

FEATHER 31-15
PRODUCED WATER TANK RELEASE
API #: 05-123 -21075
Spill/Release Point ID #: 444673
Remediation Project #: 10120

FIRST QUARTER 2018
Site Monitoring and Remediation Summary Report

March 19, 2018



Image: Google Earth

PREPARED ON BEHALF OF

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1.0 INTRODUCTION

This First Quarter 2018 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) and soil vapor extraction (SVE) remediation system at the Feather 31-15 Produced Water Tank Release site (Site).

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 were used to develop the analytical summary tables, groundwater elevation map, and benzene concentration map presented herein.

1.1 Site Background

The Site is located approximately 2.07 miles north-northwest of Keenesburg in Weld County, Colorado (Figure 1). Surrounded by agricultural crop land, the Site legal description is the northwest 1/4 of the northeast 1/4 of Section 15, Township 2 north, Range 64 west, of the 6th Principal Meridian. The Site is located on relatively flat terrain that slopes gradually to the north-northeast. The Site is approximately 3,500 feet (ft.) east of County Road 55 and approximately 380 ft. north of the Feather 31-15 wellhead, and has coordinates of 40.145495°, -104.534330°.

On February 3, 2016, Noble discovered a leak from the Feather 31-15 produced water tank. 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 # 400983708). The Form 19 was received by the COGCC and the incident was designated Spill/Release ID # 444673.

Soil and groundwater assessment activities were conducted at the Site on January 26, 2016. Tasman advanced nine (9) soil borings (BH01-BH09) and converted two (2) borings to groundwater monitoring wells (BH03 and BH08) around the tank battery, as illustrated on Figure 2. Based on data gathered during assessment activities, impacted soil excavation was completed on March 2 and 3, 2016.

During excavation activities, monitoring well BH03 was destroyed. From August 28, 2016 through December 21, 2016, Tasman returned to the Site to install 46 monitoring wells to further delineate dissolved phase impacts to groundwater at the Site. Analytical results for soil and groundwater samples collected during site assessment activities were previously reported to Noble in a Site Assessment and Excavation Report delivered on February 13, 2017. A Form 27 pertaining to remediation activities at the Site was received by the COGCC on April 3, 2017, and document number 401249112 and remediation project number 10120 were assigned to the Site.

1.2 Site Topography, Geology, and Hydrogeology

The Site is situated approximately 4,961 feet above mean sea level (ft. amsl). Surface topography across the Site slopes gently to the north.

Site assessment soil borings indicate that the subsurface geology immediately beneath the Site is composed of medium density, well graded sand and clayey sand, followed by stiff, inorganic, high plasticity lean then fat clay.

Groundwater was encountered at a range of approximately 7 ft. below ground surface (bgs) to 14 ft. bgs during monitoring well installation and groundwater sampling activities. Historic groundwater monitoring data indicates that the groundwater potentiometric surface flows toward the northeast.

2.0 FIRST QUARTER 2018 GROUNDWATER MONITORING ACTIVITIES

First Quarter 2018 groundwater monitoring activities were performed at the Site on January 25 and 26, 2018. Monitoring well BH23R sampled January 26, 2018 due to difficulty removing remediation system equipment from the well. The activities included measurement of groundwater levels and collection of groundwater samples from all 47 Site monitoring well locations.

2.1 Groundwater Level Measurements

Both general procedures and significant observations for the groundwater gauging activities performed during the First Quarter 2018 groundwater monitoring event are presented in the following sections.

General Procedures

Groundwater and light non-aqueous phase liquid (LNAPL) 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 2018 groundwater monitoring event, groundwater and LNAPL levels were gauged at all monitoring well locations the Site monitoring network. Groundwater and LNAPL elevation measurements are presented in Table 2.

Groundwater and LNAPL levels are 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. DTW data for wells containing LNAPL was converted to elevation by using the assumed LNAPL density of 0.75 times that of water. The formula used is presented in Table 2.

Significant Observations

During the First Quarter 2018 groundwater monitoring event, the groundwater elevation at the Site ranged from 4,935.47 ft. amsl in BH53R to 4,952.16 ft. amsl in BH08. The groundwater potentiometric surface at the site slopes to the northeast, with a hydraulic gradient of approximately 0.032 feet per foot between wells BH08 and BH53R. Groundwater elevation contours and the inferred flow direction are illustrated on Figure 3. LNAPL was not measured in any of the Site monitoring wells during the First Quarter 2018 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 January 25 and 26, 2018. During the First Quarter 2018 groundwater monitoring event, groundwater samples were collected from each of the 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) was purged from the 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.

Significant Observations

- LNAPL was not observed in any of the Site monitoring wells during the First Quarter 2018 monitoring event.

3.0 FIRST QUARTER 2018 GROUNDWATER SAMPLING RESULTS

This section presents the laboratory analytical results for groundwater samples collected during the First Quarter 2018 groundwater monitoring event. Groundwater laboratory analytical data is presented in Table 1 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 five (5) micrograms per liter ($\mu\text{g/L}$) in 19 of the 47 monitoring wells sampled (BH13, BH15, BH16, BH19, BH22, BH23R, BH24, BH25R, BH26, BH27, BH30R, BH31, BH33, BH36R, BH44, BH49R, BH50, BH53R, and BH54R). Benzene concentrations associated with these 19 monitoring wells ranged from 21 $\mu\text{g/L}$ in BH44 to 4,800 $\mu\text{g/L}$ in BH15. Isoconcentration contours indicating the area where benzene concentrations in groundwater were above the regulatory standard during the First Quarter 2018 sampling event are illustrated on Figure 4.
- Toluene was detected above the COGCC Table 910-1 groundwater standard of 560 $\mu\text{g/L}$ in one (1) of the 47 Site monitoring wells sampled (BH16). The toluene concentration associated with BH16 was detected at 1,100 $\mu\text{g/L}$.
- Ethylbenzene was not detected above the COGCC Table 910-1 groundwater standard of 700 $\mu\text{g/L}$ in any of the 47 Site monitoring wells sampled.
- Total xylenes were detected above the COGCC Table 910-1 groundwater standard of 1,400 $\mu\text{g/L}$ in two (2) of the 47 Site monitoring wells sampled (BH16 and BH25R). Total xylenes concentrations associated with these monitoring wells were 2,300 and 7,300 $\mu\text{g/L}$, respectively.

4.0 REMEDIATION SYSTEM

This section summarizes the installation and operational data for the AS/SVE remediation system that is currently in operation at the Site. The remediation system is shut down a minimum of one (1) week prior to quarterly sampling events to allow for normalization of Site groundwater levels.

4.1 AS/SVE Remediation System Installation

Between November 14 and 29, 2017, Tasman retrofitted eight (8) monitoring wells for use as AS wells and 13 for use as SVE wells to be used in operation of the remediation system (System). The AS/SVE remediation well network is illustrated on Figure 4. The remediation wells are connected to the System remediation equipment via above ground conveyance lines. The System remediation equipment is housed in a trailer that was placed along the southern end of the Site.

4.2 AS/SVE Remediation System Operations

Full-time operation of the AS System was initiated on December 4, 2017. On January 5, 2018, the SVE component of the System was initiated. From January 5 to January 25, 2018, the System SVE wells were operated at an average flow rate of 30 cubic feet per minute (cfm) at an average vacuum of 14.5 inches of water. The AS wells operated at an average pressure of 6.2 pounds per square inch (psi). From January 5 to 25, 2018 the System operated with an average uptime of 100%.

Remediation system air emission analytical samples were collected on January 12 and February 15, 2018 and submitted to Origins Laboratory in Denver, Colorado for analysis of BTEX and total petroleum hydrocarbons – gasoline range organics (TPH-GRO) by USEPA Method TO-15. Laboratory analytical results for these samples are summarized in Table 3. This laboratory data is used to calculate System effluent emission mass calculations. Tasman will continue to collect emission samples through the end of 2018 to determine if a Colorado Department of Public Health and Environment Air Pollution Control Division Air Pollution Emission Notice (APEN) will be required for the System operations. As detailed in Table 3, as of February 15, 2018, approximately 0.11 pounds of petroleum hydrocarbons has been emitted by the System since startup. Based on the air emission data collected to date, an APEN is currently not required as part of the System operations.

5.0 UPCOMING SITE ACTIVITIES

Anticipated upcoming Site activities include the following:

- Modify Remediation System layout to address northern portion of plume; and
- Complete the Second Quarter 2018 groundwater sampling event in April; and
- Continue operations and maintenance of the remediation system; and
- Continue monthly effluent sampling of remediation system emissions.

TABLES

TABLE 1
GROUNDWATER ANALYTICAL DATA
NOBLE ENERGY, INC. - FEATHER 31-15 PRODUCED WATER TANK RELEASE

Monitoring Well ID	Date	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Total Xylenes (µg/L)
COGCC Groundwater Standard (ug/L)		5	560	700	1,400
BH03	01/28/16	940	3,700	430	7,100
BH03	09/01/16	Removed from Monitoring Network-Well Destroyed			
BH08	01/28/16	<1.0	1.1	<1.0	3.2
BH08	09/01/16	<1.0	<1.0	<1.0	<1.0
BH08	11/03/16	<1.0	<1.0	<1.0	<1.0
BH08	01/24/17	<1.0	<1.0	<1.0	<1.0
BH08	04/05/17	<1.0	<1.0	<1.0	<2.0
BH08	07/27/17	<1.0	<1.0	<1.0	<2.0
BH08	10/30/17	<1.0	<1.0	<1.0	<2.0
BH08	01/25/18	<1.0	<1.0	<1.0	<2.0
BH10	09/01/16	<1.0	<1.0	<1.0	<1.0
BH10	11/03/16	<1.0	<1.0	<1.0	<1.0
BH10	01/24/17	<1.0	<1.0	<1.0	<1.0
BH10	04/05/17	<1.0	<1.0	<1.0	<2.0
BH10	07/27/17	<1.0	<1.0	<1.0	<2.0
BH10	10/30/17	<1.0	<1.0	<1.0	<2.0
BH10	01/25/18	<1.0	<1.0	<1.0	<2.0
BH11	09/01/16	<1.0	<1.0	<1.0	18
BH11	11/03/16	57	70	24	260
BH11	01/24/17	<1.0	<1.0	<1.0	<1.0
BH11	04/05/17	13	<1.0	8.1	30
BH11	07/27/17	9.4	<1.0	20	13
BH11	10/30/17	<1.0	<1.0	<1.0	<2.0
BH11	01/25/18	1.1	<1.0	1.2	<2.0
BH12	09/01/16	<1.0	<1.0	<1.0	<1.0
BH12	11/03/16	<1.0	<1.0	<1.0	<1.0
BH12	01/24/17	<1.0	<1.0	<1.0	<1.0
BH12	04/05/17	<1.0	<1.0	<1.0	<2.0
BH12	07/27/17	<1.0	<1.0	<1.0	<2.0
BH12	10/30/17	<1.0	<1.0	<1.0	<2.0
BH12	01/25/18	<1.0	<1.0	<1.0	<2.0
BH13	09/01/16	5,000	4,700	<1.0	16,000
BH13	11/03/16	4,800	2,900	690	15,000
BH13	01/24/17	3,000	610	380	13,000
BH13	04/05/17	2,900	670	1,100	11,000
BH13	07/27/17	1,000	190	470	3,200
BH13	10/30/17	470	27	2.3	2,600
BH13	01/25/18	22	<1.0	12	85

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Monitoring Well ID	Date	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Total Xylenes (µg/L)
COGCC Groundwater Standard (ug/L)		5	560	700	1,400
BH14	09/01/16	<1.0	<1.0	<1.0	<1.0
BH14	11/03/16	<1.0	<1.0	<1.0	<1.0
BH14	01/24/17	<1.0	<1.0	<1.0	<1.0
BH14	04/05/17	<1.0	<1.0	<1.0	<2.0
BH14	07/27/17	<1.0	<1.0	<1.0	<2.0
BH14	10/30/17	<1.0	<1.0	<1.0	<2.0
BH14	01/25/18	<1.0	<1.0	<1.0	<2.0
BH15	09/01/16	4,300	8,000	410	7,900
BH15	11/03/16	2,300	4,700	380	6,500
BH15	01/24/17	8,400	2,800	600	10,000
BH15	04/05/17	4,000	170	510	2,900
BH15	07/27/17	4,500	990	510	2,300
BH15	10/30/17	1,700	210	320	1,600
BH15	01/25/18	4,800	56	260	670
BH16	09/01/16	32,000	51,000	1,100	34,000
BH16	11/03/16	22,000	34,000	1,500	23,000
BH16	01/24/17	21,000	31,000	680	29,000
BH16	04/05/17	26,000	20,000	2,200	33,000
BH16	07/27/17	17,000	18,000	2,400	34,000
BH16	10/30/17	18,000	21,000	1,600	23,000
BH16	01/25/18	3,000	1,100	170	2,300
BH17	09/23/16	<1.0	<1.0	<1.0	<1.0
BH17	11/03/16	<1.0	<1.0	<1.0	<1.0
BH17	01/24/17	<1.0	<1.0	<1.0	<1.0
BH17	04/05/17	<1.0	<1.0	<1.0	<2.0
BH17	07/27/17	<1.0	<1.0	<1.0	<2.0
BH17	10/30/17	<1.0	<1.0	<1.0	<2.0
BH17	01/25/18	<1.0	<1.0	<1.0	<2.0
BH18	09/23/16	<1.0	<1.0	<1.0	<1.0
BH18	11/03/16	<1.0	<1.0	<1.0	<1.0
BH18	01/24/17	<1.0	<1.0	<1.0	<1.0
BH18	04/05/17	<1.0	<1.0	<1.0	<2.0
BH18	07/27/17	<1.0	<1.0	<1.0	<2.0
BH18	10/30/17	<1.0	<1.0	<1.0	<2.0
BH18	01/25/18	<1.0	<1.0	<1.0	<2.0
BH19	09/23/16	1,000	500	72	1,300
BH19	11/03/16	8,000	3,700	520	9,100
BH19	01/24/17	5,400	1.2	<1.0	3,100
BH19	04/05/17	5,600	<1.0	560	1,700

TABLE 1
GROUNDWATER ANALYTICAL DATA
NOBLE ENERGY, INC. - FEATHER 31-15 PRODUCED WATER TANK RELEASE

Monitoring Well ID	Date	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Total Xylenes (µg/L)
COGCC Groundwater Standard (ug/L)		5	560	700	1,400
BH19	07/27/17	280	44	<1.0	230
BH19	10/30/17	1,800	1.6	140	430
BH19	01/25/18	1,100	<1.0	27	60
BH20	09/23/16	<1.0	<1.0	<1.0	280
BH20	11/03/16	<1.0	<1.0	<1.0	<1.0
BH20	01/24/17	<1.0	<1.0	<1.0	<1.0
BH20	04/05/17	<1.0	<1.0	<1.0	<2.0
BH20	07/27/17	<1.0	<1.0	<1.0	<2.0
BH20	10/30/17	<1.0	<1.0	<1.0	<2.0
BH20	01/25/18	<1.0	<1.0	<1.0	<2.0
BH21	09/23/16	2,400	2,800	470	1,500
BH21	11/03/16	5,000	12,000	560	9,600
BH21	01/24/17	2,900	30	<1.0	6,200
BH21	04/05/17	4,700	<1.0	530	3,100
BH21	07/27/17	3,100	<1.0	380	130
BH21	10/30/17	1,900	150	40	6.2
BH21	01/25/18	<1.0	<1.0	<1.0	<2.0
BH22	09/23/16	8,800	24,000	1,900	28,000
BH22	11/03/16	5,500	10,000	670	19,000
BH22	01/24/17	9,100	13,000	2,000	51,000
BH22	04/05/17	8,900	2,800	2,000	23,000
BH22	07/27/17	4,800	330	750	17,000
BH22	10/30/17	1,800	91	770	3,500
BH22	01/25/18	92	1.3	2.7	2.7
BH23	09/23/16	11,000	21,000	1,400	21,000
BH23	11/03/16	6,200	6,800	430	7,900
BH23	01/24/17	4,900	5,300	<1.0	11,000
BH23	04/05/17	3,800	4,900	420	7,200
BH23	07/27/17	<1.0	<1.0	<1.0	<2.0
BH23	07/27/17	Broken Casing - Monitoring Well Destroyed			
BH23R	10/30/17	4,200	110	34	4,000
BH23R	01/26/18	35	47	12	250
BH24	09/23/16	13,000	5,200	500	4,200
BH24	11/03/16	12,000	1,900	650	2,400
BH24	01/24/17	6,300	47	<1.0	4,000
BH24	04/05/17	9,100	1.0	910	950
BH24	07/27/17	3,500	2.1	3.7	1,200
BH24	10/30/17	660	3.5	340	110
BH24	01/25/18	74	<1.0	19	14

TABLE 1
GROUNDWATER ANALYTICAL DATA
NOBLE ENERGY, INC. - FEATHER 31-15 PRODUCED WATER TANK RELEASE

Monitoring Well ID	Date	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Total Xylenes (µg/L)
COGCC Groundwater Standard (ug/L)		5	560	700	1,400
BH25	09/23/16	5,400	22,000	1,200	19,000
BH25	11/03/16	4,500	15,000	1,200	20,000
BH25	01/24/17	2,700	2,400	<1.0	16,000
BH25	04/05/17	3,400	1,100	400	14,000
BH25	07/27/17	2,900	9.9	290	11,000
BH25R	10/30/17	88	3.7	<1.0	1,800
BH25R	01/25/18	3,300	<1.0	180	7,300
BH26	09/23/16	3,900	8,100	890	13,000
BH26	11/03/16	3,700	3,000	780	13,000
BH26	01/24/17	3,300	210	<1.0	8,900
BH26	04/05/17	3,200	160	250	4,300
BH26	07/27/17	1,600	13	95	1,200
BH26	10/30/17	400	120	350	4,400
BH26	01/25/18	100	18	5.3	140
BH27	09/23/16	2,100	7,900	660	11,000
BH27	11/03/16	2,300	7,300	790	13,000
BH27	01/24/17	110	3	<1.0	190
BH27	04/05/17	1,100	19	120	1,600
BH27	07/27/17	810	<1.0	330	480
BH27	10/30/17	130	<1.0	1.1	46
BH27	01/25/18	290	<1.0	57	<2.0
BH28	09/23/16	<1.0	<1.0	<1.0	<1.0
BH28	11/03/16	<1.0	<1.0	<1.0	<1.0
BH28	01/24/17	<1.0	<1.0	<1.0	<1.0
BH28	04/05/17	<1.0	<1.0	<1.0	<2.0
BH28	07/27/17	<1.0	<1.0	<1.0	<2.0
BH28	07/27/17	Broken Casing - Monitoring Well Destroyed			
BH28R	10/30/17	<1.0	<1.0	<1.0	<2.0
BH28R	01/25/18	<1.0	<1.0	<1.0	<2.0
BH29	09/23/16	<1.0	<1.0	<1.0	<1.0
BH29	11/03/16	<1.0	<1.0	<1.0	<1.0
BH29	01/24/17	<1.0	<1.0	<1.0	<1.0
BH29	04/05/17	<1.0	<1.0	<1.0	<2.0
BH29	07/27/17	<1.0	<1.0	<1.0	<2.0
BH29	10/30/17	<1.0	<1.0	<1.0	<2.0
BH29	01/25/18	<1.0	<1.0	<1.0	<2.0
BH30	10/25/16	4,300	24,000	1,100	18,000
BH30	11/03/16	3,900	18,000	1,100	19,000
BH30	01/24/17	2,200	11,000	670	12,000

