



**SUSTAINABLE ENVIRONMENT, ENERGY,
HEALTH & SAFETY PROFESSIONAL SERVICES**

May 18, 2015

sent via email to: wheeler.preston@gmail.com

Preston Wheeler
599 Leuthold Drive
Fairbanks, AK 99712

ATTN: Preston Wheeler

**RE: October 2014 Groundwater Monitoring Well Sampling Results
3570 Phillips Field Road
Fairbanks, Alaska
ADEC File Number 102.02.001**

Preston:

NORTECH is pleased to submit this report summarizing the results of the October 2014 groundwater monitoring at 3570 Phillips Field Road in Fairbanks, Alaska (the Site). The sampling program was carried out to characterize current groundwater concentrations of petroleum hydrocarbons, groundwater gradient and to collect basic geochemistry parameters to help evaluate the viability of long term natural attenuation as a mechanism for biodegradation of on-site soil contamination.

Background

The property is located at 3570 Phillips Field Road in Fairbanks, Alaska. A 30,000-gallon diesel fuel underground storage tank (UST) was connected to a dispenser island located along Marian Drive to fuel equipment used by H&H Contractors in their day to day operations. Figure 3 illustrates the location of the subject property, the surrounding properties and location of the onsite monitoring wells. As reported by AGRA Earth & Environmental Inc. (AGRA), leaks and spills impacted soils near the former 30 by 11 foot concrete fuel island. Approximately 2000 cubic yards of contaminated soil were removed during several remedial actions conducted by AGRA and **NORTECH** between 1997 and 2013. Contaminated soil remains in the structural prism of a utility pole and in the smear zone soils.

In November 2013, six pre-packed permanent groundwater monitoring wells were installed and sampled to assess up gradient, cross-gradient, and down-gradient aquifer conditions. Additional groundwater monitoring was recommended in the Site Characterization Report dated September 18, 2014 to further evaluate groundwater contamination, natural attenuation parameters and to provide data to develop a corrective action plan.

Accounting Office:
2400 College Rd
Fairbanks, AK 99709
907.452.5688
907.452.5694 Fax

3105 Lakeshore Drive
Suite A106
Anchorage, AK 99517
907.222.2445
907.222.0915 Fax

5438 Shaune Drive
Suite B
Juneau, AK 99801
907.586.6813
907.586.6819 Fax

1623 Mill Bay Rd #5
Kodiak, AK 99615
907.942.7700
907.452.5694 Fax

www.nortechengr.com



Objectives/Scope of Work

Concentrations of Diesel Range Organic compounds remain above the ADEC's MCL within and near the source area. Water quality, geochemical and petroleum hydrocarbon characterization of the site was recommended in the work plan to help determine whether monitored natural attenuation, bio-enhancement or other in situ remedial activities are warranted. To that end, the following specific objectives for this characterization were:

- Delineation of the groundwater contamination
- Complete a relative elevation survey and determine the groundwater gradient
- Collect basic water quality and geochemistry parameters

Methodology

Field sampling was completed in general accordance with the 2002 ADEC UST Procedures Manual Standard Sampling Procedures (SSP) and 2010 Field Sampling Guidance (FSG). Prior to purging, static water levels were measured in the monitoring wells and recorded. Purging and sampling was performed with a peristaltic pump and dedicated tubing. During the purging process, field personnel monitored water quality parameters and purge volume. Purging was considered complete when at least three well volumes were removed and water quality parameters stabilized. Groundwater quality parameters (including temperature, ORP, pH, conductivity, dissolved oxygen and turbidity) were measured within a flow-through cell at three to five minute intervals during well purging. Water quality parameters were considered stabilized when three consecutive measurements indicated that: pH was within 0.1 units, conductivity was within 3 percent, the temperature was within 1 degree Celsius, and turbidity was within 10 percent.

Once groundwater quality stabilization criteria were satisfied, the pump's discharge tubing was disconnected from the flow-through cell and groundwater samples were collected for laboratory analysis. Samples were placed in clean, laboratory supplied glassware and placed immediately in a cooler with ice for transportation to the laboratory. One trip blank accompanied the samples submitted to the laboratory for analysis of volatile compounds. Samples were delivered under chain-of-custody (COC) to SGS Environmental Services in Anchorage, Alaska for analysis.

Field Activities

NORTECH mobilized to the site on October 22, 2014 to perform groundwater sampling as recommended in the Site Characterization Report dated September 18, 2014. All six wells were located and found to be in good condition with no damage or frost jacking. Depth to water was measured and recorded for well volume calculations, historical comparison and determination of groundwater flow.

MW4, MW5, and MW6 had a noticeable petroleum odor and light sheen, which was not discernable in the other wells. MW8 and MW9 had an orange algal growth that was thought to be related to high iron content in the groundwater. Laboratory samples were collected from the six groundwater monitoring wells, including a duplicate of MW5 for:

- Diesel Range Organics (DRO)



- Benzene, Toluene, Ethyl benzene, and Xylenes (BTEX)
- Gasoline Range Organics (GRO)

A copy of the laboratory report is included in Attachment, and the analytical results are summarized in Tables 1.

Results with Discussion

Water Table Elevations

Groundwater elevations were calculated relative to a temporary benchmark (TBM) placed in the utility pole. For the purposes of this and future project site work, the TBM was defined as 100'. The relative elevations of the top of the PVC at monitoring wells MW-4 through MW-9 were surveyed by **NORTECH** on May 8, 2014. Precipitation was unusually high during the summer of 2014 with record rains in June and July. The depth to water in each monitoring well was approximately 1.75 feet above the levels seen in November 2013. The Chena river gage height on October 22, 2014 was 1.39 feet, well below the summer maximum gage height of 9.94 feet on July 5th. It is anticipated that groundwater elevations in each monitoring well reached a season high sometime after this date.

Groundwater elevation data is presented in Table 2 and as well as our interpretation of groundwater elevation distribution, that are graphically presented for the and the November 2013 groundwater monitoring, the May 2014 groundwater elevation survey and the October 2014 groundwater monitoring events in Figures 4 through 6, respectively.

Chena River Gauge Height

The regional hydraulic gradient across the Fairbanks floodplain between the Chena and Tanana Rivers has been reasonably well defined as being west to northwest, with the Tanana acting to recharge the aquifer and the Chena acting as a drain. The gradient in the vicinity of the sloughs and the confluence of the Chena and Tanana Rivers is less well defined and more dependent on the stage of each river and local precipitation. The site is situated very close to the on the Chena River adjacent to a meander/oxbow that directly affects groundwater conditions expeditiously with less lag time than most other sites not in direct contact to the river. Because of this meander, the site is about 500 feet west of the upstream side of the river and 1000 feet east of the downstream side of the river. Additionally, a gravel pit with an almost direct hydraulic connection with the Chena River is located less than 200 feet from MW-9 and is shown in Figure 2.

Appendix 3 shows the gauge height of the Chena River at the Steese Highway Bridge in Fairbanks from September 2013 through December 2014. This gauge is located approximately 2.9 miles upstream of the Site. Although the specific elevation of the river adjacent to the site is not known, the behavior of the elevation can be reasonably assumed to follow the height at the Steese highway Bridge Gauge. This data shows that the river elevation can fluctuate rapidly and had a total elevation change of approximately 10 feet over the 2013/2014 period, including the historically high precipitation season of 2014.



The groundwater monitoring events are also shown on the chart. The October 2014 event occurred when the Chena River gage height had decreased rapidly from the summer high and approaching the normal autumn/winter low. At this river stage, the groundwater was most likely recharging river, which appears to be shown by the groundwater elevations dipping to the southwest toward the Chena River with an approximate differential across the site of 0.1 feet presented in Figure 6.

The May 8, 2014 groundwater elevation survey occurred just after the Chena River gauge height had reached a short-term peak and begun a rapid decrease following the springtime melt. Figure 5 shows the groundwater elevations at the site were almost level (total differential of 0.015 feet) with the highest point at the center of the site. This suggests a small potential for contaminant migration to the north during transient groundwater elevations caused by rapid changes in river stage. In this particularly case, the transience could be interpreted groundwater farthest away from the gravel pit and river are still elevated from when the river was higher, while groundwater closest to the gravel pit (and downstream side of the river) are more beginning to slope back toward the river and gravel pit.

The groundwater elevations from November 9, 2013 were back calculated using the May 8, 2014 well casing heights. The Chena River during this time was low and was quite steady with elevations raising and lowering less than one foot just before the sampling event. The groundwater elevation differential was uniform, trending south-southeast with a total change of approximately 0.15 feet.

The groundwater elevation data is limited with few sample events, however the data suggests that groundwater elevations and gradient are locally controlled by short term events and long term seasonal fluctuations. While not conclusive, it is believed that the transient water table elevation conditions occur based on short term river conditions that are observed in the Chena River and also in the nearby gravel pit. These conditions could have created a pathway for floating product (at the time of the release) and/or contaminated groundwater at the surface of the water table to smear contamination to both the north and the south of the Site, resulting in the DRO concentrations exceeding cleanup levels north and south of the source area.

While the water table elevation data suggests that groundwater flow is complex, variable and controlled by local changes, the contaminant plume is approaching thirty years old and is limited in size. This suggests that the plume had stabilized prior to remediation. Now that much the contaminant source material has been removed and no longer contributes to the groundwater plume, the continued smearing of the groundwater due to elevation changes is expected to significantly increase the natural attenuation of the remaining contaminants. Based on this, the groundwater conditions are highly dependent on the river elevation, but reasonably well understood.

NORTECH recommends continuing to collect depth to water elevation to verify conditions at the time of sampling, but calculation and graphical representation of water table elevations is not expected to change the understanding of the site conditions and is not considered necessary for future sampling events.



Groundwater Contaminant Concentrations

The groundwater contaminant concentrations for the 2013 and 2014 sampling events are summarized in Table 1.

The 2014 results were similar to the results from the 2013 groundwater monitoring event. Three wells located directly on or adjacent to the former excavation had DRO concentrations above cleanup levels, and three wells located south, east and west of the source area show no detectable contamination except for benzene detected in MW-8 well below ADEC's cleanup level. The current results show slightly increased levels of DRO in MW-4 located just northwest of the former excavation and MW-5 located directly in the source area.

A more significant increase in DRO was observed in MW-6, which is located within contaminated soils within the structural prism of the utility pole. It is believed that the increase in DRO in this monitoring well may be due to this year's remarkably high groundwater encountering limited amount of contaminated vadose zone soils remaining near the utility pole. This soil may remain a source for continued groundwater contamination and delay the natural biological degradation of contaminants in the groundwater. However, this may also be due to the magnitude of the water table changes during the summer of 2014. Additional groundwater delineation east of MW6 is not recommended unless additional sampling events indicate contaminant concentrations in MW6 continue to increase.

All other analytes, including benzene, are below cleanup levels. The three wells located south and west of the source area remained below detection limits for all analytes with the exception of MW-8, which detected benzene above the detection limit, but well below the cleanup level. Based on these results, BTEX sampling is no longer considered necessary.

The historic results show that the most consistent contaminant concentrations are during relatively low water events when the groundwater conditions are not transient. **NORTECH** recommends completing a single annual sampling event at the site in the late fall of each of the next two years to provide consistent groundwater conditions in which contaminant trends can be evaluated. Following the soil remediation activities, the groundwater concentrations are expected to be stable and decreasing in the future. Once this trend is established with annual data, future sampling events may be able to be less frequent.

