FRANK 2, 5, 6, CC7-19, 29

HISTORIC RELEASE
API #: 05-123-29603
Spill Tracking #: 447515
Remediation Project #: Not Assigned

EXCAVATION REPORT

December 1, 2016

Image: Google 2016

PREPARED ON BEHALF OF

Noble Energy, Inc.
1600 Broadway
Denver, CO 80202

PREPARED BY

Tasman Geosciences, Inc.
6899 Pecos Street, Unit C
Denver, CO 80221

December 1, 2016

Mr. Jacob Evans
Noble Energy Inc.
1600 Broadway
Denver, CO 80202

Subject: **Excavation Report**
Frank 2, 5, 6, CC7-19, 29 Historic Release
API #: 05-123-29603
Spill/Release Point ID: 447515
NENW S7 T4N R63W
Weld County, Colorado

Dear Mr. Evans:

Below please find a copy of the above referenced Excavation Report (Report) for the Frank 2, 5, 6, CC7-19, 29 Historic Release site (Site) in Weld County, Colorado. The text below describes the results of excavation and remediation activities conducted on October 27 and 28, 2016.

Introduction

The purpose of this document is to describe the excavation of impacted soil, groundwater treatment, and confirmation sampling activities conducted at the Site. The activities described below were performed to address petroleum hydrocarbon impacts identified during Site assessment activities, as a result of a historic release near the Frank CC 7-29D flow line.

Facility Background

The Site is located approximately 5.5 miles southeast of the town of Kersey in Weld County, Colorado, as shown on Figure 1. The site is surrounded by agricultural crop land, and the legal description is the northeast ¼ of the northwest ¼ of Section 7, Township 4 North, Range 63 West, of the 6th Principal Meridian. The Site is located on relatively flat terrain that slopes gradually to the north-northeast. The Site is approximately 1,800 feet (ft.) east of Weld County Road 61 and has coordinates of 40.331331°, -104.483193°.

As reported on the initial Form 19, a historic release was discovered near the Frank CC 7-29D flow line, east of the separator containment, as shown on Figure 2. The Colorado Oil and Gas Conservation Commission (COGCC) subsequently issued Spill/Release Point ID Number 447515 for this event. In response to the release, production equipment was shut in and construction activities were suspended until additional site assessment activities could be completed.

As described in the Site Assessment Report, 15 soil borings (BH01 through BH15) were advanced at the site on August 31, and September 9, 2016 and converted into temporary monitoring wells. Soil and groundwater samples collected from these borings indicated that non-aqueous and dissolved-phase groundwater impacts were present at the Site, below the release location. Analytical results for soil and groundwater samples collected during site assessment activities are summarized in Table 1 and Table 2, respectively, and illustrated on Figure 3.

Field Activities

In order to address petroleum hydrocarbon impacts to groundwater and in the smear zone, excavation activities were conducted at the Site on October 27, and 28, 2016. The purpose of excavation activities were to remove impacted material, and to introduce a groundwater treatment into the impacted area. Based on the results of site assessment sampling, the area between the separator and production tank containment berms was excavated, as far north as BH09 and as far south as BH13. The excavation area encompassed all of the wells that exhibited non-aqueous or dissolved-phase groundwater impacts (BH01 through BH05, and BH11).

During excavation activities, clean overburden soil to a depth of approximately 8 ft. below ground surface (bgs) was stockpiled on site for use in backfilling. Analytical results for soil samples collected during site assessment activities indicated that vadose zone impacts were not present at the Site. A photo-ionization detector was used to field screen excavated soil for the presence of volatile organic compounds (VOCs), and determine the depth at which hydrocarbon impacts were present. Impacted soil below 8 ft. bgs was excavated and transported off Site for disposal at the Buffalo Ridge Landfill in Keenesburg, Colorado. Groundwater and light non-aqueous phase liquid (LNAPL) were encountered in the excavation at approximately 10 ft. bgs, and additional soil was removed below the water table to approximately 12 to 13 ft bgs. A total of approximately 410 cubic yards of material were removed from the Site for disposal, and the final excavation area measured approximately 60ft. by 50 ft.

Eleven (11) confirmation soil samples (SS01 through SS11) were collected from the sidewalls of the final excavation extent, at approximately 9 ft. bgs. Soil samples were submitted to Summit Scientific in Golden, Colorado (Summit) for laboratory analyses 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 is summarized in Table 1, and the final excavation extent and confirmation soil sample locations are illustrated on Figure 4. The complete laboratory analytical reports are included as Attachment A.

During excavation activities, groundwater and LNAPL collected in the base of the excavation, at a depth of approximately 10 ft. bgs. A vacuum truck was used to remove approximately 190 barrels of groundwater and LNAPL from the excavation on October 27 and 28, 2016. Fluid removed from the excavation was transported off Site for disposal at a licensed disposal facility. Following the completion of vacuum truck operations, little or no LNAPL was noted within the excavation. Prior to backfilling, 275 pounds of carbon were applied to the groundwater at the base of the excavation, in order to address remaining petroleum hydrocarbon impacts to groundwater. The excavation was subsequently backfilled and compacted using the stockpiled overburden and imported fill material.

During excavation activities, monitoring wells BH01 through BH05, BH09, BH11, and BH13 were destroyed as a result of the soil removal and stockpiling, and heavy equipment operations. Replacement monitoring wells will be installed at the Site, in order to assess and monitor the remaining groundwater impacts.

Results

Laboratory analytical results for the 11 confirmation soil samples collected during excavation activities indicate that BTEX, naphthalene, TPH-GRO, and TPH-DRO concentrations are below applicable COGCC Table 910-1 soil standards, and confirm that vadose zone impacts are not present at the Site, outside of the excavated area.

Conclusions

Based on the results of the excavation and remediation activities described above, no soil impacts are present at the Site and impacted groundwater was removed and treated below the release area. Replacement monitoring wells will be installed to assess the remaining groundwater impacts, and quarterly groundwater monitoring events will be initiated. Should petroleum hydrocarbon impacts to groundwater persist at the Site, additional remediation strategies will be evaluated.

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
Table 2 – Groundwater Analytical Data

Figure 1 – Site Location Map
Figure 2 – Site Overview Map
Figure 3 – Site Assessment Soil and Groundwater Analytical Results Map (08/31/16 – 09/09/16)
Figure 4 – Excavation Soil Sample Analytical Results Map (10/27/16 – 10/28/16)

