REMEDIAL EXCAVATION REPORT

DUNCAN D20-13, 20-13

COGCC SPILL TRACKING # 459804
COGCC REMEDIATION # 12461

Prepared for:

2115 117th Avenue
Greeley, CO 80631

Prepared by:

6899 North Pecos Street, Unit C
Denver, CO 80221

June 14, 2019

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

Subject: **Remedial Excavation Summary Report**
Duncan D20-12, 20-13
API #: 05-123-15466
Spill/Release Point ID #: 459804
Remediation Project #: 12461
NWSW S20 T3N R64W
Weld County, Colorado

Dear Mr. Evans:

Below please find a copy of the above referenced Remedial Excavation Report (Report) for the Duncan D20-12, 20-13 site (Site) in Weld County, Colorado. The text below describes remedial excavation and environmental sampling conducted at the Site on June 6, 2019 (Excavation) by Tasman Geosciences, Inc. (Tasman), on behalf of Noble Energy, Inc. (Noble).

Introduction

The purpose of this document is to describe the excavation and removal of impacted soil and subsequent soil sampling activities conducted as part of the remedial Excavation. The activities described below were performed in response to the discovery of suspected impacted media beneath the Duncan D20-12, 20-13 tank battery during plug and abandonment procedures on December 10, 2018.

Facility Background

The Site is located approximately 7.5 miles north of the Town of Hudson in Weld County, Colorado, as shown on Figure 1. The Site is surrounded by crop land, and the legal description is the northwest ¼ of the southwest ¼ of Section 20, Township 3 North, Range 64 West, of the 6th Principal Meridian. The Site is located on terrain that slopes to the north-northeast. The Site is approximately 0.5 miles south of Weld County Road 32 and has coordinates of 40.210677°, -104.584405°.

On December 11, 2018, historic impacts were confirmed beneath the Duncan D20-12, 20-13 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 December 12, 2018. The COGCC subsequently issued Spill/Release Point ID Number 459804 for this event and the site was plugged and abandoned. Activities and results of the initial investigation were reported in the document *Duncan D20-12, 20-13 Excavation Summary Report.* A Form 27 was submitted on February 11 and COGCC subsequently issued Remediation Number 12461 for the project.

Remedial Excavation Field Activities

On June 6, 2019 Tasman returned to the Site to guide remedial Excavation activities. The purpose of the Excavation activities was to excavate and remove impacted material for off-Site disposal, and to introduce a groundwater amendment into the area of dissolved phase petroleum hydrocarbon impacts. Excavation activities were guided in the field using a photo-ionization detector (PID) and standard headspace soil screening techniques.

During excavation activities, soil samples were collected from six locations (SS05 through SS10) along the sidewalls of the Excavation at approximately 3 ft. below ground surface (ft. bgs). Soil samples were submitted to Summit Scientific Laboratory 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. At the request of Noble, one confirmation soil sample (CS01) was collected from the imported clean fill material. Confirmation soil sample, CS01, was submitted to Summit and run for suite of analytes mentioned above. Soil analytical data is summarized in Table 1 and the excavation extent and soil sample locations are illustrated on Figure 2. The laboratory analytical reports are included as Attachment A.

During Excavation activities, groundwater infiltrated into the excavation at a depth of approximately 4 ft. bgs. Prior to backfilling, 55 pounds of activated carbon were applied to the groundwater surface at the base of the excavation in order to mitigate remaining dissolved phase petroleum hydrocarbon impacts. The activated carbon safety data sheets (SDS) are included as Attachment B.

Impacted soils removed from the release location and its surroundings were transported off-Site for disposal at the Buffalo Ridge Landfill in Keenesburg, Colorado under signed noble waste manifests. A total of approximately 70 cubic yards of impacted material were removed from the Site for disposal and the final excavation area measured approximately 22 ft. by 21 ft. by 4 ft. bgs.

Results

Laboratory analytical results for the six soil samples collected from the final excavation extents indicate that BTEX, naphthalene, TPH-GRO, and TPH-DRO concentrations are below applicable COGCC Table 910-1 standards. These results confirm that vadose zone petroleum hydrocarbon impacts were successfully removed from the Site through excavation activities.

Conclusions

Based upon field and laboratory data collected during excavation activities described herein, all impacted soil in the release area has been removed from the Site. Dissolved phase groundwater petroleum hydrocarbon impacts previously identified were treated using activated carbon. A groundwater assessment will be completed to determine the extent of groundwater impacts at the Site. Quarterly groundwater monitoring will be initiated at the Site to evaluate groundwater

conditions following the assessment. 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

Attachments:

Table 1 – Soil Analytical Data

Figure 1 – Site Location Map
Figure 2 – Remedial Excavation Soil Analytical Results Map (6/6/2019)

Attachment A – Laboratory Analytical Data Report
Attachment B – Activated Carbon Safety Data Sheet