TABLE 1
GROUNDWATER ANALYTICAL DATA
NOBLE ENERGY, INC. - FEATHER 31-15 PRODUCED WATER TANK RELEASE

Monitoring Well ID	Date	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Total Xylenes (µg/L)
COGCC Groundwater Standard (ug/L)		5	560	700	1,400
BH30	04/05/17	1,400	4,900	640	6,000
BH30	07/27/17	21	17	3.7	59
BH30	07/27/17	Broken Casing - Monitoring Well Destroyed			
BH30R	10/30/17	1,200	1,000	67	11,000
BH30R	01/25/18	1,400	<1.0	34	340
BH31	10/25/16	4,100	2,700	170	3,900
BH31	11/03/16	3,700	3,700	250	4,800
BH31	01/24/17	1,300	<1.0	<1.0	2,100
BH31	04/05/17	1,500	<1.0	99	120
BH31	07/27/17	<1.0	<1.0	<1.0	<2.0
BH31	10/30/17	1.2	1.4	46	28
BH31	01/25/18	1,100	<1.0	70	2.7
BH32	10/25/16	<1.0	2.8	<1.0	2.7
BH32	11/03/16	<1.0	<1.0	<1.0	<1.0
BH32	01/24/17	<1.0	<1.0	<1.0	<1.0
BH32	04/05/17	<1.0	<1.0	<1.0	<2.0
BH32	07/27/17	<1.0	<1.0	<1.0	<2.0
BH32	10/30/17	1.2	<1.0	<1.0	8.3
BH32	01/25/18	<1.0	<1.0	<1.0	<2.0
BH33	10/25/16	11,000	17,000	790	12,000
BH33	11/03/16	10,000	18,000	870	15,000
BH33	01/24/17	<1.0	17	1.3	4,400
BH33	04/05/17	4,300	19	550	1,100
BH33	07/27/17	<1.0	<1.0	200	1,100
BH33	10/30/17	4,300	69	2.2	160
BH33	01/25/18	72	2.9	4.8	59
BH34	10/25/16	Not Sampled - Insufficient Water			
BH34	11/03/16	<1.0	<1.0	<1.0	<1.0
BH34	01/24/17	<1.0	<1.0	<1.0	<1.0
BH34	04/05/17	<1.0	<1.0	<1.0	<2.0
BH34	07/27/17	<1.0	<1.0	<1.0	<2.0
BH34	10/30/17	3.0	<1.0	<1.0	3.0
BH34	01/25/18	<1.0	<1.0	<1.0	<2.0
BH35	10/25/16	Not Sampled - Insufficient Water			
BH35	11/03/16	<1.0	<1.0	<1.0	<1.0
BH35	01/24/17	<1.0	<1.0	<1.0	<1.0
BH35	04/05/17	<1.0	<1.0	<1.0	<2.0
BH35	07/27/17	<1.0	<1.0	<1.0	<2.0
BH35	10/30/17	1.0	<1.0	<1.0	2.1

TABLE 1
GROUNDWATER ANALYTICAL DATA
NOBLE ENERGY, INC. - FEATHER 31-15 PRODUCED WATER TANK RELEASE

Monitoring Well ID	Date	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Total Xylenes (µg/L)
COGCC Groundwater Standard (ug/L)		5	560	700	1,400
BH35	01/25/18	<1.0	<1.0	<1.0	<2.0
BH36	10/25/16	6,800	9,800	520	8,500
BH36	11/03/16	4,300	2,200	320	4,700
BH36	01/24/17	2,200	24	<1.0	150
BH36	04/05/17	2,600	510	260	1,200
BH36	07/27/17	2,200	56	250	480
BH36	07/27/17	Broken Casing - Monitoring Well Destroyed			
BH36R	10/30/17	2,800	290	15	4,300
BH36R	01/25/18	2,700	<1.0	84	500
BH37	10/25/16	4,700	4,800	170	4,300
BH37	11/03/16	4,900	3,200	210	4,400
BH37	01/24/17	<1.0	<1.0	<1.0	<1.0
BH37	04/05/17	2,500	1,100	210	960
BH37	07/27/17	1,000	<1.0	27	44
BH37	10/30/17	<1.0	<1.0	<1.0	<2.0
BH37	01/25/18	3.5	<1.0	<1.0	<2.0
BH38	10/25/16	3.8	7.1	<1.0	12
BH38	11/03/16	<1.0	<1.0	<1.0	<1.0
BH38	01/24/17	<1.0	<1.0	<1.0	<1.0
BH38	04/05/17	<1.0	<1.0	<1.0	<2.0
BH38	07/27/17	1.2	<1.0	<1.0	<2.0
BH38	07/27/17	Broken Casing - Monitoring Well Destroyed			
BH38R	10/30/17	<1.0	<1.0	<1.0	<2.0
BH38R	01/25/18	<1.0	<1.0	<1.0	<2.0
BH39	11/03/16	<1.0	<1.0	<1.0	<1.0
BH39	01/24/17	<1.0	<1.0	<1.0	<1.0
BH39	04/05/17	<1.0	<1.0	<1.0	<2.0
BH39	07/27/17	<1.0	<1.0	<1.0	<2.0
BH39	10/30/17	<1.0	<1.0	<1.0	<2.0
BH39	01/25/18	<1.0	<1.0	<1.0	<2.0
BH40	11/03/16	<1.0	<1.0	<1.0	2.2
BH40	01/24/17	<1.0	<1.0	<1.0	<1.0
BH40	04/05/17	<1.0	<1.0	<1.0	<2.0
BH40	07/27/17	<1.0	<1.0	<1.0	<2.0
BH40	07/27/17	Broken Casing - Monitoring Well Destroyed			
BH40R	10/30/17	<1.0	<1.0	<1.0	<2.0
BH40R	01/25/18	<1.0	<1.0	<1.0	<2.0
BH41	11/03/16	<1.0	<1.0	<1.0	<1.0
BH41	01/24/17	<1.0	<1.0	<1.0	<1.0

TABLE 1
GROUNDWATER ANALYTICAL DATA
NOBLE ENERGY, INC. - FEATHER 31-15 PRODUCED WATER TANK RELEASE

Monitoring Well ID	Date	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Total Xylenes (µg/L)
COGCC Groundwater Standard (ug/L)		5	560	700	1,400
BH41	04/05/17	<1.0	<1.0	<1.0	<2.0
BH41	07/27/17	<1.0	<1.0	<1.0	<2.0
BH41	07/27/17	Broken Casing - Monitoring Well Destroyed			
BH41R	10/30/17	<1.0	<1.0	<1.0	<2.0
BH41R	01/25/18	<1.0	<1.0	<1.0	<2.0
BH42	11/03/16	<1.0	<1.0	<1.0	<1.0
BH42	01/24/17	<1.0	<1.0	<1.0	<1.0
BH42	04/05/17	<1.0	<1.0	<1.0	<2.0
BH42	07/27/17	<1.0	<1.0	<1.0	<2.0
BH42	07/27/17	Broken Casing - Monitoring Well Destroyed			
BH42R	10/30/17	<1.0	<1.0	<1.0	<2.0
BH42R	01/25/18	<1.0	<1.0	<1.0	<2.0
BH43	11/03/16	<1.0	1.2	<1.0	27
BH43	01/24/17	<1.0	<1.0	<1.0	<1.0
BH43	04/05/17	<1.0	<1.0	<1.0	<2.0
BH43	07/27/17	<1.0	<1.0	<1.0	<2.0
BH43	07/27/17	Broken Casing - Monitoring Well Destroyed			
BH43R	10/30/17	<1.0	<1.0	<1.0	<2.0
BH43R	01/25/18	<1.0	<1.0	<1.0	<2.0
BH44	11/03/16	4,200	20	2.3	590
BH44	01/24/17	<1.0	<1.0	<1.0	<1.0
BH44	04/05/17	580	<1.0	<1.0	<2.0
BH44	07/27/17	100	<1.0	<1.0	<2.0
BH44	10/30/17	<1.0	<1.0	<1.0	<2.0
BH44	01/25/18	21	<1.0	<1.0	<2.0
BH45	11/03/16	<1.0	9.3	<1.0	3.9
BH45	01/24/17	<1.0	<1.0	<1.0	<1.0
BH45	04/05/17	<1.0	<1.0	<1.0	<2.0
BH45	07/27/17	<1.0	<1.0	<1.0	<2.0
BH45	10/30/17	<1.0	<1.0	<1.0	<2.0
BH45	01/25/18	<1.0	<1.0	<1.0	<2.0
BH46	01/24/17	<1.0	<1.0	<1.0	<1.0
BH46	04/05/17	<1.0	<1.0	<1.0	<2.0
BH46	07/27/17	<1.0	<1.0	<1.0	<2.0
BH46	10/30/17	<1.0	<1.0	<1.0	<2.0
BH46	01/25/18	<1.0	<1.0	<1.0	<2.0
BH47	01/24/17	<1.0	<1.0	<1.0	<1.0
BH47	04/05/17	<1.0	<1.0	<1.0	<2.0
BH47	07/27/17	<1.0	<1.0	<1.0	<2.0

TABLE 1
GROUNDWATER ANALYTICAL DATA
NOBLE ENERGY, INC. - FEATHER 31-15 PRODUCED WATER TANK RELEASE

Monitoring Well ID	Date	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Total Xylenes (µg/L)
COGCC Groundwater Standard (ug/L)		5	560	700	1,400
BH47	10/30/17	<1.0	<1.0	<1.0	<2.0
BH47	01/25/18	<1.0	<1.0	<1.0	<2.0
BH48	01/24/17	<1.0	<1.0	<1.0	<1.0
BH48	04/05/17	1,300	<1.0	<1.0	8.4
BH48	07/27/17	300	<1.0	<1.0	<2.0
BH48	10/30/17	1.2	<1.0	<1.0	<2.0
BH48	01/25/18	<1.0	<1.0	<1.0	<2.0
BH49	01/24/17	<1.0	<1.0	<1.0	<1.0
BH49	04/05/17	250	<1.0	<1.0	<2.0
BH49	07/27/17	64	<1.0	<1.0	<2.0
BH49	07/27/17	Broken Casing - Monitoring Well Destroyed			
BH49R	10/30/17	<1.0	<1.0	<1.0	<2.0
BH49R	01/25/18	230	<1.0	<1.0	<2.0
BH50	01/24/17	1,600	3,400	280	5,100
BH50	04/05/17	820	1.2	160	330
BH50	07/27/17	740	<1.0	170	340
BH50	10/30/17	<1.0	<1.0	<1.0	<2.0
BH50	01/25/18	170	<1.0	150	<2.0
BH51	01/24/17	<1.0	<1.0	<1.0	<1.0
BH51	04/05/17	<1.0	<1.0	<1.0	<2.0
BH51	07/27/17	<1.0	<1.0	<1.0	<2.0
BH51	10/30/17	<1.0	<1.0	<1.0	<2.0
BH51	01/25/18	<1.0	<1.0	<1.0	<2.0
BH52	01/24/17	<1.0	<1.0	<1.0	<1.0
BH52	04/05/17	<1.0	<1.0	<1.0	<2.0
BH52	07/27/17	<1.0	<1.0	<1.0	<2.0
BH52	07/27/17	Broken Casing - Monitoring Well Destroyed			
BH52R	10/30/17	<1.0	<1.0	<1.0	<2.0
BH52R	01/25/18	<1.0	<1.0	<1.0	<2.0
BH53	07/27/17	<1.0	<1.0	<1.0	<2.0
BH53	07/27/17	Broken Casing - Monitoring Well Destroyed			
BH53R	10/30/17	<1.0	<1.0	<1.0	<2.0
BH53R	01/25/18	67	<1.0	<1.0	<2.0
BH54	07/27/17	Not Sampled - Insufficient Water			
BH54	07/27/17	Broken Casing - Monitoring Well Destroyed			
BH54R	10/30/17	<1.0	<1.0	<1.0	<2.0
BH54R	01/25/18	1,400	<1.0	<1.0	<2.0
BH55	07/27/17	<1.0	<1.0	<1.0	<2.0
BH55	07/27/17	Broken Casing - Monitoring Well Destroyed			

TABLE 1
GROUNDWATER ANALYTICAL DATA
NOBLE ENERGY, INC. - FEATHER 31-15 PRODUCED WATER TANK RELEASE

Monitoring Well ID	Date	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Total Xylenes (µg/L)
COGCC Groundwater Standard (ug/L)		5	560	700	1,400
BH55R	10/30/17	<1.0	<1.0	<1.0	<2.0
BH55R	01/25/18	1.1	<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

TABLE 2
GROUNDWATER ELEVATION DATA
NOBLE ENERGY, INC. - FEATHER 31-15
PRODUCED WATER TANK RELEASE



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)
BH03	01/28/16	NS	22.98	15.17	ND	ND	NS
BH03	09/01/16	Removed from Monitoring Network-Well Destroyed					
BH08	01/28/16	NS	24.95	13.15	ND	ND	NS
BH08	09/01/16	4960.47	22.60	6.16	ND	ND	4954.31
BH08	11/03/16	4960.47	22.57	6.79	ND	ND	4953.68
BH08	01/24/17	4960.47	22.63	7.21	ND	ND	4953.26
BH08	04/05/17	4960.47	22.60	7.54	ND	ND	4952.93
BH08	07/27/17	4960.47	22.53	7.26	ND	ND	4953.21
BH08	10/30/17	4960.47	22.52	7.92	ND	ND	4952.55
BH08	01/25/18	4960.47	22.59	8.31	ND	ND	4952.16
BH10	09/01/16	4964.48	21.98	10.36	ND	ND	4954.12
BH10	11/03/16	4964.48	21.95	10.98	ND	ND	4953.50
BH10	01/24/17	4964.48	22.03	11.37	ND	ND	4953.11
BH10	04/05/17	4964.48	21.98	11.72	ND	ND	4952.76
BH10	07/27/17	4964.48	21.95	11.49	ND	ND	4952.99
BH10	10/30/17	4964.48	21.94	12.06	ND	ND	4952.42
BH10	01/25/18	4964.48	21.98	12.40	ND	ND	4952.08
BH11	09/01/16	4960.77	16.86	6.73	ND	ND	4954.04
BH11	11/03/16	4960.77	18.32	7.29	ND	ND	4953.48
BH11	01/24/17	4960.77	17.93	7.72	ND	ND	4953.05
BH11	04/05/17	4960.77	17.79	8.04	ND	ND	4952.73
BH11	07/27/17	4960.77	17.69	7.78	ND	ND	4952.99
BH11	10/30/17	4960.77	17.63	8.40	ND	ND	4952.37
BH11	01/25/18	4959.80	15.56	7.80	ND	ND	4952.00
BH12	09/01/16	4960.63	18.90	7.05	ND	ND	4953.58
BH12	11/03/16	4960.63	18.81	7.71	ND	ND	4952.92
BH12	01/24/17	4960.63	18.70	8.15	ND	ND	4952.48
BH12	04/05/17	4960.63	18.84	8.47	ND	ND	4952.16
BH12	07/27/17	4960.63	18.59	8.20	ND	ND	4952.43
BH12	10/30/17	4960.63	18.54	8.83	ND	ND	4951.80
BH12	01/25/18	4960.63	18.55	9.20	ND	ND	4951.43
BH13	09/01/16	4963.84	21.95	10.92	ND	ND	4952.92
BH13	11/03/16	4963.84	21.62	11.54	ND	ND	4952.30
BH13	01/24/17	4963.84	21.17	11.94	ND	ND	4951.90
BH13	04/05/17	4963.84	21.14	12.23	ND	ND	4951.61
BH13	07/27/17	4963.84	20.99	11.93	ND	ND	4951.91
BH13	10/30/17	4963.84	20.83	12.56	ND	ND ¹	4951.28
BH13	01/25/18	4959.84	16.36	8.87	ND	ND	4950.97
BH14	09/01/16	4960.84	19.50	8.60	ND	ND	4952.24
BH14	11/03/16	4960.84	19.39	9.22	ND	ND	4951.62
BH14	01/24/17	4960.84	19.10	9.57	ND	ND	4951.27

TABLE 2
GROUNDWATER ELEVATION DATA
NOBLE ENERGY, INC. - FEATHER 31-15
PRODUCED WATER TANK RELEASE



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)
BH14	04/05/17	4960.84	19.02	9.84	ND	ND	4951.00
BH14	07/27/17	4960.84	19.03	9.54	ND	ND	4951.30
BH14	10/30/17	4960.84	18.90	10.10	ND	ND	4950.74
BH14	01/25/18	4960.84	15.83	10.42	ND	ND	4950.42
BH15	09/01/16	4961.83	21.04	10.90	ND	ND	4950.93
BH15	11/03/16	4961.83	22.32	11.39	ND	ND	4950.44
BH15	01/24/17	4961.83	22.32	11.67	ND	ND	4950.16
BH15	04/05/17	4961.83	22.40	11.92	ND	ND	4949.91
BH15	07/27/17	4961.83	22.35	11.57	ND	ND	4950.26
BH15	10/30/17	4961.83	22.36	12.03	ND	ND	4949.80
BH15	01/25/18	4961.83	22.32	12.38	ND	ND	4949.45
BH16	09/01/16	4960.67	19.54	8.85	ND	ND	4951.82
BH16	11/03/16	4960.67	19.50	9.44	ND	ND	4951.23
BH16	01/24/17	4960.67	19.55	9.77	ND	ND	4950.90
BH16	04/05/17	4960.67	19.60	10.04	ND	ND	4950.63
BH16	07/27/17	4960.67	19.49	9.68	ND	ND ¹	4950.99
BH16	10/30/17	4960.67	19.50	10.27	ND	ND	4950.40
BH16	01/25/18	4959.88	18.35	9.74	ND	ND	4950.14
BH17	09/23/16	4961.27	18.52	8.53	ND	ND	4952.74
BH17	11/03/16	4961.27	18.26	8.97	ND	ND	4952.30
BH17	01/24/17	4961.27	17.72	9.36	ND	ND	4951.91
BH17	04/05/17	4961.27	17.71	9.66	ND	ND	4951.61
BH17	07/27/17	4961.27	17.68	9.40	ND	ND	4951.87
BH17	10/30/17	4961.27	17.55	9.91	ND	ND	4951.36
BH17	01/25/18	4961.27	17.42	10.30	ND	ND	4950.97
BH18	09/23/16	4962.91	21.43	11.30	ND	ND	4951.61
BH18	11/03/16	4962.91	22.26	11.72	ND	ND	4951.19
BH18	01/24/17	4962.91	22.33	12.06	ND	ND	4950.85
BH18	04/05/17	4961.27	22.30	12.34	ND	ND	4948.93
BH18	07/27/17	4961.27	22.18	12.06	ND	ND	4949.21
BH18	10/30/17	4961.27	22.29	12.51	ND	ND	4948.76
BH18	01/25/18	4961.27	22.25	12.85	ND	ND	4948.42
BH19	09/23/16	4961.23	18.11	9.11	ND	ND	4952.12
BH19	11/03/16	4961.23	18.59	9.53	ND	ND	4951.70
BH19	01/24/17	4961.23	18.58	9.87	ND	ND	4951.36
BH19	04/05/17	4961.23	18.57	10.16	ND	ND	4951.07
BH19	07/27/17	4961.23	18.49	9.82	ND	ND	4951.41
BH19	10/30/17	4961.23	18.46	10.38	ND	ND	4950.85
BH19	01/25/18	4960.28	17.52	9.81	ND	ND	4950.47
BH20	09/23/16	4959.06	19.43	8.72	ND	ND	4950.34
BH20	11/03/16	4959.06	19.34	9.05	ND	ND	4950.01

