FOURTH QUARTER 2019
SITE MONITORING DATA
AND REMEDATION SUMMARY REPORT

KNAUS 28-8

COGCC SPILL TRACKING # 445476
COGCC REMEDIATION # 9767

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1.0 INTRODUCTION

This fourth 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).

Fourth 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 ¼ of the northeast ¼ 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* document number 401535243 (February 1, 2018). 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 in June 2018.

2.0 FOURTH QUARTER 2019 GROUNDWATER MONITORING ACTIVITIES

Fourth quarter 2019 groundwater monitoring activities were performed at the Site on December 30, 2019. The activities included measurement of groundwater levels and the collection of groundwater samples from each of the 18 Site monitoring well locations. Groundwater elevation measurements are presented in Table 1, and 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 fourth 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 fourth quarter 2019 groundwater monitoring event, groundwater levels were gauged at each of the 18 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 fourth quarter 2019 groundwater monitoring event, the groundwater elevation at the Site ranged from 4,700.82 ft. amsl in monitoring well BH17 to 4,700.54 ft. amsl in monitoring well BH14. The groundwater potentiometric surface at the Site slopes to the south/southeast, with a hydraulic gradient of approximately 0.003 feet per foot between monitoring wells BH17 and BH14. Groundwater elevation contours and the inferred flow direction are illustrated on Figure 3. Monitoring wells BH03, BH04R, and BH05R, in which LNAPL was previously detected did not have LNAPL detected during the fourth quarter 2019 groundwater monitoring event.

2.2 Groundwater Purging and Sampling

This section summarizes both general procedures and significant observations from the groundwater purging and sampling activities conducted on December 30, 2019. During the fourth quarter 2019 groundwater monitoring event, groundwater samples were collected from each of the 18 monitoring wells in the Site monitoring well network.

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 FOURTH QUARTER 2019 GROUNDWATER SAMPLING RESULTS

This section presents the laboratory analytical results for groundwater samples collected during the fourth 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 (µg/L) in two of the 18 Site monitoring wells sampled. The benzene concentration was 47 µg/L in BH02R and 130 µg/L in BH05R.

- Toluene was not detected above the COGCC Table 910-1 groundwater standard of 560 µg/L in any of the 18 Site monitoring wells sampled.

- Ethylbenzene was not detected above the COGCC Table 910-1 groundwater standard of 700 µg/L in any of the 18 Site monitoring wells sampled.

- Total xylenes were not detected above the COGCC Table 910-1 groundwater standard of 1,400 µg/L in any of the 18 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 third quarter 2018. Tasman returned between July 2 and 3, 2018 to install seven additional AS wells (AS-02 – AS-08) to be used in operation of the System. The AS remediation well network is illustrated on Figure 2.

AS Remediation 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.

4.2 AS Remediation System Operations

On October 16, 2018, the AS component of the System was initiated. Active AS wells included AS01 – AS08. 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.

The System was operated between October 16, 2018 and March 3, 2019 when it was shut down for the fourth quarter groundwater sampling event. The System was subsequently removed from the site to avoid interference with farming and irrigation activities. During the first quarter 2020, mobile air sparge events will be initiated and continue, contingent on farming and irrigation activities.

5.0 UPCOMING SITE ACTIVITIES

Anticipated upcoming Site activities include the following:

- Complete the first quarter 2020 groundwater sampling event in March 2020; and
- Initiate bi-weekly mobile air sparge events first quarter 2020.

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.) [7]	Depth to LNAPL (ft.) [7]	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
BH01	06/21/19	4716.22	17.04	16.77	ND	ND	4699.45
BH01	07/10/19	4716.22	17.06	13.58	ND	ND	4700.14
BH01	09/12/19	4716.22	17.02	11.78	ND	ND	4701.94
BH01	12/30/19	4716.22	17.01	13.08	ND	ND	4700.64
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
BH02R	06/21/19	4717.42	22.44	17.16	ND	ND	4699.51
BH02R	09/12/19	4717.42	22.40	11.51	ND	ND	4702.16
BH02R	12/30/19	4717.42	22.40	12.96	ND	ND	4700.71
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

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Monitoring Well ID	Date	Top of Casing Elevation (ft. AMSL)	Total Depth (ft. BTOC)	Depth to Water (ft.) [7]	Depth to LNAPL (ft.) [7]	LNAPL Thickness (ft.)	Groundwater Elevation* (ft. AMSL)
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
BH03	06/21/19	4716.91	17.58	17.34	ND	ND	4699.57
BH03	07/10/19	4716.91	17.58	13.60	ND	ND	4700.27
BH03	09/12/19	4716.91	17.55	11.76	ND	ND	4702.11
BH03	12/30/19	4716.91	17.58	13.12	ND	ND	4700.75
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
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
BH04R	06/21/19	4717.09	21.88	14.23	ND	ND	4699.43
BH04R	09/12/19	4717.09	21.88	11.75	ND	ND	4701.91
BH04R	12/30/19	4717.09	21.87	13.05	ND	ND	4700.61
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
BH05R	06/21/19	4716.96	21.44	14.09	ND	ND	4699.51
BH05R	09/12/19	4716.96	21.47	11.51	ND	ND	4702.09
BH05R	12/30/19	4716.96	21.46	12.91	ND	ND	4700.69

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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
BH06R	06/21/19	4716.64	19.07	14.39	ND	ND	4699.55
BH06R	09/12/19	4716.64	19.92	11.87	ND	ND	4702.07
BH06R	12/30/19	4716.64	19.92	13.22	ND	ND	4700.72
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	Monitoring Well Dry			
BH07	06/21/19	4716.90	16.28	16.26	ND	ND	4700.64
BH07	07/10/19	4716.90	16.29	Monitoring Well Dry			
BH07	09/12/19	4716.90	16.26	11.78	ND	ND	4701.90
BH07	12/30/19	4716.90	16.25	Monitoring Well Dry			
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
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

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GROUNDWATER ELEVATION DATA
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Monitoring Well ID	Date	Top of Casing Elevation (ft. AMSL)	Total Depth (ft. BTOC)	Depth to Water (ft.) [7]	Depth to LNAPL (ft.) [7]	LNAPL Thickness (ft.)	Groundwater Elevation* (ft. AMSL)
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
BH08	06/21/19	4717.34	22.22	14.02	ND	ND	4700.04
BH08	09/12/19	4717.34	22.68	11.89	ND	ND	4702.17
BH08	12/30/19	4717.34	22.67	13.34	ND	ND	4700.72
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
BH09	06/21/19	4716.59	21.72	14.23	ND	ND	4699.38
BH09	09/12/19	4716.59	21.67	11.78	ND	ND	4701.83
BH09	12/30/19	4716.59	21.65	13.06	ND	ND	4700.55
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
BH10	06/21/19	4716.35	19.95	14.28	ND	ND	4699.32
BH10	09/12/19	4716.35	19.94	11.70	ND	ND	4701.90
BH10	12/30/19	4716.35	19.93	13.01	ND	ND	4700.59
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
BH11	06/21/19	4716.91	22.08	14.26	ND	ND	4699.47
BH11	09/12/19	4716.91	22.12	11.74	ND	ND	4701.99
BH11	12/30/19	4716.91	22.01	13.07	ND	ND	4700.66
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

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.) [7]	Depth to LNAPL (ft.) [7]	LNAPL Thickness (ft.)	Groundwater Elevation* (ft. AMSL)
BH12	03/15/19	4716.66	19.20	16.64	ND	ND	4700.02
BH12	06/21/19	4716.66	19.22	14.16	ND	ND	4699.44
BH12	09/12/19	4716.66	18.93	11.73	ND	ND	4701.87
BH12	12/30/19	4716.66	18.93	12.98	ND	ND	4700.62
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
BH13	06/21/19	4716.99	18.74	14.29	ND	ND	4699.50
BH13	09/12/19	4716.99	18.70	11.77	ND	ND	4702.02
BH13	12/30/19	4716.99	18.44	13.09	ND	ND	4700.70
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
BH14	06/21/19	4716.41	18.95	13.86	ND	ND	4699.34
BH14	09/12/19	4716.41	18.65	11.39	ND	ND	4701.81
BH14	12/30/19	4716.41	18.64	12.66	ND	ND	4700.54
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
BH15	06/21/19	4716.33	18.74	14.10	ND	ND	4699.40
BH15	09/12/19	4716.33	18.44	11.60	ND	ND	4701.90
BH15	12/30/19	4716.33	18.44	12.93	ND	ND	4700.57
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
BH16	06/21/19	4717.24	18.96	14.32	ND	ND	4699.59
BH16	09/12/19	4717.24	18.92	11.77	ND	ND	4702.14
BH16	12/30/19	4717.24	18.91	13.14	ND	ND	4700.77
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
BH17	06/21/19	4716.75	22.09	14.38	ND	ND	4699.56

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.) [7]	Depth to LNAPL (ft.) [7]	LNAPL Thickness (ft.)	Groundwater Elevation* (ft. AMSL)
BH17	09/12/19	4716.75	22.02	11.74	ND	ND	4702.20
BH17	12/30/19	4716.75	22.03	13.12	ND	ND	4700.82
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
BH18	06/21/19	4716.80	22.68	14.74	ND	ND	4699.06
BH18	09/12/19	4716.80	22.26	11.73	ND	ND	4702.07
BH18	12/30/19	4716.80	22.23	13.11	ND	ND	4700.69

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

[7] Depth to water measurements collected prior to second quarter 2019 were measured from top of well casing. Subsequent measurements were collected from top of casing and adjusted using survey data to reflect depth of water from ground surface.

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	<1.1	<1.2	<1.3
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
BH01	06/21/19	Not Sampled - Insufficient Water Volume			
BH01	07/10/19	<1.0	<1.0	<1.0	<2.0
BH01	09/12/19	<1.0	<1.0	<1.0	<2.0
BH01	12/30/19	<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
BH02R	06/21/19	**88**	<1.0	<1.0	<2.0
BH02R	09/12/19	**570**	1.8	7.3	360
BH02R	12/30/19	**47**	<1.0	7.9	11
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**			

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**
BH03	12/14/18	**Not Sampled - LNAPL Present**			
BH03	03/15/19	1.9	<1.0	19	280
BH03	06/21/19	Not Sampled - Insufficient Water Volume			
BH03	07/10/19	<1.0	<1.0	<1.0	11
BH03	09/12/19	1.1	<1.0	1.2	<2.0
BH03	12/30/19	2.4	<1.0	<1.0	<2.0
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			
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
BH04R	06/21/19	<1.0	<1.0	<1.0	<2.0
BH04R	09/12/19	<1.0	<1.0	<1.0	<2.0
BH04R	12/30/19	<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
BH05R	06/21/19	<1.0	<1.0	<1.0	<2.0
BH05R	09/12/19	**260**	<1.0	3.9	15
BH05R	12/30/19	**130**	<1.0	12	4.8
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

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**
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
BH06R	06/21/19	<1.0	<1.0	<1.0	<2.0
BH06R	09/12/19	<1.0	<1.0	<1.0	<2.0
BH06R	12/30/19	<1.0	<1.0	<1.0	<2.0
BH07	04/15/16	<1.0	<1.1	<1.2	<1.3
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
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			
BH07	06/21/19	Not Sampled - Insufficient Water Volume			
BH07	07/10/19	Not Sampled - Insufficient Water Volume			
BH07	09/12/19	<1.0	<1.0	<1.0	<2.0
BH07	12/30/19	Not Sampled - Monitoring Well Dry			
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
BH08	06/21/19	<1.0	<1.0	<1.0	<2.0
BH08	09/12/19	<1.0	<1.0	<1.0	<2.0
BH08	12/30/19	<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**
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
BH09	06/21/19	<1.0	<1.0	<1.0	<2.0
BH09	09/12/19	<1.0	<1.0	<1.0	<2.0
BH09	12/30/19	<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
BH10	06/21/19	<1.0	<1.0	<1.0	<2.0
BH10	09/12/19	<1.0	<1.0	<1.0	<2.0
BH10	12/30/19	<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
BH11	06/21/19	<1.0	<1.0	<1.0	<2.0
BH11	09/12/19	<1.0	<1.0	<1.0	<2.0
BH11	12/30/19	<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
BH12	06/21/19	<1.0	<1.0	<1.0	<2.0
BH12	09/12/19	<1.0	<1.0	<1.0	<2.0
BH12	12/30/19	<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
BH13	03/15/19	<1.0	<1.0	<1.0	<2.0
BH13	06/21/19	<1.0	<1.0	<1.0	<2.0
BH13	09/12/19	<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	12/30/19	<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
BH14	06/21/19	<1.0	<1.0	<1.0	<2.0
BH14	09/12/19	<1.0	<1.0	<1.0	<2.0
BH14	12/30/19	<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
BH15	06/21/19	<1.0	<1.0	<1.0	<2.0
BH15	09/12/19	<1.0	<1.0	<1.0	<2.0
BH15	12/30/19	<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
BH16	06/21/19	<1.0	<1.0	<1.0	<2.0
BH16	09/12/19	<1.0	<1.0	<1.0	<2.0
BH16	12/30/19	<1.0	<1.0	2.1	7.2
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
BH17	06/21/19	<1.0	<1.0	<1.0	<2.0
BH17	09/12/19	<1.0	<1.0	<1.0	<2.0
BH17	12/30/19	<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
BH18	06/21/19	<1.0	<1.0	<1.0	<2.0
BH18	09/12/19	<1.0	<1.0	<1.0	<2.0
BH18	12/30/19	<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**

Notes:

COGCC = Colorado Oil and Gas Conservation Commission

µg/L = Micrograms per liter

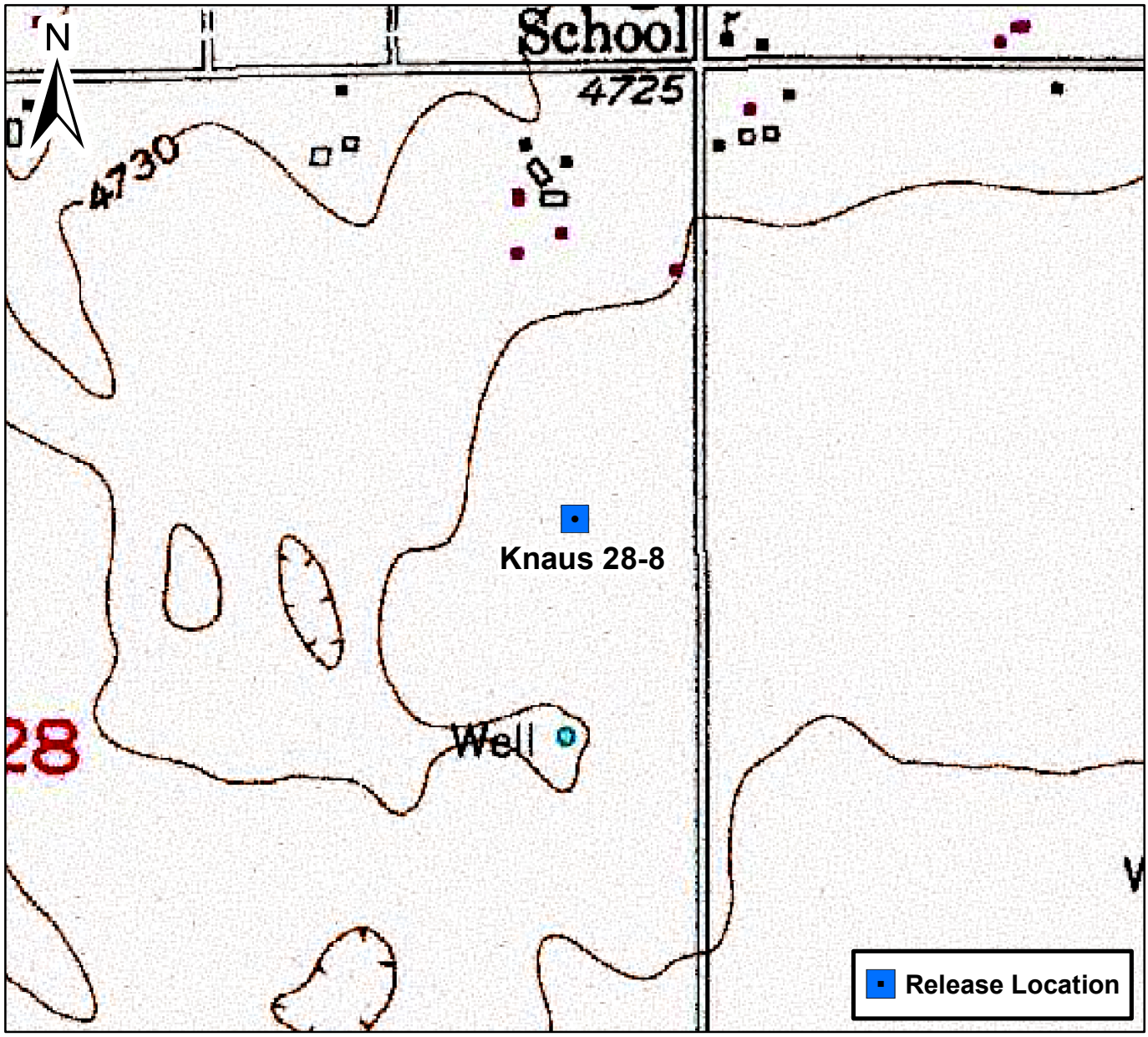
< = Analytical result is less than the indicated laboratory reporting limit

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



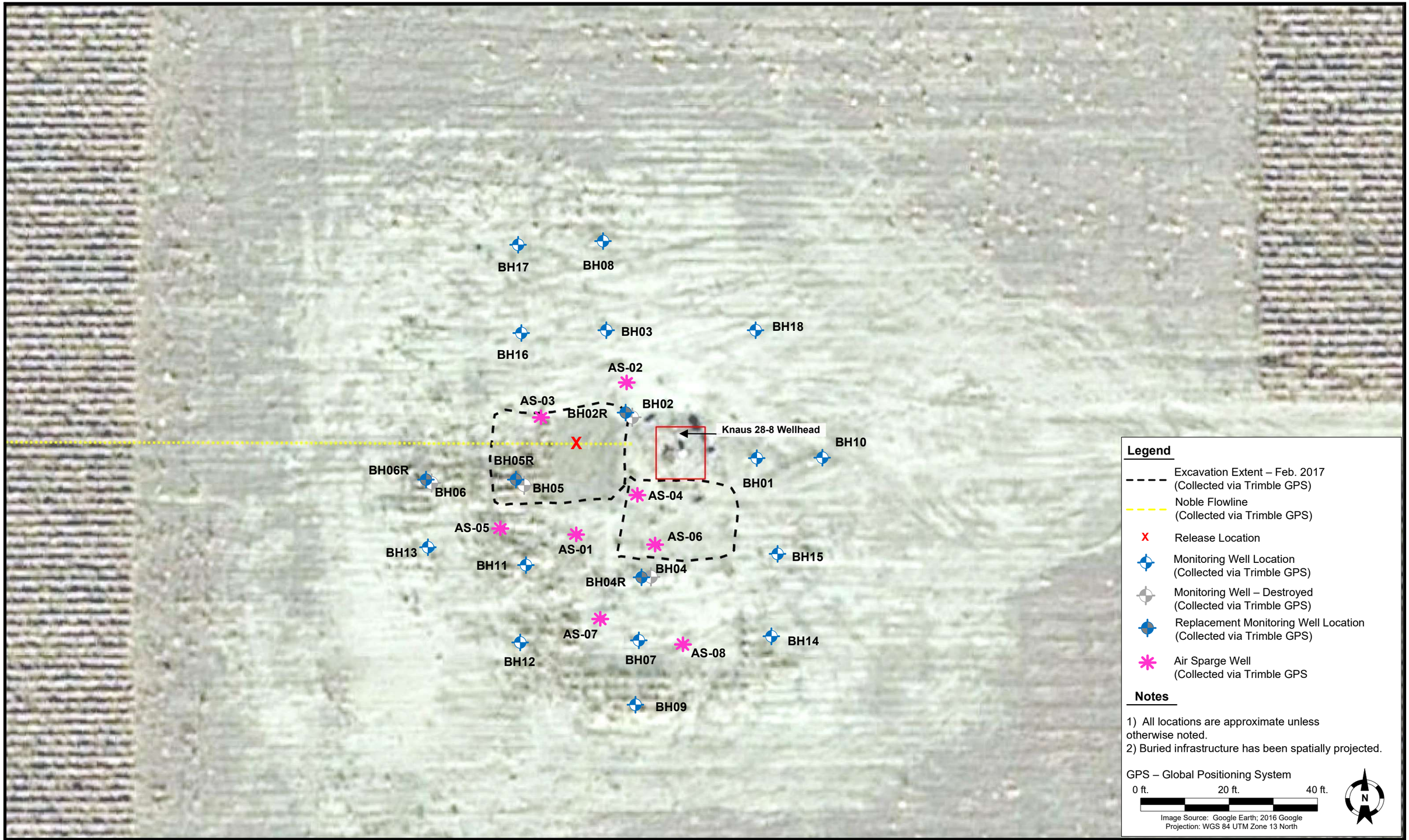
0 750 1,500 Feet

Figure 1

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

TASMAN GEOSCIENCES

Drawn By: DBA
Date: 7/6/2016



DATE:	7/1/2019
DESIGNED BY:	JW
DRAWN BY:	KC

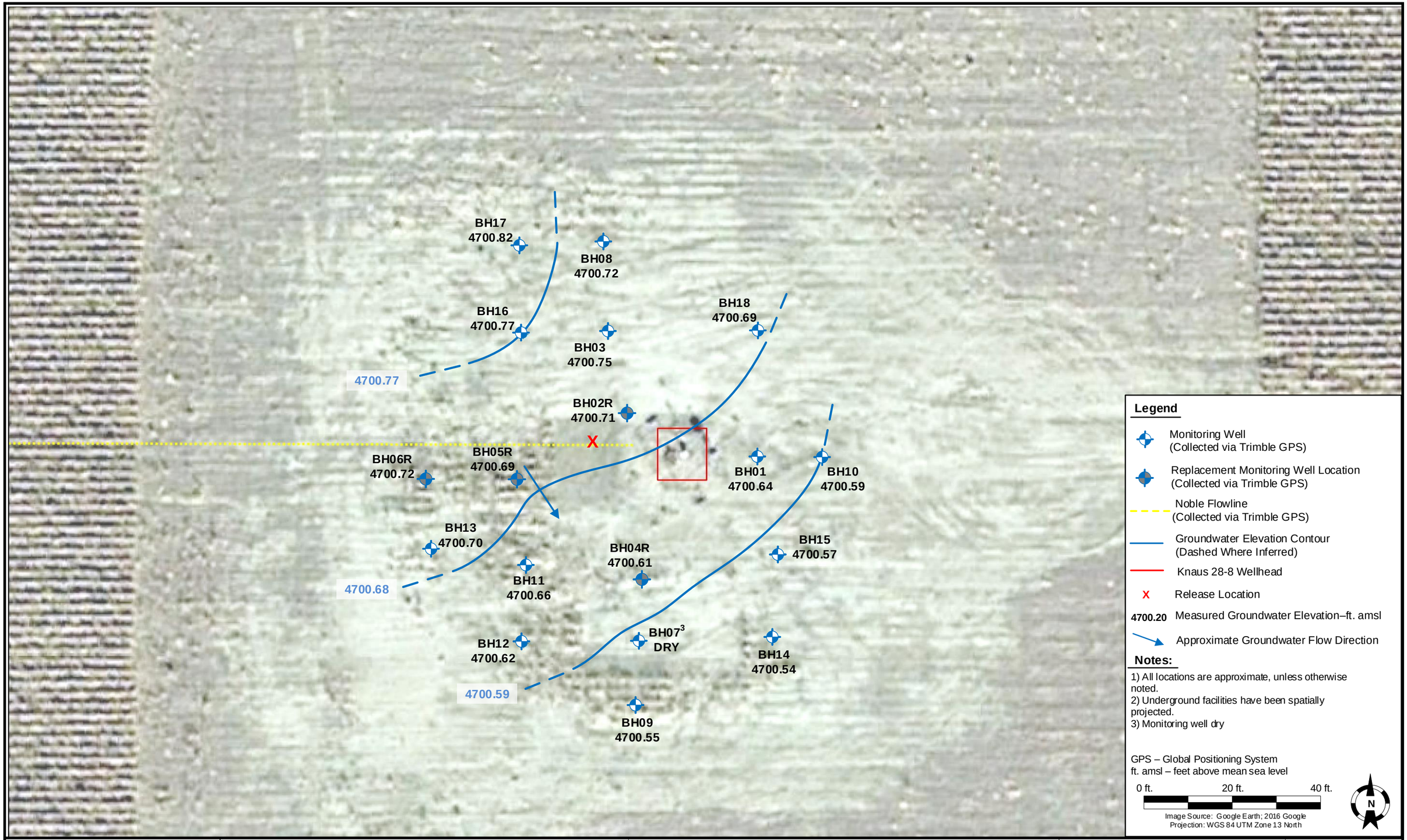
TASMAN GEOSCIENCES

Tasman Geosciences, Inc.
6855 W 119th Avenue
Broomfield, CO, 80020

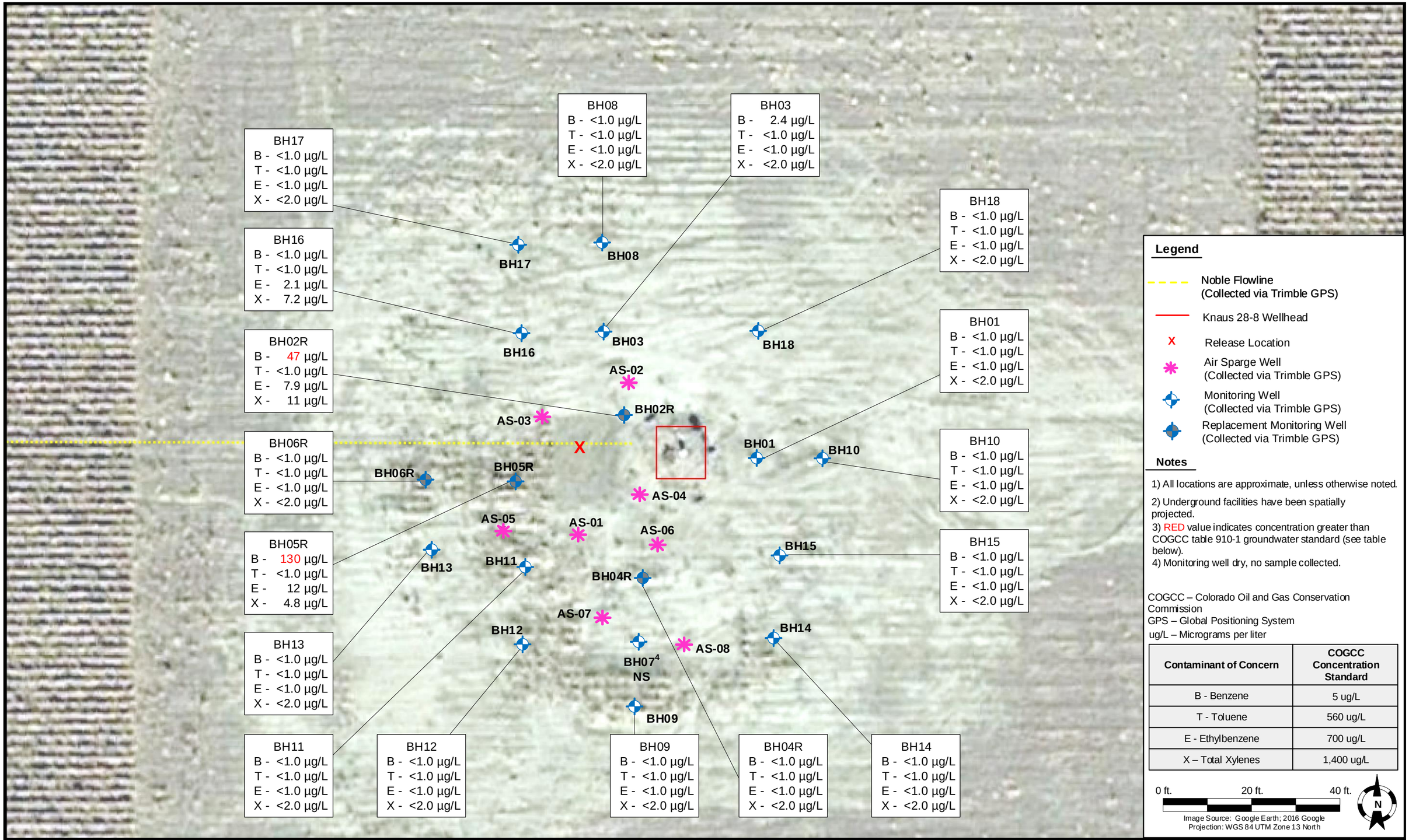
Noble Energy, Inc. – DJ Basin
Knaus 28-8
SENE, Section 28, Township 6 North, Range 66 West
Weld County, Colorado

Site Overview Map

FIGURE 2



DATE: 01/13/2020 DESIGNED BY: DA DRAWN BY: TC	TASMAN GEOSCIENCES	Tasman Geosciences, Inc. 6855 W. 119th Avenue Broomfield, CO 80020	**Noble Energy, Inc. – DJ Basin** **Knaus 28-8** SENE, Section 28, Township 6 North, Range 66 West Weld County, Colorado	Groundwater Potentiometric Surface Contour Map (12/30/2019)	FIGURE 3



DATE: 01/13/2019

DESIGNED BY: JW

DRAWN BY: TC

TASMAN GEOSCIENCES

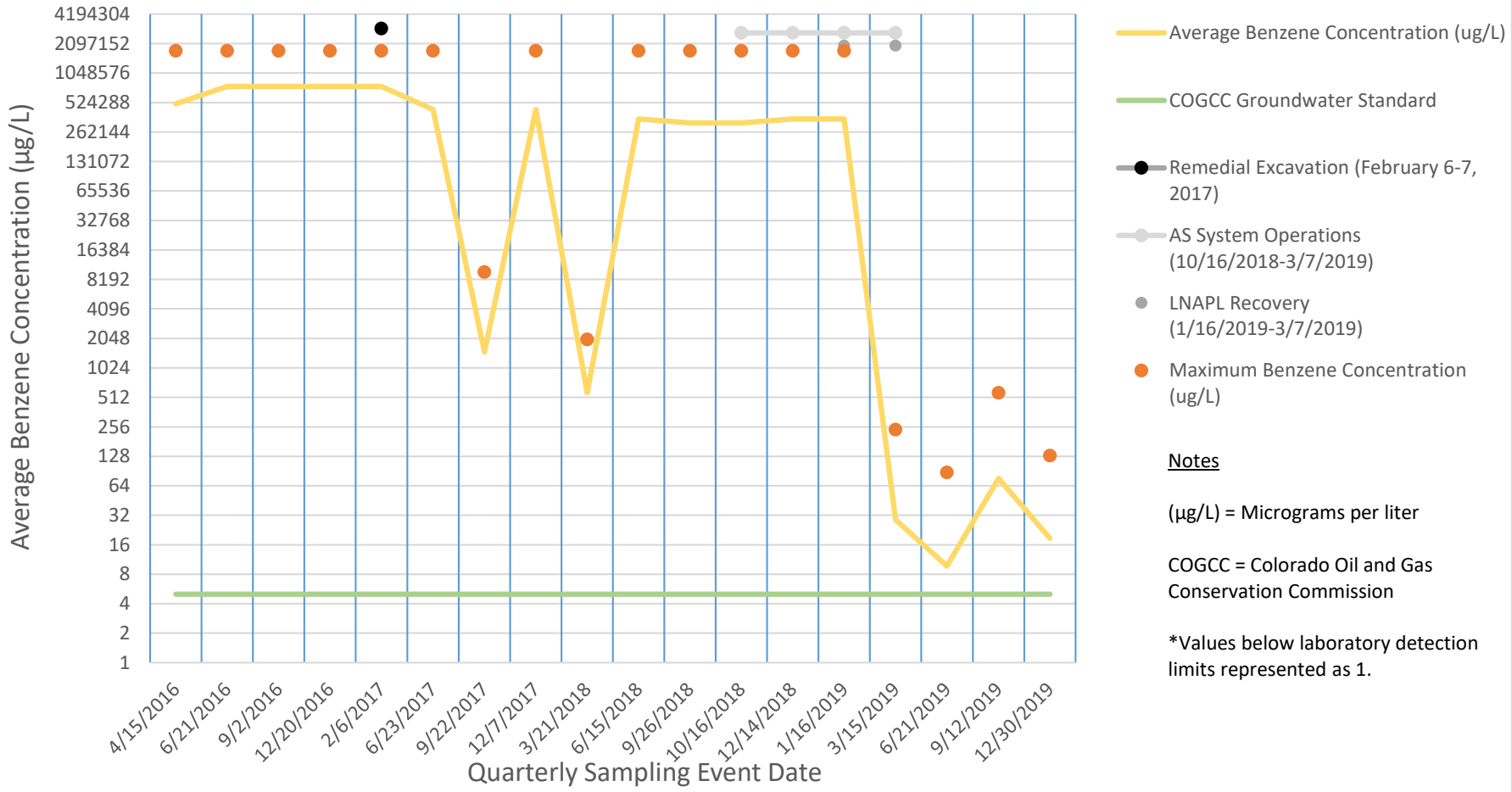
Tasman Geosciences, Inc.
6855 W 119th Avenue
Broomfield, CO, 80020

Noble Energy, Inc. – DJ Basin
Knaus 28-8
SENE, Section 28, Township 6 North, Range 66 West
Weld County, Colorado

Groundwater Analytical Results Map (12/30/2019)

FIGURE 4

Figure 5
Knaus 28-8
Benzene Concentrations VS Quarterly Sampling Event Date



Notes

(µg/L) = Micrograms per liter

COGCC = Colorado Oil and Gas Conservation Commission

*Values below laboratory detection limits represented as 1.

ATTACHMENT A

LABORATORY ANALYTICAL DATA REPORT

Summit Scientific

4653 Table Mountain Drive, Golden, Colorado 80403

303.277.9310

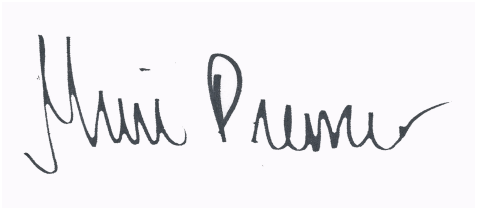
January 07, 2020

Brandon Bruns
Tasman Geosciences
6855 W. 119th Ave.
Broomfield, CO 80020

RE: Noble - Knaus 28-8
Work Order #1912434

Enclosed are the results of analyses for samples received by Summit Scientific on 12/30/19 17:30. If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Muri Premer For Paul Shrewsbury
President

S2

Tasman Geosciences 6855 W. 119th Ave. Broomfield CO, 80020	Project: Noble - Knaus 28-8 Project Number: [none] Project Manager: Brandon Bruns	**Reported:** 01/07/20 16:13

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
BH01	1912434-01	Water	12/30/19 13:07	12/30/19 17:30
BH02R	1912434-02	Water	12/30/19 13:55	12/30/19 17:30
BH03	1912434-03	Water	12/30/19 12:42	12/30/19 17:30
BH04R	1912434-04	Water	12/30/19 12:50	12/30/19 17:30
BH05R	1912434-05	Water	12/30/19 13:47	12/30/19 17:30
BH06R	1912434-06	Water	12/30/19 12:34	12/30/19 17:30
BH09	1912434-07	Water	12/30/19 11:58	12/30/19 17:30
BH08	1912434-08	Water	12/30/19 13:25	12/30/19 17:30
BH10	1912434-09	Water	12/30/19 13:15	12/30/19 17:30
BH11	1912434-10	Water	12/30/19 12:15	12/30/19 17:30
BH12	1912434-11	Water	12/30/19 12:06	12/30/19 17:30
BH13	1912434-12	Water	12/30/19 12:24	12/30/19 17:30
BH14	1912434-13	Water	12/30/19 12:58	12/30/19 17:30
BH15	1912434-14	Water	12/30/19 11:40	12/30/19 17:30
BH16	1912434-15	Water	12/30/19 11:50	12/30/19 17:30
BH17	1912434-16	Water	12/30/19 11:32	12/30/19 17:30
BH18	1912434-17	Water	12/30/19 11:25	12/30/19 17:30

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

1912434.1

741 Corporate Circle Suite I ♦ Golden, Colorado 80401
303-277-9310 ♦ 303-374-5933 Fax

Client: Noble / Tasman
Address: 6855 W 119th Ave
City/State/Zip: Broomfield / CO / 80020
Phone: 303-487-1228 Fax:
Sampler Name: Alison Dahl

Project Manager: Brandon Bruns
E-Mail: BBruns@tasman-geo.com
Project Name: Knaus 28-8
Project Number: n/a

Sample Description	Date Sampled	Time Sampled	Number of Containers	Preservative: HCl	Preservative: HNO_3	Preservative: None	Preservative: Other (Specify)	Matrix: Groundwater	Matrix: Soil	Matrix: Air - Canister Serial #	Matrix: Other (Specify)	Analyze For: BTEX	Special Instructions
BH01	12/30/19	1307	3	X				X				X	
BH02R	12/30/19	1355	3	X				X				X	
BH03	12/30/19	1242	3	X				X				X	
BH04R	12/30/19	1250	3	X				X				X	
BH05R	12/30/19	1347	3	X				X				X	
BH06R	12/30/19	1234	3	X				X				X	
BH09	12/30/19	1158	3	X				X				X	
BH08	12/30/19	1325	3	X				X				X	
BH10	12/30/19	1315	3	X				X				X	
BH11	12/30/19	1215	3	X				X				X	

Relinquished by: Alison Dahl Date/Time: 12/30/19 1600
Received by: Tasman LockBox Date/Time: 12/30/19 1600

Relinquished by: Tasman LockBox Date/Time: 12/30/19 1730
Received by: Date/Time: 12/30/19 1730

Relinquished by: Date/Time:
Received in Lab by: Date/Time:

Turn Around Time (Check)
Same Day [ ] 72 Hours [ ]
24 Hours [ ] Standard [X]
48 Hours [ ]

Sample Integrity:
Temperature Upon Receipt: 4.2
Intact: Yes [X] No [ ]

Notes:

www.s2scientific.com

Summit Scientific

1912434.2

741 Corporate Circle Suite I ♦ Golden, Colorado 80401
303-277-9310 ♦ 303-374-5933 Fax

Client: Noble / Tasman
Address: 6855 W 119th Ave
City/State/Zip: Broomfield / CO / 80020
Phone: 303-487-1228 Fax:
Sampler Name: Alison Dahl

Project Manager: Brandon Bruns
E-Mail: Bbruns@tasman-geo.com
Project Name: Kraus 28-8
Project Number: n/a

Sample Description	Date Sampled	Time Sampled	Number of Containers	Preservative: HCl	Preservative: HNO_3	Preservative: None	Preservative: Other (Specify)	Matrix: Groundwater	Matrix: Soil	Matrix: Air - Canister Serial #	Matrix: Other (Specify)	Analyze For: BTEX	Special Instructions
BH12	12/30/19	1206	3	X				X				X	
BH13	12/30/19	1224	3	X				X				X	
BH14	12/30/19	1258	3	X				X				X	
BH15	12/30/19	1140	3	X				X				X	
BH16	12/30/19	1150	3	X				X				X	
BH17	12/30/19	1132	3	X				X				X	
BH18	12/30/19	1125	3	X				X				X	

Relinquished by: Alison Dahl Date/Time: 12/30/19 1600
Received by: Tasman Lock Box Date/Time: 12/30/19 1600

Relinquished by: Tasman Lock Box Date/Time: 12/30/19 1730
Received by: Date/Time: 12/30/19 1730

Relinquished by: Date/Time:
Received in Lab by: Date/Time:

Turn Around Time (Check)
Same Day [ ] 72 Hours [ ]
24 Hours [ ] Standard [X]
48 Hours [ ]

Sample Integrity:
Temperature Upon Receipt: 4.2
Intact: Yes [X] No [ ]

Notes:

www.s2scientific.com

1912434

Sample Receipt Checklist

S2 Work Order_____

Client: NOBLE / TASMAN Client Project ID: KNAUS 28-8

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

☐ ☑ ☐ ☐ ☐

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

Temp (°C)	4.2

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.	✓			
Were all samples received intact (1)?	✓			
Was adequate sample volume provided (1)?	✓			
If custody seals are present, are they intact (1)?			✓	
Are samples with holding times due within 48 hours sample due within 48 hours present?		✓		
Is a chain-of-custody (COC) form present and filled out completely (1)?	✓			
Does the COC agree with the number and type of sample bottles received (1)?	✓			
Do the sample IDs on the bottle labels match the COC (1)?	✓			
Is the COC properly relinquished by the client w/ date and time recorded (1)?	✓			
For volatiles in water – is there headspace present? **If yes, contact client and note in narrative.**		✓		
Are samples preserved that require preservation **(excluding cooling)** (1)? Note the type of preservative in the Comments column – HCl, H2SO4, NaOH, HNO3, ect	✓			HCL
If samples are acid preserved for metals, is the pH ≤ 2(1)? Record the pH in Comments.			✓	
If dissolved metals are requested, were samples field filtered?			✓	
Additional Comments (if any):				

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

RZ — **Custodian Printed Name or Initials**

RZ — **Signature of Custodian**

12/30/19 — **Date/Time**

S2

Tasman Geosciences 6855 W. 119th Ave. Broomfield CO, 80020	Project: Noble - Knaus 28-8 Project Number: [none] Project Manager: Brandon Bruns	**Reported:** 01/07/20 16:13

BH01

1912434-01 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **12/30/19 13:07**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	1.0	ug/l	1	2001016	01/02/20	01/03/20	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	2.0	"	"	"	"	"	"	

Date Sampled: **12/30/19 13:07**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		*98.0 %*	*23-173*		"	"	"	"	
Surrogate: Toluene-d8		*102 %*	*20-170*		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		*97.5 %*	*21-167*		"	"	"	"	

S2

Tasman Geosciences 6855 W. 119th Ave. Broomfield CO, 80020	Project: Noble - Knaus 28-8 Project Number: [none] Project Manager: Brandon Bruns	**Reported:** 01/07/20 16:13

BH02R

1912434-02 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **12/30/19 13:55**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	**47**	1.0	ug/l	1	2001016	01/02/20	01/03/20	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	**7.9**	1.0	"	"	"	"	"	"	
Xylenes (total)	**11**	2.0	"	"	"	"	"	"	

Date Sampled: **12/30/19 13:55**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		*94.5 %*	*23-173*		"	"	"	"	
Surrogate: Toluene-d8		*99.8 %*	*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.

S2

Tasman Geosciences 6855 W. 119th Ave. Broomfield CO, 80020	Project: Noble - Knaus 28-8 Project Number: [none] Project Manager: Brandon Bruns	**Reported:** 01/07/20 16:13

BH03

1912434-03 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **12/30/19 12:42**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	**2.4**	1.0	ug/l	1	2001016	01/02/20	01/03/20	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	2.0	"	"	"	"	"	"	

Date Sampled: **12/30/19 12:42**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		*94.7 %*	*23-173*		"	"	"	"	
Surrogate: Toluene-d8		*98.9 %*	*20-170*		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		*121 %*	*21-167*		"	"	"	"	

S2

Tasman Geosciences 6855 W. 119th Ave. Broomfield CO, 80020	Project: Noble - Knaus 28-8 Project Number: [none] Project Manager: Brandon Bruns	**Reported:** 01/07/20 16:13

BH04R

1912434-04 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **12/30/19 12:50**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	1.0	ug/l	1	2001016	01/02/20	01/03/20	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	2.0	"	"	"	"	"	"	

Date Sampled: **12/30/19 12:50**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		*87.5 %*	*23-173*		"	"	"	"	
Surrogate: Toluene-d8		*99.8 %*	*20-170*		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		*104 %*	*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.

S2

Tasman Geosciences 6855 W. 119th Ave. Broomfield CO, 80020	Project: Noble - Knaus 28-8 Project Number: [none] Project Manager: Brandon Bruns	**Reported:** 01/07/20 16:13

BH05R

1912434-05 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **12/30/19 13:47**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	**130**	1.0	ug/l	1	2001016	01/02/20	01/03/20	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	**12**	1.0	"	"	"	"	"	"	
Xylenes (total)	**4.8**	2.0	"	"	"	"	"	"	

Date Sampled: **12/30/19 13:47**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		*96.7 %*	*23-173*		"	"	"	"	
Surrogate: Toluene-d8		*100 %*	*20-170*		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		*110 %*	*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.

S2

Tasman Geosciences 6855 W. 119th Ave. Broomfield CO, 80020	Project: Noble - Knaus 28-8 Project Number: [none] Project Manager: Brandon Bruns	**Reported:** 01/07/20 16:13

BH06R

1912434-06 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **12/30/19 12:34**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	1.0	ug/l	1	2001016	01/02/20	01/03/20	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	2.0	"	"	"	"	"	"	

Date Sampled: **12/30/19 12:34**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		*101 %*	*23-173*		"	"	"	"	
Surrogate: Toluene-d8		*103 %*	*20-170*		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		*105 %*	*21-167*		"	"	"	"	

S2

Tasman Geosciences 6855 W. 119th Ave. Broomfield CO, 80020	Project: Noble - Knaus 28-8 Project Number: [none] Project Manager: Brandon Bruns	**Reported:** 01/07/20 16:13

BH09

1912434-07 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **12/30/19 11:58**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	1.0	ug/l	1	2001016	01/02/20	01/03/20	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	2.0	"	"	"	"	"	"	

Date Sampled: **12/30/19 11:58**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		*99.2 %*	*23-173*		"	"	"	"	
Surrogate: Toluene-d8		*106 %*	*20-170*		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		*104 %*	*21-167*		"	"	"	"	

S2

Tasman Geosciences 6855 W. 119th Ave. Broomfield CO, 80020	Project: Noble - Knaus 28-8 Project Number: [none] Project Manager: Brandon Bruns	**Reported:** 01/07/20 16:13

BH08

1912434-08 (Water)

Summit Scientific

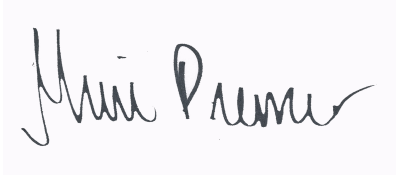
Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **12/30/19 13:25**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	1.0	ug/l	1	2001016	01/02/20	01/03/20	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	2.0	"	"	"	"	"	"	

Date Sampled: **12/30/19 13:25**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		*96.8 %*	*23-173*		"	"	"	"	
Surrogate: Toluene-d8		*99.2 %*	*20-170*		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		*95.2 %*	*21-167*		"	"	"	"	



S2

Tasman Geosciences 6855 W. 119th Ave. Broomfield CO, 80020	Project: Noble - Knaus 28-8 Project Number: [none] Project Manager: Brandon Bruns	**Reported:** 01/07/20 16:13

BH10

1912434-09 (Water)

Summit Scientific

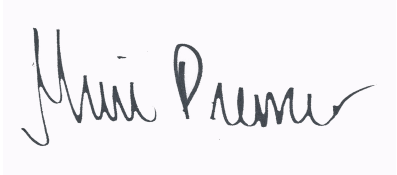
Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **12/30/19 13:15**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	1.0	ug/l	1	2001016	01/02/20	01/03/20	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	2.0	"	"	"	"	"	"	

Date Sampled: **12/30/19 13:15**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		*90.5 %*	*23-173*		"	"	"	"	
Surrogate: Toluene-d8		*97.7 %*	*20-170*		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		*98.6 %*	*21-167*		"	"	"	"	



S2

Tasman Geosciences 6855 W. 119th Ave. Broomfield CO, 80020	Project: Noble - Knaus 28-8 Project Number: [none] Project Manager: Brandon Bruns	**Reported:** 01/07/20 16:13

BH11

1912434-10 (Water)

Summit Scientific

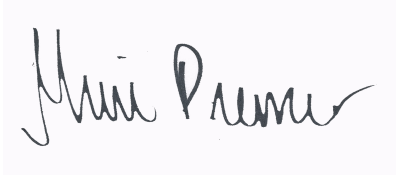
Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **12/30/19 12:15**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	1.0	ug/l	1	2001016	01/02/20	01/03/20	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	2.0	"	"	"	"	"	"	

Date Sampled: **12/30/19 12:15**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		*97.2 %*	*23-173*		"	"	"	"	
Surrogate: Toluene-d8		*100 %*	*20-170*		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		*99.8 %*	*21-167*		"	"	"	"	



S2

Tasman Geosciences 6855 W. 119th Ave. Broomfield CO, 80020	Project: Noble - Knaus 28-8 Project Number: [none] Project Manager: Brandon Bruns	**Reported:** 01/07/20 16:13

BH12

1912434-11 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **12/30/19 12:06**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	1.0	ug/l	1	2001016	01/02/20	01/03/20	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	2.0	"	"	"	"	"	"	

Date Sampled: **12/30/19 12:06**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		*94.1 %*	*23-173*		"	"	"	"	
Surrogate: Toluene-d8		*100 %*	*20-170*		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		*99.8 %*	*21-167*		"	"	"	"	

S2

Tasman Geosciences 6855 W. 119th Ave. Broomfield CO, 80020	Project: Noble - Knaus 28-8 Project Number: [none] Project Manager: Brandon Bruns	**Reported:** 01/07/20 16:13

BH13

1912434-12 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **12/30/19 12:24**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	1.0	ug/l	1	2001016	01/02/20	01/03/20	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	2.0	"	"	"	"	"	"	

Date Sampled: **12/30/19 12:24**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		*101 %*	*23-173*		"	"	"	"	
Surrogate: Toluene-d8		*102 %*	*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.

S2

Tasman Geosciences 6855 W. 119th Ave. Broomfield CO, 80020	Project: Noble - Knaus 28-8 Project Number: [none] Project Manager: Brandon Bruns	**Reported:** 01/07/20 16:13

BH14

1912434-13 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **12/30/19 12:58**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	1.0	ug/l	1	2001016	01/02/20	01/03/20	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	2.0	"	"	"	"	"	"	

Date Sampled: **12/30/19 12:58**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		*100 %*	*23-173*		"	"	"	"	
Surrogate: Toluene-d8		*101 %*	*20-170*		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		*98.1 %*	*21-167*		"	"	"	"	

S2

Tasman Geosciences 6855 W. 119th Ave. Broomfield CO, 80020	Project: Noble - Knaus 28-8 Project Number: [none] Project Manager: Brandon Bruns	**Reported:** 01/07/20 16:13

BH15

1912434-14 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **12/30/19 11:40**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	1.0	ug/l	1	2001016	01/02/20	01/03/20	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	2.0	"	"	"	"	"	"	

Date Sampled: **12/30/19 11:40**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		*100 %*	*23-173*		"	"	"	"	
Surrogate: Toluene-d8		*105 %*	*20-170*		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		*102 %*	*21-167*		"	"	"	"	

S2

Tasman Geosciences 6855 W. 119th Ave. Broomfield CO, 80020	Project: Noble - Knaus 28-8 Project Number: [none] Project Manager: Brandon Bruns	**Reported:** 01/07/20 16:13

BH16

1912434-15 (Water)

Summit Scientific

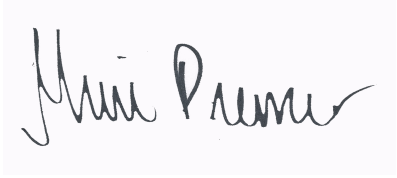
Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **12/30/19 11:50**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	1.0	ug/l	1	2001016	01/02/20	01/03/20	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	**2.1**	1.0	"	"	"	"	"	"	
Xylenes (total)	**7.2**	2.0	"	"	"	"	"	"	

Date Sampled: **12/30/19 11:50**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		*97.2 %*	*23-173*		"	"	"	"	
Surrogate: Toluene-d8		*99.3 %*	*20-170*		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		*98.5 %*	*21-167*		"	"	"	"	



S2

Tasman Geosciences 6855 W. 119th Ave. Broomfield CO, 80020	Project: Noble - Knaus 28-8 Project Number: [none] Project Manager: Brandon Bruns	**Reported:** 01/07/20 16:13

BH17

1912434-16 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **12/30/19 11:32**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	1.0	ug/l	1	2001016	01/02/20	01/03/20	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	2.0	"	"	"	"	"	"	

Date Sampled: **12/30/19 11:32**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		*96.5 %*	*23-173*		"	"	"	"	
Surrogate: Toluene-d8		*99.8 %*	*20-170*		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		*100 %*	*21-167*		"	"	"	"	

S2

Tasman Geosciences 6855 W. 119th Ave. Broomfield CO, 80020	Project: Noble - Knaus 28-8 Project Number: [none] Project Manager: Brandon Bruns	**Reported:** 01/07/20 16:13

BH18

1912434-17 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **12/30/19 11:25**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	1.0	ug/l	1	2001016	01/02/20	01/03/20	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	2.0	"	"	"	"	"	"	

Date Sampled: **12/30/19 11:25**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		*98.8 %*	*23-173*		"	"	"	"	
Surrogate: Toluene-d8		*100 %*	*20-170*		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		*101 %*	*21-167*		"	"	"	"	

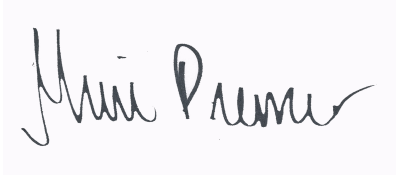
S2

Tasman Geosciences 6855 W. 119th Ave. Broomfield CO, 80020	Project: Noble - Knaus 28-8 Project Number: [none] Project Manager: Brandon Bruns	**Reported:** 01/07/20 16:13

Volatile Organic Compounds by EPA Method 8260B - Quality Control

Summit Scientific

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 2001016 - EPA 5030 Water MS										
Blank (2001016-BLK1)				Prepared: 01/02/20 Analyzed: 01/03/20						
Benzene	ND	1.0	ug/l							
Toluene	ND	1.0	"							
Ethylbenzene	ND	1.0	"							
Xylenes (total)	ND	2.0	"							
Surrogate: 1,2-Dichloroethane-d4	*12.3*		*"*	*13.3*		*92.6*	*23-173*			
Surrogate: Toluene-d8	*13.5*		*"*	*13.3*		*101*	*20-170*			
Surrogate: 4-Bromofluorobenzene	*13.1*		*"*	*13.3*		*98.3*	*21-167*			
LCS (2001016-BS1)				Prepared: 01/02/20 Analyzed: 01/03/20						
Benzene	29.8	1.0	ug/l	33.3		89.5	51-132			
Toluene	24.3	1.0	"	33.3		73.0	51-138			
Ethylbenzene	35.2	1.0	"	33.3		106	58-146			
m,p-Xylene	73.5	2.0	"	66.7		110	57-144			
o-Xylene	34.5	1.0	"	33.3		103	53-146			
Surrogate: 1,2-Dichloroethane-d4	*13.5*		*"*	*13.3*		*101*	*23-173*			
Surrogate: Toluene-d8	*13.4*		*"*	*13.3*		*101*	*20-170*			
Surrogate: 4-Bromofluorobenzene	*12.8*		*"*	*13.3*		*95.9*	*21-167*			
Matrix Spike (2001016-MS1)	**Source: 1912433-01**			Prepared: 01/02/20 Analyzed: 01/03/20						
Benzene	29.8	1.0	ug/l	33.3	ND	89.3	34-141			
Toluene	34.0	1.0	"	33.3	ND	102	27-151			
Ethylbenzene	36.8	1.0	"	33.3	ND	110	29-160			
m,p-Xylene	75.0	2.0	"	66.7	ND	112	20-166			
o-Xylene	35.2	1.0	"	33.3	ND	106	33-159			
Surrogate: 1,2-Dichloroethane-d4	*13.6*		*"*	*13.3*		*102*	*23-173*			
Surrogate: Toluene-d8	*13.7*		*"*	*13.3*		*103*	*20-170*			
Surrogate: 4-Bromofluorobenzene	*13.4*		*"*	*13.3*		*100*	*21-167*			



S2

Tasman Geosciences 6855 W. 119th Ave. Broomfield CO, 80020	Project: Noble - Knaus 28-8 Project Number: [none] Project Manager: Brandon Bruns	**Reported:** 01/07/20 16:13

Volatile Organic Compounds by EPA Method 8260B - Quality Control

Summit Scientific

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 2001016 - EPA 5030 Water MS										
Matrix Spike Dup (2001016-MSD1)	**Source: 1912433-01**			Prepared: 01/02/20 Analyzed: 01/03/20						
Benzene	29.1	1.0	ug/l	33.3	ND	87.4	34-141	2.11	30	
Toluene	33.2	1.0	"	33.3	ND	99.5	27-151	2.65	30	
Ethylbenzene	35.0	1.0	"	33.3	ND	105	29-160	4.96	30	
m,p-Xylene	72.6	2.0	"	66.7	ND	109	20-166	3.21	30	
o-Xylene	34.3	1.0	"	33.3	ND	103	33-159	2.67	30	
Surrogate: 1,2-Dichloroethane-d4	*13.9*		*"*	*13.3*		*104*	*23-173*			
Surrogate: Toluene-d8	*13.4*		*"*	*13.3*		*100*	*20-170*			
Surrogate: 4-Bromofluorobenzene	*13.2*		*"*	*13.3*		*99.0*	*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 6855 W. 119th Ave. Broomfield CO, 80020	Project: Noble - Knaus 28-8 Project Number: [none] Project Manager: Brandon Bruns	**Reported:** 01/07/20 16:13

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