep Date/Time: **10/19/2018 08:06**
Spike Init Wt./Vol.: 20 mg/L Extract Vol: 1 mL
Dupe Init Wt./Vol.: 20 mg/L Extract Vol: 1 mL

SGS

SGS NORTH AMERICA INC. CHA 1189864 RD

SGS Environmental Services
200 West Potter Road
Anchorage, AK 99518
(907) 562-2343
www.sgs.com/alaska

SECTION 1

CLIENT: Nortech

CONTACT: S. Hummel

PHONE #: 452-5688

PROJECT NAME: Loon Lane GW 2018

PROJECT/ PWSID/ PERMIT #: 17-1071

REPORTS TO: S. Hummel

E-MAIL: Scott.hummel@nortecheng.com

INVOICE TO: Nortech

QUOTE #:

P.O. #: 17-1071

INSTRUCTIONS: SECTIONS 1-5 MUST BE FILLED OUT. OMISSIONS MAY DELAY THE ONSET OF ANALYSIS.

Page 1 of 1

SECTION 3

PRESERVATIVE

SECTION 2

RESERVED FOR LAB USE	SAMPLE IDENTIFICATION	DATE MM/DD/YY	TIME HH:MM	MATRIX/ MATRIX CODE	# CONTAINERS	SAMPLE TYPE: Comp / Grab / MI (Multi-incremental)	HCl DRO AK 102	HCl GRO AK 101	HCl BTEX 8260	HCl VOC 8260	REMARKS/ LOC ID
	~~MW-4~~										
	~~MW-5~~										
(1) A-H	NW-well	10/12/18	1327	water	8	grab	X	X	X	—	
(2) A-H	W-well		1418		8		X	X	X	—	
(3) A-H	W-well 2		1424		8		X	X	X	—	
(4) A-H	E-well		1516		8		X	X	—	X	
(5) A-C	TB-Loon Ln		1300		Lab	prepped	—	X	—	X	

SECTION 5

RELINQUISHED BY:	DATE	TIME	RECEIVED BY:
(1) Scott Hummel	10/12/18	1613	10/12/18 1613
(2)	10/12/18	1615	
(3)			
(4)	10/13/18	10:45	RECEIVED FOR LABORATORY BY: KET

SECTION 4

DOD Project?

COC ID:

Cooler ID:

DATA DELIVERABLE REQUIREMENTS:

REQUESTED TURNAROUND TIME AND/OR SPECIAL INSTRUCTIONS

TEMP BLANK °C: 0.6°C OR AMBIENT [ ] (See attached Sample Receipt Form)

CHAIN OF CUSTODY SEAL: (CIRCLE) INTACT BROKEN ABSENT (See attached Sample Receipt Form)