Attachment A – Laboratory Analytical Data Reports

TABLES

TABLE 1
SOIL ANALYTICAL DATA
NOBLE ENERGY, INC. - FRANK 2, 5, 6, CC 7-19, 29 HISTORIC RELEASE

Soil Sample ID	Date	Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	Total Xylenes (mg/kg)	TPH-GRO (mg/kg)	TPH-DRO (mg/kg)	Naphthalene (mg/kg)
COGCC Standard		**0.17**	**85**	**100**	**175**	**500**		**23**
BH01@3-4'	08/31/16	0.0062	0.021	<0.0050	0.23	<50	120	0.048
BH02@5-6'	08/31/16	<0.0020	<0.0050	<0.0050	<0.010	<50	<50	<0.010
BH03@8-9'	08/31/16	<0.0020	<0.0050	<0.0050	0.021	<50	54	0.021
BH04@5-6'	08/31/16	<0.0020	<0.0050	<0.0050	<0.010	<50	<50	<0.010
BH05@5-6'	08/31/16	<0.0020	<0.0050	<0.0050	<0.010	<50	<50	<0.010
BH06@6-8'	08/31/16	<0.0020	<0.0050	<0.0050	<0.010	<50	<50	<0.010
BH07@6-9'	08/31/16	<0.0020	<0.0050	<0.0050	<0.010	<50	<50	<0.010
BH08@5-6'	08/31/16	<0.0020	<0.0050	<0.0050	<0.010	<50	<50	<0.010
BH08@8-9'	08/31/16	<0.0020	<0.0050	<0.0050	<0.010	<50	<50	<0.010
BH09@2-4'	09/09/16	<0.0020	<0.0050	<0.0050	<0.010	<50	<50	<0.010
BH10@8-9'	09/09/16	<0.0020	<0.0050	<0.0050	<0.010	<50	<50	<0.010
BH11@2-4'	09/09/16	0.038	<0.0050	<0.0050	<0.010	<50	<50	<0.010
BH12@8-9'	09/09/16	<0.0020	<0.0050	<0.0050	<0.010	<50	<50	<0.010
BH13@7-8'	09/09/16	<0.0020	<0.0050	<0.0050	<0.010	<50	<50	<0.010
BH14@8-9'	09/09/16	<0.0020	<0.0050	<0.0050	<0.010	<50	<50	<0.010
BH15@8-9'	09/09/16	<0.0020	<0.0050	<0.0050	<0.010	<50	<50	<0.010
SS01@9'	10/27/16	<0.0020	<0.0050	<0.0050	<0.010	<50	<50	<0.010
SS02@9'	10/27/16	<0.0020	<0.0050	<0.0050	<0.010	<50	<50	<0.010
SS03@9'	10/27/16	<0.0020	<0.0050	<0.0050	<0.010	<50	<50	<0.010
SS04@9'	10/27/16	<0.0020	<0.0050	<0.0050	<0.010	<50	<50	<0.010
SS05@9'	10/27/16	<0.0020	<0.0050	<0.0050	<0.010	<50	<50	<0.010
SS06@9'	10/27/16	<0.0020	<0.0050	<0.0050	<0.010	<50	<50	<0.010
SS07@9'	10/28/16	<0.0020	<0.0050	<0.0050	<0.010	<50	<50	<0.010
SS08@9'	10/28/16	<0.0020	<0.0050	<0.0050	<0.010	<50	<50	<0.010
SS09@9'	10/28/16	<0.0020	<0.0050	<0.0050	<0.010	<50	<50	<0.010
SS10@9'	10/28/16	<0.0020	<0.0050	<0.0050	<0.010	<50	<50	<0.010
SS11@9'	10/28/16	<0.0020	<0.0050	<0.0050	<0.010	<50	<50	<0.010

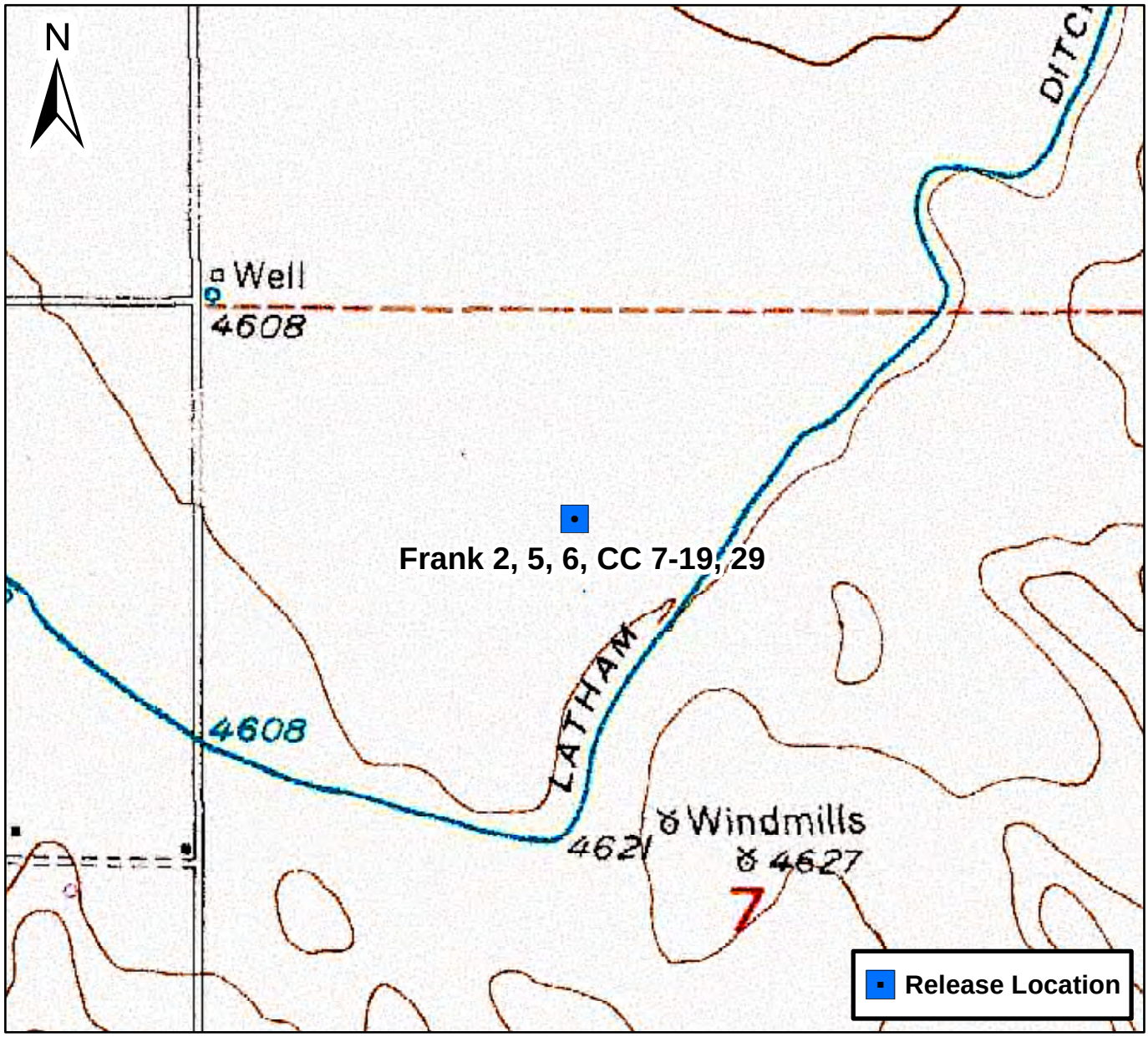
COGCC = Colorado Oil and Gas Conservation Commission
TPH-GRO = Total petroleum hydrocarbons - gasoline range organics
TPH-DRO = Total petroleum hydrocarbons - diesel range organics
mg/kg = Milligrams per kilogram
< = Analytical result is less than the indicated laboratory reporting limit
Soil standards referenced from COGCC Table 910-1
Highlighted results are equal to or exceed the COGCC Table 910-1 standard

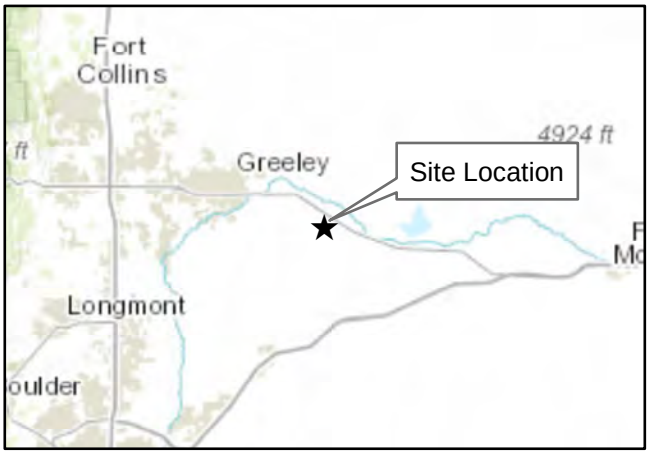
TABLE 2
GROUNDWATER ANALYTICAL DATA
NOBLE ENERGY, INC. - FRANK 2, 5, 6, CC 7-19, 29 HISTORIC RELEASE