Conclusions and Recommendations

Higher than normal ground water levels during the summer of 2014 event have brought the contaminated groundwater into formally uncontaminated soils. While it is difficult to make direct comparisons because of this change, based on the current and historical data, **NORTECH** has arrived at the following conclusions:

- Groundwater elevation data is complex, variable and controlled by local events. Data suggest the local groundwater is susceptible to gradient reversals
- DRO concentrations in MW-4, MW-5, and MW-6 are above cleanup levels and show a slight increase from 2013



- GRO, benzene, toluene, ethyl benzene, and total xylenes concentrations remain below cleanup levels and are similar to the 2013 results except in MW-8 with benzene being detected below cleanup levels
- The soil contamination remaining in the structural prism of the utility pole is considered a limited source of contaminated source soils especially in light of the (2014) high groundwater events. Based on comparisons of groundwater elevations and Chena River gage heights, the contaminated soils in the structural prism of the power pole is considered smear zone soils.
- The contaminant plume's age and data suggests that the plume is stable and of limited size
- Most of the contaminated source soils have been removed

NORTECH recommends:

- Perform two years of groundwater monitoring for DRO in the fall to verify contaminant stability and trends. Once this trend is established with annual data, future sampling events may be able to be less frequent.

Please contact me, at your earliest convenience if you have any questions about the data presented in the report or the site in general.

Sincerely,
NORTECH

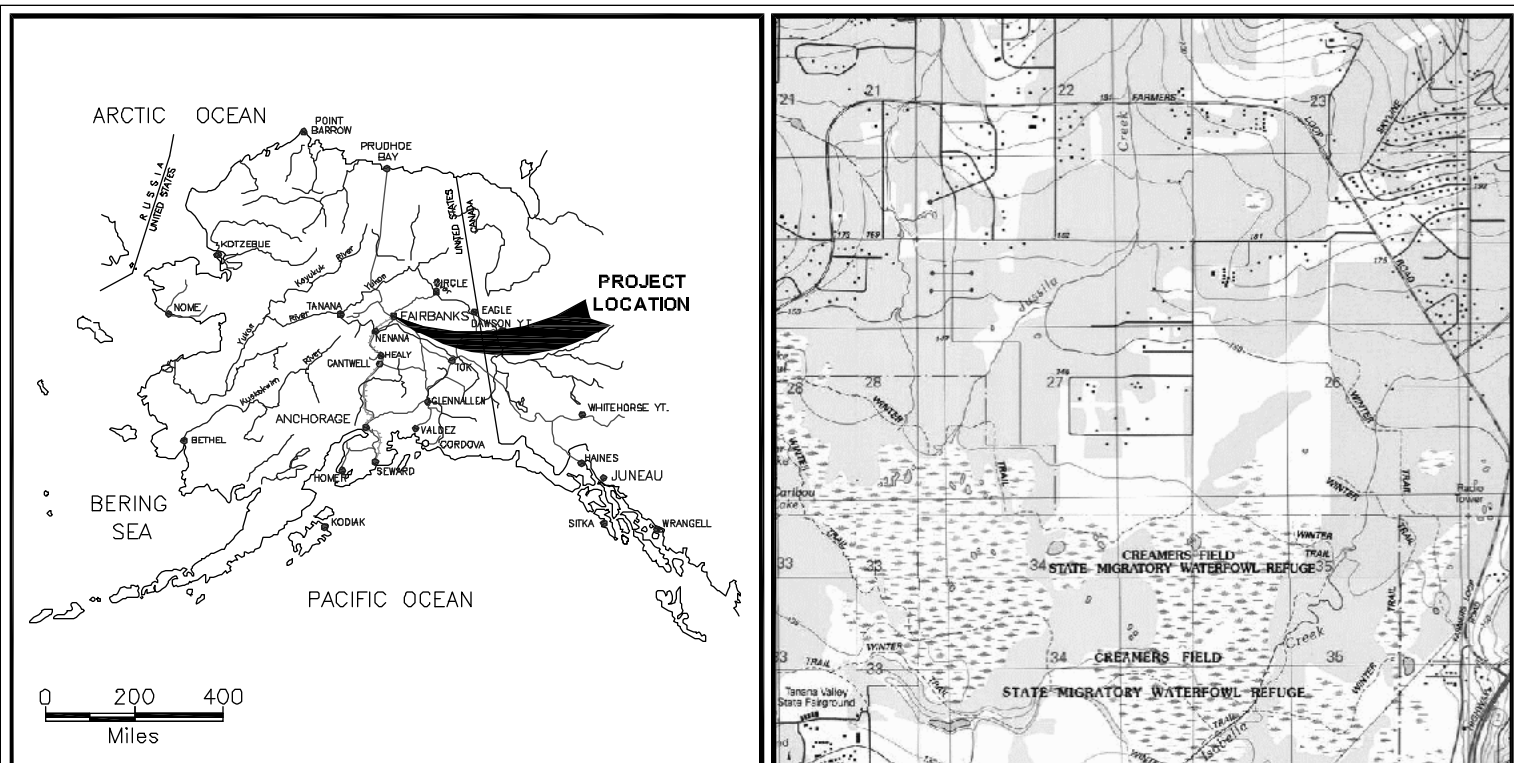
Thomas Brado
Environmental Specialist

Appendix 1: Figure 1 – Location Map
Figure 2 – Vicinity Map
Figure 3 – Site Map
Figure 4 – Groundwater Gradient October 2014
Figure 5 – Groundwater Gradient May 2014
Figure 6 – Groundwater Gradient November 2013
Figure 7 – Groundwater Analytical Results

Appendix 2: Table 1 – November 2013 and October 2014 Groundwater Results
Table 2 – Groundwater Elevations
Appendix 3: Graph 1 – Chena River Gage Heights
Appendix 4: Laboratory Reports and ADEC Laboratory Data Review Checklists



Appendix 1
Figures

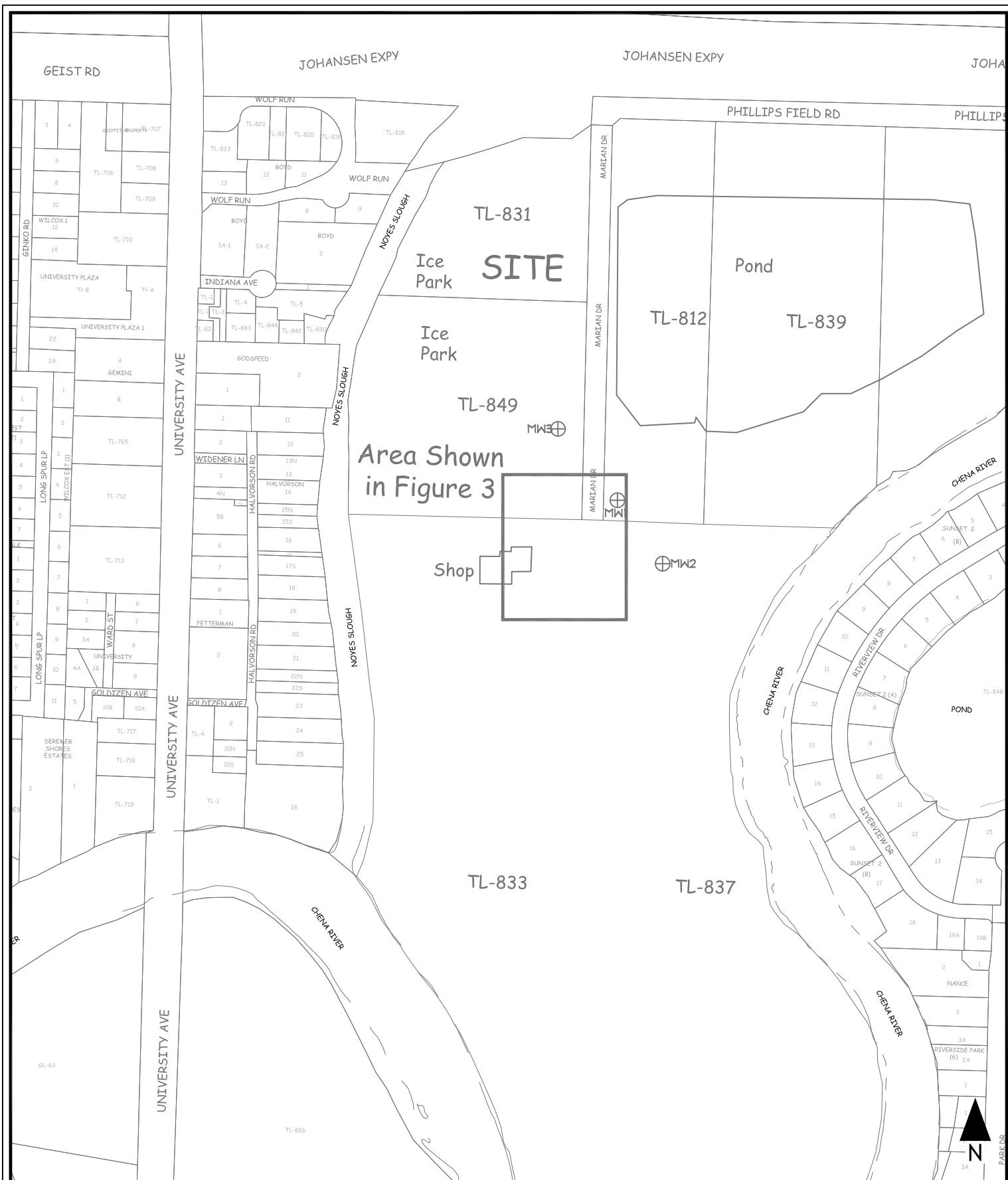


NORTECH

ENVIRONMENTAL ENGINEERING HEALTH & SAFETY
2400 College Road, Fairbanks, Alaska 99709 Ph: 907-452-5688
3105 Lakeshore Dr. Anch, Alaska 99517, Ph: 907-222-2445
5438 Shaune Drive, Jnu, Alaska 99801 Ph: 907-586-6813

Location Map
Horner / Ice Alaska Property
Fairbanks, Alaska

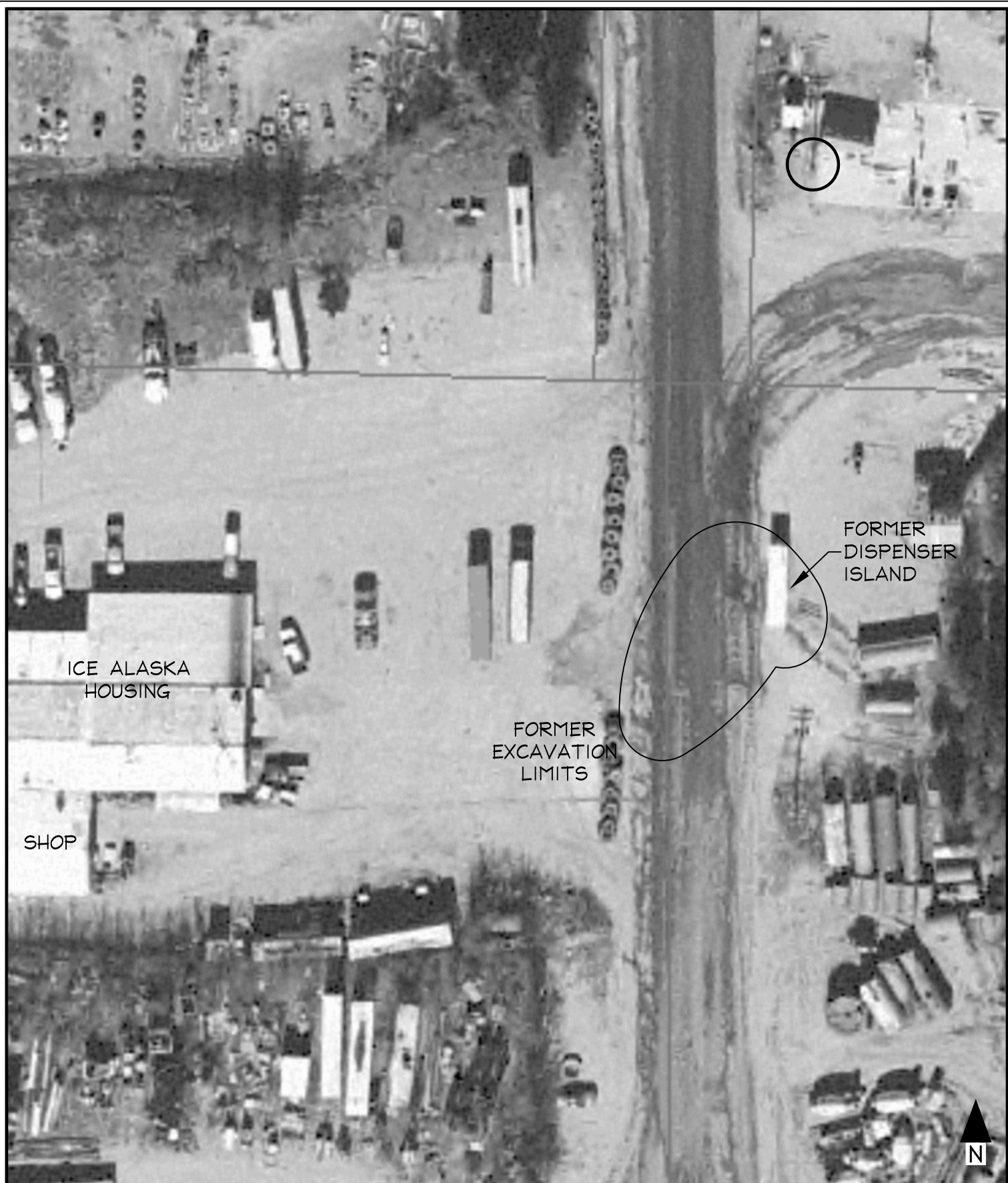
SCALE: 1"=1 mile	FIGURE:
DESIGN: PLB	1
DRAWN: PLB	
PROJECT NO: 12-1070	
DWG: 121070H(01)	
DATE: 10/23/12	