TABLES

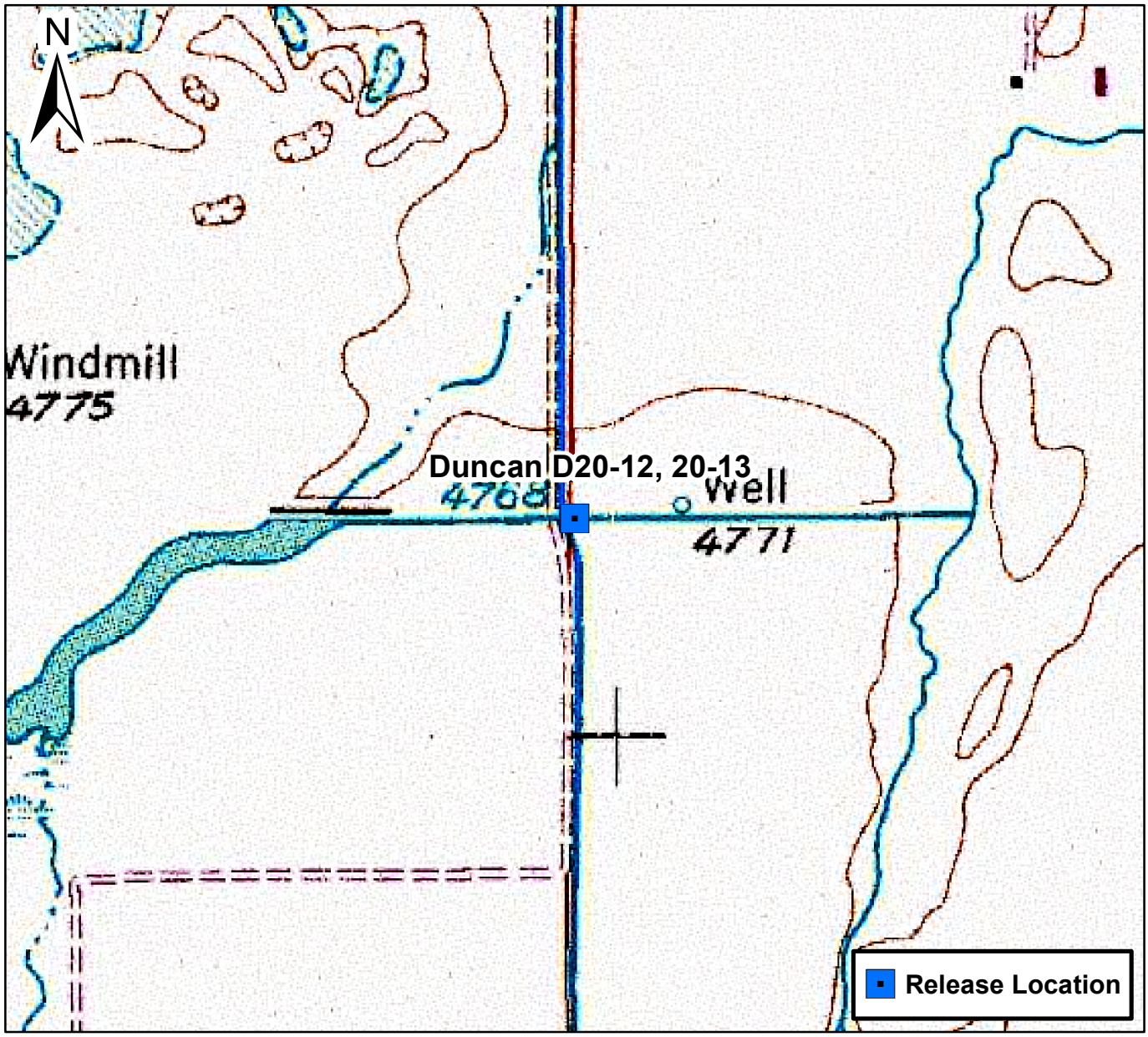
TABLE 1
SOIL ANALYTICAL DATA
NOBLE ENERGY, INC. - DUNCAN D20-12, 20-13

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**
SS01@3'	12/10/18	<0.0020	<0.0050	<0.0050	<0.010	<50	<50	<0.010
SS02@3'	12/10/18	0.043	<0.0050	0.36	0.13	**1,000**	**1,300**	0.72
SS03@3'	12/10/18	<0.0020	<0.0050	<0.0050	<0.010	<50	<50	<0.010
SS04@3'	12/10/18	**9.3**	2.0	33	**320**	**7,000**	**3,700**	8.3
SS05@3'	06/06/19	<0.0020	<0.0050	<0.0050	<0.010	<50	<50	<0.010
SS06@3'	06/06/19	<0.0020	<0.0050	<0.0050	<0.010	<50	<50	<0.010
SS07@3'	06/06/19	<0.0020	<0.0050	<0.0050	<0.010	<50	<50	<0.010
SS08@3'	06/06/19	<0.0020	<0.0050	<0.0050	<0.010	<50	<50	<0.010
SS09@3'	06/06/19	<0.0020	<0.0050	<0.0050	<0.010	<50	<50	<0.010
SS10@3'	06/06/19	<0.0020	<0.0050	<0.0050	<0.010	<50	<50	<0.010
CS01	06/06/19	<0.0020	<0.0050	<0.0050	<0.010	<50	<50	<0.010

Soil Sample ID	Date	SAR	pH	EC (mmhos/cm)
COGCC Standard		**<12**	**6-9**	**<4mmhos/cm**
SS04@3'	12/10/18	4.01	8.43	2.95

COGCC = Colorado Oil and Gas Conservation Commission
TPH-GRO = Total petroleum hydrocarbons - gasoline range organics
TPH-DRO = Total petroleum hydrocarbons - diesel range organics
SAR = Sodium Absorption Ratio
EC = Specific Conductance
mg/kg = Milligrams per kilogram
mmhos/cm = Millimhos per centimeter
< = 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



