



SS08@5'
 B - <0.0020 mg/kg
 T - <0.0050 mg/kg
 E - <0.0050 mg/kg
 X - <0.010 mg/kg
 TPH - <50 mg/kg
 N - <0.010 mg/kg

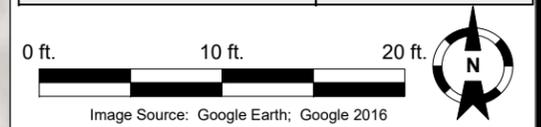
SS05@3'
 B - <0.0020 mg/kg
 T - <0.0050 mg/kg
 E - <0.0050 mg/kg
 X - <0.010 mg/kg
 TPH - <50 mg/kg
 N - <0.010 mg/kg
 SAR - 0.135
 EC - 0.493 mmhos/cm
 pH - 8.46

- Legend**
- Excavation Sample Location
 - Excavation Sample Location (Not Submitted for Laboratory Analysis)
 - Excavation Extent (Collected via Trimble GPS)

- Notes**
- 1) Site Coordinates: 40.358388, -104.796704
 - 2) All locations are approximate unless otherwise noted
 - 3) **RED** value indicates concentration greater than COGCC table 910-1 soil standard (see table below).
 - 4) Soil Samples (SS01-SS04) are associated with the Carlson J 33-30D vault pull data.

GPS – Global Positioning System
 mg/kg – Milligrams Per Kilogram
 mmhos/cm – Millimhos Per Centimeter

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
SAR – Sodium Absorption Ratio	<12 ⁵
EC – Electrical Conductivity	<4mmhos/cm or 2x background
pH	6-9



DATE: 08/01/2018
 DESIGNED BY: DA
 DRAWN BY: GB

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

Noble Energy, Inc. – DJ Basin
Carlson J 33-31D Vault Removal – Location ID: 336636
 SENE, Section 32, Township 5 North, Range 66 West
 Weld County, Colorado

Excavation Soil Analytical
 Results Map
 (07/20/2018)

Summit Scientific

741 Corporate Circle – Suite I ♦ Golden, Colorado 80401

303.277.9310 - laboratory ♦ 303.277.9531 - fax

August 06, 2018

Brandon Bruns

Tasman Geosciences

6899 Pecos St, Unit C

Denver, CO 80221

RE: Noble - Carlson J33-31D

Enclosed are the results of analyses for samples received by Summit Scientific on 07/20/18 18:30. If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Paul Shrewsbury For Ben Shrewsbury

Laboratory Manager



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

Project: Noble - Carlson J33-31D

Project Number: [none]
Project Manager: Brandon Bruns

Reported:
08/06/18 16:20

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
SS05@3'	1807281-01	Soil	07/20/18 12:10	07/20/18 18:30
SS08@5'	1807281-04	Soil	07/20/18 12:16	07/20/18 18:30

Summit Scientific

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Summit Scientific

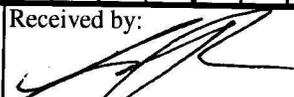
1807281

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: 417-766-9608 Fax: -
Sampler Name: GB

Project Manager: Brandon Bruns, Invoice: Jacob Evans
E-Mail: Bbruns@tasman-geo.com
Project Name: Carlson J 33 31D
Project Number: -

Sample Description	Date Sampled	Time Sampled	Number of Containers	Preservative				Matrix			Analyze For:					Special Instructions		
				HCl	HNO ₃	None	Other (Specify)	Groundwater	Soil	Air - Canister Serial #	Other (Specify)	8260 BTEX	8260B GBTEXN	8015 DRO	pH, EC, SAR		Hold	
SS05@3'	7/20/18	1210	(			X			X				X	X	X	X		
SS06@3'	↓	1212	(			X			X				X	X	X	X		
SS07@3'	↓	1214	(			X			X				X	X	X	X		
SS08@5'	↓	1216	(			X			X				X	X	X	X		
Relinquished by:  Date/Time: <u>1830 7/20/18</u>				Received by:  Date/Time: <u>7.20.18 1830</u>				Turn Around Time (Check)					Notes:					
Relinquished by: _____ Date/Time: _____				Received by: _____ Date/Time: _____				Same Day <input type="checkbox"/> 72 Hours <input type="checkbox"/> 24 Hours <input type="checkbox"/> Standard <input checked="" type="checkbox"/> 48 Hours <input type="checkbox"/>										
Relinquished by: _____ Date/Time: _____				Received in Lab by: _____ Date/Time: _____				Sample Integrity: Temperature Upon Receipt: <u>10.2</u> Intact: Yes <input type="checkbox"/> No <input type="checkbox"/>										

Sample Receipt Checklist

1807281

S2 Work Order: _____

Client: Noble/Tasman Client Project ID: Carbon J 33-31D

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

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

Temp (°C)	10.2
-----------	------

Thermometer ID: 61857155-K

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

UP
Custodian Printed Name or Initials

[Signature]
Signature or Initials of Custodian

7.20.18 1830
Date/Time



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

Project: Noble - Carlson J33-31D

Project Number: [none]
Project Manager: Brandon Brun

Reported:
08/06/18 16:20

SS05@3'
1807281-01 (Soil)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **07/20/18 12:10**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Benzene	ND	0.0020		mg/kg	1	1807265	07/23/18	07/24/18	EPA 8260B	
Toluene	ND	0.0050		"	"	"	"	"	"	
Ethylbenzene	ND	0.0050		"	"	"	"	"	"	
Xylenes (total)	ND	0.010		"	"	"	"	"	"	
Naphthalene	ND	0.010		"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	50		"	"	"	"	"	"	

Date Sampled: **07/20/18 12:10**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Surrogate: 1,2-Dichloroethane-d4		108 %		23-173		"	"	"	"	
Surrogate: Toluene-d8		100 %		20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		103 %		21-167		"	"	"	"	

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: **07/20/18 12:10**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
C10-C28 (DRO)	ND	50		mg/kg	1	1807266	"	07/24/18	EPA 8015M	

Date Sampled: **07/20/18 12:10**

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

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

Date Sampled: **07/20/18 12:10**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Calcium	559	10.4		mg/kg dry	1	1807275	07/23/18	07/25/18	EPA 6020B	

Summit Scientific

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

Project: Noble - Carlson J33-31D

Project Number: [none]
Project Manager: Brandon Brun

Reported:
08/06/18 16:20

SS05@3'
1807281-01 (Soil)

Summit Scientific

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

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Magnesium	92.5	5.22	mg/kg dry	1	1807275	07/23/18	07/25/18	EPA 6020B	
Sodium	13.1	5.22	"	"	"	"	"	"	

Calculated Analysis

Date Sampled: **07/20/18 12:10**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Sodium Adsorption Ratio	0.135	0.100	units	1	1807306	07/25/18	07/27/18	Calculation	

Physical Parameters by APHA/ASTM/EPA Methods

Date Sampled: **07/20/18 12:10**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
% Solids	95.8		%	1	1807280	07/23/18	07/24/18	Calculation	
pH	8.46		pH Units	"	1807291	07/24/18	07/24/18	EPA 9045D	

Specific Conductance by EPA Method 120.1

Date Sampled: **07/20/18 12:10**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Specific Conductance (EC)	0.493	0.0100	mmhos/cm	1	1807292	07/24/18	07/24/18	EPA 120.1	

Summit Scientific

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

Project: Noble - Carlson J33-31D

Project Number: [none]
Project Manager: Brandon Brun

Reported:
08/06/18 16:20

SS08@5'
1807281-04 (Soil)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **07/20/18 12:16**

Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
Benzene	ND	0.0020	mg/kg	1	1807265	07/23/18	07/24/18	EPA 8260B	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	ND	0.0050	"	"	"	"	"	"	
Xylenes (total)	ND	0.010	"	"	"	"	"	"	
Naphthalene	ND	0.010	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	50	"	"	"	"	"	"	

Date Sampled: **07/20/18 12:16**

Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
Surrogate: 1,2-Dichloroethane-d4		110 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		97.2 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		106 %	21-167		"	"	"	"	

