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April 19, 2016

Jason Goodwin, P.G.
Alaska HSE Area Manager
Baker Hughes Oilfield Operations, Inc.
795 East 94th Avenue
Anchorage, Alaska 99515
Via Email: jason.goodwin@bakerhughes.com

Subject: Quarterly Groundwater Monitoring and Additional Site Characterization; Nikiski Completions Facility (Baker Oil Tools – Deloris Drive), Nikiski, Alaska; ADEC File No. 2323.38.055, Hazard ID 25935

Dear Mr. Goodwin:

DNA Environmental Consultants, LLC (DNA) herein provides a summary of groundwater monitoring and sampling activities conducted at the Nikiski Completions Facility (Figure 1, Attachment 1) in February 2016. This is the third of four monitoring events scheduled for completion, on a quarterly basis, in August and November 2015, and February and May 2016. During this field event, DNA conducted additional site characterization activities that included the advancing of two soil borings and installed two additional groundwater monitoring wells. Four soil samples were collected from each soil boring and the co-located groundwater monitoring wells were developed and sampled. All soil and groundwater samples were submitted to and analyzed by Lab Sciences, Inc. (ESC) located in Mt. Juliet, Tennessee.

Site maps and figures are provided as Attachment 1. Field notes and field-generated forms are provided as Attachment 2. Soil boring logs and well construction logs are provided as Attachment 3. Tabulated data is provided in Attachment 4. The survey data as provided by the professional surveyor (DOWL) is provided as Attachment 5. A Photographic Log is provided as Attachment 6. The laboratory report and ADEC Checklist are provided as Attachment 7 to this letter.

FIELD ACTIVITIES

Field activities were conducted at the Nikiski Completions Facility on February 15 and 16, 2016. Field activities included the advancing of two soil borings and the completion of two co-located groundwater monitoring wells. Soil boring SB-19 and co-located groundwater monitoring well MW-09 were located west of MW-01, and soil boring SB-20, co-located with groundwater monitoring well MW-10 were located north of MW-01 (see Figure 2, Attachment 1).

All procedures were performed in accordance with the Alaska Department of Environmental Conservation (ADEC) approved work plans dated May 6, 2015 (DNA 2015) and January 22, 2016 (DNA 2016). Field work was conducted by Qualified Environmental Professionals, as defined in Title 18, Chapters 75 and 78

of the Alaska Administrative Code (18 AAC 75 and 78). Field notes and field-completed forms are provided in Attachment 2.

Subsurface Soil Investigation

The soil borings were advanced by direct-push drilling methods and continuously sampled in 5-foot increments using Macro-Core® samplers. Groundwater occurs at approximately 40 feet below ground surface (bgs) at the site, and all soil borings were advanced to groundwater. Retrieved soil cores were opened length-wise by cutting the acetate liner to reveal the intact core. Each soil boring was logged with details regarding soil type, odor, moisture, color, and a description of the soil as classified within the Unified Soil Classification System. Soil boring logs are provided in Attachment 3.

The two soil borings were identified as SB-19 (west of MW-01) and SB-20 (north of MW-01). All soil boring locations, including previously advanced soil boring locations, are presented on Figure 2, Attachment 1.

Soil Sampling

Soil samples were collected at approximately 10-foot intervals starting with the 5 to 10 foot Macro-Core® interval, with four samples collected from each of the two soil borings. Soil samples for off-site laboratory analysis were collected directly from the open Macro-Core® core using a dedicated TerraCore® sampler provided by the project laboratory. The samples were not homogenized because the constiuents of concern are volatile; a minimum of 25 grams of soil was placed directly into one 4-ounce pre-tared laboratory-provided jar, and immediately preserved in the field with 25 milliliters (ml) of methanol provided by the laboratory. A second fraction of soil sample was collected for percent-solid analysis. All sample jars were pre-labeled with the project sample number prior to placing soil into the jar. All samples were then immediately placed on ice and chilled to 4° Celsius (°C) ± 2°C. Chain-of-custody (CoC) procedures were followed.

All soil samples were analyzed for:

- Volatile organic compounds (VOCs; 1,1,1-trichloroethane [1,1,1-TCA], trichloroethene [TCE], tetrachloroethene [PCE] only) by United States Environmental Protection Agency (EPA) Solid Waste (SW) Method 8260B.

Groundwater Well Installation and Development

Newly installed groundwater monitoring wells MW-09 (located at soil boring SB-19) and MW-10 (located at soil boring SB-20) were installed using rotary auger drilling methods. Groundwater monitoring well borings were advanced at the same locations where soil borings had been advanced.

The groundwater monitoring wells were constructed of 2-inch-diameter, Schedule 40 poly-vinyl chloride (PVC) casing with a 10-foot-long, 0.010-inch slotted interval. The slotted interval was centered on the groundwater table. Colorado 10-20 sand was backfilled around the slotted interval and to two feet above the pre-pack. A bentonite seal was placed above the sand (2-feet thick), with a second 2-foot bentonite seal within 2 feet of the ground surface. Soil cuttings were used to fill the space between the two bentonite plugs. The bentonite material was hydrated as part of the sealing process. The monitoring wells

were completed at the ground surface as flush mounts, counter sunk 6 inches below the surface to protect from winter plowing and routine summer grading within the yard area. Soil borings with well construction details are presented in Attachment 3.

The field team waited at least 24 hours after installation of each well before developing to allow for the bentonite seals to set. All groundwater monitoring wells were developed using a stainless steel Proactive® Monsoon™ submersible positive displacement pump for purging; starting and stopping the pump periodically and lifting and lowering the pump as a surge block between each of several purge cycles. Well development was continued until at least five well casing volumes were removed or turbidity was significantly reduced. Well development forms are included in Attachment 2.

At the completion of well development, DNA installed stainless steel Solinst® Model 407 2-foot by 1-inch bladder pumps with Teflon® bladders dedicated to each well. Dual bonded tubing (driveline and Teflon®-lined water sample line) connect the pumps to a dedicated Solinst® 2-inch well cap with permanent driveline, sample port fixtures, and water level portal. The pump bottoms were set at approximately 6 inches above the bottom of the well.

Groundwater Sampling

All ten groundwater monitoring wells (MW-01 through MW-10) at the site were gauged for depth to groundwater (DTW). Nine of the ten monitoring wells were then purged following the United States Environmental Protection Agency (EPA) low-flow (minimal drawdown) sample collection technique, and then sampled. Field-completed low-flow sample collection forms are provided in Attachment 2.

All groundwater samples were analyzed for 1,1,1-TCA, PCE, and TCE by the following method:

- VOCs (low-level 1,1,1-TCA, TCE, PCE only) by EPA SW Method 8260B.

Groundwater Elevation Survey

DNA contracted DOWL to survey the horizontal location, measuring point elevations, ground surface elevations, and surface completion elevations of the two new groundwater monitoring wells at the site. Monitoring well construction details, horizontal coordinates, measuring point and ground elevations are provided in Table 1, Attachment 4. The DOWL survey report is included as Attachment 5.

Maintenance Activities and Work Plan Deviations

Maintenance items conducted during this field event included the replacement of the Teflon® bladders at MW-01 and MW-02. Two deviations from the planned work are noted also noted as follows. First, the field team was unable to collect a sample of groundwater at groundwater monitoring well MW-05 because the Solinst® well cap assembly was submerged in frozen water (see Attachment 6 for photographs). A groundwater measurement was made at MW-05, as the opening for the measurement probe was not frozen. Second, the dedicated bladder pump at MW-02, even with a replaced bladder, did not produce a sufficient purge rate. The field team therefore used a Monsoon™ submersible positive displacement pump to collect the groundwater sample at this location.

FIELD OBSERVATIONS

Soil Lithology

Similar to past findings during soil logging and sampling, soils across the site were generally well-sorted sandy gravel and gravelly sand, with some intermittent layers of poorly sorted sand. Boring logs are provided in Attachment 3.

Groundwater Elevation and Gradient

Recorded measurements and calculated elevations of the static water levels (SWLs) of groundwater at each groundwater well are presented in Table 2, Attachment 1. Figure 3 depicts groundwater elevation isocontours based on calculated elevations for the February event. In addition to measuring groundwater elevation at the on-site wells, DNA measured and calculated the groundwater elevation at two off-site wells: a groundwater well located west of the site and referred to as the "Tuboscope Water Well" and, a groundwater well located to the south of the site and referred to as the "Old McGahan Well." Overall, groundwater gradient across the site remains flat, with a maximum difference of 0.11 feet (1.32 inches) over a 1,200-foot distance. When including elevations from the two off-site wells, a gradient or inferred groundwater flow direction is not readily evident given the extremely flat regime. Inferred contours indicate a possible gradient from the west to the east, and from the east and south to the west, with a low area of water elevation extending between the south side of the site at MW-02 and MW-09 and the north side at MW-10. Because of ice at MW-05, the SWL elevation calculated at MW-05 was not included in the generation of inferred contours.

Table 3 presents historical groundwater elevation data. When compared to the December 2015 monitoring event, the average groundwater SWL elevation is approximately 0.28 feet higher.

Water Quality

Water quality data parameters recorded during low-flow well purging included temperature, conductivity, dissolved oxygen (DO), oxidation-reduction potential (ORP), and turbidity. A YSI® Model 556 water quality meter with a flow-through cell was used to temperature, conductivity, DO, and ORP. A Hach® 2100P turbidity meter was used to measure turbidity. Final water quality parameter values, recorded on low-flow sampling field forms at the end of purging and prior to sample collection, are presented on Table 4, Attachment 4.

Water quality observed in February 2016 appeared to be similar to past water quality observations. All purge water appeared clear, except at MW-02, MW-03, and MW-08 where discoloration was noted. No odor was noted during purging. Turbidity ranged from a low of 14.0 Nephelometric Turbidity Units (NTU) recorded at MW-10, to a high of 83.5 NTUs at MW-08. Temperature and pH values were within expected ranges, with the average temperature at 5.86 degrees Celsius. All conductivity values indicated a low level of dissolved constituents. DO values averaged 8.04 milligrams per liter (mg/L), indicating aerobic conditions. Positive ORP values were slightly negative at MW-03, and MW-07. Positive ORP values at the other site wells averaging 108.86 millivolts, indicate aerobic conditions.

ANALYTICAL RESULTS

Analytical results are compared to ADEC 18 AAC 75.345 Table C groundwater cleanup levels (GCLs), and soil results were compared to ADEC's Method 2 Soil Cleanup Levels (SCLs) found in 18 AAC 75.340 Table B1 for the under-40-inch zone and the most-stringent exposure pathway. The sample collection time, date, and location for all soil and water samples are summarized in Table 5, Attachment 4.

Soil Sample Analytical Results

At each soil boring location, four soil samples were collected at 10-foot intervals, beginning with 5 to 10 feet bgs. Saturated soil was found slightly deeper at SB-20, and the deepest soil sample at SB-20 was collected from 40 to 45 feet bgs instead of 35 to 40 feet bgs. Of the eight soil samples collected, four at SB-19 and four at SB-20, the project laboratory reported no detections for any of the three constituents of concern (1,1,1-TCA, TCE, and PCE). Soil sample results for 1,1,1-TCA, TCE, and PCE are presented in Table 6, Attachment 4 and summarized on Figure 4, Attachment 1.

Groundwater Sample Results

Groundwater sample analytical results for 1,1,1-TCA, TCE, and PCE are summarized in Table 7, Attachment 4 and presented on Figure 5, Attachment 1. Table 8 provides a summary of groundwater analytical results since project inception. Similar to all past sampling events, the only detection of a contaminant reported at a concentration greater than an ADEC Table C GCL was for TCE at MW-01.

Analytical results for groundwater sampled from newly installed groundwater monitoring well MW-09 reported no detections for 1,1,1-TCA, TCE, and PCE. At newly installed groundwater monitoring well MW-10, TCE, and PCE were not detected, however 1,1,1-TCA was detected but at a concentration less than the ADEC GCL.

As in past sampling events, 1,1,1-TCA was detected at concentration less than the ADEC GCL at groundwater monitoring wells MW-01, MW-04, MW-07, and MW-08.

Also similar to past sampling events, TCE was detected at MW-02, MW-03, MW-04, and MW-08 at concentrations less than the ADEC GCL. Unlike past sampling events, TCE was detected at MW-07.

PCE was not detected at any location. During past sampling events, PCE has been detected only at groundwater monitoring well MW-04 and at a concentration less than the ADEC GCL.

Figure 6 presents the inferred TCE plume boundary line above both the 0.005 mg/L GCL and the ADEC's recently proposed 0.0028 mg/L GCL. Isocontours and plume boundaries were generating using Surfer® Version 13 software. For locations where the laboratory reported no detection, a value of one half of the detection limit was entered instead of zero. The TCE plume appears fully defined. Isocontours for 1,1,1-TCA are presented on Figure 7. All values for 1,1,1-TCA are below the ADEC's Table C GCLs. 1,1,1-TCA isocontours indicate the highest values are located at the northeast portion of the site and decline to non-detect to the south and west at the site.

QUALITY ASSURANCE AND QUALITY CONTROL

This data quality assessment of analytical data was conducted to evaluate for laboratory analysis precision, accuracy, sensitivity, representativeness, comparability, and completeness by reviewing laboratory-supplied quality assurance/quality control (QA/QC) information as well as to perform independent QA/QC checks on the data.

All data were reviewed in accordance with appropriate EPA procedural guidance documents and ADEC regulatory guidance documents, including:

- EPA Functional Guidelines for Organic Data Review (EPA 2008), and
- ADEC Environmental Laboratory Data and Quality Assurance Requirements, Technical Memorandum (ADEC 2009).

An ADEC Laboratory Data Review Checklist (ADEC 2010) has been completed for the SDG listed below and is provided in Attachment 7. In the absence of project-specific control limits, laboratory QC sample recoveries and relative percent differences (RPDs) were compared to laboratory control-charted limits. Field-duplicate RPDs were compared to ADEC-recommended data quality objectives (DQOs).

All samples were collected and delivered to the project laboratory in accordance with the ADEC-approved work plan. The project laboratory, ESC, performed all analysis for water and soil samples collected during the February 2016 field event. Samples were analyzed in accordance with applicable specifications in EPA Test Methods for Evaluating Solid Waste, SW-846, Third Edition, as updated (EPA 2015) by ESC. ESC is an ADEC-approved laboratory for the methods requested. ESC reported analytical data in one sample delivery group (SDG), identified as follows and provided in Attachment 7:

- L818624.

Relevant data qualifiers, resulting from this data quality assessment, were applied to data summarized in Table 6 for soil data and Table 7 for water data. The following provides a summary of findings for each QA/QC element reviewed. Anomalies that had no impact to data quality are discussed in the ADEC data review checklist (Attachment 7), and are not further described herein.

Sample Preservation, Handling, Custody, and Holding Times

All samples were delivered via Federal Express to ESC. CoC forms, laboratory sample receipt forms, and case narratives were reviewed to determine if any sample handling activities might have affected the integrity of the samples and the quality of the associated data.

The laboratory reported that all sample containers within the sample coolers were received at the laboratory intact and within the specified temperature range of 4 °C +/- 2°C. Data flags were not assigned due to the cooler temperatures.

Dates and times of sample collection, preparation, and analysis were compared to check that method holding times were not exceeded. Method holding times for three soil samples, sample numbers 16-BNT-SB20-03-SO, 16-BNT-SB20-04-SO, and 16-BNT-FD-01-SO, were exceeded by ESC for samples submitted for EPA Method SW8260B analysis. No analytes were detected in these samples and non-

detect results are qualified with an "H". There were no other sample preservation, handling, custody, or holding-time anomalies that affected data quality for this project.

Field QA/QC

Field QA/QC protocols are designed to monitor for possible contamination during collection and transport of samples collected in the field. Collection and analysis of field duplicates also facilitated an evaluation of precision that takes into account potential variables associated with sampling procedures and laboratory analyses. For this project, trip blanks and field duplicates were submitted for analysis.

Trip Blanks

ESC prepared one water and one soil trip blank that accompanied sample containers from the laboratory to the site. The water trip blank and soil trip blank were returned to the laboratory with groundwater and soil samples, to check for cross-contamination of samples during sampling, shipment, or storage. No analytes were detected in the trip blanks.

Field Duplicates

Field duplicate samples were collected for groundwater and soil samples.

The duplicate soil sample sets included:

- 16-BNT-SB19-02-SO and 16-BNT-SB19-FD01-SO.

The duplicate groundwater sample was collected from groundwater monitoring well MW-01, and included samples:

- 16-BNT-107-GW and 16-BNT-108-GW.

The field-duplicate collection frequency met the 10% requirement in the work plan. RPDs between field-duplicate results were calculated where at least one of the results was quantitatively detected (above the practical quantification limit [PQL]). In cases where one result was above the PQL but the other result was not detected, an RPD was calculated using the PQL for the non-detect result.

Calculated RPD values were within the method required criteria of 30% for the groundwater field-duplicate pairs. No analytes were detected in the soil samples, so no field-duplicate RPDs could be calculated.

Laboratory QA/QC

Laboratory Method Blanks

The laboratory analyzed and reported a method blank (MB) for each preparatory batch to check for laboratory-based sample contamination.

TCE was detected below the method reporting limit (MRL) in the MB for batch WG850588, at 0.61 micrograms per liter (µg/L). TCE was detected in the corresponding project samples 16-BNT-101-GW, 16-BNT-102-GW, 16-BNT-103-GW, and 16-BNT-104-GW, at less than 5 times the concentration detected in the MB. These results are considered attributable to laboratory-based contamination, and are qualified

with a "B" flag at the Limit of Quantitation (LOQ) or the sample concentration, if higher. All other results were either non-detect or were greater than ten times the MB concentration, and were thus unaffected.

Laboratory Control Samples (Internal Standard Recovery)

The laboratory monitors internal precision and accuracy for each analytical batch with a set of Laboratory Control Samples/Laboratory Control Sample Duplicates (LCS/LCSDs). A known quantity of target analytes are added to blank laboratory control samples prior to extraction and analysis and recoveries are calculated. Acceptable recovery criteria vary with each analytical method and matrix. Analyses of LCS/LCSD for target analytes met laboratory and project QC goals for target analytes in all work orders. The RPD and percent recovery values between the LCS and LCSD pairs met method required precision and accuracy requirements.

Sample Matrix Effects

The laboratory analyzed and reported matrix spike (MS) and MS duplicate (MSD) samples to check for potential matrix interference. MS/MSD recovery and RPDs were evaluated only if the parent sample (the sample spiked for the MS/MSD) was in the project-sample set. Sample 16-BNT-104-GW was spiked for MS/MSD analysis of VOCs by EPA Method 8260B. There were no MS/MSD recovery or RPD failures affecting project-sample data quality.

System Monitoring Compounds

System monitoring compounds (Surrogates) are specified for organic chromatographic analytical procedures. Samples submitted for analysis of organic compounds were spiked with analyte surrogates to evaluate extraction efficiency and to check for matrix interference. Surrogate recoveries were reviewed for each project sample and analysis. There were no surrogate recovery failures affecting project-sample data quality.

Summary of Data Quality Indicators

Precision

Precision is a measure of the reproducibility of repetitive measurements. Precision was evaluated based on laboratory QC-sample and field-duplicate sample RPDs. There were no RPD failures affecting project-sample data quality. Precision is deemed acceptable for purposes of this project.

Accuracy

Accuracy is a measure of the correctness, or the closeness, between the true value and the quantity detected. Accuracy was evaluated based on analyte recoveries for laboratory QC samples and recovery of surrogate spikes for project samples. There were no recovery failures affecting project-sample data quality. Accuracy is deemed acceptable for purposes of this project.

Sensitivity

Sensitivity describes the ability of the sampling and analytical methodology to meet detection and/or quantitation limit objectives. Sensitivity was evaluated by comparing MRLs to relevant cleanup levels. Sensitivity was inadequate (MRLs exceeded cleanup levels) for TCE and PCE in soil. TCE and PCE soil results are flagged "X" for project purposes, as it cannot be conclusively determined whether these analytes were present above SCLs. Additionally, as noted above, three samples were analyzed outside of holding times. Non-detect results for these samples flagged "H" may be affected by a low bias, and therefore MRLs may not appropriately represent analytical sensitivity for these samples.

Completeness

Completeness describes the amount of valid data obtained from the sampling event(s). Completeness is calculated as the percentage of valid measurements compared to the total number of measurements. Given issues with analytical sensitivity for the soil-sample data set, separate completeness calculations were made for groundwater and soil sample data. Groundwater sample data were 100% complete, with no data rejected in the course of our review. Soil sample data, however, have a completeness score of 33%, due to two-thirds of the reported analytes with inadequate analytical sensitivity; analytical data, as reported, are not usable for ruling out the potential for TCE or PCE to be present in soil at concentrations greater than the associated ADEC Method 2 SCL.

Representativeness

Representativeness describes the degree to which data accurately and precisely represent site characteristics. Representativeness is affected by factors such as sample frequency and matrix or contaminant heterogeneity, as well as analytical performance (including sensitivity, accuracy, and precision) sample cross-contamination. Samples were collected in accordance with an approved work plan, and RPDs for field-duplicate samples were within DQOs. Some results were affected by laboratory-based sample contamination; however, affected results were below cleanup levels. Representativeness was deemed acceptable for purposes of this project.

Comparability

Comparability describes whether two data sets can be considered equivalent with respect to project goals. Comparability is affected by factors such as sampling methodology and analytical performance (including sensitivity, accuracy, and precision). Comparability was evaluated by checking that standard analytical methods were employed and analytical performance was acceptable. Project-sample results are deemed generally comparable.

Data Quality Conclusions and Limitations

Precision, accuracy, representativeness, comparability, and completeness were deemed acceptable, and with the exception of TCE and PCE results for soil samples (lacking adequate sensitivity), the data are usable for the purposes of this project.

This review was based solely on information provided by the analytical laboratory in the laboratory reports for the SDG reviewed. Instrument-level QC elements, such as calibration verification or internal standard

response were not reviewed, except to the extent that the laboratory identified instrument-level anomalies in the case narrative. A validation of the data (e.g. recalculating results based on instrument responses) or review any raw chemical data (e.g. chromatograms) was not performed.

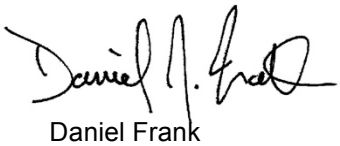
CONCLUSIONS

Groundwater monitoring and sampling continues to indicate that one contaminant of concern, TCE, regularly exceeds the ADEC GCL, but at only one of the ten groundwater monitoring wells at the site (MW-01). TCE, when detected at any of the other groundwater monitoring wells at the site, continues to be reported at a concentration less than the ADEC GCL, and in general all reported detections were lower in February 2016 when compared to past analytical results. The boundary of the dissolved-phase TCE plume in groundwater has been fully defined, with no indication that impacts are migrating in any direction. Although 1,1,1-TCA is present in site wells located on the northeast side of the site, no detections have currently or historically been reported at concentrations near or greater than the ADEC Table C GCLs.

Soil analysis for 1,1,1-TCA indicates no impact to soil for 1,1,1-TCA at SB-19 and SB-20. PCE and TCE analytical results for soil samples collected at SB-19 and SB-20 were reported by the project laboratory as non-detect, but at MRLs greater than the ADEC Method 2 SCLs. It is not expected that PCE and TCE concentrations would be detected at a concentration greater than the ADC Method 2 SCLs at SB-19 and SB-20 because the location of the borings is outside of the former source area removed in 2014, and soil data from other borings installed in 2014 and 2015 and located outside of the former source area did not contain PCE or TCE at a concentration greater than the ADEC SCLs.

Thank you for the opportunity to provide Baker Hughes with environmental consulting services on this project. If you have any questions or comments, please do not hesitate to contact me at 907-350-4898. The next sampling event is scheduled for May 2016.

Sincerely,
DNA Environmental Consultants, LLC



Daniel Frank
Senior Project Manager

cc:

Mr. Chris Clodfelter, Baker Hughes, Houston, TX

Attachments:

1. Figures
2. Field Notes and Forms
3. Soil Borings and Well Construction Details
4. Tables
5. DOWL Elevation Survey Report
6. Photographic Log
7. Laboratory Analytical Results, ADEC Data Review Checklists

REFERENCES

Alaska Department of Environmental Conservation (ADEC). 2010. ADEC Laboratory Data Review Checklist.

_____, 2009. Technical Memorandum: *Environmental Laboratory Data and Quality Assurance Requirements*. March.

DNA Environmental Consultants, LLC, 2016 (DNA). Additional Groundwater Delineation Wells, January 22.