NORTECH Sustainable Environment, Energy, Health & Safety
Professional Services
2400 College Road, Fairbanks, AK. 99709, 907-452-5686
3105 Lakeshore Dr. Ste. A106, Anchorage, AK. 99517, 907-222-2445
5438 Shaune Dr. Ste. B, Juneau, AK. 99801, 907-586-6813
1623 Mill Bay Rd. Ste.#5, PO Box 17, Kodiak, AK. 99615, 907-942-7700

Vicinity Map
Horner / Ice Alaska Property
Fairbanks, Alaska

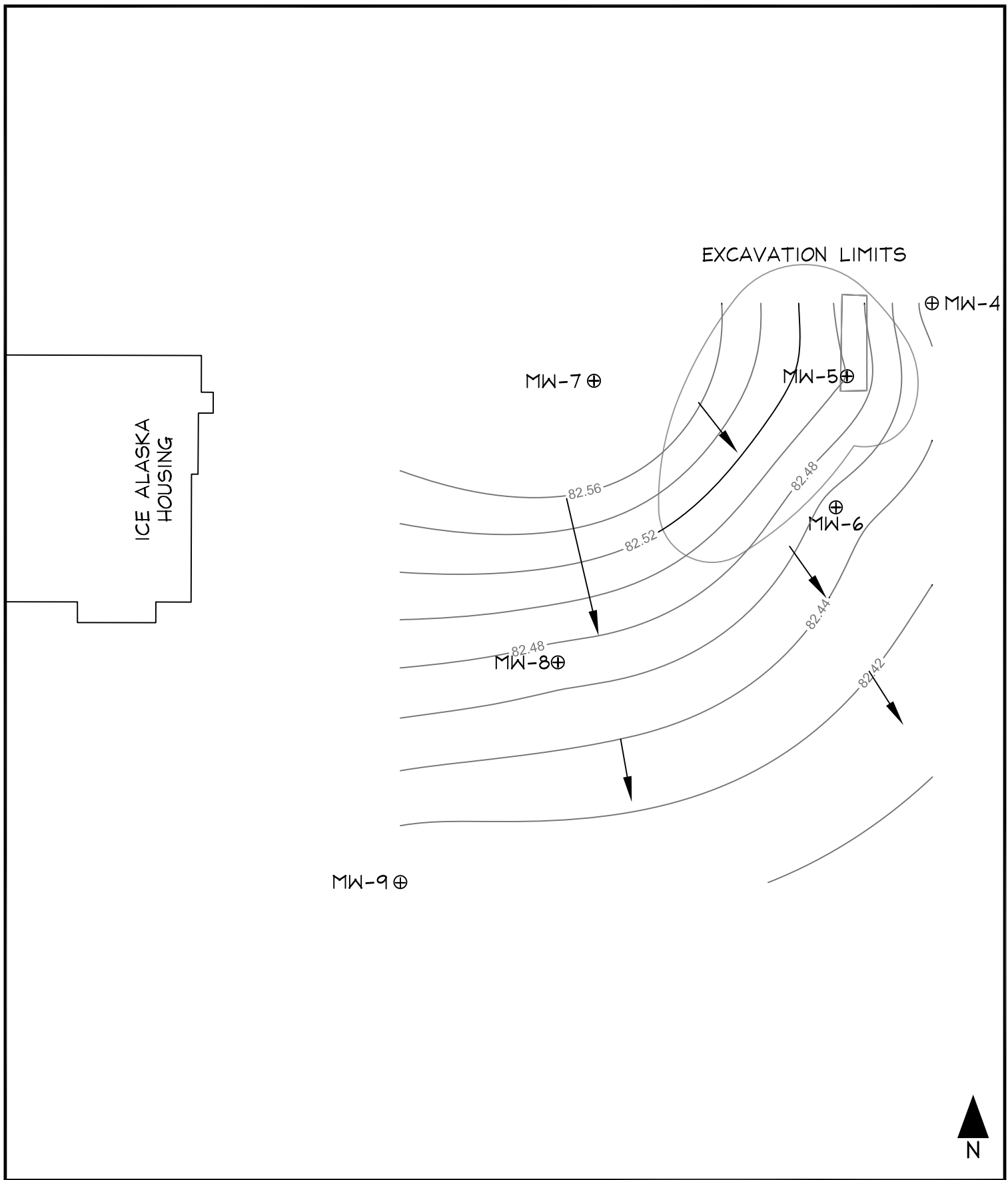
SCALE: 1" = 400'	FIGURE:
DESIGN: PLB	2
DRAWN: PLB	
PROJECT NO: 12-1070	
DWG: 121070k(02)	
DATE: 4/9/2014	



NORTECH Sustainable Environment, Energy, Health & Safety
Professional Services
2400 College Road, Fairbanks, AK. 99709, 907-452-5688
3105 Lakeshore Dr. Ste. A106, Anchorage, AK. 99517, 907-222-2445
5438 Shaune Dr. Ste. B, Juneau, AK. 99801, 907-586-6813
1623 Mill Bay Rd. Ste.#5, PO Box 17, Kodiak, AK. 99615, 907-942-7700

Site Map - Dispenser Area
Horner / Ice Alaska Property
Fairbanks, Alaska

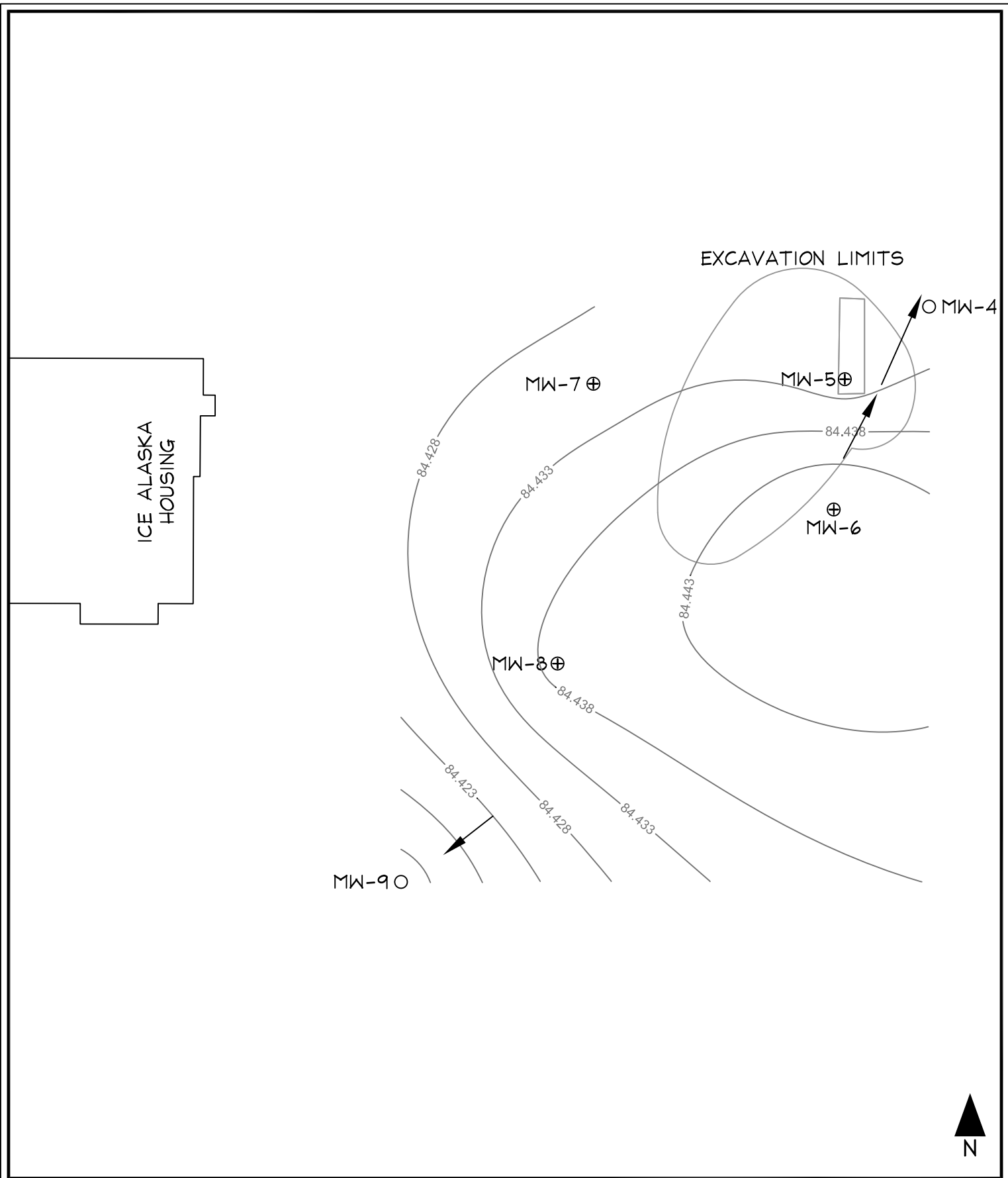
SCALE: 1" = 50'	FIGURE: 3
DESIGN: PLB	
DRAWN: PLB	
PROJECT NO: 121070	
DWG: 121070k(03)	
DATE: 4/9/2014	



NORTECH Sustainable Environment, Energy, Health & Safety
Professional Services
2400 College Road, Fairbanks, AK. 99709, 907-452-5688
3105 Lakeshore Dr. Ste. A106, Anchorage, AK. 99517, 907-222-2445
5438 Shaune Dr. Ste. B, Juneau, AK. 99801, 907-586-6813
1623 Mill Bay Rd. Ste.#5, PO Box 17, Kodiak, AK. 99615, 907-942-7700

Groundwater Gradient November 9, 2013
Horner / Ice Alaska Property
Fairbanks, Alaska

