



May 15, 2018

Mr. Kyle Waggoner  
Whiting Oil and Gas Corporation  
208 Racquette Drive  
Fort Collins, Colorado 80524

**RE: Confirmation Sampling  
Razor 12H  
Weld County, Colorado  
Project # 701530.074.03**

Mr. Waggoner:

On May 8 2018 Talon/LPE conducted soil sampling at the Razor 12H tank battery (Site) in Weld County, Colorado. The purpose of the sampling event was to ensure that produced water had not impacted soils located under a lined tank battery and if so, that all produced water impacted soil had been removed to the extent required by the Colorado Oil and Gas Conservation Commission (COGCC).

On May 1, 2018, Talon/LPE arrived on site and visually inspected the liner of the tank battery. A small tear in the liner had been observed. Whiting contractors had opened the liner and performed minor excavation below the tear. One (1) soil sample was collected at a depth of 1.5 feet below ground surface (SS-1) where the liner appeared to be compromised.

The collected sample was analyzed for Total Petroleum Hydrocarbons (TPH) via Gasoline Range Organics (GRO) method EPA8260B and Diesel Range Organics (DRO) method 8015, for Benzene, Toluene, Ethyl-benzene, and Xylenes (BTEX) via method EPA8260B, and for inorganics (Electrical Conductivity (EC), Sodium Adsorption Ratio (SAR), and pH) via method USDA60 at Summit Scientific (Summit) in Golden, Colorado. The sample analytical results were below COGCC Table 910-1 thresholds for TPH, BTEX and inorganic constituents. A soil concentration map is presented in Figure 1, and a breakdown of the soil analytical data is presented in Table 1.

Following the excavations, Whiting contractors transported and disposed the excavated stockpile material at an approved landfill facility. Clean soil was then brought in to the Site to backfill the excavated areas.



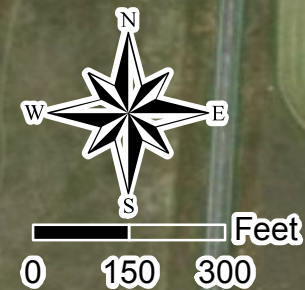
Based upon the collected analytical data, Talon/LPE believes that no further corrective action is necessary and that Whiting can request closure from the COGCC. If you have any questions or comments, please do not hesitate to call me at (970) 818-5330.

Respectfully Submitted,

A handwritten signature in black ink, appearing to read "JL", written over a light gray rectangular background.

Jason Leverton  
Environmental Scientist  
Talon/LPE

**Attachment 1**  
**Figures**



**Legend**

● Soil Sample

SS-1 @ 1.5'

SS-1 @ 1.5',mg/kg  
TPH=<50  
GRO=0.52  
DRO=<50  
EC=0.626  
SAR=0.626  
pH=8.5  
B=<0.0020  
T=<0.0050  
E=<0.0050  
X=<0.0050

52

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community



Drafted: 5/22/2018  
1 in = 300 ft  
Drafted By: IJM

Whiting Oil and Gas Corporation  
Razor 12H  
Weld County, CO  
Figure 1 - Soil Concentration Map

**Attachment 2**  
**Tables**



**Table 1 - Soil Analytical Data**

**Whiting Oil & Gas Corporation  
Razor 12H  
Weld County, Colorado**

Sample ID	Depth BGS in Feet	Date Sampled	Concentration (mg/kg)							mmhos/cm	Units	
			Benzene	Toluene	Ethylbenzene	Xylenes (Total)	GRO	DRO	TPH	EC	SAR	pH
COGCC Table 910-1 Concentration Levels			0.17	85	100	175	NA	NA	500	<4	<12	6-9
SS-1	1.5	5/8/2018	<0.0020	<0.0050	<0.0050	<0.0050	0.52	<50	<50	0.822	0.626	8.50

mg/kg - milligrams per kilogram

mmhos/cm - millimhos per centimeter

< - Analytical result is less than the reporting limit

COGCC - Colorado Oil and Gas Conservation Commission

GRO - Gasoline Range Organics

DRO - Diesel Range Organics

TPH - Total Petroleum Hydrocarbons (Combined GRO/DRO)

EC - Electrical Conductivity

SAR - Sodium Adsorption Ratio

NA - Not Analyzed

BGS - Below Ground Surface

**Attachment 3**  
**Analytical Reports**

# Summit Scientific

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741 Corporate Circle – Suite I ♦ Golden, Colorado 80401

303.277.9310 - laboratory ♦ 303.277.9531 - fax

May 15, 2018

Jennifer Galles  
Talon/LPE  
1811 East Mulberry  
Fort Collins, CO 80525  
RE: Razor 12H

Enclosed are the results of analyses for samples received by Summit Scientific on 05/08/18 15:30. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

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

Paul Shrewsbury For Ben Shrewsbury  
Laboratory Manager





Talon/LPE  
1811 East Mulberry  
Fort Collins CO, 80525

Project: Razor 12H  
Project Number: 701530.074.03  
Project Manager: Jennifer Galles

**Reported:**  
05/15/18 11:20

### ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
SS-1@1.5'	1805084-01	Soil	05/08/18 13:05	05/08/18 15:30

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.*

A handwritten signature in black ink, appearing to be 'MSM'.

# Summit Scientific

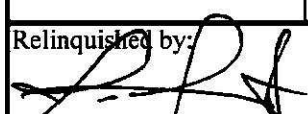
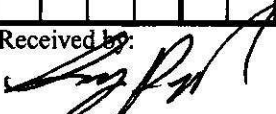

1805084

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

Page 1 of 1

Client: Talon/LPE - Bill to Whiting  
Address: 1811 East Mulberry  
City/State/Zip: Fort Collins, CO 80524  
Phone: 970-818-5330 Fax:  
Sampler Name: Jason Leverton

Project Manager: Jennifer Galles  
E-Mail: jgalles@talonlpe.com and jleverton@talonlpe.com  
Project Name: Razor 12H  
Project Number: 701530.074.03

Sample Description	Date Sampled	Time Sampled	Number of Containers	Preservative				Matrix				Analyze For:										Special Instructions			
				HCl	HNO <sub>3</sub>	None	Other (Specify)	Groundwater	Soil	Air - Canister Serial #	Other (Specify)	BTEX	TPH	EC	SAR	pH									
SS-1@1.5'	5/8/2018	13:05	1			x			x				x	x	x	x	x								
Relinquished by: 	5.8.18	Date/Time: 15:30		Received by: 	5/8/18	Date/Time: 12:00		Turn Around Time (Check)																	
								Same Day	<input type="checkbox"/>	72 Hours	<input type="checkbox"/>														
								24 Hours	<input type="checkbox"/>	Standard	<input checked="" type="checkbox"/>														
								48 Hours	<input type="checkbox"/>																
Relinquished by: 		Date/Time:		Received by:		Date/Time:		Sample Integrity:																	
								Temperature Upon Receipt: 18.5																	
								Intact: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>																	

1805084

## Sample Receipt Checklist

S2 Work Order: \_\_\_\_\_

Client: Trolox LPE Client Project ID: Razon 12HShipped Via: Pickup  
(UPS, FedEx, Hand Delivered, Pick-up, etc.)

Airbill #: \_\_\_\_\_

Matrix (check all that apply): ✓ Air ✓ Soil/Solid     Water     Other: \_\_\_\_\_  
(Describe)