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United States Environmental Protection Agency (EPA). 2015. Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, EPA publication SW-846, Third Edition, Final Updates I (1993), II (1995), IIA (1994), IIB (1995), III (1997), IIIA (1999), IIIB (2005), IV (2008), and V (2015)

_____, EPA. 2008. Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review. EPA-540- R-08-01. June.

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ATTACHMENT 1

Figures

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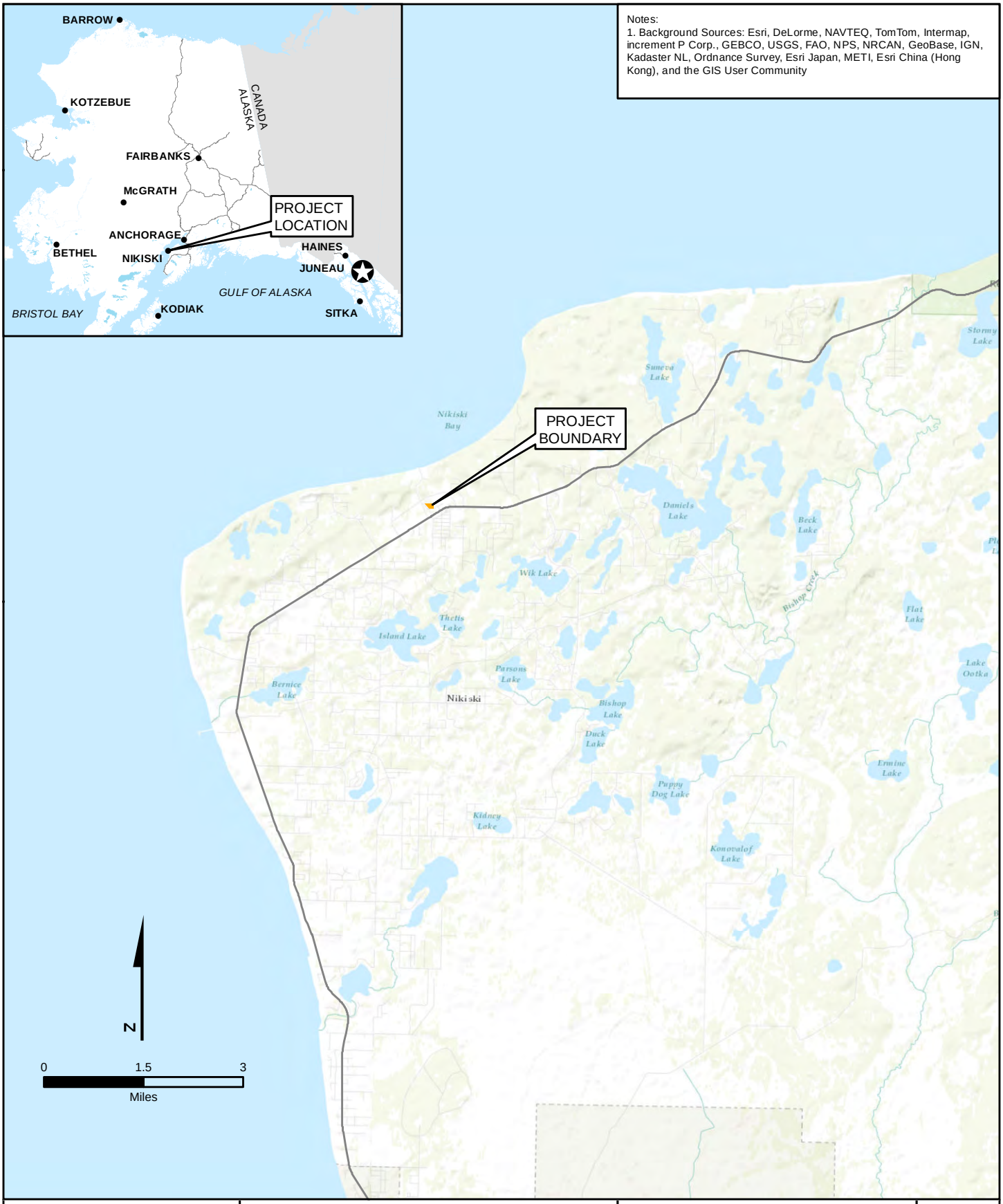

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Quarterly Monitoring and
Additional Site Characterization Report
Baker Hughes Nikiski Completions Facility
Nikiski, Alaska

1 inch equals 2 miles

Site Vicinity Map

April 13, 2016	16.BHI.01
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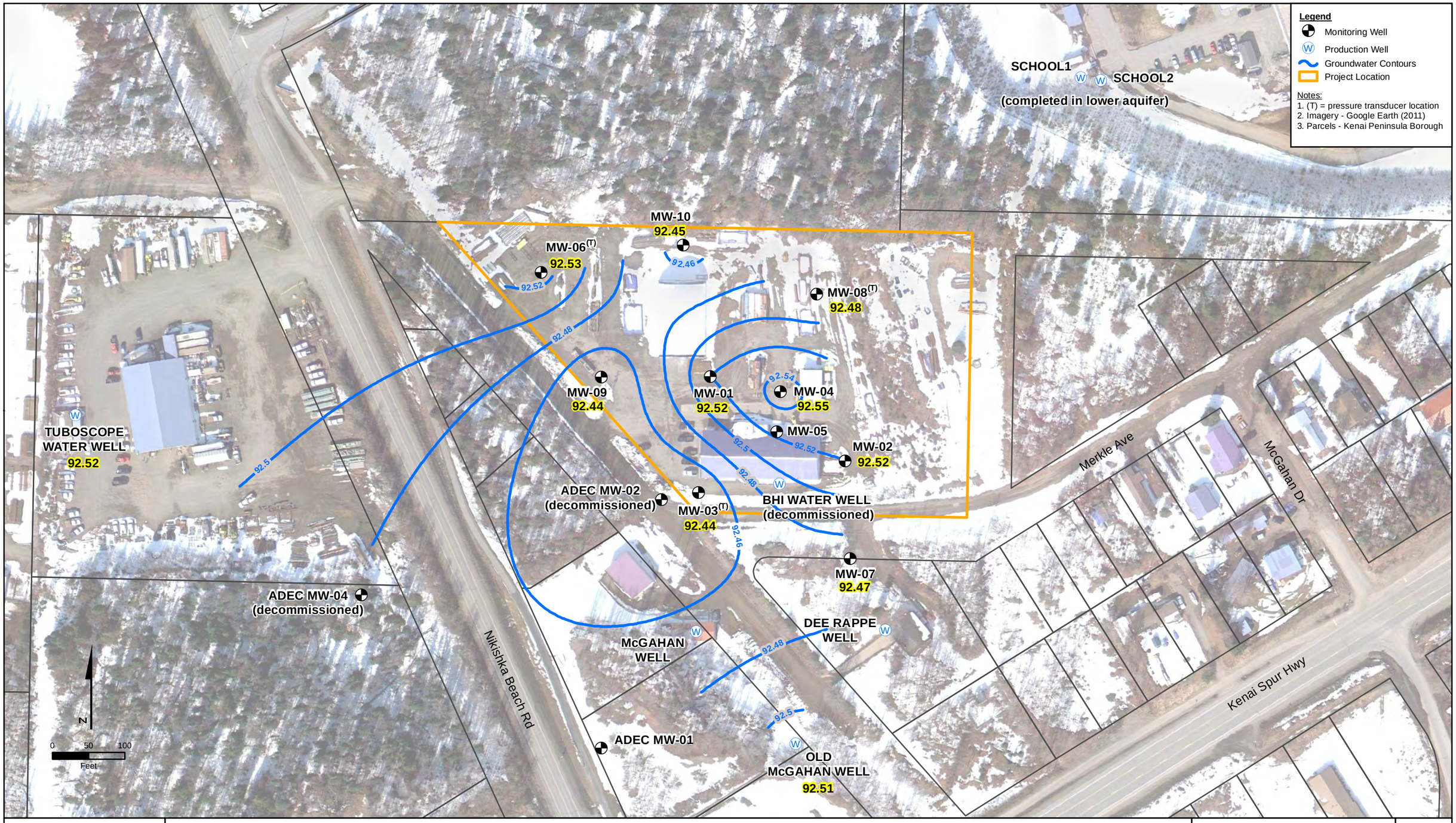
Figure **1**

C:\GIS\CLIENTS\DNA\Nikiski\Nikiski BHI\2016_April\Fig 1 Site Vicinity Map.mxd Apr 13, 2016 3:49:49 PM User: Tricia

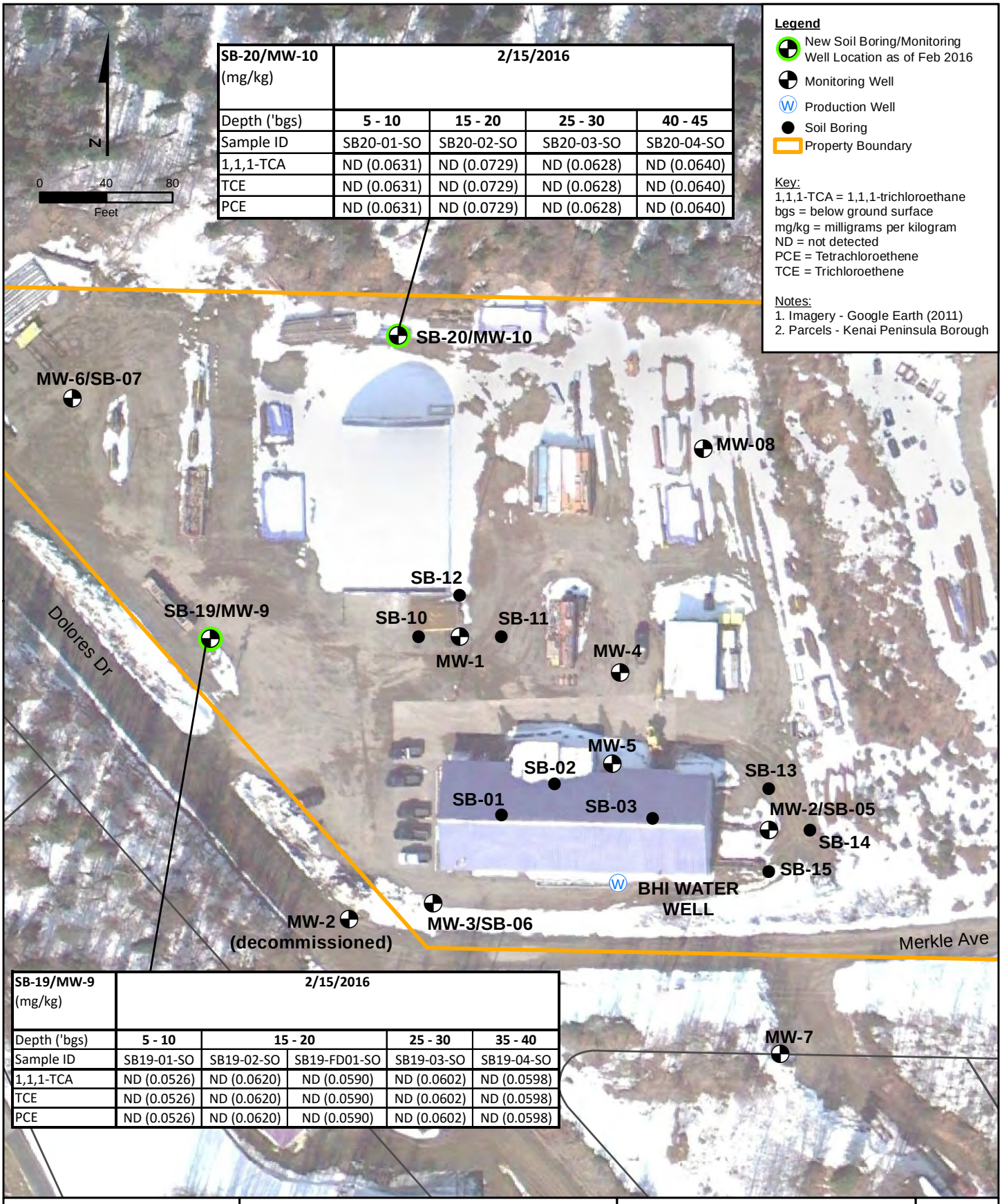
dna ENVIRONMENTAL	Quarterly Monitoring and Additional Site Characterization Report Baker Hughes Nikiski Completions Facility Nikiski, Alaska	**Site Detail Map**	Figure
	1 inch = 125 feet	April 13, 2016 / 16.BHI.01 DRAWN: TDSL / CHKD: DJF	**2**

Fig 2 Site Detail Map.mxd Apr 13, 2016 3:38:57 PM User: Tricia



dna ENVIRONMENTAL	Quarterly Monitoring and Additional Site Characterization Report Baker Hughes Nikiski Completions Facility Nikiski, Alaska	**Vicinity Groundwater Elevations and Inferred Contours**	Figure
	1 inch = 125 feet	April 13, 2016 / 16.BHI.01 DRAWN: TDSL / CHKD: DJF	**3**

Fig 3 GW Elevations and Contours.mxd Apr 13, 2016 3:51:38 PM User: Tricia



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Quarterly Monitoring and
Additional Site Characterization Report
Baker Hughes Nikiski Completions Facility
Nikiski, Alaska

1 inch equals 80 feet

Additional Characterization Soil Boring Locations and Analytical Results

April 13, 2016 | 16.BHI.01

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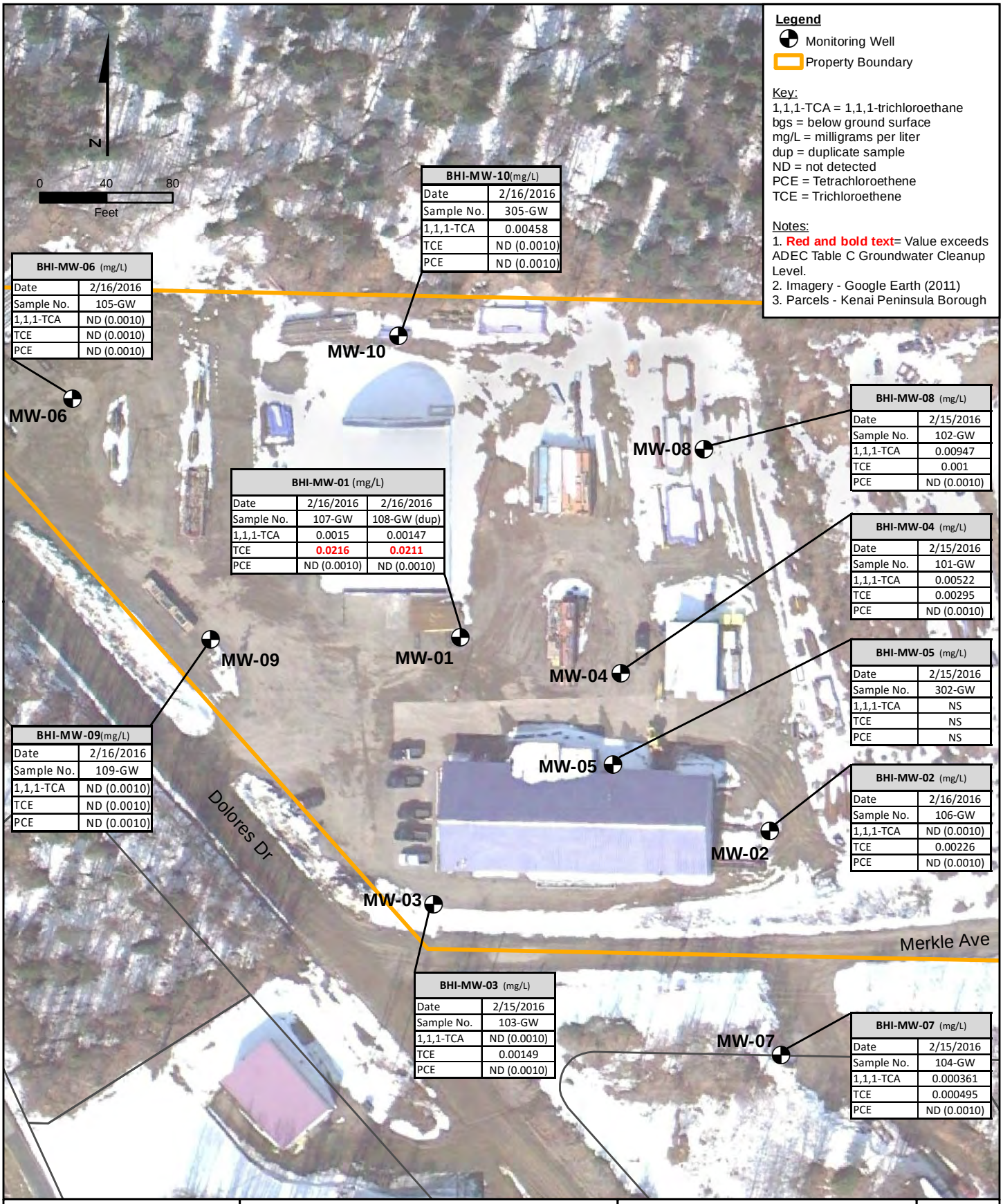
Figure **4**

C:\GIS\CLIENTS\DNA\Nikiski\Nikiski BHI\2016_April\Fig 4 Soil Boring Locations and Results.mxd Apr 13, 2016 3:53:04 PM User: Tricia



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Quarterly Monitoring and Additional Site Characterization Report
Baker Hughes Nikiski Completions Facility
Nikiski, Alaska

1 inch equals 80 feet

Groundwater Results Summary

April 13, 2016 | 16.BHI.01

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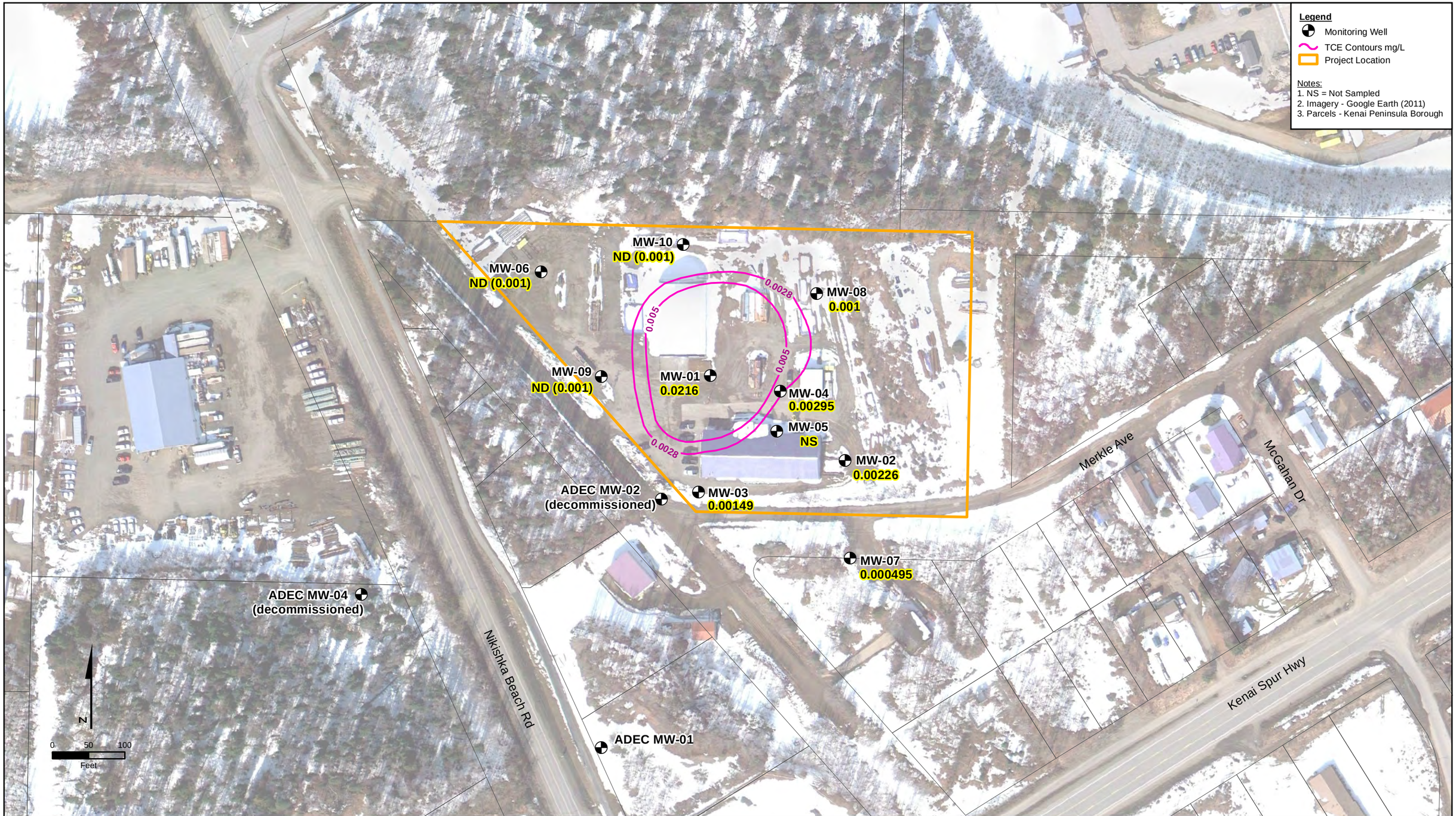
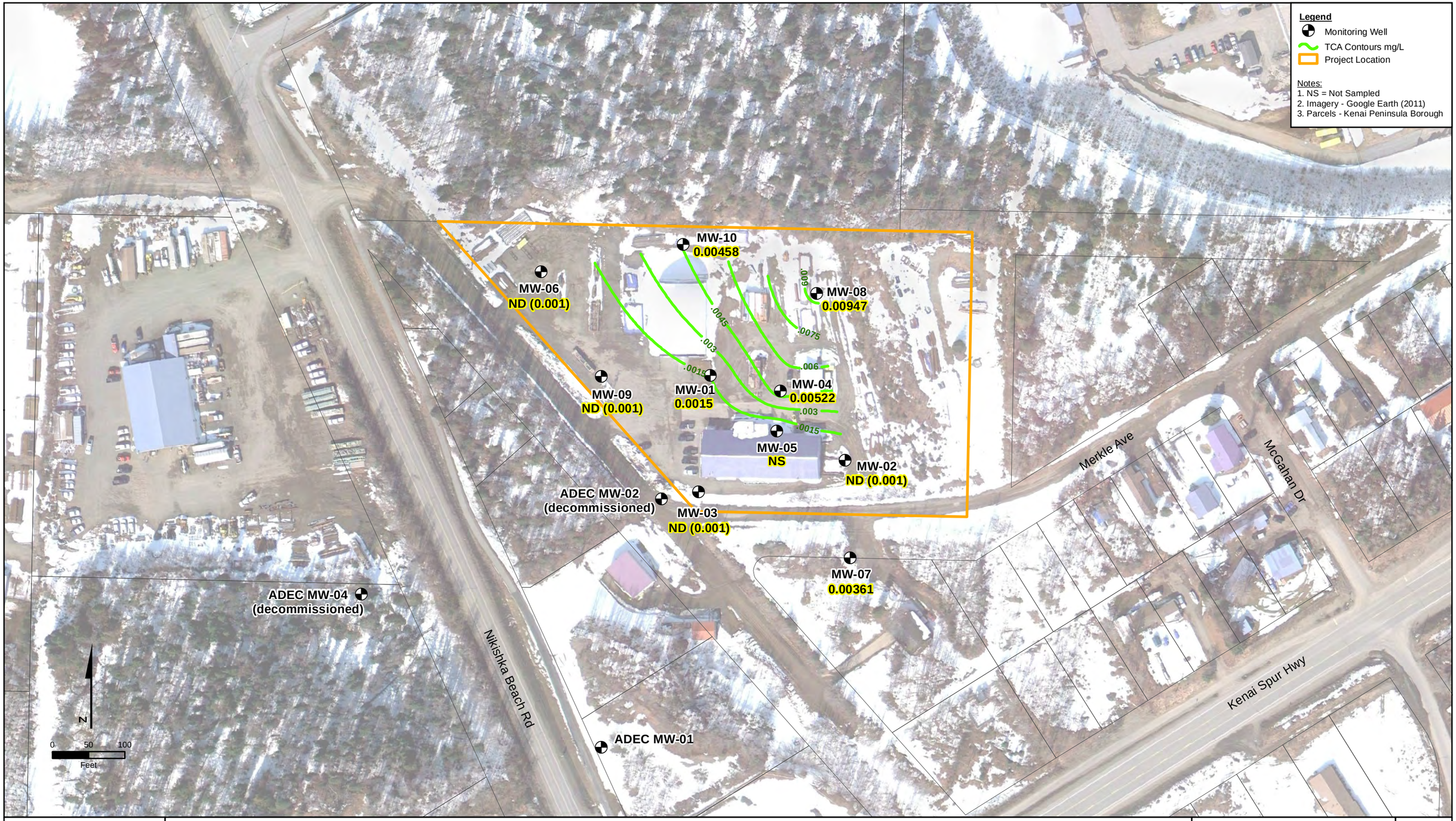
Figure **5**

C:\GIS\CLIENTS\DNA\Nikiski\Nikiski BHI\2016_April\Fig 5 Groundwater Results Summary.mxd Apr 13, 2016 3:57:31 PM User: Tricia



dna ENVIRONMENTAL	Quarterly Monitoring and Additional Site Characterization Report Baker Hughes Nikiski Completions Facility Nikiski, Alaska	**TCE Concentrations and Inferred 0.005 mg/L and 0.0028 mg/L Contours**	Figure
	1 inch = 125 feet	April 14, 2016 / 16.BHI.01 DRAWN: TDSL / CHKD: DJF	**6**

Fig 6 TCE Concentrations.mxd Apr 14, 2016 10:52:00 PM User: Tricia



dna ENVIRONMENTAL	Quarterly Monitoring and Additional Site Characterization Report Baker Hughes Nikiski Completions Facility Nikiski, Alaska	**TCA Concentrations and Inferred Contours**	Figure
	1 inch = 125 feet	April 14, 2016 / 16.BHI.01 DRAWN: TDSL / CHKD: DJF	**7**

Fig 7 TCA Concentrations.mxd Apr 14, 2016 10:54:23 PM User: Tricia

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ATTACHMENT 2

Field Notes and Forms

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BHI Nikiski Tool 12/11/15

1815 Complete site activities + load equipment + supplies into car. DNA commence drive to Anchorage to demobilize.

NOTE: D. Frank called DOWL to send surveyor to site. He arrived at 11AM and located MW-06, -08, -07 and -02 which field team could not find.