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: **07/20/18 12:16**

Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
C10-C28 (DRO)	ND	50	mg/kg	1	1807266	"	07/24/18	EPA 8015M	

Date Sampled: **07/20/18 12:16**

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

Summit Scientific

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

Project: Noble - Carlson J33-31D

Project Number: [none]
Project Manager: Brandon Bruns

Reported:
08/06/18 16:20

Volatile Organic Compounds by EPA Method 8260B - Quality Control

Summit Scientific

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

Batch 1807265 - EPA 5030 Soil MS

Blank (1807265-BLK1)

Prepared & Analyzed: 07/23/18

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	0.0390		"	0.0396		98.5	23-173				
Surrogate: Toluene-d8	0.0392		"	0.0400		98.0	20-170				
Surrogate: 4-Bromofluorobenzene	0.0392		"	0.0400		98.0	21-167				

LCS (1807265-BS1)

Prepared: 07/23/18 Analyzed: 07/24/18

Benzene	0.0893	0.0020	mg/kg	0.100		89.3	70-130				
Toluene	0.0987	0.0050	"	0.100		98.7	70-130				
Ethylbenzene	0.107	0.0050	"	0.100		107	70-130				
m,p-Xylene	0.212	0.010	"	0.200		106	70-130				
o-Xylene	0.0951	0.0050	"	0.100		95.1	70-130				
Surrogate: 1,2-Dichloroethane-d4	0.0396		"	0.0396		99.9	23-173				
Surrogate: Toluene-d8	0.0391		"	0.0400		97.8	20-170				
Surrogate: 4-Bromofluorobenzene	0.0387		"	0.0400		96.8	21-167				

Matrix Spike (1807265-MS1)

Source: 1807270-01

Prepared: 07/23/18 Analyzed: 07/24/18

Benzene	0.0891	0.0020	mg/kg	0.100	ND	89.1	70-130				
Toluene	0.0995	0.0050	"	0.100	ND	99.5	70-130				
Ethylbenzene	0.113	0.0050	"	0.100	ND	113	70-130				
m,p-Xylene	0.217	0.010	"	0.200	ND	108	70-130				
o-Xylene	0.100	0.0050	"	0.100	ND	100	70-130				
Surrogate: 1,2-Dichloroethane-d4	0.0404		"	0.0396		102	23-173				
Surrogate: Toluene-d8	0.0393		"	0.0400		98.2	20-170				
Surrogate: 4-Bromofluorobenzene	0.0400		"	0.0400		100	21-167				

Summit Scientific

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

Project: Noble - Carlson J33-31D

Project Number: [none]
Project Manager: Brandon Brun

Reported:
08/06/18 16:20

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

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

Batch 1807265 - EPA 5030 Soil MS

Matrix Spike Dup (1807265-MSD1)	Source: 1807270-01			Prepared: 07/23/18 Analyzed: 07/24/18					
Benzene	0.0967	0.0020	mg/kg	0.100	ND	96.7	70-130	8.17	30
Toluene	0.109	0.0050	"	0.100	ND	109	70-130	8.79	30
Ethylbenzene	0.122	0.0050	"	0.100	ND	122	70-130	8.25	30
m,p-Xylene	0.236	0.010	"	0.200	ND	118	70-130	8.48	30
o-Xylene	0.110	0.0050	"	0.100	ND	110	70-130	9.06	30
Surrogate: 1,2-Dichloroethane-d4	0.0398		"	0.0396		100	23-173		
Surrogate: Toluene-d8	0.0391		"	0.0400		97.6	20-170		
Surrogate: 4-Bromofluorobenzene	0.0401		"	0.0400		100	21-167		

Summit Scientific

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

Project: Noble - Carlson J33-31D

Project Number: [none]
Project Manager: Brandon Bruns

Reported:
08/06/18 16:20

Extractable Petroleum Hydrocarbons by 8015 - Quality Control
Summit Scientific

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

Batch 1807266 - EPA 3550A

Blank (1807266-BLK1)