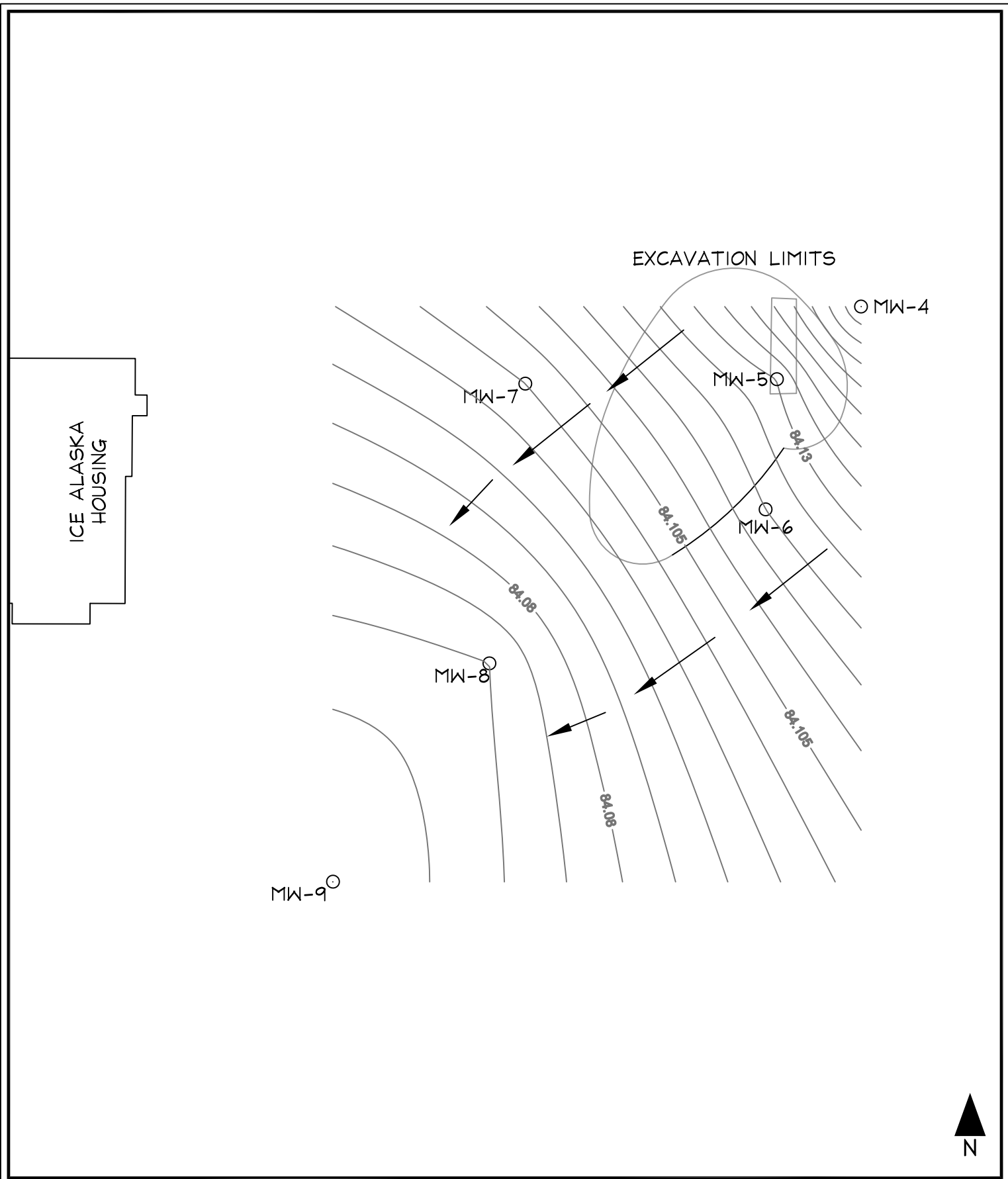
SCALE: 1" = 20'	FIGURE: 4
DESIGN: PLB	
DRAWN: PLB	
PROJECT NO: 121070	
DWG: 1210701(04)	
DATE: 4/9/2014	



NORTECH Sustainable Environment, Energy, Health & Safety
Professional Services
2400 College Road, Fairbanks, AK. 99709, 907-452-5688
3105 Lakeshore Dr. Ste. A106, Anchorage, AK. 99517, 907-222-2445
5438 Shaune Dr. Ste. B, Juneau, AK. 99801, 907-586-6813
1623 Mill Bay Rd. Ste.#5, PO Box 17, Kodiak, AK. 99615, 907-942-7700

Groundwater Gradient May 15, 2014
Horner / Ice Alaska Property
Fairbanks, Alaska

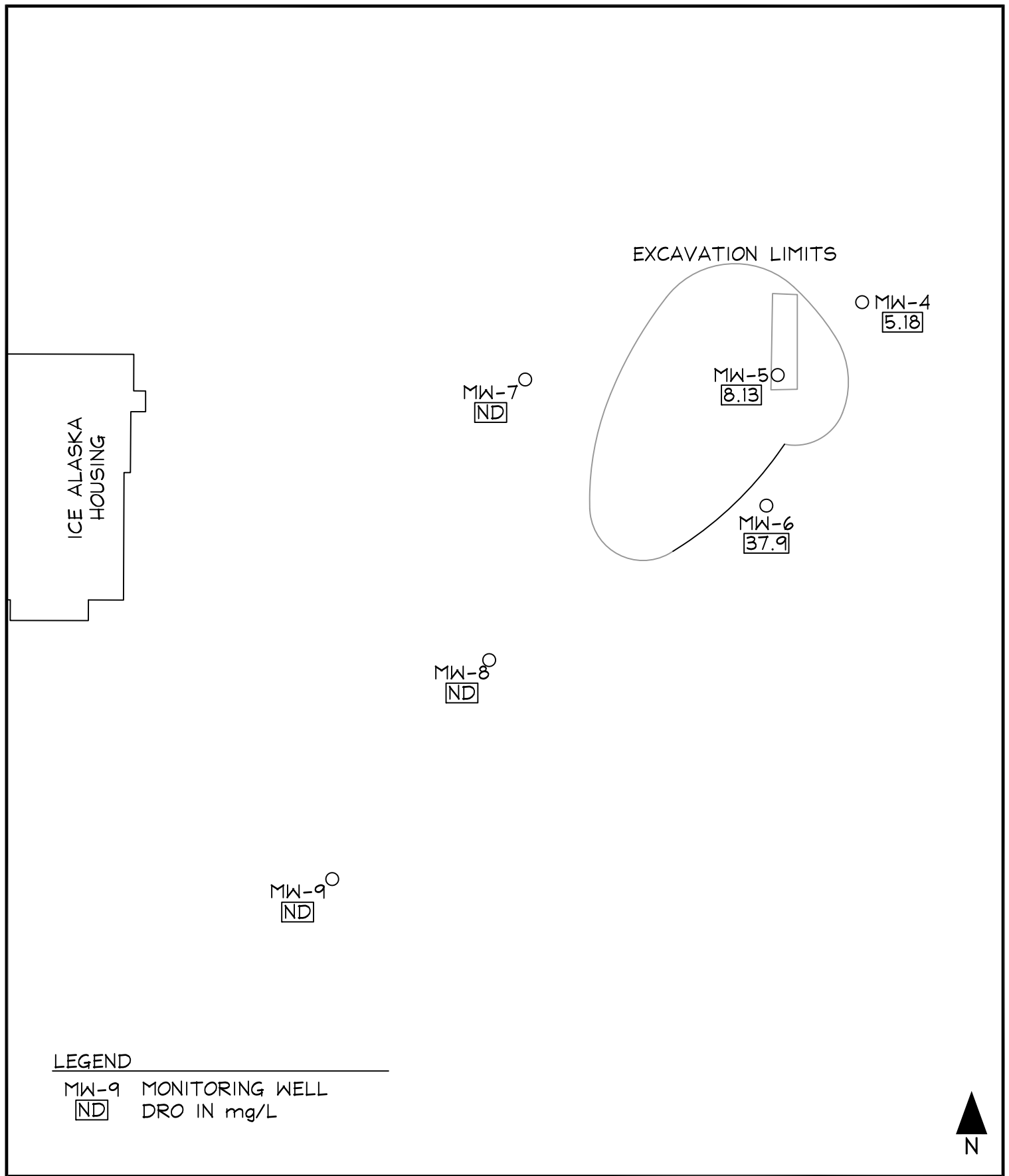
SCALE: 1" = 20'	FIGURE:
DESIGN: PLB	5
DRAWN: PLB	
PROJECT NO: 121070	
DWG: 1210701(05)	
DATE: 4/9/2014	



NORTECH Sustainable Environment, Energy, Health & Safety
Professional Services
2400 College Road, Fairbanks, AK. 99709, 907-452-5688
3105 Lakeshore Dr. Ste. A106, Anchorage, AK. 99517, 907-222-2445
5438 Shaune Dr. Ste. B, Juneau, AK. 99801, 907-586-6813
1623 Mill Bay Rd. Ste.#5, PO Box 17, Kodiak, AK. 99615, 907-942-7700

Groundwater Gradient Oct. 22, 2014
Horner / Ice Alaska Property
Fairbanks, Alaska

SCALE: 1" = 20'	FIGURE:
DESIGN: PLB	6
DRAWN: PLB	
PROJECT NO: 121070	
DWG: 1210701(06)	
DATE: 4/9/2014	



<p>NORTECH</p> <p>NORTECH Sustainable Environment, Energy, Health & Safety Professional Services</p> <p>2400 College Road, Fairbanks, AK. 99709, 907-452-5688</p> <p>3105 Lakeshore Dr. Ste. A106, Anchorage, AK. 99517, 907-222-2445</p> <p>5438 Shaune Dr. Ste. B, Juneau, AK. 99801, 907-586-6813</p> <p>1623 Mill Bay Rd. Ste.#5, PO Box 17, Kodiak, AK. 99615, 907-942-7700</p>	Groundwater Gradient Oct. 22, 2014		SCALE: 1" = 20'	FIGURE: 7
	Horner / Ice Alaska Property		DESIGN: PLB	
	Fairbanks, Alaska		DRAWN: PLB	
			PROJECT NO: 121070	
			DWG: 1210701(07)	
			DATE: 4/9/2014	



Appendix 2
Tables

Table 1
Groundwater Results
November 9, 2013 Sampling Results

Well ID	Units	ADEC Limit	MW4	MW5	M5 Dup (MW15)	MW6	MW7	MW8	MW9
DRO	mg/L	1.5	5.18	5.53	4.52	5.15	0.600U	.600U	0.600U
Benzene	mg/L	0.005	0.0009	0.0005U	0.0005U	0.0008	0.0005U	0.0005U	0.0005U
Toluene	mg/L	1.0	0.0001U	0.0001U	0.0001U	0.0015	0.0001U	0.0001U	0.0001U
Ethyl-benzene	mg/L	0.7	0.0649	0.0138	0.0144	0.0013	0.0001U	0.0001U	0.0001U
Total Xylenes	mg/L	10	0.4400	0.0553	0.0560	0.0160	0.0001U	0.0001U	0.0001U

October 22, 2014 Sampling Results

Well ID	Units	ADEC Limit	MW4	MW5	M5 Dup (MW10)	MW6	MW7	MW8	MW9
Date			2014	2014	2014	2014	2014	2014	2014
DRO	mg/L	1.5	8.17	8.13	6.58	37.9	0.600U	0.600U	0.600U
Benzene	mg/L	0.005	0.0008	0.0005U	0.0005U	0.0025	0.0005U	0.0008	0.0005U
Toluene	mg/L	1.0	0.0001U	0.0001U	0.0001U	0.0028	0.0001U	0.0001U	0.0001U
Ethyl-benzene	mg/L	0.7	0.0100	0.0025	0.0024	0.0020	0.0001U	0.0001U	0.0001U
Total Xylenes	mg/L	10	0.6800	0.0121	0.0112	0.0631	0.0001U	0.0001U	0.0001U

Notes:	U	Compound was not detected
	shade	Result is below ADEC Regulatory Limit, but above detection limit
	bold	Results is above ADEC Regulatory Limit

Field Duplicate Pair Quality Control Analysis

Sample ID	MW-5	MW-10	Average	Difference	RPD
Analyte	mg/kg	mg/kg	mg/kg	mg/kg	%
Benzene	0.0005U	0.0005U	NA	NA	NA
Toluene	0.0001U	0.0001U	NA	NA	NA
Ethyl-benzene	0.00254	0.00242	0.00248	-0.00012	-4.84%
Total Xylenes	0.0121	0.0112	0.01165	-0.0009	-7.73%
DRO	8.13	6.58	7.355	-1.55	-21.07%