~30° Partly cloudy

BHI Nikiski Tool D. FRANK A. FITZGERALD K. BARNETTE 2-15-16

0800 Meet Discovery drilling & conduct tail gate meeting.

0835 Begin at SB-1 boring location SB-1A, located west of MW-01.

0850 Begin drilling.

1145 Alexa returns with Kathelyn, conduct safety meeting. Alexa & Kathelyn sample MW-04 + MW-05.

1000 A. Fitzgerald + K. Barnett pick up hand pump at local Nikiski hardware shop to remove access water from open well head at MW-05.

1015 Unable to remove all ice from well cap due to melting well cap + possibly melting pump attachments on the well head. Break well cap with a hammer and find that the well head is completely frozen in, with an inch or so of ice between and on top of attachments. Attempt to melt without success. Unable to take GW measurement or sample well at MW-05.

Scale: 1 square = _____

Rite in the Rain

1030 Field team moves to MW-04 and begins chipping ice over the well mount to avoid water build up when using flame-thrower. Use flame-thrower to melt ice around well mount cap and screws. Remove lid, no ice found on well head (plastic well cap top had been broken in previous field effort). GW measurements taken.
Total depth: 49.33 ft. DTW: 40.81 ft.
Able to remove well head, bring into car to defrost top of the line/tubing + attachments.

1130 Set up for purge + sampling at MW-04.

1150 Begin Purge.

1220 Collect sample 16-BNT-101 GW from MW-04.

1230 DOWL Surveyor arrives onsite, walks the site w/ D. Frank + begins setting up his equipment. A. FitzGerald + K. Barnett break for lunch.

1320 A. FitzGerald + K. Barnett open well MW-08 and remove well head + tubing to defrost in the car.

1350 Begin purge at MW-08.
Total Depth: 47.56 DTW: 39.34

1415 Collect sample 16-BNT-102-GW from MW-08.

1440 Set up at MW-03.

1500 Purge begin
Total depth: 44.0 ft. DTW: 40.25 ft.

1530 Collect sample 16-BNT-103-GW at MW-03.

1545 Set up at MW-07.

1615 Begin Purge

1630 Total depth: 56.22 ft. DTW: 48.63 ft.

1645 D. Frank measures DTW at the old Tuboscope Drinking water well: 37.58 ft.

1645 Collect sample 16-BNT-104 at MW-07.
Also collect MS/MSD at MW-07.

1710 Begin to set up at MW-09 for development.

1740 Begin well development at newly drilled well, MW-09.

1915 Complete well development, clean up site. End of Day.

BHI Nikiski Tool 2/16/16

0900 Field team arrive at site, conduct health/safety meeting. Check in with Baker Hughes.
0910 Set up at MW-10 for well development. DTW 37.77, TD 44.08.
1010 Finish developing MW-10
1020 Move to MW-01, setup for sampling. DTW 33.99 TD 46.07. Defrost well head in car.
1045 Begin purge at MW-01
1112 Collect sample BNT-105-GW
1130 Move to MW-02, setup for purge. DTW 40.98 TD 44.0
1140 Start purge.
1150 Pull up pump to replace check valves due to low flow rate.
1200 Return bladder pump to well, resume purging.
1210 Remove pump and tubing, replace tubing.
1220 Defrost YSI fittings in car.
1225 Break for Lunch
1245 Return to site, begin purge.
1310 Found old McMahan Well DTW 46.05

Katelyn Barnett 2/16/16

BHI Nikiski Tool 2/16/2016

1327 Clean sediment from bladder pump. Re-start purge.
1340 Air leak between tubing and pump. go to hardware store to buy a clamp.
1355 Return to site with clamps.
1440 Bladder pump is not pumping, pull it out and set up hurricane pump for purge and sampling. Used hurricane tubing from MW-10 development.
1515 Collect sample 16-BNT-106-GW
1530 Return clamping tool to hardware store.
1540 Set up equipment at MW-01 DTW 39.36 TD 43.76. Start purge.
1630 Sample MW-01
1645 Decontaminate sampling supplies.
1650 Move to MW-09, set up sampling equipment DTW 36.51 TD 43.87
1700 Start purge.
1750 Sample 16-BNT-109-GW
1800 Move to MW-10, setup for purge. DTW 37.71 TD 43.26
1900 Collect sample 16-BNT-110-GW.
1970 Pack up, end of Day

Katelyn Barnett 2/16/2016

Rite in the Rain

Scale: 1 square =

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WELL DEVELOPMENT FORM

WELL #: MW-09

PROJECT : BHI Nikiski Tool
LOCATION: Nikiski, AK

DATE: 2/15/16

PROJECT NO. :

DRILLING METHOD (s): Rotary
PUMP METHOD (s): Positive Pressure
SURGE METHOD (s): Block
INSTALLATION DATE: 2/15/16

INSPECTOR:
CONTRACTOR: Discovery Drilling
SITE PERSONNEL:
START DEVELOPMENT DATE: 2/15/16
END DEVELOPMENT DATE: 2/15/16

WATER DEPTH (TOC): 7.76 ~~36.60~~ ft
WELL DIA. (ID CASING): 2in ft
BORING DIAMETER: 8in ft

INSTALLED DEPTH(TOC): 45 ft
MEASURED DEPTH(TOC): 36.60 ft
SILT THICKNESS: ft
TD AFTER DEVELOPMENT: ft

DIAMETER FACTORS (GAL/FT):

DIAMETER (IN):	0.75	1	(2)	3	4	5	6	7	8	9	10	11
GALLONS/ FT:	0.023	0.041	0.163	0.367	0.654	1.02	1.47	2.00	2.61	3.30	4.08	4.93

CASING VOLUME INSIDE WELL = WATER COLUMN LENGTH X WELL DIAMETER FACTOR

MINIMUM VOLUME TO BE REMOVED = 5 X A _____ GAL. (A)

_____ GALS.

ACTIVITY	START TIME	END TIME	ELAPSED TIME	TOTAL GAL	Turbidity	pH	CONDUCTIVITY	TEMP	COLOR	OTHER
Surge/Purge	1745	1755	10 min	3.5						
	1757	1805	8 min	3						
	1807	1814	7 min	3						
	1816	1821	5 min	3.5						
	1823	1828	5 min	3						
Purge	1830	1836	6 min	3.5	961					
Purge	1838	1844	6 min	3.5	380					
Purge	1846	1852	6 min	3.5	66.5					
Purge	1854	1856	2 min	2	39.4					
TOTALS/FINAL			49 min	28.5	39.4					

COMMENTS:

(28)

WELL DEVELOPMENT FORM

WELL #: MW-10

DATE: 2-16-16

PROJECT: BHI Nikiski Tool
LOCATION: Nikiski, AK

PROJECT NO.: _____

DRILLING METHOD (s): Rotary
PUMP METHOD (s): Positive Pressure
SURGE METHOD (s): Block
INSTALLATION DATE: 2-15-16

INSPECTOR: _____
CONTRACTOR: Discovery Drilling
SITE PERSONNEL: _____
START DEVELOPMENT DATE: 2-16-16
END DEVELOPMENT DATE: 2-16-16

WATER DEPTH (TOC): _____ ft
WELL DIA. (ID CASING): _____ ft
BORING DIAMETER: _____ ft
6.31

INSTALLED DEPTH(TOC): 45 ft
MEASURED DEPTH(TOC): 37.77 ft
SILT THICKNESS: _____ ft
TD AFTER DEVELOPMENT: 44.08 ft

DIAMETER FACTORS (GAL/FT):

DIAMETER (IN):	0.75	1	(2)	3	4	5	6	7	8	9	10	11
GALLONS/ FT:	0.023	0.041	0.163	0.367	0.654	1.02	1.47	2.00	2.61	3.30	4.08	4.93

CASING VOLUME INSIDE WELL = WATER COLUMN LENGTH X WELL DIAMETER FACTOR _____ GAL. (A)

MINIMUM VOLUME TO BE REMOVED = 5 X A _____ GALS.

ACTIVITY	START TIME	END TIME	ELAPSED TIME	TOTAL GAL	Turbidity	pH	CONDUCTIVITY	TEMP	COLOR	OTHER
Surge/Purge	0913	0920	7min	3.5						
	0920	0927	7min	4.0						
↓	0922	0932	10min	3.5						
Purge	0933	0987	4min	3.5	950					
	0944	0952	8min	3.5	212					
	0954	1002	8min	3.5	718					
	1003	1010	7min	3.5	122					
TOTALS/FINAL										

COMMENTS:

dna ENVIRONMENTAL — Groundwater Sampling Worksheet

Project Name: BNI Nikiski tool
Client: Baker Hughes
Sampler: D. Frank, K. Barnett
Weather Conditions: clear, sunny, 25°F

Sample Location (ie. MW1): MW-01
Date: 2-16-2016
Purge Start Time: 1550

Sample ID:	16-BNT-107-GW	Time: 1630	(primary)	dup	split	ms/msd
Sample ID:	16-BNT-108-GW	Time: 1200	primary	(dup)	split	ms/msd
Sample ID:		Time:	primary	dup	split	ms/msd

Analyses	Number/type of Bottles	Comments/ preservation:	Analyses	Number/type of Bottles	Comments/ preservation:
GRO/BTEX			Nitrate/Nitrite		
DRO			Sulfate		
RRO			Total Metals (Fe & Mg)		
DRO w/silica			Dissolved Metals (Fe & Mg)		
RRO w/silica			Alkalinity		
PAHs			Methane		

Well Information / Purge Volume Calculation

Well Casing Diameter (in): 2
Product Present? (y/n/sheen) N/O
Depth to Top of Product (ft BTOC): NA
Depth to Oil/Water Interface (ft BTOC): NA
(BTOC = below top of casing)

Total Well Depth (ft BTOC): 43.76 (depth to bottom)
Depth to Water (ft BTOC): 39.89 +6.36
Water Column (ft) 4.4
One Purge Volume (gal): 0.70 ×3 = 2.11
purge calculation formula on back

Sensory Observations

Color: Clear, Amber, Tan, Brown, Grey, Milky White, Other:
Odor: None, Low, Medium, High, Very Strong, H2S, Fuel Like, Chemical ?, Unknown
Turbidity: None, Low, Medium, High, Very Turbid, Heavy Silts

Instrument Observations

Round	Time	Volume (gal)	Temp °C	pH	Conductivity (mS/cm)	Turbidity (NTUs)	DO (mg/L)	ORP (mV)	Color	Odor	Water Level (ft BTOC)	Draw-down (ft)
1	1553	0.1	4.65	5.37	0.215		7.50	185.4	clear	N	39.36	0
2	1602	0.5	5.48	5.52	0.202	207	6.47	195.2	clear	N	39.36	0
3	1605	0.75	5.17	5.49	0.197	149	6.40	191.2	clear	N	39.36	0
4	1608	1.0	4.94	5.47	0.194	111	6.28	186.9	clear	N	39.36	0
5	1611	1.25	4.86	5.46	0.189	75.8	6.32	185.8	clear	N	39.36	0
6	1614	1.3	4.81	5.44	0.184	50.4	6.21	182.0	clear	N	39.36	0
7	1619	1.5	4.73	5.43	0.174	38.7	6.07	178.0	clear	N	39.36	0
8	1623	2.0	4.74	5.43	0.169	30.1	6.21	176.3	clear	N	39.36	0
9												
10												
11												
12												

see back for additional entry lines if needed

Purge Rate (low flow): 175 L/min
Total Volume Purged: 2.3
Measured Drawdown (ft): 0

Notes: Drawdown should be less than 0.3 feet while sampling. Minimal drawdown shall be achieved and measured by pumping at a low rate (approximately 0.1 to 0.5 liter/minute) and continually measuring water levels in the well. Note that site's hyrogeology may make it difficult to achieve this specification.

Purge Method (disposable bailer, teflon bailer, submersible pump, etc.):
Sample Method (disposable bailer, teflon bailer, submersible pump, etc.):

Well Integrity (condition of casing, flush mount sealing properly, cement seal intact, etc.):
Flush mount broken

Remarks (well recovery, unusual conditions/observations):

Signed: _____ Date: _____

Signed/Reviewer: _____ Date: _____

Instrument Observations (continued)

Round	Time	Volume (gal)	Temp °C	pH	Conductivity ( )	Turbidity (NTUs)	DO (mg/L)	ORP (mV)	Color	Odor	Water Level (ft BTOC)	Draw-down (ft)
13												
14												
15												
16												
17												
18												
19												
20												
21												

Purge Rate (low flow): _____ L/min Total Volume Purged: _____ Measured Drawdown (ft): _____

Calculating Purge Volume

Well Casing Diameter:	Multiply c) by:
2	0.16
4	0.65
6	1.47

Sand Pack Diameter:	Multiply c) by:
8	0.71
10	1
12	1.28

Note: assuming sand pack has 29% porosity

Example 1- purging only well casing volume
You have 2-inch casing and 6-foot water column.
One Purge Volume= 0.16 X 6 = 0.96 gallons water

Example 2- purging well casing and sand pack volume
You have 2-inch casing, 8-inch sand pack, and 6-foot water column.
One Purge Volume= (0.16 X 6) + (0.71 X 6) = 5.22 gallons water

Criteria for Stable Parameters (three successive readings within stability critieria)

Parameter	Working Range	Stability Criteria	Notes
Temperature:	>0.00 °C	± 0.5 °C	
pH:	0-14	± 0.1	
Conductivity:	0-999 mS/m	± 5%	
ORP:	± 1999 mV		
Dissolved Oxygen:	0-19.99 mg/L	± 10%	DO in GW typically does not exceed 13 mg/L
Turbidity;	0-800 NTU		

dna ENVIRONMENTAL — Groundwater Sampling Worksheet

Project Name: BHI NIKISKI TOOL
Client: Baker Hughes
Sampler: D. Frank, V. K. Barnett
Weather Conditions: Clear, sunny, 20°F

Sample Location (ie. MW1): MW-02
Date: 2/16/2016
Purge Start Time: 1140

Sample ID: 16-BNT-1016-GW Time: 1515 (primary) dup split ms/msd
Sample ID: Time: primary dup split ms/msd
Sample ID: Time: primary dup split ms/msd

Analyses	Number/type of Bottles	Comments/ preservation:	Analyses	Number/type of Bottles	Comments/ preservation:
GRO/BTEX			Nitrate/Nitrite		
DRO			Sulfate		
RRO			Total Metals (Fe & Mg)		
DRO w/silica			Dissolved Metals (Fe & Mg)		
RRO w/silica			Alkalinity		
PAHs			Methane		

Well Information / Purge Volume Calculation

Well Casing Diameter (in): 2
Product Present? (y/n/sheen) NO
Depth to Top of Product (ft BTOC): NA
Depth to Oil/Water Interface (ft BTOC): NA
(BTOC = below top of casing)

Total Well Depth (ft BTOC): 44.0 (depth to bottom)
Depth to Water (ft BTOC): 40.98
Water Column (ft) 3.02
One Purge Volume (gal): 0.48
purge calculation formula on back

Sensory Observations

Color: Clear, Amber, Tan, Brown, Grey, Milky White, Other:
Odor: None, Low, Medium, High, Very Strong, H2S, Fuel Like, Chemical ?, Unknown
Turbidity: None, Low, Medium, High, Very Turbid, Heavy Silts

Instrument Observations

Round	Time	Volume (gal)	Temp °C	pH	Conductivity ( )	Turbidity (NTUs)	DO (mg/L)	ORP (mV)	Color	Odor	Water Level (ft BTOC)	Draw-down (ft)
1	1146	0.5	3.78	5.09	0.099	152	10.78	242.2	tan	N	41.01	0.03
2	1457	3.5	16.64	5.93	0.075		10.55	147.1	tan	N	41.33	0.35
3	1501	5.0	16.26	5.87	0.073	89.7	10.45	146.5	tan	N	41.33	0.35
4	1505	6.0	16.29	5.88	0.072	60.3	10.40	147.5	tan	N	41.32	0.34
5												
6												
7												
8												
9												
10												
11												
12												

see back for additional entry lines if needed

Purge Rate (low flow): ~~100~~ 365 L/min Total Volume Purged: 9 Measured Drawdown (ft): 0.34

Notes: Drawdown should be less than 0.3 feet while sampling. Minimal drawdown shall be achieved and measured by pumping at a low rate (approximately 0.1 to 0.5 liter/minute) and continually measuring water levels in the well. Note that site's hyrogeology may make it difficult to achieve this specification.

Purge Method (disposable bailer, teflon bailer, submersible pump, etc.):
Sample Method (disposable bailer, teflon bailer, submersible pump, etc.):

Well Integrity (condition of casing, flush mount sealing properly, cement seal intact, etc.): Good

Remarks (well recovery, unusual conditions/observations): Low recovery

Signed: Date:
Signed/Reviewer: Date:

Instrument Observations (continued)

Round	Time	Volume (gal)	Temp °C	pH	Conductivity ( )	Turbidity (NTUs)	DO (mg/L)	ORP (mV)	Color	Odor	Water Level (ft BTOC)	Draw-down (ft)
13												
14												
15												
16												
17												
18												
19												
20												
21												

Purge Rate (low flow): _____ L/min Total Volume Purged: _____ Measured Drawdown (ft): _____

Calculating Purge Volume

Well Casing Diameter:	Multiply c) by:
2	0.16
4	0.65
6	1.47

Sand Pack Diameter:	Multiply c) by:
8	0.71
10	1
12	1.28

Note: assuming sand pack has 29% porosity

Example 1- purging only well casing volume
You have 2-inch casing and 6-foot water column.
One Purge Volume= 0.16 X 6 = 0.96 gallons water

Example 2- purging well casing and sand pack volume
You have 2-inch casing, 8-inch sand pack, and 6-foot water column.
One Purge Volume= (0.16 X 6) + (0.71 X 6) = 5.22 gallons water

Criteria for Stable Parameters (three successive readings within stability critieria)

Parameter	Working Range	Stability Criteria	Notes
Temperature:	>0.00 °C	± 0.5 °C	
pH:	0-14	± 0.1	
Conductivity:	0-999 mS/m	± 5%	
ORP:	± 1999 mV		
Dissolved Oxygen:	0-19.99 mg/L	± 10%	DO in GW typically does not exceed 13 mg/L
Turbidity;	0-800 NTU		

Groundwater Sampling Worksheet

dna ENVIRONMENTAL

Project Name: BHI NIELSEN TOOL
Client: Baker Hughes
Sampler: A. FitzGerald + K. Barnett
Weather Conditions: 35-40°, Partly Cloudy

Sample Location (ie. MW1): MW-03
Date: 2/15/16
Purge Start Time: 1500

Sample ID: IC-BNT-103-GW Time: 1530 (primary) dup split ms/msd
Sample ID: Time: primary dup split ms/msd
Sample ID: Time: primary dup split ms/msd

Analyses	Number/type of Bottles	Comments/ preservation:	Analyses	Number/type of Bottles	Comments/ preservation:
~~GRO/BTEX~~ VOCs	3	HCl	Nitrate/Nitrite		
DRO			Sulfate		
RRO			Total Metals (Fe & Mg)		
DRO w/silica			Dissolved Metals (Fe & Mg)		
RRO w/silica			Alkalinity		
PAHs			Methane		

Well Information / Purge Volume Calculation

Well Casing Diameter (in): 2
Product Present? (y/n/sheen) No.
Depth to Top of Product (ft BTOC): N/A
Depth to Oil/Water Interface (ft BTOC): N/A
(BTOC = below top of casing)

Total Well Depth (ft BTOC): 44.0 (depth to bottom)
Depth to Water (ft BTOC): 40.25
Water Column (ft) 3.75
One Purge Volume (gal): 0.6
purge calculation formula on back

Sensory Observations

Color: Clear, Amber, Tan, Brown, Grey, (Milky White,) Other:
Odor: (None) (Low,) Medium, High, Very Strong, H2S, Fuel Like, Chemical ?, Unknown
Turbidity: None, (Low,) Medium, High, Very Turbid, Heavy Silts

Instrument Observations

Round	Time	Volume (gal)	Temp °C	pH	Conductivity µS/cm	Turbidity (NTUs)	DO (mg/L)	ORP (mV)	Color	Odor	Water Level (ft BTOC)	Draw-down (ft)
1	1510	0.1	5.41	5.83	0.120	301	9.0	-7.6	Milky	none	40.23	0.02
2	1513	0.3	5.41	5.84	0.118	220	8.19	-6.1	Milky	none	40.21	0.04
3	1516	0.5	5.38	5.84	0.116	154	8.06	-5.7	Milky	none	40.20	0.05
4	1519	0.7	5.35	5.82	0.115	96	8.16	-5.7	Milky	none	40.21	0.04
5	1522	0.9	5.32	5.81	0.116	64.1	8.19	-5.5	Milky	none	40.22	0.03
6	1525	1.1	5.29	5.79	0.117	39.9	8.12	-4.5	Milky	none	40.22	0.03
7												
8												
9												
10												
11												
12												

see back for additional entry lines if needed

Purge Rate (low flow): 140 L/min Total Volume Purged: 1.1 gal Measured Drawdown (ft): 0.03

Notes: Drawdown should be less than 0.3 feet while sampling. Minimal drawdown shall be achieved and measured by pumping at a low rate (approximately 0.1 to 0.5 liter/minute) and continually measuring water levels in the well. Note that site's hyrogeology may make it difficult to achieve this specification.

Purge Method (disposable bailer, teflon bailer, submersible pump, etc.): Bladder Pump
Sample Method (disposable bailer, teflon bailer, submersible pump, etc.): Bladder Pump

Well Integrity (condition of casing, flush mount sealing properly, cement seal intact, etc.):
Good condition

Remarks (well recovery, unusual conditions/observations):
Good recovery, slow recovery.

Signed: Date: 2/15/16

Signed/Reviewer: Date:

Instrument Observations (continued)

Round	Time	Volume (gal)	Temp °C	pH	Conductivity ( )	Turbidity (NTUs)	DO (mg/L)	ORP (mV)	Color	Odor	Water Level (ft BTOC)	Draw-down (ft)
13												
14												
15												
16												
17												
18												
19												
20												
21												

Purge Rate (low flow): _____ L/min Total Volume Purged: _____ Measured Drawdown (ft): _____

Calculating Purge Volume

Well Casing Diameter:	Multiply c) by:
2	0.16
4	0.65
6	1.47

Sand Pack Diameter:	Multiply c) by:
8	0.71
10	1
12	1.28

Note: assuming sand pack has 29% porosity

Example 1- purging only well casing volume
You have 2-inch casing and 6-foot water column.
One Purge Volume= 0.16 X 6 = 0.96 gallons water

Example 2- purging well casing and sand pack volume
You have 2-inch casing, 8-inch sand pack, and 6-foot water column.
One Purge Volume= (0.16 X 6) + (0.71 X 6) = 5.22 gallons water

Criteria for Stable Parameters (three successive readings within stability critieria)

Parameter	Working Range	Stability Criteria	Notes
Temperature:	>0.00 °C	± 0.5 °C	
pH:	0-14	± 0.1	
Conductivity:	0-999 mS/m	± 5%	
ORP:	± 1999 mV		
Dissolved Oxygen:	0-19.99 mg/L	± 10%	DO in GW typically does not exceed 13 mg/L
Turbidity:	0-800 NTU		

Groundwater Sampling Worksheet

dna ENVIRONMENTAL

Project Name: BHI NIKISKI TOOL
Sample Location (ie. MW1): MW-04
Client: Baker Hughes
Date: 2/15/2016
Sampler: A. Fitzgerald + K. Barnett
Purge Start Time: 1150
Weather Conditions: ~30°, Partly Cloudy

Sample ID: 16-BNT-101-GW Time: 1220 (primary) dup split ms/msd
Sample ID: Time: primary dup split ms/msd
Sample ID: Time: primary dup split ms/msd

Analyses	Number/type of Bottles	Comments/ preservation:	Analyses	Number/type of Bottles	Comments/ preservation:
~~GRO/BTEX~~ VOCs	3	HCl	Nitrate/Nitrite		
DRO			Sulfate		
RRO			Total Metals (Fe & Mg)		
DRO w/silica			Dissolved Metals (Fe & Mg)		
RRO w/silica			Alkalinity		
PAHs			Methane		

Well Information / Purge Volume Calculation

Well Casing Diameter (in): 2
Product Present? (y/n/sheen) No
Depth to Top of Product (ft BTOC): NA
Depth to Oil/Water Interface (ft BTOC): NA
(BTOC = below top of casing)

Total Well Depth (ft BTOC): 49.33 (depth to bottom)
Depth to Water (ft BTOC): 40.81
Water Column (ft) 8.52
One Purge Volume (gal): 1.36
purge calculation formula on back

Sensory Observations

Color: (Clear) Amber, Tan, Brown, Grey, (Milky White) Other:
Odor: (None) Low, Medium, High, Very Strong, H2S, Fuel Like, Chemical ?, Unknown
Turbidity: None, (Low) Medium, High, Very Turbid, Heavy Silts

Instrument Observations

Round	Time	Volume (gal)	Temp °C	pH	Conductivity (µS/cm)	Turbidity (NTUs)	DO % ~~(mg/L)~~	ORP (mV)	Color	Odor	Water Level (ft BTOC)	Draw-down (ft)
1	1200	0.2	4.88	5.67	0.161	42.0	58.6	132.6	Milky	none	40.87	0
2	1203	0.5	5.00	5.77	0.165	26.1	56.4	112.8	clear	none	40.89	0.08
3	1206	0.8	4.98	5.80	0.165	14.6	56.1	106.8	clear	none	40.89	0.08
4	1209	1.0	4.97	5.82	0.160	11.2	55.7	104.2	clear	none	40.88	0.07
5	1212	1.2	4.95	5.83	0.155	8.29	56.5	102.6	clear	none	40.88	0.07
6	1215	1.4	4.94	5.84	0.150	6.28	56.4	101.4	clear	none	40.86	0.05
7												
8												
9												
10												
11												
12												

see back for additional entry lines if needed

Purge Rate (low flow): 270 L/min Total Volume Purged: 1.4 gal. Measured Drawdown (ft): 0.05

Notes: Drawdown should be less than 0.3 feet while sampling. Minimal drawdown shall be achieved and measured by pumping at a low rate (approximately 0.1 to 0.5 liter/minute) and continually measuring water levels in the well. Note that site's hyrogeology may make it difficult to achieve this specification.