Monitoring Well ID	Date	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Total Xylenes (µg/L)
COGCC Standard		**5**	**560**	**700**	**1,400**
BH01	09/01/16	**Sample Not Collected - 2.19 ft. LNAPL**			
BH01	09/09/16	**Sample Not Collected - 2.50 ft. LNAPL**			
BH02	09/01/16	**Sample Not Collected - 2.27 ft. LNAPL**			
BH02	09/09/16	**Sample Not Collected - 2.58 ft. LNAPL**			
BH03	09/01/16	**260**	**720**	65	640
BH03	09/09/16	**Sample Not Collected - 0.07 ft. LNAPL**			
BH04	09/01/16	**Sample Not Collected - 1.75 ft. LNAPL**			
BH04	09/09/16	**Sample Not Collected - 2.15 ft. LNAPL**			
BH05	09/01/16	**19**	29	2.2	20
BH05	09/09/16	**6.3**	12	1.3	14
BH06	09/01/16	<1.0	<1.0	<1.0	<1.0
BH06	09/09/16	<1.0	<1.0	<1.0	<1.0
BH07	09/01/16	<1.0	1.3	<1.0	3.4
BH07	09/09/16	<1.0	<1.0	<1.0	<1.0
BH09	09/09/16	<1.0	1.0	<1.0	<1.0
BH10	09/09/16	<1.0	<1.0	8.4	39
BH11	09/09/16	**130**	20	4.6	27
BH12	09/09/16	<1.0	<1.0	<1.0	<1.0
BH13	09/09/16	<1.0	<1.0	<1.0	<1.0
BH14	09/09/16	<1.0	<1.0	<1.0	<1.0
BH15	09/09/16	<1.0	<1.0	<1.0	<1.0

COGCC = Colorado Oil and Gas Conservation Commission
µg/L = Micrograms per liter
< = Analytical result is less than the indicated laboratory reporting limit
LNAPL = Light non-aqueous phase liquid
Groundwater 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

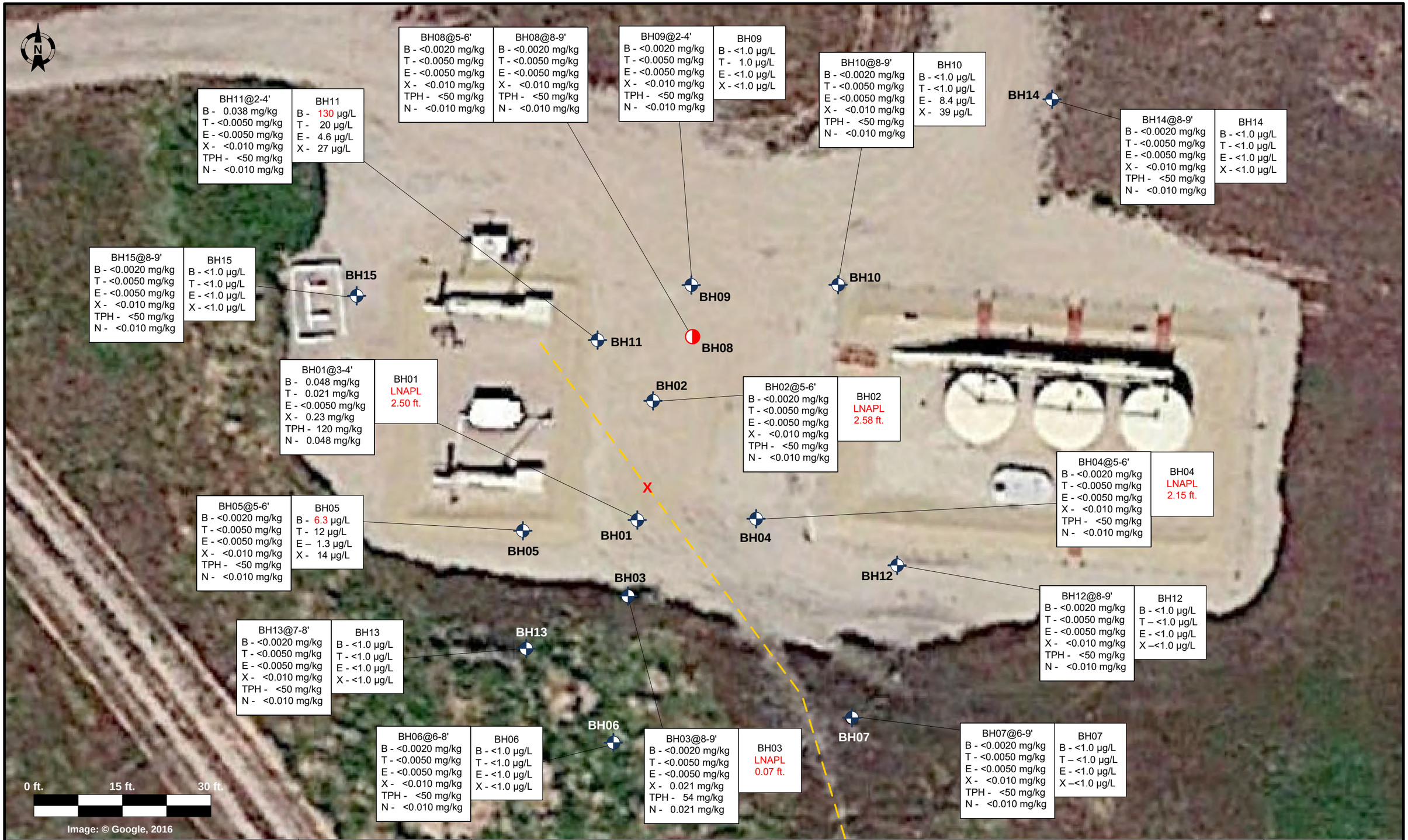
Figure 1

Site Location Map
Frank 2, 5, 6, CC 7-19, 29
NENW S7 T4N R63W
Weld County, Colorado

TASMAN GEOSCIENCES

Drawn By: DC
Date: 9/14/2016

PROJECT NO:	TASMAN GEOSCIENCES	**Facility** Noble Energy Frank 2, 5, 6, CC7-19, 29 Weld County, CO	LEGEND: Groundwater Monitoring Well Soil Boring Location (No Well Installed) Noble Flow Line Excavation Extent (Surveyed via Trimble GPS) X Approximate Release Location	Site Overview Map Figure 2
DRAWN BY: ESS				
DATE: 11/23/16				



PROJECT NO:

DRAWN BY: ESS

DATE: 11/23/16

TASMAN GEOSCIENCES

Facility
Noble Energy
Frank 2, 5, 6, CC7-19, 29
Weld County, CO

LEGEND:

- Groundwater Monitoring Well
- Soil Boring Location (No Well Installed)
- Noble Flow Line
- X — Approximate Release Location