ANCH: TEMP: 3.7 D3C COC: 1F1B

SGS

1189864

FAIRBANKS SAMPLE RECEIPT FORM

Note: This form is to be completed by Fairbanks Receiving Staff for all samples

Review Criteria:	Condition:	Comments/Actions Taken
Were **custody seals** intact? Note # & location, if applicable.	Yes No (N/A)	☐*Exemption permitted if sampler hand carries/delivers.*
COC accompanied samples?	(Yes) No N/A	
Temperature blank compliant* (i.e., 0-6°C)	(Yes) No	☐*Exemption permitted if chilled & collected <8hrs ago*
If >6°C, were samples collected <8 hours ago?	Yes No (N/A)	
If <0°C, were all sample containers ice free?	Yes No (N/A)	
Cooler ID:_____@ 0.6°C w/Therm. ID: D30		
Cooler ID:_____@_____w/Therm. ID:_____		
Cooler ID:_____@_____w/Therm. ID:_____		
Cooler ID:_____@_____w/Therm. ID:_____		
Cooler ID:_____@_____w/Therm. ID:_____		
If samples are received without a temperature blank, the "cooler temperature" will be documented in lieu of the temperature blank and "**COOLER TEMP**" will be noted to the right. In cases where neither a temp blank nor cooler temp can be obtained, note ambient ( ) or chilled ( ). Please check one.		***Note: Identify containers received at non-compliant temperature. Use form FS-0029 if more space is needed.***
Delivery Method: (Client) (hand carried) Other:_____	Tracking/AB# : Or see attached Or (N/A)	
→For samples received with payment, note amount ($) and whether cash / check / CC (**circle one**) was received.		
Were samples in **good condition** (no leaks/cracks/breakage)?	(Yes) No N/A	***Note: some samples are sent to Anchorage without inspection by SGS Fairbanks personnel.***
Packing material used (specify all that apply): (Bubble Wrap)		
Separate plastic bags Vermiculite Other:_____		
Were **Trip Blanks** (i.e., VOAs, LL-Hg) in cooler with samples?	(Yes) No N/A	
For **RUSH/SHORT Hold Time**, were COC/Bottles flagged	Yes No (N/A)	
accordingly? Was Rush/Short HT email sent, if applicable?	Yes No (N/A)	

Additional notes (if applicable):

Profile #: 362417

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

e-Sample Receipt Form

SGS Workorder #: **1189864**

Review Criteria	Condition (Yes, No, N/A)	Exceptions Noted below
Chain of Custody / Temperature Requirements		n/a Exemption permitted if sampler hand carries/delivers.
Were Custody Seals intact? Note # & location	yes	1f 1b
COC accompanied samples?	yes	
n/a **Exemption permitted if chilled & collected <8 hours ago, or for samples where chilling is not required		
Temperature blank compliant* (i.e., 0-6 °C after CF)?	yes	Cooler ID: 1 @ 3.7 °C Therm. ID: D36
	n/a	Cooler ID: @ °C Therm. ID:
	n/a	Cooler ID: @ °C Therm. ID:
	n/a	Cooler ID: @ °C Therm. ID:
	n/a	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	
If samples received without a temperature blank, the "cooler temperature" will be documented in lieu of the temperature blank & "**COOLER TEMP**" will be noted to the right. In cases where neither a temp blank nor cooler temp can be obtained, note "ambient" or "chilled".		
Note: Identify containers received at non-compliant temperature . Use form FS-0029 if more space is needed.		
Holding Time / Documentation / Sample Condition Requirements		Note: Refer to form F-083 "Sample Guide" for specific holding times.
Were samples received within holding time?	yes	
Do samples **match COC**** (i.e.,sample IDs,dates/times collected)?	yes	
**Note: If times differ <1hr, record details & login per COC.		
Were analyses requested unambiguous? (i.e., method is specified for analyses with >1 option for analysis)	yes	
		n/a ***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
1189864001-A	HCL to pH < 2	OK			
1189864001-B	HCL to pH < 2	OK			
1189864001-C	HCL to pH < 2	OK			
1189864001-D	HCL to pH < 2	OK			
1189864001-E	HCL to pH < 2	OK			
1189864001-F	HCL to pH < 2	OK			
1189864001-G	HCL to pH < 2	OK			
1189864001-H	HCL to pH < 2	OK			
1189864002-A	HCL to pH < 2	OK			
1189864002-B	HCL to pH < 2	OK			
1189864002-C	HCL to pH < 2	OK			
1189864002-D	HCL to pH < 2	OK			
1189864002-E	HCL to pH < 2	OK			
1189864002-F	HCL to pH < 2	OK			
1189864002-G	HCL to pH < 2	OK			
1189864002-H	HCL to pH < 2	OK			
1189864003-A	HCL to pH < 2	OK			
1189864003-B	HCL to pH < 2	OK			
1189864003-C	HCL to pH < 2	OK			
1189864003-D	HCL to pH < 2	OK			
1189864003-E	HCL to pH < 2	OK			
1189864003-F	HCL to pH < 2	OK			
1189864003-G	HCL to pH < 2	OK			
1189864003-H	HCL to pH < 2	OK			
1189864004-A	HCL to pH < 2	OK			
1189864004-B	HCL to pH < 2	OK			
1189864004-C	HCL to pH < 2	OK			
1189864004-D	HCL to pH < 2	OK			
1189864004-E	HCL to pH < 2	OK			
1189864004-F	HCL to pH < 2	OK			
1189864004-G	HCL to pH < 2	OK			
1189864004-H	HCL to pH < 2	OK			
1189864005-A	HCL to pH < 2	OK			
1189864005-B	HCL to pH < 2	OK			
1189864005-C	HCL to pH < 2	OK			
1189864005-D	HCL to pH < 2	OK			
1189864005-E	HCL to pH < 2	OK			