Purge Method (disposable bailer, teflon bailer, submersible pump, etc.): Bladder Pump
Sample Method (disposable bailer, teflon bailer, submersible pump, etc.): Bladder Pump

Well Integrity (condition of casing, flush mount sealing properly, cement seal intact, etc.): Had to break top of well upon arriving last field effort – needs to be replaced in the Spring.

Remarks (well recovery, unusual conditions/observations): Good recovery

Signed: Date: 2/15/2016

Signed/Reviewer: Date:

Instrument Observations (continued)

Round	Time	Volume (gal)	Temp °C	pH	Conductivity ( )	Turbidity (NTUs)	DO (mg/L)	ORP (mV)	Color	Odor	Water Level (ft BTOC)	Draw-down (ft)
13												
14												
15												
16												
17												
18												
19												
20												
21												

Purge Rate (low flow): _____ L/min Total Volume Purged: _____ Measured Drawdown (ft): _____

Calculating Purge Volume

Well Casing Diameter:	Multiply c) by:
2	0.16
4	0.65
6	1.47

Sand Pack Diameter:	Multiply c) by:
8	0.71
10	1
12	1.28

Note: assuming sand pack has 29% porosity

Example 1- purging only well casing volume
You have 2-inch casing and 6-foot water column.
One Purge Volume= 0.16 X 6 = 0.96 gallons water

Example 2- purging well casing and sand pack volume
You have 2-inch casing, 8-inch sand pack, and 6-foot water column.
One Purge Volume= (0.16 X 6) + (0.71 X 6) = 5.22 gallons water

Criteria for Stable Parameters (three successive readings within stability critieria)

Parameter	Working Range	Stability Criteria	Notes
Temperature:	>0.00 °C	± 0.5 °C	
pH:	0-14	± 0.1	
Conductivity:	0-999 mS/m	± 5%	
ORP:	± 1999 mV		
Dissolved Oxygen:	0-19.99 mg/L	± 10%	DO in GW typically does not exceed 13 mg/L
Turbidity;	0-800 NTU		

dna ENVIRONMENTAL — Groundwater Sampling Worksheet

Project Name: BHI Nikiski Tool
Client: Baker Hughes
Sampler: Dan Frank, Kathlyn Barnett
Weather Conditions: Clear, sunny, 19° F

Sample Location (ie. MW1): MW-06
Date: 2/16/2016
Purge Start Time: 1044

Sample ID:	16-BNT-105-GW	Time: 1112	primary	dup	split	ms/msd
Sample ID:		Time:	primary	dup	split	ms/msd
Sample ID:		Time:	primary	dup	split	ms/msd

Analyses	Number/type of Bottles	Comments/ preservation:	Analyses	Number/type of Bottles	Comments/ preservation:
GRO/BTEX			Nitrate/Nitrite		
DRO			Sulfate		
RRO			Total Metals (Fe & Mg)		
DRO w/silica			Dissolved Metals (Fe & Mg)		
RRO w/silica			Alkalinity		
PAHs			Methane		

Well Information / Purge Volume Calculation

Well Casing Diameter (in): 2 in
Product Present? (y/n/sheen): NO
Depth to Top of Product (ft BTOC): NA
Depth to Oil/Water Interface (ft BTOC): NA
(BTOC = below top of casing)

Total Well Depth (ft BTOC): ~~46.07~~ 33.99 (depth to bottom)
Depth to Water (ft BTOC): 33.99
Water Column (ft): 12.08
One Purge Volume (gal): 1.93
purge calculation formula on back

33.99

Sensory Observations

Color: Clear, Amber, Tan, Brown, Grey, Milky White, Other:
Odor: None, Low, Medium, High, Very Strong, H2S, Fuel Like, Chemical ?, Unknown
Turbidity: None, Low, Medium, High, Very Turbid, Heavy Silts

Instrument Observations

Round	Time	Volume (gal)	Temp °C	pH	Conductivity ( )	Turbidity (NTUs)	DO (mg/L)	ORP (mV)	Color	Odor	Water Level (ft BTOC)	Draw-down (ft)
1	1048	0.3	4.20	4.98	0.118	179	6.38	248.1	tan	No	33.99	0
2	1053	1	4.54	5.04	0.112	104	7.08	231.5	tan	NO	33.99	0
3	1056	1.25	4.52	5.06	0.112	74.5	7.26	225.0	tan	NO	33.99	0
4	1059	1.5	4.53	5.09	0.112	55.6	7.20	224.0	tan	NO	33.99	0
5	1102 ~~1057~~	2.0	4.61	5.13	0.112	43.0	7.33	218.9	tan	NO	33.99	0
6	1105	2.5	4.60	5.17	0.111	32.6	7.18	213.6	clear	NO	33.99	0
7	1109	2.7	4.59	5.21	0.110	26.4	7.21	208.4	clear	NO	33.99	0
8												
9												
10												
11												
12												

see back for additional entry lines if needed

Purge Rate (low flow): 425 L/min
Total Volume Purged: 3.0
Measured Drawdown (ft): 0.0

Notes: Drawdown should be less than 0.3 feet while sampling. Minimal drawdown shall be achieved and measured by pumping at a low rate (approximately 0.1 to 0.5 liter/minute) and continually measuring water levels in the well. Note that site's hyrogeology may make it difficult to achieve this specification.

Purge Method (disposable bailer, teflon bailer, submersible pump, etc.): Bladder pump
Sample Method (disposable bailer, teflon bailer, submersible pump, etc.): Bladder pump

Well Integrity (condition of casing, flush mount sealing properly, cement seal intact, etc.):

Remarks (well recovery, unusual conditions/observations):

Signed: _____ Date: _____

Signed/Reviewer: _____ Date: _____

Instrument Observations (continued)

Round	Time	Volume (gal)	Temp °C	pH	Conductivity ( )	Turbidity (NTUs)	DO (mg/L)	ORP (mV)	Color	Odor	Water Level (ft BTOC)	Draw-down (ft)
13												
14												
15												
16												
17												
18												
19												
20												
21												

Purge Rate (low flow): _____ L/min Total Volume Purged: _____ Measured Drawdown (ft): _____

Calculating Purge Volume

Well Casing Diameter:	Multiply c) by:
2	0.16
4	0.65
6	1.47

Sand Pack Diameter:	Multiply c) by:
8	0.71
10	1
12	1.28

Note: assuming sand pack has 29% porosity

Example 1- purging only well casing volume
You have 2-inch casing and 6-foot water column.
One Purge Volume= 0.16 X 6 = 0.96 gallons water

Example 2- purging well casing and sand pack volume
You have 2-inch casing, 8-inch sand pack, and 6-foot water column.
One Purge Volume= (0.16 X 6) + (0.71 X 6) = 5.22 gallons water

Criteria for Stable Parameters (three successive readings within stability critieria)

Parameter	Working Range	Stability Criteria	Notes
Temperature:	>0.00 °C	± 0.5 °C	
pH:	0-14	± 0.1	
Conductivity:	0-999 mS/m	± 5%	
ORP:	± 1999 mV		
Dissolved Oxygen:	0-19.99 mg/L	± 10%	DO in GW typically does not exceed 13 mg/L
Turbidity;	0-800 NTU		

Groundwater Sampling Worksheet

dna ENVIRONMENTAL

Project Name: BHI NIKISKI TOOL
Client: Baker Hughes
Sampler: A. Fitzgerald + K. Barnett
Weather Conditions: 440 Partly Cloudy

Sample Location (ie. MW1): MW-07
Date: 2/15/16
Purge Start Time: 1615

Sample ID: 16-BNT-104-GW Time: 1645 (primary) dup split (ms/msd)
Sample ID: Time: primary dup split ms/msd
Sample ID: Time: primary dup split ms/msd

Analyses	Number/type of Bottles	Comments/ preservation:	Analyses	Number/type of Bottles	Comments/ preservation:
GRO/BTEX/VOCs	6 3 MP	HCl / MS/MSD	Nitrate/Nitrite		
DRO			Sulfate		
RRO			Total Metals (Fe & Mg)		
DRO w/silica			Dissolved Metals (Fe & Mg)		
RRO w/silica			Alkalinity		
PAHs			Methane		

Well Information / Purge Volume Calculation

Well Casing Diameter (in): 2
Product Present? (y/n/sheen) No
Depth to Top of Product (ft BTOC): N/A
Depth to Oil/Water Interface (ft BTOC): N/A
(BTOC = below top of casing)

Total Well Depth (ft BTOC): 56.22 (depth to bottom)
Depth to Water (ft BTOC): 48.63
Water Column (ft) 7.59
One Purge Volume (gal): 1.21
purge calculation formula on back

Sensory Observations

Color: Clear, Amber, Tan, Brown, Grey, (Milky White) Other: Milky tan at first (dirty)
Odor: (None) Low, Medium, High, Very Strong, H2S, Fuel Like, Chemical ?, Unknown
Turbidity: None, (Low) (Medium) High, Very Turbid, Heavy Silts

Instrument Observations

Round	Time	Volume (gal)	Temp °C	pH	Conductivity (mS/cm)	Turbidity (NTUs)	DO (mg/L)	ORP (mV)	Color	Odor	Water Level (ft BTOC)	Draw-down (ft)
1	1620	0.2	4.61	6.04	0.135	383	7.70	-21.0	Milk tan	none		
2	1623	0.4	4.50	6.11	0.133	275	8.01	-12.2	milk tan	none		
3	1626	0.6	4.54	6.08	0.125	128	8.09	-7.1	Milky	none		
4	1629	0.8	4.50	6.06	0.120	74.1	8.32	-2.0	milky	none	48.69	0.06
5	1632	1.0	4.47	6.04	0.120	54.7	8.23	-11.1	milky	none	48.68	0.05
6	1635	1.2	4.48	6.04	0.121	32.4	8.20	-7.0	milky clear	none	48.66	0.03
7	1638	1.4	4.46	6.04	0.121	21.9	7.93	-5.8	clear	none	48.66	0.03
8												
9												
10												
11												
12												

see back for additional entry lines if needed

Purge Rate (low flow): 200 L/min Total Volume Purged: 1.4 Measured Drawdown (ft): 0.03

Notes: Drawdown should be less than 0.3 feet while sampling. Minimal drawdown shall be achieved and measured by pumping at a low rate (approximately 0.1 to 0.5 liter/minute) and continually measuring water levels in the well. Note that site's hyrogeology may make it difficult to achieve this specification.

Purge Method (disposable bailer, teflon bailer, submersible pump, etc.): Bladder Pump
Sample Method (disposable bailer, teflon bailer, submersible pump, etc.): Bladder Pump

Well Integrity (condition of casing, flush mount sealing properly, cement seal intact, etc.):
Well cap is broken + needs to be replaced in the spring.

Remarks (well recovery, unusual conditions/observations):
Good recovery.

Signed: Date: 2/15/16

Signed/Reviewer: Date:

Instrument Observations (continued)

Round	Time	Volume (gal)	Temp °C	pH	Conductivity ( )	Turbidity (NTUs)	DO (mg/L)	ORP (mV)	Color	Odor	Water Level (ft BTOC)	Draw-down (ft)
13												
14												
15												
16												
17												
18												
19												
20												
21												

Purge Rate (low flow): _____ L/min Total Volume Purged: _____ Measured Drawdown (ft): _____

Calculating Purge Volume

Well Casing Diameter:	Multiply c) by:
2	0.16
4	0.65
6	1.47

Sand Pack Diameter:	Multiply c) by:
8	0.71
10	1
12	1.28

Note: assuming sand pack has 29% porosity

Example 1- purging only well casing volume
You have 2-inch casing and 6-foot water column.
One Purge Volume= 0.16 X 6 = 0.96 gallons water

Example 2- purging well casing and sand pack volume
You have 2-inch casing, 8-inch sand pack, and 6-foot water column.
One Purge Volume= (0.16 X 6) + (0.71 X 6) = 5.22 gallons water

Criteria for Stable Parameters (three successive readings within stability critieria)

Parameter	Working Range	Stability Criteria	Notes
Temperature:	>0.00 °C	± 0.5 °C	
pH:	0-14	± 0.1	
Conductivity:	0-999 mS/m	± 5%	
ORP:	± 1999 mV		
Dissolved Oxygen:	0-19.99 mg/L	± 10%	DO in GW typically does not exceed 13 mg/L
Turbidity:	0-800 NTU		

Groundwater Sampling Worksheet

dna ENVIRONMENTAL

Project Name: BHI NIKISKI TOOL
Client: Baker Hughes
Sampler: A Fitzgerald + K. Barnett
Weather Conditions: 40°F, Mostly Sunny

Sample Location (ie. MW1): MW-08
Date: 02/15/16
Purge Start Time: 1350

Sample ID: 16-BNT-102-GW	Time: 1415	(primary)	dup	split	ms/msd
Sample ID:	Time:	primary	dup	split	ms/msd
Sample ID:	Time:	primary	dup	split	ms/msd

Analyses	Number/type of Bottles	Comments/ preservation:	Analyses	Number/type of Bottles	Comments/ preservation:
~~GRO/BTEX~~ VOCs	3	HCl	Nitrate/Nitrite		
DRO			Sulfate		
RRO			Total Metals (Fe & Mg)		
DRO w/silica			Dissolved Metals (Fe & Mg)		
RRO w/silica			Alkalinity		
PAHs			Methane		

Well Information / Purge Volume Calculation

Well Casing Diameter (in): 2
Product Present? (y/n/sheen): No
Depth to Top of Product (ft BTOC): N/A
Depth to Oil/Water Interface (ft BTOC): N/A
(BTOC = below top of casing)

Total Well Depth (ft BTOC): 47.56 (depth to bottom)
Depth to Water (ft BTOC): 39.34
Water Column (ft) 8.22
One Purge Volume (gal): 1.32
purge calculation formula on back

Sensory Observations

Color: Clear, Amber, (Tan), Brown, Grey, Milky White, Other:
Odor: (None), Low, Medium, High, Very Strong, H2S, Fuel Like, Chemical ?, Unknown
Turbidity: None, (Low), (Medium), High, Very Turbid, Heavy Silts

Instrument Observations

Round	Time	Volume (gal)	Temp °C	pH	Conductivity (mS/cm)	Turbidity (NTUs)	DO (mg/L)	ORP (mV)	Color	Odor	Water Level (ft BTOC)	Draw-down (ft)
1	1355	0.3	4.94	6.18	0.084	761	11.9	16.3	Tan	none	39.32	0.02
2	1358	0.5	4.68	6.18	0.083	549	10.67	15.8	Milky	none	39.33	0.01
3	1401	0.7	4.69	6.16	0.083	333	10.55	14.6	Milky	none	39.33	0.01
4	1404	1.0	4.70	6.15	0.083	145	10.35	12.6	Milky	none	39.33	0.01
5	1407	1.3	4.70	6.14	0.082	125	10.45	8.7	Milky	none	39.33	0.01
6	1410	1.6	4.69	6.14	0.082	83.5	10.41	3.9		none	39.33	0.01
7												
8												
9												
10												
11												
12												

see back for additional entry lines if needed

Purge Rate (low flow): 315 L/min
Total Volume Purged: 1.6 gal.
Measured Drawdown (ft): 0.01

Notes: Drawdown should be less than 0.3 feet while sampling. Minimal drawdown shall be achieved and measured by pumping at a low rate (approximately 0.1 to 0.5 liter/minute) and continually measuring water levels in the well. Note that site's hyrogeology may make it difficult to achieve this specification.

Purge Method (disposable bailer, teflon bailer, submersible pump, etc.): Bladder Pump
Sample Method (disposable bailer, teflon bailer, submersible pump, etc.): Bladder Pump

Well Integrity (condition of casing, flush mount sealing properly, cement seal intact, etc.): Good condition

Remarks (well recovery, unusual conditions/observations): Good recovery

Signed: _____ Date: 2/15/16

Signed/Reviewer: _____ Date: _____

Instrument Observations (continued)

Round	Time	Volume (gal)	Temp °C	pH	Conductivity ( )	Turbidity (NTUs)	DO (mg/L)	ORP (mV)	Color	Odor	Water Level (ft BTOC)	Draw-down (ft)
13												
14												
15												
16												
17												
18												
19												
20												
21												

Purge Rate (low flow): _____ L/min Total Volume Purged: _____ Measured Drawdown (ft): _____

Calculating Purge Volume

Well Casing Diameter:	Multiply c) by:
2	0.16
4	0.65
6	1.47

Sand Pack Diameter:	Multiply c) by:
8	0.71
10	1
12	1.28

Example 1- purging only well casing volume
You have 2-inch casing and 6-foot water column.
One Purge Volume= 0.16 X 6 = 0.96 gallons water

Note: assuming sand pack has 29% porosity
Example 2- purging well casing and sand pack volume
You have 2-inch casing, 8-inch sand pack, and 6-foot water column.
One Purge Volume= (0.16 X 6) + (0.71 X 6) = 5.22 gallons water

Criteria for Stable Parameters (three successive readings within stability critieria)

Parameter	Working Range	Stability Criteria	Notes
Temperature:	>0.00 °C	± 0.5 °C	
pH:	0-14	± 0.1	
Conductivity:	0-999 mS/m	± 5%	
ORP:	± 1999 mV		
Dissolved Oxygen:	0-19.99 mg/L	± 10%	DO in GW typically does not exceed 13 mg/L
Turbidity;	0-800 NTU		

dna ENVIRONMENTAL

Groundwater Sampling Worksheet

Project Name: BHI Nikiski Tool
Client: Baker Hughes
Sampler: D. Frank, K. Boerner
Weather Conditions: Clear, sunny 25°F

Sample Location (ie. MW1): MW-09
Date: 2/16/16
Purge Start Time: 1700

Sample ID: 16-BNT-109-GW Time: 1750 (primary) dup split ms/msd
Sample ID: Time: primary dup split ms/msd
Sample ID: Time: primary dup split ms/msd

Analyses	Number/type of Bottles	Comments/ preservation:	Analyses	Number/type of Bottles	Comments/ preservation:
GRO/BTEX			Nitrate/Nitrite		
DRO			Sulfate		
RRO			Total Metals (Fe & Mg)		
DRO w/silica			Dissolved Metals (Fe & Mg)		
RRO w/silica			Alkalinity		
PAHs			Methane		

Well Information / Purge Volume Calculation

Well Casing Diameter (in): 2
Product Present? (y/n/sheen) No
Depth to Top of Product (ft BTOC): NA
Depth to Oil/Water Interface (ft BTOC): NA
(BTOC = below top of casing)

Total Well Depth (ft BTOC): 43.87 (depth to bottom)
Depth to Water (ft BTOC): 36.51
Water Column (ft) 7.36
One Purge Volume (gal): 1.18 x3 = 3.53
purge calculation formula on back

Sensory Observations

Color: Clear, Amber, Tan, Brown, Grey, Milky White, Other:
Odor: None, Low, Medium, High, Very Strong, H2S, Fuel Like, Chemical ?, Unknown
Turbidity: None, Low, Medium, High, Very Turbid, Heavy Silts

Instrument Observations

Round	Time	Volume (gal)	Temp °C	pH	Conductivity (mS/cm)	Turbidity (NTUs)	DO (mg/L)	ORP (mV)	Color	Odor	Water Level (ft BTOC)	Draw-down (ft)
1	1723	.75	4.67	6.44	0.139	647	8.57	46.9	tan	NO	36.58	0.07
2	1726	1.0	4.65	6.42	0.140	302	8.53	48.5	tan	NO	36.57	0.06
3	1730	1.25	4.65	6.39	0.141	138	8.08	44.2	tan	NO	36.57	0.06
4	1734	1.5	4.67	6.37	0.139		8.35	48.8	tan	NO	36.53	0.02
5	1739	2.0	4.68	6.36	0.137	74	8.40	52.4	clear	NO	36.54	0.03
6	1743	2.25	4.68	6.34	0.136	38	8.43	53.8	clear	NO	36.54	0.03
7	1747	3.0	4.71	6.32	0.136	27	8.23	54.4	clear	NO	36.54	0.03
8												
9												
10												
11												
12												

see back for additional entry lines if needed

Purge Rate (low flow): 285 L/min
Total Volume Purged: 3.5
Measured Drawdown (ft): 0.03

Notes: Drawdown should be less than 0.3 feet while sampling. Minimal drawdown shall be achieved and measured by pumping at a low rate (approximately 0.1 to 0.5 liter/minute) and continually measuring water levels in the well. Note that site's hyrogeology may make it difficult to achieve this specification.

Purge Method (disposable bailer, teflon bailer, submersible pump, etc.):
Sample Method (disposable bailer, teflon bailer, submersible pump, etc.):

Well Integrity (condition of casing, flush mount sealing properly, cement seal intact, etc.): Good

Remarks (well recovery, unusual conditions/observations):

Signed: Date:

Signed/Reviewer: Date:

Instrument Observations (continued)

Round	Time	Volume (gal)	Temp °C	pH	Conductivity ( )	Turbidity (NTUs)	DO (mg/L)	ORP (mV)	Color	Odor	Water Level (ft BTOC)	Draw-down (ft)
13												
14												
15												
16												
17												
18												
19												
20												
21												

Purge Rate (low flow): _____ L/min Total Volume Purged: _____ Measured Drawdown (ft): _____

Calculating Purge Volume

Well Casing Diameter:	Multiply c) by:
2	0.16
4	0.65
6	1.47

Sand Pack Diameter:	Multiply c) by:
8	0.71
10	1
12	1.28

Note: assuming sand pack has 29% porosity

Example 1- purging only well casing volume
You have 2-inch casing and 6-foot water column.
One Purge Volume= 0.16 X 6 = 0.96 gallons water

Example 2- purging well casing and sand pack volume
You have 2-inch casing, 8-inch sand pack, and 6-foot water column.
One Purge Volume= (0.16 X 6) + (0.71 X 6) = 5.22 gallons water

Criteria for Stable Parameters (three successive readings within stability critieria)

Parameter	Working Range	Stability Criteria	Notes
Temperature:	>0.00 °C	± 0.5 °C	
pH:	0-14	± 0.1	
Conductivity:	0-999 mS/m	± 5%	
ORP:	± 1999 mV		
Dissolved Oxygen:	0-19.99 mg/L	± 10%	DO in GW typically does not exceed 13 mg/L
Turbidity;	0-800 NTU		

dna ENVIRONMENTAL — Groundwater Sampling Worksheet

Project Name: BHI Nikiski Tool
Client: Baker Hughes
Sampler: D. Frank, K. Barnett
Weather Conditions: Clear, sunny, 20°F

Sample Location (ie. MW1): MW-10
Date: 2/16/16
Purge Start Time: 1805

Sample ID: 16-BNT-110-GW Time: 19 primary dup split ms/msd
Sample ID: _____ Time: _____ primary dup split ms/msd
Sample ID: _____ Time: _____ primary dup split ms/msd

Analyses	Number/type of Bottles	Comments/ preservation:	Analyses	Number/type of Bottles	Comments/ preservation:
GRO/BTEX			Nitrate/Nitrite		
DRO			Sulfate		
RRO			Total Metals (Fe & Mg)		
DRO w/silica			Dissolved Metals (Fe & Mg)		
RRO w/silica			Alkalinity		
PAHs			Methane		

Well Information / Purge Volume Calculation

Well Casing Diameter (in): 2
Product Present? (y/n/sheen) N
Depth to Top of Product (ft BTOC): NA
Depth to Oil/Water Interface (ft BTOC): NA
(BTOC = below top of casing)

Total Well Depth (ft BTOC): 42.26 (depth to bottom)
Depth to Water (ft BTOC): 37.71
Water Column (ft) 5.55
One Purge Volume (gal): 0.89 x3 = 2.66
purge calculation formula on back

Sensory Observations

Color: Clear, Amber, Tan, Brown, Grey, Milky White, Other:
Odor: None, Low, Medium, High, Very Strong, H2S, Fuel Like, Chemical ?, Unknown
Turbidity: None, Low, Medium, High, Very Turbid, Heavy Silts

Instrument Observations

Round	Time	Volume (gal)	Temp °C	pH	Conductivity mS/cm	Turbidity (NTUs)	DO (mg/L)	ORP (mV)	Color	Odor	Water Level (ft BTOC)	Draw-down (ft)
1	1845	1.5	4.24	6.19	0.151	61	8.58	84.5	clear	N	37.75	.04
2	1850	2.0	4.12	6.14	0.141	14	8.34	71.6	clear	N	37.75	.04
3	1855	2.25	4.07	6.11	0.136	11	8.30	69.1	clear	N	37.74	.03
4	1859	2.5	4.06	6.10	0.133	13	8.18	68.4	clear	N	37.74	.03
5	1900	2.75	4.01	6.08	0.129	14	8.13	70.1	clear	N	37.73	.02
6												
7												
8												
9												
10												
11												
12												

see back for additional entry lines if needed

Purge Rate (low flow): 245 L/min Total Volume Purged: 2.75 Measured Drawdown (ft): 0.03 KB 0.02

Notes: Drawdown should be less than 0.3 feet while sampling. Minimal drawdown shall be achieved and measured by pumping at a low rate (approximately 0.1 to 0.5 liter/minute) and continually measuring water levels in the well. Note that site's hyrogeology may make it difficult to achieve this specification.