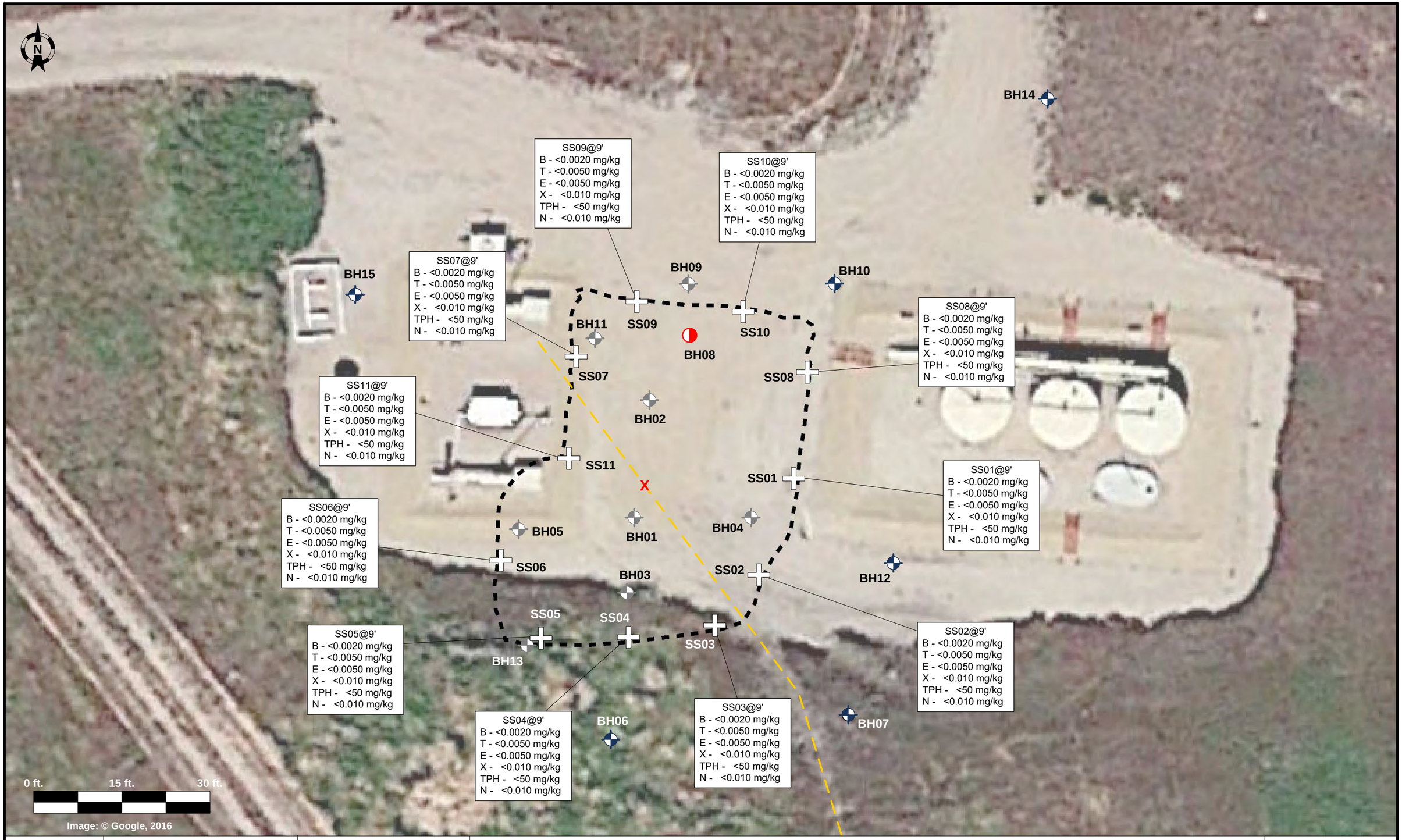
mg/kg — Milligrams Per Kilogram

µg/L — Micrograms Per Liter

B - Benzene
T - Toluene
E - Ethylbenzene
X - Total Xylenes
TPH - Total Petroleum Hydrocarbons
N - Naphthalene

Site Assessment Soil and Groundwater Analytical Results Map (08/31/16 – 09/09/16)

Figure 3



PROJECT NO:

DRAWN BY: ESS

DATE: 11/23/16

TASMAN GEOSCIENCES

Facility
Noble Energy
Frank 2, 5, 6, CC7-19, 29
Weld County, CO

LEGEND:

- Excavation Extent (Surveyed via Trimble GPS)
- Noble Flow Line
- Groundwater Monitoring Well
- Groundwater Monitoring Well (Destroyed During Excavation)
- Soil Boring (Not Converted to Monitoring Well)
- Excavation Soil Sample Location
- mg/kg Milligrams Per Kilogram
- X Approximate Release Location

B - Benzene
T - Toluene
E - Ethylbenzene
X - Total Xylenes
TPH - Total Petroleum Hydrocarbons
N - Naphthalene

Excavation Soil Sample Analytical Results Map (10/27/16 – 10/28/16)

Figure 4

ATTACHMENT A

LABORATORY ANALYTICAL DATA REPORTS

Summit Scientific

741 Corporate Circle – Suite I ♦ Golden, Colorado 80401

303.277.9310 - laboratory ♦ 303.277.9531 - fax

October 28, 2016

Brandon Bruns
Tasman Geosciences
6899 Pecos Street
Denver, CO 80221

RE: Frank 2, 5, 6, CC7-19, 29

Enclosed are the results of analyses for samples received by Summit Scientific on 10/27/16 16:00. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Paul Shrewsbury
President

Tasman Geosciences 6899 Pecos Street Denver CO, 80221	Project: Frank 2, 5, 6, CC7-19, 29 Project Number: [none] Project Manager: Brandon Bruns	**Reported:** 10/28/16 05:48

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
SS01 @ 9'	1610228-01	Soil	10/27/16 10:30	10/27/16 16:00
SS02 @ 9'	1610228-02	Soil	10/27/16 10:35	10/27/16 16:00
SS03 @ 9'	1610228-03	Soil	10/27/16 11:00	10/27/16 16:00
SS04 @ 9'	1610228-04	Soil	10/27/16 12:55	10/27/16 16:00
SS05 @ 9'	1610228-05	Soil	10/27/16 14:00	10/27/16 16:00
SS06 @ 9'	1610228-06	Soil	10/27/16 14:05	10/27/16 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.

Tasman Geosciences 6899 Pecos Street Denver CO, 80221	Project: Frank 2, 5, 6, CC7-19, 29 Project Number: [none] Project Manager: Brandon Bruns	**Reported:** 10/28/16 05:48

Summit Scientific 16102288

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

Page 1 of 1

Client: Noble/Tasman
Address:
City/State/Zip:
Phone: Fax:
Sampler Name: Eric Siegel

Project Manager: Brandon Bruns, Invoice: Raul Sanchez
E-Mail:
Project Name: Frank 2,5,6, CC7-19,29
Project Number:

Sample Description	Date Sampled	Time Sampled	Number of Containers	Preservative: HCl	Preservative: HNO_3	Preservative: None	Preservative: Other (Specify)	Matrix: Groundwater	Matrix: Soil	Matrix: Air - Canister Serial #	Matrix: Other (Specify)	Analyze For: 8260 BTEX	Analyze For: 8260B GBTEXN	Analyze For: 8015 DRO	Analyze For: pH, EC, SAR	Special Instructions
SS01e9'	10/27/16	10:30	1			X			X				X	X		
SS02e9'		10:35	1			X			X				X	X		
SS03e9'		11:00	1			X			X				X	X		
SS04e9'		12:55	1			X			X				X	X		
SS05e9'		14:00	1			X			X				X	X		
SS06e9'	↓	14:05	1			X			X				X	X		

Relinquished by: E. A. Siegel 10/27/16 15:34
Date/Time:
Received by: [signature] 10-27-16 15:34
Date/Time:

Relinquished by: [signature] 10-27-16 17:55
Date/Time:
Received by:
Date/Time:

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

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

Sample Integrity:
Temperature Upon Receipt: 4.0
Intact: Yes [X] No [ ]

Notes:

www.s2scientific.com

Tasman Geosciences 6899 Pecos Street Denver CO, 80221	Project: Frank 2, 5, 6, CC7-19, 29 Project Number: [none] Project Manager: Brandon Bruns	**Reported:** 10/28/16 05:48

Sample Receipt Checklist

S2 Work Order: 1610228

Client: Noble/Tasman Client Project ID: Frank 2,5,6, CC7-19,29

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

Matrix (check all that apply): ____Air __X__Soil/Solid ____Water ____Other: _____ (Describe)

Cooler ID					
Temp (°C)	4.0				

Thermometer ID: 61857155-K

	Yes	No	N/A	Comments (if any)
If samples require cooling, was the temperature just above 0°C to ≤ 6°C (1)? NOTE: If samples are delivered the same day of sampling, this requirement is waived provided that there is evidence that cooling has begun.	X			
Were all samples received intact (1)?	X			
Was adequate sample volume provided (1)?	X			
If custody seals are present, are they intact (1)?			X	
Are short holding time analytes or samples with HTs due within 48 hours present?	X			
Is a chain-of-custody (COC) form present and filled out completely (1)?	X			
Does the COC agree with the number and type of sample bottles received (1)?	X			
Do the sample IDs on the bottle labels match the COC (1)?	X			
Is the COC properly relinquished by the client w/ date and time recorded (1)?	X			
For volatiles in water – is there headspace present? **If yes, contact client and note in narrative.**			X	
Are samples preserved that require preservation **(excluding cooling)**(1)? Note the type of preservative in the Comments column – HCl, H2SO4, NaOH, HNO3, ect			X	
If samples are acid preserved for metals, is the pH ≤ 2(1)? Record the pH in Comments.			X	
If dissolved metals are requested, were samples field filtered?			X	
Additional Comments (if any):				
(1) **If NO, then contact the client before proceeding with analysis and note in case narrative.**				

Muri P — **Custodian Printed Name**

NA 10-27-16 — **Signature or Initials of Custodian**

16:00 — **Date/Time**

Tasman Geosciences 6899 Pecos Street Denver CO, 80221	Project: Frank 2, 5, 6, CC7-19, 29 Project Number: [none] Project Manager: Brandon Bruns	**Reported:** 10/28/16 05:48

SS01 @ 9'
1610228-01 (Soil)

Summit Scientific

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: **10/27/16 10:30**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	1610312	10/27/16	10/27/16	8015M	

Date Sampled: **10/27/16 10:30**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: o-Terphenyl		*88.7 %*	*30-150*		"	"	"	"	

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **10/27/16 10:30**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Naphthalene	ND	0.010	mg/kg	1	1610311	10/27/16	10/27/16	EPA 8260B	
Benzene	ND	0.0020	"	"	"	"	"	"	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	ND	0.0050	"	"	"	"	"	"	
Xylenes (total)	ND	0.010	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	50	"	"	"	"	"	"	

Date Sampled: **10/27/16 10:30**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		*117 %*	*23-173*		"	"	"	"	
Surrogate: Toluene-d8		*101 %*	*20-170*		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		*95.5 %*	*21-167*		"	"	"	"	

Tasman Geosciences 6899 Pecos Street Denver CO, 80221	Project: Frank 2, 5, 6, CC7-19, 29 Project Number: [none] Project Manager: Brandon Bruns	**Reported:** 10/28/16 05:48

SS02 @ 9'
1610228-02 (Soil)

Summit Scientific

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: **10/27/16 10:35**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	1610312	10/27/16	10/27/16	8015M	

Date Sampled: **10/27/16 10:35**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: o-Terphenyl		*88.4 %*	*30-150*		"	"	"	"	

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **10/27/16 10:35**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Naphthalene	ND	0.010	mg/kg	1	1610311	10/27/16	10/27/16	EPA 8260B	
Benzene	ND	0.0020	"	"	"	"	"	"	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	ND	0.0050	"	"	"	"	"	"	
Xylenes (total)	ND	0.010	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	50	"	"	"	"	"	"	

Date Sampled: **10/27/16 10:35**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		*115 %*	*23-173*		"	"	"	"	
Surrogate: Toluene-d8		*98.0 %*	*20-170*		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		*95.5 %*	*21-167*		"	"	"	"	

Tasman Geosciences 6899 Pecos Street Denver CO, 80221	Project: Frank 2, 5, 6, CC7-19, 29 Project Number: [none] Project Manager: Brandon Bruns	**Reported:** 10/28/16 05:48

SS03 @ 9'
1610228-03 (Soil)

Summit Scientific

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: **10/27/16 11:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	1610312	10/27/16	10/27/16	8015M	

Date Sampled: **10/27/16 11:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: o-Terphenyl		*90.1 %*	*30-150*		"	"	"	"	

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **10/27/16 11:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Naphthalene	ND	0.010	mg/kg	1	1610311	10/27/16	10/27/16	EPA 8260B	
Benzene	ND	0.0020	"	"	"	"	"	"	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	ND	0.0050	"	"	"	"	"	"	
Xylenes (total)	ND	0.010	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	50	"	"	"	"	"	"	

Date Sampled: **10/27/16 11:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		*116 %*	*23-173*		"	"	"	"	
Surrogate: Toluene-d8		*102 %*	*20-170*		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		*97.0 %*	*21-167*		"	"	"	"	

Tasman Geosciences 6899 Pecos Street Denver CO, 80221	Project: Frank 2, 5, 6, CC7-19, 29 Project Number: [none] Project Manager: Brandon Bruns	**Reported:** 10/28/16 05:48

SS04 @ 9'
1610228-04 (Soil)

Summit Scientific

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: **10/27/16 12:55**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	1610312	10/27/16	10/27/16	8015M	

Date Sampled: **10/27/16 12:55**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: o-Terphenyl		*89.8 %*	*30-150*		"	"	"	"	

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **10/27/16 12:55**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Naphthalene	ND	0.010	mg/kg	1	1610311	10/27/16	10/27/16	EPA 8260B	
Benzene	ND	0.0020	"	"	"	"	"	"	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	ND	0.0050	"	"	"	"	"	"	
Xylenes (total)	ND	0.010	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	50	"	"	"	"	"	"	

Date Sampled: **10/27/16 12:55**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		*93.5 %*	*23-173*		"	"	"	"	
Surrogate: Toluene-d8		*96.8 %*	*20-170*		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		*94.1 %*	*21-167*		"	"	"	"	

Tasman Geosciences 6899 Pecos Street Denver CO, 80221	Project: Frank 2, 5, 6, CC7-19, 29 Project Number: [none] Project Manager: Brandon Bruns	**Reported:** 10/28/16 05:48

SS05 @ 9'
1610228-05 (Soil)

Summit Scientific

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: **10/27/16 14:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	1610312	10/27/16	10/27/16	8015M	

Date Sampled: **10/27/16 14:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: o-Terphenyl		*90.8 %*	*30-150*		"	"	"	"	

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **10/27/16 14:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Naphthalene	ND	0.010	mg/kg	1	1610311	10/27/16	10/27/16	EPA 8260B	
Benzene	ND	0.0020	"	"	"	"	"	"	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	ND	0.0050	"	"	"	"	"	"	
Xylenes (total)	ND	0.010	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	50	"	"	"	"	"	"	

Date Sampled: **10/27/16 14:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		*115 %*	*23-173*		"	"	"	"	
Surrogate: Toluene-d8		*102 %*	*20-170*		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		*95.6 %*	*21-167*		"	"	"	"	

Tasman Geosciences 6899 Pecos Street Denver CO, 80221	Project: Frank 2, 5, 6, CC7-19, 29 Project Number: [none] Project Manager: Brandon Bruns	**Reported:** 10/28/16 05:48

SS06 @ 9'
1610228-06 (Soil)

Summit Scientific

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: **10/27/16 14:05**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	1610312	10/27/16	10/28/16	8015M	

Date Sampled: **10/27/16 14:05**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: o-Terphenyl		*92.3 %*	*30-150*		"	"	"	"	

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **10/27/16 14:05**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Naphthalene	ND	0.010	mg/kg	1	1610311	10/27/16	10/28/16	EPA 8260B	
Benzene	ND	0.0020	"	"	"	"	"	"	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	ND	0.0050	"	"	"	"	"	"	
Xylenes (total)	ND	0.010	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	50	"	"	"	"	"	"	

Date Sampled: **10/27/16 14:05**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		*118 %*	*23-173*		"	"	"	"	
Surrogate: Toluene-d8		*99.2 %*	*20-170*		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		*95.2 %*	*21-167*		"	"	"	"	

Tasman Geosciences 6899 Pecos Street Denver CO, 80221	Project: Frank 2, 5, 6, CC7-19, 29 Project Number: [none] Project Manager: Brandon Bruns	**Reported:** 10/28/16 05:48

Extractable Petroleum Hydrocarbons by 8015 - Quality Control

Summit Scientific

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1610312 - EPA 3550A										
Blank (1610312-BLK1)				Prepared & Analyzed: 10/27/16						
C10-C28 (DRO)	ND	50	mg/kg							
Surrogate: o-Terphenyl	*11.3*		"	*12.5*		*90.2*	*30-150*			
LCS (1610312-BS1)				Prepared & Analyzed: 10/27/16						
C10-C28 (DRO)	428	50	mg/kg	499		85.7	73-134			
Surrogate: o-Terphenyl	*11.7*		"	*12.5*		*93.7*	*30-150*			
Matrix Spike (1610312-MS1)	**Source: 1610227-01**			Prepared & Analyzed: 10/27/16						
C10-C28 (DRO)	449	50	mg/kg	499	30.0	84.0	50-148			
Surrogate: o-Terphenyl	*11.7*		"	*12.5*		*93.2*	*30-150*			
Matrix Spike Dup (1610312-MSD1)	**Source: 1610227-01**			Prepared & Analyzed: 10/27/16						
C10-C28 (DRO)	422	50	mg/kg	499	30.0	78.5	50-148	6.32	20	
Surrogate: o-Terphenyl	*11.4*		"	*12.5*		*91.3*	*30-150*			

Volatile Organic Compounds by EPA Method 8260B - Quality Control

Summit Scientific

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1610311 - EPA 5030 Soil MS										
Blank (1610311-BLK1)				Prepared & Analyzed: 10/27/16						
Naphthalene	ND	0.010	mg/kg							
Benzene	ND	0.0020	"							
Toluene	ND	0.0050	"							
Ethylbenzene	ND	0.0050	"							
Xylenes (total)	ND	0.010	"							
Gasoline Range Hydrocarbons	ND	50	"							
Surrogate: 1,2-Dichloroethane-d4	*0.0440*		"	*0.0400*		*110*	*23-173*			
Surrogate: Toluene-d8	*0.0400*		"	*0.0400*		*100*	*20-170*			
Surrogate: 4-Bromofluorobenzene	*0.0378*		"	*0.0400*		*94.4*	*21-167*			
LCS (1610311-BS1)				Prepared & Analyzed: 10/27/16						
Naphthalene	ND	0.010	mg/kg				66-138			
Benzene	0.0820	0.0020	"	0.100		82.0	58-130			
Toluene	0.0814	0.0050	"	0.100		81.4	61-134			
Ethylbenzene	0.102	0.0050	"	0.0992		103	74-139			
m,p-Xylene	0.192	0.010	"	0.200		96.0	73-137			
o-Xylene	0.0950	0.0050	"	0.0980		96.9	73-141			
Surrogate: 1,2-Dichloroethane-d4	*0.0448*		"	*0.0400*		*112*	*23-173*			
Surrogate: Toluene-d8	*0.0404*		"	*0.0400*		*101*	*20-170*			
Surrogate: 4-Bromofluorobenzene	*0.0395*		"	*0.0400*		*98.8*	*21-167*			
Matrix Spike (1610311-MS1)	**Source: 1610227-01**			Prepared & Analyzed: 10/27/16						
Naphthalene	ND	0.010	mg/kg		ND		10-158			
Benzene	0.0736	0.0020	"	0.100	ND	73.6	30-131			
Toluene	0.0782	0.0050	"	0.100	ND	78.2	30-134			
Ethylbenzene	0.100	0.0050	"	0.0992	ND	101	22-153			
m,p-Xylene	0.190	0.010	"	0.200	ND	95.0	10-159			
o-Xylene	0.0959	0.0050	"	0.0980	ND	97.8	31-151			
Surrogate: 1,2-Dichloroethane-d4	*0.0458*		"	*0.0400*		*115*	*23-173*			
Surrogate: Toluene-d8	*0.0389*		"	*0.0400*		*97.2*	*20-170*			
Surrogate: 4-Bromofluorobenzene	*0.0385*		"	*0.0400*		*96.3*	*21-167*			

Volatile Organic Compounds by EPA Method 8260B - Quality Control

Summit Scientific

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1610311 - EPA 5030 Soil MS										
Matrix Spike Dup (1610311-MSD1)		**Source: 1610227-01**		Prepared & Analyzed: 10/27/16						
Naphthalene	ND	0.010	mg/kg		ND		10-158		42	
Benzene	0.0747	0.0020	"	0.100	ND	74.7	30-131	1.38	34	
Toluene	0.0809	0.0050	"	0.100	ND	80.9	30-134	3.43	30	
Ethylbenzene	0.105	0.0050	"	0.0992	ND	106	22-153	5.09	24	
m,p-Xylene	0.199	0.010	"	0.200	ND	99.7	10-159	4.79	68	
o-Xylene	0.101	0.0050	"	0.0980	ND	103	31-151	5.06	38	
Surrogate: 1,2-Dichloroethane-d4	*0.0448*		"	*0.0400*		*112*	*23-173*			
Surrogate: Toluene-d8	*0.0400*		"	*0.0400*		*100*	*20-170*			
Surrogate: 4-Bromofluorobenzene	*0.0387*		"	*0.0400*		*96.8*	*21-167*			

Tasman Geosciences 6899 Pecos Street Denver CO, 80221	Project: Frank 2, 5, 6, CC7-19, 29 Project Number: [none] Project Manager: Brandon Bruns	**Reported:** 10/28/16 05:48

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

741 Corporate Circle – Suite I ♦ Golden, Colorado 80401

303.277.9310 - laboratory ♦ 303.277.9531 - fax

October 29, 2016

Brandon Bruns
Tasman Geosciences
6899 Pecos Street
Denver, CO 80221

RE: Frank 2, 5, 6, CC7-19, 29

Enclosed are the results of analyses for samples received by Summit Scientific on 10/28/16 17:45. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Ben Shrewsbury
Laboratory Manager

Tasman Geosciences 6899 Pecos Street Denver CO, 80221	Project: Frank 2, 5, 6, CC7-19, 29 Project Number: [none] Project Manager: Brandon Bruns	**Reported:** 10/29/16 16:59

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
SS07@9'	1610243-01	Soil	10/28/16 09:15	10/28/16 17:45
SS08@9'	1610243-02	Soil	10/28/16 09:25	10/28/16 17:45
SS09@9'	1610243-03	Soil	10/28/16 10:10	10/28/16 17:45
SS10@9'	1610243-04	Soil	10/28/16 10:15	10/28/16 17:45
SS11@9'	1610243-05	Soil	10/28/16 10:30	10/28/16 17:45

Summit Scientific

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

Tasman Geosciences 6899 Pecos Street Denver CO, 80221	Project: Frank 2, 5, 6, CC7-19, 29 Project Number: [none] Project Manager: Brandon Bruns	**Reported:** 10/29/16 16:59

Summit Scientific 1610243

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

Page 1 of 1

Client: Noble/Tasman
Address:
City/State/Zip:
Phone: Fax:
Sampler Name: Eric Siegel

Project Manager: Brandon Bruns, Invoice: Raul Sanchez
E-Mail:
Project Name: Frank 2.5.6. CC7-19.29
Project Number:

Sample Description	Date Sampled	Time Sampled	Number of Containers	Preservative: HCl	Preservative: HNO_3	Preservative: None	Preservative: Other (Specify)	Matrix: Groundwater	Matrix: Soil	Matrix: Air - Canister Serial #	Matrix: Other (Specify)	Analyze For: 8260 BTEX	Analyze For: 8260B GBTEXN	Analyze For: 8015 DRO	Analyze For: pH, EC, SAR	Special Instructions
SS07 e9'	10/28/16	9:15	1			X			X			X	X			
SS08 e9'	↓	9:25	1			X			X			X	X			
SS09 e9'		10:10	1			X			X			X	X			
SS10 e9'		10:15	1			X			X			X	X			
SS11 e9'	↓	10:30	1			X			X			X	X			

Relinquished by:	Date/Time:	Received by:	Date/Time:
Eric A. Siegel	10/28/16 1600	NA	10-28-16 16:00
NA	10-29-16 19:15		
		Received in Lab by:	Date/Time:

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

Sample Integrity:
Temperature Upon Receipt: 4.3
Intact: Yes [X] No [ ]

Notes:

www.s2scientific.com

Tasman Geosciences 6899 Pecos Street Denver CO, 80221	Project: Frank 2, 5, 6, CC7-19, 29 Project Number: [none] Project Manager: Brandon Bruns	**Reported:** 10/29/16 16:59

Sample Receipt Checklist

S2 Work Order: 1610243

Client: Nate/Tasman Client Project ID: Frank 2.5.6, CC7-19,29

Shipped Via: H.D. on ice Airbill #: _____
(UPS, FedEx, Hand Delivered, Pick-up, etc.)

Matrix (check all that apply): ____Air __X__Soil/Solid ____Water ____Other: _____
(Describe)

Cooler ID					
Temp (°C)	4.3				

Thermometer ID: 61857155-K

	Yes	No	N/A	Comments (if any)
If samples require cooling, was the temperature just above 0°C to ≤ 6°C [(1)]? NOTE: If samples are delivered the same day of sampling, this requirement is waived provided that there is evidence that cooling has begun.	X			
Were all samples received intact [(1)]?	X			
Was adequate sample volume provided [(1)]?	X			
If custody seals are present, are they intact [(1)]?			X	
Are short holding time analytes or samples with HTs due within 48 hours present?	X			
Is a chain-of-custody (COC) form present and filled out completely [(1)]?	X			
Does the COC agree with the number and type of sample bottles received [(1)]?	X			
Do the sample IDs on the bottle labels match the COC [(1)]?	X			
Is the COC properly relinquished by the client w/ date and time recorded [(1)]?	X			
For volatiles in water -- is there headspace present? **If yes, contact client and note in narrative.**			X	
Are samples preserved that require preservation **(excluding cooling)**[(1)]? Note the type of preservative in the Comments column -- HCl, H2SO4, NaOH, HNO3, ect			X	
If samples are acid preserved for metals, is the pH ≤ 2[(1)]? Record the pH in Comments.			X	
If dissolved metals are requested, were samples field filtered?			X	
Additional Comments (if any):				

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

Muri P.	NA 10-28-16	16:05
Custodian Printed Name	**Signature or Initials of Custodian**	**Date/Time**

Tasman Geosciences 6899 Pecos Street Denver CO, 80221	Project: Frank 2, 5, 6, CC7-19, 29 Project Number: [none] Project Manager: Brandon Bruns	**Reported:** 10/29/16 16:59

SS07@9'
1610243-01 (Soil)

Summit Scientific

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: **10/28/16 09:15**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	1610317	10/28/16	10/29/16	8015M	

Date Sampled: **10/28/16 09:15**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: o-Terphenyl		*90.9 %*	*30-150*		"	"	"	"	

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **10/28/16 09:15**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Naphthalene	ND	0.010	mg/kg	1	1610315	"	10/28/16	EPA 8260B	
Benzene	ND	0.0020	"	"	"	"	"	"	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	ND	0.0050	"	"	"	"	"	"	
Xylenes (total)	ND	0.010	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	50	"	"	"	"	"	"	

Date Sampled: **10/28/16 09:15**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		*113 %*	*23-173*		"	"	"	"	
Surrogate: Toluene-d8		*102 %*	*20-170*		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		*97.4 %*	*21-167*		"	"	"	"	

Tasman Geosciences 6899 Pecos Street Denver CO, 80221	Project: Frank 2, 5, 6, CC7-19, 29 Project Number: [none] Project Manager: Brandon Bruns	**Reported:** 10/29/16 16:59

SS08@9'
1610243-02 (Soil)

Summit Scientific

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: **10/28/16 09:25**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	1610317	10/28/16	10/29/16	8015M	

Date Sampled: **10/28/16 09:25**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: o-Terphenyl		*90.6 %*	*30-150*		"	"	"	"	

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **10/28/16 09:25**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Naphthalene	ND	0.010	mg/kg	1	1610315	"	10/28/16	EPA 8260B	
Benzene	ND	0.0020	"	"	"	"	"	"	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	ND	0.0050	"	"	"	"	"	"	
Xylenes (total)	ND	0.010	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	50	"	"	"	"	"	"	

Date Sampled: **10/28/16 09:25**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		*90.1 %*	*23-173*		"	"	"	"	
Surrogate: Toluene-d8		*104 %*	*20-170*		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		*97.7 %*	*21-167*		"	"	"	"	

Tasman Geosciences 6899 Pecos Street Denver CO, 80221	Project: Frank 2, 5, 6, CC7-19, 29 Project Number: [none] Project Manager: Brandon Bruns	**Reported:** 10/29/16 16:59

SS09@9'
1610243-03 (Soil)

Summit Scientific

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: **10/28/16 10:10**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	1610317	10/28/16	10/29/16	8015M	

Date Sampled: **10/28/16 10:10**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: o-Terphenyl		*90.1 %*	*30-150*		"	"	"	"	

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **10/28/16 10:10**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Naphthalene	ND	0.010	mg/kg	1	1610315	"	10/28/16	EPA 8260B	
Benzene	ND	0.0020	"	"	"	"	"	"	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	ND	0.0050	"	"	"	"	"	"	
Xylenes (total)	ND	0.010	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	50	"	"	"	"	"	"	

Date Sampled: **10/28/16 10:10**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		*118 %*	*23-173*		"	"	"	"	
Surrogate: Toluene-d8		*103 %*	*20-170*		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		*95.1 %*	*21-167*		"	"	"	"	

Tasman Geosciences 6899 Pecos Street Denver CO, 80221	Project: Frank 2, 5, 6, CC7-19, 29 Project Number: [none] Project Manager: Brandon Bruns	**Reported:** 10/29/16 16:59

SS10@9'
1610243-04 (Soil)

Summit Scientific

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: **10/28/16 10:15**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	1610317	10/28/16	10/29/16	8015M	

Date Sampled: **10/28/16 10:15**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: o-Terphenyl		*90.5 %*	*30-150*		"	"	"	"	

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **10/28/16 10:15**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Naphthalene	ND	0.010	mg/kg	1	1610315	"	10/28/16	EPA 8260B	
Benzene	ND	0.0020	"	"	"	"	"	"	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	ND	0.0050	"	"	"	"	"	"	
Xylenes (total)	ND	0.010	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	50	"	"	"	"	"	"	

Date Sampled: **10/28/16 10:15**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		*117 %*	*23-173*		"	"	"	"	
Surrogate: Toluene-d8		*101 %*	*20-170*		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		*94.6 %*	*21-167*		"	"	"	"	

Tasman Geosciences 6899 Pecos Street Denver CO, 80221	Project: Frank 2, 5, 6, CC7-19, 29 Project Number: [none] Project Manager: Brandon Bruns	**Reported:** 10/29/16 16:59

SS11@9'
1610243-05 (Soil)

Summit Scientific

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: **10/28/16 10:30**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	1610317	10/28/16	10/29/16	8015M	

Date Sampled: **10/28/16 10:30**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: o-Terphenyl		*94.3 %*	*30-150*		"	"	"	"	

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **10/28/16 10:30**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Naphthalene	ND	0.010	mg/kg	1	1610315	"	10/28/16	EPA 8260B	
Benzene	ND	0.0020	"	"	"	"	"	"	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	ND	0.0050	"	"	"	"	"	"	
Xylenes (total)	ND	0.010	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	50	"	"	"	"	"	"	

Date Sampled: **10/28/16 10:30**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		*122 %*	*23-173*		"	"	"	"	
Surrogate: Toluene-d8		*104 %*	*20-170*		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		*93.6 %*	*21-167*		"	"	"	"	

Extractable Petroleum Hydrocarbons by 8015 - Quality Control

Summit Scientific

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1610317 - EPA 3550A										
Blank (1610317-BLK1)				Prepared & Analyzed: 10/28/16						
C10-C28 (DRO)	ND	50	mg/kg							
Surrogate: o-Terphenyl	*11.4*		"	*12.5*		*91.3*	*30-150*			
LCS (1610317-BS1)				Prepared & Analyzed: 10/28/16						
C10-C28 (DRO)	495	50	mg/kg	499		99.2	73-134			
Surrogate: o-Terphenyl	*11.9*		"	*12.5*		*95.1*	*30-150*			
Matrix Spike (1610317-MS1)	**Source: 1610231-01**			Prepared & Analyzed: 10/28/16						
C10-C28 (DRO)	477	50	mg/kg	497	8.52	94.3	50-148			
Surrogate: o-Terphenyl	*12.5*		"	*12.5*		*100*	*30-150*			
Matrix Spike Dup (1610317-MSD1)	**Source: 1610231-01**			Prepared & Analyzed: 10/28/16						
C10-C28 (DRO)	486	50	mg/kg	496	8.52	96.3	50-148	1.89	20	
Surrogate: o-Terphenyl	*12.6*		"	*12.4*		*101*	*30-150*			

Volatile Organic Compounds by EPA Method 8260B - Quality Control

Summit Scientific

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1610315 - EPA 5030 Soil MS										
Blank (1610315-BLK1)				Prepared & Analyzed: 10/28/16						
Naphthalene	ND	0.010	mg/kg							
Benzene	ND	0.0020	"							
Toluene	ND	0.0050	"							
Ethylbenzene	ND	0.0050	"							
Xylenes (total)	ND	0.010	"							
Gasoline Range Hydrocarbons	ND	50	"							
Surrogate: 1,2-Dichloroethane-d4	*0.0465*		"	*0.0400*		*116*	*23-173*			
Surrogate: Toluene-d8	*0.0416*		"	*0.0400*		*104*	*20-170*			
Surrogate: 4-Bromofluorobenzene	*0.0390*		"	*0.0400*		*97.6*	*21-167*			
LCS (1610315-BS1)				Prepared & Analyzed: 10/28/16						
Naphthalene	ND	0.010	mg/kg				66-138			
Benzene	0.0748	0.0020	"	0.100		74.8	58-130			
Toluene	0.0812	0.0050	"	0.100		81.2	61-134			
Ethylbenzene	0.104	0.0050	"	0.0992		105	74-139			
m,p-Xylene	0.195	0.010	"	0.200		97.9	73-137			
o-Xylene	0.0983	0.0050	"	0.0980		100	73-141			
Surrogate: 1,2-Dichloroethane-d4	*0.0457*		"	*0.0400*		*114*	*23-173*			
Surrogate: Toluene-d8	*0.0396*		"	*0.0400*		*99.0*	*20-170*			
Surrogate: 4-Bromofluorobenzene	*0.0387*		"	*0.0400*		*96.8*	*21-167*			
Matrix Spike (1610315-MS1)		**Source: 1610231-01**		Prepared & Analyzed: 10/28/16						
Naphthalene	ND	0.010	mg/kg		ND		10-158			
Benzene	0.0755	0.0020	"	0.100	ND	75.5	30-131			
Toluene	0.0828	0.0050	"	0.100	ND	82.8	30-134			
Ethylbenzene	0.105	0.0050	"	0.0992	ND	105	22-153			
m,p-Xylene	0.198	0.010	"	0.200	ND	99.0	10-159			
o-Xylene	0.0992	0.0050	"	0.0980	ND	101	31-151			
Surrogate: 1,2-Dichloroethane-d4	*0.0466*		"	*0.0400*		*117*	*23-173*			
Surrogate: Toluene-d8	*0.0396*		"	*0.0400*		*99.1*	*20-170*			
Surrogate: 4-Bromofluorobenzene	*0.0388*		"	*0.0400*		*97.0*	*21-167*			

Tasman Geosciences 6899 Pecos Street Denver CO, 80221	Project: Frank 2, 5, 6, CC7-19, 29 Project Number: [none] Project Manager: Brandon Bruns	**Reported:** 10/29/16 16:59

Volatile Organic Compounds by EPA Method 8260B - Quality Control

Summit Scientific

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1610315 - EPA 5030 Soil MS										
Matrix Spike Dup (1610315-MSD1)		**Source: 1610231-01**		Prepared & Analyzed: 10/28/16						
Naphthalene	ND	0.010	mg/kg		ND		10-158		42	
Benzene	0.0891	0.0020	"	0.0992	ND	89.8	30-131	16.4	34	
Toluene	0.0834	0.0050	"	0.0992	ND	84.0	30-134	0.642	30	
Ethylbenzene	0.105	0.0050	"	0.0984	ND	107	22-153	0.345	24	
m,p-Xylene	0.197	0.010	"	0.198	ND	99.7	10-159	0.101	68	
o-Xylene	0.0997	0.0050	"	0.0972	ND	103	31-151	0.465	38	
Surrogate: 1,2-Dichloroethane-d4	*0.0479*		"	*0.0397*		*121*	*23-173*			
Surrogate: Toluene-d8	*0.0401*		"	*0.0397*		*101*	*20-170*			
Surrogate: 4-Bromofluorobenzene	*0.0379*		"	*0.0397*		*95.5*	*21-167*			

Tasman Geosciences 6899 Pecos Street Denver CO, 80221	Project: Frank 2, 5, 6, CC7-19, 29 Project Number: [none] Project Manager: Brandon Bruns	**Reported:** 10/29/16 16:59

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