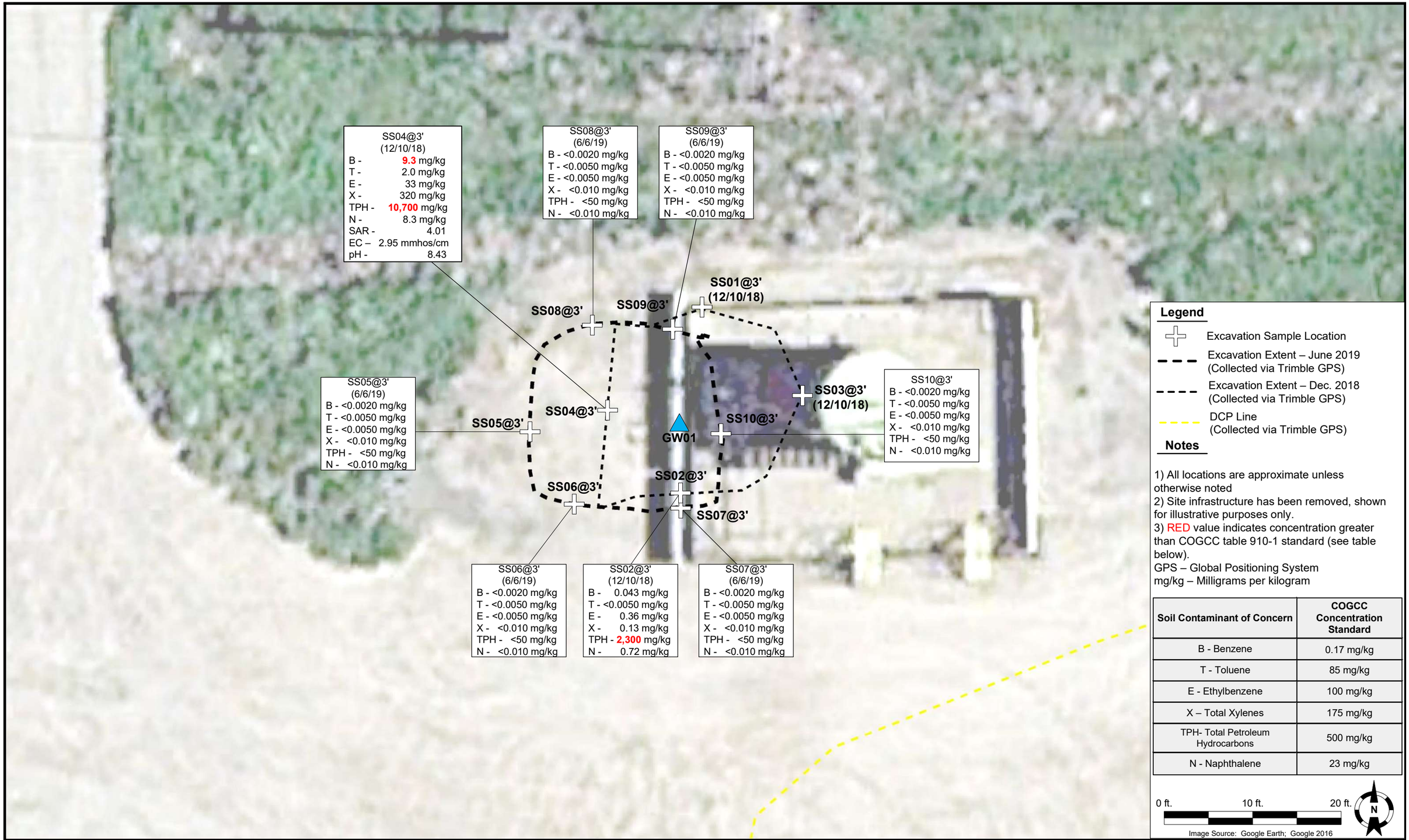
0 750 1,500 Feet

Figure 1

Site Location Map
Duncan D20-12, 20-13
NWSW S20 T3N R64W
Weld County, Colorado

TASMAN GEOSCIENCES

Drawn By: DC
Date: 2/4/2019



Soil Contaminant of Concern	COGCC Concentration Standard
B - Benzene	0.17 mg/kg
T - Toluene	85 mg/kg
E - Ethylbenzene	100 mg/kg
X – Total Xylenes	175 mg/kg
TPH- Total Petroleum Hydrocarbons	500 mg/kg
N - Naphthalene	23 mg/kg

DATE:	6/14/19
DESIGNED BY:	CO
DRAWN BY:	MG

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

Noble Energy, Inc. – DJ Basin
Duncan D20-12, 20-13
NWSW, Section 20, Township 3 North, Range 64 West
Weld County, Colorado

Remedial Excavation
Soil Analytical Results Map
(12/10/18,6/6/2019)

FIGURE
2

ATTACHMENT A

LABORATORY ANALYTICAL DATA REPORT

Summit Scientific

4653 Table Mountain Drive, Golden, Colorado 80403

303.277.9310

June 07, 2019

Brandon Bruns

Tasman Geosciences

6899 Pecos St, Unit C

Denver, CO 80221

RE: Noble - Duncan D20-12, 20-13

Work Order # 1906064

Enclosed are the results of analyses for samples received by Summit Scientific on 06/06/19 16:20. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Paul Shrewsbury For Ben Shrewsbury

Laboratory Manager

Tasman Geosciences	Project: Noble - Duncan D20-12, 20-13	
6899 Pecos St, Unit C	Project Number: [none]	**Reported:**
Denver CO, 80221	Project Manager: Brandon Bruns	06/07/19 06:21

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
SS05@3'	1906064-01	Soil	06/06/19 10:15	06/06/19 16:20
SS06@3'	1906064-02	Soil	06/06/19 12:00	06/06/19 16:20
SS07@3'	1906064-03	Soil	06/06/19 12:05	06/06/19 16:20
SS08@3'	1906064-04	Soil	06/06/19 12:20	06/06/19 16:20
SS09@3'	1906064-05	Soil	06/06/19 12:25	06/06/19 16:20
SS10@3'	1906064-06	Soil	06/06/19 12:45	06/06/19 16:20
CS01	1906064-07	Soil	06/06/19 14:00	06/06/19 16:20

Summit Scientific

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

Summit Scientific

1906064

S_2

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:	Duncan D 20-12, 20-13
Sampler Name:	GB	Project Number:	—

					Preservative				Matrix				Analysis Requested								Special Instructions
ID	Sample Description	Date Sampled	Time Sampled	# of containers	HCl	HNO3	None	Other ___	Water	Soil	Air-Canister #	Other ___	8260 BTEX	8260B GBTEXN	8015 DRO	pH, EC, SAR					
1	SS05@3'	6/6/19	1015	1			X			X				X	X						
2	SS06@3'	↓	1200	1			↓			↓				↓	↓						
3	SS07@3'		1205	1																	
4	SS08@3'		1220	1																	
5	SS09@3'		1225	1																	
6	SS10@3'		1245	1																	
7	CS01	↓	1400	1			↓			↓				↓	↓						
8																					
9																					
10																					

Relinquished by:	Date/Time: 6/6/19 1620	Received by: Tasman's Lock Box	Date/Time: 6/6/19 1620	**Turn Around Time**	(Check)
Relinquished by: Tasman's Lock Box	Date/Time: 6-6-19 17:20	Received by:	Date/Time: 6-6-19 17:20	Same Day X 24 hours ___ 48 hours ___	72 hours ___ Standard ___
Relinquished by:	Date/Time:	Received by:	Date/Time:	**Sample Integrity:** Temperature Upon Receipt: 5.7° Samples Intact: (Yes) No	

Notes:

Sample Receipt Checklist

S2 Work Order 1906064

Client: Noble/Tasman Client Project ID: Duncan D 20-12, 20-13

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

Matrix (check all that apply): _____Air ✓ Soil/Solid _____Water ____Other:_____ (Describe)