Container Id	Preservative	Container Condition	Container Id	Preservative	Container Condition

Container Condition Glossary

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

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

Laboratory Data Review Checklist

Completed By:

Scott Hummel

Title:

Chemist

Date:

November 6, 2018

CS Report Name:

Loon Lane GW 2018

Report Date:

October 23, 2018

Consultant Firm:

NORTECH, Inc.

Laboratory Name:

SGS North America, Inc.

Laboratory Report Number:

1189864

ADEC File Number:

100.38.254

Hazard Identification Number:

26321

1189864

1. Laboratory

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

   (•) Yes ( ) No Comments:

   b. If the samples were transferred to another "network" laboratory or sub-contracted to an alternate laboratory, was the laboratory performing the analyses ADEC CS approved?

   ( ) Yes (•) No Comments:

   Samples were not transferred and were analyzed by SGS North America, Inc. in Anchorage, Alaska.

2. Chain of Custody (CoC)

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

   (•) Yes ( ) No Comments:

   b. Correct Analyses requested?

   (•) Yes ( ) No Comments:

3. Laboratory Sample Receipt Documentation

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

   (•) Yes ( ) No Comments:

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

   (•) Yes ( ) No Comments:

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

   (•) Yes ( ) No Comments:

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

○ Yes ◉ No Comments:

The laboratory noted that samples were received in good condition.

e. Data quality or usability affected?

Comments:

Data quality or usability are not affected.

4. Case Narrative

a. Present and understandable?

◉ Yes ○ No Comments:

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

○ Yes ◉ No Comments:

There were no discrepancies identified in the case narrative.

c. Were all corrective actions documented?

○ Yes ◉ No Comments:

There were no necessary corrective actions.

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

Comments:

The case narrative does not note any effect upon data quality or usability.

5. Samples Results

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

◉ Yes ○ No Comments:

b. All applicable holding times met?

◉ Yes ○ No Comments:

c. All soils reported on a dry weight basis?

○ Yes ◉ No Comments:

No soil samples were requested with this work order.

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

◉ Yes ○ No Comments:

Project analyte LOQs meet CLs for this work order.

VOC analyte 1,2,3-trichloropropane is reported as non-detect above the associated CL. This analyte is not known to be present with heating fuel releases.

e. Data quality or usability affected?

○ Yes ◉ No Comments:

Data quality or usability are not affected.

6. QC Samples

a. Method Blank

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

◉ Yes ○ No Comments:

ii. All method blank results less than limit of quantitation (LOQ)?

◉ Yes ○ No Comments:

iii. If above LOQ, what samples are affected?

Comments:

MB results were below LOQ, no samples are affected.

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

○ Yes ◉ No Comments:

No data flags are necessary.

v. Data quality or usability affected?

Comments:

Data quality or 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 Comments:

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

( ) Yes (•) No Comments:

No metals or inorganic analyses requested in this work order.

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

(•) Yes ( ) No Comments:

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

(•) Yes ( ) No Comments:

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

Comments:

Laboratory results meet accuracy criteria, no samples are affected.

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

( ) Yes (•) No Comments:

No data flags are necessary.