Cooler ID					
Temp (°C)	18.5				

Thermometer ID: 61857155-K

	Yes	No	N/A	Comments (if any)
If samples require cooling, was the temperature at 4°C +/- 2°C <sup>(1)</sup> ?	✓			
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 <sup>(1)</sup> ?	✓			
Was adequate sample volume provided <sup>(1)</sup> ?	✓			
If custody seals are present, are they intact <sup>(1)</sup> ?			✓	
Are short holding time analytes or samples with HTs due within 48 hours present?			✓	
Is a chain-of-custody (COC) form present and filled out completely <sup>(1)</sup> ?	✓			
Does the COC agree with the number and type of sample bottles received <sup>(1)</sup> ?	✓			
Do the sample IDs on the bottle labels match the COC <sup>(1)</sup> ?	✓			
Is the COC properly relinquished by the client w/ date and time recorded <sup>(1)</sup> ?	✓			
For volatiles in water – is there headspace present? If yes, contact client and note in narrative.			✓	
Are samples preserved that require preservation (excluding cooling) <sup>(1)</sup> ?			✓	
Note the type of preservative in the Comments column – HCl, H <sub>2</sub> SO <sub>4</sub> , NaOH, HNO <sub>3</sub> , ect				
If samples are acid preserved for metals, is the pH ≤ 2 <sup>(1)</sup> ?			✓	
Record the pH in Comments.				
If dissolved metals are requested, were samples field filtered?			✓	
Additional Comments (if any):				

<sup>(1)</sup> If NO, then contact the client before proceeding with analysis and note in case narrative.LP  
Custodian Printed NameLyn Duff  
Signature or Initials of Custodian7/8/18 1628  
Date/Time



Talon/LPE  
1811 East Mulberry  
Fort Collins CO, 80525

Project: Razor 12H  
Project Number: 701530.074.03  
Project Manager: Jennifer Galles

Reported:  
05/15/18 11:20

**SS-1@1.5'**  
**1805084-01 (Soil)**

**Summit Scientific**

**Volatile Organic Compounds by EPA Method 8260B**

Date Sampled: **05/08/18 13:05**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	0.0020	mg/kg	1	1805093	05/09/18	05/10/18	EPA 8260B	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	ND	0.0050	"	"	"	"	"	"	
Xylenes (total)	ND	0.010	"	"	"	"	"	"	
<b>Gasoline Range Hydrocarbons</b>	<b>0.52</b>	<b>0.50</b>	"	"	"	"	"	"	

Date Sampled: **05/08/18 13:05**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<i>Surrogate: 1,2-Dichloroethane-d4</i>		123 %	70-130		"	"	"	"	
<i>Surrogate: Toluene-d8</i>		96.6 %	70-130		"	"	"	"	
<i>Surrogate: 4-Bromofluorobenzene</i>		102 %	70-130		"	"	"	"	

**Extractable Petroleum Hydrocarbons by 8015**

Date Sampled: **05/08/18 13:05**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	1805091	05/09/18	05/11/18	EPA 8015M	

Date Sampled: **05/08/18 13:05**

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

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

Date Sampled: **05/08/18 13:05**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>Calcium</b>	<b>1800</b>	11.5	mg/kg dry	1	1805122	05/10/18	05/10/18	EPA 6020B	
<b>Magnesium</b>	<b>278</b>	5.76	"	"	"	"	"	"	

Summit Scientific

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Talon/LPE  
1811 East Mulberry  
Fort Collins CO, 80525

Project: Razor 12H  
Project Number: 701530.074.03  
Project Manager: Jennifer Galles

**Reported:**  
05/15/18 11:20

**SS-1@1.5'**  
**1805084-01 (Soil)**

**Summit Scientific**

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

<b>Sodium</b>	<b>108</b>	5.76 mg/kg dry	1	1805122	05/10/18	05/10/18	EPA 6020B
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**Calculated Analysis**

Date Sampled: **05/08/18 13:05**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>Sodium Adsorption Ratio</b>	<b>0.626</b>	0.100	units	1	1805157	05/14/18	05/14/18	Calculation	

**Physical Parameters by APHA/ASTM/EPA Methods**

Date Sampled: **05/08/18 13:05**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>% Solids</b>	<b>86.8</b>		%	1	1805113	05/10/18	05/11/18	Calculation	
<b>pH</b>	<b>8.5</b>		pH Units	"	1805123	05/10/18	05/11/18	EPA 9045D	

**Specific Conductance by EPA Method 120.1**

Date Sampled: **05/08/18 13:05**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>Specific Conductance (EC)</b>	<b>0.822</b>	0.0100	mmhos/cm	1	1805124	05/10/18	05/11/18	EPA 120.1	

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1811 East Mulberry  
Fort Collins CO, 80525