Purge Method (disposable bailer, teflon bailer, submersible pump, etc.):
Sample Method (disposable bailer, teflon bailer, submersible pump, etc.):

Well Integrity (condition of casing, flush mount sealing properly, cement seal intact, etc.):

Remarks (well recovery, unusual conditions/observations):

Signed: _____ Date: _____

Signed/Reviewer: _____ Date: _____

Instrument Observations (continued)

Round	Time	Volume (gal)	Temp °C	pH	Conductivity ( )	Turbidity (NTUs)	DO (mg/L)	ORP (mV)	Color	Odor	Water Level (ft BTOC)	Draw-down (ft)
13												
14												
15												
16												
17												
18												
19												
20												
21												

Purge Rate (low flow): _____ L/min Total Volume Purged: _____ Measured Drawdown (ft): _____

Calculating Purge Volume

Well Casing Diameter:	Multiply c) by:
2	0.16
4	0.65
6	1.47

Sand Pack Diameter:	Multiply c) by:
8	0.71
10	1
12	1.28

Note: assuming sand pack has 29% porosity

Example 1- purging only well casing volume
You have 2-inch casing and 6-foot water column.
One Purge Volume= 0.16 X 6 = 0.96 gallons water

Example 2- purging well casing and sand pack volume
You have 2-inch casing, 8-inch sand pack, and 6-foot water column.
One Purge Volume= (0.16 X 6) + (0.71 X 6) = 5.22 gallons water

Criteria for Stable Parameters (three successive readings within stability critieria)

Parameter	Working Range	Stability Criteria	Notes
Temperature:	>0.00 °C	± 0.5 °C	
pH:	0-14	± 0.1	
Conductivity:	0-999 mS/m	± 5%	
ORP:	± 1999 mV		
Dissolved Oxygen:	0-19.99 mg/L	± 10%	DO in GW typically does not exceed 13 mg/L
Turbidity;	0-800 NTU		

ATTACHMENT 3

Soil Boring Logs & Well Construction Details

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SOIL BORING AND WELL CONSTRUCTION LOG

Boring Number: SB-19/MW-09
Project Number: 20275.002

Project Name BHI Nikiski Tool Phase II
Site Completions Facility
Client Baker Hughes
Field Scientist/Engineer Dan Frank
Date 2/15/2016
Weather
Total Depth 45 feet bgs
Boring Size N/A

Recovery Device
Device Diameter N/A
Sample Method
# of Samples 5
Drilling Company Discovery Drilling
Rig Type Geoprobe 7822
Hammer Drop & Weight N/A
Associated Points MW-09

X/Y Coordinates 2462033.0725/1407365.1691
X/Y Datum NAD83(2011) ASPZ4
Ground Elevation 129.3000
Elevation Datum NAVD88 Geoid 12A US ft
Extra Field Notes:

Headspace PID (ppm)	ANALYTICAL SAMPLES	ANALYTICAL DRO	SOIL DESCRIPTION AND NOTES	SOIL GRAPHIC	DEPTH (ft)	WATER LEVEL	WELL GRAPHIC	WELL DESCRIPTION
					0			
			GRAVELLY SAND WITH FINES (SW-SM); brown; dry; no odor; Sand lense 12-14 feet.		5			Bentonite
	16-BNT-SB19-01-SO				10			
					15			Soil Cuttings
	16-BNT-SB19-02-SO				20			
	16-BNT-SB19-FD01-SO		GRAVELLY SAND (SW); brown; damp; no odor.		25			
			GRAVELLY MEDIUM SAND (SP); dry to moist.					
	16-BNT-SB19-03-SO				30			
			SANDY COARSE GRAVEL WITH FINES (GP).		35			Bentonite
			SANDY GRAVEL (GP); wet; Wet at 38 feet.			▽		
	16-BNT-SB19-04-SO				40			0.010-inch Slot PVC Screen
			FINE TO MEDIUM SAND (SP); wet.		45			

End of Boring: 45 feet bgs.

SOIL BORING AND WELL CONSTRUCTION LOG

Boring Number: SB-20/MW-10
Project Number: 20275.002

Project Name BHI Nikiski Tool Phase II
Site Completions Facility
Client Baker Hughes
Field Scientist/Engineer Dan Frank
Date 2/15/2016
Weather
Total Depth 45 feet bgs
Boring Size N/A

Recovery Device
Device Diameter N/A
Sample Method
# of Samples 4
Drilling Company Discovery Drilling
Rig Type Geoprobe 7822
Hammer Drop & Weight N/A
Associated Points MW-10

X/Y Coordinates 2462215.9945/1407477.5004
X/Y Datum NAD83(2011) ASPZ4
Ground Elevation 130.7000
Elevation Datum NAVD88 Geoid 12A US ft
Extra Field Notes:

Headspace PID (ppm)	ANALYTICAL SAMPLES	ANALYTICAL DRO	SOIL DESCRIPTION AND NOTES	SOIL GRAPHIC	DEPTH (ft)	WATER LEVEL	WELL GRAPHIC	WELL DESCRIPTION
					0			
			GRAVELLY FINE SAND (SP); dry; Top 6 inches frozen..					Bentonite
			SAND (SP); dry.		5			
			GRAVELLY FINE SAND (SP); dry.					
	16-BNT-SB20-01-SO				10			
					15			
			(NO CORE).					Soil Cuttings
					20			
	16-BNT-SB20-02-SO		GRAVELLY FINE TO MEDIUM SAND (SP); dry to wet; Wet at 38 feet bgs.					
					25			
	16-BNT-SB20-03-SO							
					30			
					35			Bentonite
	16-BNT-SB20-04-SO					▽		
					40			0.010-inch Slot PVC Screen
					45			

End of Boring: 45 feet bgs.

ATTACHMENT 4

Tables

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TABLE 1: MONITORING WELL CONSTRUCTION AND LAND SURVEY DETAILS
Quarterly Monitoring and Additional Characterization Report – February 2016
Nikiski Completions Facility
Baker Hughes Oil Field Services, Inc.
Nikiski, Alaska

Well ID	Installaton Date	Well Construction Details								Initial Groundwater Depth (DTW bgs)*
		Surface Completion	Screen	Boring Diameter (inches)	Casing Diameter (inches)	Depth to Top of Screen (bgs)	Depth to Bottom of Screen (bgs)	Screen Length	Total Depth (bgs)*	
2016 Site Characterization										
BHI-MW-09	2/15/16	Flush	0.010-inch Slot PVC	7	2	35.00	45.00	10.00	45.00	38.0
BHI-MW-10	2/15/16					35.00	45.00	10.00	45.00	38.0

Well ID	Survey Date	Well Survey Details				Measured Stickup Height	Top of Screen (BTOC)	Bottom of Screen (BTOC)	Total Depth (BTOC)**	Initial Groundwater Depth (DTW BTOC)**
		Northing[2]	Easting[2]	Ground Surface Elevation[1]	Measuring Point/TOC Elevation[1]					
2016 Site Characterization										
BHI-MW-09	2/15/16	2462033.0725	1407365.1691	129.3000	128.9500	-0.35	34.36	44.36	44.36	36.60
BHI-MW-10	2/15/16	2462215.9945	1407477.5004	130.7000	130.1600	-0.54	34.08	44.08	44.08	37.77

Notes:

All measurements are in units of feet.

[1] Elevations are NAVD88 as determined by Geoid 12A, expressed in U.S. Feet.

[2] Coordinates are Alaska State Plane Zone 4, NAD83(2011) (EPOCH 2010.0000) in U.S. Feet.

Survey conducted by DOWL, LLC on February 15, 2016

* Recorded during soil boring installation

** Recorded afterwell development for TD, or before well development or sample purge for DTW.

Key:

-- = None measured

bgs = Below ground surface

BTOC = Below top of casing, a.k.a. below measuring point (MP)

DTW = Depth to water

MW = Monitoring well

TOC = Top of casing, a.k.a measuring point

TABLE 2: GROUNDWATER ELEVATION DATA
Quarterly Monitoring and Additional Characterization Report – February 2016
Nikiski Completions Facility
Baker Hughes Oil Field Services, Inc.
Nikiski, Alaska

Well ID	Survey Data		Well Design		Field Measurements				Water Elevation (feet AMSL)	Groundwater Interface within Screening Interval?
	Ground Elevation (feet AMSL)	Measuring Point/TOC Elevation (feet AMSL)	Top of Screen (BTOC)	Bottom of Screen (BTOC)	Gauge Date	Depth to LNAPL (BTOC)	Depth to Water (BTOC)	TD (BTOC)		
ON-SITE WELLS										
BHI-MW-01	132.55	131.88	33.38	43.38	2/16/16	--	39.36	43.76	92.52	Yes
BHI-MW-02	134.14	133.50	33.78	43.78	2/16/16	--	40.98	44.00	92.52	Yes
BHI-MW-03(T)	133.37	132.69	34.28	44.28	2/15/16	--	40.25	44.00	92.44	Yes
BHI-MW-04	133.64	133.36	39.22	49.22	2/15/16	--	40.81	49.33	92.55	Yes
BHI-MW-05	134.56	133.99	37.28	47.28	2/15/16	--	41.19	47.30	*92.80*	Yes
BHI-MW-06(T)	127.00	126.52	36.52	46.52	2/16/16	--	33.99	46.06	92.53	No
BHI-MW-07	141.64	141.10	46.19	56.19	2/15/16	--	48.63	56.22	92.47	Yes
BHI-MW-08(T)	132.34	131.82	37.49	47.49	2/15/16	--	39.34	47.56	92.48	Yes
BHI-MW-09	129.30	128.95	34.36	44.36	2/16/16		36.51	43.87	92.44	Yes
BHI-MW-10	130.70	130.16	34.08	44.08	2/16/16		37.71	43.26	92.45	Yes
OFF-SITE WELLS										
OLD MCGAHAN WELL	140.20	138.56	UNKNOWN		2/15/16	--	46.05	--	92.51	NA
TUBOSCOPE WATER WELL	129.80	130.10	UNKNOWN		2/16/16	--	37.58	--	92.52	NA

Notes:
All measurements are in units of feet.
(T) = Transducer present in well.

Key:
-- = Not present
AMSL = Above Mean Sea Level
BTOC = Below top of casing, a.k.a. below measuring point
LNAPL = Light non-aqueous phase liquid
NA = Not available
NR = not recorded
TD = Total Depth

0.11
1.32

TABLE 3: GROUNDWATER ELEVATION TREND
Quarterly Monitoring and Additional Characterization Report – February 2016
Nikiski Completions Facility
Baker Hughes Oil Field Services, Inc.
Nikiski, Alaska

Well ID	Survey Data		Field Measurements		Groundwater Elevation (feet AMSL)	TD (BTOC)
	Ground Elevation (feet AMSL)	Measuring Point/TOC Elevation (feet AMSL)	Gauge Date	Depth to Water (BTOC)		
BHI-MW-01	133.70	133.14	5/16/14	37.90	95.24	43.92
			8/5/14	38.45	94.69	43.80
	132.55	131.88	5/21/15	40.29	91.59	43.89
			8/29/15	40.98	90.90	44.32
			12/11/15	39.09	92.79	43.89
			2/16/16	39.36	92.52	43.76
BHI-MW-02	135.49	134.77	5/16/14	39.47	95.30	44.02
			8/5/14	40.11	94.66	43.90
	134.14	133.50	5/21/15	41.91	91.59	44.00
			8/29/15	42.58	90.92	43.92
			12/11/15	40.67	92.83	43.98
			2/16/16	40.98	92.52	44.00
BHI-MW-03(T)	134.66	133.94	5/16/14	38.65	95.29	44.50
			8/5/14	39.26	94.68	43.90
	133.37	132.69	5/21/15	41.12	91.57	44.03
			6/8/15	41.12	91.57	--
			8/28/15	41.79	90.90	43.90
			12/11/15	39.89	92.80	43.89
			2/15/16	40.25	92.44	44.00
BHI-MW-04	133.64	133.36	5/20/15	41.74	91.62	49.22
			8/28/15	42.45	90.91	49.38
			12/11/15	40.45	92.91	49.16
			2/15/16	40.81	92.55	49.33
BHI-MW-05	134.56	133.99	5/20/15	42.39	91.60	47.35
			8/29/15	43.09	90.90	47.25
			12/10/15	41.19	92.80	47.30
			2/15/16	41.19	92.80	47.30
BHI-MW-06(T)	127.00	126.52	5/21/15	34.87	91.65	46.52
			6/8/15	34.94	91.58	--
			8/29/15	35.55	90.97	46.00
			12/10/15	33.67	92.85	46.06
			2/16/16	33.99	92.53	46.06
BHI-MW-07	141.64	141.10	5/21/15	49.56	91.54	56.19
			8/28/15	50.25	90.85	56.59
			12/11/15	48.32	92.78	56.18
			2/15/16	48.63	92.47	56.22
BHI-MW-08(T)	132.34	131.82	5/21/15	40.20	91.62	47.54
			6/8/15	40.23	91.59	--
			8/29/15	40.90	90.92	47.50
			12/11/15	39.00	92.82	47.52
			2/15/16	39.34	92.48	47.56
BHI-MW-09	129.30	128.95	2/15/16	36.51	92.44	43.87
BHI-MW-10	130.70	130.16	2/16/16	37.71	92.45	43.26

Notes:
All measurements are in units of feet.
(T) = Transducer present in well.

Key:
-- = Not present
AMSL = Above Mean Sea Level
BTOC = Below top of casing, a.k.a. below measuring point
NA = Not available
NR = not recorded

TABLE 4: FIELD-COLLECTED GROUNDWATER QUALITY PARAMETERS
Quarterly Monitoring and Additional Characterization Report – February 2016
Nikiski Completions Facility
Baker Hughes Oil Field Services, Inc.
Nikiski, Alaska

Well ID	Purge/ Sample Date	Sample Method	Color	Odor	Temperature (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	DO (mg/L)	ORP (mV)
BHI-MW-01	2/16/16	Dedicated SS Bladder Pump/ low flow	clear	none	4.74	5.43	0.169	30.1	6.21	176.3
BHI-MW-02	2/16/16	SS Mega-Monsoon XL pump / low flow	tan	none	6.29	5.88	0.072	60.3	10.40	147.5
BHI-MW-03	2/15/16	Dedicated SS Bladder Pump/ low flow	milky white	none	5.29	5.79	0.117	39.9	8.12	-4.5
BHI-MW-04	2/15/16		clear	none	4.94	5.84	0.150	6.28	5.68	101.4
BHI-MW-05	2/15/16		*Surface completion frozen, not purged/sampled.*							
BHI-MW-06	2/16/16		clear	none	4.59	5.21	0.110	26.4	7.21	208.4
BHI-MW-07	2/15/16		clear	none	4.46	6.04	0.121	21.9	7.93	-5.8
BHI-MW-08	2/15/16		tan	none	4.69	6.14	0.082	83.5	10.41	3.9
BHI-MW-09	2/16/16		clear	none	4.71	6.32	0.136	27.0	8.23	54.4
BHI-MW-10	2/16/16		clear	none	4.01	6.08	0.129	14.0	8.13	70.1

Key:

°C = Degrees Celsius
DO = Dissolved oxygen
mg/L = Milligrams per liter
mS/cm = milli-siemens per centimeter
mV = Millivolts
MW = Monitoring well
NTU = Nephelometric Turbidity Units
ORP = Oxidation-reduction potential
SS = Stainless Steel

5.86 8.04 83.52

TABLE 5: SAMPLE COLLECTION SUMMARY
Quarterly Monitoring and Additional Characterization Report – February 2016
Nikiski Completions Facility
Baker Hughes Oil Field Services, Inc.
Nikiski, Alaska

Location	Sample No.	Target Sample Depth Range (Feet bgs)	Duplicate	MS/MSD	Sample Date	Sample Time	Analysis: Halogenated Volatiles[1] (EPA 8260C)
Soil Samples							
SB-19 (MW-09)	16-BNT-SB19-01-SO	5-10			2/15/16	0920	✓
	16-BNT-SB19-02-SO	15-20			2/15/16	1015	✓
	16-BNT-SB19-FD01-SO		✓		2/15/16	1200	✓
	16-BNT-SB19-03-SO	'25-30			2/15/16	1040	✓
	16-BNT-SB19-04-SO	35-40			2/15/16	1120	✓
SB-20 (MW-10)	16-BNT-SB20-01-SO	5-10			2/15/16	1355	✓
	16-BNT-SB20-02-SO	15-20			2/15/16	1440	✓
	16-BNT-SB20-03-SO	25-30			2/15/16	1500	✓
	16-BNT-SB20-04-SO	40-45			2/15/16	1535	✓
Lab Provided Trip Blank	Trip Blank	--			Laboratory Assigned		✓
Groundwater Samples							
MW-01	16-BNT-107-GW	--			2/16/16	1630	✓
	16-BNT-108-GW	--	✓		2/16/16	1200	✓
MW-02	16-BNT-106-GW	--			2/16/16	1515	✓
MW-03	16-BNT-103-GW	--			2/15/16	1530	✓
MW-04	16-BNT-101-GW	--			2/15/16	1220	✓
MW-05	*frozen surface completion, not sampled*						
MW-06	16-BNT-105-GW	--			2/16/16	1112	✓
MW-07	16-BNT-104-GW	--		✓	2/15/16	1615	✓
MW-08	16-BNT-102-GW	--			2/15/16	1350	✓
MW-09	16-BNT-109-GW	--			2/16/16	1750	✓
MW-10	16-BNT-110-GW	--			2/16/16	1900	✓
Lab Provided Trip Blank	Trip Blank	--			Laboratory Assigned		✓

Notes:

[1] = Analysis for TCE, 1,1,1-TCA, and PCE only.

Key:

1,1,1-TCA = 1,1,1-Trichloroethane
BNT = Baker Nikiski Tool
EPA = United States Environmental Protection Agency
GW = Groundwater
MS/MSD = Matrix spike/matrix duplicate spike
MW = Monitoring Well
PCE = Tetrachloroethene
SIM - Selective Ion Monitoring
TCE = Trichloroethene

TABLE 6: SOIL SAMPLE ANALYTICAL RESULTS SUMMARY
Quarterly Monitoring and Additional Characterization Report – February 2016
Nikiski Completions Facility
Baker Hughes Oil Field Services, Inc.
Nikiski, Alaska

Location	Sample No. (16-BNT-)	Target Sample Depth Range (Feet bgs)	Duplicate	Halogenated Volatiles (EPA 8260C SIM[2]) (mg/kg)		
				1,1,1-TCA	TCE	PCE
ADEC Cleanup Levels[1] (mg/kg):				***0.82 (32.4)***	***0.020 (0.0111)***	***0.024 (0.19)***
EPA Recommended Target Levels (mg/kg):				*NA*	***5.2***	*NA*
SB-19 (MW-09)	SB19-01-SO	5-10		ND (0.0526)	ND (0.0526) X	ND (0.0526) X
	SB19-02-SO	15-20		ND (0.0620)	ND (0.0620) X	ND (0.0620) X
	SB19-FD01-SO		✓	ND (0.0590) H	ND (0.0590) H, X	ND (0.0590) X
	SB19-03-SO	'25-30		ND (0.0602)	ND (0.0602) X	ND (0.0602) X
	SB19-04-SO	35-40		ND (0.0598)	ND (0.0598) X	ND (0.0598) X
SB-20 (MW-10)	SB20-01-SO	5-10		ND (0.0631)	ND (0.0631) X	ND (0.0631) X
	SB20-02-SO	15-20		ND (0.0729)	ND (0.0729) X	ND (0.0729) X
	SB20-03-SO	25-30		ND (0.0628) H	ND (0.0628) H,X	ND (0.0628) X
	SB20-04-SO	40-45		ND (0.0640) H	ND (0.0640) H,X	ND (0.0640) X

Notes: Detections above ADEC cleanup values are underlined & bolded.
[1] = 18 AAC 75.345, Proposed values in parenthesis.
[2] = Analysis for TCE, 1,1,1-TCA, and PCE only.

Key:
1,1,1-TCA = 1,1,1-Trichloroethane
ADEC = Alaska Department of Environmental Conservation
AK = Alaska
bgs = below ground surface
BNT = Baker Nikiski Tool
EPA = United States Environmental Protection Agency
FD = Field Duplicate
mg/kg = Milligrams per kilogram
MW = Monitoring well
ND = Analyte not detected above the reporting detection limit (RDL)/limit of quantitation (LOQ)
PCE = Tetrachloroethene
SB = Soil Boring
SIM = Selective ion monitoring
SO = Soil
TCE = Trichloroethene
VOC = Volatile organic compounds

Data Flags
H - Method holding times were exceeded, results may be biased low.
J = Estimated Value
X = Analyte was not detected and MRLs exceeded, the applicable ADEC Migration to Groundwater Soil Cleanup Level.