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

Comments:

Data quality or usability are not affected.

c. Surrogates – Organics Only

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

(•) Yes ( ) No Comments:

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

(•) Yes ( ) No Comments:

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

( ) Yes (•) No Comments:

There are no failed surrogates in this work order, no data flags are necessary.

iv. Data quality or usability affected?

Comments:

Data quality or usability are not affected.

d. Trip blank – Volatile analyses only (GRO, BTEX, Volatile Chlorinated Solvents, etc.): Water and Soil

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

(•) Yes ( ) No Comments:

ii. Is the cooler used to transport the trip blank and VOA samples clearly indicated on the COC? (If not, a comment explaining why must be entered below)

(•) Yes ( ) No Comments:

iii. All results less than LOQ?

(•) Yes ( ) No Comments:

iv. If above LOQ, what samples are affected?

Comments:

No results are above the LOQ, no samples are affected.

v. Data quality or usability affected?

Comments:

Data quality or usability are not affected.

e. Field Duplicate

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

◉ Yes ○ No Comments:

ii. Submitted blind to lab?

◉ Yes ○ No Comments:

Sample pair *W-well/W-well2* were submitted with this laboratory report.

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

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

Where R_1 = Sample Concentration
R_2 = Field Duplicate Concentration

◉ Yes ○ No Comments:

Calculable RPD for this sample pair are 0.66% for gasoline range organics (GRO) and 0% for toluene.

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

Comments:

Data quality or usability are not affected.

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

○ Yes ○ No ◉ Not Applicable

An equipment blank (EB) was not included in this scope of this project.

i. All results less than LOQ?

○ Yes ◉ No Comments:

No EB submitted with this work order.

ii. If above LOQ, what samples are affected?

Comments:

No samples are affected.

iii. Data quality or usability affected?

Comments:

Data quality or usability are not affected.

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

a. Defined and appropriate?

○ Yes ◉ No Comments:

No additional data flags or qualifiers are necessary for this work order.

Attachment 5

CASE OF EMERGENCY CALL 800-899-4672 ***

131759-KS

NON-HAZARDOUS WASTE MANIFEST

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

NON-HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No. EXEMPT

Manifest Document No. 131759A

2. Page 1 of 1

3. Generator's Name and Mailing Address
NORTECH ENVIRONMENTAL
2400 COLLEGE ROAD
FAIRBANKS, AK 99709

NORTECH ENVIRONMENTAL
2400 COLLEGE ROAD
FAIRBANKS, AK 99709

4. Generator's Phone (907) 452-5688

5. Transporter 1 Company Name
NRC ALASKA LLC

6. US EPA ID Number
AKR000004184

A. State Transporter's ID

B. Transporter 1 Phone 907-258-1558

7. Transporter 2 Company Name

8. US EPA ID Number

C. State Transporter's ID

D. Transporter 2 Phone

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

10. US EPA ID Number
AKR000004184

E. State Facility's ID

F. Facility's Phone 907-258-1558

11. WASTE DESCRIPTION

HM		Containers No.	Containers Type	13. Total Quantity	14. Unit Wt./Vol.
	a. Material Not Regulated by DOT	1	TP	200	G
	b.				
	c.				
	d.				

GENERATOR

G. Additional Descriptions for Materials Listed Above

EA0302 IDW DECON WATER/GROUNDWATER

17-1071 (~~100~~ 75) 17-1001 (SU)

18-1314 (~~125~~ 75)

H. Handling Codes for Wastes Listed Above
D19987

15. Special Handling Instructions and Additional Information

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

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

Printed/Typed Name: S. Hummel

Signature: Scott McHummel

Date: Month 10 Day 16 Year 18

TRANSPORTER

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name: Kimberly Simons

Signature: Kimberly Simons

Date: Month 10 Day 16 Year 18

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name

Signature

Date: Month Day Year

FACILITY

19. Discrepancy Indication Space

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

Printed/Typed Name

Signature

Date: Month Day Year

NON-HAZARDOUS WASTE