Temp (°C)	5.7°

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

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

AT — **Custodian Printed Name or Initials**

Signature of Custodian

6-6-19 — **Date/Time**

Tasman Geosciences 6899 Pecos St, Unit C Denver CO, 80221	Project: Noble - Duncan D20-12, 20-13 Project Number: [none] Project Manager: Brandon Bruns	**Reported:** 06/07/19 06:21

SS05@3'

1906064-01 (Soil)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **06/06/19 10:15**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	0.0020	mg/kg	1	1906077	06/06/19	06/06/19	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: **06/06/19 10:15**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		*79.0 %*	*23-173*		"	"	"	"	
Surrogate: Toluene-d8		*84.7 %*	*20-170*		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		*94.9 %*	*21-167*		"	"	"	"	

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: **06/06/19 10:15**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	1906079	06/06/19	06/06/19	EPA 8015M	

Date Sampled: **06/06/19 10:15**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: o-Terphenyl		*93.3 %*	*30-150*		"	"	"	"	

Tasman Geosciences 6899 Pecos St, Unit C Denver CO, 80221	Project: Noble - Duncan D20-12, 20-13 Project Number: [none] Project Manager: Brandon Bruns	**Reported:** 06/07/19 06:21

SS06@3'

1906064-02 (Soil)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

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

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	0.0020	mg/kg	1	1906077	06/06/19	06/06/19	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: **06/06/19 12:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		*80.6 %*	*23-173*		"	"	"	"	
Surrogate: Toluene-d8		*92.2 %*	*20-170*		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		*92.3 %*	*21-167*		"	"	"	"	

Extractable Petroleum Hydrocarbons by 8015

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

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	1906079	06/06/19	06/06/19	EPA 8015M	

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

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: o-Terphenyl		*96.1 %*	*30-150*		"	"	"	"	

Tasman Geosciences 6899 Pecos St, Unit C Denver CO, 80221	Project: Noble - Duncan D20-12, 20-13 Project Number: [none] Project Manager: Brandon Bruns	**Reported:** 06/07/19 06:21

SS07@3'

1906064-03 (Soil)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **06/06/19 12:05**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	0.0020	mg/kg	1	1906077	06/06/19	06/06/19	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: **06/06/19 12:05**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		*84.6 %*	*23-173*		"	"	"	"	
Surrogate: Toluene-d8		*94.4 %*	*20-170*		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		*96.8 %*	*21-167*		"	"	"	"	

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: **06/06/19 12:05**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	1906079	06/06/19	06/06/19	EPA 8015M	

Date Sampled: **06/06/19 12:05**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: o-Terphenyl		*93.2 %*	*30-150*		"	"	"	"	

Tasman Geosciences 6899 Pecos St, Unit C Denver CO, 80221	Project: Noble - Duncan D20-12, 20-13 Project Number: [none] Project Manager: Brandon Bruns	**Reported:** 06/07/19 06:21

SS08@3'

1906064-04 (Soil)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

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

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	0.0020	mg/kg	1	1906077	06/06/19	06/06/19	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: **06/06/19 12:20**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		*84.5 %*	*23-173*		"	"	"	"	
Surrogate: Toluene-d8		*92.6 %*	*20-170*		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		*90.6 %*	*21-167*		"	"	"	"	

Extractable Petroleum Hydrocarbons by 8015

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

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	1906079	06/06/19	06/06/19	EPA 8015M	

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

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

Tasman Geosciences 6899 Pecos St, Unit C Denver CO, 80221	Project: Noble - Duncan D20-12, 20-13 Project Number: [none] Project Manager: Brandon Bruns	**Reported:** 06/07/19 06:21

SS09@3'

1906064-05 (Soil)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

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

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	0.0020	mg/kg	1	1906077	06/06/19	06/06/19	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: **06/06/19 12:25**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		*84.3 %*	*23-173*		"	"	"	"	
Surrogate: Toluene-d8		*90.4 %*	*20-170*		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		*90.8 %*	*21-167*		"	"	"	"	

Extractable Petroleum Hydrocarbons by 8015

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

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	1906079	06/06/19	06/06/19	EPA 8015M	

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

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

Tasman Geosciences 6899 Pecos St, Unit C Denver CO, 80221	Project: Noble - Duncan D20-12, 20-13 Project Number: [none] Project Manager: Brandon Bruns	**Reported:** 06/07/19 06:21

SS10@3'

1906064-06 (Soil)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **06/06/19 12:45**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	0.0020	mg/kg	1	1906077	06/06/19	06/06/19	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: **06/06/19 12:45**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		*80.9 %*	*23-173*		"	"	"	"	
Surrogate: Toluene-d8		*91.4 %*	*20-170*		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		*92.1 %*	*21-167*		"	"	"	"	

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: **06/06/19 12:45**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	1906079	06/06/19	06/06/19	EPA 8015M	

Date Sampled: **06/06/19 12:45**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: o-Terphenyl		*98.3 %*	*30-150*		"	"	"	"	

Tasman Geosciences 6899 Pecos St, Unit C Denver CO, 80221	Project: Noble - Duncan D20-12, 20-13 Project Number: [none] Project Manager: Brandon Bruns	**Reported:** 06/07/19 06:21

CS01

1906064-07 (Soil)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

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

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	0.0020	mg/kg	1	1906077	06/06/19	06/06/19	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: **06/06/19 14:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		*82.9 %*	*23-173*		"	"	"	"	
Surrogate: Toluene-d8		*92.0 %*	*20-170*		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		*92.5 %*	*21-167*		"	"	"	"	

Extractable Petroleum Hydrocarbons by 8015

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

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	1906079	06/06/19	06/06/19	EPA 8015M	

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

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: o-Terphenyl		*93.7 %*	*30-150*		"	"	"	"	

Tasman Geosciences	Project: Noble - Duncan D20-12, 20-13	
6899 Pecos St, Unit C	Project Number: [none]	**Reported:**
Denver CO, 80221	Project Manager: Brandon Bruns	06/07/19 06:21

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 1906077 - EPA 5030 Soil MS										
Blank (1906077-BLK1)				Prepared: 06/06/19 Analyzed: 06/07/19						
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	*0.0406*		"	*0.0400*		*101*	*23-173*			
Surrogate: Toluene-d8	*0.0398*		"	*0.0400*		*99.4*	*20-170*			
Surrogate: 4-Bromofluorobenzene	*0.0394*		"	*0.0400*		*98.4*	*21-167*			
LCS (1906077-BS1)				Prepared: 06/06/19 Analyzed: 06/07/19						
Benzene	0.0931	0.0020	mg/kg	0.100		93.1	70-130			
Toluene	0.101	0.0050	"	0.100		101	70-130			
Ethylbenzene	0.113	0.0050	"	0.100		113	70-130			
m,p-Xylene	0.222	0.010	"	0.200		111	70-130			
o-Xylene	0.107	0.0050	"	0.100		107	70-130			
Surrogate: 1,2-Dichloroethane-d4	*0.0406*		"	*0.0400*		*101*	*23-173*			
Surrogate: Toluene-d8	*0.0404*		"	*0.0400*		*101*	*20-170*			
Surrogate: 4-Bromofluorobenzene	*0.0417*		"	*0.0400*		*104*	*21-167*			
Matrix Spike (1906077-MS1)		**Source: 1906061-02**		Prepared: 06/06/19 Analyzed: 06/07/19						
Benzene	0.0932	0.0020	mg/kg	0.100	ND	93.2	70-130			
Toluene	0.102	0.0050	"	0.100	ND	102	70-130			
Ethylbenzene	0.111	0.0050	"	0.100	ND	111	70-130			
m,p-Xylene	0.220	0.010	"	0.200	ND	110	70-130			
o-Xylene	0.105	0.0050	"	0.100	ND	105	70-130			
Surrogate: 1,2-Dichloroethane-d4	*0.0406*		"	*0.0400*		*102*	*23-173*			
Surrogate: Toluene-d8	*0.0396*		"	*0.0400*		*99.1*	*20-170*			
Surrogate: 4-Bromofluorobenzene	*0.0391*		"	*0.0400*		*97.8*	*21-167*			

Tasman Geosciences	Project: Noble - Duncan D20-12, 20-13	
6899 Pecos St, Unit C	Project Number: [none]	**Reported:**
Denver CO, 80221	Project Manager: Brandon Bruns	06/07/19 06:21

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 1906077 - EPA 5030 Soil MS										
Matrix Spike Dup (1906077-MSD1)		**Source: 1906061-02**		Prepared: 06/06/19 Analyzed: 06/07/19						
Benzene	0.0954	0.0020	mg/kg	0.100	ND	95.4	70-130	2.29	30	
Toluene	0.105	0.0050	"	0.100	ND	105	70-130	2.31	30	
Ethylbenzene	0.114	0.0050	"	0.100	ND	114	70-130	2.90	30	
m,p-Xylene	0.229	0.010	"	0.200	ND	114	70-130	4.16	30	
o-Xylene	0.108	0.0050	"	0.100	ND	108	70-130	2.68	30	
Surrogate: 1,2-Dichloroethane-d4	*0.0427*		*"*	*0.0400*		*107*	*23-173*			
Surrogate: Toluene-d8	*0.0400*		*"*	*0.0400*		*100*	*20-170*			
Surrogate: 4-Bromofluorobenzene	*0.0424*		*"*	*0.0400*		*106*	*21-167*			

Tasman Geosciences	Project: Noble - Duncan D20-12, 20-13	
6899 Pecos St, Unit C	Project Number: [none]	**Reported:**
Denver CO, 80221	Project Manager: Brandon Bruns	06/07/19 06:21

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 1906079 - EPA 3550A										
Blank (1906079-BLK1)				Prepared & Analyzed: 06/06/19						
C10-C28 (DRO)	ND	50	mg/kg							
LCS (1906079-BS1)				Prepared: 06/06/19 Analyzed: 06/07/19						
C10-C28 (DRO)	445	50	mg/kg	500		89.0	70-130			
Matrix Spike (1906079-MS1)	**Source: 1906061-01**			Prepared: 06/06/19 Analyzed: 06/07/19						
C10-C28 (DRO)	504	50	mg/kg	500	125	75.9	70-130			
Matrix Spike Dup (1906079-MSD1)	**Source: 1906061-01**			Prepared: 06/06/19 Analyzed: 06/07/19						
C10-C28 (DRO)	533	50	mg/kg	500	125	81.7	70-130	5.62	20	

Tasman Geosciences	Project: Noble - Duncan D20-12, 20-13	
6899 Pecos St, Unit C	Project Number: [none]	**Reported:**
Denver CO, 80221	Project Manager: Brandon Bruns	06/07/19 06:21

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

ATTACHMENT B

ACTIVATED CARBON SAFETY DATA SHEET

Section 1 – Identification of the substance/mixture and of the company/undertaking			
Product Identifier/Name:	Activated Carbon		
Trade Name and Synonyms:	OxPure® brand, with particle sizes from microns to millimeters		
Chemical Name:	Activated Carbon		
Relevant Identified Uses of the Substance or Mixture and Uses Advised Against:	Adsorbents in various liquid and gas (including vapor, air, etc.) phases, Carriers/supports for catalyst applications.		
Restrictions On Use:	None known		
Details of the Supplier:	Oxbow Activated Carbon LLC, 2535 Jason Court, Oceanside, CA 92056, USA Phone: 1-760-630-5724	**Questions Contact:**	SDS.Support@Oxbow.com
		Emergency Phone:	US: 1-800-222-1222

Section 2 – Hazards Identification	
GHS Classification and Labelling of the Substance or Mixture:	
Label Elements **Signal Word:** **Hazard Statement:** **Hazard Symbol:** **Precautionary Statement:**	 Warning May form combustible dust concentrations in air. None **Prevention:** Prevent dust accumulation to minimize explosion hazard. Keep away from heat/sparks/open flames/hot surfaces. - No smoking. Keep container tightly closed. Ground/bond container and receiving equipment. Wear respiratory protection. Use only outdoors or in a well-ventilated area. Observe good industrial hygiene practices. **Response:** In case of fire: Use appropriate media to extinguish. Wash hands after handling. **Storage:** Store away from incompatible materials. **Disposal:** Dispose of waste and residues in accordance with local authority requirements.
Exposure Limits:	See Section 8 of the SDS
Physical hazards:	Not classified.
Health hazards:	Not classified.
OSHA defined hazards:	Combustible dust
Other Hazards: Hazard(s) not otherwise classified (HNOC) **Supplemental information**	None known. This material does not ignite easily; however, feasible electrical precautions against dust explosion are recommended. Contact with strong oxidizers such as ozone, liquid oxygen, chlorine, permanganate, etc., may result in fire. Wet activated carbon depletes oxygen from air and, therefore, dangerously low levels of oxygen may be encountered. Whenever workers enter a vessel containing activated carbon, the vessel's oxygen content should be determined and work procedures for potentially low oxygen areas should be followed. Spent (or used) activated carbons may exhibit properties pertaining to the adsorbed components.

Section 3 – Composition / Information on Ingredients				
Substances:	Activated carbon	100%	CAS NO.	7440-44-0
Mixtures: Composition comments:	All concentrations are in percent by weight unless ingredient is a gas. Gas concentrations are in percent by volume.			

Section 4 – First Aid Measures	
Description of First Aid	**Inhalation**: Move to fresh air. Call a physician if symptoms develop or persist. If

Measures:	dizziness, nausea, or unconsciousness occurs, seek immediate medical assistance. If breathing has stopped, assist ventilation with a mechanical device. Get medical attention immediately. **Eye Contact**: Do not rub eyes. Rinse with water. Get medical attention if irritation develops and persists. **Skin Contact**: Wash off with soap and water. Get medical attention if irritation develops and persists. **Ingestion:** Rinse mouth. Get medical attention if symptoms occur.
Most Important Symptoms and Effects, acute and delayed:	Dusts may irritate the respiratory tract, skin and eyes. Coughing. Exposed individuals may experience eye tearing, redness, and discomfort.
Indication of Any Immediate Medical Attention and Special Treatment Needed:	Treat symptomatically.
General information	Ensure that medical personnel are aware of the material(s) involved, and take precautions to protect themselves.
Section 5 – Firefighting Measures	
Extinguishing Media:	**Suitable Extinguishing Media:** Water fog. Foam. Dry chemical powder. Carbon dioxide (CO2). Apply extinguishing media carefully to avoid creating airborne dust. Avoid high pressure media which could cause the formation of a potentially explosible dust-air mixture. **Unsuitable Extinguishing Media:** Do not use water jet as an extinguisher, as this will spread the fire.
Special Hazards Arising from the Substance or Mixture:	Material burns slowly without flame. Activated carbon which has been allowed to smolder for a long time in a confined space may accumulate carbon monoxide above its permissible exposure limit. Do not enter permitted confined space or enclosed area without proper PPE. High concentrations of dust may form combustible dust concentrations in air. Contact with strong oxidizers such as ozone, liquid oxygen, chlorine, permanganate, etc., may result in fire. During fire, hazardous combustion products are released that may include: Carbon oxides (COx).
Special protective equipment and precautions for firefighters **Fire fighting equipment/instructions** **Specific methods** **General fire hazards**	Self-contained breathing apparatus and full protective clothing must be worn in case of fire. In case of fire and/or explosion do not breathe fumes. Move containers from fire area if you can do so without risk. Use standard firefighting procedures and consider the hazards of other involved materials. May form combustible dust concentrations in air.
Section 6 – Accidental Release Measures	
Personal Precautions, Protective Equipment, Emergency Procedures:	Keep people away from and upwind of spill/leak. Use only non-sparking tools. Dust deposits should not be allowed to accumulate on surfaces, as these may form an explosive mixture if they are released into the atmosphere in sufficient concentration. Wear appropriate protective equipment and clothing during clean-up. Emergency personnel need self-contained breathing equipment. Ensure adequate ventilation. Local authorities should be advised if significant spillages cannot be contained. For personal protection, see section 8 of the SDS.
Environmental Precautions:	Avoid discharge into drains, water courses or onto the ground.
Methods and Material for Containment and Clean-up:	Eliminate all ignition sources (no smoking, flares, sparks, or flames in immediate area). Take precautionary measures against static discharge. Use only non-sparking

<table>
<tr><td></td><td>tools. Avoid dispersal of dust in the air (i.e., clearing dust surfaces with compressed air). The product is immiscible with water and will sediment in water systems. Stop the flow of material, if this is without risk.
Large Spills: Wet down with water and dike for later disposal. Shovel the material into waste container. Following product recovery, flush area with water.
Small Spills: Sweep up or vacuum up spillage and collect in suitable container for disposal.
Never return spills to original containers for re-use. For waste disposal, see section 13 of the SDS.
Used or spent activated carbon may contain pollutants which require the material to be treated according to specific laws or local permits and may require the use of risk management measures when handling the product.</td></tr>
<tr><td>Reference to Other Sections:</td><td>Section 8 of the SDS</td></tr>
<tr><td colspan="2">Section 7 – Handling And Storage</td></tr>
<tr><td>Precautions For Safe Handling:</td><td>Minimize dust generation and accumulation. Avoid significant deposits of material, especially on horizontal surfaces, which may become airborne and form combustible dust clouds and may contribute to secondary fires. Routine housekeeping should be instituted to ensure that dusts do not accumulate on surfaces. Dry powders can build static electricity charges when subjected to the friction of transfer and mixing operations. Provide adequate precautions, such as electrical grounding and bonding, or inert atmospheres. Keep away from heat/sparks/open flames/hot surfaces. No smoking. Explosion-proof general and local exhaust ventilation. Avoid prolonged exposure. Do not enter storage areas or confined spaces unless adequately ventilated. Oxygen concentration should not fall below 19.5 %at sea level (pO_2 = 135 mmHg). Oxygen level alarms are advisable in enclosed storage areas/confined spaces containing wet activated carbon. Mechanical ventilation or local exhaust ventilation may be required. Wear appropriate personal protective equipment. Observe good industrial hygiene practices.</td></tr>
<tr><td>Conditions For Safe Storage:</td><td>Keep dry. Avoid high temperatures. Protect from direct sunlight. Keep containers tightly closed in a dry, cool and well-ventilated place. Store away from incompatible materials (see Section 10 of the SDS). Access to storage of wet activated carbon should be restricted. Oxygen level alarms are advisable in enclosed storage rooms containing wet activated carbon.</td></tr>
<tr><td>Incompatibilities:</td><td>Heat and source of ignition, strong oxidizing acids or oxidants</td></tr>
<tr><td>Specific End Use:</td><td>Not Available</td></tr>
<tr><td colspan="2">Section 8 – Exposure Controls / Personal Protection</td></tr>
<tr><td>Control Parameters:</td><td>Occupational exposure limits
US. OSHA Table Z-3 (29 CFR 1910.1000)
<table>
<tr><th>Material</th><th>Type</th><th>Value</th><th>Form</th></tr>
<tr><td>Activated Carbon OxPure brand</td><td>TWA</td><td>5 mg/m3
15 mg/m3</td><td>Respirable fraction
Total dust</td></tr>
<tr><td>Activated Carbon (CAS 7440-44-0)</td><td>TWA</td><td>5 mg/m3
15 mg/m3</td><td>Respirable fraction
Total dust</td></tr>
</table>
US. NIOSH: Pocket Guide to Chemical Hazards
<table>
<tr><th>Material</th><th>Type</th><th>Value</th><th>Form</th></tr>
<tr><td>Activated Carbon OxPure brand</td><td>TWA</td><td>2.5 mg/m3</td><td>Respirable</td></tr>
<tr><td>Activated Carbon (CAS 7440-44-0)</td><td>TWA</td><td>2.5 mg/m3</td><td>Respirable</td></tr>
</table></td></tr>
</table>

	Biological limit values: No biological exposure limits noted for the ingredient(s).
Engineering Controls	Good general ventilation (typically 10 air changes per hour) should be used. Ventilation rates should be matched to conditions. If applicable, use process enclosures, local exhaust ventilation, or other engineering controls to maintain airborne levels below recommended exposure limits. If exposure limits have not been established, maintain airborne levels to an acceptable level. Low oxygen work procedures should be in place – Wet activated carbon depletes oxygen from air and, therefore, dangerously low levels of oxygen may be encountered. Whenever workers enter a vessel containing activated carbon, the vessels oxygen content should be determined and work procedures for potentially low oxygen areas should be followed. Alternatively the room may be fitted with oxygen level sensors having an alarm setting at 18 vol%.
Personal Protection Information:	**Respiratory Protection:** If engineering controls do not maintain airborne concentrations below recommended exposure limits (where applicable) or to an acceptable level (in countries where exposure limits have not been established), an approved respirator must be worn. **Eye/Face Protection:** Wear safety glasses with side shields (or goggles). **Skin Protection-Hand Protection:** Wear appropriate chemical resistant gloves. Suitable gloves can be recommended by the glove supplier. **Skin Protection-Other**: Wear suitable protective clothing. **Thermal hazard:** Wear appropriate thermal protective clothing, when necessary.
General Hygiene:	When using, do not eat, drink or smoke. Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants.

Section 9 – Physical and Chemical Properties

Information on Basic Physical and Chemical Properties:

Appearance: **Color**	Solid Black	**Flammability:**	Not available
Odor:	Odorless	**Upper Flammability/Explosive Limit:**	Not available
Odor Threshold:	Not available	**Lower Flammability/Explosive Limit:**	Not available
pH:	Not available	**Vapor Pressure:**	Not available
Melting Point:	Not available	**Vapor Density:**	Not available
Freezing Point:	Not available	**Relative Density:**	Not available
Initial Boiling Point:	Not available	**Solubility:**	Insoluble
Boiling Range:	Not available	**Partition Coefficient: n-octanol/water:**	Not available
Flash Point:	Not available	**Auto Ignition Temperature:**	Not available
Evaporation Rate:	Not available	**Decomposition Temperature:**	Not available
		Viscosity:	Not available
Other Info: **Bulk Density**	 0.1 – 1 g/cm^3	**Molecular Formula** **Molecular Weight**	C 12.01 g/mol

Section 10 – Stability and Reactivity	
Reactivity:	The product is stable and non-reactive under normal conditions of use, storage and transport.
Chemical Stability:	Material is stable under normal conditions.
Hazardous Polymerization:	Not available
Possibility of Hazardous Reaction	Contact with strong oxidizers like chlorine, liquid oxygen, permanganate, ozone, may result in rapid combustion and possible explosion. Wet activated carbon depletes oxygen from air and, therefore, dangerously low levels of oxygen may be encountered. Whenever workers enter a vessel containing activated carbon, the

	vessel's oxygen content should be determined and work procedures for potentially low oxygen areas should be followed.
Conditions to Avoid:	Keep away from heat, sparks and open flame. Do not contact with incompatible materials. Minimize dust generation and accumulation.
Incompatible Materials:	Keep away from strong oxidizing acids and other strong oxidants.
Hazardous Decomposition Products	No hazardous decomposition products are known.
Section 11 – Toxicological Information	
Information on Toxicological Effects:	
Routes of Entry:	**Inhalation:** Prolonged inhalation may be harmful. Prolonged and repeated overexposure to dust can lead to pneumoconiosis. Pre-existing pulmonary disorders, such as emphysema, may possibly be aggravated by prolonged exposure to high concentrations of carbon. **Skin Contact:** Frequent or prolonged contact may defat and dry the skin, leading to discomfort and dermatitis. **Eye Contact:** May irritate eyes. **Ingestion:** May cause discomfort if swallowed. When large amounts are ingested orally, congestion may occur. However, ingestion is not likely to be a primary route of occupational exposure.
Acute Toxicity:	Not expected to be acutely toxic.
Skin corrosivity/Irritation:	May cause skin irritation.
Eye damage/irritation	May cause eye irritation.
Sensitization:	**Respiratory sensitization:** Not a respiratory sensitizer. **Skin sensitization:** This product is not expected to cause skin sensitization.
Repeated Dose Toxicity:	**Specific target organ toxicity -single exposure:** Not classified. **Specific target organ toxicity -repeated exposure:** Not classified.
Carcinogenicity:	This product is not considered to be a carcinogen by IARC, ACGIH, NTP, or OSHA. **IARC Monographs. Overall Evaluation of Carcinogenicity:** Not listed. **NTP Report on Carcinogens:** Not listed. **OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050):** Not regulated.
Mutagenicity:	No data available to indicate product or any components present at greater than 0.1% are mutagenic or genotoxic.
Reproduction: Toxicity:	This product is not expected to cause reproductive or developmental effects.
Aspiration hazard: **Chronic effects:** **Further information:**	Due to the physical form of the material it is not an aspiration hazard. Prolonged inhalation may be harmful. Excessive concentrations of activated carbon may reduce visibility, cause unpleasant deposits in the eye, ears, and nasal passages, or irritate the skin or mucous membranes by mechanical means. However, normal workplace exposure has not been determined to cause a significant health effect.
Section 12 – Ecological Information	
Ecotoxicity:	The product is not classified as environmentally hazardous. However, this does not exclude the possibility that large or frequent spills can have a harmful or damaging effect on the environment.
Persistence & Degradability:	The product solely consists of inorganic compounds which are not biodegradable.
Bioaccumulation Potential:	Bioaccumulation is unlikely to be significant because of the low water solubility of this product.
Mobility in Soil:	The product is insoluble in water and will sediment in water systems.
Results of PBT and vpvB Assessment:	Not available
Other Adverse Effects:	No other adverse environmental effects (e.g. ozone depletion, photochemical ozone creation potential, endocrine disruption, global warming potential) are expected

	from this component.
Section 13 – Disposal Considerations	
Waste Treatment Methods:	**Disposal instructions:** Collect and reclaim or dispose in sealed containers at licensed waste disposal site. Dispose of contents/container in accordance with local/regional/national/international regulations. **Local disposal regulations:** Dispose in accordance with all applicable regulations. **Hazardous waste code:** The waste code should be assigned in discussion between the user, the producer and the waste disposal company. **Waste from residues/unused products:** Dispose of in accordance with local regulations. Empty containers or liners may retain some product residues. This material and its container must be disposed of in a safe manner (see: Disposal instructions). **Contaminated packaging**: Since emptied containers may retain product residue, follow label warnings even after container is emptied. Empty containers should be taken to an approved waste handling site for recycling or disposal.
Section 14 – Transport Information	
DOT: **IATA:** **IMDG**	Not regulated as dangerous goods. Not regulated as dangerous goods. Not regulated as dangerous goods.
UN Number: **UN Proper Shipping Name:** **Transport Hazard Class(es):** **Packing Group:** **Environmental Hazards:** **Marine Pollutant:** **Special Precautions for User:** **IMDG/IMO:**	Not available Not available Not applicable Not applicable Not applicable The product is not classified as marine pollutant. Not available Not regulated as dangerous goods.
Transportation in Bulk According to Annex II of MARPOL73/78 and the IBC Code:	Not applicable
General information:	Wet activated carbon depletes oxygen from air and therefore dangerously low levels of oxygen may be encountered. Whenever workers enter a vessel containing activated carbon, the vessel(s) oxygen content should be determined and work procedures for potentially low oxygen areas should be followed.
Section 15 – Regulatory Information	
Safety Health and Environmental Regulations/ Legislation Specific for the Substance or Mixture	**US federal regulations:** This product is a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200. **TSCA Section 12(b) Export Notification (40 CFR 707, Subpt. D):** Not regulated. **OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050):** Not regulated. **CERCLA Hazardous Substance List (40 CFR 302.4):** Not listed **Superfund Amendments and Reauthorization Act of 1986 (SARA)** **Hazard Categories:** Immediate Hazard - Yes Delayed Hazard - No Fire Hazard - Yes Pressure Hazard - No Reactivity Hazard - No **SARA 302 Extremely hazardous substance:** Not listed. **SARA 311/312 Hazardous chemical:** Yes **SARA 313 (TRI reporting):** Not regulated.

Other federal regulations
Clean Air Act (CAA) Section 112 Hazardous Air Pollutants (HAPs) List: Not regulated.
Clean Air Act (CAA) Section 112(r) Accidental Release Prevention (40 CFR 68.130): Not regulated.
Safe Drinking Water Act (SDWA): Not regulated.

US state regulations
US. Massachusetts RTK - Substance List: Not regulated.
US. New Jersey Worker and Community Right-to-Know Act: Activated Carbon (CAS 7440-44-0)
US. Pennsylvania Worker and Community Right-to-Know Law: Not listed.
US. Rhode Island RTK: Not regulated.
California Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65): This material is not known to contain any chemicals currently listed as carcinogens or reproductive toxins.

International Inventories

Country(s) or region	Inventory name	On inventory (yes/no)*
Australia	Australian Inventory of Chemical Substances (AICS)	Yes
Canada	Domestic Substances List (DSL)	Yes
China	Inventory of Existing Chemical Substances in China (IECSC)	Yes
Europe	European Inventory of Existing Commercial Chemical Substances (EINECS)	Yes
Korea	Existing Chemicals List (ECL)	Yes
New Zealand	New Zealand Inventory	Yes
Philippines	Philippine Inventory of Chemicals and Chemical Substances (PICCS)	Yes
United States Puerto Rico	Toxic Substances Control Act (TSCA) Inventory	Yes

*A "Yes" indicates this product complies with the inventory requirements administered by the governing country(s). A "No" indicates that one or more components of the product are not listed or exempt from listing on the inventory administered by the governing country(s).

Section 16 – Other Information

Revision date **Version #**	1-February-2019 04
HMIS® Ratings	Health: 1 Flammability: 1 Physical hazard: 0 **Caution**: HMIS® ratings are based on a 0-4 rating scale, with 0 representing minimal hazards or risks, and 4 representing significant hazards or risks. Although HMIS® ratings are not required on SDSs under 29 CFR 1910.1200, the preparer may choose to provide them. HMIS® ratings are to be used with a fully implemented HMIS® program. HMIS® is a registered mark of the National Paint & Coatings Association (NPCA). HMIS® materials may be purchased exclusively from J. J. Keller (800) 327-6868. The customer is responsible for determining the PPE code for this material.
NFPA Ratings	

Refer to NFPA 654, Standard for the Prevention of Fire and Dust Explosions from the Manufacturing, Processing, and Handling of Combustible Particulate Solids, for safe handling.