Prepared: 07/23/18 Analyzed: 07/24/18

C10-C28 (DRO) ND 50 mg/kg

LCS (1807266-BS1)

Prepared: 07/23/18 Analyzed: 07/24/18

C10-C28 (DRO) 508 50 mg/kg 500 102 70-130

Matrix Spike (1807266-MS1)

Source: 1807270-01

Prepared: 07/23/18 Analyzed: 07/24/18

C10-C28 (DRO) 429 50 mg/kg 500 40.6 77.6 70-130

Matrix Spike Dup (1807266-MSD1)

Source: 1807270-01

Prepared: 07/23/18 Analyzed: 07/24/18

C10-C28 (DRO) 502 50 mg/kg 500 40.6 92.3 70-130 15.8 20

Summit Scientific

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

Project: Noble - Carlson J33-31D

Project Number: [none]
Project Manager: Brandon Bruns

Reported:
08/06/18 16:20

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

Summit Scientific

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

Batch 1807275 - General Preparation

Blank (1807275-BLK1)

Prepared: 07/23/18 Analyzed: 07/25/18

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

LCS (1807275-BS1)

Prepared: 07/23/18 Analyzed: 07/25/18

Calcium	521	10.0	mg/kg wet	500		104	70-130			
Magnesium	541	5.00	"	500		108	70-130			
Sodium	552	5.00	"	500		110	70-130			

Duplicate (1807275-DUP1)

Source: 1807230-01

Prepared: 07/23/18 Analyzed: 07/25/18

Calcium	297	11.7	mg/kg dry		322			7.84	20	
Magnesium	134	5.86	"		145			7.59	20	
Sodium	85.6	5.86	"		90.4			5.44	20	

Matrix Spike (1807275-MS1)

Source: 1807230-01

Prepared: 07/23/18 Analyzed: 07/25/18

Calcium	908	11.7	mg/kg dry	586	322	100	70-130			
Magnesium	769	5.86	"	586	145	107	70-130			
Sodium	739	5.86	"	586	90.4	111	70-130			

Matrix Spike Dup (1807275-MSD1)

Source: 1807230-01

Prepared: 07/23/18 Analyzed: 07/25/18

Calcium	957	11.7	mg/kg dry	586	322	108	70-130	5.21	25	
Magnesium	773	5.86	"	586	145	107	70-130	0.528	25	
Sodium	769	5.86	"	586	90.4	116	70-130	4.07	25	

Summit Scientific

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

Project: Noble - Carlson J33-31D

Project Number: [none]
Project Manager: Brandon Bruns

Reported:
08/06/18 16:20

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

Summit Scientific

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

Batch 1807280 - General Preparation

Duplicate (1807280-DUP1)		Source: 1807283-01		Prepared: 07/23/18 Analyzed: 07/24/18		
% Solids	93.4		%		92.7	0.720 20

Batch 1807291 - General Preparation

LCS (1807291-BS1)				Prepared & Analyzed: 07/24/18	
pH	9.1		pH Units	9.18	99.3 95-105
Duplicate (1807291-DUP1)		Source: 1807277-01		Prepared & Analyzed: 07/24/18	
pH	8.5		pH Units	8.4	0.827 20

Summit Scientific

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

Project: Noble - Carlson J33-31D

Project Number: [none]
Project Manager: Brandon Brun

Reported:
08/06/18 16:20

Specific Conductance by EPA Method 120.1 - Quality Control
Summit Scientific

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

Batch 1807292 - General Preparation

LCS (1807292-BS1)

Prepared & Analyzed: 07/24/18

Specific Conductance (EC)	0.748	0.0100	mmhos/cm	0.750	99.8	90-110
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Duplicate (1807292-DUP1)

Source: 1807277-01

Prepared & Analyzed: 07/24/18

Specific Conductance (EC)	0.642	0.0100	mmhos/cm	0.632	1.41	20
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Summit Scientific

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

Project: Noble - Carlson J33-31D

Project Number: [none]
Project Manager: Brandon Bruns

Reported:
08/06/18 16:20

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