Notes:	# U	Analyte not detected at the listed Limit of Quantitation
	NA	The calculation is not applicable.
	RPD	Relative percent difference

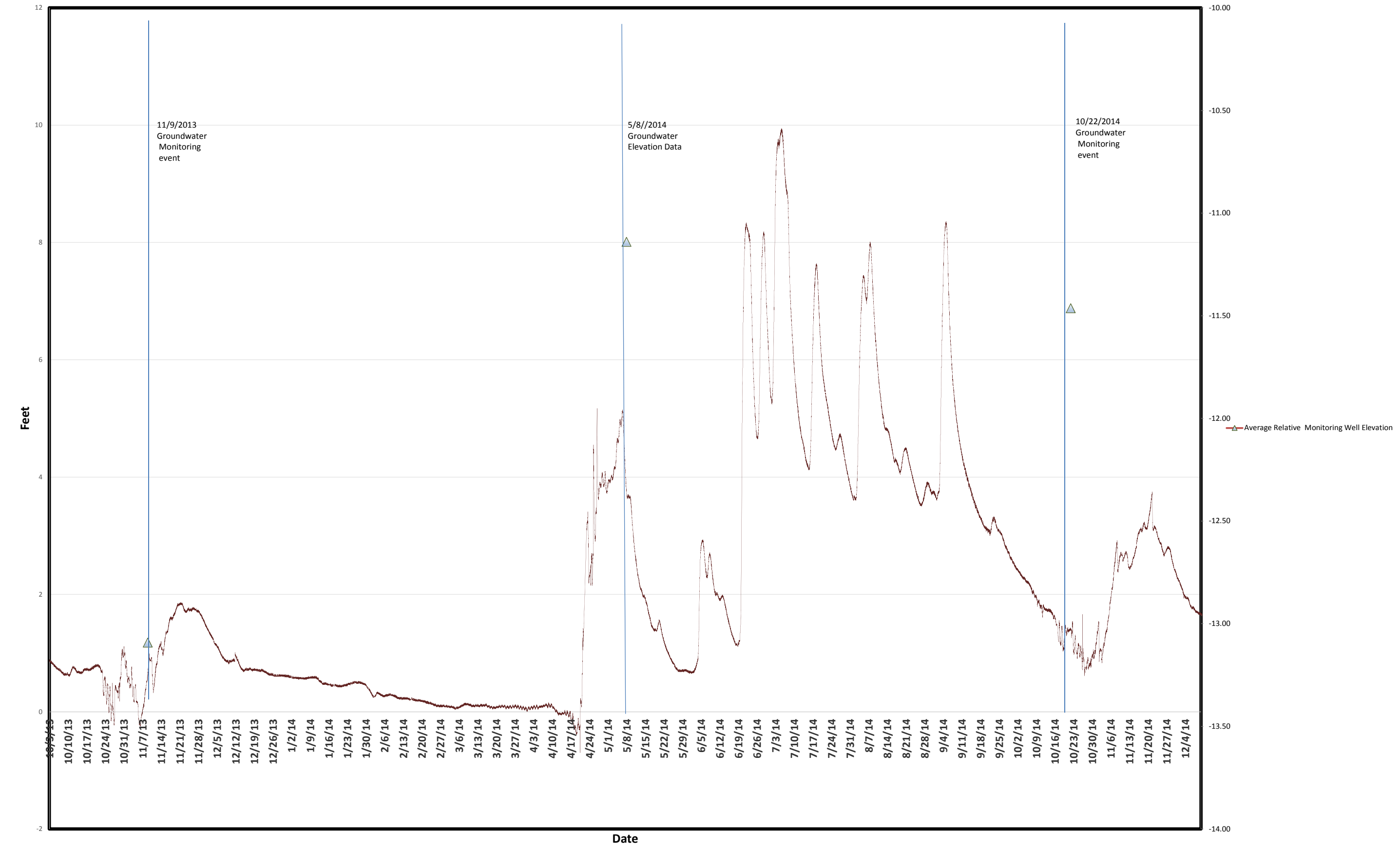
Table 2
Groundwater Elevations

Monitoring Well	GW Elevation 11/9/2013	Chena River Gage Height	GW Elevation 5/8/14	Chena River Gage Height	GW Elevation 10/22/2014	Chena River Gage Height
MW-4	82.43	0.9	84.43	3.68	84.17	1.39
MW-5	82.5	0.9	84.43	3.68	84.13	1.39
MW-6	82.45	0.9	84.45	3.68	84.12	1.39
MW-7	82.63	0.9	84.43	3.68	84.1	1.39
MW-8	82.47	0.9	84.44	3.68	84.07	1.39
MW-9	82.4	0.9	84.41	3.68	84.06	1.39



Appendix 3
Chena River Gage Heights

Chena River Gage Heights





Appendix 4
Laboratory Reports and ADEC Laboratory Date Review Checklists

Laboratory Report of Analysis

To: Nortech
2400 College Rd.
Fairbanks, AK 99709
(907)385-7587

Report Number: **1148653**

Client Project: **12-1070 Ice Alaska**

Dear Doug Dusek,

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 five 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.

Jennifer Dawkins
Project Manager

Date

Case Narrative

SGS Client: **Nortech**
 SGS Project: **1148653**
 Project Name/Site: **12-1070 Ice Alaska**
 Project Contact: **Doug Dusek**

Refer to sample receipt form for information on sample condition.

MW-4 (1148653001) PS

AK102 - The pattern is consistent with a weathered middle distillate.

MW-5 (1148653002) PS

AK102 - The pattern is consistent with a weathered middle distillate.

MW-6 (1148653003) PS

AK102 - The pattern is consistent with a weathered middle distillate.

MW-7 (1148653004) PS

AK102 - The pattern is consistent with a weathered middle distillate.

MW-10 (1148653007) PS

AK102 - The pattern is consistent with a weathered middle distillate.

*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: 10/31/2014 4:16:36PM

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. If you have any questions regarding this report, or if we can be of any other assistance, please contact your SGS Project Manager at 907-562-2343. All work is provided under SGS general terms and conditions (<http://www.sgs.com/terms_and_conditions.htm>), unless other written agreements have been accepted by both parties.

SGS maintains a formal Quality Assurance/Quality Control (QA/QC) program. A copy of our Quality Assurance Plan (QAP), which outlines this program, is available at your request. The laboratory certification numbers are AK00971 (DW Chemistry & Microbiology) & UST-005 (CS) for ADEC and 2944.01 for DOD ELAP/ISO17025 (RCRA methods: 1020A, 1311, 3010A, 3050B, 3520C, 3550C, 5030B, 5035B, 6020, 7470A, 7471B, 8021B, 8082A, 8260B, 8270D, 8270D-SIM, 9040B, 9045C, 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	Continuing Calibration Verification
CL	Control Limit
D	The analyte concentration is the result of a dilution.
DF	Dilution Factor
DL	Detection Limit (i.e., maximum method detection limit)
E	The analyte result is above the calibrated range.
F	Indicates value that is greater than or equal to the DL
GT	Greater Than
IB	Instrument Blank
ICV	Initial Calibration Verification
J	The quantitation is an estimation.
JL	The analyte was positively identified, but the quantitation is a low estimation.
LCS(D)	Laboratory Control Spike (Duplicate)
LOD	Limit of Detection (i.e., 1/2 of the LOQ)
LOQ	Limit of Quantitation (i.e., reporting or practical quantitation limit)
LT	Less Than
M	A matrix effect was present.
MB	Method Blank
MS(D)	Matrix Spike (Duplicate)
ND	Indicates the analyte is not detected.
Q	QC parameter out of acceptance range.
R	Rejected
RPD	Relative Percent Difference
U	Indicates the analyte was analyzed for but not detected.

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

Sample Summary

<u>Client Sample ID</u>	<u>Lab Sample ID</u>	<u>Collected</u>	<u>Received</u>	<u>Matrix</u>
MW-4	1148653001	10/22/2014	10/23/2014	Water (Surface, Eff., Ground)
MW-5	1148653002	10/22/2014	10/23/2014	Water (Surface, Eff., Ground)
MW-6	1148653003	10/22/2014	10/23/2014	Water (Surface, Eff., Ground)
MW-7	1148653004	10/22/2014	10/23/2014	Water (Surface, Eff., Ground)
MW-8	1148653005	10/22/2014	10/23/2014	Water (Surface, Eff., Ground)
MW-9	1148653006	10/22/2014	10/23/2014	Water (Surface, Eff., Ground)
MW-10	1148653007	10/22/2014	10/23/2014	Water (Surface, Eff., Ground)
Trip Blank	1148653008	10/22/2014	10/23/2014	Water (Surface, Eff., Ground)

<u>Method</u>	<u>Method Description</u>
SW8021B	BTEX 8021
AK102	DRO Low Volume (W)

Print Date: 10/31/2014 4:16:38PM

Detectable Results Summary

Client Sample ID: **MW-4**
 Lab Sample ID: 1148653001
Semivolatile Organic Fuels
Volatile Fuels

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Diesel Range Organics	8.17	mg/L
Benzene	0.780	ug/L
Ethylbenzene	100	ug/L
o-Xylene	114	ug/L
P & M -Xylene	566	ug/L

Client Sample ID: **MW-5**
 Lab Sample ID: 1148653002
Semivolatile Organic Fuels
Volatile Fuels

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Diesel Range Organics	8.13	mg/L
Ethylbenzene	2.54	ug/L
P & M -Xylene	12.1	ug/L

Client Sample ID: **MW-6**
 Lab Sample ID: 1148653003
Semivolatile Organic Fuels
Volatile Fuels

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Diesel Range Organics	37.9	mg/L
Benzene	2.48	ug/L
Ethylbenzene	2.03	ug/L
o-Xylene	45.0	ug/L
P & M -Xylene	18.1	ug/L
Toluene	2.79	ug/L

Client Sample ID: **MW-8**
 Lab Sample ID: 1148653005
Volatile Fuels

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Benzene	0.750	ug/L

Client Sample ID: **MW-10**
 Lab Sample ID: 1148653007
Semivolatile Organic Fuels
Volatile Fuels

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Diesel Range Organics	6.58	mg/L
Ethylbenzene	2.42	ug/L
P & M -Xylene	11.2	ug/L

Results of MW-4

Client Sample ID: **MW-4**
 Client Project ID: **12-1070 Ice Alaska**
 Lab Sample ID: 1148653001
 Lab Project ID: 1148653

Collection Date: 10/22/14 11:13
 Received Date: 10/23/14 09:20
 Matrix: Water (Surface, Eff., Ground)
 Solids (%):
 Location:

Results by Semivolatile Organic Fuels

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Diesel Range Organics	8.17	0.600	0.180	mg/L	1		10/30/14 14:16
Surrogates							
5a Androstane	71.5	50-150		%	1		10/30/14 14:16

Batch Information

Analytical Batch: XFC11657
 Analytical Method: AK102
 Analyst: MCM
 Analytical Date/Time: 10/30/14 14:16
 Container ID: 1148653001-D

Prep Batch: XXX32276
 Prep Method: SW3520C
 Prep Date/Time: 10/26/14 08:50
 Prep Initial Wt./Vol.: 250 mL
 Prep Extract Vol: 1 mL

Print Date: 10/31/2014 4:16:39PM

Results of MW-4

Client Sample ID: **MW-4**
 Client Project ID: **12-1070 Ice Alaska**
 Lab Sample ID: 1148653001
 Lab Project ID: 1148653

Collection Date: 10/22/14 11:13
 Received Date: 10/23/14 09:20
 Matrix: Water (Surface, Eff., Ground)
 Solids (%):
 Location:

Results by Volatile Fuels

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Benzene	0.780	0.500	0.150	ug/L	1		10/24/14 01:05
Ethylbenzene	100	1.00	0.310	ug/L	1		10/24/14 01:05
o-Xylene	114	10.0	3.10	ug/L	10		10/24/14 10:14
P & M -Xylene	566	20.0	6.20	ug/L	10		10/24/14 10:14
Toluene	1.00 U	1.00	0.310	ug/L	1		10/24/14 01:05
Surrogates							
1,4-Difluorobenzene	100	77-115		%	1		10/24/14 01:05

Batch Information

Analytical Batch: VFC12195
 Analytical Method: SW8021B
 Analyst: ST
 Analytical Date/Time: 10/24/14 01:05
 Container ID: 1148653001-A

Prep Batch: VXX26674
 Prep Method: SW5030B
 Prep Date/Time: 10/23/14 08:00
 Prep Initial Wt./Vol.: 5 mL
 Prep Extract Vol: 5 mL

Analytical Batch: VFC12196
 Analytical Method: SW8021B
 Analyst: ST
 Analytical Date/Time: 10/24/14 10:14
 Container ID: 1148653001-B

Prep Batch: VXX26676
 Prep Method: SW5030B
 Prep Date/Time: 10/24/14 08:00
 Prep Initial Wt./Vol.: 5 mL
 Prep Extract Vol: 5 mL

Results of MW-5

Client Sample ID: **MW-5**
 Client Project ID: **12-1070 Ice Alaska**
 Lab Sample ID: 1148653002
 Lab Project ID: 1148653

Collection Date: 10/22/14 10:47
 Received Date: 10/23/14 09:20
 Matrix: Water (Surface, Eff., Ground)
 Solids (%):
 Location:

Results by Semivolatile Organic Fuels

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Diesel Range Organics	8.13	0.600	0.180	mg/L	1		10/30/14 14:36
Surrogates							
5a Androstane	72.3	50-150		%	1		10/30/14 14:36

Batch Information

Analytical Batch: XFC11657
 Analytical Method: AK102
 Analyst: MCM
 Analytical Date/Time: 10/30/14 14:36
 Container ID: 1148653002-D

Prep Batch: XXX32276
 Prep Method: SW3520C
 Prep Date/Time: 10/26/14 08:50
 Prep Initial Wt./Vol.: 250 mL
 Prep Extract Vol: 1 mL

Print Date: 10/31/2014 4:16:39PM

Results of MW-5

Client Sample ID: **MW-5**
 Client Project ID: **12-1070 Ice Alaska**
 Lab Sample ID: 1148653002
 Lab Project ID: 1148653

Collection Date: 10/22/14 10:47
 Received Date: 10/23/14 09:20
 Matrix: Water (Surface, Eff., Ground)
 Solids (%):
 Location:

Results by Volatile Fuels

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Benzene	0.500 U	0.500	0.150	ug/L	1		10/24/14 01:23
Ethylbenzene	2.54	1.00	0.310	ug/L	1		10/24/14 01:23
o-Xylene	1.00 U	1.00	0.310	ug/L	1		10/24/14 01:23
P & M -Xylene	12.1	2.00	0.620	ug/L	1		10/24/14 01:23
Toluene	1.00 U	1.00	0.310	ug/L	1		10/24/14 01:23
Surrogates							
1,4-Difluorobenzene	95.3	77-115		%	1		10/24/14 01:23

Batch Information

Analytical Batch: VFC12195
 Analytical Method: SW8021B
 Analyst: ST
 Analytical Date/Time: 10/24/14 01:23
 Container ID: 1148653002-A

Prep Batch: VXX26674
 Prep Method: SW5030B
 Prep Date/Time: 10/23/14 08:00
 Prep Initial Wt./Vol.: 5 mL
 Prep Extract Vol: 5 mL

Results of MW-6

Client Sample ID: **MW-6**
 Client Project ID: **12-1070 Ice Alaska**
 Lab Sample ID: 1148653003
 Lab Project ID: 1148653

Collection Date: 10/22/14 10:30
 Received Date: 10/23/14 09:20
 Matrix: Water (Surface, Eff., Ground)
 Solids (%):
 Location:

Results by Semivolatile Organic Fuels

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Diesel Range Organics	37.9	0.600	0.180	mg/L	1		10/30/14 14:57
Surrogates							
5a Androstane	72.1	50-150		%	1		10/30/14 14:57

Batch Information

Analytical Batch: XFC11657
 Analytical Method: AK102
 Analyst: MCM
 Analytical Date/Time: 10/30/14 14:57
 Container ID: 1148653003-D

Prep Batch: XXX32276
 Prep Method: SW3520C
 Prep Date/Time: 10/26/14 08:50
 Prep Initial Wt./Vol.: 250 mL
 Prep Extract Vol: 1 mL

Print Date: 10/31/2014 4:16:39PM

Results of MW-6

Client Sample ID: **MW-6**
 Client Project ID: **12-1070 Ice Alaska**
 Lab Sample ID: 1148653003
 Lab Project ID: 1148653

Collection Date: 10/22/14 10:30
 Received Date: 10/23/14 09:20
 Matrix: Water (Surface, Eff., Ground)
 Solids (%):
 Location:

Results by Volatile Fuels

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Benzene	2.48	0.500	0.150	ug/L	1		10/24/14 01:42
Ethylbenzene	2.03	1.00	0.310	ug/L	1		10/24/14 01:42
o-Xylene	45.0	1.00	0.310	ug/L	1		10/24/14 01:42
P & M -Xylene	18.1	2.00	0.620	ug/L	1		10/24/14 01:42
Toluene	2.79	1.00	0.310	ug/L	1		10/24/14 01:42
Surrogates							
1,4-Difluorobenzene	92.3	77-115		%	1		10/24/14 01:42

Batch Information

Analytical Batch: VFC12195
 Analytical Method: SW8021B
 Analyst: ST
 Analytical Date/Time: 10/24/14 01:42
 Container ID: 1148653003-A

Prep Batch: VXX26674
 Prep Method: SW5030B
 Prep Date/Time: 10/23/14 08:00
 Prep Initial Wt./Vol.: 5 mL
 Prep Extract Vol: 5 mL

Print Date: 10/31/2014 4:16:39PM

Results of MW-7

Client Sample ID: **MW-7**
 Client Project ID: **12-1070 Ice Alaska**
 Lab Sample ID: 1148653004
 Lab Project ID: 1148653

Collection Date: 10/22/14 13:20
 Received Date: 10/23/14 09:20
 Matrix: Water (Surface, Eff., Ground)
 Solids (%):
 Location:

Results by Semivolatile Organic Fuels

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Diesel Range Organics	0.600 U	0.600	0.180	mg/L	1		10/30/14 15:18
Surrogates							
5a Androstane	73.5	50-150		%	1		10/30/14 15:18

Batch Information

Analytical Batch: XFC11657
 Analytical Method: AK102
 Analyst: MCM
 Analytical Date/Time: 10/30/14 15:18
 Container ID: 1148653004-D

Prep Batch: XXX32276
 Prep Method: SW3520C
 Prep Date/Time: 10/26/14 08:50
 Prep Initial Wt./Vol.: 250 mL
 Prep Extract Vol: 1 mL

Print Date: 10/31/2014 4:16:39PM

Results of MW-7

Client Sample ID: **MW-7**
 Client Project ID: **12-1070 Ice Alaska**
 Lab Sample ID: 1148653004
 Lab Project ID: 1148653

Collection Date: 10/22/14 13:20
 Received Date: 10/23/14 09:20
 Matrix: Water (Surface, Eff., Ground)
 Solids (%):
 Location:

Results by Volatile Fuels

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Benzene	0.500 U	0.500	0.150	ug/L	1		10/24/14 02:00
Ethylbenzene	1.00 U	1.00	0.310	ug/L	1		10/24/14 02:00
o-Xylene	1.00 U	1.00	0.310	ug/L	1		10/24/14 02:00
P & M -Xylene	2.00 U	2.00	0.620	ug/L	1		10/24/14 02:00
Toluene	1.00 U	1.00	0.310	ug/L	1		10/24/14 02:00
Surrogates							
1,4-Difluorobenzene	95.5	77-115		%	1		10/24/14 02:00

Batch Information

Analytical Batch: VFC12195
 Analytical Method: SW8021B
 Analyst: ST
 Analytical Date/Time: 10/24/14 02:00
 Container ID: 1148653004-A

Prep Batch: VXX26674
 Prep Method: SW5030B
 Prep Date/Time: 10/23/14 08:00
 Prep Initial Wt./Vol.: 5 mL
 Prep Extract Vol: 5 mL

Results of MW-8

Client Sample ID: **MW-8**
 Client Project ID: **12-1070 Ice Alaska**
 Lab Sample ID: 1148653005
 Lab Project ID: 1148653

Collection Date: 10/22/14 14:00
 Received Date: 10/23/14 09:20
 Matrix: Water (Surface, Eff., Ground)
 Solids (%):
 Location:

Results by Semivolatile Organic Fuels

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Diesel Range Organics	0.600 U	0.600	0.180	mg/L	1		10/30/14 15:38
Surrogates							
5a Androstane	70.4	50-150		%	1		10/30/14 15:38

Batch Information

Analytical Batch: XFC11657
 Analytical Method: AK102
 Analyst: MCM
 Analytical Date/Time: 10/30/14 15:38
 Container ID: 1148653005-D

Prep Batch: XXX32276
 Prep Method: SW3520C
 Prep Date/Time: 10/26/14 08:50
 Prep Initial Wt./Vol.: 250 mL
 Prep Extract Vol: 1 mL

Print Date: 10/31/2014 4:16:39PM

Results of MW-8

Client Sample ID: **MW-8**
 Client Project ID: **12-1070 Ice Alaska**
 Lab Sample ID: 1148653005
 Lab Project ID: 1148653

Collection Date: 10/22/14 14:00
 Received Date: 10/23/14 09:20
 Matrix: Water (Surface, Eff., Ground)
 Solids (%):
 Location:

Results by Volatile Fuels

Parameter	Result Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	0.750	0.500	0.150	ug/L	1		10/24/14 02:19
Ethylbenzene	1.00 U	1.00	0.310	ug/L	1		10/24/14 02:19
o-Xylene	1.00 U	1.00	0.310	ug/L	1		10/24/14 02:19
P & M -Xylene	2.00 U	2.00	0.620	ug/L	1		10/24/14 02:19
Toluene	1.00 U	1.00	0.310	ug/L	1		10/24/14 02:19
Surrogates							
1,4-Difluorobenzene	95.5	77-115		%	1		10/24/14 02:19

Batch Information

Analytical Batch: VFC12195
 Analytical Method: SW8021B
 Analyst: ST
 Analytical Date/Time: 10/24/14 02:19
 Container ID: 1148653005-A

Prep Batch: VXX26674
 Prep Method: SW5030B
 Prep Date/Time: 10/23/14 08:00
 Prep Initial Wt./Vol.: 5 mL
 Prep Extract Vol: 5 mL

Results of MW-9

Client Sample ID: **MW-9**
 Client Project ID: **12-1070 Ice Alaska**
 Lab Sample ID: 1148653006
 Lab Project ID: 1148653

Collection Date: 10/22/14 13:40
 Received Date: 10/23/14 09:20
 Matrix: Water (Surface, Eff., Ground)
 Solids (%):
 Location:

Results by Semivolatile Organic Fuels

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Diesel Range Organics	0.600 U	0.600	0.180	mg/L	1		10/30/14 15:59
Surrogates							
5a Androstane	68.2	50-150		%	1		10/30/14 15:59

Batch Information

Analytical Batch: XFC11657
 Analytical Method: AK102
 Analyst: MCM
 Analytical Date/Time: 10/30/14 15:59
 Container ID: 1148653006-D

Prep Batch: XXX32276
 Prep Method: SW3520C
 Prep Date/Time: 10/26/14 08:50
 Prep Initial Wt./Vol.: 250 mL
 Prep Extract Vol: 1 mL

Print Date: 10/31/2014 4:16:39PM

Results of MW-9

Client Sample ID: **MW-9**
 Client Project ID: **12-1070 Ice Alaska**
 Lab Sample ID: 1148653006
 Lab Project ID: 1148653

Collection Date: 10/22/14 13:40
 Received Date: 10/23/14 09:20
 Matrix: Water (Surface, Eff., Ground)
 Solids (%):
 Location:

Results by Volatile Fuels

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Benzene	0.500 U	0.500	0.150	ug/L	1		10/24/14 02:37
Ethylbenzene	1.00 U	1.00	0.310	ug/L	1		10/24/14 02:37
o-Xylene	1.00 U	1.00	0.310	ug/L	1		10/24/14 02:37
P & M -Xylene	2.00 U	2.00	0.620	ug/L	1		10/24/14 02:37
Toluene	1.00 U	1.00	0.310	ug/L	1		10/24/14 02:37
Surrogates							
1,4-Difluorobenzene	95	77-115		%	1		10/24/14 02:37

Batch Information

Analytical Batch: VFC12195
 Analytical Method: SW8021B
 Analyst: ST
 Analytical Date/Time: 10/24/14 02:37
 Container ID: 1148653006-A

Prep Batch: VXX26674
 Prep Method: SW5030B
 Prep Date/Time: 10/23/14 08:00
 Prep Initial Wt./Vol.: 5 mL
 Prep Extract Vol: 5 mL

Results of MW-10

Client Sample ID: **MW-10**
 Client Project ID: **12-1070 Ice Alaska**
 Lab Sample ID: 1148653007
 Lab Project ID: 1148653

Collection Date: 10/22/14 13:55
 Received Date: 10/23/14 09:20
 Matrix: Water (Surface, Eff., Ground)
 Solids (%):
 Location:

Results by Semivolatile Organic Fuels

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Diesel Range Organics	6.58	0.600	0.180	mg/L	1		10/30/14 16:20
Surrogates							
5a Androstane	69.8	50-150		%	1		10/30/14 16:20

Batch Information

Analytical Batch: XFC11657
 Analytical Method: AK102
 Analyst: MCM
 Analytical Date/Time: 10/30/14 16:20
 Container ID: 1148653007-D

Prep Batch: XXX32276
 Prep Method: SW3520C
 Prep Date/Time: 10/26/14 08:50
 Prep Initial Wt./Vol.: 250 mL
 Prep Extract Vol: 1 mL

Print Date: 10/31/2014 4:16:39PM

Results of MW-10

Client Sample ID: **MW-10**
 Client Project ID: **12-1070 Ice Alaska**
 Lab Sample ID: 1148653007
 Lab Project ID: 1148653

Collection Date: 10/22/14 13:55
 Received Date: 10/23/14 09:20
 Matrix: Water (Surface, Eff., Ground)
 Solids (%):
 Location:

Results by Volatile Fuels

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Benzene	0.500 U	0.500	0.150	ug/L	1		10/24/14 02:56
Ethylbenzene	2.42	1.00	0.310	ug/L	1		10/24/14 02:56
o-Xylene	1.00 U	1.00	0.310	ug/L	1		10/24/14 02:56
P & M -Xylene	11.2	2.00	0.620	ug/L	1		10/24/14 02:56
Toluene	1.00 U	1.00	0.310	ug/L	1		10/24/14 02:56
Surrogates							
1,4-Difluorobenzene	95.8	77-115		%	1		10/24/14 02:56

Batch Information

Analytical Batch: VFC12195
 Analytical Method: SW8021B
 Analyst: ST
 Analytical Date/Time: 10/24/14 02:56
 Container ID: 1148653007-A

Prep Batch: VXX26674
 Prep Method: SW5030B
 Prep Date/Time: 10/23/14 08:00
 Prep Initial Wt./Vol.: 5 mL
 Prep Extract Vol: 5 mL

Results of Trip Blank

Client Sample ID: **Trip Blank**
 Client Project ID: **12-1070 Ice Alaska**
 Lab Sample ID: 1148653008
 Lab Project ID: 1148653

Collection Date: 10/22/14 10:30
 Received Date: 10/23/14 09:20
 Matrix: Water (Surface, Eff., Ground)
 Solids (%):
 Location:

Results by Volatile Fuels

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Benzene	0.500 U	0.500	0.150	ug/L	1		10/23/14 23:33
Ethylbenzene	1.00 U	1.00	0.310	ug/L	1		10/23/14 23:33
o-Xylene	1.00 U	1.00	0.310	ug/L	1		10/23/14 23:33
P & M -Xylene	2.00 U	2.00	0.620	ug/L	1		10/23/14 23:33
Toluene	1.00 U	1.00	0.310	ug/L	1		10/23/14 23:33
Surrogates							
1,4-Difluorobenzene	98.5	77-115		%	1		10/23/14 23:33

Batch Information

Analytical Batch: VFC12195
 Analytical Method: SW8021B
 Analyst: ST
 Analytical Date/Time: 10/23/14 23:33
 Container ID: 1148653008-A

Prep Batch: VXX26674
 Prep Method: SW5030B
 Prep Date/Time: 10/23/14 08:00
 Prep Initial Wt./Vol.: 5 mL
 Prep Extract Vol: 5 mL

Method Blank

Blank ID: MB for HBN 1660952 [VXX/26674]
Blank Lab ID: 1242069

Matrix: Water (Surface, Eff., Ground)

QC for Samples:

1148653001, 1148653002, 1148653003, 1148653004, 1148653005, 1148653006, 1148653007, 1148653008

Results by SW8021B

<u>Parameter</u>	<u>Results</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>
Benzene	0.250U	0.500	0.150	ug/L
Ethylbenzene	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
Toluene	0.500U	1.00	0.310	ug/L
Surrogates				
1,4-Difluorobenzene	91	77-115		%

Batch Information

Analytical Batch: VFC12195
Analytical Method: SW8021B
Instrument: Agilent 7890 PID/FID
Analyst: ST
Analytical Date/Time: 10/23/2014 10:00:00PM

Prep Batch: VXX26674
Prep Method: SW5030B
Prep Date/Time: 10/23/2014 8:00:00AM
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Blank Spike Summary

Blank Spike ID: LCS for HBN 1148653 [VXX26674]
 Blank Spike Lab ID: 1242070
 Date Analyzed: 10/23/2014 22:37

Spike Duplicate ID: LCSD for HBN 1148653 [VXX26674]
 Spike Duplicate Lab ID: 1242071
 Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1148653001, 1148653002, 1148653003, 1148653004, 1148653005, 1148653006, 1148653007, 1148653008

Results by SW8021B

Parameter	Blank Spike (ug/L)			Spike Duplicate (ug/L)			CL	RPD (%)	RPD CL
	Spike	Result	Rec (%)	Spike	Result	Rec (%)			
Benzene	100	109	109	100	107	107	(80-120)	1.20	(< 20)
Ethylbenzene	100	105	105	100	102	102	(75-125)	3.00	(< 20)
o-Xylene	100	99.9	100	100	96.7	97	(80-120)	3.30	(< 20)
P & M -Xylene	200	206	103	200	200	100	(75-130)	2.50	(< 20)
Toluene	100	107	107	100	107	107	(75-120)	0.20	(< 20)
Surrogates									
1,4-Difluorobenzene	50	105	105	50	108	108	(77-115)	3.20	

Batch Information

Analytical Batch: VFC12195
 Analytical Method: SW8021B
 Instrument: Agilent 7890 PID/FID
 Analyst: ST

Prep Batch: VXX26674
 Prep Method: SW5030B
 Prep Date/Time: 10/23/2014 08:00
 Spike Init Wt./Vol.: 100 ug/L Extract Vol: 5 mL
 Dupe Init Wt./Vol.: 100 ug/L Extract Vol: 5 mL

Method Blank

Blank ID: MB for HBN 1660961 [VXX/26676]
Blank Lab ID: 1242115

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1148653001

Results by SW8021B

<u>Parameter</u>	<u>Results</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>
o-Xylene	0.500U	1.00	0.310	ug/L
P & M -Xylene	1.00U	2.00	0.620	ug/L
Surrogates				
1,4-Difluorobenzene	103	77-115		%

Batch Information

Analytical Batch: VFC12196
Analytical Method: SW8021B
Instrument: Agilent 7890A PID/FID
Analyst: ST
Analytical Date/Time: 10/24/2014 8:09:00AM

Prep Batch: VXX26676
Prep Method: SW5030B
Prep Date/Time: 10/24/2014 8:00:00AM
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Blank Spike Summary

Blank Spike ID: LCS for HBN 1148653 [VXX26676]
 Blank Spike Lab ID: 1242116
 Date Analyzed: 10/24/2014 08:46

Spike Duplicate ID: LCSD for HBN 1148653
 [VXX26676]
 Spike Duplicate Lab ID: 1242117
 Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1148653001

Results by SW8021B

Parameter	Blank Spike (ug/L)			Spike Duplicate (ug/L)			CL	RPD (%)	RPD CL
	Spike	Result	Rec (%)	Spike	Result	Rec (%)			
o-Xylene	100	106	106	100	103	103	(80-120)	3.10	(< 20)
P & M -Xylene	200	213	107	200	208	104	(75-130)	2.70	(< 20)
Surrogates									
1,4-Difluorobenzene	50	104	104	50	108	108	(77-115)	3.40	

Batch Information

Analytical Batch: VFC12196
 Analytical Method: SW8021B
 Instrument: Agilent 7890A PID/FID
 Analyst: ST

Prep Batch: VXX26676
 Prep Method: SW5030B
 Prep Date/Time: 10/24/2014 08:00
 Spike Init Wt./Vol.: 100 ug/L Extract Vol: 5 mL
 Dupe Init Wt./Vol.: 100 ug/L Extract Vol: 5 mL

Method Blank

Blank ID: MB for HBN 1660948 [XXX/32276]
Blank Lab ID: 1242058

Matrix: Water (Surface, Eff., Ground)

QC for Samples:

1148653001, 1148653002, 1148653003, 1148653004, 1148653005, 1148653006, 1148653007

Results by AK102

<u>Parameter</u>	<u>Results</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>
Diesel Range Organics	0.300U	0.600	0.180	mg/L
Surrogates				
5a Androstane	76.2	60-120		%

Batch Information

Analytical Batch: XFC11657

Analytical Method: AK102

Instrument: HP 7890A FID SV E F

Analyst: MCM

Analytical Date/Time: 10/30/2014 12:33:00PM

Prep Batch: XXX32276

Prep Method: SW3520C

Prep Date/Time: 10/26/2014 8:50:44AM

Prep Initial Wt./Vol.: 250 mL

Prep Extract Vol: 1 mL

Print Date: 10/31/2014 4:16:45PM

Blank Spike Summary

Blank Spike ID: LCS for HBN 1148653 [XXX32276]
 Blank Spike Lab ID: 1242059
 Date Analyzed: 10/30/2014 12:53

Spike Duplicate ID: LCSD for HBN 1148653
 [XXX32276]
 Spike Duplicate Lab ID: 1242060
 Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1148653001, 1148653002, 1148653003, 1148653004, 1148653005, 1148653006, 1148653007

Results by AK102

Parameter	Blank Spike (mg/L)			Spike Duplicate (mg/L)			CL	RPD (%)	RPD CL
	Spike	Result	Rec (%)	Spike	Result	Rec (%)			
Diesel Range Organics	20	15.0	75	20	16.8	84	(75-125)	11.50	(< 20)
Surrogates									
5a Androstane	0.4	74.3	74	0.4	78.8	79	(60-120)	5.90	

Batch Information

Analytical Batch: **XFC11657**
 Analytical Method: **AK102**
 Instrument: **HP 7890A** **FID SV E F**
 Analyst: **MCM**

Prep Batch: **XXX32276**
 Prep Method: **SW3520C**
 Prep Date/Time: **10/26/2014 08:50**
 Spike Init Wt./Vol.: 20 mg/L Extract Vol: 1 mL
 Dupe Init Wt./Vol.: 20 mg/L Extract Vol: 1 mL

Print Date: 10/31/2014 4:16:46PM



1148653



Locations Nationwide
Alaska Maryland
New Jersey New York
North Carolina Indiana
West Virginia Kentucky
www.us.sgs.com

