

**FIRST QUARTER 2019
SITE MONITORING AND REMEDIATION
SUMMARY REPORT**

KNAUS 28-8

COGCC SPILL TRACKING # 445476
COGCC REMEDIATION # 9767

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TABLE OF CONTENTS

1.0 INTRODUCTION.....	1
1.1 Site Background.....	1
2.0 FIRST QUARTER 2019 GROUNDWATER MONITORING ACTIVITIES	2
2.1 Groundwater Level Measurements	2
2.2 Groundwater Purging and Sampling	2
3.0 FIRST QUARTER 2019 GROUNDWATER SAMPLING RESULTS.....	3
4.0 REMEDIATION SYSTEM.....	4
4.1 AS Remediation System Installation	4
4.1.1 AS Remediation System Operations	4
5.0 UPCOMING SITE ACTIVITIES	5

TABLES

Table 1 – Groundwater Elevation Data

Table 2 – Groundwater Analytical Data

FIGURES

Figure 1 – Site Location Map

Figure 2 – Site Overview Map

Figure 3 – Groundwater Potentiometric Surface Contour Map (March 15, 2019)

Figure 4 – Groundwater Analytical Results Map (March 15, 2019)

ATTACHMENTS

Attachment A – Laboratory Analytical Data Report

1.0 INTRODUCTION

This first quarter 2019 Site Monitoring and Remediation Summary Report (Report) presents the results of groundwater sampling activities and details the installation and operation of an air sparge (AS) remediation system (System) at the Knaus 28-8 site (Site).

First quarter 2019 field activities detailed in this report were performed by Tasman Geosciences, Inc. (Tasman), on behalf of Noble Energy, Inc. (Noble) in order to further evaluate groundwater conditions and conduct remediation activities at the Site. The data collected was used to develop the analytical summary tables, groundwater elevation map, and analytical results map presented herein.

1.1 Site Background

The Site is located approximately four miles southwest of the town of Lucerne in Weld County, Colorado, as shown on Figure 1. The site is surrounded by crop land, and the legal description is the southeast $\frac{1}{4}$ of the northeast $\frac{1}{4}$ of Section 28, Township 6 North, Range 66 West, of the 6th Principal Meridian. The Site is approximately 465 feet west of the Weld County Road 31, and has coordinates of 40.461743°, -104.775176°.

On April 12, 2016, Noble discovered surfaced fluids in an agricultural field near the Knaus 28-8 wellhead. Subsequently, Noble filed a Form 19 Initial Spill/Release Report (Form 19) with the Colorado Oil and Gas Conservation Commission (COGCC) for the incident (Document # 401026744). The Form 19 was received by the COGCC and the incident was designated Spill/Release ID # 445476.

An excavation to repair the line was conducted at the Site in April 2016, where Tasman collected confirmation samples from the excavation sidewalls and base. Based on Site excavation sampling results, Site assessment activities were conducted at the Site between April and May 2016. A remedial excavation was conducted in February 2017 to remove remaining soil impacts that were detected during the initial excavation to repair the line. Analytical results for soil and groundwater samples collected during site assessment and excavation activities are presented in the *Knaus 28-2 Excavation and Site Assessment Activities Report* (February 1, 2017). A Form 27 pertaining to remediation activities at the Site was received by the COGCC on July 21, 2016, and document number 200439963 and remediation project number 9767 were assigned.

During assessment activities groundwater samples were collected and analytical results exceeded COGCC Table 910-1 standards. During the remedial excavation monitoring wells BH02, BH04, BH05, and BH06 were destroyed. Replacement wells BH02R, BH04R, BH05R, and BH06R and two additional compliance wells, BH09 and BH10 were installed in June 2017. To further delineate the groundwater plume, monitoring wells BH11 through BH18 were installed June 2018.

2.0 FIRST QUARTER 2019 GROUNDWATER MONITORING ACTIVITIES

First Quarter 2019 groundwater monitoring activities were performed at the Site on March 15, 2019. The activities included measurement of groundwater levels from all 18 Site monitoring well locations and the collection of groundwater samples. Groundwater elevation measurements are presented in Table 1 laboratory analytical data is presented in Table 2.

2.1 Groundwater Level Measurements

Both general procedures and significant observations for the groundwater gauging activities performed during the first quarter 2019 groundwater monitoring event are presented in the following sections.

General Procedures

Groundwater levels are gauged quarterly in order to evaluate hydraulic characteristics and to provide information regarding seasonal and annual fluctuations in groundwater elevations at the Site. During the first quarter 2019 groundwater monitoring event, groundwater levels were gauged at all monitoring well locations in the Site monitoring network.

Groundwater is measured on the north side of the well casing to the nearest 0.01-foot using an oil-water interface probe (IP). Groundwater level data were subsequently converted to elevations (ft. amsl) by subtracting the measured depth-to-water (DTW) from the well's top-of-casing (TOC) elevation survey datum. When applicable, DTW data for wells containing Light Non-Aqueous Phase Liquid (LNAPL) were converted to elevation by using the assumed LNAPL density of 0.75 times that of water.

Significant Observations

During the first quarter 2019 groundwater monitoring event, the groundwater elevation at the Site ranged from 4,700.02 ft. amsl in BH12 to 4,700.31 ft. amsl in BH17. The groundwater potentiometric surface at the site slopes to the south/southeast, with a hydraulic gradient of approximately 0.003 feet per foot between wells BH12 and BH17. Groundwater elevation contours and the inferred flow direction are illustrated on Figure 3. Monitoring well BH07 was dry and therefore not sampled.

2.2 Groundwater Purging and Sampling

This section summarizes both general procedures and significant observations from the groundwater purging and sampling activities conducted on March 15, 2019. During the first quarter 2019 groundwater monitoring event, groundwater samples were collected from 17 of the monitoring wells in the Site monitoring well network. One well was dry and was not sampled.

General Procedures

Prior to collecting groundwater samples, groundwater levels were measured at each of the Site monitoring wells, as described above. The presence of LNAPL was also evaluated using an IP. Subsequently, a minimum of three casing volumes of groundwater (calculated from total well depth and groundwater level measurements) were purged from each well prior to collecting a groundwater sample.

Groundwater samples were collected using dedicated, disposable, polyethylene bailers and were placed in clean laboratory-supplied containers for the selected analytical method, packed in an ice-filled cooler, and kept at approximately 4 degrees Celsius for transportation to the laboratory.

Groundwater samples were submitted under standard chain-of-custody procedures to Summit Scientific Laboratory in Golden, Colorado for analysis of benzene, toluene, ethylbenzene, and total xylenes (BTEX) using United States Environmental Protection Agency (USEPA) Method 8260B.

3.0 FIRST QUARTER 2019 GROUNDWATER SAMPLING RESULTS

This section presents the laboratory analytical results for groundwater samples collected during the first quarter 2019 groundwater monitoring event. Groundwater laboratory analytical data is presented in Table 2 and illustrated on Figure 4. The complete laboratory analytical report is provided in Attachment A. A summary of the groundwater laboratory analytical data collected by Tasman is presented below:

- Benzene was detected above the COGCC Table 910-1 groundwater standard of 5 micrograms per liter ($\mu\text{g/L}$) in two of the 17 Site monitoring wells sampled. The benzene concentrations ranged from 39 $\mu\text{g/L}$ at BH05R to 240 $\mu\text{g/L}$ at BH02R.
- Toluene was not detected above the COGCC Table 910-1 groundwater standard of 560 $\mu\text{g/L}$ in any of the 17 Site monitoring wells sampled.
- Ethylbenzene was not detected above the COGCC Table 910-1 groundwater standard of 700 $\mu\text{g/L}$ in any of the 17 Site monitoring wells sampled.
- Total xylenes were not detected above the COGCC Table 910-1 groundwater standard of 1,400 $\mu\text{g/L}$ in any of the 17 Site monitoring wells sampled.

4.0 REMEDIATION SYSTEM

This section summarizes the installation and operational data for the System that operated at the Site. The remediation system was shut down a minimum of one week prior to quarterly groundwater monitoring events to allow for normalization of Site groundwater levels.

4.1 AS Remediation System Installation

On June 11, 2018 Tasman installed AS-01, which was used in an AS pilot test conducted during the second quarter 2018. Tasman returned between July 2 and 3, 2018 to install seven additional AS wells to be used in operation of the System. The AS remediation well network is illustrated on Figure 2.

Remediation AS wells were completed to a total depth of 20 ft. bgs and constructed of 1-inch schedule 40 PVC casing with 3 ft. of 0.010-inch machine-slotted PVC screen. The System remediation equipment is housed in a trailer that was placed along the eastern end of the Site, as shown on Figure 2.

4.1.1 AS Remediation System Operations

On October 16, 2018, the AS component of the System was initiated. Active AS wells included AS-01 - 08. Monitoring wells BH01 – BH06R, BH08 – BH11, and BH14 – BH18 were outfitted as passive SVE wells. A Red River Compression generator was used to power the System.

From January 1 to March 7, 2019 the AS wells operated at an average flow rate of 6.42 cfm and at an average pressure of 1.68 pounds per square inch (psi). During this time frame, the System operated with an average uptime of 98%. Pressure surveys were conducted to determine the radius of influence achieved by AS operations. On January 16, 2019 a maximum pressure of 1.7 inches of water column was achieved at 32.4 linear feet at BH08. This was also the greatest distance that influence was observed.

Soil vapor concentrations are measured across the Site using the Site groundwater monitoring wells. A photoionization detector (PID) is used to measure the vapor phase petroleum hydrocarbon concentrations to monitor passive emissions from AS operations. PID readings ranged from 0 to 297.6 milligrams per kilogram (mg/kg) across the site over the first quarter of 2019 with the highest concentrations typically recorded at groundwater monitoring wells BH03, BH05R and BH06R.

Based on the laboratory results from the first quarter 2019 groundwater samples, concentrations have dropped three orders of magnitude at groundwater monitoring well BH04R since system start up in the third quarter 2018. Due to the historic presence of LNAPL at BH03 and BH05R,

remediation efforts during the first quarter 2019 were focused in the area of these two wells. Approximately .02 ounces of LNAPL was removed via hand bailer from BH03 and BH05R during the first quarter of 2019 and for the first time since March 21, 2018 LNAPL was not detected at either BH03 or BH05R during the quarterly sampling event.

The system was shut down on March 7, 2019 for the first quarter groundwater sampling event and remained off for the remainder of the first quarter 2019 due to equipment repairs. Due to farming and irrigation activities the equipment was removed from the site on April 9, 2019. The System will remain off until these activities are completed.

5.0 UPCOMING SITE ACTIVITIES

Anticipated upcoming Site activities include the following:

- Complete the second quarter 2019 groundwater sampling event in June 2019; and
- Continue monitor LNAPL levels at BH03 and BH05R on a biweekly basis or as site access allows; and
- Remove LNAPL from wells with the use of a bailer when LNAPL is detected.

TABLES

TABLE 1
GROUNDWATER ELEVATION DATA
NOBLE ENERGY, INC. - KNAUS 28-8

Monitoring Well ID	Date	Top of Casing Elevation (ft. AMSL)	Total Depth (ft. BTOC)	Depth to Water (ft. BTOC)	Depth to LNAPL (ft. BTOC)	LNAPL Thickness (ft.)	Groundwater Elevation* (ft. AMSL)
BH01	04/15/16	4660.12	16.81	14.29	ND	ND	4645.83
BH01	06/21/16	4660.12	16.24	13.63	ND	ND	4646.49
BH01	07/08/16	4658.07 ¹	NM	10.71	ND	ND	4647.36
BH01	09/02/16	4658.07	14.18	9.24	ND	ND	4648.83
BH01	12/20/16	4660.19 ⁴	16.30	14.03	ND	ND	4646.16
BH01	06/23/17	4660.13	16.33	14.35	ND	ND	4645.78
BH01	09/22/17	4660.13	16.31	11.82	ND	ND	4648.31
BH01	12/07/17	4660.13	16.59	13.60	ND	ND	4646.53
BH01	03/21/18	4660.13	16.56	14.80	ND	ND	4645.33
BH01	06/15/18	4716.22	16.89	15.26	ND	ND	4700.96
BH01	09/26/18	4716.22	16.84	14.29	ND	ND	4701.93
BH01	12/14/18	4716.22	16.96	15.30	ND	ND	4700.92
BH01	03/15/19	4716.22	17.06	16.11	ND	ND	4700.11
BH02	04/15/16	4660.56	17.71	17.13	ND	ND	4643.43
BH02	06/21/16	4660.56	17.71	13.99	ND	ND	4646.57
BH02	07/08/16	4660.56	NM	13.04	ND	ND	4647.52
BH02	09/02/16	Well Casing Damaged - Elevation Control Lost					
BH02 ³	09/12/16	NS	14.69	8.98	ND	ND	NS
BH02	12/20/16	NS	17.58	14.20	ND	ND	NS
BH02	02/07/17	Well Destroyed During Excavation					
BH02R	06/23/17	4661.34	22.39	15.45	ND	ND	4645.89
BH02R	09/22/17	4661.34	22.40	12.96	ND	ND	4648.38
BH02R	12/07/17	4661.34	22.40	14.74	ND	ND	4646.60
BH02R	03/21/18	4661.34	22.39	15.95	ND	ND	4645.39
BH02R	06/15/18	4717.42	22.45	16.40	ND	ND	4701.02
BH02R	09/26/18	4717.42	22.41	15.43	ND	ND	4701.99
BH02R	12/14/18	4717.42	22.42	16.42	ND	ND	4701.00
BH02R	03/15/19	4717.42	22.49	17.22	ND	ND	4700.20
BH03	04/15/16	4660.75	17.41	14.66	Trace	<0.01	4646.09
BH03	06/21/16	4660.75	17.41	16.42	13.54	2.88	4646.49
BH03	07/08/16	4660.75	NM	13.32	13.24	0.08	4647.49
BH03	09/02/16	4660.75	16.99	11.95	11.76	0.19	4648.94
BH03	12/20/16	4660.75	16.93	14.77	14.43	0.34	4646.24
BH03	06/23/17	4660.83	NM	15.07	14.84	0.23	4645.93
BH03	09/22/17	4660.83	17.12	12.39	12.36	0.03	4648.46
BH03	12/07/17	4660.83	NM	14.21	14.15	0.06	4646.67
BH03	03/21/18	4660.83	17.36	15.37	ND	ND	4645.46
BH03	06/15/18	4716.91	17.50	15.91	15.86	0.05	4701.04
BH03 ⁽¹⁾	09/26/18	4716.91	17.38	14.85	14.84	0.01	4702.07
BH03	12/14/18	4716.91	NM	15.88	15.84	0.04	4701.06
BH03	03/15/19	4716.91	17.62	16.67	ND	ND	4700.24
BH04	04/15/16	4659.97	17.24	14.47	ND	ND	4645.50
BH04	06/21/16	4659.97	17.24	14.76	13.12	1.64	4646.44
BH04	07/08/16	4659.97	NM	12.75	12.60	0.15	4647.33
BH04	09/02/16	4659.97	17.26	11.12	ND	ND	4648.85
BH04	12/20/16	4659.97	17.24	14.00	13.77	0.23	4646.14
BH04	02/07/17	Well Destroyed During Excavation					
BH04R	06/23/17	4661.01	21.83	15.21	ND	ND	4645.80
BH04R	09/22/17	4661.01	21.81	12.78	ND	ND	4648.23
BH04R	12/07/17	4661.01	21.89	14.49	ND	ND	4646.52
BH04R	03/21/18	4661.01	21.88	15.71	ND	ND	4645.30

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Monitoring Well ID	Date	Top of Casing Elevation (ft. AMSL)	Total Depth (ft. BTOC)	Depth to Water (ft. BTOC)	Depth to LNAPL (ft. BTOC)	LNAPL Thickness (ft.)	Groundwater Elevation* (ft. AMSL)
BH04R	06/15/18	4717.09	21.94	16.17	ND	ND	4700.92
BH04R	09/26/18	4717.09	21.88	15.20	ND	ND	4701.89
BH04R	12/14/18	4717.09	21.62	16.19	ND	ND	4700.90
BH04R	03/15/19	4717.09	21.79	17.01	ND	ND	4700.08
BH05	04/15/16	4661.14	17.11	15.06	Trace	<0.01	4646.08
BH05	06/21/16	4661.14	16.81	14.60	14.56	0.04	4646.57
BH05	07/08/16	4661.14	NM	13.74	13.72	0.02	4647.42
BH05	09/02/16	4661.14	16.88	12.29	12.28	0.01	4648.86
BH05	12/20/16	4661.14	17.22	15.29	14.83	0.46	4646.20
BH05	02/07/17	Well Destroyed During Excavation					
BH05R	06/23/17	4660.88	21.49	15.05	ND	ND	4645.83
BH05R	09/22/17	4660.88	21.49	12.52	ND	ND	4648.36
BH05R	12/07/17	4660.88	21.49	14.29	14.28	0.01	4646.60
BH05R	03/21/18	4660.88	21.50	15.46	ND	ND	4645.42
BH05R	06/15/18	4716.96	21.51	15.94	NM	NM	NM ⁶
BH05R ⁽¹⁾	09/26/18	4716.96	21.48	14.96	14.95	0.01	4702.01
BH05R	12/14/18	4716.96	NM	15.95	15.94	0.01	4701.02
BH05R	03/15/19	4716.96	21.54	16.77	ND	ND	4700.19
BH06	04/15/16	4660.85	16.65	14.77	ND	ND	4646.08
BH06	06/21/16	4660.85	16.62	14.24	ND	ND	4646.61
BH06	07/08/16	4660.85	NM	13.39	ND	ND	4647.46
BH06	09/02/16	4660.85	16.78	11.92	ND	ND	4648.93
BH06	12/20/16	4660.85	16.81	14.61	ND	ND	4646.24
BH06	02/07/17	Well Destroyed During Excavation					
BH06R	06/23/17	4660.56	19.43	14.62	ND	ND	4645.94
BH06R	09/22/17	4660.56	19.40	12.16	ND	ND	4648.40
BH06R	12/07/17	4660.56	19.58	13.91	ND	ND	4646.65
BH06R	03/21/18	4660.56	19.60	15.12	ND	ND	4645.44
BH06R	06/15/18	4716.64	19.68	15.59	ND	ND	4701.05
BH06R	09/26/18	4716.64	19.63	14.61	ND	ND	4702.03
BH06R	12/14/18	4716.64	19.80	15.62	ND	ND	4701.02
BH06R	03/15/19	4716.64	19.83	16.41	ND	ND	4700.23
BH07	04/15/16	4660.84	17.20	14.90	ND	ND	4645.94
BH07	06/21/16	4660.84	16.91	14.38	ND	ND	4646.46
BH07	07/08/16	4660.84	NM	13.56	ND	ND	4647.28
BH07	09/02/16	4660.84	16.90	12.13	ND	ND	4648.71
BH07	12/20/16	4660.84	16.88	14.77	ND	ND	4646.07
BH07	06/23/17	4660.82	16.95	15.05	ND	ND	4645.77
BH07	09/22/17	4660.82	16.93	12.61	ND	ND	4648.21
BH07	12/07/17	4660.82	16.59	14.33	ND	ND	4646.49
BH07	03/21/18	4660.82	16.88	15.56	ND	ND	4645.26
BH07	06/15/18	4716.90	16.40	16.02	ND	ND	4700.88
BH07	09/26/18	4716.90	16.42	15.03	ND	ND	4701.87
BH07	12/14/18	4716.90	16.28	16.01	ND	ND	4700.89
BH07	03/15/19	4716.90	16.32	16.32	ND	ND	4700.58
BH08	06/21/16	4661.26	22.25	14.62	ND	ND	4646.64
BH08	07/08/16	4661.26	NM	13.71	ND	ND	4647.55
BH08	09/02/16	4658.51 ²	19.50	9.28	ND	ND	4649.23
BH08	12/20/16	4661.45 ⁵	22.44	14.98	ND	ND	4646.47
BH08	06/23/17	4661.26	22.43	15.32	ND	ND	4645.94
BH08	09/22/17	4661.26	22.42	12.76	ND	ND	4648.50

TABLE 1
GROUNDWATER ELEVATION DATA
NOBLE ENERGY, INC. - KNAUS 28-8

Monitoring Well ID	Date	Top of Casing Elevation (ft. AMSL)	Total Depth (ft. BTOC)	Depth to Water (ft. BTOC)	Depth to LNAPL (ft. BTOC)	LNAPL Thickness (ft.)	Groundwater Elevation* (ft. AMSL)
BH08	12/07/17	4661.26	22.54	14.54	ND	ND	4646.72
BH08	03/21/18	4661.26	22.48	15.75	ND	ND	4645.51
BH08	06/15/18	4717.34	22.56	16.22	ND	ND	4701.12
BH08	09/26/18	4717.34	22.52	15.23	ND	ND	4702.11
BH08	12/14/18	4717.34	22.52	16.23	ND	ND	4701.11
BH08	03/15/19	4717.34	22.58	17.05	ND	ND	4700.29
BH09	06/23/17	4660.51	21.60	14.76	ND	ND	4645.75
BH09	09/22/17	4660.51	21.61	12.32	ND	ND	4648.19
BH09	12/07/17	4660.51	21.59	14.05	ND	ND	4646.46
BH09	03/21/18	4660.51	21.60	15.26	ND	ND	4645.25
BH09	06/15/18	4716.59	21.70	15.72	ND	ND	4700.87
BH09	09/26/18	4716.59	21.67	14.76	ND	ND	4701.83
BH09	12/14/18	4716.59	21.64	15.76	ND	ND	4700.83
BH09	03/15/19	4716.59	21.71	16.56	ND	ND	4700.03
BH10	06/23/17	4660.28	19.65	14.43	ND	ND	4645.85
BH10	09/22/17	4660.28	19.62	11.99	ND	ND	4648.29
BH10	12/07/17	4660.28	19.75	13.75	ND	ND	4646.53
BH10	03/21/18	4660.28	19.71	14.96	ND	ND	4645.32
BH10	06/15/18	4716.35	19.91	15.43	ND	ND	4700.92
BH10	09/26/18	4716.35	19.88	14.47	ND	ND	4701.88
BH10	12/14/18	4716.35	19.91	15.47	ND	ND	4700.88
BH10	03/15/19	4716.35	19.94	16.26	ND	ND	4700.09
BH11	06/11/18	4716.91	20.82	15.87	ND	ND	4701.04
BH11	06/15/18	4716.91	21.30	15.93	ND	ND	4700.98
BH11	09/26/18	4716.91	21.21	14.97	ND	ND	4701.94
BH11	12/14/18	4716.91	21.57	15.98	ND	ND	4700.93
BH11	03/15/19	4716.91	22.01	16.77	ND	ND	4700.14
BH12	06/11/18	4716.66	18.95	15.66	ND	ND	4701.00
BH12	06/15/18	4716.66	19.01	15.73	ND	ND	4700.93
BH12	09/26/18	4716.66	19.20	14.76	ND	ND	4701.90
BH12	12/14/18	4716.66	18.94	15.73	ND	ND	4700.93
BH12	03/15/19	4716.66	19.20	16.64	ND	ND	4700.02
BH13	06/11/18	4716.99	18.71	15.90	ND	ND	4701.09
BH13	06/15/18	4716.99	18.92	15.97	ND	ND	4701.02
BH13	09/26/18	4716.99	18.71	14.99	ND	ND	4702.00
BH13	12/14/18	4716.99	18.71	15.99	ND	ND	4701.00
BH13	03/15/19	4716.99	18.51	16.74	ND	ND	4700.25
BH14	06/11/18	4716.41	18.66	15.49	ND	ND	4700.92
BH14	06/15/18	4716.41	18.68	15.55	ND	ND	4700.86
BH14	09/26/18	4716.41	18.66	14.59	ND	ND	4701.82
BH14	12/14/18	4716.41	18.66	15.57	ND	ND	4700.84
BH14	03/15/19	4716.41	18.95	16.37	ND	ND	4700.04
BH15	06/11/18	4716.33	18.46	15.38	ND	ND	4700.95
BH15	06/15/18	4716.33	18.50	15.44	ND	ND	4700.89
BH15	09/26/18	4716.33	18.68	14.47	ND	ND	4701.86
BH15	12/14/18	4716.33	18.45	15.45	ND	ND	4700.88
BH15	03/15/19	4716.33	18.75	16.27	ND	ND	4700.06

TABLE 1
GROUNDWATER ELEVATION DATA
NOBLE ENERGY, INC. - KNAUS 28-8

Monitoring Well ID	Date	Top of Casing Elevation (ft. AMSL)	Total Depth (ft. BTOC)	Depth to Water (ft. BTOC)	Depth to LNAPL (ft. BTOC)	LNAPL Thickness (ft.)	Groundwater Elevation* (ft. AMSL)
BH16	06/11/18	4717.24	18.93	16.12	ND	ND	4701.12
BH16	06/15/18	4717.24	19.00	16.15	ND	ND	4701.09
BH16	09/26/18	4717.24	18.93	15.16	ND	ND	4702.08
BH16	12/14/18	4717.24	18.93	16.16	ND	ND	4701.08
BH16	03/15/19	4717.24	19.24	17.01	ND	ND	4700.23
BH17	06/11/18	4716.75	21.84	15.45	ND	ND	4701.30
BH17	06/15/18	4716.75	21.75	15.62	ND	ND	4701.13
BH17	09/26/18	4716.75	21.65	14.62	ND	ND	4702.13
BH17	12/14/18	4716.75	21.99	15.62	ND	ND	4701.13
BH17	03/15/19	4716.75	22.01	16.44	ND	ND	4700.31
BH18	06/11/18	4716.80	21.85	15.76	ND	ND	4701.04
BH18	06/15/18	4716.80	22.23	15.80	ND	ND	4701.00
BH18	09/26/18	4716.80	22.13	14.81	ND	ND	4701.99
BH18	12/14/18	4716.80	22.12	15.81	ND	ND	4700.99
BH18	03/15/19	4716.80	22.23	16.63	ND	ND	4700.17

Notes:

ft. = Feet

AMSL = Above mean sea level

BTOC = Below top of casing

LNAPL = Light non-aqueous phase liquid

ND = No LNAPL detected

NM = Not Measured

NS = Not Surveyed

(1) = LNAPL present and removed with bailer. Interface Probe did not detect it. LNAPL thickness estimated at 0.01ft

* Groundwater elevation was corrected for product thickness (when present) using the following calculation:

Groundwater elevation = (TOC Elevation - Measured Depth to Water)+(LNAPL Thickness in Well x LNAPL Relative Density)

LNAPL relative density was estimated to be approximately 0.75

¹ Approximately 2.05 ft of casing broken off of BH01 prior to gauging on 7/8/16. Top of casing elevation is estimated, not surveyed.

² Approximately 2.75 ft of casing broken off of BH08 prior to gauging on 9/2/16. Top of casing elevation is estimated, not surveyed.

³ Damaged casing cut off just below ground surface, repaired with new stick up casing after sampling.

⁴ BH01 damaged, well repaired with approximately 2.12 ft of casing. Top of casing elevation is estimated, not surveyed.

⁵ BH08 damaged, well repaired with approximately 2.94 ft of casing. Top of casing elevation is estimated, not surveyed.

⁶ IP malfunction while gauging LNAPL, groundwater elevation lost

TABLE 2
GROUNDWATER ANALYTICAL DATA
NOBLE ENERGY, INC. - KNAUS 28-8

Monitoring Well ID	Date	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Total Xylenes (µg/L)
COGCC Standard		5	560	700	1,400
BH01	04/15/16	<1.0	<1.0	<1.0	<1.0
BH01	06/21/16	<1.0	<1.0	<1.0	<1.0
BH01	09/02/16	380	1.4	<1.0	340
BH01	12/20/16	32	<1.0	<1.0	1.3
BH01	06/23/17	<1.0	<1.0	<1.0	<2.0
BH01	09/22/17	<1.0	<1.0	<1.0	<2.0
BH01	12/07/17	<1.0	<1.0	<1.0	<2.0
BH01	03/21/18	<1.0	<1.0	<1.0	<2.0
BH01	06/15/18	<1.0	<1.0	<1.0	<2.0
BH01	09/26/18	<1.0	<1.0	<1.0	<2.0
BH01	12/14/18	<1.0	<1.0	<1.0	<2.0
BH01	03/15/19	<1.0	<1.0	<1.0	<2.0
BH02	04/15/16	5,300	3,900	130	1,200
BH02	06/21/16	7,300	1,500	97	2,300
BH02 ¹	09/12/16	9,700	3,800	<1.0	3,400
BH02	12/20/16	7,700	14	<1.0	1,000
BH02	02/07/17	Monitoring Well Destroyed During Excavation			
BH02R	06/23/17	<1.0	<1.0	<1.0	<2.0
BH02R	09/22/17	<1.0	<1.0	<1.0	<2.0
BH02R	12/07/17	<1.0	<1.0	<1.0	<2.0
BH02R	03/21/18	130	<1.0	<1.0	9.6
BH02R	06/15/18	130	<1.0	6.1	6.1
BH02R	09/26/18	380	1.2	10	9.4
BH02R	12/14/18	110	1.0	33	29
BH02R	03/15/19	240	<1.0	37	62
BH03	04/15/16	Not Sampled - LNAPL Present			
BH03	06/21/16	Not Sampled - LNAPL Present			
BH03	09/02/16	Not Sampled - LNAPL Present			
BH03	12/20/16	Not Sampled - LNAPL Present			
BH03	06/23/17	Not Sampled - LNAPL Present			
BH03 ¹	09/22/17	500	46	33	2,300
BH03	12/07/17	Not Sampled - LNAPL Present			
BH03	03/21/18	45	<1.0	1.9	810
BH03	06/15/18	Not Sampled - LNAPL Present			
BH03	09/26/18	Not Sampled - LNAPL Present			
BH03	12/14/18	Not Sampled - LNAPL Present			
BH03	03/15/19	1.9	<1.0	19	280
BH04	04/15/16	1,700	2,600	130	1,200
BH04	06/21/16	Not Sampled - LNAPL Present			
BH04 ¹	09/02/16	14,000	12,000	240	5,600
BH04	12/20/16	Not Sampled - LNAPL Present			
BH04	02/07/17	Monitoring Well Destroyed During Excavation			

TABLE 2
GROUNDWATER ANALYTICAL DATA
NOBLE ENERGY, INC. - KNAUS 28-8

Monitoring Well ID	Date	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Total Xylenes (µg/L)
COGCC Standard		5	560	700	1,400
BH04R	06/23/17	<1.0	<1.0	<1.0	12
BH04R	09/22/17	1400	<1.0	<1.0	13
BH04R	12/07/17	190	<1.0	9.2	4.0
BH04R	03/21/18	2,000	<1.0	8.7	3.1
BH04R	06/15/18	970	<1.0	39	4.0
BH04R	09/26/18	1,200	<1.0	44	13
BH04R	12/14/18	2.2	<1.0	<1.0	<2.0
BH04R	03/15/19	<1.0	<1.0	<1.0	<2.0
BH05	04/15/16	Not Sampled - LNAPL Present			
BH05	06/21/16	Not Sampled - LNAPL Present			
BH05	09/02/16	Not Sampled - LNAPL Present			
BH05	12/20/16	Not Sampled - LNAPL Present			
BH05	02/07/17	Monitoring Well Destroyed During Excavation			
BH05R	06/23/17	2,800	860	<1.0	1,000
BH05R ¹	09/22/17	9,800	3,300	140	12,000
BH05R	12/07/17	Not Sampled - LNAPL Present			
BH05R	03/21/18	1,700	1.4	45	900
BH05R	06/15/18	Not Sampled - LNAPL Present			
BH05R	09/26/18	Not Sampled - LNAPL Present			
BH05R	12/14/18	Not Sampled - LNAPL Present			
BH05R	03/15/19	39	<1.0	48	59
BH06	04/15/16	<1.0	8.0	<1.0	<1.0
BH06	06/21/16	<1.0	<1.0	<1.0	<1.0
BH06	09/02/16	<1.0	1.4	<1.0	<1.0
BH06	12/20/16	3.1	<1.0	<1.0	6.7
BH06	02/07/17	Monitoring Well Destroyed During Excavation			
BH06R	06/23/17	1.9	<1.0	<1.0	<2.0
BH06R	09/22/17	<1.0	<1.0	<1.0	6.5
BH06R	12/07/17	<1.0	<1.0	<1.0	<2.0
BH06R	03/21/18	<1.0	<1.0	<1.0	<2.0
BH06R	06/15/18	<1.0	<1.0	<1.0	<2.0
BH06R	09/26/18	<1.0	<1.0	<1.0	<2.0
BH06R	12/14/18	<1.0	<1.0	<1.0	<2.0
BH06R	03/15/19	<1.0	<1.0	<1.0	<2.0
BH07	04/15/16	<1.0	<1.0	<1.0	<1.0
BH07	06/21/16	<1.0	<1.0	<1.0	<1.0
BH07	09/02/16	1,600	6.6	<1.0	200
BH07	12/20/16	9,000	24	<1.0	630
BH07	06/23/17	9,100	1.5	<1.0	260
BH07	09/22/17	240	<1.0	<1.0	<2.0
BH07	12/07/17	3,900	<1.0	11	<2.0
BH07	03/21/18	690	<1.0	19	3.9

TABLE 2
GROUNDWATER ANALYTICAL DATA
NOBLE ENERGY, INC. - KNAUS 28-8

Monitoring Well ID	Date	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Total Xylenes (µg/L)
COGCC Standard		5	560	700	1,400
BH07	06/15/18	Not Sampled - Insufficient Water Volume			
BH07	09/26/18	<1.0	<1.0	<1.0	<2.0
BH07	12/14/18	Not Sampled - Insufficient Water Volume			
BH07	03/15/19	Not Sampled - Insufficient Water Volume			
BH08	06/21/16	<1.0	<1.0	<1.0	<1.0
BH08	09/02/16	<1.0	1.4	<1.0	<1.0
BH08	12/20/16	<1.0	<1.0	<1.0	<1.0
BH08	06/23/17	<1.0	<1.0	<1.0	<2.0
BH08	09/22/17	<1.0	<1.0	<1.0	<2.0
BH08	12/07/17	<1.0	<1.0	<1.0	<2.0
BH08	03/21/18	<1.0	<1.0	<1.0	<2.0
BH08	06/15/18	<1.0	<1.0	<1.0	<2.0
BH08	09/26/18	<1.0	<1.0	<1.0	<2.0
BH08	12/14/18	<1.0	<1.0	<1.0	<2.0
BH08	03/15/19	<1.0	<1.0	<1.0	<2.0
BH09	06/23/17	<1.0	<1.0	<1.0	<2.0
BH09	09/22/17	<1.0	<1.0	<1.0	<2.0
BH09	12/07/17	<1.0	<1.0	<1.0	<2.0
BH09	03/21/18	<1.0	<1.0	<1.0	<2.0
BH09	06/15/18	1.8	<1.0	<1.0	<2.0
BH09	09/26/18	2.6	<1.0	<1.0	<2.0
BH09	12/14/18	<1.0	<1.0	<1.0	<2.0
BH09	03/15/19	<1.0	<1.0	<1.0	<2.0
BH10	06/23/17	<1.0	<1.0	<1.0	<2.0
BH10	09/22/17	<1.0	<1.0	<1.0	<2.0
BH10	12/07/17	<1.0	<1.0	<1.0	<2.0
BH10	03/21/18	<1.0	<1.0	<1.0	<2.0
BH10	06/15/18	<1.0	<1.0	<1.0	<2.0
BH10	09/26/18	<1.0	<1.0	<1.0	<2.0
BH10	12/14/18	<1.0	<1.0	<1.0	<2.0
BH10	03/15/19	<1.0	<1.0	<1.0	<2.0
BH11	06/11/18	340	<1.0	5.8	<2.0
BH11	09/26/18	<1.0	<1.0	<1.0	<2.0
BH11	12/14/18	<1.0	<1.0	<1.0	<2.0
BH11	03/15/19	<1.0	<1.0	<1.0	<2.0
BH12	06/11/18	<1.0	<1.0	<1.0	<2.0
BH12	09/26/18	<1.0	<1.0	<1.0	<2.0
BH12	12/14/18	<1.0	<1.0	<1.0	<2.0
BH12	03/15/19	<1.0	<1.0	<1.0	<2.0
BH13	06/11/18	<1.0	<1.0	<1.0	<2.0
BH13	09/26/18	<1.0	<1.0	<1.0	<2.0
BH13	12/14/18	<1.0	<1.0	<1.0	<2.0

TABLE 2
GROUNDWATER ANALYTICAL DATA
NOBLE ENERGY, INC. - KNAUS 28-8

Monitoring Well ID	Date	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Total Xylenes (µg/L)
COGCC Standard		5	560	700	1,400
BH13	03/15/19	<1.0	<1.0	<1.0	<2.0
BH14	06/11/18	<1.0	<1.0	<1.0	<2.0
BH14	09/26/18	<1.0	<1.0	<1.0	<2.0
BH14	12/14/18	1.2	<1.0	<1.0	<2.0
BH14	03/15/19	<1.0	<1.0	<1.0	<2.0
BH15	06/11/18	1.2	<1.0	3.9	<2.0
BH15	09/26/18	<1.0	<1.0	<1.0	<2.0
BH15	12/14/18	1.6	<1.0	<1.0	<2.0
BH15	03/15/19	<1.0	<1.0	<1.0	<2.0
BH16	06/11/18	1.0	<1.0	9.2	27
BH16	09/26/18	<1.0	<1.0	5.6	15
BH16	12/14/18	<1.0	<1.0	<1.0	<2.0
BH16	03/15/19	<1.0	<1.0	<1.0	<2.0
BH17	06/11/18	<1.0	<1.0	<1.0	<2.0
BH17	09/26/18	<1.0	<1.0	<1.0	<2.0
BH17	12/14/18	<1.0	<1.0	<1.0	<2.0
BH17	03/15/19	<1.0	<1.0	<1.0	<2.0
BH18	06/11/18	<1.0	<1.0	<1.0	<2.0
BH18	09/26/18	<1.0	<1.0	<1.0	<2.0
BH18	12/14/18	<1.0	<1.0	<1.0	<2.0
BH18	03/15/19	<1.0	<1.0	<1.0	<2.0

Notes:

COGCC = Colorado Oil and Gas Conservation Commission

µg/L = Micrograms per liter

< = Analytical result is less than the indicated laboratory reporting limit

Groundwater standards referenced from COGCC Table 910-1

Highlighted results are equal to or exceed the COGCC Table 910-1 standard

¹ Sheen present on groundwater sample.

FIGURES

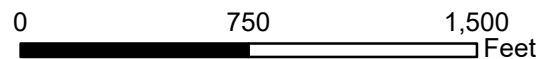
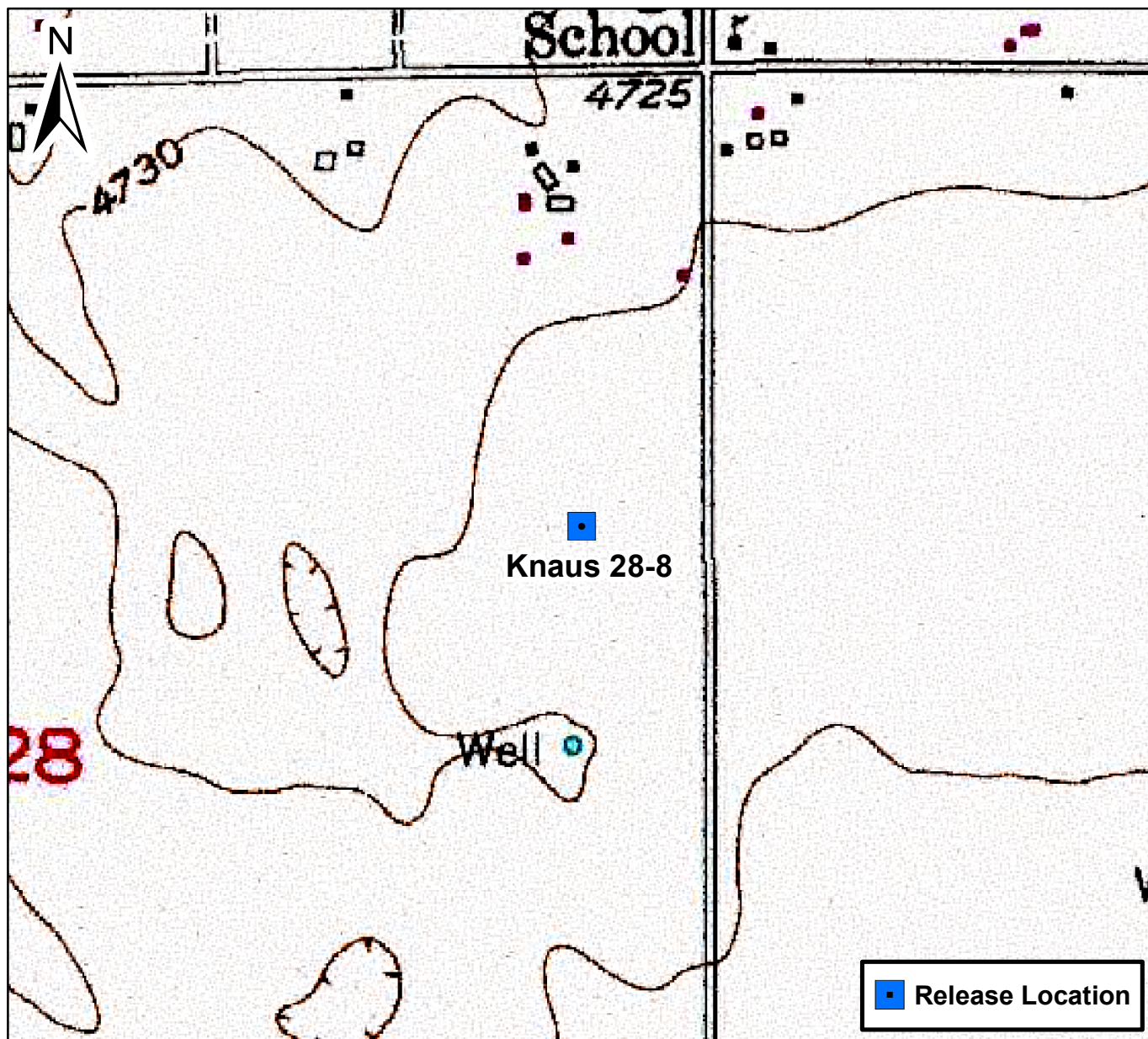
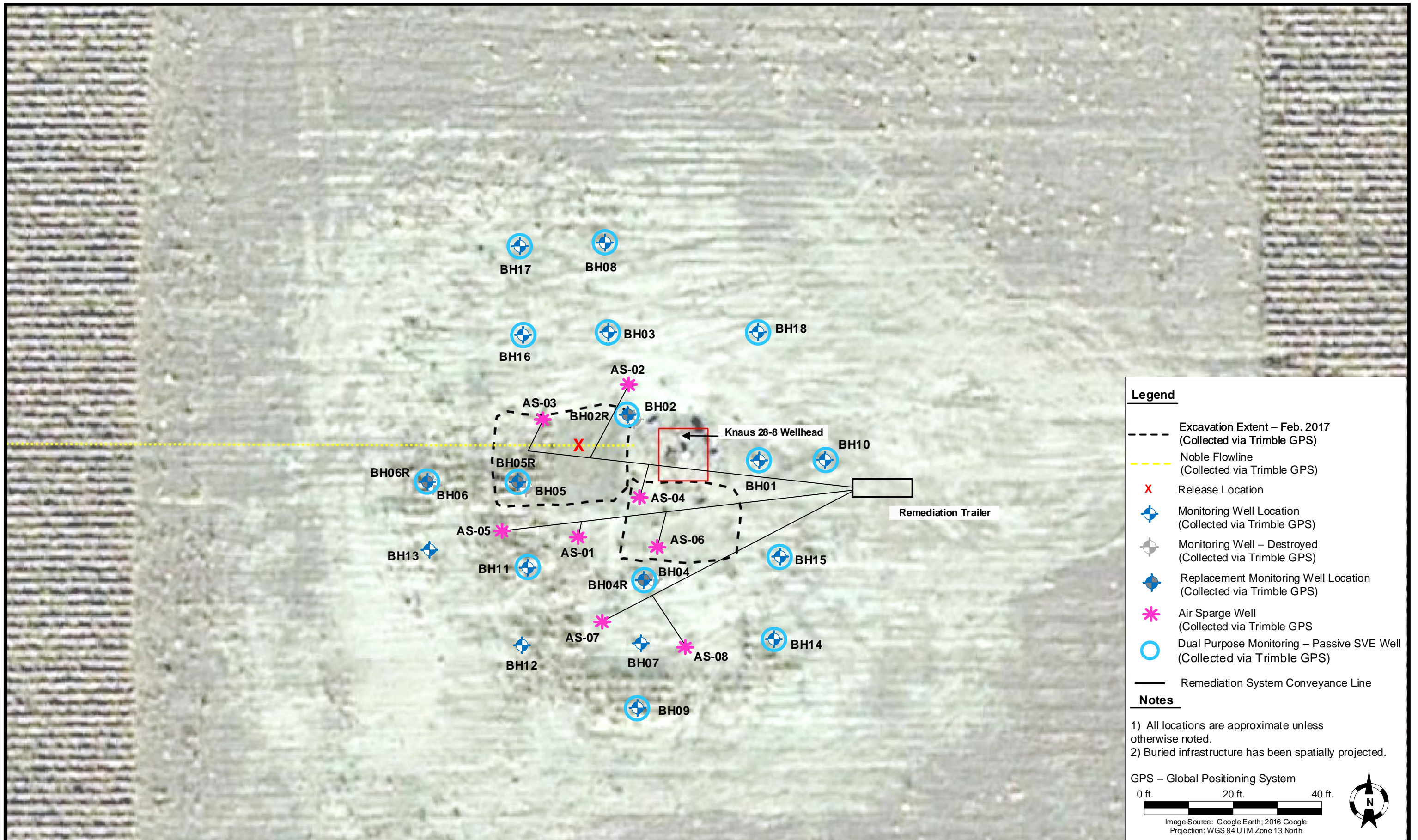



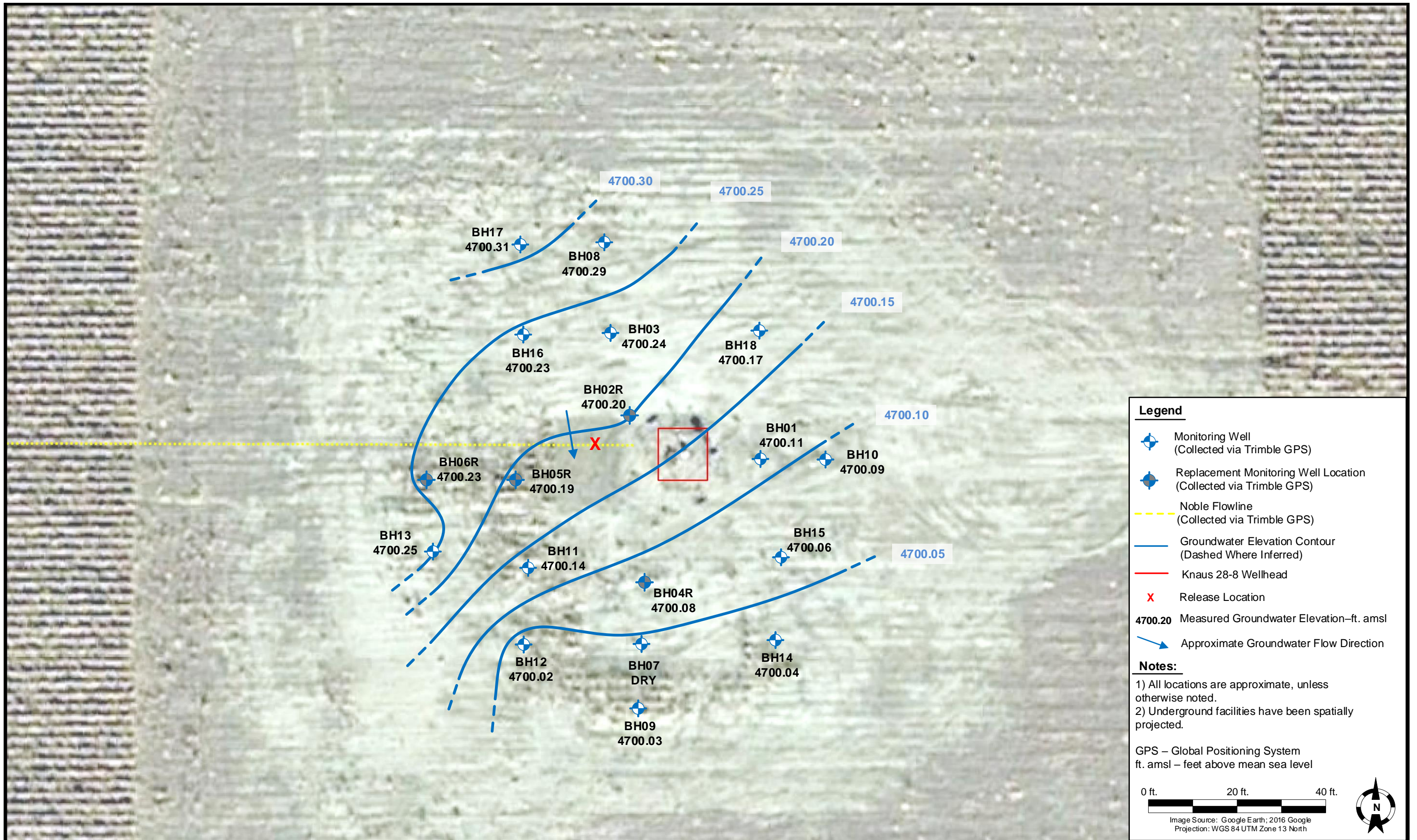
Figure 1

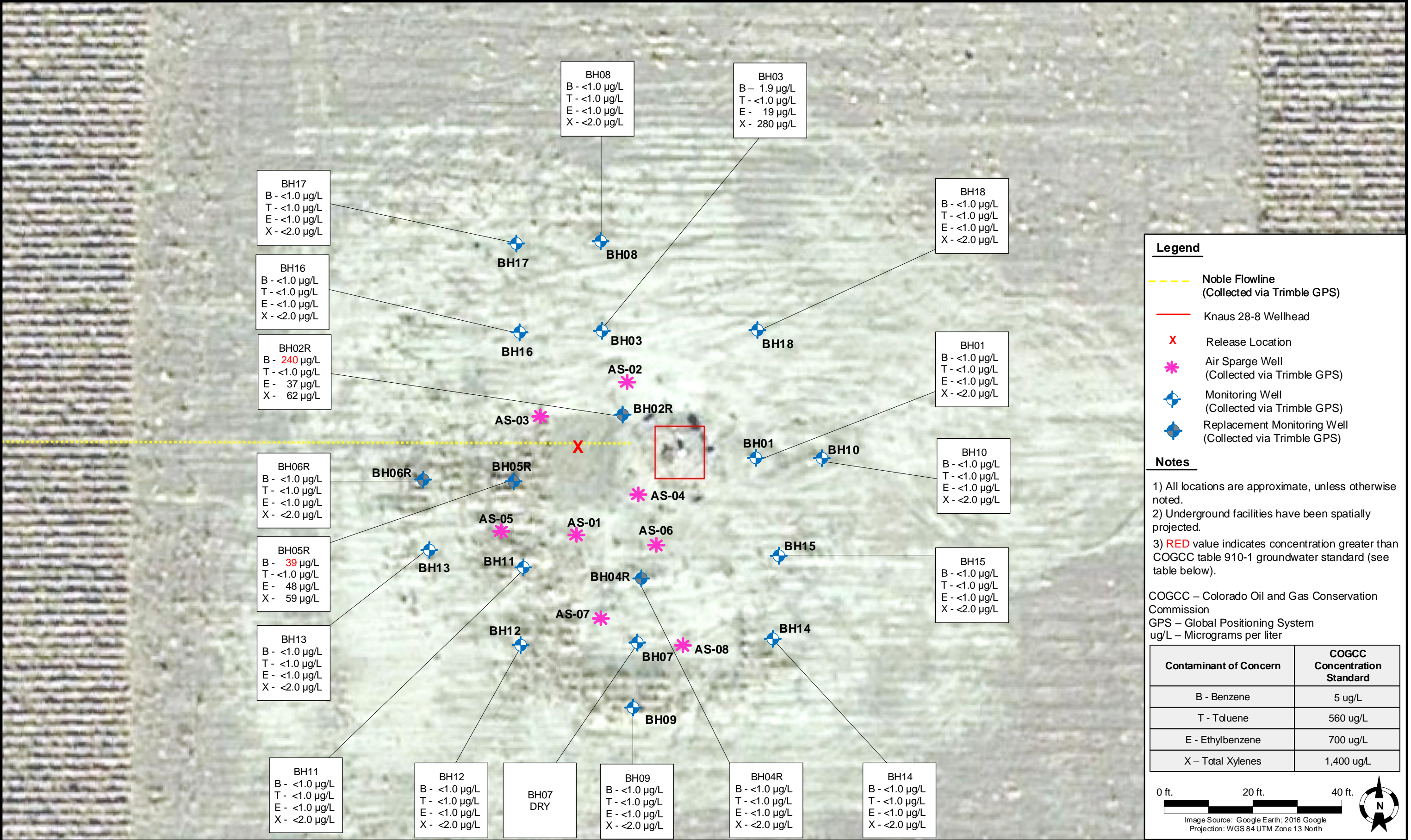
Site Location Map
Knaus 28-8
SENE S28 T6N R66W Weld
County, Colorado





DATE: 1/28/2019	 TASMAN GEOSCIENCES Tasman Geosciences, Inc. 6899 Pecos Street – Unit C Denver, CO 80221	Noble Energy, Inc. – DJ Basin Knaus 28-8 SENE, Section 28, Township 6 North, Range 66 West Weld County, Colorado	Site Overview Map	FIGURE 2
DESIGNED BY: DA				
DRAWN BY: GB				





ATTACHMENT A

LABORATORY ANALYTICAL DATA REPORT

Summit Scientific

4653 Table Mountain Drive, Golden, Colorado 80403

303.277.9310

March 25, 2019

Brandon Bruns

Tasman Geosciences

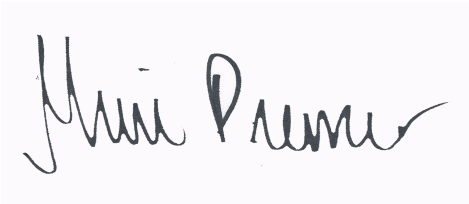
6899 Pecos St, Unit C

Denver, CO 80221

RE: Noble - Knaus 28-8

Enclosed are the results of analyses for samples received by Summit Scientific on 03/15/19 18:30. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

A handwritten signature in black ink, reading "Muri Premier", is displayed on a light purple rectangular background.

Muri Premier For Ben Shrewsbury

Laboratory Manager



Tasman Geosciences
6899 Pecos St, Unit C
Denver CO, 80221

Project: Noble - Knaus 28-8

Project Number: [none]
Project Manager: Brandon Bruns

Reported:
03/25/19 09:46

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
BH01	1903130-01	Water	03/15/19 11:21	03/15/19 18:30
BH02R	1903130-02	Water	03/15/19 11:38	03/15/19 18:30
BH03	1903130-03	Water	03/15/19 12:34	03/15/19 18:30
BH04R	1903130-04	Water	03/15/19 11:58	03/15/19 18:30
BH05R	1903130-05	Water	03/15/19 12:27	03/15/19 18:30
BH06R	1903130-06	Water	03/15/19 12:20	03/15/19 18:30
BH08	1903130-07	Water	03/15/19 11:25	03/15/19 18:30
BH09	1903130-08	Water	03/15/19 10:40	03/15/19 18:30
BH10	1903130-09	Water	03/15/19 11:30	03/15/19 18:30
BH11	1903130-10	Water	03/15/19 10:58	03/15/19 18:30
BH12	1903130-11	Water	03/15/19 12:06	03/15/19 18:30
BH13	1903130-12	Water	03/15/19 12:40	03/15/19 18:30
BH14	1903130-13	Water	03/15/19 12:18	03/15/19 18:30
BH15	1903130-14	Water	03/15/19 12:25	03/15/19 18:30
BH16	1903130-15	Water	03/15/19 11:11	03/15/19 18:30
BH17	1903130-16	Water	03/15/19 10:40	03/15/19 18:30
BH18	1903130-17	Water	03/15/19 11:36	03/15/19 18:30

Summit Scientific

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Summit Scientific

S₂

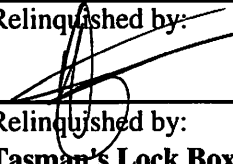
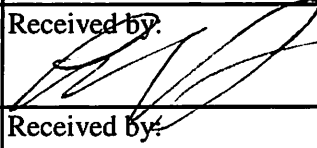
1903/30.1

4653 Table Mountain Drive ♦ Golden, Colorado 80403
303-277-9310

Page 1 of 2

Client:	Noble / Tasman	Project Manager:	Brandon Bruns, Invoice: Jacob Evans
Address:	6899 Pecos Street	E-Mail:	Bbruns@tasman-geo.com
City/State/Zip:	Denver / CO/ 80221		
Phone:	970.210.6571	Project Name:	KNAUS 28-8
Sampler Name:	T. Lichtenberg	Project Number:	

ID	Sample Description	Date Sampled	Time Sampled	# of containers	Preservative				Matrix				Analysis Requested						Special Instructions	
					HCl	HNO3	None	Other	Water	Soil	Air-Canister #	Other	\$260 BTEX	\$260B GBTEXN	\$015 DRO	pH, EC, SAR				
1	BH01	3/15/19	1121	1	X				X					X						
2	BH02 R		1138	3																
3	BH03		1234																	
4	BH04 R		1158																	
5	BH05 R		1227																	
6	BH06 R		1220																	
7	BH08		1125																	
8	BH09		1040																	
9	BH10		1130																	
10	BH11		1058																	

Relinquished by:	Date/Time:	Received by:	Date/Time:	Turn Around Time	(Check)	Notes: on vcp
	3/15/19 0100	Tasman's Lock Box	3/15/19 0100	Same Day	72 hours	
Relinquished by:	Date/Time:	Received by:	Date/Time:	24 hours	Standard	
Tasman's Lock Box	3-15-19 1830		3-15-19 1830	48 hours		
Relinquished by:	Date/Time:	Received by:	Date/Time:	Sample Integrity:		
				Temperature Upon Receipt:	2.5	
				Samples Intact:	Yes No	

Summit Scientific

S₂

1903130.2

4653 Table Mountain Drive ♦ Golden, Colorado 80403
303-277-9310

Page 2 of 2

Client:	Noble / Tasman	Project Manager:	Brandon Bruns, Invoice: Jacob Evans
Address:	6899 Pecos Street	E-Mail:	Bbruns@tasman-geo.com
City/State/Zip:	Denver / CO/ 80221		
Phone:	970.210.6571	Project Name:	KNAUS 28.8
Sampler Name:	T. Lichtenberg	Project Number:	

ID	Sample Description	Date Sampled	Time Sampled	# of containers	Preservative				Matrix				Analysis Requested						Special Instructions	
					HCl	HNO ₃	None	Other	Water	Soil	Air-Canister #	Other	8260 BTEX	8260B GBTEXN	8015 DRO	pH, EC, SAR				
1	BH12	3/15/19	1200	3	X					X				X						
2	BH13		1240	1																
3	BH14		1218	3																
4	BH15		1225	1																
5	BH16		1111	1																
6	BH17		1040	1																
7	BH18		1130	1																
8																				
9																				
10																				

Relinquished by:	Date/Time:	Received by:	Date/Time:	Turn Around Time (Check) Same Day _____ 72 hours _____ 24 hours _____ Standard <u>✓</u> 48 hours _____ Sample Integrity: Temperature Upon Receipt: <u>2.5</u> Samples Intact: <u>Yes</u> No	Notes: 07102
Relinquished by:	Date/Time:	Received by:	Date/Time:		
Relinquished by:	Date/Time:	Received by:	Date/Time:		

Sample Receipt Checklist

S2 Work Order 1903/30

Client: Noble/Tosman Client Project ID: Kraus 23-8

Shipped Via: H.D./P.U./FedEx/UPS/USPS/Other P.U. Airbill #: _____

Matrix (check all that apply): ☐ Air ☐ Soil/Solid ☒ Water ☐ Other: _____ (Describe)

Temp (°C)	<u>2.5</u>
-----------	------------

Thermometer ID: 61857155-K

	Yes	No	N/A	Comments (if any)
If samples require cooling, was the temperature at 4°C +/- 2°C ⁽¹⁾ ? NOTE: If samples are delivered the same day of sampling, this requirement is met provided that there is evidence that cooling has begun.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>on ice</u>
Were all samples received intact ⁽¹⁾ ?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Was adequate sample volume provided ⁽¹⁾ ?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
If custody seals are present, are they intact ⁽¹⁾ ?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Are samples with holding times due within 48 hours sample due within 48 hours present?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Is a chain-of-custody (COC) form present and filled out completely ⁽¹⁾ ?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Does the COC agree with the number and type of sample bottles received ⁽¹⁾ ?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Do the sample IDs on the bottle labels match the COC ⁽¹⁾ ?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Is the COC properly relinquished by the client w/ date and time recorded ⁽¹⁾ ?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
For volatiles in water – is there headspace present? If yes, contact client and note in narrative.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Are samples preserved that require preservation (excluding cooling) ⁽¹⁾ ? Note the type of preservative in the Comments column – HCl, H2SO4, NaOH, HNO3, ect	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>HCl</u>
If samples are acid preserved for metals, is the pH ≤ 2 ⁽¹⁾ ? Record the pH in Comments.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
If dissolved metals are requested, were samples field filtered?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	

Additional Comments (if any):

⁽¹⁾ If NO, then contact the client before proceeding with analysis and note in case narrative.

UP
Custodian Printed Name or Initials

[Signature]
Signature of Custodian

3.15.19 1405
Date/Time



Tasman Geosciences
6899 Pecos St, Unit C
Denver CO, 80221

Project: Noble - Knaus 28-8

Project Number: [none]
Project Manager: Brandon Bruns

Reported:
03/25/19 09:46

BH01
1903130-01 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **03/15/19 11:21**

Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
Benzene	ND	1.0	ug/l	1	1903172	03/18/19	03/19/19	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	2.0	"	"	"	"	"	"	

Date Sampled: **03/15/19 11:21**

Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
Surrogate: 1,2-Dichloroethane-d4		75.3 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		99.2 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		96.9 %	21-167		"	"	"	"	

Summit Scientific

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.



Tasman Geosciences
6899 Pecos St, Unit C
Denver CO, 80221

Project: Noble - Knaus 28-8

Project Number: [none]

Project Manager: Brandon Bruns

Reported:
03/25/19 09:46

BH02R
1903130-02 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **03/15/19 11:38**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Benzene	240	10		ug/l	10	1903172	03/18/19	03/19/19	EPA 8260B	
Toluene	ND	1.0		"	1	"	"	"	"	
Ethylbenzene	37	1.0		"	"	"	"	"	"	
Xylenes (total)	62	2.0		"	"	"	"	"	"	

Date Sampled: **03/15/19 11:38**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Surrogate: 1,2-Dichloroethane-d4		107 %		23-173		"	"	"	"	
Surrogate: Toluene-d8		104 %		20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		97.9 %		21-167		"	"	"	"	

Summit Scientific

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.



Tasman Geosciences
6899 Pecos St, Unit C
Denver CO, 80221

Project: Noble - Knaus 28-8

Project Number: [none]
Project Manager: Brandon Bruns

Reported:
03/25/19 09:46

BH03
1903130-03 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **03/15/19 12:34**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Benzene	1.9	1.0		ug/l	1	1903172	03/18/19	03/19/19	EPA 8260B	
Toluene	ND	1.0		"	"	"	"	"	"	
Ethylbenzene	19	1.0		"	"	"	"	"	"	
Xylenes (total)	280	2.0		"	"	"	"	"	"	

Date Sampled: **03/15/19 12:34**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Surrogate: 1,2-Dichloroethane-d4		118 %		23-173		"	"	"	"	
Surrogate: Toluene-d8		102 %		20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		119 %		21-167		"	"	"	"	

Summit Scientific

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Tasman Geosciences
6899 Pecos St, Unit C
Denver CO, 80221

Project: Noble - Knaus 28-8

Project Number: [none]

Project Manager: Brandon Bruns

Reported:
03/25/19 09:46

BH04R
1903130-04 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **03/15/19 11:58**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Benzene	ND	1.0	ug/l	1	1903172	03/18/19	03/19/19	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	2.0	"	"	"	"	"	"	

Date Sampled: **03/15/19 11:58**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Surrogate: 1,2-Dichloroethane-d4		103 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		101 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		98.2 %	21-167		"	"	"	"	

Summit Scientific

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.



Tasman Geosciences
6899 Pecos St, Unit C
Denver CO, 80221

Project: Noble - Knaus 28-8

Project Number: [none]

Project Manager: Brandon Bruns

Reported:
03/25/19 09:46

BH05R
1903130-05 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **03/15/19 12:27**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Benzene	39	1.0	ug/l	1	1903172	03/18/19	03/19/19	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	48	1.0	"	"	"	"	"	"	
Xylenes (total)	59	2.0	"	"	"	"	"	"	

Date Sampled: **03/15/19 12:27**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Surrogate: 1,2-Dichloroethane-d4		106 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		103 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		105 %	21-167		"	"	"	"	

Summit Scientific

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.



Tasman Geosciences
6899 Pecos St, Unit C
Denver CO, 80221

Project: Noble - Knaus 28-8

Project Number: [none]

Project Manager: Brandon Bruns

Reported:
03/25/19 09:46

BH06R
1903130-06 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **03/15/19 12:20**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Benzene	ND	1.0	ug/l	1	1903172	03/18/19	03/19/19	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	2.0	"	"	"	"	"	"	

Date Sampled: **03/15/19 12:20**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Surrogate: 1,2-Dichloroethane-d4		97.7 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		102 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		94.8 %	21-167		"	"	"	"	

Summit Scientific

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Tasman Geosciences
6899 Pecos St, Unit C
Denver CO, 80221

Project: Noble - Knaus 28-8

Project Number: [none]

Project Manager: Brandon Bruns

Reported:
03/25/19 09:46

BH08
1903130-07 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **03/15/19 11:25**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Benzene	ND	1.0	ug/l	1	1903172	03/18/19	03/19/19	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	2.0	"	"	"	"	"	"	

Date Sampled: **03/15/19 11:25**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Surrogate: 1,2-Dichloroethane-d4		100 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		102 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		92.7 %	21-167		"	"	"	"	

Summit Scientific

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Tasman Geosciences
6899 Pecos St, Unit C
Denver CO, 80221

Project: Noble - Knaus 28-8

Project Number: [none]

Project Manager: Brandon Bruns

Reported:
03/25/19 09:46

BH09
1903130-08 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **03/15/19 10:40**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Benzene	ND	1.0	ug/l	1	1903172	03/18/19	03/19/19	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	2.0	"	"	"	"	"	"	

Date Sampled: **03/15/19 10:40**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Surrogate: 1,2-Dichloroethane-d4		103 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		101 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		95.5 %	21-167		"	"	"	"	

Summit Scientific

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.



Tasman Geosciences
6899 Pecos St, Unit C
Denver CO, 80221

Project: Noble - Knaus 28-8

Project Number: [none]

Project Manager: Brandon Bruns

Reported:
03/25/19 09:46

BH10
1903130-09 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **03/15/19 11:30**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Benzene	ND	1.0	ug/l	1	1903172	03/18/19	03/19/19	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	2.0	"	"	"	"	"	"	

Date Sampled: **03/15/19 11:30**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Surrogate: 1,2-Dichloroethane-d4		104 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		102 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		94.8 %	21-167		"	"	"	"	

Summit Scientific

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.



Tasman Geosciences
6899 Pecos St, Unit C
Denver CO, 80221

Project: Noble - Knaus 28-8

Project Number: [none]

Project Manager: Brandon Bruns

Reported:
03/25/19 09:46

BH11
1903130-10 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **03/15/19 10:58**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Benzene	ND	1.0	ug/l	1	1903172	03/18/19	03/19/19	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	2.0	"	"	"	"	"	"	

Date Sampled: **03/15/19 10:58**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Surrogate: 1,2-Dichloroethane-d4		109 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		102 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		94.4 %	21-167		"	"	"	"	

Summit Scientific

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Tasman Geosciences
6899 Pecos St, Unit C
Denver CO, 80221

Project: Noble - Knaus 28-8

Project Number: [none]

Project Manager: Brandon Bruns

Reported:
03/25/19 09:46

BH12
1903130-11 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **03/15/19 12:06**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Benzene	ND	1.0	ug/l	1	1903172	03/18/19	03/19/19	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	2.0	"	"	"	"	"	"	

Date Sampled: **03/15/19 12:06**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Surrogate: 1,2-Dichloroethane-d4		88.5 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		92.6 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		95.3 %	21-167		"	"	"	"	

Summit Scientific

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.



Tasman Geosciences
6899 Pecos St, Unit C
Denver CO, 80221

Project: Noble - Knaus 28-8

Project Number: [none]

Project Manager: Brandon Bruns

Reported:
03/25/19 09:46

BH13
1903130-12 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **03/15/19 12:40**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Benzene	ND	1.0	ug/l	1	1903172	03/18/19	03/19/19	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	2.0	"	"	"	"	"	"	

Date Sampled: **03/15/19 12:40**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Surrogate: 1,2-Dichloroethane-d4		92.9 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		93.7 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		95.3 %	21-167		"	"	"	"	

Summit Scientific

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.



Tasman Geosciences
6899 Pecos St, Unit C
Denver CO, 80221

Project: Noble - Knaus 28-8

Project Number: [none]

Project Manager: Brandon Bruns

Reported:
03/25/19 09:46

BH14
1903130-13 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **03/15/19 12:18**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Benzene	ND	1.0	ug/l	1	1903172	03/18/19	03/19/19	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	2.0	"	"	"	"	"	"	

Date Sampled: **03/15/19 12:18**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Surrogate: 1,2-Dichloroethane-d4		91.4 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		94.3 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		93.4 %	21-167		"	"	"	"	

Summit Scientific

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.



Tasman Geosciences
6899 Pecos St, Unit C
Denver CO, 80221

Project: Noble - Knaus 28-8

Project Number: [none]

Project Manager: Brandon Bruns

Reported:
03/25/19 09:46

BH15
1903130-14 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **03/15/19 12:25**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Benzene	ND	1.0	ug/l	1	1903172	03/18/19	03/19/19	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	2.0	"	"	"	"	"	"	

Date Sampled: **03/15/19 12:25**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Surrogate: 1,2-Dichloroethane-d4		91.5 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		92.9 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		96.2 %	21-167		"	"	"	"	

Summit Scientific

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.



Tasman Geosciences
6899 Pecos St, Unit C
Denver CO, 80221

Project: Noble - Knaus 28-8

Project Number: [none]

Project Manager: Brandon Bruns

Reported:
03/25/19 09:46

BH16
1903130-15 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **03/15/19 11:11**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Benzene	ND	1.0	ug/l	1	1903172	03/18/19	03/19/19	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	2.0	"	"	"	"	"	"	

Date Sampled: **03/15/19 11:11**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Surrogate: 1,2-Dichloroethane-d4		91.9 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		93.4 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		93.2 %	21-167		"	"	"	"	

Summit Scientific

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.



Tasman Geosciences
6899 Pecos St, Unit C
Denver CO, 80221

Project: Noble - Knaus 28-8

Project Number: [none]

Project Manager: Brandon Bruns

Reported:
03/25/19 09:46

BH17
1903130-16 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **03/15/19 10:40**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Benzene	ND	1.0	ug/l	1	1903172	03/18/19	03/19/19	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	2.0	"	"	"	"	"	"	

Date Sampled: **03/15/19 10:40**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Surrogate: 1,2-Dichloroethane-d4		89.6 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		93.4 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		94.4 %	21-167		"	"	"	"	

Summit Scientific

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.



Tasman Geosciences
6899 Pecos St, Unit C
Denver CO, 80221

Project: Noble - Knaus 28-8

Project Number: [none]

Project Manager: Brandon Bruns

Reported:
03/25/19 09:46

BH18
1903130-17 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **03/15/19 11:36**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Benzene	ND	1.0	ug/l	1	1903172	03/18/19	03/19/19	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	2.0	"	"	"	"	"	"	

Date Sampled: **03/15/19 11:36**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Surrogate: 1,2-Dichloroethane-d4		94.1 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		95.4 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		93.5 %	21-167		"	"	"	"	

Summit Scientific

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Tasman Geosciences
6899 Pecos St, Unit C
Denver CO, 80221

Project: Noble - Knaus 28-8

Project Number: [none]
Project Manager: Brandon Bruns

Reported:
03/25/19 09:46

Volatile Organic Compounds by EPA Method 8260B - Quality Control

Summit Scientific

Analyte	Reporting			Spike	Source		%REC		RPD	
	Result	Limit	Units	Level	Result	%REC	Limits	RPD	Limit	Notes

Batch 1903172 - EPA 5030 Water MS

Blank (1903172-BLK1)

Prepared: 03/18/19 Analyzed: 03/19/19

Benzene	ND	1.0	ug/l							
Toluene	ND	1.0	"							
Ethylbenzene	ND	1.0	"							
Xylenes (total)	ND	2.0	"							
Surrogate: 1,2-Dichloroethane-d4	12.2		"	13.3		91.1	23-173			
Surrogate: Toluene-d8	13.7		"	13.3		102	20-170			
Surrogate: 4-Bromofluorobenzene	12.6		"	13.3		94.4	21-167			

LCS (1903172-BS1)

Prepared: 03/18/19 Analyzed: 03/19/19

Benzene	35.0	1.0	ug/l	33.3		105	70-130			
Toluene	35.7	1.0	"	33.3		107	70-130			
Ethylbenzene	40.4	1.0	"	33.3		121	70-130			
m,p-Xylene	73.7	2.0	"	66.7		111	70-130			
o-Xylene	36.6	1.0	"	33.3		110	70-130			
Surrogate: 1,2-Dichloroethane-d4	13.1		"	13.3		98.3	23-173			
Surrogate: Toluene-d8	13.9		"	13.3		104	20-170			
Surrogate: 4-Bromofluorobenzene	12.9		"	13.3		96.8	21-167			

Matrix Spike (1903172-MS1)

Source: 1903120-01

Prepared: 03/18/19 Analyzed: 03/19/19

Benzene	35.7	1.0	ug/l	33.3	ND	107	70-130			
Toluene	36.4	1.0	"	33.3	ND	109	70-130			
Ethylbenzene	41.9	1.0	"	33.3	ND	126	70-130			
m,p-Xylene	76.1	2.0	"	66.7	ND	114	70-130			
o-Xylene	38.3	1.0	"	33.3	ND	115	70-130			
Surrogate: 1,2-Dichloroethane-d4	13.6		"	13.3		102	23-173			
Surrogate: Toluene-d8	14.0		"	13.3		105	20-170			
Surrogate: 4-Bromofluorobenzene	13.0		"	13.3		97.7	21-167			

Summit Scientific

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Tasman Geosciences
6899 Pecos St, Unit C
Denver CO, 80221

Project: Noble - Knaus 28-8

Project Number: [none]
Project Manager: Brandon Brunns

Reported:
03/25/19 09:46

Volatile Organic Compounds by EPA Method 8260B - Quality Control
Summit Scientific

Analyte	Reporting			Spike	Source		%REC		RPD	
	Result	Limit	Units	Level	Result	%REC	Limits	RPD	Limit	Notes

Batch 1903172 - EPA 5030 Water MS

Matrix Spike Dup (1903172-MSD1)	Source: 1903120-01			Prepared: 03/18/19 Analyzed: 03/19/19						
Benzene	31.1	1.0	ug/l	33.3	ND	93.4	70-130	13.7	30	
Toluene	31.8	1.0	"	33.3	ND	95.5	70-130	13.5	30	
Ethylbenzene	37.3	1.0	"	33.3	ND	112	70-130	11.7	30	
m,p-Xylene	66.7	2.0	"	66.7	ND	100	70-130	13.1	30	
o-Xylene	33.5	1.0	"	33.3	ND	101	70-130	13.4	30	
Surrogate: 1,2-Dichloroethane-d4	14.0		"	13.3		105	23-173			
Surrogate: Toluene-d8	13.7		"	13.3		103	20-170			
Surrogate: 4-Bromofluorobenzene	13.3		"	13.3		99.5	21-167			

Summit Scientific

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Tasman Geosciences
6899 Pecos St, Unit C
Denver CO, 80221

Project: Noble - Knaus 28-8

Project Number: [none]
Project Manager: Brandon Bruns

Reported:
03/25/19 09:46

Notes and Definitions

DET	Analyte DETECTED
ND	Analyte NOT DETECTED at or above the reporting limit
NR	Not Reported
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference