

ASSESSMENT AND REMEDIAL EXCAVATION REPORT

MUNDS 13-29, DICKERSON 14-29A

COGCC SPILL TRACKING # 459197
COGCC REMEDIATION # 12255

Prepared for:



2115 117th Avenue
Greeley, CO 80631

Prepared by:



6855 W 119th Ave.
Broomfield, CO 80020

August 1, 2019

Mr. Jacob Evans
Noble Energy Inc.
2115 117th Avenue
Greeley, CO 80631

Subject: **Assessment and Remedial Excavation Report**
 Munds 13-29, Dickerson 14-29A
 Location ID: 333157
 Spill/Release Point ID #: 459197
 Remediation Project #: 12255
 SESW S29 T4N R65W
 Weld County, Colorado

Dear Mr. Evans:

Below please find a copy of the above referenced Assessment and Remedial Excavation Report (Report) for the Munds 13-29, Dickerson 14-29A site (Site) in Weld County, Colorado. The text below describes environmental assessment and associated soil sampling activities conducted by Tasman Geosciences, Inc. (Tasman), on behalf of Noble Energy, Inc. (Noble), between March 28, 2019 and July 2, 2019.

Introduction

The purpose of this document is to describe the results of site assessment and sampling activities at the Site. The activities described below were performed in response to the discovery of a release from the Munds 13-29, Dickerson 14-29A produced water vessel on November 20, 2018.

Facility Background

The Site is located approximately 4.5 miles east of the Town of Gilcrest in Weld County, Colorado, as shown on Figure 1. The Site is surrounded by crop land, and the legal description is the southeast ¼ of the southwest ¼ of Section 29, Township 4 North, Range 65 West, of the 6th Principal Meridian. The Site is located on terrain that slopes gradually to the west. The Site is approximately 50 feet north of Weld County Road 40 and has coordinates of 40.276357°, -104.690061°.

On November 20, 2018, historic impacts were confirmed beneath the Munds 13-29, Dickerson 14-29A tank battery during plug and abandonment activities. The approximate release location is shown on Figure 2. A Form 19 was submitted to the Colorado Oil and Gas Conservation Commission (COGCC) on November 21, 2018. The COGCC subsequently issued Spill/Release Point ID Number 459197 for this event and the site was plugged and abandoned. A Site Investigation and Remediation Workplan (Form 27) was submitted for the site on January 3, 2019 (document 401891478) and approved on January 4, 2019. The COGCC issued Remediation # 12255 for this site. Initial excavation and sampling activities, including test pits TP01-TP14, were reported in the document *Munds 13-29, Dickerson 14-29A Excavation Summary Report* submitted to Noble on February 19, 2019.

Field Activities – Soil Boring Site Assessment

On March 28, 2019 Tasman was retained to assess any potential soil or groundwater impacts remaining after the remedial excavation associated with the historic produced water vessel release at the former Munds 13-29, Dickerson 14-29A tank battery. Eight boreholes were installed using direct push drilling techniques. Soil boring locations are illustrated on Figure 2, and boring logs are included in Attachment A. During soil boring activities, soil samples were collected and field screened for volatile organic compounds (VOC) using a photoionization detector (PID) and standard head space sampling techniques. Soil samples from the depth interval exhibiting the highest PID reading above the groundwater table were retained for laboratory analysis. A total of 11 soil samples were submitted to Summit Scientific Laboratory in Golden, Colorado (Summit) for analysis of benzene, toluene, ethylbenzene, and total xylenes (BTEX), naphthalene, and total petroleum hydrocarbons-gasoline range organics (TPH-GRO) using United States Environmental Protection Agency (USEPA) Method 8260B, as well as total petroleum hydrocarbons-diesel range organics (TPH-DRO) using USEPA Method 8015. Soil analytical data from borehole samples indicated the presence of soil in exceedance of COGCC Table 910-1 regulatory standards in the area of BH06. Soil analytical results are summarized in Table 1 and sample locations are illustrated on Figure 2. Complete laboratory analytical reports are included in Attachment B. Groundwater was not encountered during soil boring Site assessment activities.

Field Activities – Test Pit Site Assessment

Tasman, along with 4X Industrial (excavation contractor), returned to the site on June 26, 2019 to complete an additional test pit assessment to further delineate the vertical and lateral extent of vadose zone soil impacts. A total of eight test pits (TP15-TP22) were completed from 9 to 14 feet below ground surface (ft. bgs). All samples were field screened for VOCs with a PID using standard headspace sampling techniques. The soil sample with the highest PID reading from each test pit was submitted to Summit for BTEX, naphthalene, TPH-GRO and TPH-DRO analysis. All soil samples submitted were below COGCC Table 910-1 regulatory standards. Soil analytical data is summarized in Table 1 and test pit locations are illustrated on Figure 3. The laboratory report is included in Attachment B.

Field Activities – Remedial Excavation

After the completion of site assessment activities, the remedial excavation of material impacted above COGCC Table 910-1 standards was conducted between June 27, 2019 and July 2, 2019. Three separate excavations were completed in the area surrounding the former produced water vault, at Test Pit 03 (TP03) and at soil boring location BH06 where sample results exceeded COGCC Table 910-1 standards. Test pit TP05 is adjacent to a privately-owned underground irrigation line, thus additional excavation was not conducted in that vicinity. The extent of each excavation was determined by collecting excavation sidewall and base soil samples and field screening for VOCs using a PID and standard headspace sampling techniques.

A total of ten samples (SS06@9'-SS11@9', SS16@9'-SS19@9') were collected along the sidewalls of the produced water vault excavation at approximately 9 ft. bgs, while one sample was collected at

approximately 3 ft. bgs (SS20@3'). A total of four samples (FS01@10', FS02@10', FS04@10', FS05@10') were taken from the base of the produced water vault excavation at approximately 10 ft. bgs. All samples were submitted to Summit for BTEX, naphthalene, TPH-GRO and TPH-DRO analysis. Excavation sidewall sample SS20@3' was also analyzed for sodium adsorption ratio (SAR) by USEPA Method 6020/United States Department of Agriculture (USDA) Method 60 6(2,3A) and specific conductance (EC) and pH via American Public Health Association (APHA)/American Society for Testing Materials (ASTM)/USEPA methods. The final extent of the excavation measured approximately 40 ft. by 40 ft. by 10 ft. bgs.

Tasman collected four soil samples (SS12@7'- SS15@7') from along the sidewalls and one soil sample from the base (FS03@8') of the excavation surrounding test pit TP03. The five soil samples were submitted to Summit for BTEX, naphthalene, TPH-GRO and TPH-DRO analysis. The final extent of the excavation measured approximately 10 ft. by 8 ft. by 8 ft. bgs.

Tasman collected four soil samples (SS21@9'-SS24@9') from along the sidewalls and one soil sample from the base (FS06@10') of the excavation surrounding the soil boring location BH06. The five soil samples were submitted to Summit for BTEX, naphthalene, TPH-GRO and TPH-DRO analysis. The final extent of the excavation measured approximately 10 ft. by 8 ft. by 10 ft. bgs.

Approximately 980 cubic yards of impacted soil was removed for off-site disposal at Buffalo Ridge Landfill in Keenesburg, Colorado under signed Noble waste manifests. Following the completion of the excavations, backfilling operations were completed. Groundwater was not encountered during the excavation activities. All soil analytical data is summarized in Table 1. Sample locations and final excavation extents are illustrated on Figure 4.

Results

Laboratory analytical results for the soil samples collected during Site assessment and remedial excavation activities indicate that material in exceedance of COGCC Table 910-1 standards were removed in the areas around the former produced water vault and the test pit TP03. Laboratory analytical data indicates petroleum hydrocarbon soil impacts in exceedance of applicable COGCC Table 910-1 standards remain in the areas of borehole BH06 and test pit TP05.

Conclusions

Based on field and laboratory data collected during Site assessment and remedial excavation activities, vadose zone hydrocarbon impacts were successfully removed in the area of the former tank battery. Vadose zone soil impacts were left in place in the northern portion of the Site at the TP05 location, and to the southwest portion of the Site at the BH06 location. Soil impacts were left in place due to the proximity of the Weld County Road 40 right-of-way (ROW) and an Anadarko flowline at the BH06 location. Soil impacts were also left in place due to the proximity of a privately-owned underground irrigation line at the TP05 location. Therefore, additional in-situ remediation efforts will be evaluated at the Site to address residual petroleum hydrocarbon impacts to soil. These efforts may include monitored natural attenuation or the installation of a soil vapor extraction (SVE) remediation system.

Remarks

The discussion and conclusions contained in this report represent the professional opinions of Tasman Geosciences, Inc. These opinions are based on currently available information and are arrived at in accordance with currently accepted geologic and engineering practices.

Please contact me at (720) 431-1190 if you require additional information.

Sincerely,
Tasman Geosciences, Inc.



Brandon Bruns, PE
Project Manager

Attached:

Table 1 – Soil Analytical Data

Figure 1 – Site Location Map

Figure 2 – Site Assessment Analytical Figure (03/28/19)

Figure 3 – Test Pit Assessment Analytical Figure (06/26/19)

Figure 4 – Excavation Soil Analytical Figure (11/19/18, 03/28/19, 06/26/19 – 07/02/19)

Attachment A – Boring Logs

Attachment B – Laboratory Analytical Data Reports

TABLES

TABLE 1
SOIL ANALYTICAL DATA
NOBLE ENERGY, INC. -MUNDS 13-29, DICKERSON 14-29A

Soil Sample ID	Date	Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	Total Xylenes (mg/kg)	Naphthalene (mg/kg)	TPH-GRO (mg/kg)	TPH-DRO (mg/kg)
COGCC Standard		0.17	85	100	175	23	500	
SS01@3' ⁽¹⁾	11/19/18	0.19	<0.0050	0.032	0.11	<0.010	<50	<50
SS01@5'	11/19/18	3.0	<0.0050	2.9	26	0.082	1,200	69
SS02@3'	11/19/18	<0.0020	<0.0050	<0.0050	<0.010	<0.010	<50	<50
SS02@5'	11/19/18	0.036	<0.0050	0.037	0.53	<0.010	<50	<50
SS03@3'	11/19/18	0.0075	<0.0050	0.030	0.24	0.027	<50	<50
SS03@5'	11/19/18	0.049	<0.0050	0.16	1.1	0.042	<50	<50
SS04@3'	11/19/18	0.026	<0.0050	0.072	0.40	0.020	<50	<50
SS04@5'	11/19/18	0.048	<0.0050	0.19	1.8	0.039	<50	<50
SS05@6'	11/19/18	0.31	<0.0050	0.021	<0.010	<0.010	<50	<50
TP03@5'	11/19/18	1.7	<0.0050	0.28	<0.010	0.038	<50	70
TP03@10'	11/19/18	<0.0020	<0.0050	<0.0050	<0.010	<0.010	<50	<50
TP05@5'	11/19/18	0.0098	<0.0050	0.029	0.43	<0.010	<50	<50
TP05@10'	11/19/18	0.16	0.25	14	170	0.033	4,600	59
TP07@5'	11/19/18	0.0082	<0.0050	<0.0050	<0.010	<0.010	<50	<50
TP07@10'	11/19/18	0.011	<0.0050	<0.0050	<0.010	<0.010	<50	<50
TP08@5' ⁽²⁾	11/20/18	1.2	<0.0050	3.1	12	0.19	250	110
TP08@10' ⁽²⁾	11/20/18	<0.0020	<0.0050	0.076	1.1	0.070	<50	93
TP08@13'	11/20/18	0.0061	0.027	0.059	0.87	0.021	<50	<50
TP09@5'	11/20/18	<0.0020	<0.0050	<0.0050	<0.010	<0.010	<50	<50
TP09@10'	11/20/18	<0.0020	<0.0050	<0.0050	<0.010	<0.010	<50	<50
TP09@13' ⁽²⁾	11/20/18	<0.0020	0.015	0.072	1.4	0.059	<50	120
TP10@5'	11/20/18	<0.0020	<0.0050	<0.0050	<0.010	<0.010	<50	<50
TP10@10'	11/20/18	<0.0020	<0.0050	<0.0050	<0.010	<0.010	<50	<50
TP10@13'	11/20/18	<0.0020	<0.0050	<0.0050	<0.010	<0.010	<50	<50
TP11@5'	11/20/18	<0.0020	<0.0050	<0.0050	<0.010	<0.010	<50	<50
TP11@10'	11/20/18	<0.0020	<0.0050	<0.0050	<0.010	<0.010	<50	<50
TP11@13'	11/20/18	<0.0020	<0.0050	<0.0050	<0.010	<0.010	<50	<50
TP12@5'	11/20/18	<0.0020	<0.0050	<0.0050	<0.010	<0.010	<50	<50
TP12@10' ⁽²⁾	11/20/18	<0.0020	<0.0050	0.058	0.97	0.067	<50	87
TP12@13' ⁽²⁾	11/20/18	0.0056	0.18	0.33	15	0.060	<50	110
TP13@5'	11/20/18	<0.0020	<0.0050	0.013	0.13	0.011	<50	<50
TP13@10'	11/20/18	<0.0020	<0.0050	<0.0050	<0.010	<0.010	<50	<50
TP13@13'	11/20/18	<0.0020	<0.0050	<0.0050	<0.010	<0.010	<50	<50
TP14@5'	11/20/18	<0.0020	<0.0050	<0.0050	<0.010	<0.010	<50	<50
BH01@15-16'	03/28/19	<0.0020	<0.0050	<0.0050	<0.010	<0.010	<50	<50
BH02@14-16'	03/28/19	<0.0020	<0.0050	<0.0050	<0.010	<0.010	<50	<50
BH03@10-11'	03/28/19	<0.0020	<0.0050	<0.0050	<0.010	<0.010	<50	<50
BH04@9-10'	03/28/19	<0.0020	<0.0050	<0.0050	0.019	<0.010	<50	54
BH04@12-13'	03/28/19	<0.0020	<0.0050	0.023	0.50	0.013	<50	<50
BH05@9-10'	03/28/19	0.034	<0.0050	0.018	0.010	<0.010	<50	<50
BH06@7-8'	03/28/19	0.55	0.0058	0.56	3.9	<0.010	90	<50
BH06@14-16'	03/28/19	<0.0020	<0.0050	<0.0050	<0.010	<0.010	<50	<50
BH07@9-10'	03/28/19	<0.0020	<0.0050	<0.0050	<0.010	<0.010	<50	54
BH08@8-10'	03/28/19	<0.0020	<0.0050	<0.0050	0.17	<0.010	<50	57
BH08@12-13'	03/28/19	0.015	2.6	0.85	8.8	0.089	<50	150
TP15@3'	06/26/19	<0.0020	<0.0050	0.021	0.15	<0.010	<50	<50
TP16@6'	06/26/19	0.0078	<0.0050	<0.0050	<0.010	<0.010	<50	<50
TP17@9'	06/26/19	0.018	<0.0050	0.0056	0.011	<0.010	<50	<50
TP18@9'	06/26/19	<0.0020	<0.0050	<0.0050	<0.010	<0.010	<50	<50
TP19@11'	06/26/19	0.036	0.43	0.27	3.5	0.026	140	<50

TABLE 1
SOIL ANALYTICAL DATA
NOBLE ENERGY, INC. -MUNDS 13-29, DICKERSON 14-29A

Soil Sample ID	Date	Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	Total Xylenes (mg/kg)	Naphthalene (mg/kg)	TPH-GRO (mg/kg)	TPH-DRO (mg/kg)
COGCC Standard		0.17	85	100	175	23	500	
TP20@10'	06/26/19	<0.0020	0.017	0.051	1.0	0.064	<50	120
TP21@6'	06/26/19	0.027	<0.0050	0.11	1.2	0.014	<50	<50
TP22@3'	06/26/19	0.019	<0.0050	0.038	0.43	<0.010	<50	<50
SS06@9'	06/27/19	0.013	0.0058	1.1	18	0.096	310	93
FS01@10'	06/27/19	0.060	<0.0050	0.045	0.37	<0.010	<50	<50
SS07@9'	06/27/19	<0.0020	<0.0050	0.015	0.074	<0.010	<50	<50
SS08@9'	06/27/19	0.18	<0.0050	0.54	4.6	0.018	120	<50
SS09@9'	06/28/19	0.0099	<0.0050	0.038	0.55	<0.010	<50	<50
SS10@9'	06/28/19	0.0084	<0.0050	0.0095	0.010	<0.010	<50	<50
FS02@10'	06/28/19	<0.0020	<0.0050	<0.0050	<0.010	<0.010	<50	<50
SS11@9'	06/28/19	0.089	<0.0050	0.026	0.25	<0.010	<50	<50
SS12@7'	06/28/19	<0.0020	<0.0050	<0.0050	<0.010	<0.010	<50	<50
SS13@7'	06/28/19	<0.0020	<0.0050	0.025	<0.010	<0.010	<50	<50
SS14@7'	06/28/19	<0.0020	<0.0050	<0.0050	<0.010	<0.010	<50	<50
SS15@7'	06/28/19	<0.0020	<0.0050	<0.0050	<0.010	<0.010	<50	<50
FS03@8'	06/28/19	<0.0020	<0.0050	<0.0050	<0.010	<0.010	<50	<50
SS16@9'	06/28/19	<0.0020	<0.0050	<0.0050	<0.010	<0.010	<50	<50
FS04@10'	06/28/19	<0.0020	<0.0050	<0.0050	<0.010	<0.010	<50	<50
SS17@9'	06/28/19	0.0038	<0.0050	<0.0050	0.021	<0.010	<50	<50
SS18@9'	06/28/19	0.015	<0.0050	0.0057	0.072	<0.010	<50	<50
SS19@9'	06/28/19	0.056	<0.0050	0.0064	<0.010	<0.010	<50	<50
FS05@10'	06/28/19	<0.0020	<0.0050	<0.0050	<0.010	<0.010	<50	<50
SS20@3'	07/02/19	<0.0020	<0.0050	<0.0050	<0.010	<0.010	<50	<50
SS21@9'	07/02/19	0.55	<0.0050	0.32	3.5	0.021	<50	<50
SS22@9'	07/02/19	0.0095	<0.0050	0.011	0.11	<0.010	<50	<50
SS23@9'	07/02/19	0.034	<0.0050	0.0055	0.013	<0.010	<50	<50
SS24@9'	07/02/19	0.18	<0.0050	0.042	0.20	<0.010	<50	<50
FS06@10'	07/02/19	<0.0020	<0.0050	<0.0050	<0.010	<0.010	<50	<50

Soil Sample ID	Date	EC (mmhos/cm)	pH	SAR
		<4 or 2x BG	6-9	<12
SS03@3'	11/19/18	5.03	8.59	1.48
SS20@3'	07/02/19	0.610	8.04	0.530

Notes:

COGCC = Colorado Oil and Gas Conservation Commission

TPH-GRO = Total petroleum hydrocarbons - gasoline range organics

TPH-DRO = Total petroleum hydrocarbons - diesel range organics

EC = Specific conductance

mmhos/cm = Millimhos per centimeter

BG = Background

SAR = Sodium adsorption ratio

mg/kg = Milligrams per kilogram

TABLE 1
SOIL ANALYTICAL DATA
NOBLE ENERGY, INC. -MUNDS 13-29, DICKERSON 14-29A

Soil Sample ID	Date	Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	Total Xylenes (mg/kg)	Naphthalene (mg/kg)	TPH-GRO (mg/kg)	TPH-DRO (mg/kg)
COGCC Standard		0.17	85	100	175	23	500	

1. The MS/MSD recovery was outside (above) acceptable limits for benzene, ethylbenzene and m,p-Xylene in the MS and/or MSD samples, indicating matrix interference. Since the MS and MSD samples were sourced by field sample SS01@3', the results for benzene, ethylbenzene and m,p-Xylene in sample SS01@3' may be biased high, due to matrix interference.

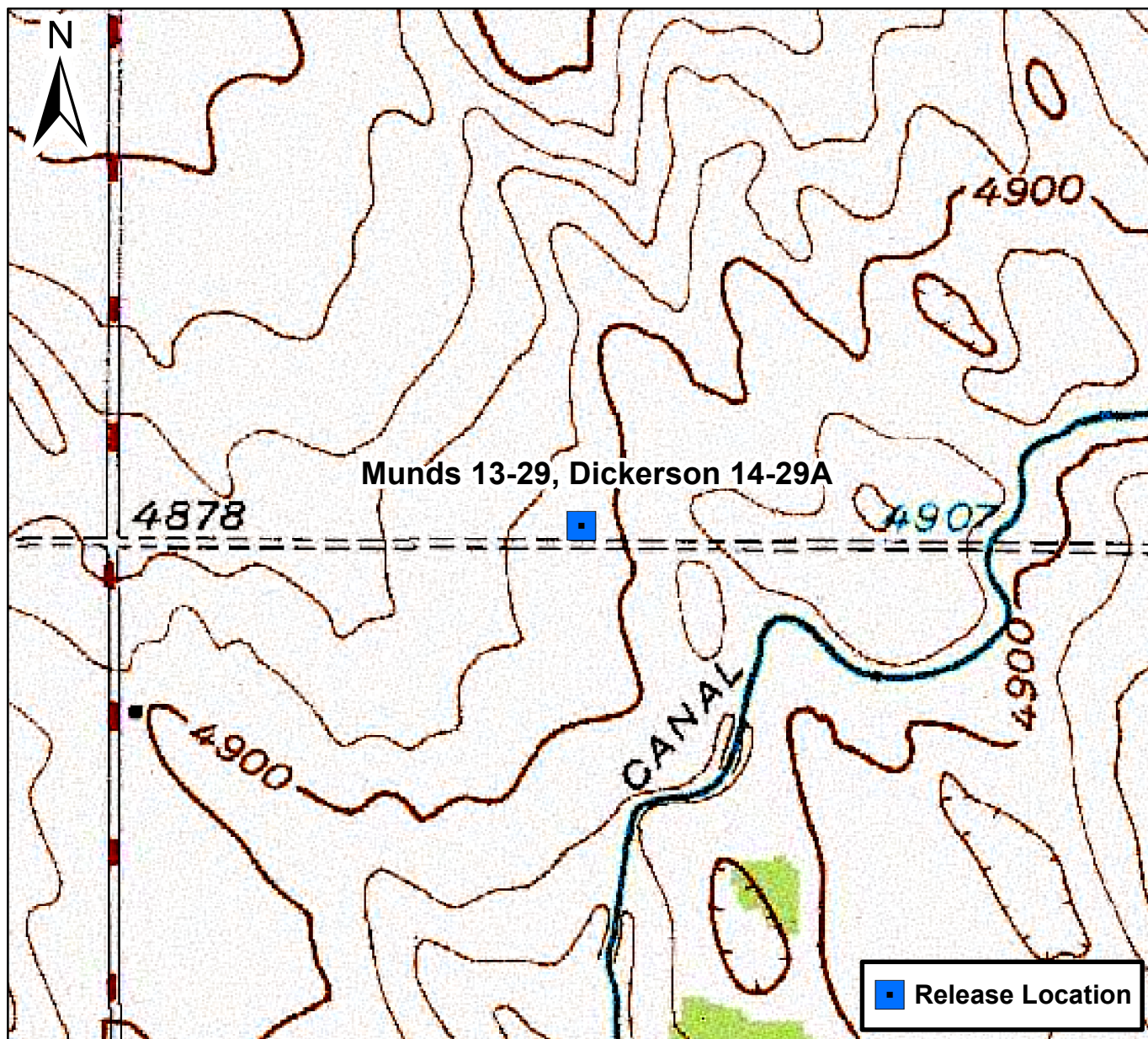
2. The surrogate recovery for 1,2-Dichloroethane-d4 and/or 4-Bromofluorobenzene in this sample cannot be accurately quantified due to interference from coeluting organic compounds present in the sample extract.

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

Soil standards referenced from COGCC Table 910-1

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

FIGURES

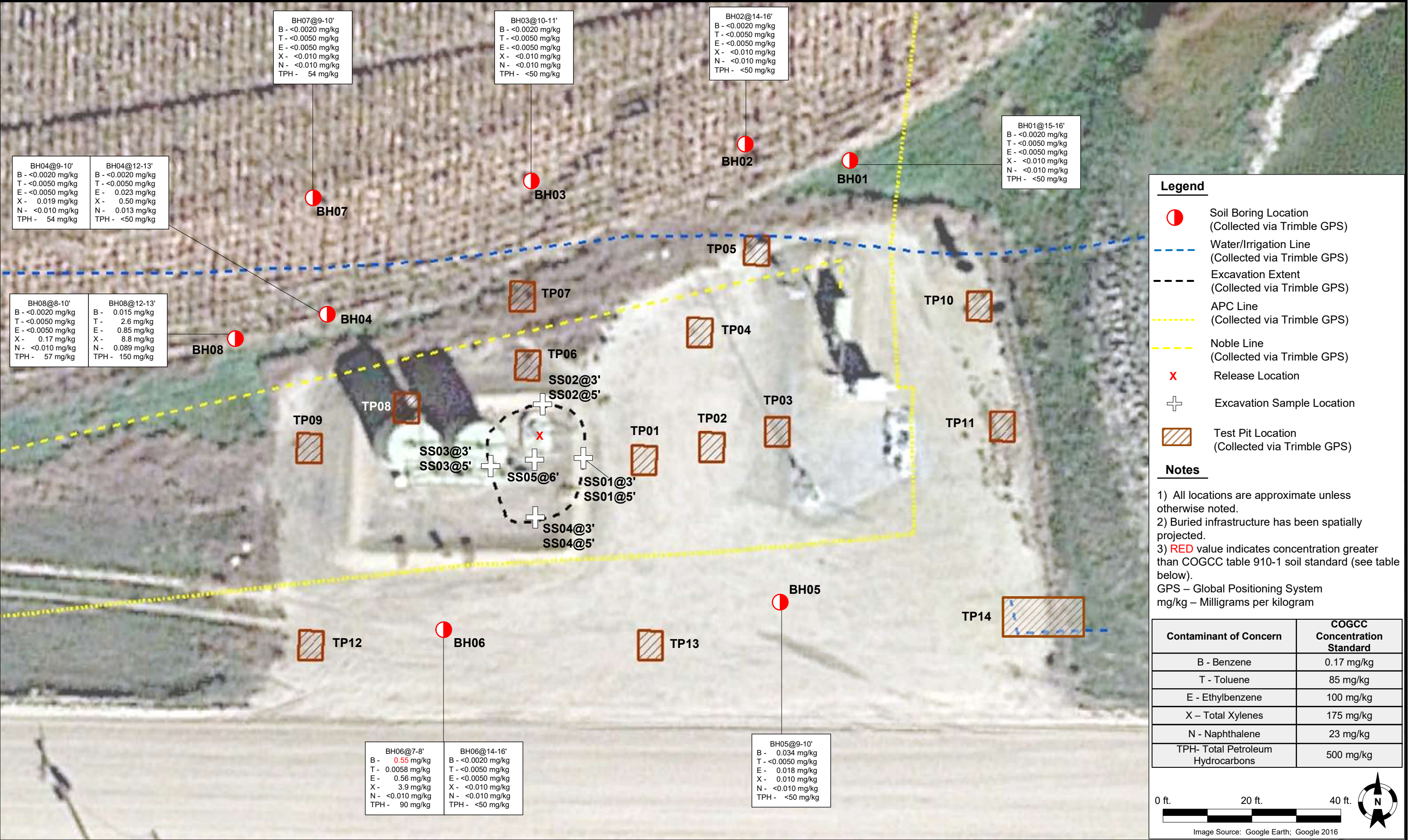


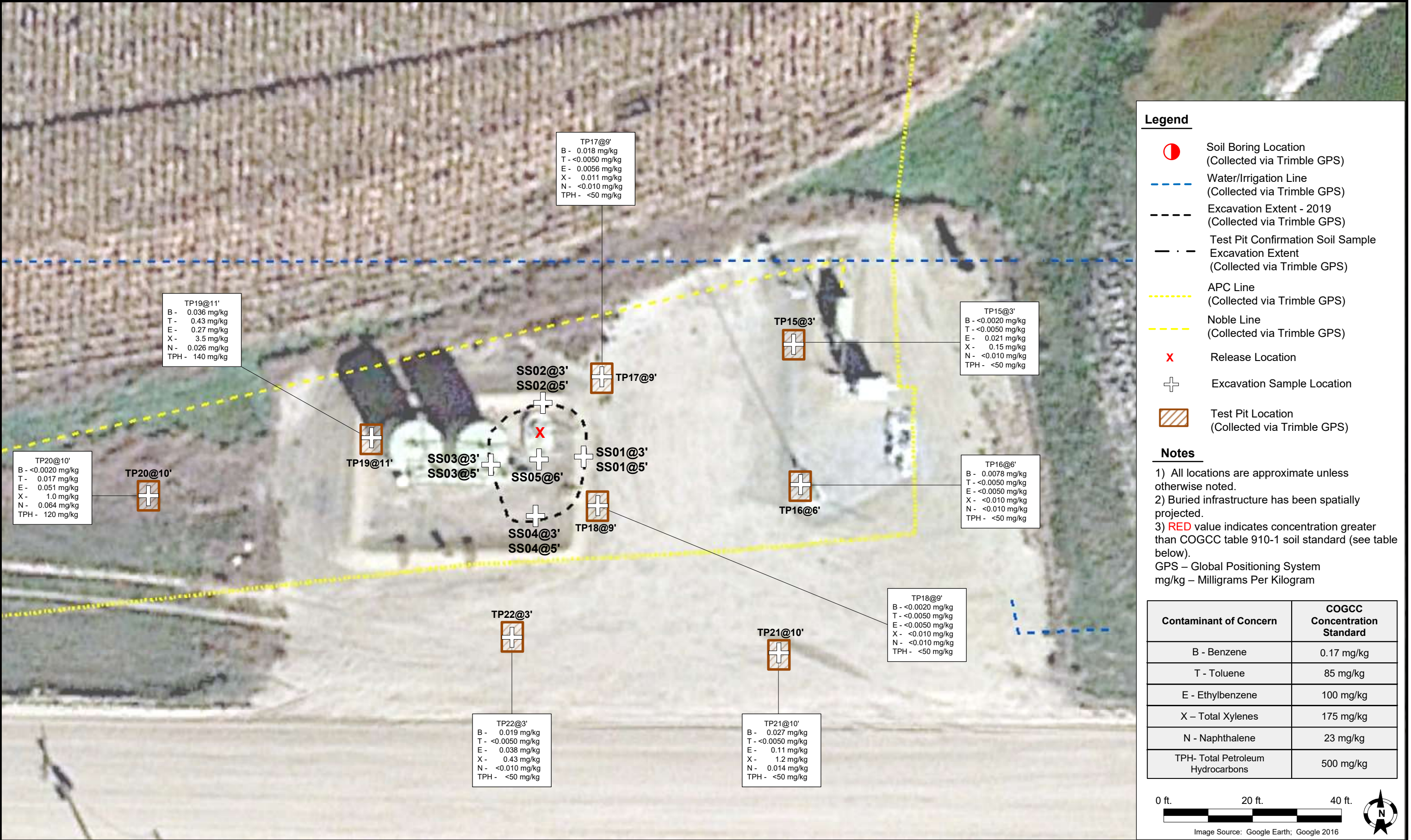
0 750 1,500 Feet

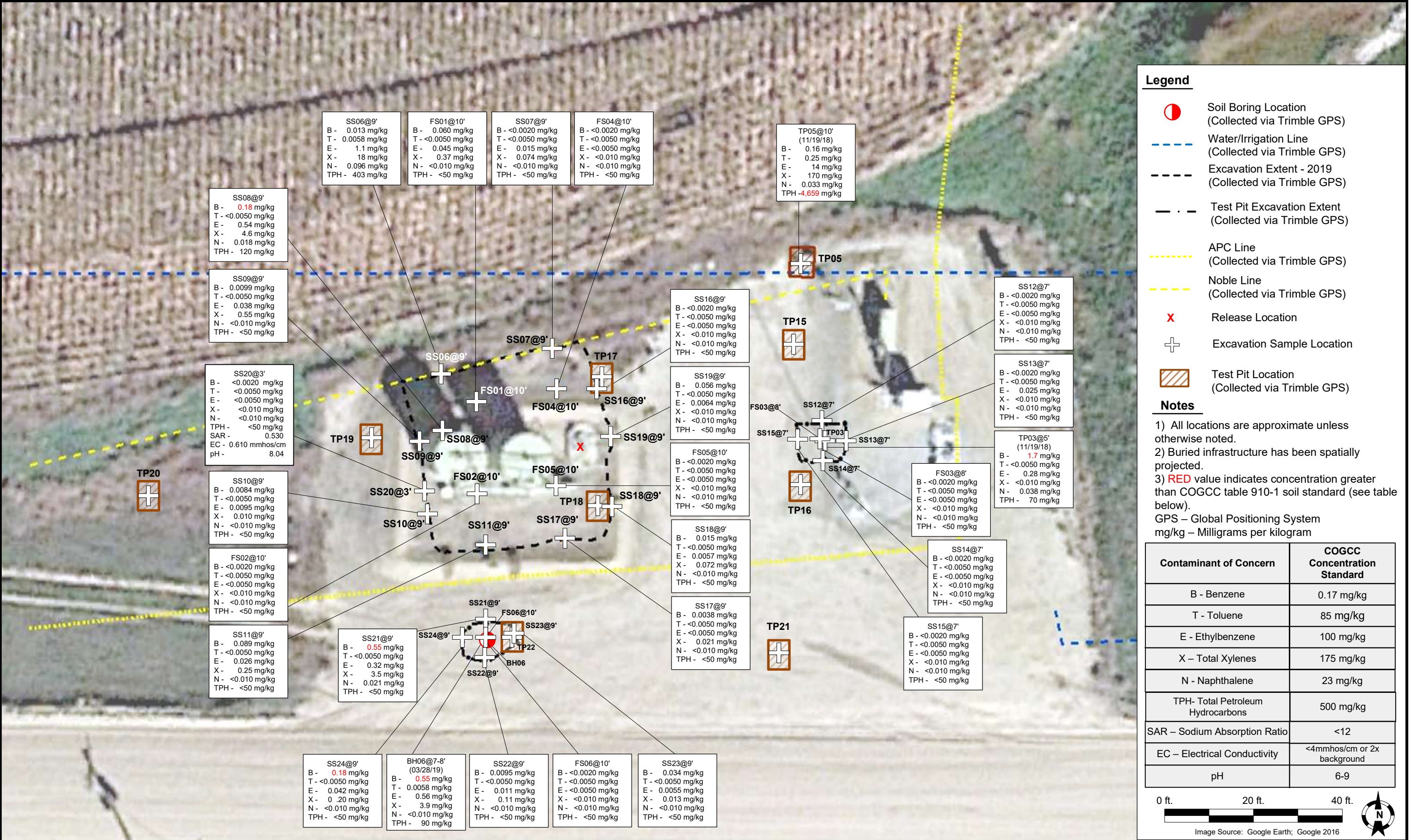
Figure 1

Site Location Map
Munds 13-29, Dickerson 14-29A
SESW S29 T4N R65W
Weld County, Colorado









ATTACHMENT A

BORING LOGS



6899 Pecos Street, Unit C
Denver, Colorado 80221

CLIENT: Noble Energy

LOGGED BY: Max Garza

PROJECT MANAGER: Brandon Bruns

DRILLING CONTRACTOR: Tasman Geosciences

DRILLING EQUIPMENT: PowerProbe

DRILL BIT SIZE (INCHES): 2.375"

DATE STARTED - COMPLETED: 3/28/19 - 3/28/19

TOTAL WELL DEPTH (FT. BGS): 16

DEPTH TO WATER (FT. BGS): ND

Munds 13-29, Dickerson 14-29A

BORING / WELL ID: BH01

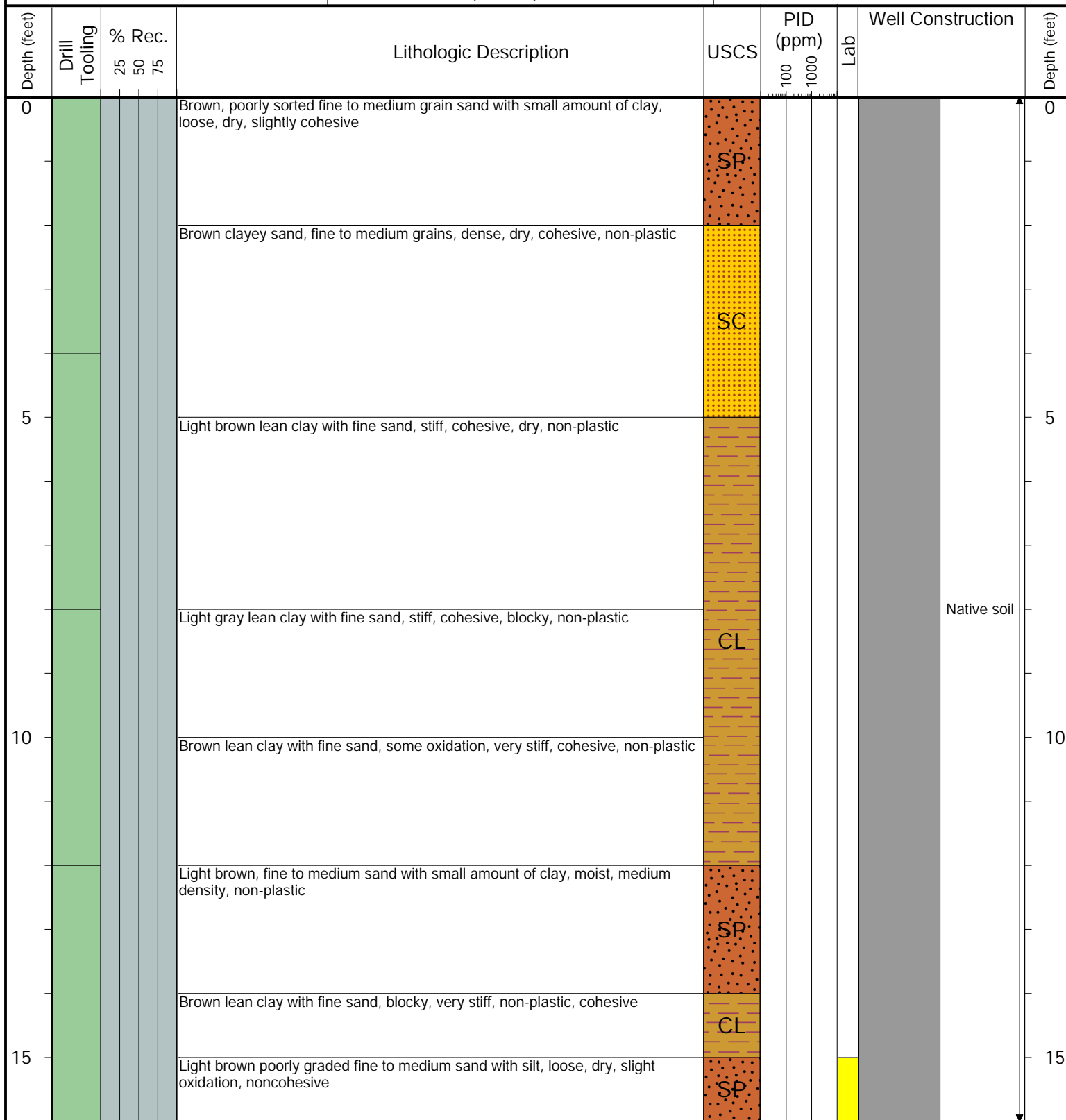
LOCATION: Weld County, Colorado

LATITUDE (WGS 84): 40.276524258866

LONGITUDE (WGS 84): -104.68980760195

CASING ELEVATION (FT. AMSL): NM

GROUND ELEVATION (FT. AMSL): NM



Drilling / Sample Method:

Macro-Core

Hollow Stem Auger

Solid Stem Auger

Hand Auger

Laboratory Sample Types:

Geotechnical Lab

Analytical Chemistry Lab

Geotechnical & Analytical Chemistry Lab



6899 Pecos Street, Unit C
Denver, Colorado 80221

CLIENT: Noble Energy

LOGGED BY: Max Garza

PROJECT MANAGER: Brandon Bruns

DRILLING CONTRACTOR: Tasman Geosciences

DRILLING EQUIPMENT: PowerProbe

DRILL BIT SIZE (INCHES): 2.375"

DATE STARTED - COMPLETED: 3/28/19 - 3/28/19

TOTAL WELL DEPTH (FT. BGS): 16

DEPTH TO WATER (FT. BGS): ND

Munds 13-29, Dickerson 14-29A

BORING / WELL ID: BH02

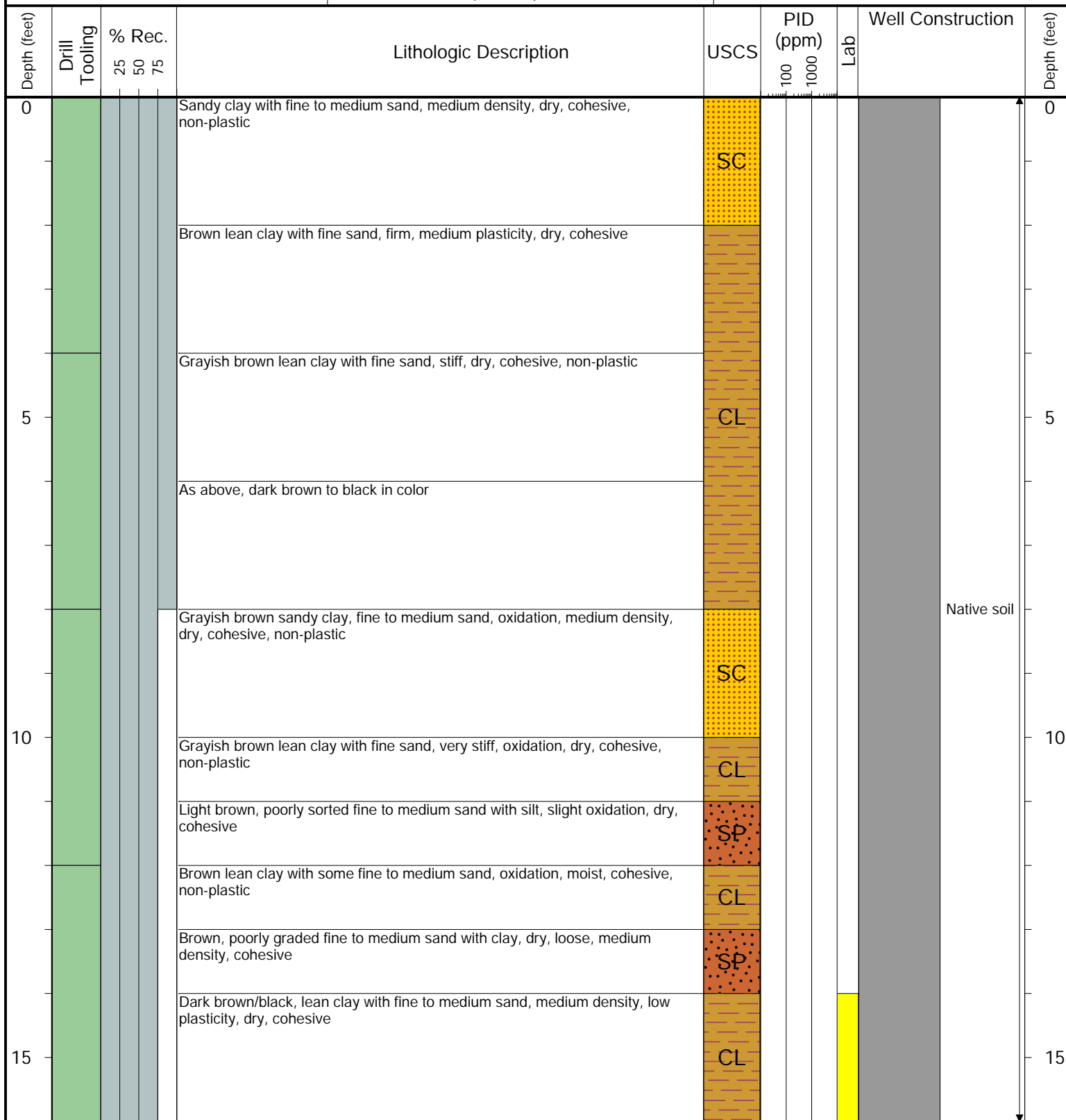
LOCATION: Weld County, Colorado

LATITUDE (WGS 84): 40.276510918696

LONGITUDE (WGS 84): -104.69006583377

CASING ELEVATION (FT. AMSL): NM

GROUND ELEVATION (FT. AMSL): NM



Drilling / Sample Method:

Macro-Core

Solid Stem Auger

Hollow Stem Auger

Hand Auger

Laboratory Sample Types:

Geotechnical Lab

Analytical Chemistry Lab

Geotechnical & Analytical Chemistry Lab



6899 Pecos Street, Unit C
Denver, Colorado 80221

CLIENT: Noble Energy

LOGGED BY: Max Garza

PROJECT MANAGER: Brandon Bruns

DRILLING CONTRACTOR: Tasman Geosciences

DRILLING EQUIPMENT: PowerProbe

DRILL BIT SIZE (INCHES): 2.375"

DATE STARTED - COMPLETED: 3/28/19 - 3/28/19

TOTAL WELL DEPTH (FT. BGS): 13

DEPTH TO WATER (FT. BGS): ND

Munds 13-29, Dickerson 14-29A

BORING / WELL ID: BH03

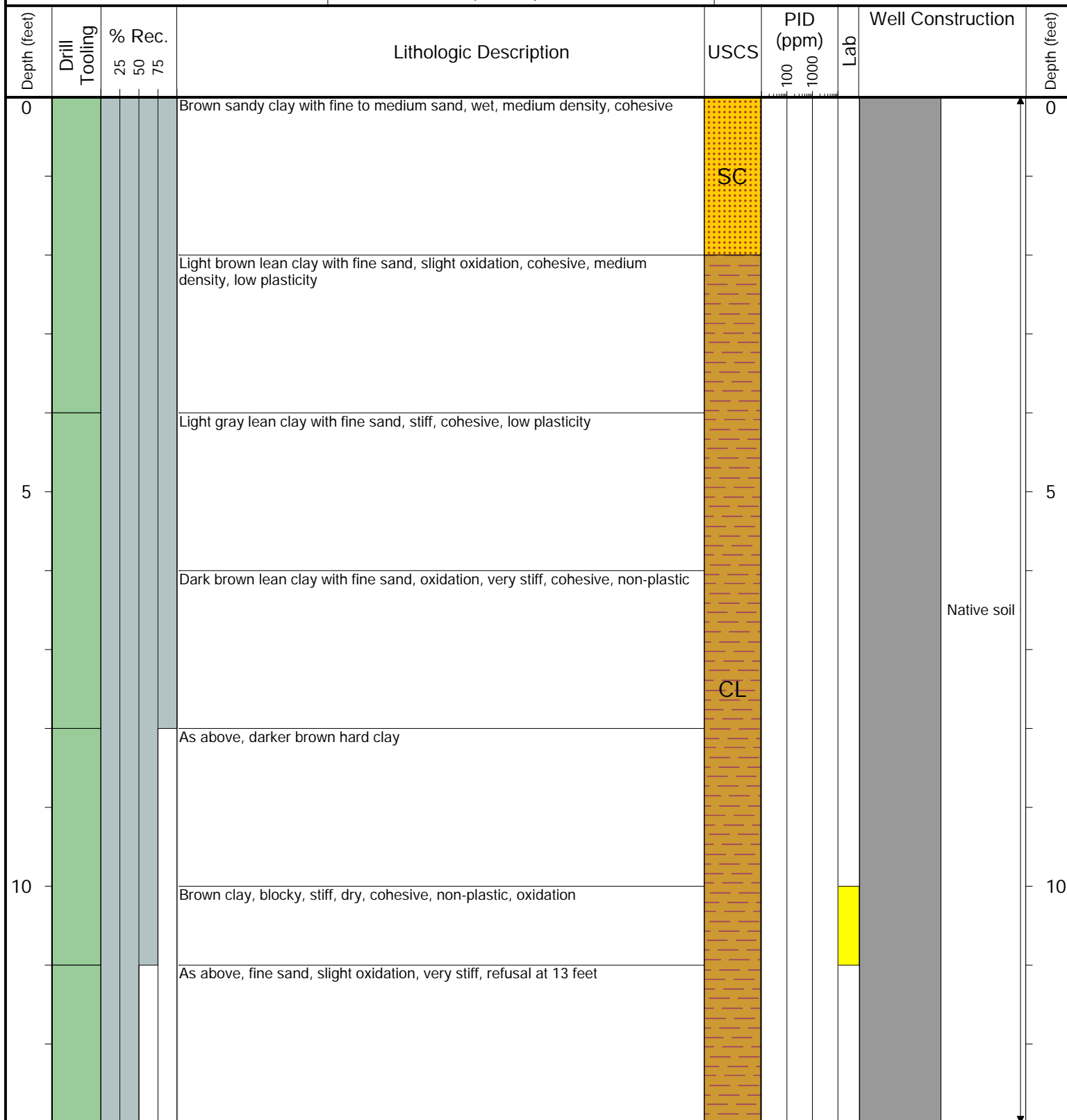
LOCATION: Weld County, Colorado

LATITUDE (WGS 84): 40.276535480787

LONGITUDE (WGS 84): -104.68989231762

CASING ELEVATION (FT. AMSL): NM

GROUND ELEVATION (FT. AMSL): NM



Drilling / Sample Method:

Macro-Core

Hollow Stem Auger

Solid Stem Auger

Hand Auger

Laboratory Sample Types:

Geotechnical Lab

Analytical Chemistry Lab

Geotechnical & Analytical Chemistry Lab



6899 Pecos Street, Unit C
Denver, Colorado 80221

CLIENT: Noble Energy

LOGGED BY: Max Garza

PROJECT MANAGER: Brandon Bruns

DRILLING CONTRACTOR: Tasman Geosciences

DRILLING EQUIPMENT: PowerProbe

DRILL BIT SIZE (INCHES): 2.375"

DATE STARTED - COMPLETED: 3/28/19 - 3/28/19

TOTAL WELL DEPTH (FT. BGS): 13

DEPTH TO WATER (FT. BGS): ND

Munds 13-29, Dickerson 14-29A

BORING / WELL ID: BH04

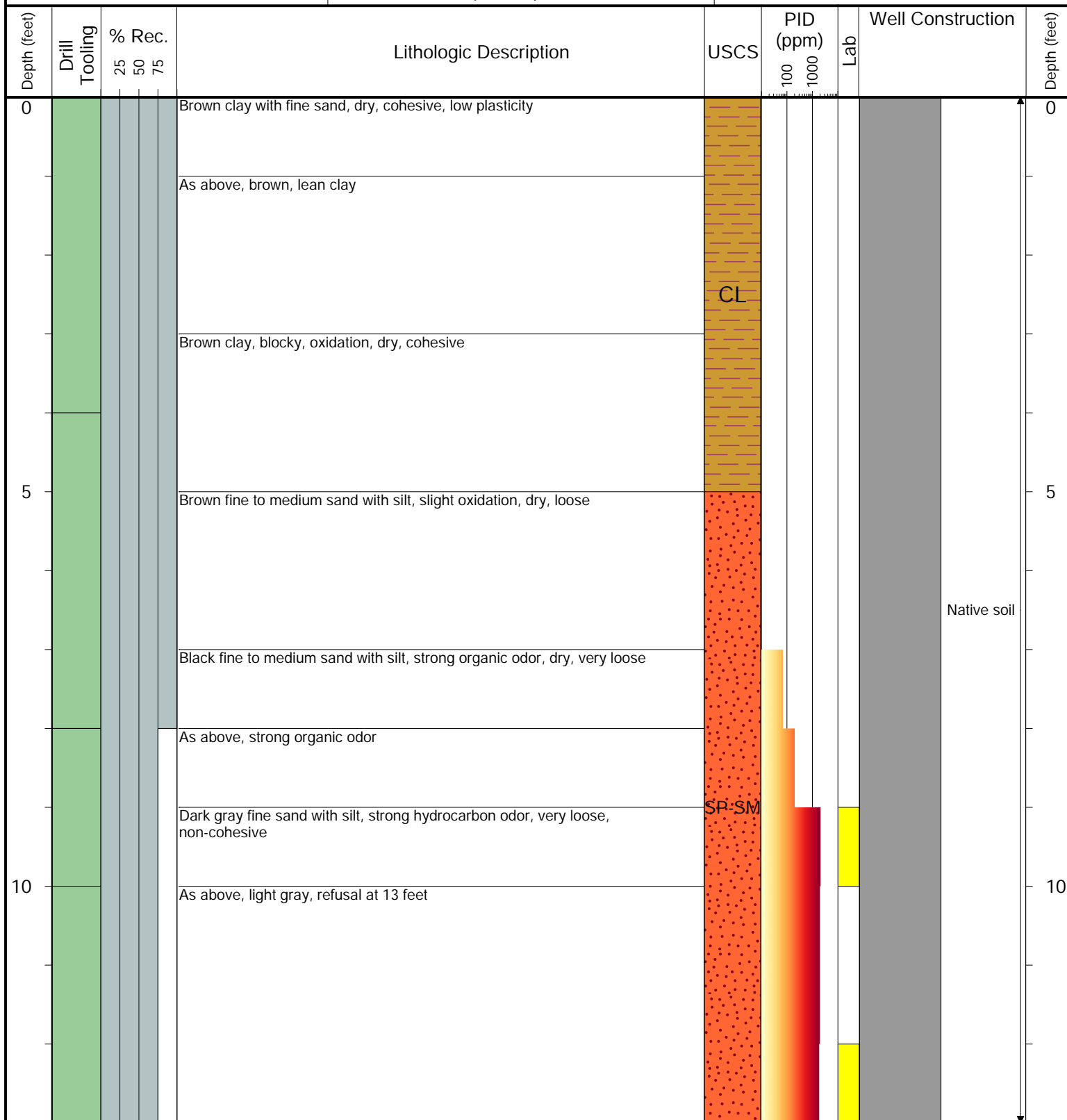
LOCATION: Weld County, Colorado

LATITUDE (WGS 84): 40.276430953676

LONGITUDE (WGS 84): -104.69022952436

CASING ELEVATION (FT. AMSL): NM

GROUND ELEVATION (FT. AMSL): NM



Drilling / Sample Method:

Macro-Core

Solid Stem Auger

Hollow Stem Auger

Hand Auger

Laboratory Sample Types:

Geotechnical Lab

Analytical Chemistry Lab

Geotechnical & Analytical Chemistry Lab



6899 Pecos Street, Unit C
Denver, Colorado 80221

CLIENT: Noble Energy

LOGGED BY: Max Garza

PROJECT MANAGER: Brandon Bruns

DRILLING CONTRACTOR: Tasman Geosciences

DRILLING EQUIPMENT: PowerProbe

DRILL BIT SIZE (INCHES): 2.375"

DATE STARTED - COMPLETED: 3/28/19 - 3/28/19

TOTAL WELL DEPTH (FT. BGS): 15

DEPTH TO WATER (FT. BGS): 4

Munds 13-29, Dickerson 14-29A

BORING / WELL ID: BH05

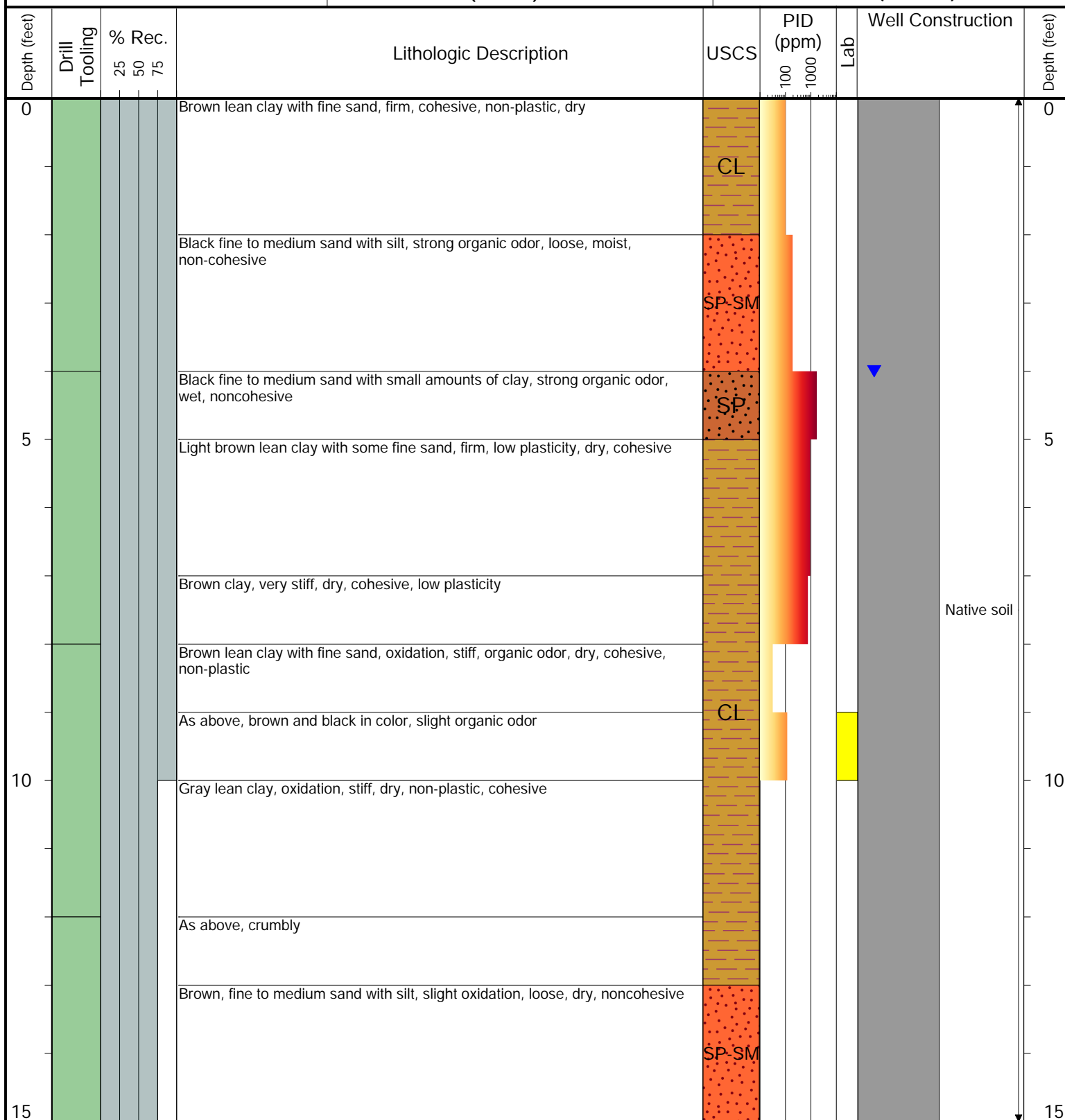
LOCATION: Weld County, Colorado

LATITUDE (WGS 84): 40.276501885256

LONGITUDE (WGS 84): -104.69024138076

CASING ELEVATION (FT. AMSL): NM

GROUND ELEVATION (FT. AMSL): NM



Drilling / Sample Method:

Macro-Core

Hollow Stem Auger

Solid Stem Auger

Hand Auger

Laboratory Sample Types:

Geotechnical Lab

Analytical Chemistry Lab

Geotechnical & Analytical Chemistry Lab



6899 Pecos Street, Unit C
Denver, Colorado 80221

CLIENT: Noble Energy

LOGGED BY: Max Garza

PROJECT MANAGER: Brandon Bruns

DRILLING CONTRACTOR: Tasman Geosciences

DRILLING EQUIPMENT: PowerProbe

DRILL BIT SIZE (INCHES): 2.375"

DATE STARTED - COMPLETED: 3/28/19 - 3/28/19

TOTAL WELL DEPTH (FT. BGS): 16

DEPTH TO WATER (FT. BGS): ND

Munds 13-29, Dickerson 14-29A

BORING / WELL ID: BH06

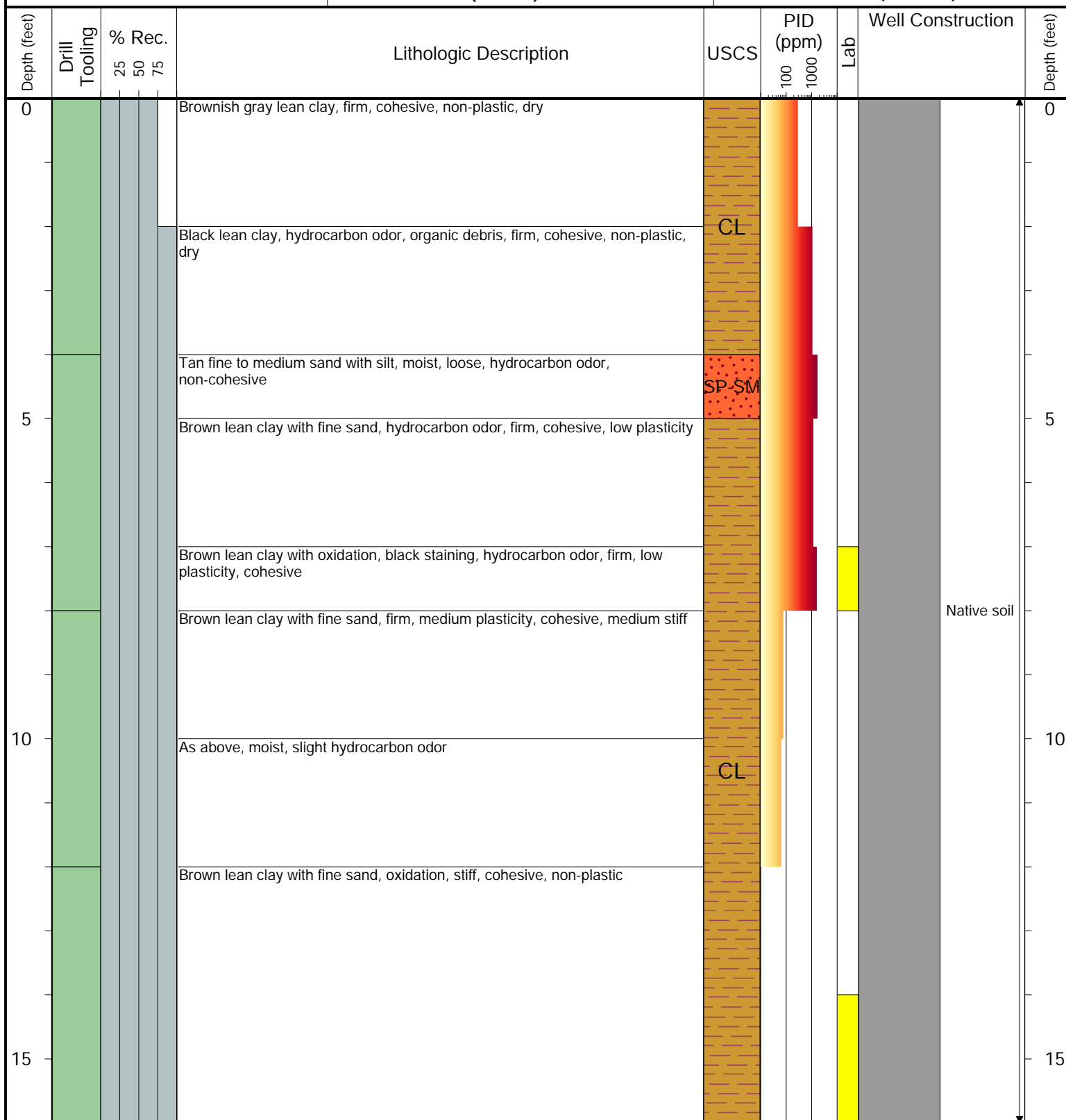
LOCATION: Weld County, Colorado

LATITUDE (WGS 84): 40.276415618172

LONGITUDE (WGS 84): -104.69030375789

CASING ELEVATION (FT. AMSL): NM

GROUND ELEVATION (FT. AMSL): NM



Drilling / Sample Method:

Macro-Core

Hollow Stem Auger

Solid Stem Auger

Hand Auger

Laboratory Sample Types:

Geotechnical Lab

Analytical Chemistry Lab

Geotechnical & Analytical Chemistry Lab



6899 Pecos Street, Unit C
Denver, Colorado 80221

CLIENT: Noble Energy

LOGGED BY: Max Garza

PROJECT MANAGER: Brandon Bruns

DRILLING CONTRACTOR: Tasman Geosciences

DRILLING EQUIPMENT: PowerProbe

DRILL BIT SIZE (INCHES): 2.375"

DATE STARTED - COMPLETED: 3/28/19 - 3/28/19

TOTAL WELL DEPTH (FT. BGS): 10

DEPTH TO WATER (FT. BGS): ND

Munds 13-29, Dickerson 14-29A

BORING / WELL ID: BH07

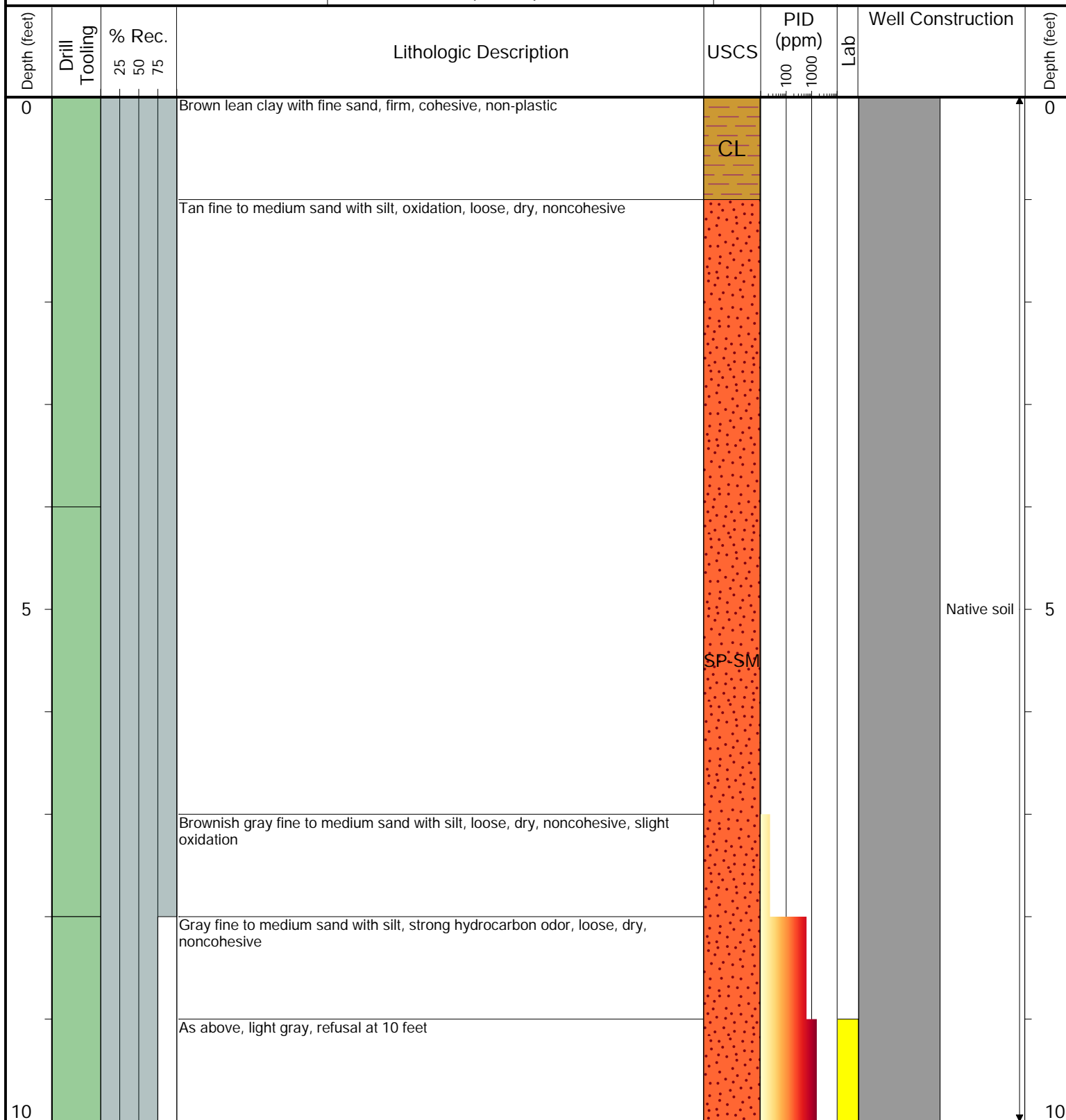
LOCATION: Weld County, Colorado

LATITUDE (WGS 84): 40.276235443752

LONGITUDE (WGS 84): -104.69013640078

CASING ELEVATION (FT. AMSL): NM

GROUND ELEVATION (FT. AMSL): NM



Drilling / Sample Method:

Macro-Core

Hollow Stem Auger

Solid Stem Auger

Hand Auger

Laboratory Sample Types:

Geotechnical Lab

Analytical Chemistry Lab

Geotechnical & Analytical Chemistry Lab



6899 Pecos Street, Unit C
Denver, Colorado 80221

CLIENT: Noble Energy

LOGGED BY: Max Garza

PROJECT MANAGER: Brandon Bruns

DRILLING CONTRACTOR: Tasman Geosciences

DRILLING EQUIPMENT: PowerProbe

DRILL BIT SIZE (INCHES): 2.375"

DATE STARTED - COMPLETED: 3/28/19 - 3/28/19

TOTAL WELL DEPTH (FT. BGS): 13

DEPTH TO WATER (FT. BGS): ND

Munds 13-29, Dickerson 14-29A

BORING / WELL ID: BH08

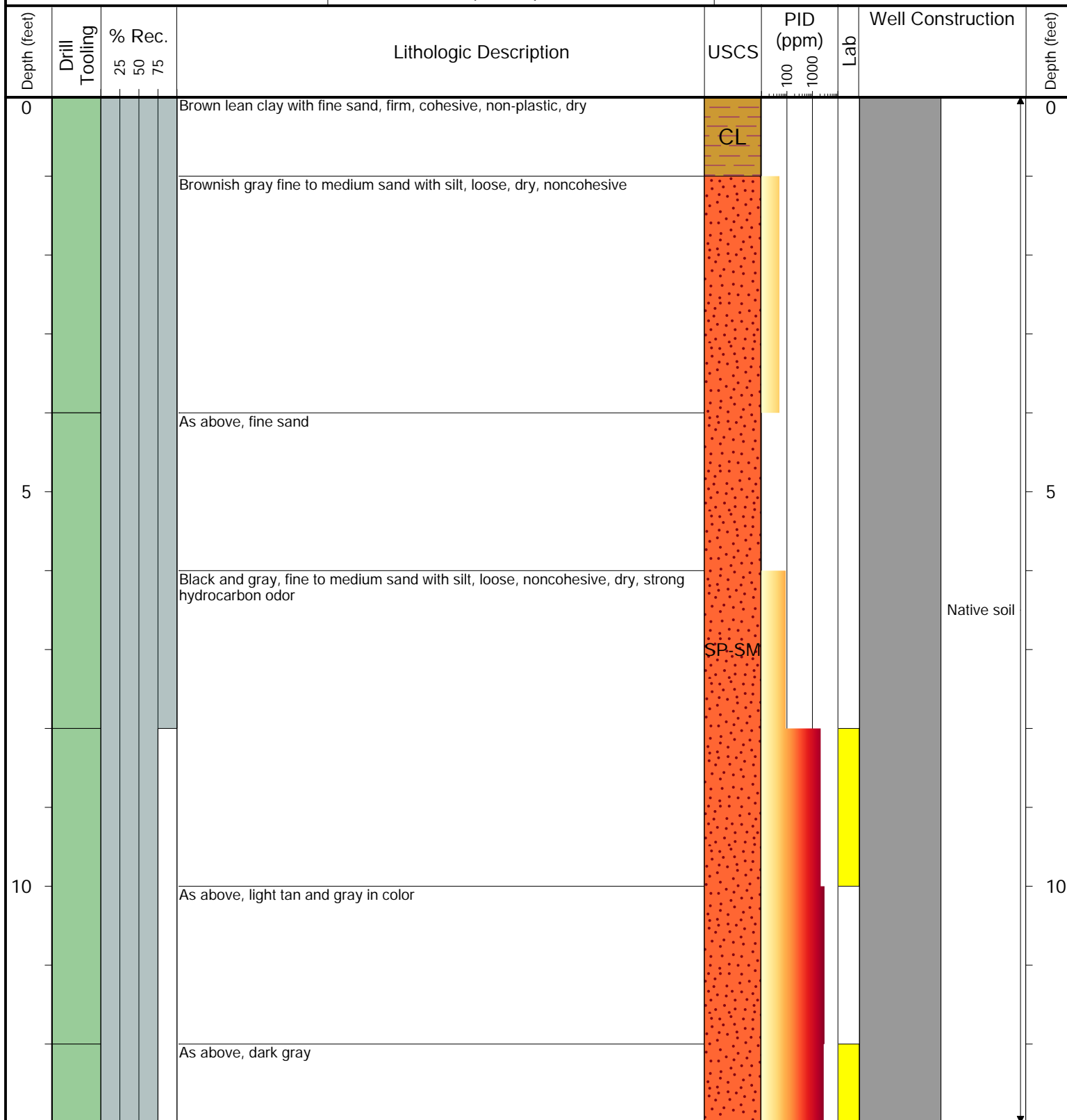
LOCATION: Weld County, Colorado

LATITUDE (WGS 84): 40.276251599439

LONGITUDE (WGS 84): -104.68986460069

CASING ELEVATION (FT. AMSL): NM

GROUND ELEVATION (FT. AMSL): NM



Drilling / Sample Method:

Macro-Core

Solid Stem Auger

Hollow Stem Auger

Hand Auger

Laboratory Sample Types:

Geotechnical Lab

Analytical Chemistry Lab

Geotechnical & Analytical Chemistry Lab

ATTACHMENT B

LABORATORY ANALYTICAL DATA REPORTS

Summit Scientific

4653 Table Mountain Drive, Golden, Colorado 80403

303.277.9310

June 27, 2019

Brandon Bruns

Tasman Geosciences

6899 Pecos St, Unit C

Denver, CO 80221

RE: Noble - Munds 13-29, Dickerson 14-29A

Work Order # 1906342

Enclosed are the results of analyses for samples received by Summit Scientific on 06/26/19 16:00. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

A handwritten signature in black ink, appearing to read 'P. Shrewsbury', with a stylized, cursive script.

Paul Shrewsbury For Ben Shrewsbury

Laboratory Manager



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

Project: Noble - Munds 13-29, Dickerson 14-29A

Project Number: [none]
Project Manager: Brandon Bruns

Reported:
06/27/19 06:46

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
TP15@3'	1906342-01	Soil	06/26/19 08:33	06/26/19 16:00
TP16@6'	1906342-02	Soil	06/26/19 08:54	06/26/19 16:00
TP17@9'	1906342-03	Soil	06/26/19 09:12	06/26/19 16:00
TP18@9'	1906342-04	Soil	06/26/19 09:31	06/26/19 16:00
TP19@11'	1906342-05	Soil	06/26/19 09:48	06/26/19 16:00
TP20@10'	1906342-06	Soil	06/26/19 10:14	06/26/19 16:00
TP21@6'	1906342-07	Soil	06/26/19 10:30	06/26/19 16:00
TP22@3'	1906342-08	Soil	06/26/19 10:52	06/26/19 16:00

Summit Scientific

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

Summit Scientific

S₂


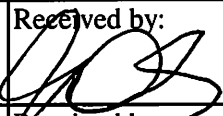
1906342

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

Page 1 of 1

Client: Noble / Tasman Project Manager: Brandon Bruns, Invoice: Jacob Evans
Address: 6899 Pecos Street E-Mail: Bbruns@tasman-geo.com
City/State/Zip: Denver / CO/ 80221
Phone: 303-487-1228 Project Name: Munds 13-29, Dickerson 14-29A
Sampler Name: GB & KC Project Number: -

ID	Sample Description	Date Sampled	Time Sampled	# of containers	Preservative				Matrix				Analysis Requested						Special Instructions
					HCl	HNO ₃	None	Other	Water	Soil	Air-Canister #	Other	\$260 BTEX	\$260B GBTEXN	\$8015 DRO	pH, EC, SAR			
1	TP15@3'	6/26/19	0833	1			X			X				X	X				
2	TP16@6'		0854	1															
3	TP17@9'		0912	1															
4	TP18@9'		0931	1															
5	TP19@11'		0948	1															
6	TP20@10'		1014	1															
7	TP21@6'		1030	1															
8	TP22@3'	↓	1052	1															
9																			
10																			

Relinquished by: 	Date/Time: 6/26/19 1500	Received by: Tasman's Lock Box	Date/Time: 6/26/19 1500	Turn Around Time (Check) Same Day <input checked="" type="checkbox"/> 72 hours ___ 24 hours ___ Standard ___ 48 hours ___	Notes:
Relinquished by: Tasman's Lock Box	Date/Time: 6-26-19 16:00	Received by: 	Date/Time: 6-26-19 16:00	Sample Integrity: Temperature Upon Receipt: 8.5°	
Relinquished by:	Date/Time:	Received by:	Date/Time:	Samples Intact: <input checked="" type="radio"/> Yes <input type="radio"/> No	

Sample Receipt Checklist

S2 Work Order 1906342

Client: Noble/Tasman

Client Project ID: Munds 13-29, Dickerson 14-29A

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

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

Temp (°C)	<u>8.5°</u>
-----------	-------------

Thermometer ID: 61857155-K

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

Additional Comments (if any):

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

Logan S
Custodian Printed Name or Initials

[Signature]
Signature of Custodian

6-26-19 16:00
Date/Time



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

Project: Noble - Munds 13-29, Dickerson 14-29A

Project Number: [none]
Project Manager: Brandon Bruns

Reported:
06/27/19 06:46

TP15@3'
1906342-01 (Soil)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **06/26/19 08:33**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	0.0020	mg/kg	1	1906389	06/26/19	06/26/19	EPA 8260B	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	0.021	0.0050	"	"	"	"	"	"	
Xylenes (total)	0.15	0.010	"	"	"	"	"	"	
Naphthalene	ND	0.010	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	50	"	"	"	"	"	"	

Date Sampled: **06/26/19 08:33**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		84.3 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		91.6 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		110 %	21-167		"	"	"	"	

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: **06/26/19 08:33**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	1906391	06/26/19	06/26/19	EPA 8015M	

Date Sampled: **06/26/19 08:33**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: o-Terphenyl		127 %	30-150		"	"	"	"	

Summit Scientific

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



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

Project: Noble - Munds 13-29, Dickerson 14-29A

Project Number: [none]
Project Manager: Brandon Bruns

Reported:
06/27/19 06:46

TP16@6'
1906342-02 (Soil)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **06/26/19 08:54**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Benzene	0.0078	0.0020	mg/kg	1	1906389	06/26/19	06/26/19	EPA 8260B	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	ND	0.0050	"	"	"	"	"	"	
Xylenes (total)	ND	0.010	"	"	"	"	"	"	
Naphthalene	ND	0.010	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	50	"	"	"	"	"	"	

Date Sampled: **06/26/19 08:54**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Surrogate: 1,2-Dichloroethane-d4		84.1 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		94.1 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		97.1 %	21-167		"	"	"	"	

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: **06/26/19 08:54**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
C10-C28 (DRO)	ND	50	mg/kg	1	1906391	06/26/19	06/26/19	EPA 8015M	

Date Sampled: **06/26/19 08:54**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Surrogate: o-Terphenyl		128 %	30-150		"	"	"	"	

Summit Scientific

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



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

Project: Noble - Munds 13-29, Dickerson 14-29A

Project Number: [none]
Project Manager: Brandon Bruns

Reported:
06/27/19 06:46

TP17@9'
1906342-03 (Soil)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **06/26/19 09:12**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	0.018	0.0020	mg/kg	1	1906389	06/26/19	06/26/19	EPA 8260B	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	0.0056	0.0050	"	"	"	"	"	"	
Xylenes (total)	0.011	0.010	"	"	"	"	"	"	
Naphthalene	ND	0.010	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	50	"	"	"	"	"	"	

Date Sampled: **06/26/19 09:12**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		84.2 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		93.4 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		94.3 %	21-167		"	"	"	"	

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: **06/26/19 09:12**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	1906391	06/26/19	06/26/19	EPA 8015M	

Date Sampled: **06/26/19 09:12**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: o-Terphenyl		134 %	30-150		"	"	"	"	

Summit Scientific

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



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

Project: Noble - Munds 13-29, Dickerson 14-29A

Project Number: [none]
Project Manager: Brandon Bruns

Reported:
06/27/19 06:46

TP18@9'
1906342-04 (Soil)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **06/26/19 09:31**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Benzene	ND	0.0020	mg/kg	1	1906389	06/26/19	06/26/19	EPA 8260B	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	ND	0.0050	"	"	"	"	"	"	
Xylenes (total)	ND	0.010	"	"	"	"	"	"	
Naphthalene	ND	0.010	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	50	"	"	"	"	"	"	

Date Sampled: **06/26/19 09:31**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Surrogate: 1,2-Dichloroethane-d4		80.6 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		94.6 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		95.2 %	21-167		"	"	"	"	

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: **06/26/19 09:31**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
C10-C28 (DRO)	ND	50	mg/kg	1	1906391	06/26/19	06/26/19	EPA 8015M	

Date Sampled: **06/26/19 09:31**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Surrogate: o-Terphenyl		128 %	30-150		"	"	"	"	

Summit Scientific

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



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

Project: Noble - Munds 13-29, Dickerson 14-29A

Project Number: [none]
Project Manager: Brandon Bruns

Reported:
06/27/19 06:46

TP19@11'
1906342-05 (Soil)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **06/26/19 09:48**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Benzene	0.036	0.0020	mg/kg	1	1906389	06/26/19	06/26/19	EPA 8260B	
Toluene	0.43	0.0050	"	"	"	"	"	"	
Ethylbenzene	0.27	0.0050	"	"	"	"	"	"	
Xylenes (total)	3.5	0.10	"	10	"	"	"	"	
Naphthalene	0.026	0.010	"	1	"	"	"	"	
Gasoline Range Hydrocarbons	140	50	"	"	"	"	"	"	

Date Sampled: **06/26/19 09:48**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
<i>Surrogate: 1,2-Dichloroethane-d4</i>		118 %	23-173		"	"	"	"	
<i>Surrogate: Toluene-d8</i>		95.6 %	20-170		"	"	"	"	
<i>Surrogate: 4-Bromofluorobenzene</i>		136 %	21-167		"	"	"	"	

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: **06/26/19 09:48**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
C10-C28 (DRO)	ND	50	mg/kg	1	1906391	06/26/19	06/26/19	EPA 8015M	

Date Sampled: **06/26/19 09:48**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
<i>Surrogate: o-Terphenyl</i>		128 %	30-150		"	"	"	"	

Summit Scientific

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



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

Project: Noble - Munds 13-29, Dickerson 14-29A

Project Number: [none]
Project Manager: Brandon Bruns

Reported:
06/27/19 06:46

TP20@10'
1906342-06 (Soil)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **06/26/19 10:14**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	0.0020	mg/kg	1	1906389	06/26/19	06/27/19	EPA 8260B	
Toluene	0.017	0.0050	"	"	"	"	"	"	
Ethylbenzene	0.051	0.0050	"	"	"	"	"	"	
Xylenes (total)	1.0	0.010	"	"	"	"	"	"	
Naphthalene	0.064	0.010	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	50	"	"	"	"	"	"	

Date Sampled: **06/26/19 10:14**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		82.6 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		90.4 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		164 %	21-167		"	"	"	"	

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: **06/26/19 10:14**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	120	50	mg/kg	1	1906391	06/26/19	06/26/19	EPA 8015M	

Date Sampled: **06/26/19 10:14**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: o-Terphenyl		118 %	30-150		"	"	"	"	

Summit Scientific

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



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

Project: Noble - Munds 13-29, Dickerson 14-29A

Project Number: [none]
Project Manager: Brandon Bruns

Reported:
06/27/19 06:46

TP21@6'
1906342-07 (Soil)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **06/26/19 10:30**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Benzene	0.027	0.0020	mg/kg	1	1906389	06/26/19	06/27/19	EPA 8260B	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	0.11	0.0050	"	"	"	"	"	"	
Xylenes (total)	1.2	0.010	"	"	"	"	"	"	
Naphthalene	0.014	0.010	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	50	"	"	"	"	"	"	

Date Sampled: **06/26/19 10:30**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
<i>Surrogate: 1,2-Dichloroethane-d4</i>		86.2 %	23-173		"	"	"	"	
<i>Surrogate: Toluene-d8</i>		93.4 %	20-170		"	"	"	"	
<i>Surrogate: 4-Bromofluorobenzene</i>		107 %	21-167		"	"	"	"	

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: **06/26/19 10:30**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
C10-C28 (DRO)	ND	50	mg/kg	1	1906391	06/26/19	06/26/19	EPA 8015M	

Date Sampled: **06/26/19 10:30**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
<i>Surrogate: o-Terphenyl</i>		122 %	30-150		"	"	"	"	

Summit Scientific

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



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

Project: Noble - Munds 13-29, Dickerson 14-29A

Project Number: [none]
Project Manager: Brandon Bruns

Reported:
06/27/19 06:46

TP22@3'
1906342-08 (Soil)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **06/26/19 10:52**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Benzene	0.019	0.0020	mg/kg	1	1906389	06/26/19	06/27/19	EPA 8260B	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	0.038	0.0050	"	"	"	"	"	"	
Xylenes (total)	0.43	0.010	"	"	"	"	"	"	
Naphthalene	ND	0.010	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	50	"	"	"	"	"	"	

Date Sampled: **06/26/19 10:52**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Surrogate: 1,2-Dichloroethane-d4		84.5 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		90.2 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		106 %	21-167		"	"	"	"	

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: **06/26/19 10:52**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
C10-C28 (DRO)	ND	50	mg/kg	1	1906391	06/26/19	06/26/19	EPA 8015M	

Date Sampled: **06/26/19 10:52**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Surrogate: o-Terphenyl		115 %	30-150		"	"	"	"	

Summit Scientific

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



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

Project: Noble - Munds 13-29, Dickerson 14-29A

Project Number: [none]
Project Manager: Brandon Brunns

Reported:
06/27/19 06:46

Volatile Organic Compounds by EPA Method 8260B - Quality Control

Summit Scientific

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

Batch 1906389 - EPA 5030 Soil MS

Blank (1906389-BLK1)

Prepared: 06/26/19 Analyzed: 06/27/19

Benzene	ND	0.0020	mg/kg							
Toluene	ND	0.0050	"							
Ethylbenzene	ND	0.0050	"							
Xylenes (total)	ND	0.010	"							
Naphthalene	ND	0.010	"							
Gasoline Range Hydrocarbons	ND	50	"							
Surrogate: 1,2-Dichloroethane-d4	0.0312		"	0.0400		78.0		23-173		
Surrogate: Toluene-d8	0.0374		"	0.0400		93.4		20-170		
Surrogate: 4-Bromofluorobenzene	0.0372		"	0.0400		93.0		21-167		

LCS (1906389-BS1)

Prepared: 06/26/19 Analyzed: 06/27/19

Benzene	0.111	0.0020	mg/kg	0.100		111		70-130		
Toluene	0.111	0.0050	"	0.100		111		70-130		
Ethylbenzene	0.119	0.0050	"	0.100		119		70-130		
m,p-Xylene	0.241	0.010	"	0.200		121		70-130		
o-Xylene	0.118	0.0050	"	0.100		118		70-130		
Surrogate: 1,2-Dichloroethane-d4	0.0312		"	0.0400		78.1		23-173		
Surrogate: Toluene-d8	0.0375		"	0.0400		93.8		20-170		
Surrogate: 4-Bromofluorobenzene	0.0369		"	0.0400		92.3		21-167		

Matrix Spike (1906389-MS1)

Source: 1906342-01

Prepared: 06/26/19 Analyzed: 06/27/19

Benzene	0.116	0.0020	mg/kg	0.100	ND	116		70-130		
Toluene	0.114	0.0050	"	0.100	ND	114		70-130		
Ethylbenzene	0.126	0.0050	"	0.100	0.0212	105		70-130		
m,p-Xylene	0.315	0.010	"	0.200	0.152	81.3		70-130		
o-Xylene	0.124	0.0050	"	0.100	ND	124		70-130		
Surrogate: 1,2-Dichloroethane-d4	0.0338		"	0.0400		84.4		23-173		
Surrogate: Toluene-d8	0.0372		"	0.0400		92.9		20-170		
Surrogate: 4-Bromofluorobenzene	0.0373		"	0.0400		93.2		21-167		

Summit Scientific

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



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

Project: Noble - Munds 13-29, Dickerson 14-29A

Project Number: [none]
Project Manager: Brandon Brunns

Reported:
06/27/19 06:46

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

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

Batch 1906389 - EPA 5030 Soil MS

Matrix Spike Dup (1906389-MSD1)	Source: 1906342-01			Prepared: 06/26/19 Analyzed: 06/27/19						
Benzene	0.112	0.0020	mg/kg	0.100	ND	112	70-130	3.71	30	
Toluene	0.114	0.0050	"	0.100	ND	114	70-130	0.0526	30	
Ethylbenzene	0.126	0.0050	"	0.100	0.0212	104	70-130	0.286	30	
m,p-Xylene	0.316	0.010	"	0.200	0.152	81.8	70-130	0.266	30	
o-Xylene	0.122	0.0050	"	0.100	ND	122	70-130	1.34	30	
Surrogate: 1,2-Dichloroethane-d4	0.0350		"	0.0400		87.6	23-173			
Surrogate: Toluene-d8	0.0338		"	0.0400		84.6	20-170			
Surrogate: 4-Bromofluorobenzene	0.0401		"	0.0400		100	21-167			

Summit Scientific

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



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

Project: Noble - Munds 13-29, Dickerson 14-29A

Project Number: [none]
Project Manager: Brandon Bruns

Reported:
06/27/19 06:46

Extractable Petroleum Hydrocarbons by 8015 - Quality Control
Summit Scientific

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

Batch 1906391 - EPA 3550A

Blank (1906391-BLK1)

Prepared: 06/26/19 Analyzed: 06/27/19

C10-C28 (DRO) ND 50 mg/kg

LCS (1906391-BS1)

Prepared: 06/26/19 Analyzed: 06/27/19

C10-C28 (DRO) 542 50 mg/kg 500 108 70-130

Matrix Spike (1906391-MS1)

Source: 1906342-01

Prepared: 06/26/19 Analyzed: 06/27/19

C10-C28 (DRO) 601 50 mg/kg 500 45.7 111 70-130

Matrix Spike Dup (1906391-MSD1)

Source: 1906342-01

Prepared: 06/26/19 Analyzed: 06/27/19

C10-C28 (DRO) 599 50 mg/kg 500 45.7 111 70-130 0.216 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.



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

Project: Noble - Munds 13-29, Dickerson 14-29A

Project Number: [none]
Project Manager: Brandon Bruns

Reported:
06/27/19 06:46

Notes and Definitions

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

Summit Scientific

4653 Table Mountain Drive, Golden, Colorado 80403

303.277.9310

June 28, 2019

Brandon Bruns

Tasman Geosciences

6899 Pecos St, Unit C

Denver, CO 80221

RE: Noble - Munds 13-29, Dickerson 14-29A

Work Order # 1906364

Enclosed are the results of analyses for samples received by Summit Scientific on 06/27/19 17:57. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

A handwritten signature in black ink, reading "Muri Premier". The signature is written in a cursive style with a large, stylized "M" and a long, sweeping underline.

Muri Premier For Ben Shrewsbury

Laboratory Manager



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

Project: Noble - Munds 13-29, Dickerson 14-29A

Project Number: [none]
Project Manager: Brandon Bruns

Reported:
06/28/19 15:57

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
SS06@9'	1906364-01	Soil	06/27/19 10:35	06/27/19 17:57
FS01@10'	1906364-02	Soil	06/27/19 11:35	06/27/19 17:57
SS07@9'	1906364-03	Soil	06/27/19 11:41	06/27/19 17:57
SS08@9'	1906364-04	Soil	06/27/19 13:15	06/27/19 17:57

This report has been edited from the original.

Sample ID's have been changed.

Sample SS07@10' has been changed to FS01@10'

Sample ID SS08@9' has been changed to SS07@9'

Sample ID SS09@9' has been changed to SS08@9'

by request of GB on 6/28/2019

Summit Scientific

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

Summit Scientific

S₂

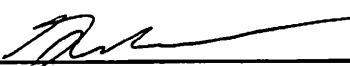

1906364

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

Page 1 of 1

Client: Noble / Tasman Project Manager: Brandon Bruns, Invoice: Jacob Evans
Address: 6899 Pecos Street E-Mail: Bbruns@tasman-geo.com
City/State/Zip: Denver / CO/ 80221
Phone: 303-487-1228 Project Name: Munds 13-29, Dickerson 14-29A
Sampler Name: GB Project Number:

ID	Sample Description	Date Sampled	Time Sampled	# of containers	Preservative				Matrix				Analysis Requested						Special Instructions	
					HCl	HNO ₃	None	Other	Water	Soil	Air-Canister #	Other	8260 BTEX	8260B GBTEXN	8015 DRO	pH, EC, SAR				
1	SS06 @ 9'	6/27/19	1035	1			X			X				X	X					
2	SS07 @ 10'		1135	1			X			X				X	X					
3	SS08 @ 9'		1141	1			X			X				X	X					
4	SS09 @ 9'		1315	1			X			X				X	X					
5																				
6																				
7																				
8																				
9																				
10																				

Relinquished by:	Date/Time:	Received by:	Date/Time:	Turn Around Time	(Check)	Notes:
	6/27/19 1600	Tasman's Lock Box	6/27/19 1600	Same Day	X 72 hours	
Relinquished by:	Date/Time:	Received by:	Date/Time:	24 hours	Standard	
Tasman's Lock Box	6/27/19 1730		06/27/19 1730	48 hours		
Relinquished by:	Date/Time:	Received by:	Date/Time:	Sample Integrity:		
				Temperature Upon Receipt:	33	
				Samples Intact:	Yes No	

Sample Receipt Checklist

S2 Work Order 1906364

Client: Noble/Tasman Client Project ID: Munds 13-29, Dickerson 14-29A

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

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

Temp (°C)	<u>3.3</u>
-----------	------------

Thermometer ID: 61857155-K

	Yes	No	N/A	Comments (if any)
If samples require cooling, was the temperature at 4°C +/- 2°C ⁽¹⁾ ?				
NOTE: If samples are delivered the same day of sampling, this requirement is met provided that there is evidence that cooling has begun.	<u>X</u>			
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 samples with holding times due within 48 hours sample due within 48 hours present?	<u>X</u>			<u>SAME DAY TAT</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⁾ ?				
Note the type of preservative in the Comments column – HCl, H2SO4, NaOH, HNO3, ect			<u>X</u>	
If samples are acid preserved for metals, is the pH ≤ 2 ⁽¹⁾ ?			<u>X</u>	
Record the pH in Comments.			<u>X</u>	
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.

Custodian Printed Name or Initials

Signature of Custodian

Date/Time

06/27/19
1810



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

Project: Noble - Munds 13-29, Dickerson 14-29A

Project Number: [none]
Project Manager: Brandon Bruns

Reported:
06/28/19 15:57

SS06@9'
1906364-01 (Soil)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **06/27/19 10:35**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	0.013	0.0020	mg/kg	1	1906414	06/27/19	06/28/19	EPA 8260B	
Toluene	0.0058	0.0050	"	"	"	"	"	"	
Ethylbenzene	1.1	0.50	"	100	"	"	"	"	
Xylenes (total)	18	1.0	"	"	"	"	"	"	
Naphthalene	0.096	0.010	"	1	"	"	"	"	
Gasoline Range Hydrocarbons	310	50	"	100	"	"	"	"	

Date Sampled: **06/27/19 10:35**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		94.4 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		100 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		109 %	21-167		"	"	"	"	

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: **06/27/19 10:35**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	93	50	mg/kg	1	1906415	06/27/19	06/27/19	EPA 8015M	

Date Sampled: **06/27/19 10:35**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: o-Terphenyl		100 %	30-150		"	"	"	"	

Summit Scientific

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

Project: Noble - Munds 13-29, Dickerson 14-29A

Project Number: [none]
Project Manager: Brandon Bruns

Reported:
06/28/19 15:57

FS01@10'
1906364-02 (Soil)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **06/27/19 11:35**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Benzene	0.060	0.0020	mg/kg	1	1906414	06/27/19	06/27/19	EPA 8260B	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	0.045	0.0050	"	"	"	"	"	"	
Xylenes (total)	0.37	0.010	"	"	"	"	"	"	
Naphthalene	ND	0.010	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	50	"	"	"	"	"	"	

Date Sampled: **06/27/19 11:35**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Surrogate: 1,2-Dichloroethane-d4		94.9 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		99.4 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		108 %	21-167		"	"	"	"	

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: **06/27/19 11:35**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
C10-C28 (DRO)	ND	50	mg/kg	1	1906415	06/27/19	06/27/19	EPA 8015M	

Date Sampled: **06/27/19 11:35**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Surrogate: o-Terphenyl		99.9 %	30-150		"	"	"	"	

Summit Scientific

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



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

Project: Noble - Munds 13-29, Dickerson 14-29A

Project Number: [none]
Project Manager: Brandon Bruns

Reported:
06/28/19 15:57

SS07@9'
1906364-03 (Soil)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **06/27/19 11:41**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Benzene	ND	0.0020	mg/kg	1	1906414	06/27/19	06/27/19	EPA 8260B	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	0.015	0.0050	"	"	"	"	"	"	
Xylenes (total)	0.074	0.010	"	"	"	"	"	"	
Naphthalene	ND	0.010	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	50	"	"	"	"	"	"	

Date Sampled: **06/27/19 11:41**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Surrogate: 1,2-Dichloroethane-d4		98.7 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		100 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		108 %	21-167		"	"	"	"	

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: **06/27/19 11:41**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
C10-C28 (DRO)	ND	50	mg/kg	1	1906415	06/27/19	06/27/19	EPA 8015M	

Date Sampled: **06/27/19 11:41**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Surrogate: o-Terphenyl		107 %	30-150		"	"	"	"	

Summit Scientific

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



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

Project: Noble - Munds 13-29, Dickerson 14-29A

Project Number: [none]
Project Manager: Brandon Bruns

Reported:
06/28/19 15:57

SS08@9'
1906364-04 (Soil)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **06/27/19 13:15**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	0.18	0.0020	mg/kg	1	1906414	06/27/19	06/28/19	EPA 8260B	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	0.54	0.0050	"	"	"	"	"	"	
Xylenes (total)	4.6	1.0	"	100	"	"	"	"	
Naphthalene	0.018	0.010	"	1	"	"	"	"	
Gasoline Range Hydrocarbons	120	50	"	100	"	"	"	"	

Date Sampled: **06/27/19 13:15**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		95.3 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		103 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		100 %	21-167		"	"	"	"	

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: **06/27/19 13:15**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	1906415	06/27/19	06/28/19	EPA 8015M	

Date Sampled: **06/27/19 13:15**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: o-Terphenyl		109 %	30-150		"	"	"	"	

Summit Scientific

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



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

Project: Noble - Munds 13-29, Dickerson 14-29A

Project Number: [none]
Project Manager: Brandon Brun

Reported:
06/28/19 15:57

Volatile Organic Compounds by EPA Method 8260B - Quality Control

Summit Scientific

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

Batch 1906414 - EPA 5030 Soil MS

Blank (1906414-BLK1)

Prepared: 06/27/19 Analyzed: 06/28/19

Benzene	ND	0.0020	mg/kg							
Toluene	ND	0.0050	"							
Ethylbenzene	ND	0.0050	"							
Xylenes (total)	ND	0.010	"							
Naphthalene	ND	0.010	"							
Gasoline Range Hydrocarbons	ND	50	"							
Surrogate: 1,2-Dichloroethane-d4	0.0376		"	0.0400		94.0	23-173			
Surrogate: Toluene-d8	0.0405		"	0.0400		101	20-170			
Surrogate: 4-Bromofluorobenzene	0.0385		"	0.0400		96.3	21-167			

LCS (1906414-BS1)

Prepared: 06/27/19 Analyzed: 06/28/19

Benzene	0.0906	0.0020	mg/kg	0.100		90.6	70-130			
Toluene	0.100	0.0050	"	0.100		100	70-130			
Ethylbenzene	0.114	0.0050	"	0.100		114	70-130			
m,p-Xylene	0.232	0.010	"	0.200		116	70-130			
o-Xylene	0.109	0.0050	"	0.100		109	70-130			
Surrogate: 1,2-Dichloroethane-d4	0.0372		"	0.0400		92.9	23-173			
Surrogate: Toluene-d8	0.0411		"	0.0400		103	20-170			
Surrogate: 4-Bromofluorobenzene	0.0410		"	0.0400		103	21-167			

Matrix Spike (1906414-MS1)

Source: 1906364-02

Prepared: 06/27/19 Analyzed: 06/28/19

Benzene	0.193	0.0020	mg/kg	0.100	0.0603	133	70-130			QM-07
Toluene	0.102	0.0050	"	0.100	ND	102	70-130			
Ethylbenzene	0.175	0.0050	"	0.100	0.0451	129	70-130			
m,p-Xylene	0.722	0.010	"	0.200	0.367	178	70-130			QM-07
o-Xylene	0.111	0.0050	"	0.100	ND	111	70-130			
Surrogate: 1,2-Dichloroethane-d4	0.0375		"	0.0400		93.7	23-173			
Surrogate: Toluene-d8	0.0409		"	0.0400		102	20-170			
Surrogate: 4-Bromofluorobenzene	0.0420		"	0.0400		105	21-167			

Summit Scientific

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

Project: Noble - Munds 13-29, Dickerson 14-29A

Project Number: [none]
Project Manager: Brandon Bruns

Reported:
06/28/19 15:57

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 1906414 - EPA 5030 Soil MS

Matrix Spike Dup (1906414-MSD1)		Source: 1906364-02			Prepared: 06/27/19 Analyzed: 06/28/19					
Benzene	0.162	0.0020	mg/kg	0.100	0.0603	101	70-130	18.0	30	
Toluene	0.101	0.0050	"	0.100	ND	101	70-130	0.826	30	
Ethylbenzene	0.167	0.0050	"	0.100	0.0451	122	70-130	4.18	30	
m,p-Xylene	0.663	0.010	"	0.200	0.367	148	70-130	8.61	30	QM-07
o-Xylene	0.111	0.0050	"	0.100	ND	111	70-130	0.486	30	
Surrogate: 1,2-Dichloroethane-d4	0.0376		"	0.0400		94.0	23-173			
Surrogate: Toluene-d8	0.0399		"	0.0400		99.7	20-170			
Surrogate: 4-Bromofluorobenzene	0.0426		"	0.0400		106	21-167			

Summit Scientific

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



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

Project: Noble - Munds 13-29, Dickerson 14-29A

Project Number: [none]
Project Manager: Brandon Bruns

Reported:
06/28/19 15:57

Extractable Petroleum Hydrocarbons by 8015 - Quality Control
Summit Scientific

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

Batch 1906415 - EPA 3550A

Blank (1906415-BLK1)

Prepared: 06/27/19 Analyzed: 06/28/19

C10-C28 (DRO) ND 50 mg/kg

LCS (1906415-BS1)

Prepared: 06/27/19 Analyzed: 06/28/19

C10-C28 (DRO) 530 50 mg/kg 500 106 70-130

Matrix Spike (1906415-MS1)

Source: 1906363-01

Prepared: 06/27/19 Analyzed: 06/28/19

C10-C28 (DRO) 525 50 mg/kg 500 34.4 98.2 70-130

Matrix Spike Dup (1906415-MSD1)

Source: 1906363-01

Prepared: 06/27/19 Analyzed: 06/28/19

C10-C28 (DRO) 562 50 mg/kg 500 34.4 106 70-130 6.75 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.



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

Project: Noble - Munds 13-29, Dickerson 14-29A

Project Number: [none]
Project Manager: Brandon Bruns

Reported:
06/28/19 15:57

Notes and Definitions

QM-07	The spike recovery was outside acceptance limits for the MS and/or MSD. The batch was accepted based on acceptable LCS/LCSD recovery.
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

Summit Scientific

4653 Table Mountain Drive, Golden, Colorado 80403

303.277.9310

July 03, 2019

Brandon Bruns

Tasman Geosciences

6899 Pecos St, Unit C

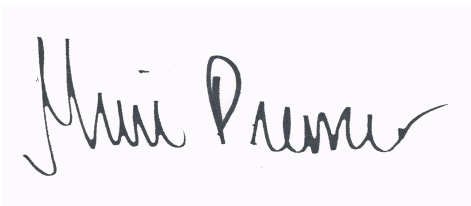
Denver, CO 80221

RE: Noble - Munds 13-29, Dickerson 14-29A

Work Order # 1906393

Enclosed are the results of analyses for samples received by Summit Scientific on 06/28/19 18:02. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

A handwritten signature in black ink, reading "Muri Premier", on a light blue background.

Muri Premier For Ben Shrewsbury

Laboratory Manager



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

Project: Noble - Munds 13-29, Dickerson 14-29A

Project Number: [none]
Project Manager: Brandon Bruns

Reported:
07/03/19 11:40

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
SS09@9'	1906393-01	Soil	06/28/19 10:20	06/28/19 18:02
SS10@9'	1906393-02	Soil	06/28/19 10:25	06/28/19 18:02
FS02@10'	1906393-03	Soil	06/28/19 10:30	06/28/19 18:02
SS11@9'	1906393-04	Soil	06/28/19 10:35	06/28/19 18:02
SS12@7'	1906393-05	Soil	06/28/19 11:45	06/28/19 18:02
SS13@7'	1906393-06	Soil	06/28/19 11:48	06/28/19 18:02
SS14@7'	1906393-07	Soil	06/28/19 11:50	06/28/19 18:02
SS15@7'	1906393-08	Soil	06/28/19 11:55	06/28/19 18:02
FS03@8'	1906393-09	Soil	06/28/19 12:00	06/28/19 18:02
SS16@9'	1906393-10	Soil	06/28/19 12:20	06/28/19 18:02
FS04@10'	1906393-11	Soil	06/28/19 12:25	06/28/19 18:02
SS17@9'	1906393-12	Soil	06/28/19 13:50	06/28/19 18:02
SS18@9'	1906393-13	Soil	06/28/19 13:55	06/28/19 18:02
SS19@9'	1906393-14	Soil	06/28/19 14:00	06/28/19 18:02
FS05@10'	1906393-15	Soil	06/28/19 14:05	06/28/19 18:02

This report has been reissued. Second page of Chain Of custody has been signed, dated and time recorded by receiver 7-3-2019

Summit Scientific

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

Summit Scientific

S₂

1906393.1



4653 Table Mountain Drive ♦ Golden, Colorado 80403

303-277-9310

Page 1 of 2

Client: Noble / Tasman Project Manager: Brandon Bruns, Invoice: Jacob Evans
 Address: 6899 Pecos Street E-Mail: Bbruns@tasman-geo.com
 City/State/Zip: Denver / CO/ 80221
 Phone: 303-487-1228 Project Name: Murders 13-29, Dickerson 14-29A
 Sampler Name: GB Project Number:

ID	Sample Description	Date Sampled	Time Sampled	# of containers	Preservative				Matrix				Analysis Requested						Special Instructions	
					HCl	HNO3	None	Other	Water	Soil	Air-Canister #	Other	8260 BTEX	8260B GBTEXN	8015 DRO	pH, EC, SAR				
1	SS04 @ 9'	6/28/19	1020				X			X				X	X					
2	SS10 @ 9'		1025																	
3	FS02 @ 10'		1030																	
4	SS11 @ 9'		1035																	
5	SS12 @ 7'		1145																	
6	SS13 @ 7'		1148																	
7	SS14 @ 7'		1150																	
8	SS15 @ 7'		1155																	
9	FS03 @ 8'		1200																	
10	SS16 @ 9'		1220																	

Relinquished by:	Date/Time:	Received by:	Date/Time:	Turn Around Time	(Check)	Notes:
	6/28/19 1630	Tasman's Lock Box	6/28/19 1630	Same Day	X 72 hours	
Relinquished by:	Date/Time:	Received by:	Date/Time:	24 hours	Standard	
Tasman's Lock Box	06/28/19 1730		06/28/19 1730	48 hours		
Relinquished by:	Date/Time:	Received by:	Date/Time:	Sample Integrity:		
				Temperature Upon Receipt:	4.4	
				Samples Intact:	Yes No	

Summit Scientific

S₂

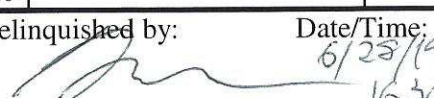
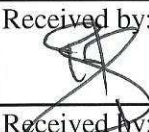
1906393.2

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

Page 2 of 2

Client:	Noble / Tasman	Project Manager:	Brandon Bruns, Invoice: Jacob Evans
Address:	6899 Pecos Street	E-Mail:	Bbruns@tasman-geo.com
City/State/Zip:	Denver / CO/ 80221		
Phone:	303-487-1228	Project Name:	Muds 13-29, Dickerson 14-29A
Sampler Name:	GB	Project Number:	-

ID	Sample Description	Date Sampled	Time Sampled	# of containers	Preservative				Matrix				Analysis Requested						Special Instructions	
					HCl	HNO3	None	Other	Water	Soil	Air-Canister #	Other	8260 BTEX	8260B GBTEXN	8015 DRO	pH, EC, SAR				
1	FS04 @ 10"	6/28/19	1225	1			X			X				X	X					
2	SS17 @ 9"	↓	1350	↓			↓			↓				↓	↓					
3	SS18 @ 9"	↓	1355	↓			↓			↓				↓	↓					
4	SS19 @ 9"	↓	1400	↓			↓			↓				↓	↓					
5	FS05 @ 10"	↓	1405	↓			↓			↓				↓	↓					
6																				
7																				
8																				
9																				
10																				

Relinquished by:	Date/Time:	Received by:	Date/Time:	Turn Around Time	(Check)	Notes:
	6/28/19 1630	Tasman's Lock Box	6/28/19 1630	Same Day	X 72 hours	
Relinquished by:	Date/Time:	Received by:	Date/Time:	24 hours	Standard	
Tasman's Lock Box	6/28/19 1730		6/28/19 1730	48 hours		
Relinquished by:	Date/Time:	Received by:	Date/Time:	Sample Integrity:	Temperature Upon Receipt:	
				4.4	4.4	
				Samples Intact:	Yes No	

Sample Receipt Checklist

S2 Work Order 1906393

Client: Noble/Tasman

Client Project ID: Munds 13-29, Dickerson 14-29A

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

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

Temp (°C)	<u>4.4</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⁾ ?	<input checked="" type="checkbox"/>			
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⁾ ?	<input checked="" type="checkbox"/>			
Was adequate sample volume provided ⁽¹⁾ ?	<input checked="" type="checkbox"/>			
If custody seals are present, are they intact ⁽¹⁾ ?			<input checked="" type="checkbox"/>	
Are samples with holding times due within 48 hours sample due within 48 hours present?	<input checked="" type="checkbox"/>			<u>SAME DAY TAT</u>
Is a chain-of-custody (COC) form 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 w/ date and time recorded ⁽¹⁾ ?	<input checked="" type="checkbox"/>			
For volatiles in water – is there headspace present? If yes, contact client and note in narrative.			<input checked="" type="checkbox"/>	
Are samples preserved that require preservation (excluding cooling) ⁽¹⁾ ?			<input checked="" type="checkbox"/>	
Note the type of preservative in the Comments column – HCl, H2SO4, NaOH, HNO3, ect			<input checked="" type="checkbox"/>	
If samples are acid preserved for metals, is the pH ≤ 2 ⁽¹⁾ ?			<input checked="" type="checkbox"/>	
Record the pH in Comments.			<input checked="" type="checkbox"/>	
If dissolved metals are requested, were samples field filtered?			<input checked="" type="checkbox"/>	

Additional Comments (if any):

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

RZ
Custodian Printed Name or Initials

[Signature]
Signature of Custodian

06/28/19
Date/Time 1804



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

Project: Noble - Munds 13-29, Dickerson 14-29A

Project Number: [none]
Project Manager: Brandon Bruns

Reported:
07/03/19 11:40

SS09@9'
1906393-01 (Soil)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **06/28/19 10:20**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	0.0099	0.0020	mg/kg	1	1906445	06/28/19	06/29/19	EPA 8260B	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	0.038	0.0050	"	"	"	"	"	"	
Xylenes (total)	0.55	0.010	"	"	"	"	"	"	
Naphthalene	ND	0.010	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	50	"	"	"	"	"	"	

Date Sampled: **06/28/19 10:20**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<i>Surrogate: 1,2-Dichloroethane-d4</i>		<i>111 %</i>	<i>23-173</i>		<i>"</i>	<i>"</i>	<i>"</i>	<i>"</i>	
<i>Surrogate: Toluene-d8</i>		<i>100 %</i>	<i>20-170</i>		<i>"</i>	<i>"</i>	<i>"</i>	<i>"</i>	
<i>Surrogate: 4-Bromofluorobenzene</i>		<i>109 %</i>	<i>21-167</i>		<i>"</i>	<i>"</i>	<i>"</i>	<i>"</i>	

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: **06/28/19 10:20**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	1906446	06/28/19	06/28/19	EPA 8015M	

Date Sampled: **06/28/19 10:20**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<i>Surrogate: o-Terphenyl</i>		<i>97.0 %</i>	<i>30-150</i>		<i>"</i>	<i>"</i>	<i>"</i>	<i>"</i>	

Summit Scientific

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



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

Project: Noble - Munds 13-29, Dickerson 14-29A

Project Number: [none]
Project Manager: Brandon Bruns

Reported:
07/03/19 11:40

SS10@9'
1906393-02 (Soil)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **06/28/19 10:25**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Benzene	0.0084	0.0020	mg/kg	1	1906445	06/28/19	06/29/19	EPA 8260B	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	0.0095	0.0050	"	"	"	"	"	"	
Xylenes (total)	0.10	0.010	"	"	"	"	"	"	
Naphthalene	ND	0.010	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	50	"	"	"	"	"	"	

Date Sampled: **06/28/19 10:25**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Surrogate: 1,2-Dichloroethane-d4		109 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		98.6 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		102 %	21-167		"	"	"	"	

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: **06/28/19 10:25**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
C10-C28 (DRO)	ND	50	mg/kg	1	1906446	06/28/19	06/28/19	EPA 8015M	

Date Sampled: **06/28/19 10:25**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Surrogate: o-Terphenyl		96.6 %	30-150		"	"	"	"	

Summit Scientific

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



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

Project: Noble - Munds 13-29, Dickerson 14-29A

Project Number: [none]
Project Manager: Brandon Bruns

Reported:
07/03/19 11:40

FS02@10'
1906393-03 (Soil)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **06/28/19 10:30**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Benzene	ND	0.0020	mg/kg	1	1906445	06/28/19	06/29/19	EPA 8260B	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	ND	0.0050	"	"	"	"	"	"	
Xylenes (total)	ND	0.010	"	"	"	"	"	"	
Naphthalene	ND	0.010	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	50	"	"	"	"	"	"	

Date Sampled: **06/28/19 10:30**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Surrogate: 1,2-Dichloroethane-d4		110 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		99.8 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		100 %	21-167		"	"	"	"	

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: **06/28/19 10:30**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
C10-C28 (DRO)	ND	50	mg/kg	1	1906446	06/28/19	06/29/19	EPA 8015M	

Date Sampled: **06/28/19 10:30**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Surrogate: o-Terphenyl		92.6 %	30-150		"	"	"	"	

Summit Scientific

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



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

Project: Noble - Munds 13-29, Dickerson 14-29A

Project Number: [none]
Project Manager: Brandon Bruns

Reported:
07/03/19 11:40

SS11@9'
1906393-04 (Soil)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **06/28/19 10:35**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Benzene	0.089	0.0020	mg/kg	1	1906445	06/28/19	06/29/19	EPA 8260B	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	0.026	0.0050	"	"	"	"	"	"	
Xylenes (total)	0.25	0.010	"	"	"	"	"	"	
Naphthalene	ND	0.010	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	50	"	"	"	"	"	"	

Date Sampled: **06/28/19 10:35**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Surrogate: 1,2-Dichloroethane-d4		115 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		103 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		106 %	21-167		"	"	"	"	

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: **06/28/19 10:35**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
C10-C28 (DRO)	ND	50	mg/kg	1	1906446	06/28/19	06/29/19	EPA 8015M	

Date Sampled: **06/28/19 10:35**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Surrogate: o-Terphenyl		103 %	30-150		"	"	"	"	

Summit Scientific

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



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

Project: Noble - Munds 13-29, Dickerson 14-29A

Project Number: [none]
Project Manager: Brandon Bruns

Reported:
07/03/19 11:40

SS12@7'
1906393-05 (Soil)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **06/28/19 11:45**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Benzene	ND	0.0020	mg/kg	1	1906445	06/28/19	06/29/19	EPA 8260B	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	ND	0.0050	"	"	"	"	"	"	
Xylenes (total)	ND	0.010	"	"	"	"	"	"	
Naphthalene	ND	0.010	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	50	"	"	"	"	"	"	

Date Sampled: **06/28/19 11:45**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Surrogate: 1,2-Dichloroethane-d4		68.6 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		91.7 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		86.8 %	21-167		"	"	"	"	

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: **06/28/19 11:45**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
C10-C28 (DRO)	ND	50	mg/kg	1	1906446	06/28/19	06/29/19	EPA 8015M	

Date Sampled: **06/28/19 11:45**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Surrogate: o-Terphenyl		97.0 %	30-150		"	"	"	"	

Summit Scientific

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



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

Project: Noble - Munds 13-29, Dickerson 14-29A

Project Number: [none]
Project Manager: Brandon Brun

Reported:
07/03/19 11:40

SS13@7'
1906393-06 (Soil)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **06/28/19 11:48**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Benzene	ND	0.0020	mg/kg	1	1906445	06/28/19	06/29/19	EPA 8260B	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	0.025	0.0050	"	"	"	"	"	"	
Xylenes (total)	ND	0.010	"	"	"	"	"	"	
Naphthalene	ND	0.010	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	50	"	"	"	"	"	"	

Date Sampled: **06/28/19 11:48**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Surrogate: 1,2-Dichloroethane-d4		64.6 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		89.6 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		94.5 %	21-167		"	"	"	"	

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: **06/28/19 11:48**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
C10-C28 (DRO)	ND	50	mg/kg	1	1906446	06/28/19	06/29/19	EPA 8015M	

Date Sampled: **06/28/19 11:48**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Surrogate: o-Terphenyl		103 %	30-150		"	"	"	"	

Summit Scientific

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



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

Project: Noble - Munds 13-29, Dickerson 14-29A

Project Number: [none]
Project Manager: Brandon Brun

Reported:
07/03/19 11:40

SS14@7'
1906393-07 (Soil)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **06/28/19 11:50**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Benzene	ND	0.0020	mg/kg	1	1906445	06/28/19	06/29/19	EPA 8260B	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	ND	0.0050	"	"	"	"	"	"	
Xylenes (total)	ND	0.010	"	"	"	"	"	"	
Naphthalene	ND	0.010	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	50	"	"	"	"	"	"	

Date Sampled: **06/28/19 11:50**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Surrogate: 1,2-Dichloroethane-d4		80.8 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		95.2 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		94.3 %	21-167		"	"	"	"	

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: **06/28/19 11:50**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
C10-C28 (DRO)	ND	50	mg/kg	1	1906446	06/28/19	06/29/19	EPA 8015M	

Date Sampled: **06/28/19 11:50**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Surrogate: o-Terphenyl		97.4 %	30-150		"	"	"	"	

Summit Scientific

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

Project: Noble - Munds 13-29, Dickerson 14-29A

Project Number: [none]
Project Manager: Brandon Bruns

Reported:
07/03/19 11:40

SS15@7'
1906393-08 (Soil)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **06/28/19 11:55**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Benzene	ND	0.0020	mg/kg	1	1906445	06/28/19	06/29/19	EPA 8260B	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	ND	0.0050	"	"	"	"	"	"	
Xylenes (total)	ND	0.010	"	"	"	"	"	"	
Naphthalene	ND	0.010	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	50	"	"	"	"	"	"	

Date Sampled: **06/28/19 11:55**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Surrogate: 1,2-Dichloroethane-d4		67.0 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		90.9 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		90.5 %	21-167		"	"	"	"	

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: **06/28/19 11:55**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
C10-C28 (DRO)	ND	50	mg/kg	1	1906446	06/28/19	06/29/19	EPA 8015M	

Date Sampled: **06/28/19 11:55**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Surrogate: o-Terphenyl		98.6 %	30-150		"	"	"	"	

Summit Scientific

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

Project: Noble - Munds 13-29, Dickerson 14-29A

Project Number: [none]
Project Manager: Brandon Bruns

Reported:
07/03/19 11:40

FS03@8'
1906393-09 (Soil)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **06/28/19 12:00**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Benzene	ND	0.0020	mg/kg	1	1906445	06/28/19	06/29/19	EPA 8260B	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	ND	0.0050	"	"	"	"	"	"	
Xylenes (total)	ND	0.010	"	"	"	"	"	"	
Naphthalene	ND	0.010	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	50	"	"	"	"	"	"	

Date Sampled: **06/28/19 12:00**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Surrogate: 1,2-Dichloroethane-d4		108 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		100 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		100 %	21-167		"	"	"	"	

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: **06/28/19 12:00**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
C10-C28 (DRO)	ND	50	mg/kg	1	1906446	06/28/19	06/29/19	EPA 8015M	

Date Sampled: **06/28/19 12:00**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Surrogate: o-Terphenyl		102 %	30-150		"	"	"	"	

Summit Scientific

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

Project: Noble - Munds 13-29, Dickerson 14-29A

Project Number: [none]
Project Manager: Brandon Bruns

Reported:
07/03/19 11:40

SS16@9'
1906393-10 (Soil)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **06/28/19 12:20**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Benzene	ND	0.0020	mg/kg	1	1906445	06/28/19	06/29/19	EPA 8260B	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	ND	0.0050	"	"	"	"	"	"	
Xylenes (total)	ND	0.010	"	"	"	"	"	"	
Naphthalene	ND	0.010	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	50	"	"	"	"	"	"	

Date Sampled: **06/28/19 12:20**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Surrogate: 1,2-Dichloroethane-d4		65.5 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		92.2 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		89.0 %	21-167		"	"	"	"	

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: **06/28/19 12:20**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
C10-C28 (DRO)	ND	50	mg/kg	1	1906446	06/28/19	06/29/19	EPA 8015M	

Date Sampled: **06/28/19 12:20**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Surrogate: o-Terphenyl		103 %	30-150		"	"	"	"	

Summit Scientific

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

Project: Noble - Munds 13-29, Dickerson 14-29A

Project Number: [none]
Project Manager: Brandon Brun

Reported:
07/03/19 11:40

FS04@10'
1906393-11 (Soil)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **06/28/19 12:25**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Benzene	ND	0.0020	mg/kg	1	1906445	06/28/19	06/29/19	EPA 8260B	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	ND	0.0050	"	"	"	"	"	"	
Xylenes (total)	ND	0.010	"	"	"	"	"	"	
Naphthalene	ND	0.010	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	50	"	"	"	"	"	"	

Date Sampled: **06/28/19 12:25**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Surrogate: 1,2-Dichloroethane-d4		105 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		99.4 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		97.1 %	21-167		"	"	"	"	

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: **06/28/19 12:25**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
C10-C28 (DRO)	ND	50	mg/kg	1	1906446	06/28/19	06/29/19	EPA 8015M	

Date Sampled: **06/28/19 12:25**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Surrogate: o-Terphenyl		97.8 %	30-150		"	"	"	"	

Summit Scientific

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

Project: Noble - Munds 13-29, Dickerson 14-29A

Project Number: [none]
Project Manager: Brandon Bruns

Reported:
07/03/19 11:40

SS17@9'
1906393-12 (Soil)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **06/28/19 13:50**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	0.0038	0.0020	mg/kg	1	1906445	06/28/19	06/29/19	EPA 8260B	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	ND	0.0050	"	"	"	"	"	"	
Xylenes (total)	0.021	0.010	"	"	"	"	"	"	
Naphthalene	ND	0.010	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	50	"	"	"	"	"	"	

Date Sampled: **06/28/19 13:50**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<i>Surrogate: 1,2-Dichloroethane-d4</i>		107 %	23-173		"	"	"	"	
<i>Surrogate: Toluene-d8</i>		99.6 %	20-170		"	"	"	"	
<i>Surrogate: 4-Bromofluorobenzene</i>		100 %	21-167		"	"	"	"	

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: **06/28/19 13:50**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	1906446	06/28/19	06/29/19	EPA 8015M	

Date Sampled: **06/28/19 13:50**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<i>Surrogate: o-Terphenyl</i>		104 %	30-150		"	"	"	"	

Summit Scientific

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

Project: Noble - Munds 13-29, Dickerson 14-29A

Project Number: [none]
Project Manager: Brandon Bruns

Reported:
07/03/19 11:40

SS18@9'
1906393-13 (Soil)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **06/28/19 13:55**

Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
Benzene	0.015	0.0020	mg/kg	1	1906445	06/28/19	06/29/19	EPA 8260B	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	0.0057	0.0050	"	"	"	"	"	"	
Xylenes (total)	0.072	0.010	"	"	"	"	"	"	
Naphthalene	ND	0.010	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	50	"	"	"	"	"	"	

Date Sampled: **06/28/19 13:55**

Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
<i>Surrogate: 1,2-Dichloroethane-d4</i>		66.8 %	23-173		"	"	"	"	
<i>Surrogate: Toluene-d8</i>		91.7 %	20-170		"	"	"	"	
<i>Surrogate: 4-Bromofluorobenzene</i>		90.2 %	21-167		"	"	"	"	

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: **06/28/19 13:55**

Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
C10-C28 (DRO)	ND	50	mg/kg	1	1906446	06/28/19	06/29/19	EPA 8015M	

Date Sampled: **06/28/19 13:55**

Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
<i>Surrogate: o-Terphenyl</i>		96.7 %	30-150		"	"	"	"	

Summit Scientific

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



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

Project: Noble - Munds 13-29, Dickerson 14-29A

Project Number: [none]
Project Manager: Brandon Bruns

Reported:
07/03/19 11:40

SS19@9'
1906393-14 (Soil)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **06/28/19 14:00**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Benzene	0.056	0.0020	mg/kg	1	1906445	06/28/19	06/29/19	EPA 8260B	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	0.0064	0.0050	"	"	"	"	"	"	
Xylenes (total)	ND	0.010	"	"	"	"	"	"	
Naphthalene	ND	0.010	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	50	"	"	"	"	"	"	

Date Sampled: **06/28/19 14:00**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Surrogate: 1,2-Dichloroethane-d4		105 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		99.4 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		99.7 %	21-167		"	"	"	"	

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: **06/28/19 14:00**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
C10-C28 (DRO)	ND	50	mg/kg	1	1906446	06/28/19	06/29/19	EPA 8015M	

Date Sampled: **06/28/19 14:00**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Surrogate: o-Terphenyl		98.7 %	30-150		"	"	"	"	

Summit Scientific

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



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

Project: Noble - Munds 13-29, Dickerson 14-29A

Project Number: [none]
Project Manager: Brandon Bruns

Reported:
07/03/19 11:40

FS05@10'
1906393-15 (Soil)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **06/28/19 14:05**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Benzene	ND	0.0020	mg/kg	1	1906445	06/28/19	06/29/19	EPA 8260B	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	ND	0.0050	"	"	"	"	"	"	
Xylenes (total)	ND	0.010	"	"	"	"	"	"	
Naphthalene	ND	0.010	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	50	"	"	"	"	"	"	

Date Sampled: **06/28/19 14:05**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Surrogate: 1,2-Dichloroethane-d4		94.7 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		85.0 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		105 %	21-167		"	"	"	"	

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: **06/28/19 14:05**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
C10-C28 (DRO)	ND	50	mg/kg	1	1906446	06/28/19	06/29/19	EPA 8015M	

Date Sampled: **06/28/19 14:05**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Surrogate: o-Terphenyl		98.0 %	30-150		"	"	"	"	

Summit Scientific

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



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

Project: Noble - Munds 13-29, Dickerson 14-29A

Project Number: [none]
Project Manager: Brandon Brun

Reported:
07/03/19 11:40

Volatile Organic Compounds by EPA Method 8260B - Quality Control

Summit Scientific

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

Batch 1906445 - EPA 5030 Soil MS

Blank (1906445-BLK1)

Prepared & Analyzed: 06/28/19

Benzene	ND	0.0020	mg/kg							
Toluene	ND	0.0050	"							
Ethylbenzene	ND	0.0050	"							
Xylenes (total)	ND	0.010	"							
Naphthalene	ND	0.010	"							
Gasoline Range Hydrocarbons	ND	50	"							
Surrogate: 1,2-Dichloroethane-d4	0.0405		"	0.0400		101	23-173			
Surrogate: Toluene-d8	0.0396		"	0.0400		99.1	20-170			
Surrogate: 4-Bromofluorobenzene	0.0390		"	0.0400		97.6	21-167			

LCS (1906445-BS1)

Prepared & Analyzed: 06/28/19

Benzene	0.0856	0.0020	mg/kg	0.100		85.6	70-130			
Toluene	0.0940	0.0050	"	0.100		94.0	70-130			
Ethylbenzene	0.103	0.0050	"	0.100		103	70-130			
m,p-Xylene	0.206	0.010	"	0.200		103	70-130			
o-Xylene	0.0976	0.0050	"	0.100		97.6	70-130			
Surrogate: 1,2-Dichloroethane-d4	0.0405		"	0.0400		101	23-173			
Surrogate: Toluene-d8	0.0399		"	0.0400		99.8	20-170			
Surrogate: 4-Bromofluorobenzene	0.0408		"	0.0400		102	21-167			

Matrix Spike (1906445-MS1)

Source: 1906391-01

Prepared: 06/28/19 Analyzed: 06/29/19

Benzene	0.0846	0.0020	mg/kg	0.100	ND	84.6	70-130			
Toluene	0.0919	0.0050	"	0.100	ND	91.9	70-130			
Ethylbenzene	0.102	0.0050	"	0.100	ND	102	70-130			
m,p-Xylene	0.205	0.010	"	0.200	ND	102	70-130			
o-Xylene	0.0968	0.0050	"	0.100	ND	96.8	70-130			
Surrogate: 1,2-Dichloroethane-d4	0.0422		"	0.0400		105	23-173			
Surrogate: Toluene-d8	0.0398		"	0.0400		99.6	20-170			
Surrogate: 4-Bromofluorobenzene	0.0403		"	0.0400		101	21-167			

Summit Scientific

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



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

Project: Noble - Munds 13-29, Dickerson 14-29A

Project Number: [none]
Project Manager: Brandon Bruns

Reported:
07/03/19 11:40

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 1906445 - EPA 5030 Soil MS

Matrix Spike Dup (1906445-MSD1)		Source: 1906391-01			Prepared: 06/28/19 Analyzed: 06/29/19					
Benzene	0.0838	0.0020	mg/kg	0.100	ND	83.8	70-130	0.962	30	
Toluene	0.0912	0.0050	"	0.100	ND	91.2	70-130	0.754	30	
Ethylbenzene	0.101	0.0050	"	0.100	ND	101	70-130	1.19	30	
m,p-Xylene	0.201	0.010	"	0.200	ND	100	70-130	1.95	30	
o-Xylene	0.0968	0.0050	"	0.100	ND	96.8	70-130	0.00	30	
Surrogate: 1,2-Dichloroethane-d4	0.0419		"	0.0400		105	23-173			
Surrogate: Toluene-d8	0.0394		"	0.0400		98.4	20-170			
Surrogate: 4-Bromofluorobenzene	0.0407		"	0.0400		102	21-167			

Summit Scientific

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



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

Project: Noble - Munds 13-29, Dickerson 14-29A

Project Number: [none]
Project Manager: Brandon Bruns

Reported:
07/03/19 11:40

Extractable Petroleum Hydrocarbons by 8015 - Quality Control
Summit Scientific

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

Batch 1906446 - EPA 3550A

Blank (1906446-BLK1)

Prepared & Analyzed: 06/28/19

C10-C28 (DRO) ND 50 mg/kg

LCS (1906446-BS1)

Prepared & Analyzed: 06/28/19

C10-C28 (DRO) 487 50 mg/kg 500 97.4 70-130

Matrix Spike (1906446-MS1)

Source: 1906387-01

Prepared & Analyzed: 06/28/19

C10-C28 (DRO) 506 50 mg/kg 500 87.8 83.7 70-130

Matrix Spike Dup (1906446-MSD1)

Source: 1906387-01

Prepared & Analyzed: 06/28/19

C10-C28 (DRO) 497 50 mg/kg 500 87.8 81.8 70-130 1.92 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.



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

Project: Noble - Munds 13-29, Dickerson 14-29A

Project Number: [none]
Project Manager: Brandon Bruns

Reported:
07/03/19 11:40

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

Summit Scientific

4653 Table Mountain Drive, Golden, Colorado 80403

303.277.9310

July 03, 2019

Brandon Bruns

Tasman Geosciences

6899 Pecos St, Unit C

Denver, CO 80221

RE: Noble - Munds 13-29, Dickerson 14-29A

Work Order # 1907027

Enclosed are the results of analyses for samples received by Summit Scientific on 07/02/19 17:38. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

A handwritten signature in black ink, appearing to read 'Paul Shrewsbury', written in a cursive style.

Paul Shrewsbury For Ben Shrewsbury

Laboratory Manager



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

Project: Noble - Munds 13-29, Dickerson 14-29A

Project Number: [none]
Project Manager: Brandon Bruns

Reported:
07/03/19 06:26

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
SS20@3'	1907027-01	Soil	07/02/19 08:35	07/02/19 17:38
SS21@9'	1907027-02	Soil	07/02/19 09:20	07/02/19 17:38
SS22@9'	1907027-03	Soil	07/02/19 09:22	07/02/19 17:38
SS23@9'	1907027-04	Soil	07/02/19 09:26	07/02/19 17:38
SS24@9'	1907027-05	Soil	07/02/19 09:28	07/02/19 17:38
FS06@10'	1907027-06	Soil	07/02/19 09:30	07/02/19 17:38

Summit Scientific

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

Summit Scientific

S₂


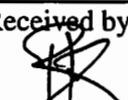
1907027

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

Page 1 of 1

Client: Noble / Tasman Project Manager: Brandon Bruns, Invoice:
Address: 6899 Pecos Street E-Mail: Bbruns@tasman-geo.com
City/State/Zip: Denver / CO/ 80221
Phone: 303-487-1228 Project Name: munds 13-29, Dickerson 14-29 A
Sampler Name: GB Project Number: -

ID	Sample Description	Date Sampled	Time Sampled	# of containers	Preservative				Matrix				Analysis Requested					Special Instructions
					HCl	HNO ₃	None	Other	Water	Soil	Air-Canister #	Other	8260 BTEX	8260B GBTEXN	8015 DRO	pH, EC, SAR		
1	SS20 @ 3'	7/2/19	0835	1			X			X				X	X	X		
2	SS21 @ 9'		0920	1										X	X			
3	SS22 @ 9'		0922	1										X	X			
4	SS23 @ 9'		0926	1										X	X			
5	SS24 @ 9'		0928	1										X	X			
6	F506 @ 10'		0930	1										X	X			
7																		
8																		
9																		
10																		

Relinquished by: 	Date/Time: 7/2/19 1630	Received by: Tasman's Lock Box	Date/Time: 7/2/19 1630	Turn Around Time (Check) Same Day <input checked="" type="checkbox"/> 72 hours 24 hours <input type="checkbox"/> Standard 48 hours <input type="checkbox"/>	Notes:
Relinquished by: Tasman's Lock Box	Date/Time: 07/02/19 1730	Received by: 	Date/Time: 07/02/19 1730	Sample Integrity: <u>S.7</u>	
Relinquished by:	Date/Time:	Received by:	Date/Time:	Temperature Upon Receipt: <u>S.7</u> Samples Intact: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	

Sample Receipt Checklist

S2 Work Order 1907027

Client: Noble/Tasman Client Project ID: Munds 13-29, Dickerson 14-29A

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

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

Temp (°C)	<u>5.7</u>
-----------	------------

Thermometer ID: 61857155-K

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

Additional Comments (if any):

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

BB
Custodian Printed Name or Initials

[Signature]
Signature of Custodian

07/02/19
Date/Time 1801



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

Project: Noble - Munds 13-29, Dickerson 14-29A

Project Number: [none]
Project Manager: Brandon Bruns

Reported:
07/03/19 06:26

SS20@3'
1907027-01 (Soil)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **07/02/19 08:35**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	0.0020	mg/kg	1	1907051	07/02/19	07/03/19	EPA 8260B	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	ND	0.0050	"	"	"	"	"	"	
Xylenes (total)	ND	0.010	"	"	"	"	"	"	
Naphthalene	ND	0.010	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	50	"	"	"	"	"	"	

Date Sampled: **07/02/19 08:35**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		104 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		100 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		100 %	21-167		"	"	"	"	

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: **07/02/19 08:35**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	1907052	07/02/19	07/02/19	EPA 8015M	

Date Sampled: **07/02/19 08:35**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: o-Terphenyl		98.6 %	30-150		"	"	"	"	

Soluble Nutrients by EPA 6020/USDA60 6(2, 3A) - Dry Weight Basis

Date Sampled: **07/02/19 08:35**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Calcium	2320	12.0	mg/kg dry	1	1907050	07/02/19	07/02/19	EPA 6020B	

Summit Scientific

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

Project: Noble - Munds 13-29, Dickerson 14-29A

Project Number: [none]
Project Manager: Brandon Bruns

Reported:
07/03/19 06:26

SS20@3'
1907027-01 (Soil)

Summit Scientific

Soluble Nutrients by EPA 6020/USDA60 6(2, 3A) - Dry Weight Basis

Magnesium	564	6.01	mg/kg dry	1	1907050	07/02/19	07/02/19	EPA 6020B
Sodium	109	6.01	"	"	"	"	"	"

Calculated Analysis

Date Sampled: **07/02/19 08:35**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Sodium Adsorption Ratio	0.530	0.100	units	1	1907053	07/03/19	07/03/19	Calculation	

Physical Parameters by APHA/ASTM/EPA Methods

Date Sampled: **07/02/19 08:35**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
% Solids	83.2		%	1	1907049	07/02/19	07/03/19	Calculation	
pH	8.04		pH Units	"	1907048	"	07/02/19	EPA 9045D	

Specific Conductance by EPA Method 120.1

Date Sampled: **07/02/19 08:35**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Specific Conductance (EC)	0.610	0.0100	mmhos/cm	1	1907047	07/02/19	07/02/19	EPA 120.1	

Summit Scientific

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

Project: Noble - Munds 13-29, Dickerson 14-29A

Project Number: [none]
Project Manager: Brandon Bruns

Reported:
07/03/19 06:26

SS21@9'
1907027-02 (Soil)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **07/02/19 09:20**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Benzene	0.55	0.020		mg/kg	10	1907051	07/02/19	07/03/19	EPA 8260B	
Toluene	ND	0.0050		"	1	"	"	"	"	
Ethylbenzene	0.32	0.0050		"	"	"	"	"	"	
Xylenes (total)	3.5	0.10		"	10	"	"	"	"	
Naphthalene	0.021	0.010		"	1	"	"	"	"	
Gasoline Range Hydrocarbons	ND	50		"	"	"	"	"	"	

Date Sampled: **07/02/19 09:20**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Surrogate: 1,2-Dichloroethane-d4		123 %		23-173		"	"	"	"	
Surrogate: Toluene-d8		102 %		20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		149 %		21-167		"	"	"	"	

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: **07/02/19 09:20**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
C10-C28 (DRO)	ND	50		mg/kg	1	1907052	07/02/19	07/02/19	EPA 8015M	

Date Sampled: **07/02/19 09:20**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Surrogate: o-Terphenyl		99.1 %		30-150		"	"	"	"	

Summit Scientific

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

Project: Noble - Munds 13-29, Dickerson 14-29A

Project Number: [none]
Project Manager: Brandon Bruns

Reported:
07/03/19 06:26

SS22@9'
1907027-03 (Soil)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **07/02/19 09:22**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Benzene	0.0095	0.0020	mg/kg	1	1907051	07/02/19	07/03/19	EPA 8260B	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	0.011	0.0050	"	"	"	"	"	"	
Xylenes (total)	0.11	0.010	"	"	"	"	"	"	
Naphthalene	ND	0.010	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	50	"	"	"	"	"	"	

Date Sampled: **07/02/19 09:22**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Surrogate: 1,2-Dichloroethane-d4		112 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		99.9 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		104 %	21-167		"	"	"	"	

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: **07/02/19 09:22**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
C10-C28 (DRO)	ND	50	mg/kg	1	1907052	07/02/19	07/02/19	EPA 8015M	

Date Sampled: **07/02/19 09:22**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Surrogate: o-Terphenyl		99.2 %	30-150		"	"	"	"	

Summit Scientific

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

Project: Noble - Munds 13-29, Dickerson 14-29A

Project Number: [none]
Project Manager: Brandon Bruns

Reported:
07/03/19 06:26

SS23@9'
1907027-04 (Soil)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **07/02/19 09:26**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Benzene	0.034	0.0020	mg/kg	1	1907051	07/02/19	07/03/19	EPA 8260B	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	0.0055	0.0050	"	"	"	"	"	"	
Xylenes (total)	0.013	0.010	"	"	"	"	"	"	
Naphthalene	ND	0.010	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	50	"	"	"	"	"	"	

Date Sampled: **07/02/19 09:26**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Surrogate: 1,2-Dichloroethane-d4		104 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		101 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		102 %	21-167		"	"	"	"	

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: **07/02/19 09:26**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
C10-C28 (DRO)	ND	50	mg/kg	1	1907052	07/02/19	07/02/19	EPA 8015M	

Date Sampled: **07/02/19 09:26**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Surrogate: o-Terphenyl		98.0 %	30-150		"	"	"	"	

Summit Scientific

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



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

Project: Noble - Munds 13-29, Dickerson 14-29A

Project Number: [none]
Project Manager: Brandon Bruns

Reported:
07/03/19 06:26

SS24@9'
1907027-05 (Soil)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **07/02/19 09:28**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Benzene	0.18	0.0020	mg/kg	1	1907051	07/02/19	07/03/19	EPA 8260B	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	0.042	0.0050	"	"	"	"	"	"	
Xylenes (total)	0.20	0.010	"	"	"	"	"	"	
Naphthalene	ND	0.010	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	50	"	"	"	"	"	"	

Date Sampled: **07/02/19 09:28**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Surrogate: 1,2-Dichloroethane-d4		112 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		99.8 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		109 %	21-167		"	"	"	"	

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: **07/02/19 09:28**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
C10-C28 (DRO)	ND	50	mg/kg	1	1907052	07/02/19	07/02/19	EPA 8015M	

Date Sampled: **07/02/19 09:28**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Surrogate: o-Terphenyl		98.9 %	30-150		"	"	"	"	

Summit Scientific

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



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

Project: Noble - Munds 13-29, Dickerson 14-29A

Project Number: [none]
Project Manager: Brandon Bruns

Reported:
07/03/19 06:26

FS06@10'
1907027-06 (Soil)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **07/02/19 09:30**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Benzene	ND	0.0020	mg/kg	1	1907051	07/02/19	07/03/19	EPA 8260B	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	ND	0.0050	"	"	"	"	"	"	
Xylenes (total)	ND	0.010	"	"	"	"	"	"	
Naphthalene	ND	0.010	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	50	"	"	"	"	"	"	

Date Sampled: **07/02/19 09:30**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Surrogate: 1,2-Dichloroethane-d4		111 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		101 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		99.4 %	21-167		"	"	"	"	

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: **07/02/19 09:30**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
C10-C28 (DRO)	ND	50	mg/kg	1	1907052	07/02/19	07/02/19	EPA 8015M	

Date Sampled: **07/02/19 09:30**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Surrogate: o-Terphenyl		97.4 %	30-150		"	"	"	"	

Summit Scientific

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

Project: Noble - Munds 13-29, Dickerson 14-29A

Project Number: [none]
Project Manager: Brandon Brun

Reported:
07/03/19 06:26

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 1907051 - EPA 5030 Soil MS

Blank (1907051-BLK1)

Prepared: 07/02/19 Analyzed: 07/03/19

Benzene	ND	0.0020	mg/kg							
Toluene	ND	0.0050	"							
Ethylbenzene	ND	0.0050	"							
Xylenes (total)	ND	0.010	"							
Naphthalene	ND	0.010	"							
Gasoline Range Hydrocarbons	ND	50	"							
Surrogate: 1,2-Dichloroethane-d4	0.0371		"	0.0400		92.8	23-173			
Surrogate: Toluene-d8	0.0382		"	0.0400		95.5	20-170			
Surrogate: 4-Bromofluorobenzene	0.0384		"	0.0400		96.0	21-167			

LCS (1907051-BS1)

Prepared: 07/02/19 Analyzed: 07/03/19

Benzene	0.0803	0.0020	mg/kg	0.100		80.3	70-130			
Toluene	0.0890	0.0050	"	0.100		89.0	70-130			
Ethylbenzene	0.0947	0.0050	"	0.100		94.7	70-130			
m,p-Xylene	0.193	0.010	"	0.200		96.7	70-130			
o-Xylene	0.0907	0.0050	"	0.100		90.7	70-130			
Surrogate: 1,2-Dichloroethane-d4	0.0398		"	0.0400		99.5	23-173			
Surrogate: Toluene-d8	0.0398		"	0.0400		99.6	20-170			
Surrogate: 4-Bromofluorobenzene	0.0395		"	0.0400		98.7	21-167			

Matrix Spike (1907051-MS1)

Source: 1907025-07

Prepared: 07/02/19 Analyzed: 07/03/19

Benzene	0.133	0.0020	mg/kg	0.100	0.0448	88.5	70-130			
Toluene	0.381	0.0050	"	0.100	0.259	122	70-130			
Ethylbenzene	0.111	0.0050	"	0.100	0.0142	96.3	70-130			
m,p-Xylene	0.308	0.010	"	0.200	0.113	97.6	70-130			
o-Xylene	0.130	0.0050	"	0.100	0.0328	97.5	70-130			
Surrogate: 1,2-Dichloroethane-d4	0.0417		"	0.0400		104	23-173			
Surrogate: Toluene-d8	0.0393		"	0.0400		98.2	20-170			
Surrogate: 4-Bromofluorobenzene	0.0396		"	0.0400		99.1	21-167			

Summit Scientific

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

Project: Noble - Munds 13-29, Dickerson 14-29A

Project Number: [none]
Project Manager: Brandon Brunns

Reported:
07/03/19 06:26

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 1907051 - EPA 5030 Soil MS

Matrix Spike Dup (1907051-MSD1)

Source: 1907025-07

Prepared: 07/02/19 Analyzed: 07/03/19

Benzene	0.132	0.0020	mg/kg	0.100	0.0448	86.9	70-130	1.24	30	
Toluene	0.389	0.0050	"	0.100	0.259	130	70-130	2.10	30	
Ethylbenzene	0.115	0.0050	"	0.100	0.0142	101	70-130	4.09	30	
m,p-Xylene	0.338	0.010	"	0.200	0.113	112	70-130	9.11	30	
o-Xylene	0.142	0.0050	"	0.100	0.0328	109	70-130	8.44	30	
Surrogate: 1,2-Dichloroethane-d4	0.0412		"	0.0400		103	23-173			
Surrogate: Toluene-d8	0.0394		"	0.0400		98.5	20-170			
Surrogate: 4-Bromofluorobenzene	0.0404		"	0.0400		101	21-167			

Summit Scientific

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

Project: Noble - Munds 13-29, Dickerson 14-29A

Project Number: [none]
Project Manager: Brandon Bruns

Reported:
07/03/19 06:26

Extractable Petroleum Hydrocarbons by 8015 - Quality Control
Summit Scientific

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

Batch 1907052 - EPA 3550A

Blank (1907052-BLK1)

Prepared: 07/02/19 Analyzed: 07/03/19

C10-C28 (DRO) ND 50 mg/kg

LCS (1907052-BS1)

Prepared: 07/02/19 Analyzed: 07/03/19

C10-C28 (DRO) 463 50 mg/kg 500 92.5 70-130

Matrix Spike (1907052-MS1)

Source: 1907025-07

Prepared: 07/02/19 Analyzed: 07/03/19

C10-C28 (DRO) 480 50 mg/kg 500 28.9 90.3 70-130

Matrix Spike Dup (1907052-MSD1)

Source: 1907025-07

Prepared: 07/02/19 Analyzed: 07/03/19

C10-C28 (DRO) 500 50 mg/kg 500 28.9 94.2 70-130 4.07 20

Summit Scientific

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

Project: Noble - Munds 13-29, Dickerson 14-29A

Project Number: [none]
Project Manager: Brandon Brun

Reported:
07/03/19 06:26

Soluble Nutrients by EPA 6020/USDA60 6(2, 3A) - Dry Weight Basis - Quality Control

Summit Scientific

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

Batch 1907050 - General Preparation

Blank (1907050-BLK1)

Prepared & Analyzed: 07/02/19

Calcium	ND	10.0	mg/kg wet
Magnesium	ND	5.00	"
Sodium	ND	5.00	"

LCS (1907050-BS1)

Prepared & Analyzed: 07/02/19

Calcium	546	10.0	mg/kg wet	500	109	70-130
Magnesium	602	5.00	"	500	120	70-130
Sodium	568	5.00	"	500	114	70-130

Duplicate (1907050-DUP1)

Source: 1907027-01

Prepared & Analyzed: 07/02/19

Calcium	2280	12.0	mg/kg dry	2320	1.90	20
Magnesium	566	6.01	"	564	0.403	20
Sodium	123	6.01	"	109	11.8	20

Matrix Spike (1907050-MS1)

Source: 1907027-01

Prepared & Analyzed: 07/02/19

Calcium	2770	12.0	mg/kg dry	601	2320	73.7	70-130
Magnesium	1190	6.01	"	601	564	105	70-130
Sodium	714	6.01	"	601	109	101	70-130

Matrix Spike Dup (1907050-MSD1)

Source: 1907027-01

Prepared & Analyzed: 07/02/19

Calcium	2780	12.0	mg/kg dry	601	2320	75.5	70-130	0.404	25
Magnesium	1180	6.01	"	601	564	102	70-130	1.29	25
Sodium	724	6.01	"	601	109	102	70-130	1.33	25

Summit Scientific

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

Project: Noble - Munds 13-29, Dickerson 14-29A

Project Number: [none]
Project Manager: Brandon Bruns

Reported:
07/03/19 06:26

Physical Parameters by APHA/ASTM/EPA Methods - Quality Control
Summit Scientific

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

Batch 1907048 - General Preparation

LCS (1907048-BS1)

Prepared & Analyzed: 07/02/19

pH	9.42		pH Units	9.23	102	95-105
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Duplicate (1907048-DUP1)

Source: 1907027-01

Prepared & Analyzed: 07/02/19

pH	8.16		pH Units	8.04	1.48	20
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Batch 1907049 - General Preparation

Duplicate (1907049-DUP1)

Source: 1907027-01

Prepared: 07/02/19 Analyzed: 07/03/19

% Solids	83.7		%	83.2	0.599	20
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Summit Scientific

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

Project: Noble - Munds 13-29, Dickerson 14-29A

Project Number: [none]
Project Manager: Brandon Bruns

Reported:
07/03/19 06:26

Specific Conductance by EPA Method 120.1 - Quality Control
Summit Scientific

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

Batch 1907047 - General Preparation

Blank (1907047-BLK1)

Prepared & Analyzed: 07/02/19

Specific Conductance (EC) ND 0.0100 mmhos/cm

LCS (1907047-BS1)

Prepared & Analyzed: 07/02/19

Specific Conductance (EC) 0.722 0.0100 mmhos/cm 0.750 96.3 90-110

Duplicate (1907047-DUP1)

Source: 1907027-01

Prepared & Analyzed: 07/02/19

Specific Conductance (EC) 0.618 0.0100 mmhos/cm 0.610 1.22 20

Summit Scientific

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

Project: Noble - Munds 13-29, Dickerson 14-29A

Project Number: [none]
Project Manager: Brandon Bruns

Reported:
07/03/19 06:26

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