TABLE 8: CLORINATED HYDROCARBONS CONCENTRATION TRENDS – GROUNDWATER
Quarterly Monitoring and Additional Characterization Report – February 2016
Nikiski Completions Facility
Baker Hughes Oil Field Services, Inc.
Nikiski, Alaska

Well ID	Sample No.	Sample Date	Duplicate	Halogenated Volatiles (EPA 8260C; mg/L)		
				1,1,1-TCA	TCE	PCE
ADEC Groundwater Cleanup Level[1][2]:				***0.2 (8.010)***	***0.005 (0.00282)[3]***	***0.005 (0.0406)***
BHI-MW-01	14-BHI-103-GW	5/16/14		0.0017	**0.043**	ND (0.00020)
	14-BHI-202-GW	8/5/14		0.0015	**0.031**	ND (0.00020)
	14-BHI-203-GW	8/5/14	✓	0.0017	**0.034**	ND (0.00020)
	15-BNT-103-GW	5/21/15		0.0023	**0.018**	ND (0.0002)
	15-BNT-FD101-GW	5/21/15	✓	0.0024	**0.019**	ND (0.0002)
	15-BNT-208-GW	8/29/15		0.006	**0.022**	ND (0.00020)
	15-BNT-209-GW	8/29/15	✓	0.0059	**0.023**	ND (0.00020)
	15-BNT-303-GW	12/11/15		ND (0.00020)	**0.016**	ND (0.00020)
	15-BNT-304-GW	12/11/15	✓	ND (0.00020)	**0.016**	ND (0.00020)
	16-BNT-107-GW	2/16/16		0.00150	**0.0216**	ND (0.0010)
	16-BNT-108-GW	2/16/16	✓	0.00147	**0.0211**	ND (0.0010)
BHI-MW-02	14-BHI-106-GW	5/16/14		0.00033	0.0029	ND (0.00020)
	14-BHI-201-GW	8/5/14		0.0003	0.0025	ND (0.00020)
	15-BNT-104-GW	5/21/15		0.00026	0.0024	ND (0.0002)
	15-BNT-204-GW	8/28/15		0.00031	0.0025	ND (0.00020)
	15-BNT-306-GW	12/11/15		0.00027	0.0025	ND (0.00020)
	16-BNT-106-GW	2/16/16		ND (0.0010)	0.00226	ND (0.0010)
BHI-MW-03[T]	14-BHI-101-GW	5/16/14		0.00029	0.00067	ND (0.00020)
	14-BHI-102-GW	5/16/14	✓	0.00029	0.00069	ND (0.00020)
	14-BHI-204-GW	8/6/14		0.00049	0.001	ND (0.00020)
	15-BNT-105-GW	5/21/15		0.00026	0.00088	ND (0.0002)
	15-BNT-201-GW	8/28/15		0.00025	0.0006	ND (0.00020)
	15-BNT-301-GW	12/1015		ND (0.00020)	0.00075	ND (0.00020)
	16-BNT-103-GW	2/15/16		ND (0.0010)	0.00149 B	ND (0.0010)
BHI-MW-04	15-BNT-101-GW	5/20/15		0.005	0.0018	0.00027
	15-BNT-207-GW	8/29/15		0.0075	0.0047	0.00059
	NS	12/10/15		*frozen pump lines, not sampled*		
	16-BNT-101-GW	2/15/16		0.00522	0.00295 B	ND (0.0010)
BHI-MW-05	15-BNT-102-GW	5/20/15		0.0014	0.0019	ND (0.0002)
	15-BNT-206-GW	8/28/15		0.002	0.0021	ND (0.00020)
	15-BNT-302-GW	12/10/15		ND (0.00020)	0.0014	ND (0.00020)
	NS			*frozen surface access, not sampled*		
BHI-MW-06[T]	15-BNT-107-GW	5/21/15		ND (0.0002)	ND (0.0002)	ND (0.0002)
	15-BNT-202-GW	8/28/15		ND (0.00020)	ND (0.00020)	ND (0.00020)
	15-BNT-308-GW	12/11/15		ND (0.00020)	ND (0.00020)	ND (0.00020)
	16-BNT-105-GW	2/16/16		ND (0.0010)	ND (0.0010)	ND (0.0010)
BHI-MW-07	15-BNT-106-GW	5/21/15		0.00037	ND (0.0002)	ND (0.0002)
	15-BNT-205-GW	8/28/15		0.00043	ND (0.00020)	ND (0.00020)
	15-BNT-307-GW	12/11/15		ND (0.00020)	ND (0.00020)	ND (0.00020)
	16-BNT-104-GW	2/15/16		0.000361 J	0.000495 BJ	ND (0.0010)
BHI-MW-08[T]	15-BNT-108-GW	5/21/15		0.0073	0.00065	ND (0.0002)
	15-BNT-203-GW	8/28/15		0.013	0.00091	ND (0.00020)
	15-BNT-305-GW	12/11/15		0.012	0.00065	ND (0.00020)
	16-BNT-102-GW	2/15/16		0.00947	0.001 BJ	ND (0.0010)
BHI-MW-09	16-BNT-109-GW	2/16/16		ND (0.0010)	ND (0.0010)	ND (0.0010)
BHI-MW-10	16-BNT-110-GW	2/16/16		0.00458	ND (0.0010)	ND (0.0010)

Notes: Results above ADEC cleanup values are **underlined & bolded**.

[1] 18 AAC 75.345, Table C
[2] Value in parentheses are ADEC proposed cleanup levels as of August 2015.
[3] EPA Recommended Target Level is 0.0025 mg/L.
[T] Transducer present in well.

Key:

1,1,1-TCA = 1,1,1-Trichloroethane
ADEC = Alaska Department of Environmental Conservation
BNT = Baker Nikiski Tool
EPA = United States Environmental Protection Agency
GW = Groundwater
mg/L = milligrams per liter
MW = Monitoring well
ND = non-detect, Reported Detection Limit provided in parenthesis
NS = not sampled
PCE = Tetrachloroethene
SIM = Selective ion monitoring
TCE = Trichloroethene

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ATTACHMENT 5

DOWL Land Survey Report

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2016 BAKER HUGHES NIKISKI COMPLETIONS FACILITY

NIKISKI, ALASKA

SURVEYING REPORT

Prepared for:

DNA Environmental, LLC.
1105 East 11th Ave, Suite 4
Anchorage, Alaska 99501

Prepared by:

DOWL
4041 B Street
Anchorage, Alaska 99503
(907) 562-2000

DOWL Project Number 1133.62015.01

February 24, 2016

2016 BAKER HUGHES NIKISKI COMPLETIONS FACILITY

TABLE OF CONTENTS

LIST OF ACRONYMS

GPS .....Global Positioning System

RTK.....Real Time Kinematic GPS

SURVEY SUMMARY

1.0 INTRODUCTION

This project consisted of locating (2) newly installed groundwater monitoring wells along with associated soil boring locations, and locating (2) drinking water wells all at or near the Baker Hughes completions facility in Nikiski, Alaska. This project is the continuation of a monitoring project commenced in May of 2014, readdressed May 2015, and the latest installment this February 2016, with the 2014 work being under a separate sub-consultant agreement with a separate contractor. In November 2014 under a direct contract with the Kenai Peninsula Borough, DOWL provided ground water information for numerous wells in the Nikiski area, including some of these wells. During that survey there were some discrepancies noticed between the two datasets. During the May 2015 survey, a new OPUS solution was performed to clarify the differences. It was determined that the OPUS solution from the 2014 Baker Survey did not agree with the OPUS solution from the 2015 Baker survey. This survey reflects the use of the new 2015 OPUS solution that agrees with DOWL Nikiski Ground water survey performed in November of 2014. The OPUS report is attached for future use.

2.0 HORIZONTAL CONTROL SUMMARY

A field survey was performed by DOWL on February 15th, 2015 by of A. Willie Stoll, PLS. Positions for all of the site features were performed using Real Time Kinematic (RTK) GPS. Positions for all features located have location accuracy better than 0.2-feet.

3.0 VERTICAL CONTROL SUMMARY

Closed digital Differential level loops were ran from the control monument, to all of the features located. Elevations were established at each Monitoring well on the lip of the casing, and on the interior surface of the PVC pipe. Elevations were established for the soil borings at the existing ground surface. At the newly located water wells, an elevation was established at the rim of the well casing. The differential level loop performed to determine the elevations had a misclosure of less than 0.02' as outlined in the attached Level Processing Summary. The reported ground elevations were determined using RTK GPS.

4.0 SURVEYOR'S CERTIFICATION

I, A. William Stoll, Alaska Land Surveyor #12041, do hereby certify that the information contained herein is the result of work performed by me or by others working under our direct supervision.

5.0 SURVEY POINT LISTING

"BHI-MW-01" & "SB-04"
NAD83(2011) (EPOCH 2010.0000)
60° 43' 57.98901" N
151° 18' 04.54883" W
Top of Case=132.21'
Top of PVC Pipe=131.88'
Ground Elevation=132.6'
***May 2015 Surveyed Value**

"BHI-MW-02" & "SB-05"
NAD83(2011) (EPOCH 2010.0000)
60° 43' 56.87553" N
151° 18' 00.75928" W
Top of Case=133.70'
Top of PVC Pipe=133.50'
Ground Elevation=134.1'
***May 2015 Surveyed Value**

"BHI-MW-03" & "SB-06"
NAD83(2011) (EPOCH 2010.0000)
60° 43' 56.40137" N
151° 18' 04.80659" W
Top of Case=132.87'
Top of PVC Pipe=132.69'
Ground Elevation=133.4'
***May 2015 Surveyed Value**

"BHI-MW-04" & "SB-08"
NAD83(2011) (EPOCH 2010.0000)
60° 43' 57.79373" N
151° 18' 02.59508" W
Top of Case=133.61'
Top of PVC Pipe=133.36'
Ground Elevation=133.6'
***May 2015 Surveyed Value**

2016 BAKER HUGHES NIKISKI COMPLETIONS FACILITY

“BHI-MW-05” & “SB-09”
NAD83(2011) (EPOCH 2010.0000)
60° 43' 57.25109" N
151° 18' 02.67084" W
Top of Case=134.41’
Top of PVC Pipe=133.99’
Ground Elevation=134.6’
***May 2015 Surveyed Value**

“BHI-MW-06” & “SB-07”
NAD83(2011) (EPOCH 2010.0000)
60° 43' 59.35795" N
151° 18' 09.30790" W
Top of Case=126.79’
Top of PVC Pipe=126.52’
Ground Elevation=127.0’
***May 2015 Surveyed Value**

“BHI-MW-07” & “SB-16”
NAD83(2011) (EPOCH 2010.0000)
60° 43' 55.54759" N
151° 18' 00.56970" W
Top of Case=141.47’
Top of PVC Pipe=141.10’
Ground Elevation=141.6’
***May 2015 Surveyed Value**

“BHI-MW-08” & “SB-18”
NAD83(2011) (EPOCH 2010.0000)
60° 43' 59.13570" N
151° 18' 01.64244" W
Top of Case=132.22’
Top of PVC Pipe=131.82’
Ground Elevation=132.3’
***May 2015 Surveyed Value**

2016 BAKER HUGHES NIKISKI COMPLETIONS FACILITY

“McGhann Test Well”
NAD83(2011) (EPOCH 2010.0000)
60° 43' 55.44320" N
151° 18' 06.41612" W
Top of Case=138.65’
Ground Elevation=135.6’
***May 2015 Surveyed Value**

“McGhann Abandoned”
NAD83(2011) (EPOCH 2010.0000)
60° 43' 53.02088" N
151° 18' 01.96405" W
Top of Case=138.56’
Ground Elevation=140.2’
***May 2015 Surveyed Value**

“SB-10”
NAD83(2011) (EPOCH 2010.0000)
60° 43' 57.97958" N
151° 18' 05.06473" W
Ground Elevation=132.6’
***May 2015 Surveyed Value**

“SB-11”
NAD83(2011) (EPOCH 2010.0000)
60° 43' 57.95075" N
151° 18' 04.01558" W
Ground Elevation=132.8’
***May 2015 Surveyed Value**

2016 BAKER HUGHES NIKISKI COMPLETIONS FACILITY

“SB-12”
NAD83(2011) (EPOCH 2010.0000)
60° 43' 58.22735" N
151° 18' 04.54354" W
Ground Elevation=132.2’
***May 2015 Surveyed Value**

“SB-13”
NAD83(2011) (EPOCH 2010.0000)
60° 43' 57.13470" N
151° 18' 00.74348" W
Ground Elevation=133.9’
***May 2015 Surveyed Value**

“SB-14”
NAD83(2011) (EPOCH 2010.0000)
60° 43' 56.86681" N
151° 18' 00.25777" W
Ground Elevation=133.9’
***May 2015 Surveyed Value**

“SB-15”
NAD83(2011) (EPOCH 2010.0000)
60° 43' 56.62951" N
151° 18' 00.75180" W
Ground Elevation=134.5’
***May 2015 Surveyed Value**

2016 BAKER HUGHES NIKISKI COMPLETIONS FACILITY

“SB-17”
NAD83(2011) (EPOCH 2010.0000)
60° 43' 59.71381" N
151° 17' 57.09998" W
Ground Elevation=170.2’
***May 2015 Surveyed Value**

“MW-09”
NAD83(2011) (EPOCH 2010.0000)
60° 43' 57.94219" N
151° 18' 07.56516" W
Top of Case=129.30’
Top of PVC Pipe=128.95’
Ground Elevation=129.3’
***February 2016 Value**

“MW-10”
NAD83(2011) (EPOCH 2010.0000)
60° 43' 59.76521" N
151° 18' 05.37933" W
Top of Case=130.45’
Top of PVC Pipe=130.16’
Ground Elevation=130.7’
***February 2016 Value**

“Tuboscope Well”
NAD83(2011) (EPOCH 2010.0000)
60° 43' 57.29254" N
151° 18' 22.17292" W
Top of Case=130.10’
Ground Elevation=129.8’
***February 2016 Value**

2016 BAKER HUGHES NIKISKI COMPLETIONS FACILITY

“Water Well”
NAD83(2011) (EPOCH 2010.0000)
60° 43' 54.59242" N
151° 18' 05.57313" W
Top of Case=136.16’
Ground Elevation=134.3’
***February 2016 Value**

“Ground Elevation Point”
NAD83(2011) (EPOCH 2010.0000)
60° 43' 48.67992" N
151° 18' 07.83715" W
Ground Elevation=176.1’
***February 2016 RTK GPS derived Elevation**

FILE: 2___1410.15o OP1432311278788

2005 NOTE: The IGS precise and IGS rapid orbits were not available
2005 at processing time. The IGS ultra-rapid orbit was/will be used to
2005 process the data.
2005

NGS OPUS SOLUTION REPORT
==========

All computed coordinate accuracies are listed as peak-to-peak values.
For additional information: http://www.ngs.noaa.gov/OPUS/about.jsp#accuracy

USER: wstoll@dowl.com DATE: May 22, 2015
RINEX FILE: 2___141s.15o TIME: 16:15:25 UTC

SOFTWARE: page5 1209.04 master93.pl 022814 START: 2015/05/21 18:11:00
EPHEMERIS: igu18454.eph [ultra-rapid] STOP: 2015/05/21 22:54:00
NAV FILE: brdc1410.15n OBS USED: 11718 / 12526 : 94%
ANT NAME: LEIAT502 NONE # FIXED AMB: 58 / 62 : 94%
ARP HEIGHT: 1.479 OVERALL RMS: 0.016(m)

REF FRAME: NAD_83(2011)(EPOCH:2010.0000) IGS08 (EPOCH:2015.3859)

X:	-2742136.866(m)	0.013(m)	-2742137.938(m)	0.013(m)
Y:	-1501193.119(m)	0.015(m)	-1501192.111(m)	0.015(m)
Z:	5540884.567(m)	0.018(m)	5540884.830(m)	0.018(m)

LAT:	60 43 57.92100	0.021(m)	60 43 57.91229	0.021(m)
E LON:	208 41 55.19856	0.011(m)	208 41 55.10626	0.011(m)
W LON:	151 18 4.80144	0.011(m)	151 18 4.89374	0.011(m)
EL HGT:	45.161(m)	0.009(m)	45.614(m)	0.009(m)
ORTHO HGT:	40.396(m)	0.016(m) [NAVD88 (Computed using GEOID12B)]		

	UTM COORDINATES (UTM (Zone 05))	STATE PLANE COORDINATES (SPC (5004 AK 4))
Northing (Y) [meters]	6734219.140	750427.695
Easting (X) [meters]	592637.546	429007.626
Convergence [degrees]	1.48193393	-1.13526394
Point Scale	0.99970515	0.99996174
Combined Factor	0.99969808	0.99995467

US NATIONAL GRID DESIGNATOR: 5VNH9263734219(NAD 83)

BASE STATIONS USED

PID	DESIGNATION	LATITUDE	LONGITUDE	DISTANCE(m)
DO1812	AC51 STRANDLINEAK2007 CORS ARP	N612953.103	W1515007.161	90019.3
DL6498	ANC2 ANC AIRPORT 2 CORS ARP	N611030.813	W1495900.298	86776.4
DM7484	AC23 SOLDOTNA__AK2007 CORS ARP	N602830.337	W1505240.545	36908.0

NEAREST NGS PUBLISHED CONTROL POINT

UW5907 KISH N604437.588 W1511740.209 1281.7

This position and the above vector components were computed without any knowledge by the National Geodetic Survey regarding the equipment or field operating procedures used.

- when it has to be right

Level Summary
1133.62015.01 Baker Hughes 2016 LEV01

02/24/2016 10:02:10

Project Information

Project name:	1133.62015.01 Baker Hughes 2016 LEV01
Date created:	02/24/2016 08:39:47
Application software:	LEICA Geo Office 8.3

02-15-16

Line length:	3675.8910 fts
Method:	BF
Start point id:	MW01
Number of stations:	21
Date/time:	02/24/2016 18:19:50
Number of observations:	42

Processing Parameters

Adjustment method:	by distance
Processed with Staff Corrections:	No
Height difference:	0.0170 fts

Tolerance	Permitted [fts]	Actual [fts]	Accepted
Misclosure	0.0417	0.0170	✓
Height error per station	0.0016	0.0008	✓
Distance balance	32.8083	54.6710	✗

Points

Point Id	Epoch	Height [fts]	Corr [fts]	Delta Hgt. [fts]	Point Class	Sd. Hgt. [fts]
MW01	02/24/2016 18:19:51	132.0800	-	-	Control	-
9	02/24/2016 18:19:54	129.3619	-0.0011	-2.7181	Measured	-
9A	02/24/2016 18:19:58	129.0008	-0.0012	-0.3612	Measured	-
9B	02/24/2016 18:20:02	128.9486	-0.0014	-0.0522	Measured	-
1001	02/24/2016 18:20:06	131.5636	-0.0034	2.6150	Measured	-
1002	02/24/2016 18:20:10	128.8373	-0.0047	-2.7263	Measured	-
11	02/24/2016 18:20:14	130.1033	-0.0058	1.2659	Measured	-
1003	02/24/2016 18:20:18	128.8432	-0.0068	-1.2601	Measured	-
1004	02/24/2016 18:20:22	131.5058	-0.0081	2.6627	Measured	-
1005	02/24/2016 18:20:26	130.9285	-0.0105	-0.5774	Measured	-
1006	02/24/2016 18:20:30	134.5584	-0.0116	3.6299	Measured	-
12	02/24/2016 18:20:34	136.1593	-0.0117	1.6009	Measured	-
12A	02/24/2016 18:20:38	134.2782	-0.0118	-1.8811	Measured	-
1007	02/24/2016 18:20:42	134.5581	-0.0118	0.2799	Measured	-
MW03	02/24/2016 18:20:46	132.8773	-0.0127	-1.6809	Measured	-

1	02/24/2016 18:20:50	132.5165	-0.0135	-0.3608	Measured	-
13.FF	02/24/2016 18:20:54	134.7281	-0.0139	2.2116	Measured	-
10	02/24/2016 18:20:58	130.4386	-0.0154	-4.2895	Measured	-
10-A	02/24/2016 18:21:02	130.2175	-0.0155	-0.2212	Measured	-
10-B	02/24/2016 18:21:06	130.1573	-0.0157	-0.0602	Measured	-
1008	02/24/2016 18:21:10	132.7876	-0.0164	2.6303	Measured	-
MW01	02/24/2016 18:21:14	132.0800	-	-0.7076	Control	-

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ATTACHMENT 6

Photographic Log

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Photographic Log

Attachment 6

Photo: **2** Time: **1754** Date: **2/14/2016** Direction: **Northeast**
Subject: **Utility locates completed at proposed SB-20/MW-10.**

Photo: **1** Time: **1804** Date: **2/14/2016** Direction: **West**
Subject: **Utility locates completed at proposed SB-19/MW-09**

dna ENVIRONMENTAL

Nikiski, Alaska

Photo: **3** Time: **1915** Date: **2/15/2016** Direction: **West**
Subject: **Drilling at SB-19/MW-09.**

Baker Hughes Nikiski Completions Facility

Photo: **4** Time: **0846** Date: **2/15/2016** Direction: **East**
Subject: **Drilling at SB-19/MW-09.**

Photographic Log

Attachment 6

Nikiski, Alaska

Photo: **5** Time: **1352** Date: **2/15/2016** Direction: **West**
Subject: **Drilling at SB-20/MW-20.**

Baker Hughes Nikiski Completions Facility

Photo: **6** Time: **1352** Date: **2/15/2016** Direction: **West**
Subject: **Drilling at SB-20/MW-20.**

Nikiski, Alaska

Photo: **7** Time: **0947** Date: **2/15/2016** Direction: **Down**
Subject: **MW-05 iced in.**

Baker Hughes Nikiski Completions Facility

Photo: **8** Time: **1016** Date: **2/15/2016** Direction: **Down**
Subject: **MW-05 opened.**

Nikiski, Alaska

Photo: **9** Time: **1027** Date: **2/15/2016** Direction: **Down**
Subject: **MW-05 iced in.**

Baker Hughes Nikiski Completions Facility

Photo: **10** Time: **1033** Date: **2/15/2016** Direction: **Down**
Subject: **MW-05 iced in.**

Photo: **11** Time: **1808** Date: **2/14/2016** Direction: **East**
Subject: **Old McGahan well head**

Photo: **12** Time: **1608** Date: **2/15/2016** Direction: **East**
Subject: **Tuboscope well head.**

Nikiski, Alaska

Photo: **13** Time: **1803** Date: **2/15/2016** Direction: **Down**
Subject: **Well development at MW-09**

Baker Hughes Nikiski Completions Facility

Photo: **14** Time: **1807** Date: **2/16/2016** Direction: **West**
Subject: **Sample collection at MW-10.**

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ATTACHMENT 7

Laboratory Analytical Results, ADEC Data Review Checklists, QAR

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Laboratory Data Review Checklist

Completed by: Rodney Guritz

Title: Chemist Date: March 18, 2016

CS Report Name: Nikiski Tool Report Date: March 2016

Consultant Firm: Arctic Data Services, LLC for DNA Environmental, LLC

Laboratory Name: ESC Lab Sciences Laboratory Report Number: L818624

ADEC File Number: N/A 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 were transferred to another laboratory.

2. Chain of Custody (COC)
   a. COC information completed, signed, and dated (including released/received by)?
      □■Yes□ No □NA (Please explain.) Comments:

   b. Correct analyses requested?
      □■Yes□ No □NA (Please explain.) Comments:

3. Laboratory Sample Receipt Documentation
   a. Sample/cooler temperature documented and within range at receipt (4° ± 2° C)?
      □■Yes□No □NA (Please explain.) Comments:

   b. Sample preservation acceptable – acidified waters, Methanol preserved VOC soil (GRO, BTEX, Volatile Chlorinated Solvents, etc.)?
      □■Yes□ No □NA (Please explain.) Comments:

c. Sample condition documented – broken, leaking (Methanol), zero headspace (VOC vials)?
□■Yes□ No □NA (Please explain.) Comments:

Samples were received in good condition.

d. If there were any discrepancies, were they documented? For example, incorrect sample containers/preservation, sample temperature outside of acceptable range, insufficient or missing samples, etc.?
□ Yes □ No □■ NA (Please explain.) Comments:

There were no sample-receiving discrepancies, other than the low temperature noted above.

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

Data quality and usability were not affected.

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:

The laboratory noted holding time exceedance for three samples (see Section 5.b.)

c. Were all corrective actions documented?
□ Yes □ No □■ NA (Please explain.) Comments:

No corrective actions were required.

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

The case narrative notes no effect on sample data quality or usability.

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:

Holding time was exceeded for samples 16-BNT-SB20-03-SO, 16-BNT-SB20-04-SO, and 16-BNT-FD-01-SO. No analytes were detected in these samples; non-detect results are flagged UN.

c. All soils reported on a dry weight basis?
□■Yes□No □NA (Please explain.) Comments:

No soil samples were reported in this work order.

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:

Soil reporting limits exceeded the ADEC migration to ground water soil cleanup levels for TCE and PCE for every soil sample. These results are flagged UX as tentatively rejected due to inadequate analytical sensitivity.

e. Data quality or usability affected?
Comments:

Data quality affected as described above. TCE and PCE in soil results are not usable as the reporting limits exceeded ADEC cleanup levels. Results for other soil samples affected by a potential low bias from exceeded holding times should be used with caution.

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:

TCE was detected below the PQL in the method blank batch WG850588, at 0.661 ug/L.

iii. If above PQL, what samples are affected?
Comments:

TCE was detected in the corresponding project samples 16-BNT-101-GW, 16-BNT-102-GW, 16-BNT-103-GW, 16-BNT-104-GW, less than 5 times the concentration detected in the blank. These results are considered attributable to laboratory-based contamination, and are qualified “UB” as not detected at the PQL or the sample concentration whichever is higher. Remaining associated results were either non-detect or greater than ten times the MB concentration.

iv. Do the affected sample(s) have data flags and if so, are the data flags clearly defined?
□■Yes□ No □ NA (Please explain.) Comments:

See above.

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

Comments:

Data quality was affected as described above. Impact to data usability was minimal as affected results were significantly below the cleanup level.

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:

An LCS/LCSD and MS/MSD were reported for each batch. Recovery and RPD was evaluated for reported analytes only.

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

□ Yes □ No □■NA (Please explain.) Comments:

There were no metals/inorganics analyzed or reported 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 □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/MSD, 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:

There were no recovery or RPD failures.

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

□ Yes □ No □■NA (Please explain.) Comments:

No results were affected.

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

Comments:

Data quality and usability were not affected.

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:

There were no surrogate-recovery failures.

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

Data quality and usability were not affected.

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

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:

Trip blanks were submitted with the water and soil project samples, for VOC analysis.

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:

Samples were submitted in a single cooler. We do not consider results affected.

iii. All results less than PQL?
□■Yes□No □NA (Please explain.) Comments:

No analytes were detected in the trip blanks.

iv. If above PQL, what samples are affected?

Comments:

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

Comments:

Data quality and usability were not affected.

e. Field Duplicate

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

□■Yes□No □ NA (Please explain.) Comments:

Water field duplicate was 16-BNT-107-GW/16-BNT-108-GW. Soil field duplicate was SB19-02-SO/SB19-FD01-SO.