SGS
CHAIN

CLIENT: <i>NORTECH</i>		PHONE NO: <i>907-452-5688</i>		Instructions: Sections 1 - 5 must be filled out. Omissions may delay the onset of analysis.		Page <i>1</i> of <i>1</i>	
CONTACT: <i>DUG VUSEK</i>		PROJECT/ PWSID/ PERMIT#: <i>18 12-1070</i>		Preservative			
PROJECT NAME: <i>ICE ALASKA</i>		E-MAIL: <i>ddusek@nortechengr.com</i>					
REPORTS TO: <i>DUG VUSEK</i>		QUOTE #:					
INVOICE TO:		P.O. #:					
RESERVED for lab use	SAMPLE IDENTIFICATION	DATE mm/dd/yy	TIME HH:MM	MATRIX/ MATRIX CODE	REMARKS/ LOC ID		
① A-E	<i>17W-4</i>	<i>10/22/14</i>	<i>1113</i>	<i>W</i>			
② A-E	<i>17W-5</i>		<i>1047</i>				
③ A-E	<i>17W-6</i>		<i>1030</i>				
④ A-E	<i>17W-7</i>		<i>1320</i>				
⑤ A-E	<i>17W-8</i>		<i>1400</i>				
⑥ A-E	<i>17W-9</i>		<i>1340</i>				
⑦ A-E	<i>17W-10</i>		<i>1355</i>				
⑧ A-C	<i>TRIP</i>						
Relinquished By: (1) <i>[Signature]</i>		Date <i>10/22/14</i>	Time <i>1440</i>	Received By: <i>[Signature]</i>	Section 4 DOD Project? Yes No		
Relinquished By: (2) <i>[Signature]</i>		Date <i>10/22/14</i>	Time <i>1500</i>	Received By: <i>[Signature]</i>	Cooler ID: <i>1440</i>		
Relinquished By: (3) <i>[Signature]</i>		Date	Time	Received By:	Requested Turnaround Time and/or Special Instructions:		
Relinquished By: (4) <i>[Signature]</i>		Date <i>10/23/14</i>	Time <i>09:20</i>	Received For Laboratory By: <i>[Signature]</i>	Temp Blank °C: <i>0.9</i> or Ambient []		
				Chain of Custody Seal: (Circle) <i>INTACT</i> <i>BROKEN</i> <i>ABSENT</i>		(See attached Sample Receipt Form)	





1148653



SAMPLE RECEIPT FORM FOR TRANSFERS

Note: This form is to be completed by Anchorage Sample Receiving staff for all shipments received at SGS-Anchorage from SGS-Fairbanks.

Were samples received numbered with all criteria on Sample Receipt Form F0004 documented by Fairbanks Sample Receiving staff? If "No," <i>Anchorage Sample Receiving staff must complete the receiving process & document pH verification, sample condition, etc. on the SRF initiated by Fairbanks staff</i> (attached).	Yes <input checked="" type="radio"/> No <input type="radio"/> N/A	Use space below for additional notes...
If work was pre-logged, was the predefined comment cleared?	Yes <input type="radio"/> No <input checked="" type="radio"/> N/A	
Review Criteria:	Condition:	Comments/Action Taken:
Were custody seals intact? Note # & location: <i>IFIB</i> COC accompanied samples?	<input checked="" type="radio"/> Yes <input type="radio"/> No <input type="radio"/> N/A	
Temperature blank compliant (i.e., 0-6°C after correction factor)? Cooler ID: <i>1</i> @ <i>0.6</i> w/ Therm.ID: <i>200</i> Cooler ID: _____ @ _____ w/ Therm.ID: _____ Cooler ID: _____ @ _____ w/ Therm.ID: _____ Cooler ID: _____ @ _____ w/ Therm.ID: _____ Cooler ID: _____ @ _____ w/ Therm.ID: _____ <i>Note: If non-compliant, use form FS-0029 to document affected samples/analyses.</i> If samples are received <u>without</u> 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 <u>nor</u> cooler temp can be obtained, note "ambient" or "chilled." If temperature(s) <0°C, were all containers ice free?	<input checked="" type="radio"/> Yes <input type="radio"/> No <input type="radio"/> N/A	
RUSH/SHORT Hold e-mail forwarded to lab if applicable?	Yes <input type="radio"/> No <input checked="" type="radio"/> N/A	
Delivery method: <i>Lynden</i> Other: _____		
Completed by: <i>KMW 10/23/14 09:20</i>		



Sample Containers and Preservatives

<u>Container Id</u>	<u>Preservative</u>	<u>Container Condition</u>	<u>Container Id</u>	<u>Preservative</u>	<u>Container Condition</u>
1148653001-A	HCL to pH < 2	OK			
1148653001-B	HCL to pH < 2	OK			
1148653001-C	HCL to pH < 2	OK			
1148653001-D	HCL to pH < 2	OK			
1148653001-E	HCL to pH < 2	OK			
1148653002-A	HCL to pH < 2	OK			
1148653002-B	HCL to pH < 2	OK			
1148653002-C	HCL to pH < 2	OK			
1148653002-D	HCL to pH < 2	OK			
1148653002-E	HCL to pH < 2	PA			
1148653003-A	HCL to pH < 2	OK			
1148653003-B	HCL to pH < 2	OK			
1148653003-C	HCL to pH < 2	OK			
1148653003-D	HCL to pH < 2	OK			
1148653003-E	HCL to pH < 2	OK			
1148653004-A	HCL to pH < 2	OK			
1148653004-B	HCL to pH < 2	OK			
1148653004-C	HCL to pH < 2	OK			
1148653004-D	HCL to pH < 2	OK			
1148653004-E	HCL to pH < 2	OK			
1148653005-A	HCL to pH < 2	OK			
1148653005-B	HCL to pH < 2	OK			
1148653005-C	HCL to pH < 2	OK			
1148653005-D	HCL to pH < 2	OK			
1148653005-E	HCL to pH < 2	OK			
1148653006-A	HCL to pH < 2	OK			
1148653006-B	HCL to pH < 2	OK			
1148653006-C	HCL to pH < 2	OK			
1148653006-D	HCL to pH < 2	OK			
1148653006-E	HCL to pH < 2	OK			
1148653007-A	HCL to pH < 2	OK			
1148653007-B	HCL to pH < 2	OK			
1148653007-C	HCL to pH < 2	OK			
1148653007-D	HCL to pH < 2	OK			
1148653007-E	HCL to pH < 2	PA			
1148653008-A	HCL to pH < 2	OK			
1148653008-B	HCL to pH < 2	OK			
1148653008-C	HCL to pH < 2	OK			



Returned Bottles Inventory

Name of
individual
returning
bottles:

Date

Received:

10/23/14

Client Name:

Nortech

Received by:

KMW

Project Name:

ICE Alaska

SGS PM:

JD

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

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

Amount to Invoice Client \$:

12.00

WO#:

1148653

Laboratory Data Review Checklist

Completed by:	Thomas Brado		
Title:	Environmental Specialist	Date:	02/26/2015
CS Report Name:	Ice Alaska 2014 Groundwater Sampling Results	Report Date:	02/26/2015
Consultant Firm:	NORTECH Inc.		
Laboratory Name:	SGS North America	Laboratory Report Number:	1148653
ADEC File Number:	102.02.001	ADEC RecKey Number:	

1. Laboratory

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

☒ Yes ☐ No ☐ NA (Please explain.) Comments:

--

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

☐ Yes ☐ No ☒ NA (Please explain) Comments:

No Samples Transferred.

2. Chain of Custody (COC)

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

☒ Yes ☐ No ☐ NA (Please explain) Comments:

--

b. Correct analyses requested?

☒ Yes ☐ No ☐ NA (Please explain) Comments:

--

3. Laboratory Sample Receipt Documentation

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

☐ Yes ☒ No ☐ NA (Please explain) Comments:

0.9 C

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

☐ Yes ☒ No ☐ NA (Please explain)

Comments:

Sample preservative added to 2E and 7E to correct the PH

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

☒ Yes ☐ No ☐ NA (Please explain)

Comments:

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

☒ Yes ☐ No ☐ NA (Please explain)

Comments:

Sample preservative added to 2E and 7E to correct the pH

e. Data quality or usability affected? (Please explain)

Comments:

No, sample pH was corrected

4. Case Narrative

a. Present and understandable?

☒ Yes ☐ No ☐ NA (Please explain)

Comments:

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

☐ Yes ☐ No ☒ NA (Please explain)

Comments:

no discrepancies, errors, or QC failures

c. Were all corrective actions documented?

☒ Yes ☐ No ☒ NA (Please explain)

Comments:

No corrective actions to document.

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

Comments:

not applicable

5. Samples Results

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

☒ Yes ☐ No ☐ NA (Please explain)

Comments:

b. All applicable holding times met?

☒ Yes ☐ No ☐ NA (Please explain)

Comments:

c. All soils reported on a dry weight basis?

☐ Yes ☐ No ☒ NA (Please explain)

Comments:

No soil samples.

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

☒ Yes ☐ No ☐ NA (Please explain)

Comments:

e. Data quality or usability affected? (Please explain)

Comments:

no

6. QC Samples

a. Method Blank

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

☒ Yes ☐ No ☐ NA (Please explain)

Comments:

ii. All method blank results less than PQL?

☒ Yes ☐ No ☐ NA (Please explain)

Comments:

iii. If above PQL, what samples are affected?

Comments:

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

☐ Yes ☐ No ☒ NA (Please explain) Comments:

no samples affected

v. Data quality or usability affected? (Please explain)

Comments:

No

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

i. Organics - One LCS/LCSD reported per matrix, analysis and 20 samples? (LCS/LCSD required per AK methods, LCS required per SW846)

☒ Yes ☐ No ☐ NA (Please explain) Comments:

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

☐ Yes ☐ No ☒ NA (Please explain) Comments:

no metals/inorganics sampled

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

☒ Yes ☐ No ☐ NA (Please explain) Comments:

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/DMSD, and or sample/sample duplicate. (AK Petroleum methods 20%; all other analyses see the laboratory QC pages)

☒ Yes ☐ No ☐ NA (Please explain) Comments:

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

Comments:

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

☐ Yes ☐ No ☒ NA (Please explain) Comments:

No samples flagged

vii. Data quality or usability affected? (Please explain)

Comments:

no

c. Surrogates - Organics Only

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

☒ Yes ☐ No ☐ NA (Please explain) Comments:

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

☒ Yes ☐ No ☐ NA (Please explain) Comments:

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

☐ Yes ☐ No ☒ NA (Please explain) Comments:

No failed recoveries

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

Comments:

no failed recoveries, not affected

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

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

☒ Yes ☐ No ☐ NA (Please explain.) Comments:

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

☐ Yes ☒ No ☐ NA (Please explain.) Comments:

only one cooler, all samples and trip blank in the same cooler.

iii. All results less than PQL?

☒ Yes ☐ No ☐ NA (Please explain.)

Comments:

iv. If above PQL, what samples are affected?

Comments:

v. Data quality or usability affected? (Please explain.)

Comments:

not affected

e. Field Duplicate

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

☒ Yes ☐ No ☐ NA (Please explain)

Comments:

ii. Submitted blind to lab?

☒ Yes ☐ No ☐ NA (Please explain.)

Comments:

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

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

Where R_1 = Sample Concentration

R_2 = Field Duplicate Concentration

☒ Yes ☐ No ☐ NA (Please explain)

Comments:

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

☐ Yes ☒ No ☐ NA (Please explain)

Comments:

not affected

f. Decontamination or Equipment Blank (if applicable)

☐ Yes ☐ No ☒ NA (Please explain)

Comments:

No decon or equip blank necessary for project

i. All results less than PQL?

☐ Yes ☐ No ☒ NA (Please explain)

Comments:

no decon blank

ii. If above PQL, what samples are affected?

Comments:

none

iii. Data quality or usability affected? (Please explain.)

Comments:

no

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

a. Defined and appropriate?

☒ Yes ☐ No ☐ NA (Please explain)

Comments:

Reset Form