Project: Razor 12H  
Project Number: 701530.074.03  
Project Manager: Jennifer Galles

Reported:  
05/15/18 11:20

## Volatile Organic Compounds by EPA Method 8260B - Quality Control

### Summit Scientific

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

#### Batch 1805093 - EPA 5030 Soil MS

##### Blank (1805093-BLK1)

Prepared: 05/09/18 Analyzed: 05/10/18

Benzene	ND	0.0020	mg/kg
Toluene	ND	0.0050	"
Ethylbenzene	ND	0.0050	"
Xylenes (total)	ND	0.010	"
Gasoline Range Hydrocarbons	ND	0.50	"

Surrogate: 1,2-Dichloroethane-d4	0.0455		"	0.0396	115	70-130
Surrogate: Toluene-d8	0.0387		"	0.0400	96.8	70-130
Surrogate: 4-Bromofluorobenzene	0.0403		"	0.0400	101	70-130

##### LCS (1805093-BS1)

Prepared: 05/09/18 Analyzed: 05/10/18

Benzene	0.0892	0.0020	mg/kg	0.100	89.2	70-130
Toluene	0.0938	0.0050	"	0.100	93.8	70-130
Ethylbenzene	0.114	0.0050	"	0.100	114	70-130
m,p-Xylene	0.217	0.010	"	0.200	108	70-130
o-Xylene	0.101	0.0050	"	0.100	101	70-130

Surrogate: 1,2-Dichloroethane-d4	0.0446		"	0.0396	113	70-130
Surrogate: Toluene-d8	0.0390		"	0.0400	97.6	70-130
Surrogate: 4-Bromofluorobenzene	0.0388		"	0.0400	97.1	70-130

##### Matrix Spike (1805093-MS1)

Source: 1805083-01

Prepared: 05/09/18 Analyzed: 05/10/18

Benzene	0.0892	0.0020	mg/kg	0.100	ND	89.2	70-130
Toluene	0.0918	0.0050	"	0.100	ND	91.8	70-130
Ethylbenzene	0.116	0.0050	"	0.100	ND	116	70-130
m,p-Xylene	0.220	0.010	"	0.200	ND	110	70-130
o-Xylene	0.104	0.0050	"	0.100	ND	104	70-130

Surrogate: 1,2-Dichloroethane-d4	0.0469		"	0.0396	118	70-130
Surrogate: Toluene-d8	0.0393		"	0.0400	98.2	70-130
Surrogate: 4-Bromofluorobenzene	0.0398		"	0.0400	99.5	70-130

Summit Scientific

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Talon/LPE  
1811 East Mulberry  
Fort Collins CO, 80525

Project: Razor 12H  
Project Number: 701530.074.03  
Project Manager: Jennifer Galles

Reported:  
05/15/18 11:20

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

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

**Batch 1805093 - EPA 5030 Soil MS**

Matrix Spike Dup (1805093-MSD1)	Source: 1805083-01			Prepared: 05/09/18 Analyzed: 05/10/18						
Benzene	0.0902	0.0020	mg/kg	0.100	ND	90.2	70-130	1.14	30	
Toluene	0.0976	0.0050	"	0.100	ND	97.6	70-130	6.15	30	
Ethylbenzene	0.114	0.0050	"	0.100	ND	114	70-130	1.90	30	
m,p-Xylene	0.214	0.010	"	0.200	ND	107	70-130	2.73	30	
o-Xylene	0.103	0.0050	"	0.100	ND	103	70-130	1.48	30	
Surrogate: 1,2-Dichloroethane-d4	0.0462		"	0.0396		117	70-130			
Surrogate: Toluene-d8	0.0392		"	0.0400		98.0	70-130			
Surrogate: 4-Bromofluorobenzene	0.0392		"	0.0400		98.0	70-130			

Summit Scientific

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Talon/LPE  
1811 East Mulberry  
Fort Collins CO, 80525

Project: Razor 12H  
Project Number: 701530.074.03  
Project Manager: Jennifer Galles

**Reported:**  
05/15/18 11:20

**Extractable Petroleum Hydrocarbons by 8015 - Quality Control**  
**Summit Scientific**

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

**Batch 1805091 - EPA 3550A**

**Blank (1805091-BLK1)**

Prepared: 05/09/18 Analyzed: 05/10/18

C10-C28 (DRO) ND 50 mg/kg

**LCS (1805091-BS1)**

Prepared: 05/09/18 Analyzed: 05/10/18

C10-C28 (DRO) 421 50 mg/kg 500 84.1 81.4-129

**Matrix Spike (1805091-MS1)**

**Source: 1805066-01**

Prepared: 05/09/18 Analyzed: 05/10/18

C10-C28 (DRO) 413 50 mg/kg 500 22.0 78.2 77.8-133

**Matrix Spike Dup (1805091-MSD1)**

**Source: 1805066-01**

Prepared: 05/09/18 Analyzed: 05/10/18

C10-C28 (DRO) 430 50 mg/kg 500 22.0 81.5 77.8-133 3.91 8.48

Summit Scientific

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Talon/LPE  
1811 East Mulberry  
Fort Collins CO, 80525

Project: Razor 12H  
Project Number: 701530.074.03  
Project Manager: Jennifer Galles

**Reported:**  
05/15/18 11:20

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

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

**Batch 1805122 - General Preparation**

**Blank (1805122-BLK1)**

Prepared & Analyzed: 05/10/18

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

**LCS (1805122-BS1)**

Prepared & Analyzed: 05/10/18

Calcium	456	10.0	mg/kg wet	500	91.2	70-130
Magnesium	455	5.00	"	500	91.1	70-130
Sodium	474	5.00	"	500	94.8	70-130

**Duplicate (1805122-DUP1)**

Source: 1805043-01

Prepared & Analyzed: 05/10/18

Calcium	133	11.1	mg/kg dry	137	2.69	20
Magnesium	111	5.53	"	122	9.42	20
Sodium	776	5.53	"	782	0.869	20

**Matrix Spike (1805122-MS1)**

Source: 1805043-01

Prepared & Analyzed: 05/10/18

Calcium	613	11.1	mg/kg dry	553	137	86.1	70-130
Magnesium	719	5.53	"	553	122	108	70-130
Sodium	1300	5.53	"	553	782	93.5	70-130

**Matrix Spike Dup (1805122-MSD1)**

Source: 1805043-01

Prepared & Analyzed: 05/10/18

Calcium	584	11.1	mg/kg dry	553	137	80.9	70-130	4.86	25
Magnesium	698	5.53	"	553	122	104	70-130	3.01	25
Sodium	1270	5.53	"	553	782	88.1	70-130	2.33	25

Summit Scientific

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Talon/LPE  
1811 East Mulberry  
Fort Collins CO, 80525

Project: Razor 12H  
Project Number: 701530.074.03  
Project Manager: Jennifer Galles

**Reported:**  
05/15/18 11:20

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

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

**Batch 1805123 - General Preparation**

**Duplicate (1805123-DUP1)**      **Source: 1805043-01**      Prepared: 05/07/18      Analyzed: 05/08/18

pH	8.5	pH Units	8.5	0.471	20
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Summit Scientific

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Talon/LPE  
1811 East Mulberry  
Fort Collins CO, 80525

Project: Razor 12H  
Project Number: 701530.074.03  
Project Manager: Jennifer Galles

**Reported:**  
05/15/18 11:20

**Specific Conductance by EPA Method 120.1 - Quality Control**  
**Summit Scientific**

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

**Batch 1805124 - General Preparation**

**Duplicate (1805124-DUP1)**      **Source: 1805043-01**      Prepared: 05/10/18      Analyzed: 05/11/18

Specific Conductance (EC)	0.927	0.0100	mmhos/cm	0.914	1.41	20
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Summit Scientific

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Talon/LPE  
1811 East Mulberry  
Fort Collins CO, 80525

Project: Razor 12H  
Project Number: 701530.074.03  
Project Manager: Jennifer Galles

**Reported:**  
05/15/18 11:20

### 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