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:

Water field duplicate RPDs were within the DQO of 30%. No analytes were detected in the soil field duplicate so no RPDs were calculated.

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

Comments:

Data quality and usability were not affected; see above for details.

f. Decontamination or Equipment Blank (If not used explain why).

□Yes □ No □■NA (Please explain.) Comments:

Water and soil samples were collected using disposable or dedicated sampling equipment; no equipment blanks were necessary.

i. All results less than PQL?

□Yes □No □ ■NA (Please explain.) Comments:

ii. If above PQL, what samples are affected?

Comments:

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

Comments:

Not applicable (see above).

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

a. Defined and appropriate?

□■ Yes □ No □NA (Please explain.) Comments:

The lab flagged detected results associated with Method Blank hits with a B flag. We changed this to a UB flag for reporting see section 6a.

ANALYTICAL REPORT

March 02, 2016

Baker Hughes

Sample Delivery Group:	L818624
Samples Received:	02/18/2016
Project Number:	695700003
Description:	Nikiski Tool Project
Site:	ALASKA
Report To:	Dan Frank 111 W. 9th Avenue Anchorage, AK 99501

Entire Report Reviewed By:

Jarred Willis
Technical Service Representative

16-BNT-SB19-01-S0 L818624-01 Solid

Collected by: D. Frank
Collected date/time: 02/15/16 09:20
Received date/time: 02/18/16 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Total Solids by Method 2540 G-2011	WG851122	1	02/23/16 16:52	02/23/16 16:57	MEL
Volatile Organic Compounds (GC/MS) by Method 8260B	WG852601	50.5	02/29/16 18:09	02/29/16 22:07	JHH

16-BNT-SB19-02-S0 L818624-02 Solid

Collected by: D. Frank
Collected date/time: 02/15/16 10:15
Received date/time: 02/18/16 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Total Solids by Method 2540 G-2011	WG851122	1	02/23/16 16:52	02/23/16 16:57	MEL
Volatile Organic Compounds (GC/MS) by Method 8260B	WG852601	60	02/29/16 18:09	02/29/16 22:28	JHH

16-BNT-SB19-03-S0 L818624-03 Solid

Collected by: D. Frank
Collected date/time: 02/15/16 10:40
Received date/time: 02/18/16 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Total Solids by Method 2540 G-2011	WG851122	1	02/23/16 16:52	02/23/16 16:57	MEL
Volatile Organic Compounds (GC/MS) by Method 8260B	WG852601	58.5	02/29/16 18:09	02/29/16 22:49	JHH

16-BNT-SB19-04-SO L818624-04 Solid

Collected by: D. Frank
Collected date/time: 02/15/16 11:20
Received date/time: 02/18/16 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Total Solids by Method 2540 G-2011	WG851122	1	02/23/16 16:52	02/23/16 16:57	MEL
Volatile Organic Compounds (GC/MS) by Method 8260B	WG852601	57	02/29/16 18:09	02/29/16 23:09	JHH

16-BNT-SB20-01-S0 L818624-05 Solid

Collected by: D. Frank
Collected date/time: 02/15/16 13:55
Received date/time: 02/18/16 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Total Solids by Method 2540 G-2011	WG851122	1	02/23/16 16:52	02/23/16 16:57	MEL
Volatile Organic Compounds (GC/MS) by Method 8260B	WG852601	61.5	02/29/16 18:09	02/29/16 23:29	JHH

16-BNT-SB20-02-S0 L818624-06 Solid

Collected by: D. Frank
Collected date/time: 02/15/16 14:40
Received date/time: 02/18/16 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Total Solids by Method 2540 G-2011	WG851122	1	02/23/16 16:52	02/23/16 16:57	MEL
Volatile Organic Compounds (GC/MS) by Method 8260B	WG852601	70	02/29/16 18:09	02/29/16 23:50	JHH

16-BNT-SB20-03-S0 L818624-07 Solid

Collected by: D. Frank
Collected date/time: 02/15/16 15:00
Received date/time: 02/18/16 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Total Solids by Method 2540 G-2011	WG851122	1	02/23/16 16:52	02/23/16 16:57	MEL
Volatile Organic Compounds (GC/MS) by Method 8260B	WG852601	61.5	02/29/16 18:09	03/01/16 00:10	JHH

16-BNT-SB20-04-S0 L818624-08 Solid

Collected by: D. Frank | Collected date/time: 02/15/16 15:35 | Received date/time: 02/18/16 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Total Solids by Method 2540 G-2011	WG851122	1	02/23/16 16:52	02/23/16 16:57	MEL
Volatile Organic Compounds (GC/MS) by Method 8260B	WG852601	51.5	02/29/16 18:09	03/01/16 00:30	JHH

16-BNT-FD-01-S0 L818624-09 Solid

Collected by: D. Frank | Collected date/time: 02/15/16 12:00 | Received date/time: 02/18/16 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Total Solids by Method 2540 G-2011	WG851122	1	02/23/16 16:52	02/23/16 16:57	MEL
Volatile Organic Compounds (GC/MS) by Method 8260B	WG852601	57.5	02/29/16 18:09	03/01/16 00:51	JHH

16-BNT-101-GW L818624-10 GW

Collected by: D. Frank | Collected date/time: 02/15/16 12:20 | Received date/time: 02/18/16 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Volatile Organic Compounds (GC/MS) by Method 8260B	WG850588	1	02/25/16 07:58	02/25/16 07:58	JAH

16-BNT-102-GW L818624-11 GW

Collected by: D. Frank | Collected date/time: 02/15/16 14:15 | Received date/time: 02/18/16 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Volatile Organic Compounds (GC/MS) by Method 8260B	WG850588	1	02/25/16 08:18	02/25/16 08:18	JAH

16-BNT-103-GW L818624-12 GW

Collected by: D. Frank | Collected date/time: 02/15/16 15:30 | Received date/time: 02/18/16 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Volatile Organic Compounds (GC/MS) by Method 8260B	WG850588	1	02/25/16 08:38	02/25/16 08:38	JAH

16-BNT-104-GW L818624-13 GW

Collected by: D. Frank | Collected date/time: 02/15/16 16:45 | Received date/time: 02/18/16 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Volatile Organic Compounds (GC/MS) by Method 8260B	WG850588	1	02/25/16 02:40	02/25/16 02:40	JAH

16-BNT-105-GW L818624-14 GW

Collected by: D. Frank | Collected date/time: 02/16/16 11:12 | Received date/time: 02/18/16 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Volatile Organic Compounds (GC/MS) by Method 8260B	WG850588	1	02/25/16 08:58	02/25/16 08:58	JAH

16-BNT-106-GW L818624-15 GW

Collected by: D. Frank | Collected date/time: 02/16/16 15:15 | Received date/time: 02/18/16 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Volatile Organic Compounds (GC/MS) by Method 8260B	WG850909	1	02/21/16 00:27	02/21/16 00:27	DAH

16-BNT-107-GW L818624-16 GW

Collected by: D. Frank | Collected date/time: 02/16/16 16:30 | Received date/time: 02/18/16 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Volatile Organic Compounds (GC/MS) by Method 8260B	WG851944	1	02/26/16 07:52	02/26/16 07:52	DWR

16-BNT-108-GW L818624-17 GW

Collected by: D. Frank | Collected date/time: 02/16/16 12:00 | Received date/time: 02/18/16 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Volatile Organic Compounds (GC/MS) by Method 8260B	WG851944	1	02/26/16 08:11	02/26/16 08:11	DWR

16-BNT-109-GW L818624-18 GW

Collected by: D. Frank | Collected date/time: 02/16/16 17:50 | Received date/time: 02/18/16 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Volatile Organic Compounds (GC/MS) by Method 8260B	WG851944	1	02/26/16 08:31	02/26/16 08:31	DWR

16-BNT-110-GW L818624-19 GW

Collected by: D. Frank | Collected date/time: 02/16/16 19:00 | Received date/time: 02/18/16 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Volatile Organic Compounds (GC/MS) by Method 8260B	WG851944	1	02/26/16 08:50	02/26/16 08:50	DWR

TRIP BLANK L818624-20 Solid

Collected by: D. Frank | Collected date/time: 02/15/16 00:00 | Received date/time: 02/18/16 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Volatile Organic Compounds (GC/MS) by Method 8260B	WG851281	25	02/26/16 04:15	02/26/16 14:07	JAH

TRIP BLANK L818624-21 GW

Collected by: D. Frank | Collected date/time: 02/15/16 00:00 | Received date/time: 02/18/16 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Volatile Organic Compounds (GC/MS) by Method 8260B	WG851944	1	02/26/16 06:35	02/26/16 06:35	DWR

All MDL (LOD) and RDL (LOQ) values reported for environmental samples have been corrected for the dilution factor used in the analysis. All Method and Batch Quality Control are within established criteria except where addressed in this case narrative, a non-conformance form or properly qualified within the sample results. By my digital signature below, I affirm to the best of my knowledge, all problems/anomalies observed by the laboratory as having the potential to affect the quality of the data have been identified by the laboratory, and no information or data have been knowingly withheld that would affect the quality of the data.

Jarred Willis
Technical Service Representative

Project Narrative

The VOCs on L818624-07, -08, -09 were originally analyzed in-hold, but they had to be rerun and are being reported from the reruns that were just a few minutes out of hold. Both runs confirm that all three of the samples are non-detect for the reported VOCs.

Sample Handling and Receiving

The following samples were prepared and/or analyzed past recommended holding time. Concentrations should be considered minimum values.

ESC Sample ID	Project Sample ID	Method
L818624-07	16-BNT-SB20-03-S0	8260B
L818624-08	16-BNT-SB20-04-S0	8260B
L818624-09	16-BNT-FD-01-S0	8260B

Total Solids by Method 2540 G-2011

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	%			date / time	
Total Solids	96.1		1	02/23/2016 16:57	WG851122

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result (dry)	Qualifier	MDL	RDL (dry)	Dilution	Analysis	Batch
	mg/kg		mg/kg	mg/kg		date / time	
Tetrachloroethene	U		0.0139	0.0526	50.5	02/29/2016 22:07	WG852601
1,1,1-Trichloroethane	U		0.0144	0.0526	50.5	02/29/2016 22:07	WG852601
Trichloroethene	U		0.0141	0.0526	50.5	02/29/2016 22:07	WG852601
(S) Toluene-d8	*98.7*			*88.7-115*		*02/29/2016 22:07*	WG852601
(S) Dibromofluoromethane	*103*			*76.3-123*		*02/29/2016 22:07*	WG852601
(S) 4-Bromofluorobenzene	*103*			*69.7-129*		*02/29/2016 22:07*	WG852601

Total Solids by Method 2540 G-2011

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	%			date / time	
Total Solids	96.8		1	02/23/2016 16:57	WG851122

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result (dry)	Qualifier	MDL	RDL (dry)	Dilution	Analysis	Batch
	mg/kg		mg/kg	mg/kg		date / time	
Tetrachloroethene	U		0.0166	0.0620	60	02/29/2016 22:28	WG852601
1,1,1-Trichloroethane	U		0.0172	0.0620	60	02/29/2016 22:28	WG852601
Trichloroethene	U		0.0167	0.0620	60	02/29/2016 22:28	WG852601
(S) Toluene-d8	*98.7*			*88.7-115*		*02/29/2016 22:28*	WG852601
(S) Dibromofluoromethane	*102*			*76.3-123*		*02/29/2016 22:28*	WG852601
(S) 4-Bromofluorobenzene	*101*			*69.7-129*		*02/29/2016 22:28*	WG852601

Total Solids by Method 2540 G-2011

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	%			date / time	
Total Solids	97.1		1	02/23/2016 16:57	WG851122

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result (dry)	Qualifier	MDL	RDL (dry)	Dilution	Analysis	Batch
	mg/kg		mg/kg	mg/kg		date / time	
Tetrachloroethene	U		0.0161	0.0602	58.5	02/29/2016 22:49	WG852601
1,1,1-Trichloroethane	U		0.0167	0.0602	58.5	02/29/2016 22:49	WG852601
Trichloroethene	U		0.0163	0.0602	58.5	02/29/2016 22:49	WG852601
(S) Toluene-d8	*98.0*			*88.7-115*		*02/29/2016 22:49*	WG852601
(S) Dibromofluoromethane	*102*			*76.3-123*		*02/29/2016 22:49*	WG852601
(S) 4-Bromofluorobenzene	*102*			*69.7-129*		*02/29/2016 22:49*	WG852601

Total Solids by Method 2540 G-2011

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	%			date / time	
Total Solids	95.3		1	02/23/2016 16:57	WG851122

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result (dry)	Qualifier	MDL	RDL (dry)	Dilution	Analysis	Batch
	mg/kg		mg/kg	mg/kg		date / time	
Tetrachloroethene	U		0.0157	0.0598	57	02/29/2016 23:09	WG852601
1,1,1-Trichloroethane	U		0.0163	0.0598	57	02/29/2016 23:09	WG852601
Trichloroethene	U		0.0159	0.0598	57	02/29/2016 23:09	WG852601
(S) Toluene-d8	*98.7*			*88.7-115*		*02/29/2016 23:09*	WG852601
(S) Dibromofluoromethane	*103*			*76.3-123*		*02/29/2016 23:09*	WG852601
(S) 4-Bromofluorobenzene	*102*			*69.7-129*		*02/29/2016 23:09*	WG852601

Total Solids by Method 2540 G-2011

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	%			date / time	
Total Solids	97.5		1	02/23/2016 16:57	WG851122

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result (dry)	Qualifier	MDL	RDL (dry)	Dilution	Analysis	Batch
	mg/kg		mg/kg	mg/kg		date / time	
Tetrachloroethene	U		0.0170	0.0631	61.5	02/29/2016 23:29	WG852601
1,1,1-Trichloroethane	U		0.0176	0.0631	61.5	02/29/2016 23:29	WG852601
Trichloroethene	U		0.0172	0.0631	61.5	02/29/2016 23:29	WG852601
(S) Toluene-d8	*99.0*			*88.7-115*		*02/29/2016 23:29*	WG852601
(S) Dibromofluoromethane	*102*			*76.3-123*		*02/29/2016 23:29*	WG852601
(S) 4-Bromofluorobenzene	*103*			*69.7-129*		*02/29/2016 23:29*	WG852601

Total Solids by Method 2540 G-2011

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	%			date / time	
Total Solids	96.0		1	02/23/2016 16:57	WG851122

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result (dry)	Qualifier	MDL	RDL (dry)	Dilution	Analysis	Batch
	mg/kg		mg/kg	mg/kg		date / time	
Tetrachloroethene	U		0.0193	0.0729	70	02/29/2016 23:50	WG852601
1,1,1-Trichloroethane	U		0.0200	0.0729	70	02/29/2016 23:50	WG852601
Trichloroethene	U		0.0195	0.0729	70	02/29/2016 23:50	WG852601
(S) Toluene-d8	*99.0*			*88.7-115*		*02/29/2016 23:50*	WG852601
(S) Dibromofluoromethane	*103*			*76.3-123*		*02/29/2016 23:50*	WG852601
(S) 4-Bromofluorobenzene	*102*			*69.7-129*		*02/29/2016 23:50*	WG852601

Total Solids by Method 2540 G-2011

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	%			date / time	
Total Solids	97.9		1	02/23/2016 16:57	WG851122

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result (dry)	Qualifier	MDL	RDL (dry)	Dilution	Analysis	Batch
	mg/kg		mg/kg	mg/kg		date / time	
Tetrachloroethene	U		0.0170	0.0628	61.5	03/01/2016 00:10	WG852601
1,1,1-Trichloroethane	U		0.0176	0.0628	61.5	03/01/2016 00:10	WG852601
Trichloroethene	U		0.0172	0.0628	61.5	03/01/2016 00:10	WG852601
(S) Toluene-d8	*98.4*			*88.7-115*		*03/01/2016 00:10*	WG852601
(S) Dibromofluoromethane	*103*			*76.3-123*		*03/01/2016 00:10*	WG852601
(S) 4-Bromofluorobenzene	*99.5*			*69.7-129*		*03/01/2016 00:10*	WG852601

Total Solids by Method 2540 G-2011

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	%			date / time	
Total Solids	80.5		1	02/23/2016 16:57	WG851122

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result (dry)	Qualifier	MDL	RDL (dry)	Dilution	Analysis	Batch
	mg/kg		mg/kg	mg/kg		date / time	
Tetrachloroethene	U		0.0142	0.0640	51.5	03/01/2016 00:30	WG852601
1,1,1-Trichloroethane	U		0.0147	0.0640	51.5	03/01/2016 00:30	WG852601
Trichloroethene	U		0.0144	0.0640	51.5	03/01/2016 00:30	WG852601
(S) Toluene-d8	*98.7*			*88.7-115*		*03/01/2016 00:30*	WG852601
(S) Dibromofluoromethane	*102*			*76.3-123*		*03/01/2016 00:30*	WG852601
(S) 4-Bromofluorobenzene	*104*			*69.7-129*		*03/01/2016 00:30*	WG852601

Total Solids by Method 2540 G-2011

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	%			date / time	
Total Solids	97.4		1	02/23/2016 16:57	WG851122

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result (dry)	Qualifier	MDL	RDL (dry)	Dilution	Analysis	Batch
	mg/kg		mg/kg	mg/kg		date / time	
Tetrachloroethene	U		0.0159	0.0590	57.5	03/01/2016 00:51	WG852601
1,1,1-Trichloroethane	U		0.0164	0.0590	57.5	03/01/2016 00:51	WG852601
Trichloroethene	U		0.0160	0.0590	57.5	03/01/2016 00:51	WG852601
(S) Toluene-d8	*99.4*			*88.7-115*		*03/01/2016 00:51*	WG852601
(S) Dibromofluoromethane	*101*			*76.3-123*		*03/01/2016 00:51*	WG852601
(S) 4-Bromofluorobenzene	*101*			*69.7-129*		*03/01/2016 00:51*	WG852601

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Tetrachloroethene	U		0.372	1.00	1	02/25/2016 07:58	WG850588
1,1,1-Trichloroethane	5.22		0.319	1.00	1	02/25/2016 07:58	WG850588
Trichloroethene	2.95	B	0.398	1.00	1	02/25/2016 07:58	WG850588
(S) Toluene-d8	*101*			*90.0-115*		*02/25/2016 07:58*	WG850588
(S) Dibromofluoromethane	*92.0*			*79.0-121*		*02/25/2016 07:58*	WG850588
(S) 4-Bromofluorobenzene	*109*			*80.1-120*		*02/25/2016 07:58*	WG850588

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Tetrachloroethene	U		0.372	1.00	1	02/25/2016 08:18	WG850588
1,1,1-Trichloroethane	9.47		0.319	1.00	1	02/25/2016 08:18	WG850588
Trichloroethene	1.00	B J	0.398	1.00	1	02/25/2016 08:18	WG850588
(S) Toluene-d8	*99.4*			*90.0-115*		*02/25/2016 08:18*	WG850588
(S) Dibromofluoromethane	*92.8*			*79.0-121*		*02/25/2016 08:18*	WG850588
(S) 4-Bromofluorobenzene	*110*			*80.1-120*		*02/25/2016 08:18*	WG850588

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Tetrachloroethene	U		0.372	1.00	1	02/25/2016 08:38	WG850588
1,1,1-Trichloroethane	U		0.319	1.00	1	02/25/2016 08:38	WG850588
Trichloroethene	1.49	B	0.398	1.00	1	02/25/2016 08:38	WG850588
(S) Toluene-d8	*100*			*90.0-115*		*02/25/2016 08:38*	WG850588
(S) Dibromofluoromethane	*93.9*			*79.0-121*		*02/25/2016 08:38*	WG850588
(S) 4-Bromofluorobenzene	*110*			*80.1-120*		*02/25/2016 08:38*	WG850588

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Tetrachloroethene	U		0.372	1.00	1	02/25/2016 02:40	WG850588
1,1,1-Trichloroethane	0.361	J	0.319	1.00	1	02/25/2016 02:40	WG850588
Trichloroethene	0.495	B J	0.398	1.00	1	02/25/2016 02:40	WG850588
(S) Toluene-d8	*100*			*90.0-115*		*02/25/2016 02:40*	WG850588
(S) Dibromofluoromethane	*93.2*			*79.0-121*		*02/25/2016 02:40*	WG850588
(S) 4-Bromofluorobenzene	*110*			*80.1-120*		*02/25/2016 02:40*	WG850588

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Tetrachloroethene	U		0.372	1.00	1	02/25/2016 08:58	WG850588
1,1,1-Trichloroethane	U		0.319	1.00	1	02/25/2016 08:58	WG850588
Trichloroethene	U		0.398	1.00	1	02/25/2016 08:58	WG850588
(S) Toluene-d8	*100*			*90.0-115*		*02/25/2016 08:58*	WG850588
(S) Dibromofluoromethane	*90.2*			*79.0-121*		*02/25/2016 08:58*	WG850588
(S) 4-Bromofluorobenzene	*110*			*80.1-120*		*02/25/2016 08:58*	WG850588

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Tetrachloroethene	U		0.372	1.00	1	02/21/2016 00:27	WG850909
1,1,1-Trichloroethane	U		0.319	1.00	1	02/21/2016 00:27	WG850909
Trichloroethene	2.26		0.398	1.00	1	02/21/2016 00:27	WG850909
(S) Toluene-d8	*102*			*90.0-115*		*02/21/2016 00:27*	WG850909
(S) Dibromofluoromethane	*95.4*			*79.0-121*		*02/21/2016 00:27*	WG850909
(S) 4-Bromofluorobenzene	*90.7*			*80.1-120*		*02/21/2016 00:27*	WG850909

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Tetrachloroethene	U		0.372	1.00	1	02/26/2016 07:52	WG851944
1,1,1-Trichloroethane	1.50		0.319	1.00	1	02/26/2016 07:52	WG851944
Trichloroethene	21.6		0.398	1.00	1	02/26/2016 07:52	WG851944
(S) Toluene-d8	*106*			*90.0-115*		*02/26/2016 07:52*	WG851944
(S) Dibromofluoromethane	*111*			*79.0-121*		*02/26/2016 07:52*	WG851944
(S) 4-Bromofluorobenzene	*98.9*			*80.1-120*		*02/26/2016 07:52*	WG851944

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Tetrachloroethene	U		0.372	1.00	1	02/26/2016 08:11	WG851944
1,1,1-Trichloroethane	1.47		0.319	1.00	1	02/26/2016 08:11	WG851944
Trichloroethene	21.1		0.398	1.00	1	02/26/2016 08:11	WG851944
(S) Toluene-d8	*105*			*90.0-115*		*02/26/2016 08:11*	WG851944
(S) Dibromofluoromethane	*111*			*79.0-121*		*02/26/2016 08:11*	WG851944
(S) 4-Bromofluorobenzene	*99.2*			*80.1-120*		*02/26/2016 08:11*	WG851944

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Tetrachloroethene	U		0.372	1.00	1	02/26/2016 08:31	WG851944
1,1,1-Trichloroethane	U		0.319	1.00	1	02/26/2016 08:31	WG851944
Trichloroethene	U		0.398	1.00	1	02/26/2016 08:31	WG851944
(S) Toluene-d8	*105*			*90.0-115*		*02/26/2016 08:31*	WG851944
(S) Dibromofluoromethane	*114*			*79.0-121*		*02/26/2016 08:31*	WG851944
(S) 4-Bromofluorobenzene	*98.4*			*80.1-120*		*02/26/2016 08:31*	WG851944

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Tetrachloroethene	U		0.372	1.00	1	02/26/2016 08:50	WG851944
1,1,1-Trichloroethane	4.58		0.319	1.00	1	02/26/2016 08:50	WG851944
Trichloroethene	U		0.398	1.00	1	02/26/2016 08:50	WG851944
(S) Toluene-d8	*105*			*90.0-115*		*02/26/2016 08:50*	WG851944
(S) Dibromofluoromethane	*114*			*79.0-121*		*02/26/2016 08:50*	WG851944
(S) 4-Bromofluorobenzene	*100*			*80.1-120*		*02/26/2016 08:50*	WG851944

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	mg/kg		mg/kg	mg/kg		date / time	
Tetrachloroethene	U		0.00690	0.0250	25	02/26/2016 14:07	WG851281
1,1,1-Trichloroethane	U		0.00715	0.0250	25	02/26/2016 14:07	WG851281
Trichloroethene	U		0.00700	0.0250	25	02/26/2016 14:07	WG851281
(S) Toluene-d8	*107*			*88.7-115*		*02/26/2016 14:07*	WG851281
(S) Dibromofluoromethane	*97.1*			*76.3-123*		*02/26/2016 14:07*	WG851281
(S) 4-Bromofluorobenzene	*94.5*			*69.7-129*		*02/26/2016 14:07*	WG851281