TABLE 2
GROUNDWATER ELEVATION DATA
NOBLE ENERGY, INC. - FEATHER 31-15
PRODUCED WATER TANK RELEASE



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)
BH20	01/24/17	4959.06	19.14	9.29	ND	ND	4949.77
BH20	04/05/17	4959.06	19.05	9.52	ND	ND	4949.54
BH20	07/27/17	4959.06	19.06	9.13	ND	ND	4949.93
BH20	10/30/17	4959.06	18.91	9.62	ND	ND	4949.44
BH20	01/25/18	4959.06	18.90	9.90	ND	ND	4949.16
BH21	09/23/16	4960.89	21.22	14.49	ND	ND	4946.40
BH21	11/03/16	4960.89	21.22	12.18	ND	ND	4948.71
BH21	01/24/17	4960.89	21.20	12.27	ND	ND	4948.62
BH21	04/05/17	4960.89	21.30	12.57	ND	ND	4948.32
BH21 ²	07/27/17	Well Damaged - Elevation Control Lost			ND	ND	NM
BH21	10/30/17	4960.90	21.24	12.59	ND	ND	4948.31
BH21	01/25/18	4960.90	21.40	12.96	ND	ND	4947.94
BH22	09/23/16	4961.11	20.94	11.49	ND	ND	4949.62
BH22	11/03/16	4961.11	20.90	11.79	ND	ND	4949.32
BH22	01/24/17	4961.11	20.70	11.94	ND	ND	4949.17
BH22	04/05/17	4961.11	20.80	12.20	ND	ND	4948.91
BH22 ²	07/27/17	Well Damaged - Elevation Control Lost			ND	ND	NM
BH22 ¹	10/30/17	4961.11	20.51	12.29	ND	ND	4948.82
BH22	01/25/18	4961.11	20.85	12.54	ND	ND	4948.57
BH23	09/23/16	4960.67	22.71	11.91	ND	ND	4948.76
BH23	11/03/16	4960.67	22.68	12.21	ND	ND	4948.46
BH23	01/24/17	4960.67	22.50	12.29	ND	ND	4948.38
BH23	04/05/17	4960.67	22.57	12.58	ND	ND	4948.09
BH23 ²	07/27/17	Well Damaged - Elevation Control Lost			ND	ND	NM
BH23	07/27/17	Broken Casing - Monitoring Well Destroyed					
BH23R	10/30/17	4960.74	22.91	12.65	ND	ND	4948.09
BH23R	01/25/18	Well Damaged - Elevation Control Lost			NM	NM	NM
BH24	09/23/16	4960.30	21.75	11.63	ND	ND	4948.67
BH24	11/03/16	4960.30	22.38	11.87	ND	ND	4948.43
BH24	01/24/17	4960.30	22.70	11.95	ND	ND	4948.35
BH24	04/05/17	4960.30	22.82	12.22	ND	ND	4948.08
BH24	07/27/17	4960.30	22.75	11.91	ND	ND	4948.39
BH24	10/30/17	4960.30	22.77	12.23	ND	ND	4948.07
BH24	01/25/18	4960.30	22.95	12.59	ND	ND	4947.71
BH25	09/23/16	4960.28	22.91	11.98	ND	ND	4948.30
BH25	11/03/16	4960.28	22.91	12.23	ND	ND	4948.05
BH25	01/24/17	4960.28	22.88	12.36	ND	ND	4947.92
BH25	04/05/17	4960.28	22.94	12.63	ND	ND	4947.65
BH25 ²	07/27/17	Well Damaged - Elevation Control Lost			ND	ND	NM
BH25	07/27/17	Broken Casing - Monitoring Well Destroyed					
BH25R	10/30/17	4960.31	22.87	16.03	ND	ND	4944.28

TABLE 2
GROUNDWATER ELEVATION DATA
NOBLE ENERGY, INC. - FEATHER 31-15
PRODUCED WATER TANK RELEASE



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)
BH25R	01/25/18	4960.31	23.04	12.92	ND	ND	4947.39
BH26	09/23/16	4959.46	22.85	12.76	ND	ND	4946.70
BH26	11/03/16	4959.46	22.60	12.96	ND	ND	4946.50
BH26	01/24/17	4959.46	22.51	12.89	ND	ND	4946.57
BH26	04/05/17	4959.46	22.60	13.07	ND	ND	4946.39
BH26	07/27/17	4959.46	22.51	12.72	ND	ND	4946.74
BH26	10/30/17	4959.46	22.50	13.01	ND	ND	4946.45
BH26	01/25/18	4959.46	22.42	13.18	ND	ND	4946.28
BH27	09/23/16	4958.65	22.47	13.43	ND	ND	4945.22
BH27	11/03/16	4958.65	22.38	13.59	ND	ND	4945.06
BH27	01/24/17	4958.65	22.32	13.53	ND	ND	4945.12
BH27	04/05/17	4958.65	22.44	13.72	ND	ND	4944.93
BH27 ²	07/27/17	Well Damaged - Elevation Control Lost			ND	ND	NM
BH27	10/30/17	4958.64	22.37	13.51	ND	ND	4945.13
BH27	01/25/18	4958.64	22.52	13.80	ND	ND	4944.84
BH28	09/23/16	4957.57	22.68	14.01	ND	ND	4943.56
BH28	11/03/16	4957.57	22.56	14.05	ND	ND	4943.52
BH28	01/24/17	4957.57	22.38	13.91	ND	ND	4943.66
BH28	04/05/17	4957.57	22.46	14.01	ND	ND	4943.56
BH28 ²	07/27/17	Well Damaged - Elevation Control Lost			ND	ND	NM
BH28	07/27/17	Broken Casing - Monitoring Well Destroyed					
BH28R	10/30/17	4957.35	22.51	17.64	ND	ND	4939.71
BH28R	01/25/18	4957.35	22.59	13.61	ND	ND	4943.74
BH29	09/23/16	4958.73	21.53	13.07	ND	ND	4945.66
BH29	11/03/16	4958.73	21.86	13.30	ND	ND	4945.43
BH29	01/24/17	4958.73	21.93	13.26	ND	ND	4945.47
BH29	04/05/17	4958.73	21.92	13.45	ND	ND	4945.28
BH29 ²	07/27/17	Well Damaged - Elevation Control Lost			ND	ND	NM
BH29	10/30/17	4958.73	22.05	13.32	ND	ND	4945.41
BH29	01/25/18	4958.73	22.10	13.50	ND	ND	4945.23
BH30	11/03/16	4957.11	22.22	13.75	ND	ND	4943.36
BH30	01/24/17	4957.11	22.16	13.62	ND	ND	4943.49
BH30	04/05/17	4957.11	22.27	13.71	ND	ND	4943.40
BH30 ²	07/27/17	Well Damaged - Elevation Control Lost			ND	ND	NM
BH30	07/27/17	Broken Casing - Monitoring Well Destroyed					
BH30R	10/30/17	4957.80	26.58	19.18	ND	ND	4938.62
BH30R	01/25/18	4957.80	26.76	14.30	ND	ND	4943.50
BH31	11/03/16	4958.22	20.43	13.14	ND	ND	4945.08
BH31	01/24/17	4958.22	20.35	13.09	ND	ND	4945.13
BH31	04/05/17	4958.22	24.20	13.25	ND	ND	4944.97
BH31 ²	07/27/17	Well Damaged - Elevation Control Lost			ND	ND	NM

TABLE 2
GROUNDWATER ELEVATION DATA
NOBLE ENERGY, INC. - FEATHER 31-15
PRODUCED WATER TANK RELEASE



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)
BH31	10/30/17	4958.23	20.50	13.08	ND	ND	4945.15
BH31	01/25/18	4958.23	20.75	13.36	ND	ND	4944.87
BH32	11/03/16	4959.15	22.97	13.61	ND	ND	4945.54
BH32	01/24/17	4959.15	22.98	13.61	ND	ND	4945.54
BH32	04/05/17	4959.15	23.05	13.82	ND	ND	4945.33
BH32 ²	07/27/17	Well Damaged - Elevation Control Lost			ND	ND	NM
BH32	10/30/17	4959.15	23.02	14.77	ND	ND	4944.38
BH32	01/25/18	4959.15	23.05	13.89	ND	ND	4945.26
BH33	11/03/16	4956.82	22.78	14.91	ND	ND	4941.91
BH33	01/24/17	4956.82	22.71	14.66	ND	ND	4942.16
BH33	04/05/17	4956.82	22.83	14.76	ND	ND	4942.06
BH33 ²	07/27/17	Well Damaged - Elevation Control Lost			ND	ND	NM
BH33	10/30/17	4956.84	22.69	14.38	ND	ND	4942.46
BH33	01/25/18	4956.84	22.65	14.40	ND	ND	4942.44
BH34	11/03/16	4957.08	21.84	19.37	ND	ND	4937.71
BH34	01/24/17	4957.08	21.82	13.08	ND	ND	4944.00
BH34	04/05/17	4957.08	21.88	13.22	ND	ND	4943.86
BH34 ²	07/27/17	Well Damaged - Elevation Control Lost			ND	ND	NM
BH34	10/30/17	4958.32	23.09	14.19	ND	ND	4944.13
BH34	01/25/18	4958.32	23.16	14.41	ND	ND	4943.91
BH35	11/03/16	4957.41	22.52	17.90	ND	ND	4939.51
BH35	01/24/17	4957.41	22.49	15.03	ND	ND	4942.38
BH35	04/05/17	4957.41	17.56	15.17	ND	ND	4942.24
BH35	07/27/17	4957.41	22.51	14.74	ND	ND	4942.67
BH35	10/30/17	4957.41	22.52	14.79	ND	ND	4942.62
BH35	01/25/18	4957.41	22.59	14.90	ND	ND	4942.51
BH36	11/03/16	4955.19	22.02	14.64	ND	ND	4940.55
BH36	01/24/17	4955.19	21.96	14.34	ND	ND	4940.85
BH36	04/05/17	4955.19	22.06	14.36	ND	ND	4940.83
BH36 ²	07/27/17	Well Damaged - Elevation Control Lost			ND	ND	NM
BH36	07/27/17	Broken Casing - Monitoring Well Destroyed					
BH36R	10/30/17	4955.91	26.68	14.61	ND	ND	4941.30
BH36R	01/25/18	4955.91	26.69	14.71	ND	ND	4941.20
BH37	11/03/16	4954.95	22.13	15.97	ND	ND	4938.98
BH37	01/24/17	4954.95	22.14	15.56	ND	ND	4939.39
BH37	04/05/17	4954.95	22.17	15.61	ND	ND	4939.34
BH37 ²	07/27/17	Well Damaged - Elevation Control Lost			ND	ND	NM
BH37	10/30/17	4954.98	22.29	15.15	ND	ND	4939.83
BH37	01/25/18	4954.98	22.27	15.06	ND	ND	4939.92
BH38	11/03/16	4955.15	22.05	15.13	ND	ND	4940.02
BH38	01/24/17	4955.15	22.02	14.80	ND	ND	4940.35

TABLE 2
GROUNDWATER ELEVATION DATA
NOBLE ENERGY, INC. - FEATHER 31-15
PRODUCED WATER TANK RELEASE



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)
BH38	04/05/17	4955.15	22.07	14.84	ND	ND	4940.31
BH38 ²	07/27/17	Well Damaged - Elevation Control Lost			ND	ND	NM
BH38	07/27/17	Broken Casing - Monitoring Well Destroyed					
BH38R	10/30/17	4955.69	26.66	14.86	ND	ND	4940.83
BH38R	01/25/18	4955.69	26.69	14.83	ND	ND	4940.86
BH39	11/03/16	4955.83	22.46	14.25	ND	ND	4941.58
BH39	01/24/17	4955.83	22.42	13.98	ND	ND	4941.85
BH39	04/05/17	4955.83	22.49	14.06	ND	ND	4941.77
BH39 ²	07/27/17	Well Damaged - Elevation Control Lost			ND	ND	NM
BH39	10/30/17	4955.85	22.41	13.70	ND	ND	4942.15
BH39	01/25/18	4955.85	22.42	13.71	ND	ND	4942.14
BH40	11/03/16	4960.60	21.72	11.08	ND	ND	4949.52
BH40	01/24/17	4960.60	21.43	11.24	ND	ND	4949.36
BH40	04/05/17	4960.60	21.31	11.56	ND	ND	4949.04
BH40 ²	07/27/17	Well Damaged - Elevation Control Lost			ND	ND	NM
BH40	07/27/17	Broken Casing - Monitoring Well Destroyed					
BH40R	10/30/17	4961.06	22.73	12.09	ND	ND	4948.97
BH40R	01/25/18	4961.06	22.40	12.37	ND	ND	4948.69
BH41	11/03/16	4959.08	21.13	11.14	ND	ND	4947.94
BH41	01/24/17	4959.08	20.94	11.27	ND	ND	4947.81
BH41	04/05/17	4959.08	20.92	11.52	ND	ND	4947.56
BH41 ²	07/27/17	Well Damaged - Elevation Control Lost			ND	ND	NM
BH41	07/27/17	Broken Casing - Monitoring Well Destroyed					
BH41R	10/30/17	4959.22	21.59	11.66	ND	ND	4947.56
BH41R	01/25/18	4959.22	21.65	12.00	ND	ND	4947.22
BH42	11/03/16	4959.24	22.18	12.44	ND	ND	4946.80
BH42	01/24/17	4959.24	22.07	12.25	ND	ND	4946.99
BH42	04/05/17	4959.24	22.17	12.50	ND	ND	4946.74
BH42 ²	07/27/17	Well Damaged - Elevation Control Lost			ND	ND	NM
BH42	07/27/17	Broken Casing - Monitoring Well Destroyed					
BH42R	10/30/17	4959.01	22.03	20.57	ND	ND	4938.44
BH42R	01/25/18	4959.01	22.10	12.48	ND	ND	4946.53
BH43	11/03/16	4959.74	21.72	11.53	ND	ND	4948.21
BH43	01/24/17	4959.74	21.26	11.64	ND	ND	4948.10
BH43	04/05/17	4959.74	21.10	11.82	ND	ND	4947.92
BH43 ²	07/27/17	Well Damaged - Elevation Control Lost			ND	ND	NM
BH43	07/27/17	Broken Casing - Monitoring Well Destroyed					
BH43R	10/30/17	4960.58	22.53	20.23	ND	ND	4940.35
BH43R	01/25/18	4960.58	22.60	13.00	ND	ND	4947.58

TABLE 2
GROUNDWATER ELEVATION DATA
NOBLE ENERGY, INC. - FEATHER 31-15
PRODUCED WATER TANK RELEASE



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)
BH44	11/03/16	4955.00	21.68	17.75	ND	ND	4937.25
BH44	01/24/17	4955.00	21.64	17.29	ND	ND	4937.71
BH44	04/05/17	4955.00	21.71	17.24	ND	ND	4937.76
BH44 ²	07/27/17	Well Damaged - Elevation Control Lost			ND	ND	NM
BH44	10/30/17	4955.00	21.67	16.70	ND	ND	4938.30
BH44	01/25/18	4955.00	21.90	16.72	ND	ND	4938.28
BH45	11/03/16	4954.87	22.21	21.08	ND	ND	4933.79
BH45	01/24/17	4954.87	22.19	17.14	ND	ND	4937.73
BH45	04/05/17	4954.87	22.25	17.06	ND	ND	4937.81
BH45 ²	07/27/17	Well Damaged - Elevation Control Lost			ND	ND	NM
BH45	10/30/17	4954.89	22.23	16.49	ND	ND	4938.40
BH45	01/25/18	4954.89	22.30	16.50	ND	ND	4938.39
BH46	01/24/17	4955.31	22.25	15.64	ND	ND	4939.67
BH46	04/05/17	4955.31	22.30	15.64	ND	ND	4939.67
BH46 ²	07/27/17	Well Damaged - Elevation Control Lost			ND	ND	NM
BH46	10/30/17	4955.32	22.27	15.24	ND	ND	4940.08
BH46	01/25/18	4955.32	22.34	15.23	ND	ND	4940.09
BH47	01/24/17	4954.60	22.25	18.91	ND	ND	4935.69
BH47	04/05/17	4954.60	22.31	18.51	ND	ND	4936.09
BH47 ²	07/27/17	Well Damaged - Elevation Control Lost			ND	ND	NM
BH47	10/30/17	4954.63	22.31	17.90	ND	ND	4936.73
BH47	01/25/18	4954.63	22.39	17.85	ND	ND	4936.78
BH48	01/24/17	4954.71	22.30	18.58	ND	ND	4936.13
BH48	04/05/17	4954.71	22.36	18.54	ND	ND	4936.17
BH48 ²	07/27/17	Well Damaged - Elevation Control Lost			ND	ND	NM
BH48	10/30/17	4954.72	22.35	17.97	ND	ND	4936.75
BH48	01/25/18	4954.72	22.42	17.86	ND	ND	4936.86
BH49	01/24/17	4954.51	22.22	18.39	ND	ND	4936.12
BH49	04/05/17	4954.51	22.29	18.23	ND	ND	4936.28
BH49 ²	07/27/17	Well Damaged - Elevation Control Lost			ND	ND	NM
BH49	07/27/17	Broken Casing - Monitoring Well Destroyed					
BH49R	10/30/17	4954.53	25.93	17.48	ND	ND	4937.05
BH49R	01/25/18	4954.53	26.03	17.26	ND	ND	4937.27
BH50	01/24/17	4955.18	22.26	16.87	ND	ND	4938.31
BH50	04/05/17	4955.18	22.40	16.68	ND	ND	4938.50
BH50 ²	07/27/17	Well Damaged - Elevation Control Lost			ND	ND	NM
BH50	10/30/17	4955.18	22.27	16.06	ND	ND	4939.12
BH50	01/25/18	4955.18	22.49	16.05	ND	ND	4939.13
BH51	01/24/17	4955.85	22.10	19.59	ND	ND	4936.26

TABLE 2
GROUNDWATER ELEVATION DATA
NOBLE ENERGY, INC. - FEATHER 31-15
PRODUCED WATER TANK RELEASE



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)
BH51	04/05/17	4955.85	22.17	19.26	ND	ND	4936.59
BH51 ²	07/27/17	Well Damaged - Elevation Control Lost			ND	ND	NM
BH51	10/30/17	4955.87	22.16	18.43	ND	ND	4937.44
BH51	01/25/18	4955.87	22.20	18.27	ND	ND	4937.60
BH52	01/24/17	4955.46	22.31	19.45	ND	ND	4936.01
BH52	04/05/17	4955.46	22.36	17.34	ND	ND	4938.12
BH52 ²	07/27/17	Well Damaged - Elevation Control Lost			ND	ND	NM
BH52	07/27/17	Broken Casing - Monitoring Well Destroyed					
BH52R	10/30/17	4954.68	29.59	16.46	ND	ND	4938.22
BH52R	01/25/18	4954.68	29.65	15.22	ND	ND	4939.46
BH53 ²	07/27/17	Well Damaged - Elevation Control Lost			ND	ND	NM
BH53	07/27/17	Broken Casing - Monitoring Well Destroyed					
BH53R	10/30/17	4956.07	33.21	20.83	ND	ND	4935.24
BH53R	01/25/18	4956.07	33.18	20.60	ND	ND	4935.47
BH54 ²	07/27/17	Well Damaged - Elevation Control Lost			ND	ND	DRY
BH54	07/27/17	Broken Casing - Monitoring Well Destroyed					
BH54R	10/30/17	4957.29	32.62	22.13	ND	ND	4935.16
BH54R	01/25/18	4957.29	32.53	21.21	ND	ND	4936.08
BH55 ²	07/27/17	Well Damaged - Elevation Control Lost			ND	ND	NM
BH55	07/27/17	Broken Casing - Monitoring Well Destroyed					
BH55R	10/30/17	4957.03	36.46	20.82	ND	ND	4936.21
BH55R	01/25/18	4957.03	36.55	20.46	ND	ND	4936.57

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

Monitoring wells MW-01 through MW-06 were destroyed during site excavations

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

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

LNAPL relative density was assumed to be approximately 0.75

1. Sheen present on groundwater.

2. Cattle damaged monitoring well prior to the 3Q2017 sampling event, resulting in lost casing elevation.

TABLE 3
REMEDATION SYSTEM AIR EMISSION DATA SUMMARY
NOBLE ENERGY, INC. FEATHER 31-15 PRODUCED WATER TANK RELEASE



Soil Vapor Extraction															
Date	SVE Runtime Meter Reading	Period Incremental Operating Hours	Total Hours In Operating Period	Period Runtime Factor (%)	Effluent Temp (°F)	Sys Vacuum (inches of WC)	Effluent OVC (ppm)	Effluent Concentration (ug/m3)	Air Flow Rate (cfm)	Grams/cubic feet	grams/minute	Mass Extracted (lbs)		Incremental Mass Removed (lbs)	Cumulative Mass Removed (lbs)
												lbs/hour	lbs total		
01/12/18	8,345.1	167.5	168	100%	73.2	-14.5	0.3	4,675	23.4	0.00013	0.003	0.00041	0.07	0.07	0.07
02/15/18	8,846.4	501.3	816	61%	62.7	-14.4	0.1	4,591	5.9	0.00013	0.001	0.00010	0.05	0.05	0.12
Notes: HC: Hydrocarbon OVC: Organic Vapor Concentration WC: Water Column ° F : degrees fahrenheit ppm: parts per million cfm: cubic feet per minute Effluent concentration is based on total petroleum hydrocarbons - gasoline range organics															
	No remediation system air emission laboratory analytical sample was collected on this date. Analytical data and mass extracted calculations from the previous sample date are used for this date.														

FIGURES

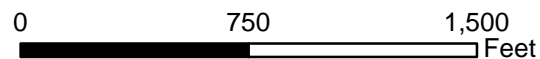
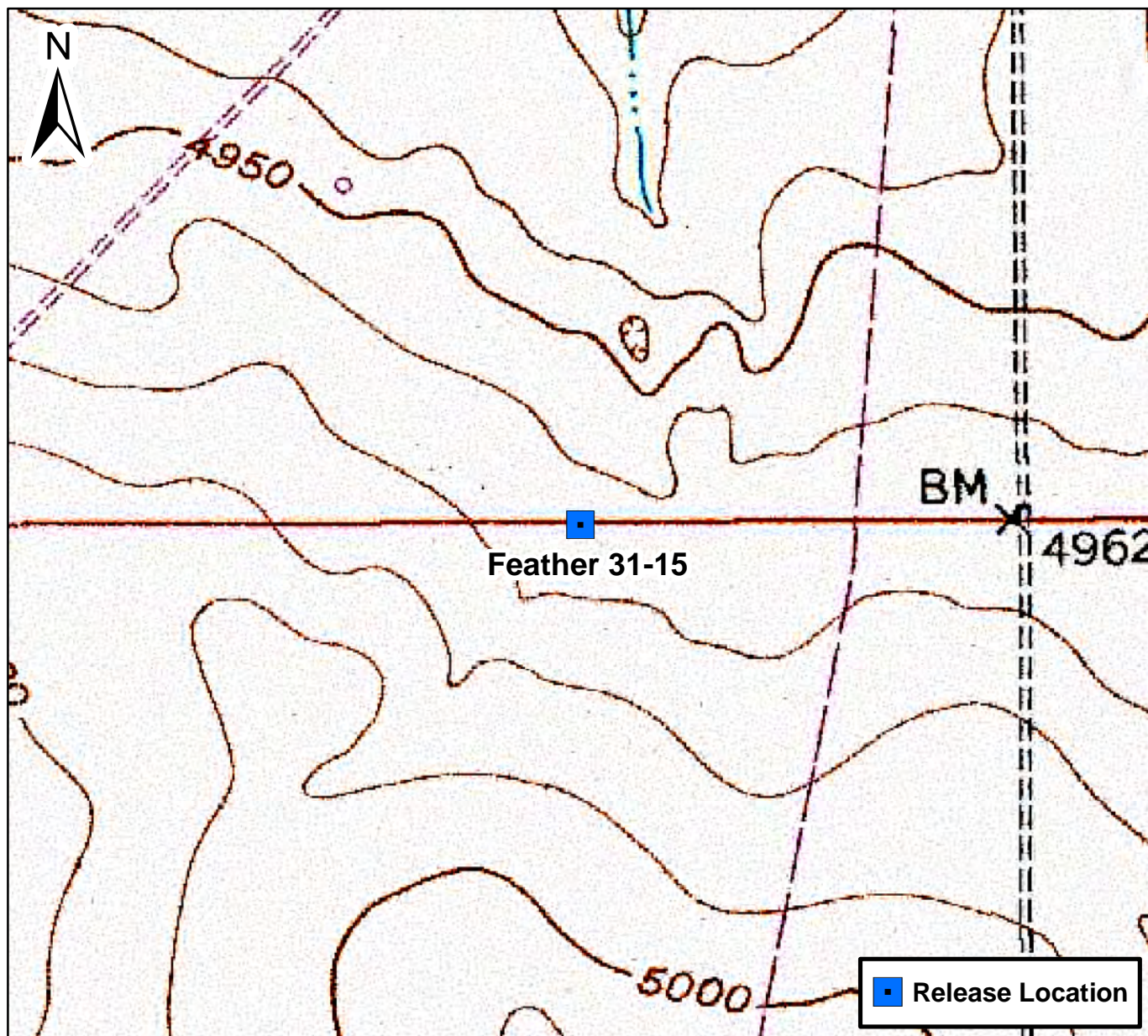
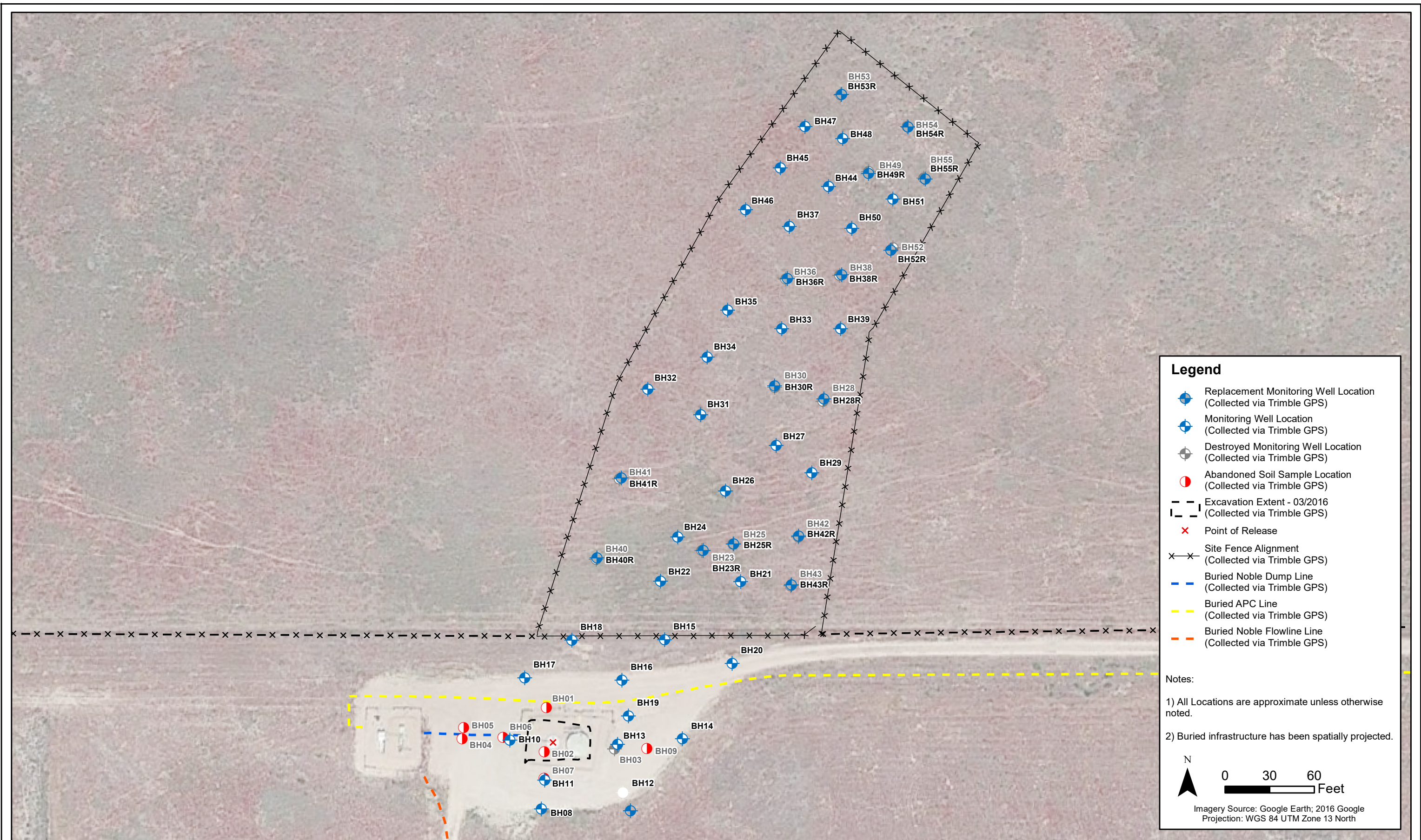
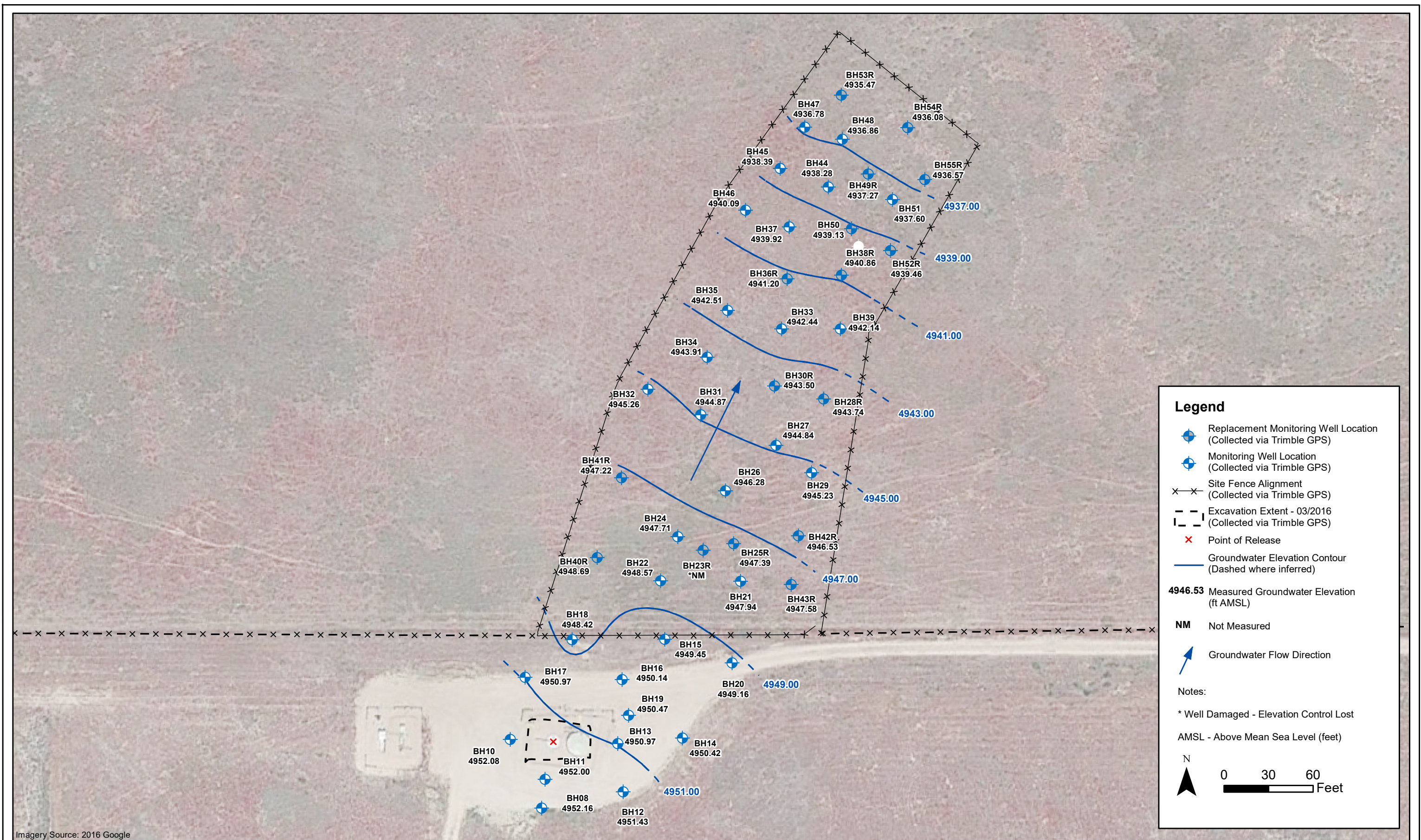


Figure 1

Site Location Map
 Feather 31-15 Produced Water Tank Release
 NWNE S15 T2N R64W
 Weld County, Colorado







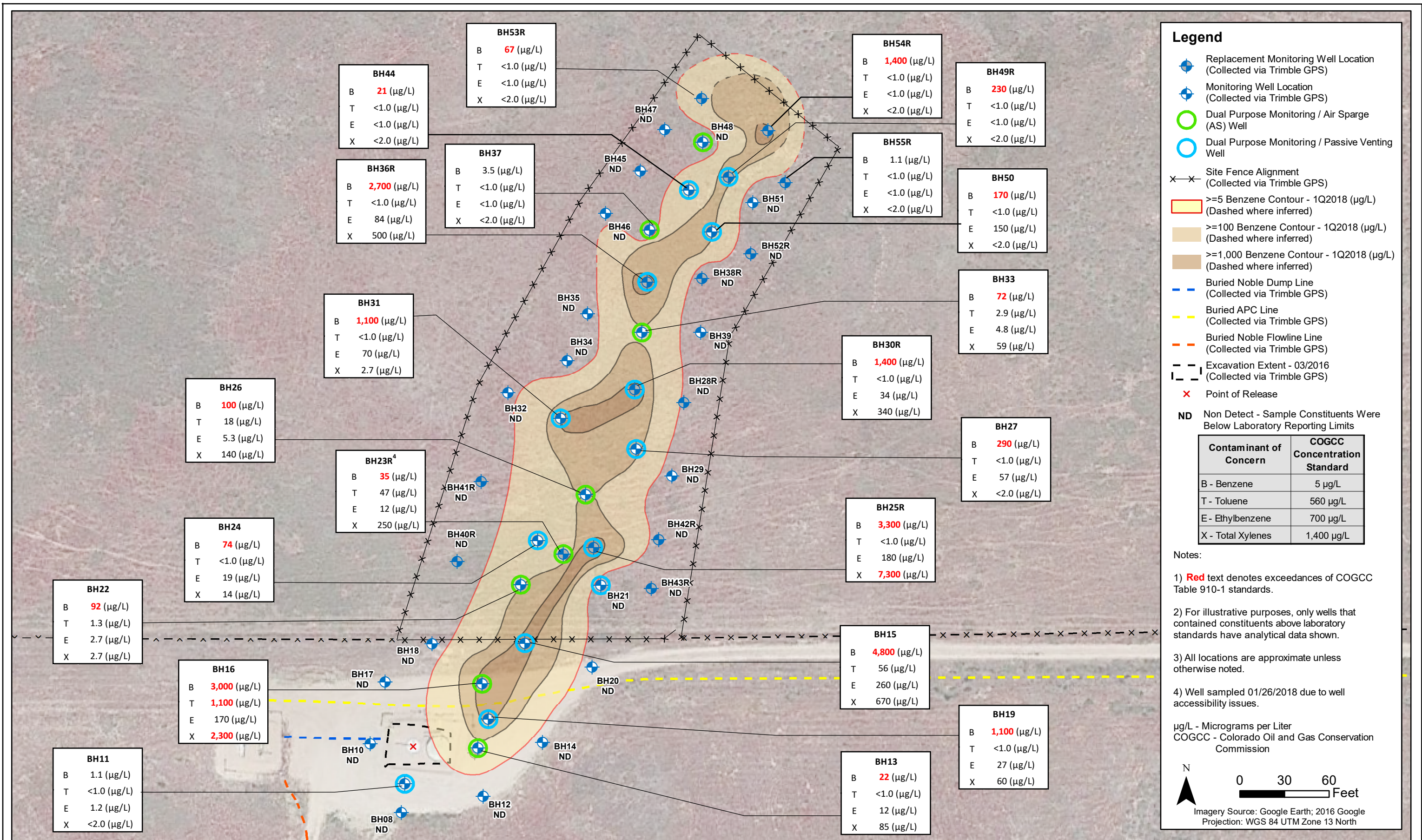
DATE:	February 2018
DESIGNED BY:	B.Bruns
DRAWN BY:	D. Arnold



Noble Energy - DJ Basin
Feather 31-15 Produced Water Tank Release
 NWNE Section 15, Township 2 North, Range 64 West
 Weld County, Colorado

Groundwater Potentiometric
 Surface Map
 (01/25/18)

Figure
3



ATTACHMENT A

LABORATORY ANALYTICAL DATA REPORT

Summit Scientific

741 Corporate Circle – Suite I ♦ Golden, Colorado 80401

303.277.9310 - laboratory ♦ 303.277.9531 - fax

February 01, 2018

Brandon Bruns
Tasman Geosciences
6899 Pecos Street
Denver, CO 80221
RE: Feather 31-15

Enclosed are the results of analyses for samples received by Summit Scientific on 01/25/18 16:40-01/26/18 17:20.
If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Paul Shrewsbury For Ben Shrewsbury
Laboratory Manager



Tasman Geosciences
6899 Pecos Street
Denver CO, 80221

Project: Feather 31-15

Project Number: [none]
Project Manager: Brandon Brunns

Reported:
02/01/18 14:36

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
BH08	1801287-01	Water	01/25/18 09:40	01/25/18 16:40
BH10	1801287-02	Water	01/25/18 10:27	01/25/18 16:40
BH11	1801287-03	Water	01/25/18 10:15	01/25/18 16:40
BH12	1801287-04	Water	01/25/18 09:53	01/25/18 16:40
BH13	1801287-05	Water	01/25/18 11:00	01/25/18 16:40
BH14	1801287-06	Water	01/25/18 10:05	01/25/18 16:40
BH15	1801287-07	Water	01/25/18 11:10	01/25/18 16:40
BH16	1801287-08	Water	01/25/18 11:30	01/25/18 16:40
BH17	1801287-09	Water	01/25/18 10:00	01/25/18 16:40
BH18	1801287-10	Water	01/25/18 10:25	01/25/18 16:40
BH19	1801287-11	Water	01/25/18 11:38	01/25/18 16:40
BH20	1801287-12	Water	01/25/18 10:05	01/25/18 16:40
BH21	1801287-13	Water	01/25/18 13:10	01/25/18 16:40
BH22	1801287-14	Water	01/25/18 13:20	01/25/18 16:40
BH24	1801287-15	Water	01/25/18 13:38	01/25/18 16:40
BH25R	1801287-16	Water	01/25/18 13:15	01/25/18 16:40
BH26	1801287-17	Water	01/25/18 13:08	01/25/18 16:40
BH27	1801287-18	Water	01/25/18 11:55	01/25/18 16:40
BH28R	1801287-19	Water	01/25/18 11:25	01/25/18 16:40
BH29	1801287-20	Water	01/25/18 11:45	01/25/18 16:40
BH30R	1801287-21	Water	01/25/18 12:40	01/25/18 16:40
BH31	1801287-22	Water	01/25/18 12:25	01/25/18 16:40
BH32	1801287-23	Water	01/25/18 11:47	01/25/18 16:40
BH33	1801287-24	Water	01/25/18 13:20	01/25/18 16:40
BH34	1801287-25	Water	01/25/18 12:50	01/25/18 16:40
BH35	1801287-26	Water	01/25/18 12:55	01/25/18 16:40
BH36R	1801287-27	Water	01/25/18 13:15	01/25/18 16:40

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 Street
Denver CO, 80221

Project: Feather 31-15

Project Number: [none]
Project Manager: Brandon Brunns

Reported:
02/01/18 14:36

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
BH37	1801287-28	Water	01/25/18 12:35	01/25/18 16:40
BH38R	1801287-29	Water	01/25/18 12:55	01/25/18 16:40
BH39	1801287-30	Water	01/25/18 12:35	01/25/18 16:40
BH40R	1801287-31	Water	01/25/18 11:11	01/25/18 16:40
BH41R	1801287-32	Water	01/25/18 11:40	01/25/18 16:40
BH42R	1801287-33	Water	01/25/18 11:40	01/25/18 16:40
BH43R	1801287-34	Water	01/25/18 11:00	01/25/18 16:40
BH44	1801287-35	Water	01/25/18 12:16	01/25/18 16:40
BH45	1801287-36	Water	01/25/18 12:10	01/25/18 16:40
BH46	1801287-37	Water	01/25/18 12:45	01/25/18 16:40
BH47	1801287-38	Water	01/25/18 11:35	01/25/18 16:40
BH48	1801287-39	Water	01/25/18 12:00	01/25/18 16:40
BH49R	1801287-40	Water	01/25/18 11:45	01/25/18 16:40
BH50	1801287-41	Water	01/25/18 12:20	01/25/18 16:40
BH51	1801287-42	Water	01/25/18 12:10	01/25/18 16:40
BH52R	1801287-43	Water	01/25/18 12:30	01/25/18 16:40
BH53R	1801287-44	Water	01/25/18 11:15	01/25/18 16:40
BH54R	1801287-45	Water	01/25/18 10:55	01/25/18 16:40
BH55R	1801287-46	Water	01/25/18 11:05	01/25/18 16:40
BH23R	1801294-01	Water	01/26/18 14:15	01/26/18 17:20

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

1801287.1


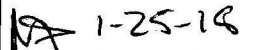
741 Corporate Circle Suite I ♦ Golden, Colorado 80401
303-277-9310 ♦ 303-374-5933 Fax

Page 1 of 5

Client: Noble/Tasman
Address: -
City/State/Zip: -
Phone: 303-487-1228 Fax: -
Sampler Name: GB & BF

Project Manager: Brandon Bruns, Invoice: Jacob Evans
E-Mail: Bbruns@tasman-geo.com
Project Name: Feather 31-15
Project Number: -

Sample Description	Date Sampled	Time Sampled	Number of Containers	Preservative				Matrix				Analyze For:								Special Instructions					
				HCl	HNO ₃	None	Other (Specify)	Groundwater	Soil	Air - Canister Serial #	Other (Specify)	8260 BTEX	8260B GBTEXN	8015 DRO	pH, EC, SAR										
BH08	1/25/2018	940	3	X				X					X												
BH10	1/25/2018	1027	3	X				X					X												
BH11	1/25/2018	1015	3	X				X					X												
BH12	1/25/2018	953	3	X				X					X												
BH13	1/25/2018	1100	3	X				X					X												
BH14	1/25/2018	1005	3	X				X					X												
BH15	1/25/2018	1110	3	X				X					X												
BH16	1/25/2018	1130	3	X				X					X												
BH17	1/25/2018	1000	3	X				X					X												
BH18	1/25/2018	1025	3	X				X					X												

Relinquished by: 	Date/Time: 16:40 1/25/18	Received by: 	Date/Time: 1-25-18 16:40	Turn Around Time (Check) Same Day <input type="checkbox"/> 72 Hours <input type="checkbox"/> 24 Hours <input type="checkbox"/> Standard <input checked="" type="checkbox"/> 48 Hours <input type="checkbox"/>	Notes:
Relinquished by:	Date/Time:	Received by:	Date/Time:	Sample Integrity: Temperature Upon Receipt: 2.8 Intact: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	
Relinquished by:	Date/Time:	Received in Lab by:	Date/Time:		

1801294

Page 1 of 1

Project Manager:	Brandon Bruns, Invoice: Jacob Evans (Noble)
E-Mail:	bbruns@tasman-geo.com
Project Name:	Feather 31-15
Project Number:	

[illegible]

Summit Scientific


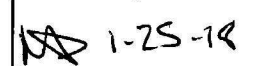
1801287.2

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Page 2 of 5

Client: Noble/Tasman
Address: -
City/State/Zip: -
Phone: 303-487-1228 Fax: -
Sampler Name: GB & BF

Project Manager: Brandon Bruns, Invoice: Jacob Evans
E-Mail: Bbruns@tasman-geo.com
Project Name: Feather 31-15
Project Number: -

Sample Description	Date Sampled	Time Sampled	Number of Containers	Preservative				Matrix				Analyze For:								Special Instructions							
				HCl	HNO ₃	None	Other (Specify)	Groundwater	Soil	Air - Canister Serial #	Other (Specify)	8260 BTEX	8260B GBTEXN	8015 DRO	pH, EC, SAR												
BH19	1/25/2018	1138	3	X				X					X														
BH20	1/25/2018	1005	3	X				X					X														
BH21	1/25/2018	1310	3	X				X					X														
BH22	1/25/2018	1320	3	X				X					X														
BH24	1/25/2018	1338	3	X				X					X														
BH25R	1/25/2018	1315	3	X				X					X														
BH26	1/25/2018	1308	3	X				X					X														
BH27	1/25/2018	1155	3	X				X					X														
BH28R	1/25/2018	1125	3	X				X					X														
BH29	1/25/2018	1145	3	X				X					X														
Relinquished by: 				Date/Time: 16:40 1/25/18				Received by:  1-25-18 16:40				Date/Time:				Turn Around Time (Check) Same Day <input type="checkbox"/> 72 Hours <input type="checkbox"/> 24 Hours <input type="checkbox"/> Standard <input checked="" type="checkbox"/> 48 Hours <input type="checkbox"/>								Notes:			
Relinquished by:				Date/Time:				Received by:				Date/Time:				Sample Integrity: Temperature Upon Receipt: 28 Intact: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>											
Relinquished by:				Date/Time:				Received in Lab by:				Date/Time:															

Summit Scientific

1801287.3


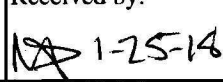
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Page 3 of 5

Client: Noble/Tasman
Address: -
City/State/Zip: -
Phone: 303-487-1228 Fax: -
Sampler Name: GB & BF

Project Manager: Brandon Bruns, Invoice: Jacob Evans
E-Mail: Bbruns@tasman-geo.com
Project Name: Feather 31-15
Project Number: -

Sample Description	Date Sampled	Time Sampled	Number of Containers	Preservative				Matrix				Analyze For:								Special Instructions			
				HCl	HNO ₃	None	Other (Specify)	Groundwater	Soil	Air - Canister Serial #	Other (Specify)	8260 BTEX	8260B GBTEXN	8015 DRO	pH, EC, SAR								
BH30R	1/25/2018	1240	3	X				X					X										
BH31	1/25/2018	1225	3	X				X					X										
BH32	1/25/2018	1147	3	X				X					X										
BH33	1/25/2018	1320	3	X				X					X										
BH34	1/25/2018	1250	3	X				X					X										
BH35	1/25/2018	1255	3	X				X					X										
BH36R	1/25/2018	1315	3	X				X					X										
BH37	1/25/2018	1235	3	X				X					X										
BH38R	1/25/2018	1255	3	X				X					X										
BH39	1/25/2018	1235	3	X				X					X										

Relinquished by: 	Date/Time: 10:40 1/25/18	Received by: 	Date/Time: 1-25-18 10:40	Turn Around Time (Check) Same Day <input type="checkbox"/> 72 Hours <input type="checkbox"/> 24 Hours <input type="checkbox"/> Standard <input checked="" type="checkbox"/> 48 Hours <input type="checkbox"/>	Notes:
Relinquished by:	Date/Time:	Received by:	Date/Time:	Sample Integrity: Temperature Upon Receipt: 2.8 Intact: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	
Relinquished by:	Date/Time:	Received in Lab by:	Date/Time:		

Summit Scientific


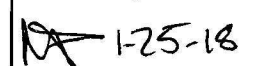
1801287.4

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Page 4 of 5

Client: Noble/Tasman
Address: -
City/State/Zip: -
Phone: 303-487-1228 Fax: -
Sampler Name: GB & BF

Project Manager: Brandon Bruns, Invoice: Jacob Evans
E-Mail: Bbruns@tasman-geo.com
Project Name: Feather 31-15
Project Number: -

Sample Description	Date Sampled	Time Sampled	Number of Containers	Preservative				Matrix				Analyze For:								Special Instructions			
				HCl	HNO ₃	None	Other (Specify)	Groundwater	Soil	Air - Canister Serial #	Other (Specify)	8260 BTEX	8260B GBTEXN	8015 DRO	pH, EC, SAR								
BH40R	1/25/2018	1111	3	X				X					X										
BH41R	1/25/2018	1140	3	X				X					X										
BH42R	1/25/2018	1140	3	X				X					X										
BH43R	1/25/2018	1100	3	X				X					X										
BH44	1/25/2018	1216	3	X				X					X										
BH45	1/25/2018	1210	3	X				X					X										
BH46	1/25/2018	1245	3	X				X					X										
BH47	1/25/2018	1135	3	X				X					X										
BH48	1/25/2018	1200	3	X				X					X										
BH49R	1/25/2018	1145	3	X				X					X										
Relinquished by: 				Date/Time: 10:40 1/25/18		Received by:  1-25-18				Date/Time: 10:40		Turn Around Time (Check)										Notes:	
Relinquished by:				Date/Time:		Received by:				Date/Time:		Same Day <input type="checkbox"/> 72 Hours <input type="checkbox"/> 24 Hours <input type="checkbox"/> Standard <input checked="" type="checkbox"/> 48 Hours <input type="checkbox"/>											
Relinquished by:				Date/Time:		Received in Lab by:				Date/Time:		Sample Integrity: Temperature Upon Receipt: 28 Intact: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>											

Summit Scientific



1801287.5

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303-277-9310 ♦ 303-374-5933 Fax

Page 5 of 5

Client: Noble/Tasman
Address: -
City/State/Zip: -
Phone: 303-487-1228 Fax: -
Sampler Name: GB & BF

Project Manager: Brandon Bruns, Invoice: Jacob Evans
E-Mail: Bbruns@tasman-geo.com
Project Name: Feather 31-15
Project Number: -

Sample Description	Date Sampled	Time Sampled	Number of Containers	Preservative				Matrix				Analyze For:								Special Instructions					
				HCl	HNO ₃	None	Other (Specify)	Groundwater	Soil	Air - Canister Serial #	Other (Specify)	8260 BTEX	8260B GBTEXN	8015 DRO	pH, EC, SAR										
BH50	1/25/2018	1220	3	X				X					X												
BH51	1/25/2018	1210	3	X				X					X												
BH52R	1/25/2018	1230	3	X				X					X												
BH53R	1/25/2018	1115	3	X				X					X												
BH54R	1/25/2018	1055	3	X				X					X												
BH55R	1/25/2018	1105	3	X				X					X												
Relinquished by: 				Date/Time: 16:40 1/25/18				Received by:  1-25-18 16:40				Date/Time:				Turn Around Time (Check) Same Day <input type="checkbox"/> 72 Hours <input type="checkbox"/> 24 Hours <input type="checkbox"/> Standard <input checked="" type="checkbox"/> 48 Hours <input type="checkbox"/>								Notes:	
Relinquished by:				Date/Time:				Received by:				Date/Time:				Sample Integrity: Temperature Upon Receipt: 2.8 Intact: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>									
Relinquished by:				Date/Time:				Received in Lab by:				Date/Time:													

Sample Receipt Checklist

S2 Work Order: 1801287

Client: Noble / Tasman

Client Project ID: Feather 31-15

Shipped Via: P.O.

(UPS, FedEx, Hand Delivered, Pick-up, etc.)

Airbill #: _____

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

Cooler ID					
Temp (°C)	<u>2.8</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⁾ ?	<u> X </u>			
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⁾ ?	<u> X </u>			
Was adequate sample volume provided ⁽¹⁾ ?	<u> X </u>			
If custody seals are present, are they intact ⁽¹⁾ ?			<u> X </u>	
Are short holding time analytes or samples with HTs due within 48 hours present?			<u> X </u>	
Is a chain-of-custody (COC) form present and filled out completely ⁽¹⁾ ?	<u> X </u>			
Does the COC agree with the number and type of sample bottles received ⁽¹⁾ ?	<u> X </u>			
Do the sample IDs on the bottle labels match the COC ⁽¹⁾ ?	<u> X </u>			
Is the COC properly relinquished by the client w/ date and time recorded ⁽¹⁾ ?	<u> X </u>			
For volatiles in water – is there headspace present? If yes, contact client and note in narrative.		<u> X </u>		
Are samples preserved that require preservation (excluding cooling) ⁽¹⁾ ?	<u> X </u>			<u>HCL</u>
Note the type of preservative in the Comments column – HCl, H2SO4, NaOH, HNO3, ect				
If samples are acid preserved for metals, is the pH ≤ 2 ⁽¹⁾ ?			<u> X </u>	
Record the pH in Comments.				
If dissolved metals are requested, were samples field filtered?			<u> X </u>	

Additional Comments (if any):

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

Murip.
Custodian Printed Name

LA 1-25-18
Signature or Initials of Custodian

17:10
Date/Time

Sample Receipt Checklist

1801294

S2 Work Order: _____

Client: Noble/Tasman Client Project ID: Feather 31-15

Shipped Via: AD (UPS, FedEx, Hand Delivered, Pick-up, etc.) Airbill #: _____

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

Cooler ID					
Temp (°C)	5.2				

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

Additional Comments (if any):

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

Murp.
Custodian Printed Name

NA 1-26-19
Signature or Initials of Custodian

17:25
Date/Time



Tasman Geosciences
6899 Pecos Street
Denver CO, 80221

Project: Feather 31-15
Project Number: [none]
Project Manager: Brandon Brunns

Reported:
02/01/18 14:36

BH08
1801287-01 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **01/25/18 09:40**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	1.0	ug/l	1	1801286	01/29/18	01/29/18	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	2.0	"	"	"	"	"	"	

Date Sampled: **01/25/18 09:40**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		81.9 %	37-154		"	"	"	"	
Surrogate: Toluene-d8		93.1 %	45-149		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		92.9 %	45-146		"	"	"	"	

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 Street
Denver CO, 80221

Project: Feather 31-15
Project Number: [none]
Project Manager: Brandon Brunns

Reported:
02/01/18 14:36

BH10
1801287-02 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **01/25/18 10:27**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	1.0	ug/l	1	1801286	01/29/18	01/29/18	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	2.0	"	"	"	"	"	"	

Date Sampled: **01/25/18 10:27**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		84.9 %	37-154		"	"	"	"	
Surrogate: Toluene-d8		92.9 %	45-149		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		92.3 %	45-146		"	"	"	"	

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 Street
Denver CO, 80221

Project: Feather 31-15
Project Number: [none]
Project Manager: Brandon Bruns

Reported:
02/01/18 14:36

BH11
1801287-03 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **01/25/18 10:15**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	1.1	1.0	ug/l	1	1801286	01/29/18	01/29/18	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	1.2	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	2.0	"	"	"	"	"	"	

Date Sampled: **01/25/18 10:15**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		87.2 %	37-154		"	"	"	"	
Surrogate: Toluene-d8		92.6 %	45-149		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		93.2 %	45-146		"	"	"	"	

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 Street
Denver CO, 80221

Project: Feather 31-15
Project Number: [none]
Project Manager: Brandon Brunns

Reported:
02/01/18 14:36

BH12
1801287-04 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **01/25/18 09:53**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	1.0	ug/l	1	1801286	01/29/18	01/29/18	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	2.0	"	"	"	"	"	"	

Date Sampled: **01/25/18 09:53**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		86.5 %	37-154		"	"	"	"	
Surrogate: Toluene-d8		93.1 %	45-149		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		92.3 %	45-146		"	"	"	"	

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Tasman Geosciences
6899 Pecos Street
Denver CO, 80221

Project: Feather 31-15
Project Number: [none]
Project Manager: Brandon Bruns

Reported:
02/01/18 14:36

BH13
1801287-05 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **01/25/18 11:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	22	1.0	ug/l	1	1801286	01/30/18	01/30/18	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	12	1.0	"	"	"	"	"	"	
Xylenes (total)	85	2.0	"	"	"	"	"	"	

Date Sampled: **01/25/18 11:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		86.6 %	37-154		"	"	"	"	
Surrogate: Toluene-d8		92.4 %	45-149		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		94.3 %	45-146		"	"	"	"	

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Project: Feather 31-15
Project Number: [none]
Project Manager: Brandon Brunns

Reported:
02/01/18 14:36

BH14
1801287-06 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **01/25/18 10:05**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	1.0	ug/l	1	1801286	01/30/18	01/30/18	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	2.0	"	"	"	"	"	"	

Date Sampled: **01/25/18 10:05**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		86.2 %	37-154		"	"	"	"	
Surrogate: Toluene-d8		92.3 %	45-149		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		91.1 %	45-146		"	"	"	"	

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Project: Feather 31-15
Project Number: [none]
Project Manager: Brandon Bruns

Reported:
02/01/18 14:36

BH15
1801287-07 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **01/25/18 11:10**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	4800	100	ug/l	100	1801286	01/30/18	01/30/18	EPA 8260B	
Toluene	56	1.0	"	1	"	"	"	"	
Ethylbenzene	260	1.0	"	"	"	"	"	"	
Xylenes (total)	670	2.0	"	"	"	"	"	"	

Date Sampled: **01/25/18 11:10**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<i>Surrogate: 1,2-Dichloroethane-d4</i>		109 %	37-154		"	"	"	"	
<i>Surrogate: Toluene-d8</i>		99.6 %	45-149		"	"	"	"	
<i>Surrogate: 4-Bromofluorobenzene</i>		101 %	45-146		"	"	"	"	

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Project: Feather 31-15
Project Number: [none]
Project Manager: Brandon Brunns

Reported:
02/01/18 14:36

BH16
1801287-08 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **01/25/18 11:30**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	3000	100	ug/l	100	1801286	01/27/18	01/27/18	EPA 8260B	
Toluene	1100	100	"	"	"	"	"	"	
Ethylbenzene	170	100	"	"	"	"	"	"	
Xylenes (total)	2300	200	"	"	"	"	"	"	

Date Sampled: **01/25/18 11:30**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<i>Surrogate: 1,2-Dichloroethane-d4</i>		85.4 %	37-154		"	"	"	"	
<i>Surrogate: Toluene-d8</i>		97.4 %	45-149		"	"	"	"	
<i>Surrogate: 4-Bromofluorobenzene</i>		85.8 %	45-146		"	"	"	"	

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Project: Feather 31-15
Project Number: [none]
Project Manager: Brandon Brunns

Reported:
02/01/18 14:36

BH17
1801287-09 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **01/25/18 10:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	1.0	ug/l	1	1801286	01/30/18	01/30/18	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	2.0	"	"	"	"	"	"	

Date Sampled: **01/25/18 10:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		85.3 %	37-154		"	"	"	"	
Surrogate: Toluene-d8		91.2 %	45-149		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		90.7 %	45-146		"	"	"	"	

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Project: Feather 31-15
Project Number: [none]
Project Manager: Brandon Brunns

Reported:
02/01/18 14:36

BH18
1801287-10 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **01/25/18 10:25**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	1.0	ug/l	1	1801286	01/30/18	01/30/18	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	2.0	"	"	"	"	"	"	

Date Sampled: **01/25/18 10:25**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		87.7 %	37-154		"	"	"	"	
Surrogate: Toluene-d8		92.8 %	45-149		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		90.8 %	45-146		"	"	"	"	

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Project: Feather 31-15
Project Number: [none]
Project Manager: Brandon Bruns

Reported:
02/01/18 14:36

BH19
1801287-11 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **01/25/18 11:38**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	1100	100	ug/l	100	1801286	01/30/18	01/30/18	EPA 8260B	
Toluene	ND	1.0	"	1	"	"	"	"	
Ethylbenzene	27	1.0	"	"	"	"	"	"	
Xylenes (total)	60	2.0	"	"	"	"	"	"	

Date Sampled: **01/25/18 11:38**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		108 %	37-154		"	"	"	"	
Surrogate: Toluene-d8		101 %	45-149		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		102 %	45-146		"	"	"	"	

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Project: Feather 31-15
Project Number: [none]
Project Manager: Brandon Brunns

Reported:
02/01/18 14:36

BH20
1801287-12 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **01/25/18 10:05**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	1.0	ug/l	1	1801286	01/30/18	01/30/18	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	2.0	"	"	"	"	"	"	

Date Sampled: **01/25/18 10:05**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		86.7 %	37-154		"	"	"	"	
Surrogate: Toluene-d8		94.1 %	45-149		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		89.5 %	45-146		"	"	"	"	

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Project: Feather 31-15
Project Number: [none]
Project Manager: Brandon Brunns

Reported:
02/01/18 14:36

BH21
1801287-13 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **01/25/18 13:10**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	1.0	ug/l	1	1801286	01/30/18	01/30/18	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	2.0	"	"	"	"	"	"	

Date Sampled: **01/25/18 13:10**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		117 %	37-154		"	"	"	"	
Surrogate: Toluene-d8		96.4 %	45-149		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		94.1 %	45-146		"	"	"	"	

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Project: Feather 31-15
Project Number: [none]
Project Manager: Brandon Bruns

Reported:
02/01/18 14:36

BH22
1801287-14 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **01/25/18 13:20**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	92	1.0	ug/l	1	1801286	01/30/18	01/30/18	EPA 8260B	
Toluene	1.3	1.0	"	"	"	"	"	"	
Ethylbenzene	2.7	1.0	"	"	"	"	"	"	
Xylenes (total)	2.7	2.0	"	"	"	"	"	"	

Date Sampled: **01/25/18 13:20**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<i>Surrogate: 1,2-Dichloroethane-d4</i>		84.1 %	37-154		"	"	"	"	
<i>Surrogate: Toluene-d8</i>		91.7 %	45-149		"	"	"	"	
<i>Surrogate: 4-Bromofluorobenzene</i>		90.2 %	45-146		"	"	"	"	

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Project: Feather 31-15
Project Number: [none]
Project Manager: Brandon Bruns

Reported:
02/01/18 14:36

BH24
1801287-15 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **01/25/18 13:38**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	74	1.0	ug/l	1	1801286	01/30/18	01/30/18	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	19	1.0	"	"	"	"	"	"	
Xylenes (total)	14	2.0	"	"	"	"	"	"	

Date Sampled: **01/25/18 13:38**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		85.1 %	37-154		"	"	"	"	
Surrogate: Toluene-d8		92.4 %	45-149		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		92.1 %	45-146		"	"	"	"	

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Denver CO, 80221

Project: Feather 31-15
Project Number: [none]
Project Manager: Brandon Bruns

Reported:
02/01/18 14:36

BH25R
1801287-16 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **01/25/18 13:15**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	3300	100	ug/l	100	1801286	01/30/18	01/30/18	EPA 8260B	
Toluene	ND	1.0	"	1	"	"	"	"	
Ethylbenzene	180	1.0	"	"	"	"	"	"	
Xylenes (total)	7300	200	"	100	"	"	"	"	

Date Sampled: **01/25/18 13:15**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		109 %	37-154		"	"	"	"	
Surrogate: Toluene-d8		99.4 %	45-149		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		104 %	45-146		"	"	"	"	

Summit Scientific

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Project: Feather 31-15
Project Number: [none]
Project Manager: Brandon Brunns

Reported:
02/01/18 14:36

BH26
1801287-17 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **01/25/18 13:08**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	100	1.0	ug/l	1	1801286	01/30/18	01/30/18	EPA 8260B	
Toluene	18	1.0	"	"	"	"	"	"	
Ethylbenzene	5.3	1.0	"	"	"	"	"	"	
Xylenes (total)	140	2.0	"	"	"	"	"	"	

Date Sampled: **01/25/18 13:08**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<i>Surrogate: 1,2-Dichloroethane-d4</i>		84.8 %	37-154		"	"	"	"	
<i>Surrogate: Toluene-d8</i>		92.6 %	45-149		"	"	"	"	
<i>Surrogate: 4-Bromofluorobenzene</i>		89.8 %	45-146		"	"	"	"	

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Denver CO, 80221

Project: Feather 31-15
Project Number: [none]
Project Manager: Brandon Bruns

Reported:
02/01/18 14:36

BH27
1801287-18 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **01/25/18 11:55**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	290	1.0	ug/l	1	1801286	01/30/18	01/30/18	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	57	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	2.0	"	"	"	"	"	"	

Date Sampled: **01/25/18 11:55**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		83.3 %	37-154		"	"	"	"	
Surrogate: Toluene-d8		92.2 %	45-149		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		93.3 %	45-146		"	"	"	"	

Summit Scientific

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Project: Feather 31-15
Project Number: [none]
Project Manager: Brandon Bruns

Reported:
02/01/18 14:36

BH28R
1801287-19 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **01/25/18 11:25**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	1.0	ug/l	1	1801286	01/30/18	01/30/18	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	2.0	"	"	"	"	"	"	

Date Sampled: **01/25/18 11:25**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		90.7 %	37-154		"	"	"	"	
Surrogate: Toluene-d8		92.2 %	45-149		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		89.4 %	45-146		"	"	"	"	

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Project: Feather 31-15
Project Number: [none]
Project Manager: Brandon Brunns

Reported:
02/01/18 14:36

BH29
1801287-20 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **01/25/18 11:45**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	1.0	ug/l	1	1801286	01/30/18	01/30/18	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	2.0	"	"	"	"	"	"	

Date Sampled: **01/25/18 11:45**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		84.7 %	37-154		"	"	"	"	
Surrogate: Toluene-d8		92.3 %	45-149		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		90.5 %	45-146		"	"	"	"	

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Denver CO, 80221

Project: Feather 31-15
Project Number: [none]
Project Manager: Brandon Bruns

Reported:
02/01/18 14:36

BH30R
1801287-21 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **01/25/18 12:40**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	1400	100	ug/l	100	1801287	01/30/18	01/30/18	EPA 8260B	
Toluene	ND	1.0	"	1	"	"	"	"	
Ethylbenzene	34	1.0	"	"	"	"	"	"	
Xylenes (total)	340	2.0	"	"	"	"	"	"	

Date Sampled: **01/25/18 12:40**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		111 %	37-154		"	"	"	"	
Surrogate: Toluene-d8		101 %	45-149		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		104 %	45-146		"	"	"	"	

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Project: Feather 31-15
Project Number: [none]
Project Manager: Brandon Bruns

Reported:
02/01/18 14:36

BH31
1801287-22 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **01/25/18 12:25**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	1100	100	ug/l	100	1801287	01/30/18	01/30/18	EPA 8260B	
Toluene	ND	1.0	"	1	"	"	"	"	
Ethylbenzene	70	1.0	"	"	"	"	"	"	
Xylenes (total)	2.7	2.0	"	"	"	"	"	"	

Date Sampled: **01/25/18 12:25**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		113 %	37-154		"	"	"	"	
Surrogate: Toluene-d8		100 %	45-149		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		105 %	45-146		"	"	"	"	

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Project: Feather 31-15
Project Number: [none]
Project Manager: Brandon Brunns

Reported:
02/01/18 14:36

BH32
1801287-23 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **01/25/18 11:47**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	1.0	ug/l	1	1801287	01/30/18	01/30/18	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	2.0	"	"	"	"	"	"	

Date Sampled: **01/25/18 11:47**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		89.9 %	37-154		"	"	"	"	
Surrogate: Toluene-d8		92.9 %	45-149		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		89.9 %	45-146		"	"	"	"	

Summit Scientific

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Denver CO, 80221

Project: Feather 31-15
Project Number: [none]
Project Manager: Brandon Bruns

Reported:
02/01/18 14:36

BH33
1801287-24 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **01/25/18 13:20**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	72	1.0	ug/l	1	1801287	01/30/18	01/30/18	EPA 8260B	
Toluene	2.9	1.0	"	"	"	"	"	"	
Ethylbenzene	4.8	1.0	"	"	"	"	"	"	
Xylenes (total)	59	2.0	"	"	"	"	"	"	

Date Sampled: **01/25/18 13:20**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<i>Surrogate: 1,2-Dichloroethane-d4</i>		83.9 %	37-154		"	"	"	"	
<i>Surrogate: Toluene-d8</i>		90.5 %	45-149		"	"	"	"	
<i>Surrogate: 4-Bromofluorobenzene</i>		88.4 %	45-146		"	"	"	"	

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Project: Feather 31-15
Project Number: [none]
Project Manager: Brandon Brunns

Reported:
02/01/18 14:36

BH34
1801287-25 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **01/25/18 12:50**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	1.0	ug/l	1	1801287	01/30/18	01/30/18	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	2.0	"	"	"	"	"	"	

Date Sampled: **01/25/18 12:50**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		87.4 %	37-154		"	"	"	"	
Surrogate: Toluene-d8		92.1 %	45-149		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		91.1 %	45-146		"	"	"	"	

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Project: Feather 31-15
Project Number: [none]
Project Manager: Brandon Brunns

Reported:
02/01/18 14:36

BH35
1801287-26 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **01/25/18 12:55**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	1.0	ug/l	1	1801287	01/30/18	01/30/18	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	2.0	"	"	"	"	"	"	

Date Sampled: **01/25/18 12:55**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		87.7 %	37-154		"	"	"	"	
Surrogate: Toluene-d8		91.2 %	45-149		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		89.5 %	45-146		"	"	"	"	

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Project: Feather 31-15
Project Number: [none]
Project Manager: Brandon Bruns

Reported:
02/01/18 14:36

BH36R
1801287-27 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **01/25/18 13:15**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	2700	100	ug/l	100	1801287	01/30/18	01/30/18	EPA 8260B	
Toluene	ND	1.0	"	1	"	"	"	"	
Ethylbenzene	84	1.0	"	"	"	"	"	"	
Xylenes (total)	500	2.0	"	"	"	"	"	"	

Date Sampled: **01/25/18 13:15**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		106 %	37-154		"	"	"	"	
Surrogate: Toluene-d8		100 %	45-149		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		99.5 %	45-146		"	"	"	"	

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Project: Feather 31-15
Project Number: [none]
Project Manager: Brandon Brunns

Reported:
02/01/18 14:36

BH37
1801287-28 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **01/25/18 12:35**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	3.5	1.0	ug/l	1	1801287	01/30/18	01/30/18	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	2.0	"	"	"	"	"	"	

Date Sampled: **01/25/18 12:35**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		86.6 %	37-154		"	"	"	"	
Surrogate: Toluene-d8		91.4 %	45-149		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		89.6 %	45-146		"	"	"	"	

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Project: Feather 31-15
Project Number: [none]
Project Manager: Brandon Brunns

Reported:
02/01/18 14:36

BH38R
1801287-29 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **01/25/18 12:55**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	1.0	ug/l	1	1801287	01/30/18	01/30/18	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	2.0	"	"	"	"	"	"	

Date Sampled: **01/25/18 12:55**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		88.2 %	37-154		"	"	"	"	
Surrogate: Toluene-d8		92.8 %	45-149		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		91.4 %	45-146		"	"	"	"	

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Project: Feather 31-15
Project Number: [none]
Project Manager: Brandon Bruns

Reported:
02/01/18 14:36

BH39
1801287-30 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **01/25/18 12:35**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	1.0	ug/l	1	1801287	01/30/18	01/30/18	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	2.0	"	"	"	"	"	"	

Date Sampled: **01/25/18 12:35**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		88.0 %	37-154		"	"	"	"	
Surrogate: Toluene-d8		91.4 %	45-149		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		92.2 %	45-146		"	"	"	"	

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Project: Feather 31-15
Project Number: [none]
Project Manager: Brandon Brunns

Reported:
02/01/18 14:36

BH40R
1801287-31 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **01/25/18 11:11**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	1.0	ug/l	1	1801287	01/30/18	01/30/18	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	2.0	"	"	"	"	"	"	

Date Sampled: **01/25/18 11:11**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		85.5 %	37-154		"	"	"	"	
Surrogate: Toluene-d8		91.0 %	45-149		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		90.4 %	45-146		"	"	"	"	

Summit Scientific

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Project: Feather 31-15
Project Number: [none]
Project Manager: Brandon Bruns

Reported:
02/01/18 14:36

BH41R
1801287-32 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **01/25/18 11:40**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	1.0	ug/l	1	1801287	01/30/18	01/30/18	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	2.0	"	"	"	"	"	"	

Date Sampled: **01/25/18 11:40**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		80.6 %	37-154		"	"	"	"	
Surrogate: Toluene-d8		92.6 %	45-149		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		90.6 %	45-146		"	"	"	"	

Summit Scientific

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Project: Feather 31-15
Project Number: [none]
Project Manager: Brandon Bruns

Reported:
02/01/18 14:36

BH42R
1801287-33 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **01/25/18 11:40**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	1.0	ug/l	1	1801287	01/30/18	01/30/18	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	2.0	"	"	"	"	"	"	

Date Sampled: **01/25/18 11:40**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		87.3 %	37-154		"	"	"	"	
Surrogate: Toluene-d8		92.6 %	45-149		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		91.0 %	45-146		"	"	"	"	

Summit Scientific

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Project: Feather 31-15
Project Number: [none]
Project Manager: Brandon Bruns

Reported:
02/01/18 14:36

BH43R
1801287-34 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **01/25/18 11:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	1.0	ug/l	1	1801287	01/30/18	01/30/18	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	2.0	"	"	"	"	"	"	

Date Sampled: **01/25/18 11:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		88.3 %	37-154		"	"	"	"	
Surrogate: Toluene-d8		92.3 %	45-149		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		89.5 %	45-146		"	"	"	"	

Summit Scientific

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Project: Feather 31-15
Project Number: [none]
Project Manager: Brandon Brunns

Reported:
02/01/18 14:36

BH44
1801287-35 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **01/25/18 12:16**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	21	1.0	ug/l	1	1801287	01/30/18	01/30/18	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	2.0	"	"	"	"	"	"	

Date Sampled: **01/25/18 12:16**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		85.3 %	37-154		"	"	"	"	
Surrogate: Toluene-d8		89.9 %	45-149		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		90.0 %	45-146		"	"	"	"	

Summit Scientific

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Project: Feather 31-15
Project Number: [none]
Project Manager: Brandon Bruns

Reported:
02/01/18 14:36

BH45
1801287-36 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **01/25/18 12:10**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	1.0	ug/l	1	1801287	01/30/18	01/30/18	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	2.0	"	"	"	"	"	"	

Date Sampled: **01/25/18 12:10**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		89.3 %	37-154		"	"	"	"	
Surrogate: Toluene-d8		91.7 %	45-149		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		86.6 %	45-146		"	"	"	"	

Summit Scientific

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Project: Feather 31-15
Project Number: [none]
Project Manager: Brandon Brunns

Reported:
02/01/18 14:36

BH46
1801287-37 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **01/25/18 12:45**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	1.0	ug/l	1	1801287	01/30/18	01/30/18	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	2.0	"	"	"	"	"	"	

Date Sampled: **01/25/18 12:45**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		88.7 %	37-154		"	"	"	"	
Surrogate: Toluene-d8		92.3 %	45-149		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		90.7 %	45-146		"	"	"	"	

Summit Scientific

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Project: Feather 31-15
Project Number: [none]
Project Manager: Brandon Bruns

Reported:
02/01/18 14:36

BH47
1801287-38 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **01/25/18 11:35**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	1.0	ug/l	1	1801287	01/30/18	01/30/18	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	2.0	"	"	"	"	"	"	

Date Sampled: **01/25/18 11:35**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		87.9 %	37-154		"	"	"	"	
Surrogate: Toluene-d8		91.6 %	45-149		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		89.9 %	45-146		"	"	"	"	

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Denver CO, 80221

Project: Feather 31-15
Project Number: [none]
Project Manager: Brandon Brunns

Reported:
02/01/18 14:36

BH48
1801287-39 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **01/25/18 12:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	1.0	ug/l	1	1801287	01/30/18	01/30/18	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	2.0	"	"	"	"	"	"	

Date Sampled: **01/25/18 12:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		92.4 %	37-154		"	"	"	"	
Surrogate: Toluene-d8		93.0 %	45-149		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		89.9 %	45-146		"	"	"	"	

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Denver CO, 80221

Project: Feather 31-15
Project Number: [none]
Project Manager: Brandon Brunns

Reported:
02/01/18 14:36

BH49R
1801287-40 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **01/25/18 11:45**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	230	1.0	ug/l	1	1801287	01/30/18	01/30/18	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	2.0	"	"	"	"	"	"	

Date Sampled: **01/25/18 11:45**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		84.5 %	37-154		"	"	"	"	
Surrogate: Toluene-d8		91.2 %	45-149		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		86.6 %	45-146		"	"	"	"	

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Project: Feather 31-15
Project Number: [none]
Project Manager: Brandon Bruns

Reported:
02/01/18 14:36

BH50
1801287-41 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **01/25/18 12:20**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	170	1.0	ug/l	1	1801288	01/27/18	01/27/18	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	150	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	2.0	"	"	"	"	"	"	

Date Sampled: **01/25/18 12:20**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		108 %	37-154		"	"	"	"	
Surrogate: Toluene-d8		99.2 %	45-149		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		100 %	45-146		"	"	"	"	

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6899 Pecos Street
Denver CO, 80221

Project: Feather 31-15
Project Number: [none]
Project Manager: Brandon Brunns

Reported:
02/01/18 14:36

BH51
1801287-42 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **01/25/18 12:10**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	1.0	ug/l	1	1801288	01/27/18	01/27/18	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	2.0	"	"	"	"	"	"	

Date Sampled: **01/25/18 12:10**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		102 %	37-154		"	"	"	"	
Surrogate: Toluene-d8		95.4 %	45-149		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		101 %	45-146		"	"	"	"	

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Project: Feather 31-15
Project Number: [none]
Project Manager: Brandon Brunns

Reported:
02/01/18 14:36

BH52R
1801287-43 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **01/25/18 12:30**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	1.0	ug/l	1	1801288	01/27/18	01/27/18	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	2.0	"	"	"	"	"	"	

Date Sampled: **01/25/18 12:30**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		106 %	37-154		"	"	"	"	
Surrogate: Toluene-d8		96.2 %	45-149		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		102 %	45-146		"	"	"	"	

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Project: Feather 31-15
Project Number: [none]
Project Manager: Brandon Brunns

Reported:
02/01/18 14:36

BH53R
1801287-44 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **01/25/18 11:15**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	67	1.0	ug/l	1	1801288	01/27/18	01/27/18	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	2.0	"	"	"	"	"	"	

Date Sampled: **01/25/18 11:15**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		108 %	37-154		"	"	"	"	
Surrogate: Toluene-d8		97.3 %	45-149		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		101 %	45-146		"	"	"	"	

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Project: Feather 31-15
Project Number: [none]
Project Manager: Brandon Bruns

Reported:
02/01/18 14:36

BH54R
1801287-45 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **01/25/18 10:55**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	1400	25	ug/l	25	1801288	01/27/18	01/27/18	EPA 8260B	
Toluene	ND	1.0	"	1	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	2.0	"	"	"	"	"	"	

Date Sampled: **01/25/18 10:55**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		108 %	37-154		"	"	"	"	
Surrogate: Toluene-d8		99.2 %	45-149		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		102 %	45-146		"	"	"	"	

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Project: Feather 31-15
Project Number: [none]
Project Manager: Brandon Bruns

Reported:
02/01/18 14:36

BH55R
1801287-46 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **01/25/18 11:05**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	1.1	1.0	ug/l	1	1801288	01/27/18	01/27/18	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	2.0	"	"	"	"	"	"	

Date Sampled: **01/25/18 11:05**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		103 %	37-154		"	"	"	"	
Surrogate: Toluene-d8		97.4 %	45-149		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		99.6 %	45-146		"	"	"	"	

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Project: Feather 31-15
Project Number: [none]
Project Manager: Brandon Brunns

Reported:
02/01/18 14:36

BH23R
1801294-01 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **01/26/18 14:15**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	35	1.0	ug/l	1	1801299	01/29/18	01/31/18	EPA 8260B	
Toluene	47	1.0	"	"	"	"	"	"	
Ethylbenzene	12	1.0	"	"	"	"	"	"	
Xylenes (total)	250	2.0	"	"	"	"	"	"	

Date Sampled: **01/26/18 14:15**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<i>Surrogate: 1,2-Dichloroethane-d4</i>		86.7 %	37-154		"	"	01/31/18	"	
<i>Surrogate: Toluene-d8</i>		93.7 %	45-149		"	"	01/31/18	"	
<i>Surrogate: 4-Bromofluorobenzene</i>		89.7 %	45-146		"	"	01/31/18	"	

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Project: Feather 31-15
Project Number: [none]
Project Manager: Brandon Bruns

Reported:
02/01/18 14:36

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 1801286 - EPA 5030 Water MS

Blank (1801286-BLK1)

Prepared & Analyzed: 01/27/18

Benzene	ND	1.0	ug/l							
Toluene	ND	1.0	"							
Ethylbenzene	ND	1.0	"							
Xylenes (total)	ND	2.0	"							
Surrogate: 1,2-Dichloroethane-d4	13.1		"	13.3		98.1	37-154			
Surrogate: Toluene-d8	13.0		"	13.3		97.4	45-149			
Surrogate: 4-Bromofluorobenzene	13.7		"	13.3		103	45-146			

LCS (1801286-BS1)

Prepared & Analyzed: 01/28/18

Benzene	37.8	1.0	ug/l	33.3		113	51-132			
Toluene	38.5	1.0	"	33.3		115	51-138			
Ethylbenzene	42.6	1.0	"	33.1		129	58-146			
m,p-Xylene	82.4	2.0	"	66.5		124	57-144			
o-Xylene	40.6	1.0	"	32.7		124	53-146			
Surrogate: 1,2-Dichloroethane-d4	14.2		"	13.3		107	37-154			
Surrogate: Toluene-d8	13.1		"	13.3		98.0	45-149			
Surrogate: 4-Bromofluorobenzene	13.3		"	13.3		99.9	45-146			

Matrix Spike (1801286-MS1)

Source: 1801287-01

Prepared & Analyzed: 01/28/18

Benzene	37.6	1.0	ug/l	33.3	ND	113	34-141			
Toluene	38.3	1.0	"	33.3	ND	115	27-151			
Ethylbenzene	43.3	1.0	"	33.1	ND	131	29-160			
m,p-Xylene	84.5	2.0	"	66.5	ND	127	20-166			
o-Xylene	40.3	1.0	"	32.7	ND	123	33-159			
Surrogate: 1,2-Dichloroethane-d4	14.0		"	13.3		105	37-154			
Surrogate: Toluene-d8	12.9		"	13.3		96.5	45-149			
Surrogate: 4-Bromofluorobenzene	13.4		"	13.3		100	45-146			

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Project: Feather 31-15
Project Number: [none]
Project Manager: Brandon Bruns

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02/01/18 14:36

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 1801286 - EPA 5030 Water MS

Matrix Spike Dup (1801286-MSD1)				Source: 1801287-01		Prepared & Analyzed: 01/28/18				
Benzene	38.3	1.0	ug/l	33.3	ND	115	34-141	1.74	32	
Toluene	39.1	1.0	"	33.3	ND	117	27-151	2.04	25	
Ethylbenzene	42.7	1.0	"	33.1	ND	129	29-160	1.35	50	
m,p-Xylene	82.1	2.0	"	66.5	ND	123	20-166	2.80	36	
o-Xylene	40.4	1.0	"	32.7	ND	124	33-159	0.421	26	
Surrogate: 1,2-Dichloroethane-d4	14.7		"	13.3		111	37-154			
Surrogate: Toluene-d8	13.1		"	13.3		98.4	45-149			
Surrogate: 4-Bromofluorobenzene	13.1		"	13.3		98.0	45-146			

Batch 1801287 - EPA 5030 Water MS

Blank (1801287-BLK1)				Prepared & Analyzed: 01/28/18						
Benzene	ND	1.0	ug/l							
Toluene	ND	1.0	"							
Ethylbenzene	ND	1.0	"							
Xylenes (total)	ND	2.0	"							
Surrogate: 1,2-Dichloroethane-d4	13.3		"	13.3		99.8	37-154			
Surrogate: Toluene-d8	12.7		"	13.3		95.6	45-149			
Surrogate: 4-Bromofluorobenzene	13.4		"	13.3		100	45-146			

LCS (1801287-BS1)				Prepared & Analyzed: 01/28/18						
Benzene	38.9	1.0	ug/l	33.3		117	51-132			
Toluene	39.3	1.0	"	33.3		118	51-138			
Ethylbenzene	43.4	1.0	"	33.1		131	58-146			
m,p-Xylene	84.1	2.0	"	66.5		126	57-144			
o-Xylene	41.0	1.0	"	32.7		126	53-146			
Surrogate: 1,2-Dichloroethane-d4	14.3		"	13.3		108	37-154			
Surrogate: Toluene-d8	13.2		"	13.3		98.8	45-149			
Surrogate: 4-Bromofluorobenzene	13.3		"	13.3		100	45-146			

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Project: Feather 31-15
Project Number: [none]
Project Manager: Brandon Bruns

Reported:
02/01/18 14:36

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 1801287 - EPA 5030 Water MS

Matrix Spike (1801287-MS1)		Source: 1801287-23			Prepared & Analyzed: 01/28/18					
Benzene	38.9	1.0	ug/l	33.3	ND	117	34-141			
Toluene	39.2	1.0	"	33.3	ND	117	27-151			
Ethylbenzene	42.9	1.0	"	33.1	ND	130	29-160			
m,p-Xylene	83.2	2.0	"	66.5	ND	125	20-166			
o-Xylene	40.2	1.0	"	32.7	ND	123	33-159			
Surrogate: 1,2-Dichloroethane-d4	14.6		"	13.3		109	37-154			
Surrogate: Toluene-d8	12.9		"	13.3		96.8	45-149			
Surrogate: 4-Bromofluorobenzene	13.1		"	13.3		98.4	45-146			

Matrix Spike Dup (1801287-MSD1)		Source: 1801287-23			Prepared & Analyzed: 01/28/18					
Benzene	39.0	1.0	ug/l	33.3	ND	117	34-141	0.231	32	
Toluene	39.7	1.0	"	33.3	ND	119	27-151	1.47	25	
Ethylbenzene	44.4	1.0	"	33.1	ND	134	29-160	3.55	50	
m,p-Xylene	85.8	2.0	"	66.5	ND	129	20-166	3.06	36	
o-Xylene	41.8	1.0	"	32.7	ND	128	33-159	3.73	26	
Surrogate: 1,2-Dichloroethane-d4	14.6		"	13.3		109	37-154			
Surrogate: Toluene-d8	13.0		"	13.3		97.7	45-149			
Surrogate: 4-Bromofluorobenzene	13.3		"	13.3		100	45-146			

Batch 1801288 - EPA 5030 Water MS

Blank (1801288-BLK1)		Prepared & Analyzed: 01/27/18								
Benzene	ND	1.0	ug/l							
Toluene	ND	1.0	"							
Ethylbenzene	ND	1.0	"							
Xylenes (total)	ND	2.0	"							
Surrogate: 1,2-Dichloroethane-d4	13.2		"	13.3		99.2	37-154			
Surrogate: Toluene-d8	12.9		"	13.3		96.7	45-149			
Surrogate: 4-Bromofluorobenzene	13.6		"	13.3		102	45-146			

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Project: Feather 31-15
Project Number: [none]
Project Manager: Brandon Bruns

Reported:
02/01/18 14:36

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 1801288 - EPA 5030 Water MS

LCS (1801288-BS1)

Prepared & Analyzed: 01/27/18

Benzene	37.2	1.0	ug/l	33.3		112	51-132		
Toluene	37.2	1.0	"	33.3		112	51-138		
Ethylbenzene	40.4	1.0	"	33.1		122	58-146		
m,p-Xylene	75.9	2.0	"	66.5		114	57-144		
o-Xylene	38.6	1.0	"	32.7		118	53-146		
Surrogate: 1,2-Dichloroethane-d4	14.0		"	13.3		105	37-154		
Surrogate: Toluene-d8	13.2		"	13.3		98.9	45-149		
Surrogate: 4-Bromofluorobenzene	13.3		"	13.3		100	45-146		

Matrix Spike (1801288-MS1)

Source: 1801278-01

Prepared & Analyzed: 01/27/18

Benzene	37.2	1.0	ug/l	33.3	ND	112	34-141		
Toluene	37.0	1.0	"	33.3	ND	111	27-151		
Ethylbenzene	40.8	1.0	"	33.1	ND	123	29-160		
m,p-Xylene	76.8	2.0	"	66.5	ND	115	20-166		
o-Xylene	39.5	1.0	"	32.7	ND	121	33-159		
Surrogate: 1,2-Dichloroethane-d4	14.3		"	13.3		107	37-154		
Surrogate: Toluene-d8	12.9		"	13.3		96.6	45-149		
Surrogate: 4-Bromofluorobenzene	13.2		"	13.3		99.1	45-146		

Matrix Spike Dup (1801288-MSD1)

Source: 1801278-01

Prepared & Analyzed: 01/27/18

Benzene	37.4	1.0	ug/l	33.3	ND	112	34-141	0.562	32
Toluene	37.8	1.0	"	33.3	ND	113	27-151	2.14	25
Ethylbenzene	41.1	1.0	"	33.1	ND	124	29-160	0.830	50
m,p-Xylene	77.9	2.0	"	66.5	ND	117	20-166	1.41	36
o-Xylene	40.0	1.0	"	32.7	ND	123	33-159	1.43	26
Surrogate: 1,2-Dichloroethane-d4	14.6		"	13.3		110	37-154		
Surrogate: Toluene-d8	13.1		"	13.3		98.4	45-149		
Surrogate: 4-Bromofluorobenzene	13.4		"	13.3		101	45-146		

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Project: Feather 31-15
Project Number: [none]
Project Manager: Brandon Brunns

Reported:
02/01/18 14:36

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 1801299 - EPA 5030 Water MS

Blank (1801299-BLK1)

Prepared: 01/29/18 Analyzed: 01/31/18

Benzene	ND	1.0	ug/l							
Toluene	ND	1.0	"							
Ethylbenzene	ND	1.0	"							
Xylenes (total)	ND	2.0	"							
Surrogate: 1,2-Dichloroethane-d4	11.4		"	13.3		85.2	37-154			
Surrogate: Toluene-d8	12.2		"	13.3		91.8	45-149			
Surrogate: 4-Bromofluorobenzene	12.3		"	13.3		92.1	45-146			

LCS (1801299-BS1)

Prepared: 01/29/18 Analyzed: 01/31/18

Benzene	30.3	1.0	ug/l	33.3		91.0	51-132			
Toluene	32.0	1.0	"	33.3		96.1	51-138			
Ethylbenzene	34.0	1.0	"	33.1		103	58-146			
m,p-Xylene	64.9	2.0	"	66.5		97.6	57-144			
o-Xylene	32.3	1.0	"	32.7		99.0	53-146			
Surrogate: 1,2-Dichloroethane-d4	11.4		"	13.3		85.8	37-154			
Surrogate: Toluene-d8	12.4		"	13.3		92.6	45-149			
Surrogate: 4-Bromofluorobenzene	12.2		"	13.3		91.9	45-146			

Matrix Spike (1801299-MS1)

Source: 1801301-01

Prepared: 01/29/18 Analyzed: 01/31/18

Benzene	30.5	1.0	ug/l	33.3	ND	91.6	34-141			
Toluene	32.1	1.0	"	33.3	ND	96.4	27-151			
Ethylbenzene	34.6	1.0	"	33.1	ND	105	29-160			
m,p-Xylene	66.7	2.0	"	66.5	ND	100	20-166			
o-Xylene	32.9	1.0	"	32.7	ND	101	33-159			
Surrogate: 1,2-Dichloroethane-d4	11.3		"	13.3		84.6	37-154			
Surrogate: Toluene-d8	12.2		"	13.3		91.7	45-149			
Surrogate: 4-Bromofluorobenzene	12.4		"	13.3		92.9	45-146			

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Project: Feather 31-15
Project Number: [none]
Project Manager: Brandon Bruns

Reported:
02/01/18 14:36

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 1801299 - EPA 5030 Water MS

Matrix Spike Dup (1801299-MSD1)	Source: 1801301-01			Prepared: 01/29/18		Analyzed: 01/31/18				
Benzene	30.8	1.0	ug/l	33.3	ND	92.3	34-141	0.783	32	
Toluene	32.4	1.0	"	33.3	ND	97.3	27-151	0.867	25	
Ethylbenzene	34.3	1.0	"	33.1	ND	104	29-160	0.928	50	
m,p-Xylene	65.8	2.0	"	66.5	ND	98.9	20-166	1.42	36	
o-Xylene	33.0	1.0	"	32.7	ND	101	33-159	0.394	26	
Surrogate: 1,2-Dichloroethane-d4	12.6		"	13.3		94.3	37-154			
Surrogate: Toluene-d8	12.6		"	13.3		94.4	45-149			
Surrogate: 4-Bromofluorobenzene	12.2		"	13.3		91.8	45-146			

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 Street
Denver CO, 80221

Project: Feather 31-15

Project Number: [none]
Project Manager: Brandon Bruns

Reported:
02/01/18 14:36

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



January 17, 2018

Tasman Geosciences

Brandon Bruns

6899 Pecos Street, Unit C

Denver

CO 80211

Project Name - Noble - Feather 31-15

Project Number - [none]

Attached are your analytical results for Noble - Feather 31-15 received by Origins Laboratory, Inc. January 12, 2018. This project is associated with Origins project number Y801192-01.

The analytical results in the following report were analyzed under the guidelines of EPA Methods. These methods are identified as follows; "SW" are defined in SW-846, "EPA" are defined in 40CFR part 136 and "SM" are defined in the most current revision of Standard Methods For the Examination of Water and Wastewater.

The analytical results apply specifically to the samples and analyses specified per the attached Chain of Custody. As such, this report shall not be reproduced except in full, without the written approval of Origin's laboratory.

Unless otherwise noted, the analytical results for all soil samples are reported on a wet weight basis. All analytical analyses were performed under NELAP guidelines unless noted by a data qualifier.

Any holding time exceedances, deviations from the method specifications or deviations from Origins Laboratory's Standard Operating Procedures are outlined in the case narrative.

Thank you for selecting Origins for your analytical needs. Please contact us with any questions concerning this report, or if we can help with anything at all.

Origins Laboratory, Inc.
303.433.1322
o-squad@oelabinc.com



1725 Elk Place, Denver, CO 80211 | Phone: 303.433.1322 | Fax: 303.265.9645

Tasman Geosciences

6899 Pecos Street, Unit C

Denver CO 80211

Brandon Bruns

Project Number: [none]

Project: Noble - Feather 31-15

CROSS REFERENCE REPORT

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
V001	Y801192-01	Air	January 12, 2018 14:00	01/12/2018 16:00

Origins Laboratory, Inc.



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.

Jen Pellegrini For Noelle Doyle Mathis, President

Tasman Geosciences
6899 Pecos Street, Unit C
Denver CO 80211

Brandon Bruns
Project Number: [none]
Project: Noble - Feather 31-15

ORIGINS
LABORATORY, INC

1725 Elk Place
Denver, CO 80211
Phone: 303.433.1322
Fax: 303.265.9645

Client: Tasman / Noble
Address: 6899 Pecos St. W. Denver, CO 80221
Telephone Number: 720-431-1190
Email Address: bbruns@tasman-geo.com

Project Manager: Brandon Bruns
Project Name: Feather 31-15
Project Number: —
Samples Collected By: B. Fields

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page 1 of 1

211192

Sample ID Description	Date Sampled	Time Sampled	# of Containers	Preservative				Matrix			Analysis	Sample Instructions
				Unpreserved	HCl	HNO ₃	Other	Groundwater	Soil	Other		
V001	11/21/18	1400	1	X							10-15 GBETA X	1
												2
												3
												4
												5
												6
												7
												8
												9
												10

Relinquished By:

Relinquished By:

Date: 11/21/18

Date: 11/21/18

Time: 1600

Time: 1600

Received By:

Received By:

Date: 1-12-18

Date: 1-12-18

Time: 1600

Time: 1600

Turnaround Time: Same Day ☐ 24 Hr ☐ 48 Hr ☐ Standard ☒

Date Results Needed: 1/14

Origins Laboratory, Inc.

Jefe Pellegrini

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 Street, Unit C
Denver CO 80211

Brandon Bruns
Project Number: [none]
Project: Noble - Feather 31-15

Origins Laboratory

F-012207-01-R1
Effective Date: 01/09/12

Sample Receipt Checklist

Origins Work Order: Y801192

Client: Tasman

Client Project ID: Noble - Feather 31-15

Checklist Completed by: JG

Shipped Via: HD

(UPS, FedEx, Hand Delivered, Pick-up, etc.)

Date/time completed: 1/15/18

Airbill #: N/A

Matrix(s) Received: (Check all that apply): Soil/Solid Water X Other: Air

Cooler Number/Temperature: 1 17.4 °C 1 °C 1 °C (Describe) °C

Thermometer ID: 9003

Requirement Description	Yes	No	N/A	Comments (if any)
If samples require cooling, was the temperature between 0°C to ≤ 6°C ⁽¹⁾ ?		<input checked="" type="checkbox"/>		<u>Air</u>
Is there ice present (document if blue ice is used)	<input checked="" type="checkbox"/>			
Are custody seals present on cooler? (if so, document in comments if they are signed and dated, broken or intact)		<input checked="" type="checkbox"/>		
Are custody seals present on each sample container? (if so, document in comments if they are signed and dated, broken or intact)		<input checked="" type="checkbox"/>		
Were all samples received intact ⁽¹⁾ ?	<input checked="" type="checkbox"/>			
Was adequate sample volume provided ⁽¹⁾ ?	<input checked="" type="checkbox"/>			
Are short holding time analytes or samples with HTs due within 48 hours present ⁽¹⁾ ?		<input checked="" type="checkbox"/>		
Is a chain-of-custody (COC) present and filled out completely ⁽¹⁾ ?	<input checked="" type="checkbox"/>			
Does the COC agree with the number and type of sample bottles received ⁽¹⁾ ?	<input checked="" type="checkbox"/>			
Do the sample IDs on the bottle labels match the COC ⁽¹⁾ ?	<input checked="" type="checkbox"/>			
Is the COC properly relinquished by the client with date and time recorded ⁽¹⁾ ?	<input checked="" type="checkbox"/>			
For volatiles in water – is there headspace (> ¼ inch bubble) present? If yes, contact client and note in narrative.			<input checked="" type="checkbox"/>	
Are samples preserved that require preservation and was it checked ⁽¹⁾ ? (note ID of confirmation instrument used in comments) / (preservation is not confirmed for subcontracted analyses in order to insure sample integrity)/(pH <2 for samples preserved with HNO ₃ , HCL, H ₂ SO ₄) / (pH >10 for samples preserved with NaAsO ₂ +NaOH, ZnAc+NaOH)			<input checked="" type="checkbox"/>	
Additional Comments (if any):				

⁽¹⁾If NO, then contact the client before proceeding with analysis and note date/time and person contacted as well as the corrective action to in the additional comments (above) and the case narrative.

Reviewed by JG (Project Manager)

1/16/18
Date/Time Reviewed

Origins Laboratory, Inc.

Jefe Pellegrini

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 Street, Unit C
Denver CO 80211

Brandon Bruns
Project Number: [none]
Project: Noble - Feather 31-15

V001
1/12/2018 2:00:00PM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.
Y801192-01 (Air)

GBTEX by TO-15M GC/MS

								T
Gasoline Range Hydrocarbons	4510	2100	ug/m ³ Air	4.68	B8A1608	01/16/2018	01/16/2018	
Benzene	ND	13.1	"	"	"	"	"	U
Toluene	ND	23.4	"	"	"	"	"	U
Ethylbenzene	ND	23.4	"	"	"	"	"	U
m,p-Xylene	135	88.9	"	"	"	"	"	
o-Xylene	29.9	22.0	"	"	"	"	"	
Surrogate: 1,2-Dichloroethane-d4	100 %	70-130			"	"	"	
Surrogate: Toluene-d8	98.4 %	70-130			"	"	"	
Surrogate: 4-Bromofluorobenzene	95.4 %	70-130			"	"	"	

Origins Laboratory, Inc.



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 Street, Unit C
Denver CO 80211

Brandon Brunns
Project Number: [none]
Project: Noble - Feather 31-15

Volatile Organic Compounds by TO-15 in Air - Quality Control Origins Laboratory, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B8A1608 - Default Prep - Air										
Blank (B8A1608-BLK1)					Prepared: 01/16/2018 Analyzed: 01/16/2018					T
Gasoline Range Hydrocarbons	ND	448	ug/m ³ Air							U
Benzene	ND	2.80	"							U
Toluene	ND	5.00	"							U
Ethylbenzene	ND	5.00	"							U
m,p-Xylene	ND	19.0	"							U
o-Xylene	ND	4.70	"							U
Surrogate: 1,2-Dichloroethane-d4	19.0		ppbv	20.0		95.2	70-130			
Surrogate: Toluene-d8	19.8		"	20.0		99.2	70-130			
Surrogate: 4-Bromofluorobenzene	20.9		"	20.0		104	70-130			
LCS (B8A1608-BS1)					Prepared: 01/16/2018 Analyzed: 01/16/2018					T
Benzene	33.4	2.80	ug/m ³ Air	32.6		102	70-130			
Toluene	40.4	5.00	"	39.6		102	70-130			
Ethylbenzene	45.3	5.00	"	45.6		99.4	70-130			
m,p-Xylene	181	19.0	"	179		101	70-130			
o-Xylene	46.8	4.70	"	46.5		101	70-130			
Surrogate: 1,2-Dichloroethane-d4	19.7		ppbv	20.0		98.4	70-130			
Surrogate: Toluene-d8	19.8		"	20.0		99.2	70-130			
Surrogate: 4-Bromofluorobenzene	19.4		"	20.0		97.1	70-130			
LCS Dup (B8A1608-BSD1)					Prepared: 01/16/2018 Analyzed: 01/16/2018					T
Benzene	33.9	2.80	ug/m ³ Air	32.6		104	70-130	1.71	20	
Toluene	40.9	5.00	"	39.6		103	70-130	1.30	20	
Ethylbenzene	46.4	5.00	"	45.6		102	70-130	2.37	20	
m,p-Xylene	186	19.0	"	179		104	70-130	2.79	20	
o-Xylene	47.7	4.70	"	46.5		103	70-130	2.02	20	
Surrogate: 1,2-Dichloroethane-d4	19.7		ppbv	20.0		98.4	70-130			

Origins Laboratory, Inc.



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 Street, Unit C
Denver CO 80211

Brandon Bruns
Project Number: [none]
Project: Noble - Feather 31-15

Volatile Organic Compounds by TO-15 in Air - Quality Control
Origins Laboratory, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch B8A1608 - Default Prep - Air

LCS Dup (B8A1608-BSD1)

Prepared: 01/16/2018 Analyzed: 01/16/2018

T

Surrogate: Toluene-d8	19.8		ppbv	20.0		99.2	70-130			
Surrogate: 4-Bromofluorobenzene	20.3		"	20.0		101	70-130			

Origins Laboratory, Inc.



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.

Jen Pellegrini For Noelle Doyle Mathis, President

Tasman Geosciences

6899 Pecos Street, Unit C

Denver CO 80211

Brandon Bruns

Project Number: [none]

Project: Noble - Feather 31-15

Notes and Definitions

U Sample is Non-Detect.

T The TO-15 analysis is not part of the NELAC accreditation

ND Analyte NOT DETECTED at or above the reporting limit

RPD Relative Percent Difference

All soil results are reported at a wet weight basis.

Origins Laboratory, Inc.



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.

February 26, 2018

Tasman Geosciences

Brandon Bruns

6899 Pecos Street, Unit C

Denver

CO 80211

Project Name - Noble - Feather 31-15**Project Number - [none]**

Attached are your analytical results for Noble - Feather 31-15 received by Origins Laboratory, Inc. February 16, 2018. This project is associated with Origins project number Y802224-01.

The analytical results in the following report were analyzed under the guidelines of EPA Methods. These methods are identified as follows; "SW" are defined in SW-846, "EPA" are defined in 40CFR part 136 and "SM" are defined in the most current revision of Standard Methods For the Examination of Water and Wastewater.

The analytical results apply specifically to the samples and analyses specified per the attached Chain of Custody. As such, this report shall not be reproduced except in full, without the written approval of Origin's laboratory.

Unless otherwise noted, the analytical results for all soil samples are reported on a wet weight basis. All analytical analyses were performed under NELAP guidelines unless noted by a data qualifier.

Any holding time exceedances, deviations from the method specifications or deviations from Origins Laboratory's Standard Operating Procedures are outlined in the case narrative.

Thank you for selecting Origins for your analytical needs. Please contact us with any questions concerning this report, or if we can help with anything at all.

Origins Laboratory, Inc.
303.433.1322
o-squad@oelabinc.com



Tasman Geosciences

6899 Pecos Street, Unit C

Denver CO 80211

Brandon Bruns

Project Number: [none]

Project: Noble - Feather 31-15

CROSS REFERENCE REPORT

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
V001 - 021518	Y802224-01	Air	February 15, 2018 10:15	02/16/2018 09:07

Origins Laboratory, Inc.



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.

Jen Pellegrini For Noelle Doyle Mathis, President

Brandon Bruns
Project Number: [none]
Project: Noble - Feather 31-15

ORIGINS
LABORATORY, INC



Client: Noble Tasman
Address: 1899 Piccas St. NW
Denver, CO 80201
Telephone Number: 720-431-1190

Project Manager/Send Report To: Bryan Bruijs
Email Address: bbruijs@tasman-geo.com
Project Name/Number: Feather 31-15
Samples Collected By: BB

Y302224

page 1 of 1

www.originslaboratory.com

Sample ID Description	Date Sampled	Time Sampled	# of Containers	Preservative					Matrix				Analyst/Method	Sample Instructions	
				Unpreserved	HCl	HNO ₃	Other	Groundwater	Soil	As Summa Canister #	Other				
U001-021518	2/15/18	1015	1	✓						980			✓	1	Sample Instructions Turnaround Time: Same Day <input type="checkbox"/> 24 Hr <input type="checkbox"/> 48 Hr <input type="checkbox"/> 72 Hr <input type="checkbox"/> Standard <input checked="" type="checkbox"/>
														2	
														3	
														4	
														5	
														6	
														7	
														8	
														9	
														10	
Relinquished By: 	Date: 2/15/18	Time: 0907		Received By: 					Date: 2/16/18				Time: 0907		
Relinquished By:	Date:	Time:		Received By:					Date:				Time:		

Nota Dacelle Mandadi:

Comments:

Origins Laboratory, Inc.

Jeff Pellgrini

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 Street, Unit C
Denver CO 80211

Brandon Bruns
Project Number: [none]
Project: Noble - Feather 31-15

Origins Laboratory

F-012207-01-R1
Effective Date: 01/09/12

Sample Receipt Checklist

Origins Work Order: 4802224

Client: Tasman

Client Project ID: Noble - Feather

Checklist Completed by: Jen Pellegrini

Shipped Via: HD
(UPS, FedEx, Hand Delivered, Pick-up, etc.)

Date/time completed: 2/16/18

Airbill #: NA

Matrix(s) Received: (Check all that apply): Soil/Solid Water X Other: air

Cooler Number/Temperature: 1 / 24.1 °C / °C / °C (Describe)

Thermometer ID: T023

Requirement Description	Yes	No	N/A	Comments (if any)
If samples require cooling, was the temperature between 0°C to ≤ 6°C ⁽¹⁾ ?			X	
Is there ice present (document if blue ice is used)			X	
Are custody seals present on cooler? (if so, document in comments if they are signed and dated, broken or intact)		X		
Are custody seals present on each sample container? (if so, document in comments if they are signed and dated, broken or intact)		X		
Were all samples received intact ⁽¹⁾ ?	X			
Was adequate sample volume provided ⁽¹⁾ ?	X			
Are short holding time analytes or samples with HTs due within 48 hours present ⁽¹⁾ ?		X		
Is a chain-of-custody (COC) present and filled out completely ⁽¹⁾ ?	X			
Does the COC agree with the number and type of sample bottles received ⁽¹⁾ ?	X			
Do the sample IDs on the bottle labels match the COC ⁽¹⁾ ?	X			
Is the COC properly relinquished by the client with date and time recorded ⁽¹⁾ ?	X			
For volatiles in water – is there headspace (> ¼ inch bubble) present? If yes, contact client and note in narrative.			X	
Are samples preserved that require preservation and was it checked ⁽¹⁾ ? (note ID of confirmation instrument used in comments) / (preservation is not confirmed for subcontracted analyses in order to insure sample integrity)/(pH <2 for samples preserved with HNO ₃ , HCL, H ₂ SO ₄) / (pH >10 for samples preserved with NaAsO ₂ +NaOH, ZnAc+NaOH)			X	
Additional Comments (if any):				

⁽¹⁾ If NO, then contact the client before proceeding with analysis and note date/time and person contacted as well as the corrective action to in the additional comments (above) and the case narrative.

Reviewed by (Project Manager) JAP

Date/Time Reviewed 2/16/18

Origins Laboratory, Inc.

Jen Pellegrini

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 Street, Unit C
Denver CO 80211

Brandon Bruns
Project Number: [none]
Project: Noble - Feather 31-15

V001 - 021518

2/15/2018 10:15:00AM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.
Y802224-01 (Air)

GBTEX by TO-15M GC/MS

T								
Gasoline Range Hydrocarbons	4280	2050	ug/m ³ Air	4.58	B8B1901	02/19/2018	02/21/2018	
Benzene	ND	12.8	"	"	"	"	"	U
Toluene	30.7	22.9	"	"	"	"	"	
Ethylbenzene	ND	22.9	"	"	"	"	"	U
m,p-Xylene	235	87.0	"	"	"	"	"	
o-Xylene	45.3	21.5	"	"	"	"	"	
Surrogate: 1,2-Dichloroethane-d4	104 %	70-130			"	"	02/20/2018	
Surrogate: Toluene-d8	102 %	70-130			"	"	"	
Surrogate: 4-Bromofluorobenzene	103 %	70-130			"	"	"	

Origins Laboratory, Inc.



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 Street, Unit C
Denver CO 80211

Brandon Brunns
Project Number: [none]
Project: Noble - Feather 31-15

Volatile Organic Compounds by TO-15 in Air - Quality Control Origins Laboratory, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B8B1901 - Default Prep - Air										
Blank (B8B1901-BLK1)					Prepared: 02/19/2018 Analyzed: 02/19/2018					T
Gasoline Range Hydrocarbons	ND	448	ug/m ³ Air							U
Benzene	ND	2.80	"							U
Toluene	ND	5.00	"							U
Ethylbenzene	ND	5.00	"							U
m,p-Xylene	ND	19.0	"							U
o-Xylene	ND	4.70	"							U
Surrogate: 1,2-Dichloroethane-d4	20.5		ppbv	20.0		103	70-130			
Surrogate: Toluene-d8	19.8		"	20.0		99.2	70-130			
Surrogate: 4-Bromofluorobenzene	21.3		"	20.0		106	70-130			
LCS (B8B1901-BS1)					Prepared: 02/19/2018 Analyzed: 02/19/2018					T
Benzene	34.2	2.80	ug/m ³ Air	32.6		105	70-130			
Toluene	42.4	5.00	"	39.6		107	70-130			
Ethylbenzene	47.9	5.00	"	45.6		105	70-130			
m,p-Xylene	200	19.0	"	179		112	70-130			
o-Xylene	50.8	4.70	"	46.5		109	70-130			
Surrogate: 1,2-Dichloroethane-d4	20.3		ppbv	20.0		101	70-130			
Surrogate: Toluene-d8	19.5		"	20.0		97.6	70-130			
Surrogate: 4-Bromofluorobenzene	18.9		"	20.0		94.6	70-130			
LCS Dup (B8B1901-BSD1)					Prepared: 02/19/2018 Analyzed: 02/19/2018					T
Benzene	34.6	2.80	ug/m ³ Air	32.6		106	70-130	1.30	20	
Toluene	43.1	5.00	"	39.6		109	70-130	1.67	20	
Ethylbenzene	49.4	5.00	"	45.6		108	70-130	3.03	20	
m,p-Xylene	204	19.0	"	179		114	70-130	2.28	20	
o-Xylene	52.1	4.70	"	46.5		112	70-130	2.53	20	
Surrogate: 1,2-Dichloroethane-d4	20.2		ppbv	20.0		101	70-130			

Origins Laboratory, Inc.



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 Street, Unit C
Denver CO 80211

Brandon Bruns
Project Number: [none]
Project: Noble - Feather 31-15

Volatile Organic Compounds by TO-15 in Air - Quality Control
Origins Laboratory, Inc.

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

Batch B8B1901 - Default Prep - Air

LCS Dup (B8B1901-BSD1)

Prepared: 02/19/2018 Analyzed: 02/19/2018

T

Surrogate: Toluene-d8	19.6		ppbv	20.0		98.2	70-130			
Surrogate: 4-Bromofluorobenzene	18.8		"	20.0		94.2	70-130			

Origins Laboratory, Inc.



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 Street, Unit C

Denver CO 80211

Brandon Bruns

Project Number: [none]

Project: Noble - Feather 31-15

Notes and Definitions

U Sample is Non-Detect.

T The TO-15 analysis is not part of the NELAC accreditation

ND Analyte NOT DETECTED at or above the reporting limit

RPD Relative Percent Difference

All soil results are reported at a wet weight basis.

Origins Laboratory, Inc.



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.

Jen Pellegrini For Noelle Doyle Mathis, President