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Tetrachloroethene	U		0.372	1.00	1	02/26/2016 06:35	WG851944
1,1,1-Trichloroethane	U		0.319	1.00	1	02/26/2016 06:35	WG851944
Trichloroethene	U		0.398	1.00	1	02/26/2016 06:35	WG851944
(S) Toluene-d8	*104*			*90.0-115*		*02/26/2016 06:35*	WG851944
(S) Dibromofluoromethane	*110*			*79.0-121*		*02/26/2016 06:35*	WG851944
(S) 4-Bromofluorobenzene	*100*			*80.1-120*		*02/26/2016 06:35*	WG851944

Method Blank (MB)

(MB) 02/23/16 16:57

Analyte	MB Result %	MB Qualifier	MB RDL %
Total Solids	0.000400		

L819009-11 Original Sample (OS) • Duplicate (DUP)

(OS) 02/23/16 16:57 • (DUP) 02/23/16 16:57

Analyte	Original Result %	DUP Result %	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Total Solids	85.4	85.8	1	0.492		5

Laboratory Control Sample (LCS)

(LCS) 02/23/16 16:57

Analyte	Spike Amount %	LCS Result %	LCS Rec. %	Rec. Limits %	LCS Qualifier
Total Solids	50.0	50.0	100	85.0-115	

Method Blank (MB)

(MB) 02/24/16 23:56

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Tetrachloroethene	U		0.000372	0.00100
1,1,1-Trichloroethane	U		0.000319	0.00100
Trichloroethene	0.000661		0.000398	0.00100
(S) Toluene-d8	*100*			*90.0-115*
(S) Dibromofluoromethane	*91.8*			*79.0-121*
(S) 4-Bromofluorobenzene	*110*			*80.1-120*

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) 02/24/16 22:56 • (LCSD) 02/24/16 23:16

Analyte	Spike Amount mg/l	LCS Result mg/l	LCSD Result mg/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Tetrachloroethene	0.0250	0.0273	0.0278	109	111	73.5-130			1.88	20
1,1,1-Trichloroethane	0.0250	0.0227	0.0227	91.0	90.6	71.1-129			0.400	20
Trichloroethene	0.0250	0.0263	0.0268	105	107	79.5-121			1.67	20
(S) Toluene-d8				*101*	*101*	*90.0-115*				
(S) Dibromofluoromethane				*93.2*	*92.0*	*79.0-121*				
(S) 4-Bromofluorobenzene				*108*	*108*	*80.1-120*				

L818624-13 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) 02/25/16 02:40 • (MS) 02/25/16 01:39 • (MSD) 02/25/16 01:59

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Tetrachloroethene	0.0250	ND	0.0230	0.0260	92.0	104	1	57.4-141			12.4	20
1,1,1-Trichloroethane	0.0250	0.000361	0.0197	0.0219	77.4	86.2	1	58.7-134			10.6	20
Trichloroethene	0.0250	0.000495	0.0219	0.0247	85.5	96.7	1	48.9-148			12.0	20
(S) Toluene-d8					*101*	*101*		*90.0-115*				
(S) Dibromofluoromethane					*92.7*	*92.5*		*79.0-121*				
(S) 4-Bromofluorobenzene					*110*	*108*		*80.1-120*				

Method Blank (MB)

(MB) 02/20/16 17:14

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Tetrachloroethene	U		0.000372	0.00100
1,1,1-Trichloroethane	U		0.000319	0.00100
Trichloroethene	U		0.000398	0.00100
(S) Toluene-d8	*103*			*90.0-115*
(S) Dibromofluoromethane	*96.7*			*79.0-121*
(S) 4-Bromofluorobenzene	*90.5*			*80.1-120*

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) 02/20/16 16:13 • (LCSD) 02/20/16 16:33

Analyte	Spike Amount mg/l	LCS Result mg/l	LCSD Result mg/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Tetrachloroethene	0.0250	0.0252	0.0214	101	85.8	73.5-130			16.1	20
1,1,1-Trichloroethane	0.0250	0.0267	0.0227	107	90.7	71.1-129			16.4	20
Trichloroethene	0.0250	0.0255	0.0219	102	87.7	79.5-121			14.9	20
(S) Toluene-d8				*100*	*101*	*90.0-115*				
(S) Dibromofluoromethane				*94.5*	*96.7*	*79.0-121*				
(S) 4-Bromofluorobenzene				*92.4*	*90.9*	*80.1-120*				

L818608-06 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) 02/24/16 21:00 • (MS) 02/24/16 19:19 • (MSD) 02/24/16 19:39

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Tetrachloroethene	0.0250	ND	11.8	12.2	94.3	97.3	500	57.4-141			3.11	20
1,1,1-Trichloroethane	0.0250	ND	12.5	12.9	99.9	103	500	58.7-134			2.97	20
Trichloroethene	0.0250	ND	11.7	12.5	93.7	99.7	500	48.9-148			6.18	20
(S) Toluene-d8					*100*	*100*		*90.0-115*				
(S) Dibromofluoromethane					*104*	*103*		*79.0-121*				
(S) 4-Bromofluorobenzene					*101*	*100*		*80.1-120*				

Method Blank (MB)

(MB) 02/26/16 06:42

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Tetrachloroethene	U		0.000276	0.00100
1,1,1-Trichloroethane	U		0.000286	0.00100
Trichloroethene	U		0.000279	0.00100
(S) Toluene-d8	*106*			*88.7-115*
(S) Dibromofluoromethane	*103*			*76.3-123*
(S) 4-Bromofluorobenzene	*93.5*			*69.7-129*

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) 02/26/16 05:27 • (LCSD) 02/26/16 05:45

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCSD Result mg/kg	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Tetrachloroethene	0.0250	0.0223	0.0218	89.2	87.1	71.1-133			2.42	20
1,1,1-Trichloroethane	0.0250	0.0253	0.0258	101	103	69.9-127			2.13	20
Trichloroethene	0.0250	0.0243	0.0243	97.2	97.2	77.2-122			0.0700	20
(S) Toluene-d8				*107*	*106*	*88.7-115*				
(S) Dibromofluoromethane				*101*	*103*	*76.3-123*				
(S) 4-Bromofluorobenzene				*95.4*	*92.5*	*69.7-129*				

L818929-03 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) 02/26/16 12:13 • (MS) 02/26/16 12:32 • (MSD) 02/26/16 12:51

Analyte	Spike Amount mg/kg	Original Result mg/kg	MS Result mg/kg	MSD Result mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Tetrachloroethene	0.0250	ND	0.0133	0.0145	53.2	57.9	1	37.7-140			8.48	29.2
1,1,1-Trichloroethane	0.0250	ND	0.0173	0.0179	69.3	71.4	1	49.0-138			2.99	25.3
Trichloroethene	0.0250	ND	0.0162	0.0163	64.8	65.1	1	48.0-132			0.490	24.8
(S) Toluene-d8					*106*	*106*		*88.7-115*				
(S) Dibromofluoromethane					*102*	*102*		*76.3-123*				
(S) 4-Bromofluorobenzene					*89.6*	*92.5*		*69.7-129*				

Method Blank (MB)

(MB) 02/26/16 06:07

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Tetrachloroethene	U		0.000372	0.00100
1,1,1-Trichloroethane	U		0.000319	0.00100
Trichloroethene	U		0.000398	0.00100
(S) Toluene-d8	*105*			*90.0-115*
(S) Dibromofluoromethane	*110*			*79.0-121*
(S) 4-Bromofluorobenzene	*98.4*			*80.1-120*

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) 02/26/16 04:50 • (LCSD) 02/26/16 05:09

Analyte	Spike Amount mg/l	LCS Result mg/l	LCSD Result mg/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Tetrachloroethene	0.0250	0.0230	0.0227	91.8	91.0	73.5-130			0.960	20
1,1,1-Trichloroethane	0.0250	0.0255	0.0254	102	102	71.1-129			0.270	20
Trichloroethene	0.0250	0.0239	0.0233	95.5	93.4	79.5-121			2.24	20
(S) Toluene-d8				*107*	*107*	*90.0-115*				
(S) Dibromofluoromethane				*109*	*111*	*79.0-121*				
(S) 4-Bromofluorobenzene				*106*	*102*	*80.1-120*				

L819193-34 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) 02/26/16 10:26 • (MS) 02/26/16 10:46 • (MSD) 02/26/16 11:05

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Tetrachloroethene	0.0250	ND	0.0201	0.0193	80.3	77.3	1	57.4-141			3.81	20
1,1,1-Trichloroethane	0.0250	ND	0.0241	0.0231	96.3	92.2	1	58.7-134			4.35	20
Trichloroethene	0.0250	ND	0.0212	0.0203	84.8	81.3	1	48.9-148			4.28	20
(S) Toluene-d8					*106*	*106*		*90.0-115*				
(S) Dibromofluoromethane					*112*	*113*		*79.0-121*				
(S) 4-Bromofluorobenzene					*102*	*103*		*80.1-120*				

Method Blank (MB)

(MB) 02/29/16 20:57

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Tetrachloroethene	U		0.000276	0.00100
1,1,1-Trichloroethane	U		0.000286	0.00100
Trichloroethene	U		0.000279	0.00100
(S) Toluene-d8	*99.6*			*88.7-115*
(S) Dibromofluoromethane	*103*			*76.3-123*
(S) 4-Bromofluorobenzene	*101*			*69.7-129*

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) 02/29/16 19:35 • (LCSD) 02/29/16 19:56

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCSD Result mg/kg	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Tetrachloroethene	0.0250	0.0240	0.0245	95.9	98.0	71.1-133			2.26	20
1,1,1-Trichloroethane	0.0250	0.0256	0.0257	102	103	69.9-127			0.370	20
Trichloroethene	0.0250	0.0240	0.0240	96.0	96.1	77.2-122			0.0500	20
(S) Toluene-d8				*98.9*	*98.6*	*88.7-115*				
(S) Dibromofluoromethane				*104*	*103*	*76.3-123*				
(S) 4-Bromofluorobenzene				*95.6*	*96.8*	*69.7-129*				

L820252-06 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) 03/01/16 01:32 • (MS) 03/01/16 01:52 • (MSD) 03/01/16 02:13

Analyte	Spike Amount mg/kg	Original Result mg/kg	MS Result mg/kg	MSD Result mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Tetrachloroethene	0.0250	ND	0.102	0.104	81.9	83.0	5	37.7-140			1.41	29.2
1,1,1-Trichloroethane	0.0250	ND	0.128	0.118	102	94.6	5	49.0-138			7.75	25.3
Trichloroethene	0.0250	ND	0.113	0.110	90.2	88.2	5	48.0-132			2.17	24.8
(S) Toluene-d8					*97.8*	*99.5*		*88.7-115*				
(S) Dibromofluoromethane					*106*	*103*		*76.3-123*				
(S) 4-Bromofluorobenzene					*97.9*	*99.2*		*69.7-129*				

Abbreviations and Definitions

SDG	Sample Delivery Group.
MDL	Method Detection Limit.
RDL	Reported Detection Limit.
ND,U	Not detected at the Reporting Limit (or MDL where applicable).
RPD	Relative Percent Difference.
(dry)	Results are reported based on the dry weight of the sample. [this will only be present on a dry report basis for soils].
Original Sample	The non-spiked sample in the prep batch used to determine the Relative Percent Difference (RPD) from a quality control sample. The Original Sample may not be included within the reported SDG.
(S)	Surrogate (Surrogate Standard) - Analytes added to every blank, sample, Laboratory Control Sample/Duplicate and Matrix Spike/Duplicate; used to evaluate analytical efficiency by measuring recovery. Surrogates are not expected to be detected in all environmental media.
Rec.	Recovery.
SDL	Sample Detection Limit.
MQL	Method Quantitation Limit.
Unadj. MQL	Unadjusted Method Quantitation Limit.

Qualifier	Description
B	The same analyte is found in the associated blank.
J	The identification of the analyte is acceptable; the reported value is an estimate.

ESC Lab Sciences is the only environmental laboratory accredited/certified to support your work nationwide from one location. One phone call, one point of contact, one laboratory. No other lab is as accessible or prepared to handle your needs throughout the country. Our capacity and capability from our single location laboratory is comparable to the collective totals of the network laboratories in our industry. The most significant benefit to our "one location" design is the design of our laboratory campus. The model is conducive to accelerated productivity, decreasing turn-around time, and preventing cross contamination, thus protecting sample integrity. Our focus on premium quality and prompt service allows us to be **YOUR LAB OF CHOICE.**
* Not all certifications held by the laboratory are applicable to the results reported in the attached report.

State Accreditations

Alabama	40660	Nevada	TN-03-2002-34
Alaska	UST-080	New Hampshire	2975
Arizona	AZ0612	New Jersey–NELAP	TN002
Arkansas	88-0469	New Mexico	TN00003
California	01157CA	New York	11742
Colorado	TN00003	North Carolina	Env375
Conneticut	PH-0197	North Carolina [1]	DW21704
Florida	E87487	North Carolina [2]	41
Georgia	NELAP	North Dakota	R-140
Georgia [1]	923	Ohio–VAP	CL0069
Idaho	TN00003	Oklahoma	9915
Illinois	200008	Oregon	TN200002
Indiana	C-TN-01	Pennsylvania	68-02979
Iowa	364	Rhode Island	221
Kansas	E-10277	South Carolina	84004
Kentucky [1]	90010	South Dakota	n/a
Kentucky [2]	16	Tennessee [1 4]	2006
Louisiana	AI30792	Texas	T 104704245-07-TX
Maine	TN0002	Texas [5]	LAB0152
Maryland	324	Utah	6157585858
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	109
Minnesota	047-999-395	Washington	C1915
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	9980939910
Montana	CERT0086	Wyoming	A2LA
Nebraska	NE-OS-15-05		

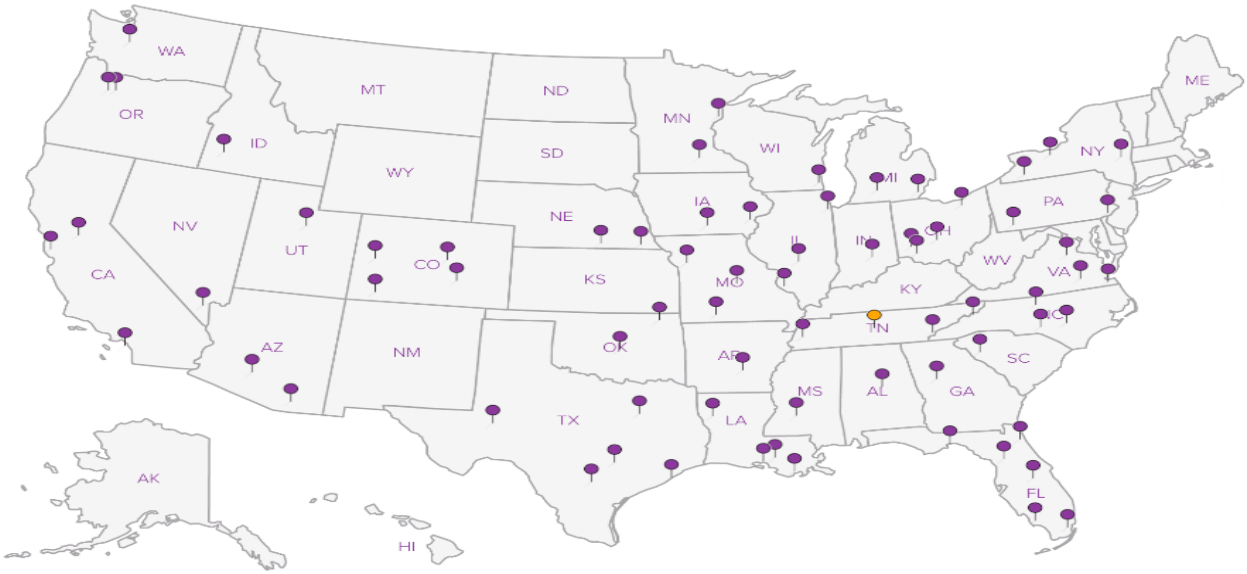
Third Party & Federal Accreditations

A2LA – ISO 17025	1461.01	AIHA	100789
A2LA – ISO 17025 [5]	1461.02	DOD	1461.01
Canada	1461.01	USDA	S-67674
EPA–Crypto	TN00003		

[1] Drinking Water [2] Underground Storage Tanks [3] Aquatic Toxicity [4] Chemical/Microbiological [5] Mold [n/a] Accreditation not applicable

Our Locations

ESC Lab Sciences has sixty-four client support centers that provide sample pickup and/or the delivery of sampling supplies. If you would like assistance from one of our support offices, please contact our main office. **ESC Lab Sciences performs all testing at our central laboratory.**



DNA Environmental- Anchorage, AK

111 W. 9th Avenue
Anchorage, AK 99501

Billing Information:
Accounts Payable- Dan Frank
111 W. 9th Avenue
Anchorage, AK 99501
BHI Direct

Report to: Dan Frank

Email To: daniel.frank@dnaenviro.com

Project Description: Nikiski Tool Project

City/State Collected: Nikiski, AK

Phone: 907-350-4897
Fax:

Client Project #

Lab Project # DNAENVAAK-NIKISKI

Collected by (print): D. Frank

Site/Facility ID # Nikiski Tool

P.O. #

Collected by (signature):

Immediately Packed on Ice N ___ Y X

Rush? (Lab MUST Be Notified)
___ Same Day 200%
___ Next Day 100%
___ Two Day 50%
___ Three Day 25%

Date Results Needed

Email? ___No X__Yes
FAX? ___No ___Yes

Analysis / Container / Preservative

Chain of Custody Page 1 of 3

ESC LABORATORY SCIENCES
YOUR LAB OF CHOICE
12065 Lebanon Rd
Mount Juliet, TN 37122
Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

L# L818624
A228

Acctnum: DNAENVAAK
Template: T109138
Prelogin: P539023
TSR: 358 - Jarred Willis
PB: 1-25-16 GM
Shipped Via: FedEX 2nd Day

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	VOC Screen / TS 4ozClr-NoPres	VOCs 8260* 40mlAmb-HCl	VOCs 8260* 60mlAmb/MeOH/Syr	VOCs 8260*- Trip Blk 40mlAmb-HCl-Blk	VOCs 8260*- Trip Blk 60mlAmb/MeOH/Syr	Rem./Contaminant	Sample # (lab only)
16-BNT-SB19-01-SO	Grab	SS		2-15-16	0920	2	X		X				-01
16-BNT-SB19-02-SO	Grab	SS		2-15-16	1015	2	X		X				-02
16-BNT-SB19-03-SO	Grab	SS		2-15-16	1040	2	X		X				-03
16-BNT-SB19-04-SO	Grab	SS		2-15-16	1120	2	X		X				-04
16-BNT-SB20-01-SO	Grab	SS		2-15-16	1355	2	X		X				-05
16-BNT-SB20-02-SO	Grab	SS		2-15-16	~~1500~~ 1440 DF	2	X		X				-06
16-BNT-SB20-03-SO	Grab	SS		2-15-16	1500	2	X		X				-07
16-BNT-SB20-04-SO	Grab	SS		2-15-16	1535	2	X		X				-08
16-BNT-FD01-SO	Grab	SS		2-15-16	1200	2	X		X				-09
16-BNT-101-GW	Grab	GW		2-15-16	1220	3		X					-10

* Matrix: SS - Soil GW - Groundwater WW - WasteWater DW - Drinking Water OT - Other_____

Remarks: VOCs= TCE, 1,1,1-TCA, and PCE

pH _____ Temp _____

Flow _____ Other _____

661736076161

Hold #

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
	2-17-16	1100	
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)

Samples returned via: ☐ UPS ☒ FedEx ☐ Courier ☐ _____

Temp: 3.2 °C Bottles Received: 53

Date: 2-18-16 Time: 940

Condition: N (lab use only) GD10

COC Seal Intact: ___Y ___N ___NA

pH Checked: NCF:

DNA Environmental- Anchorage, AK

111 W. 9th Avenue
Anchorage, AK 99501

Billing Information:
Accounts Payable- Dan Frank
111 W. 9th Avenue
Anchorage, AK 99501
~~BHI~~ Direct

Report to: **Dan Frank**

Email To: **daniel.frank@dnaenviro.com**

Project Description: **Nikiski Tool Project**

City/State Collected: Nikiski, AK

Phone: **907-350-4897**
Fax:

Client Project #

Lab Project # **DNAENVAAK-NIKISKI**

Collected by (print): D. Frank

Site/Facility ID #

P.O. #

Collected by (signature):

Immediately Packed on Ice N___ Y X

Rush? (Lab MUST Be Notified)
___ Same Day 200%
___ Next Day 100%
___ Two Day 50%
___ Three Day 25%

Date Results Needed

Email? ___No X__Yes
FAX? ___No ___Yes

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	VOC Screen / TS 4ozClr-NoPres	VOCs 8260* 40mlAmb-HCl	VOCs 8260* 60mlAmb/MeOH/Syr	VOCs 8260*- Trip Blk 40mlAmb-HCl-Blk	VOCs 8260*- Trip Blk 60mlAmb/MeOH/Syr	Rem./Contaminant	Sample # (lab only)
16-BNT-102-GW	G	GW		2-15-16	1415	3		X					-11
16-BNT-103-GW	G	GW		2-15-16	1530	3		X					-12
16-BNT-104-GW	G	GW		2-15-16	1645	~~3~~ DF		X					-13
16-BNT-105-GW	G	GW		2-~~15~~16-16 DF	1112	3		X					-14
16-BNT-106-GW	G	GW		2-16-16	~~1515~~ 1515	3		X					-15
16-BNT-107-GW	G	GW		2-16-16	1630 DF	3		X					-16
16-BNT-108-GW	G	GW		2-16-16	1200	3		X					-17
16-BNT-109-GW	G	GW		2-16-16	1750	3		X					-18
16-BNT-110-GW	G	GW		2-16-16	1900	3		X					-19
		GW				3		X					

Analysis / Container / Preservative

Chain of Custody Page 2 of 3

ESC LABORATORY SCIENCES
YOUR LAB OF CHOICE
12065 Lebanon Rd
Mount Juliet, TN 37122
Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

L# L818624
Table #
Acctnum: DNAENVAAK
Template: T109138
Prelogin: P539023
TSR: 358 - Jarred Willis
PB: 1-25-16 GW
Shipped Via: FedEX 2nd Day

* Matrix: **SS** - Soil **GW** - Groundwater **WW** - WasteWater **DW** - Drinking Water **OT** - Other_____

Remarks:VOCs= TCE, 1,1,1-TCA, and PCE *** MS/MSD volumes included for/with 104-GW

pH _____ Temp _____
Flow _____ Other _____

Hold #

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
	2-17-16	1100	
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)
			Daly

Samples returned via: ☐ UPS ☒ FedEx ☐ Courier ☐ _____

Temp: 3.2 °C Bottles Received: 53

Date: 2-18-16 Time: 9w

Condition: ok (lab use only) GW0

COC Seal Intact: ___Y ___N ___NA

pH Checked: NCF:

DNA Environmental- Anchorage, AK

111 W. 9th Avenue
Anchorage, AK 99501

Billing Information:
Accounts Payable- Dan Frank
111 W. 9th Avenue
Anchorage, AK 99501
BHI direct

Report to: Dan Frank

Email To: daniel.frank@dnaenviro.com

Project Description: Nikiski Tool

City/State Collected: Nikiski, AK

Phone: 907-350-4897
Fax:

Client Project #

Lab Project # DNAENVAAK-WET

Collected by (print): D. Frank

Site/Facility ID #

P.O. #

Collected by (signature):

Immediately Packed on Ice N ___ Y ___

Rush? (Lab MUST Be Notified)
___ Same Day 200%
___ Next Day 100%
___ Two Day 50%
___ Three Day 25%

Date Results Needed

Email? ___No X__Yes
FAX? ___No ___Yes

Analysis / Container / Preservative

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	VOC Screen / TS 4ozClr-NoPres	VOCs 8260* 40mlAmb-HCl	VOCs 8260* 60mlAmb/MeOH/Syr	VOCs 8260*- Trip Blk 40mlAmb-HCl-Blk	VOCs 8260*- Trip Blk 60mlAmb/MeOH/Syr	Rem./Contaminant	Sample # (lab only)
TRIP BLANK		SS		Laboratory assigned		1					X		-20
TRIP BLANK		GW		Laboratory assigned		1				X			-21
		SS				2	X		X				
		GW				3		X					

Chain of Custody Page 3 of 3

ESC LABORATORY SCIENCES
YOUR LAB OF CHOICE
12065 Lebanon Rd
Mount Juliet, TN 37122
Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

L# L818624

Table #

Acctnum: DNAENVAAK
Template: T109138
Prelogin: P539023
TSR: 358 - Jarred Willis
PB: 1-25-16 Em

Shipped Via: FedEX 2nd Day

* Matrix: SS - Soil GW - Groundwater WW - WasteWater DW - Drinking Water OT - Other_____

Remarks: VOCs= TCE, 1,1,1-TCA, and PCE

pH _____ Temp _____

Flow _____ Other _____

Hold #

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
	2-17-16	1100	
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)
			Daly

Samples returned via: ☐ UPS ☐ FedEx ☐ Courier ☐ _____

Temp: 3.2 °C Bottles Received: 53

Date: 2-18-16 Time: 900

Condition: ok (lab use only) GOOD

COC Seal Intact: ✓ Y ___N ___NA

pH Checked: NCF: