



**PDC Energy, Inc.**  
Fourth Quarter 2018 Groundwater Monitoring Summary

January 14, 2019

Former Swanson 34-20 Tank Battery  
SWSE Section 20 T6N R66W  
Spill Point ID # 436120  
Remediation # 11750

This groundwater monitoring summary has been prepared by Tasman Geosciences, Inc. for the former Swanson 34-20 tank battery. On December 17, 2018, groundwater monitoring was conducted at all five monitoring well locations (BH01 – BH05). Five groundwater samples were submitted to Summit Scientific Laboratory for analysis of benzene, toluene, ethylbenzene, and total xylenes (BTEX) by USEPA Method 8260B.

Fourth quarter 2018 analytical results indicate that BTEX concentrations are below applicable COGCC Table 910-1 groundwater standards in all monitoring well locations

Monitored natural attenuation (MNA) was selected as the remediation strategy for this site during the third quarter 2018 and will remain the selected remediation strategy for the first quarter 2019.

First quarter 2019 groundwater sampling will be conducted during March 2019. Per the Condition of Approval (COA) issued by the COGCC on November 5, 2018, the well completion logs are included as Attachment A. Analytical results are summarized in Table 1 and the laboratory report is included as Attachment B. Sample locations and corresponding analytical results are illustrated on Figure 1. Groundwater elevation data is summarized on Figure 2.

BH03		
Compound (µg/L)	9/28/2018	12/17/2018
Benzene	<1.0	<1.0
Toluene	<1.0	<1.0
Ethylbenzene	<1.0	<1.0
Total Xylenes	<2.0	<2.0
Depth to Water (ft. bgs)	4.90	6.79

BH04		
Compound (µg/L)	9/28/2018	12/17/2018
Benzene	<1.0	<1.0
Toluene	<1.0	<1.0
Ethylbenzene	<1.0	<1.0
Total Xylenes	<2.0	<2.0
Depth to Water (ft. bgs)	5.84	7.63

BH02		
Compound (µg/L)	9/28/2018	12/17/2018
Benzene	<1.0	<1.0
Toluene	<1.0	<1.0
Ethylbenzene	<1.0	<1.0
Total Xylenes	<2.0	<2.0
Depth to Water (ft. bgs)	4.48	6.25

BH01		
Compound (µg/L)	9/28/2018	12/17/2018
Benzene	3.8	<1.0
Toluene	<1.0	<1.0
Ethylbenzene	16	<1.0
Total Xylenes	67	<2.0
Depth to Water (ft. bgs)	4.97	6.75

BH05		
Compound (µg/L)	9/28/2018	12/17/2018
Benzene	<1.0	<1.0
Toluene	<1.0	<1.0
Ethylbenzene	<1.0	<1.0
Total Xylenes	<2.0	<2.0
Depth to Water (ft. bgs)	5.67	7.37

Surface Drainage



**Legend**

- Excavation Extent (Collected via Trimble GPS)
- Excavation Groundwater Sample Location
- Monitoring Well Location (Collected via Trimble GPS)
- Point of Release
- Groundwater Flow Direction (4Q18)

**Notes**

All locations are approximate unless otherwise noted.

Surface drainage direction is estimated based on site topography and is not related to regional topography.

GPS – Global Positioning System  
 µg/L – Micrograms per liter  
 ft. bgs – Feet below ground surface

0 ft. 20 ft. 40 ft.



Image Source: Google Earth; 2017 Google  
 Projection: WGS 84 UTM Zone 13 North



DATE: January 14, 2019

DESIGNED BY: C. Hamlin

DRAWN BY: K. Chritz



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

**PDC Energy, Inc. – DJ Basin**  
**Former Swanson 34-20 Tank Battery**  
 SWSE, Section 20, Township 6 North, Range 66 West  
 Weld County, Colorado

**GROUNDWATER  
 ANALYICAL RESULTS  
 MAP**

**FIGURE  
 1**



DATE: January 14, 2018

DESIGNED BY: C. Hamlin

DRAWN BY: D. Cavinder



**TASMAN**  
GEOSCIENCES

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

**PDC Energy, Inc. – DJ Basin**  
**Former Swanson 34-20 Tank Battery**  
SWSE, Section 20, Township 6 North, Range 66 West  
Weld County, Colorado

**GROUNDWATER  
ELEVATION CONTOUR  
FIGURE**

**FIGURE  
2**

**TABLE 1**  
**FORMER SWANSON 34-20 TANK BATTERY**  
**GROUNDWATER ANALYTICAL RESULTS SUMMARY TABLE**

Sample ID	Date Sampled	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Total Xylenes (µg/L)	Depth to Water <sup>(2)</sup> (feet)	Groundwater Elevation (ft AMSL)
COGCC Table 910-1 Groundwater Standard (µg/L) <sup>(1)</sup>		5	560	700	1,400		
GW01	8/17/2018	<b>13</b>	<1.0	<1.0	<2.0	~ 8.0	NM
GW02	8/22/2018	<b>72</b>	<1.0	25	490	~ 8.0	NM
BH01	9/28/2018	3.8	<1.0	16	67	4.97	4726.39
BH01	12/17/2018	<1.0	<1.0	<1.0	<2.0	6.75	4724.61
BH02	9/28/2018	<1.0	<1.0	<1.0	<2.0	4.48	4726.24
BH02	12/17/2018	<1.0	<1.0	<1.0	<2.0	6.25	4724.47
BH03	9/28/2018	<1.0	<1.0	<1.0	<2.0	4.90	4726.88
BH03	12/17/2018	<1.0	<1.0	<1.0	<2.0	6.79	4724.99
BH04	9/28/2018	<1.0	<1.0	<1.0	<2.0	5.84	4725.62
BH04	12/17/2018	<1.0	<1.0	<1.0	<2.0	7.63	4723.83
BH05	9/28/2018	<1.0	<1.0	<1.0	<2.0	5.67	4725.18
BH05	12/17/2018	<1.0	<1.0	<1.0	<2.0	7.37	4723.48

**Notes:**

1. Groundwater standards referenced from 2 CCR 404-1, Table 910-1, effective May 1, 2018.
2. Depth to water measurements were collected from top of casing and adjusted using survey data to reflect depth of water from ground surface.

COGCC = Colorado Oil and Gas Conservation Commission

µg/L = Micrograms per liter

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

ft AMSL = Feet Above Mean Sea Level

NM = Not Measured

**BOLD** = Analytical result is in exceedance of COGCC groundwater standards.

## **ATTACHMENT A**



6899 Pecos Street, Unit C  
Denver, Colorado 80221

CLIENT: PDC Energy Inc.

LOGGED BY: Tyler Blessing

PROJECT MANAGER: Brock Nelson

DRILLING CONTRACTOR: Tasman Geosciences, Inc.

DRILLING EQUIPMENT: Direct Push

DRILL BIT SIZE (INCHES): 2.375"

DATE STARTED - COMPLETED: 9/26/2018

TOTAL WELL DEPTH (FT. BGS): 14

DEPTH TO WATER (FT. BGS): 6

Swanson 34-20

BORING / WELL ID: BH01

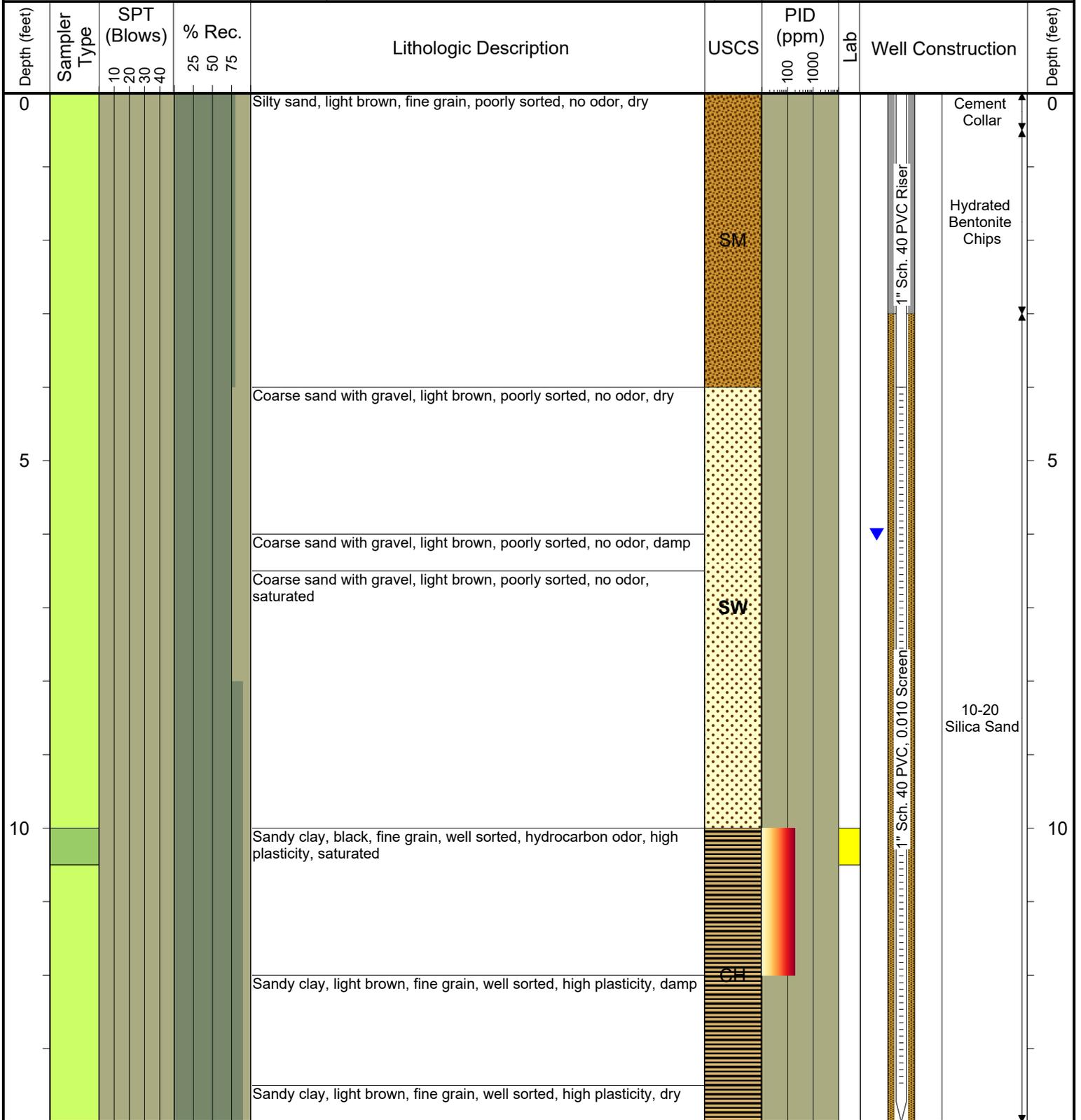
LOCATION: Greeley, CO

NORTHING (CO STATE PLANE): 4479713

EASTING (CO STATE PLANE): 516993.2

CASING ELEVATION (FT. AMSL): 4732.44

GROUND ELEVATION (FT. AMSL): 4731.36



Drilling / Sample Method:

- Solid Stem Auger
- Push Probe
- Hollow Stem Auger
- Push Probe Macro Liner

Laboratory Sample Types:

- Geotechnical Lab
- Analytical Chemistry Lab
- Geotechnical & Analytical Chemistry Lab



6899 Pecos Street, Unit C  
Denver, Colorado 80221

CLIENT: PDC Energy Inc.

LOGGED BY: Alex Chapin

PROJECT MANAGER: Brock Nelson

DRILLING CONTRACTOR: Tasman Geosciences, Inc.

DRILLING EQUIPMENT: Direct Push

DRILL BIT SIZE (INCHES): 2.375"

DATE STARTED - COMPLETED: 9/26/2018

TOTAL WELL DEPTH (FT. BGS): 13

DEPTH TO WATER (FT. BGS): 5

Swanson 34-20

BORING / WELL ID: BH02

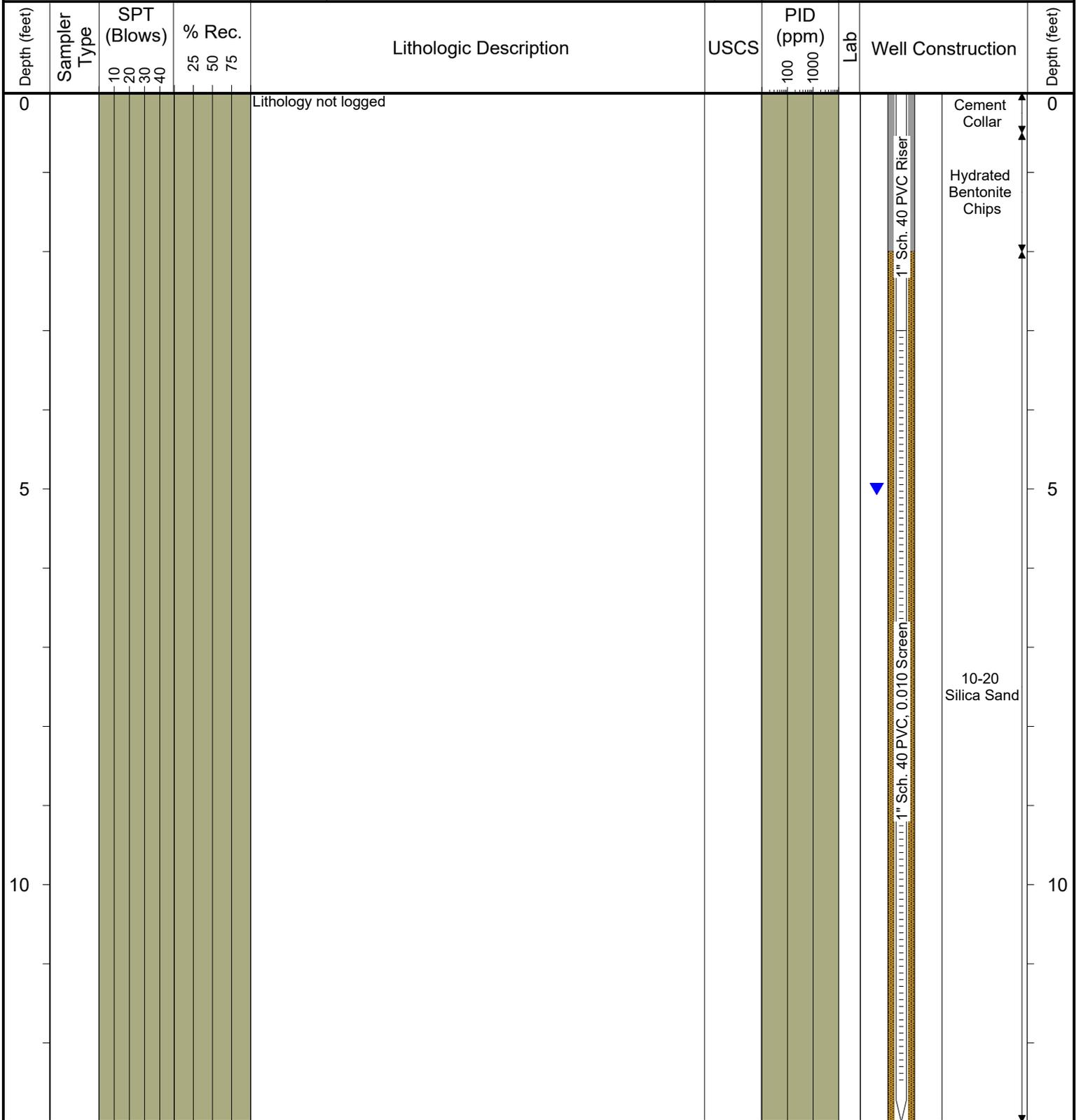
LOCATION: Greeley, CO

NORTHING (CO STATE PLANE): 4479713.6

EASTING (CO STATE PLANE): 517005.7

CASING ELEVATION (FT. AMSL): 4731.84

GROUND ELEVATION (FT. AMSL): 4730.72



Drilling / Sample Method:

- Solid Stem Auger
- Push Probe
- Push Probe Macro Liner

Laboratory Sample Types:

- Geotechnical Lab
- Analytical Chemistry Lab
- Geotechnical & Analytical Chemistry Lab



6899 Pecos Street, Unit C  
Denver, Colorado 80221

CLIENT: PDC Energy Inc.

LOGGED BY: Alex Chapin

PROJECT MANAGER: Brock Nelson

DRILLING CONTRACTOR: Tasman Geosciences, Inc.

DRILLING EQUIPMENT: Direct Push

DRILL BIT SIZE (INCHES): 2.375"

DATE STARTED - COMPLETED: 9/26/2018

TOTAL WELL DEPTH (FT. BGS): 13

DEPTH TO WATER (FT. BGS): 5

Swanson 34-20

BORING / WELL ID: BH03

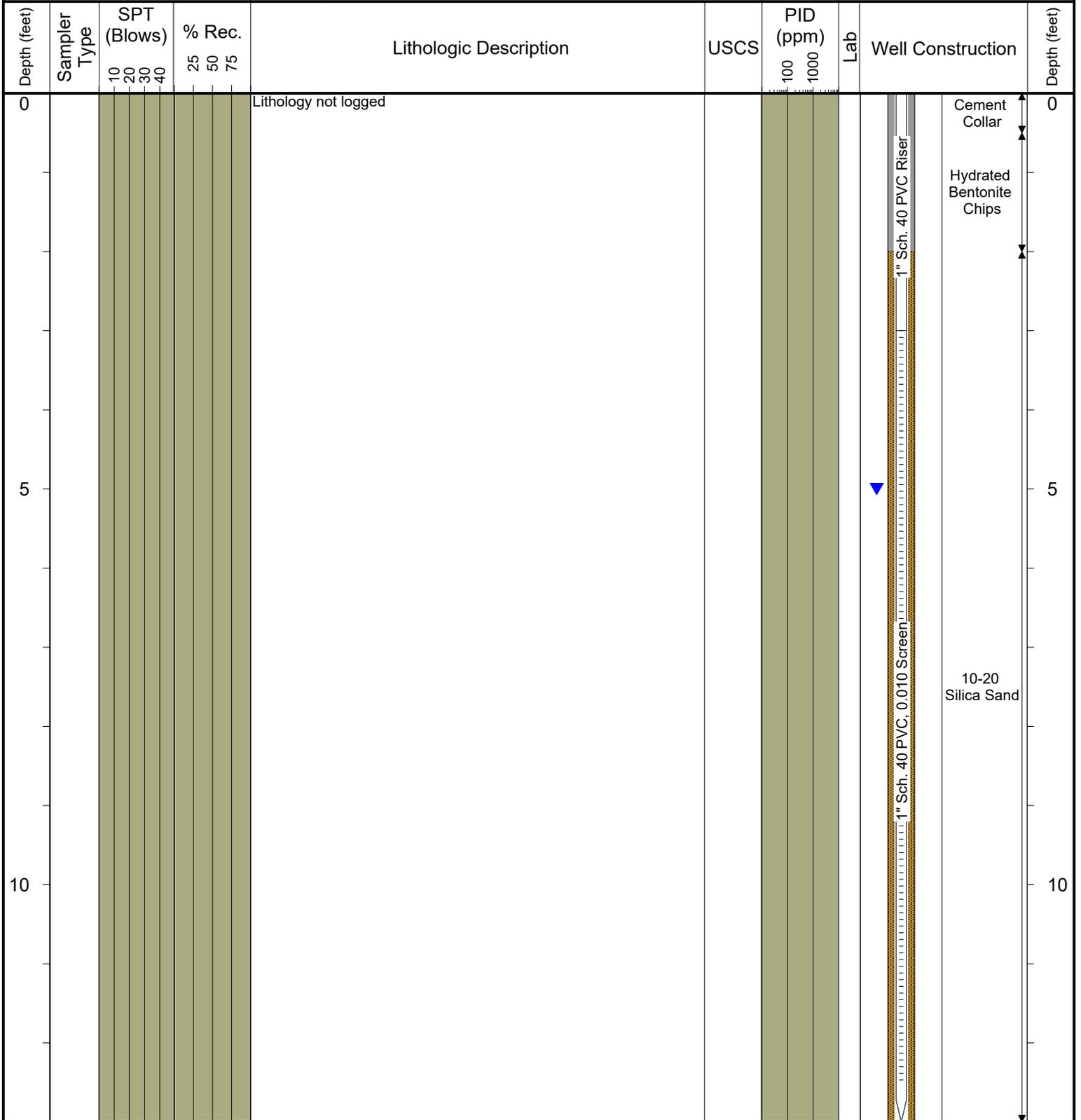
LOCATION: Greeley, CO

NORTHING (CO STATE PLANE): 4479730.6

EASTING (CO STATE PLANE): 516993.9

CASING ELEVATION (FT. AMSL): 4732.37

GROUND ELEVATION (FT. AMSL): 4731.78



Drilling / Sample Method:

- Solid Stem Auger
- Push Probe
- Push Probe Macro Liner

Laboratory Sample Types:

- Geotechnical Lab
- Analytical Chemistry Lab
- Geotechnical & Analytical Chemistry Lab



6899 Pecos Street, Unit C  
Denver, Colorado 80221

CLIENT: PDC Energy Inc.

LOGGED BY: Alex Chapin

PROJECT MANAGER: Brock Nelson

DRILLING CONTRACTOR: Tasman Geosciences, Inc.

DRILLING EQUIPMENT: Direct Push

DRILL BIT SIZE (INCHES): 2.375"

DATE STARTED - COMPLETED: 9/26/2018

TOTAL WELL DEPTH (FT. BGS): 13

DEPTH TO WATER (FT. BGS): 5

Swanson 34-20

BORING / WELL ID: BH04

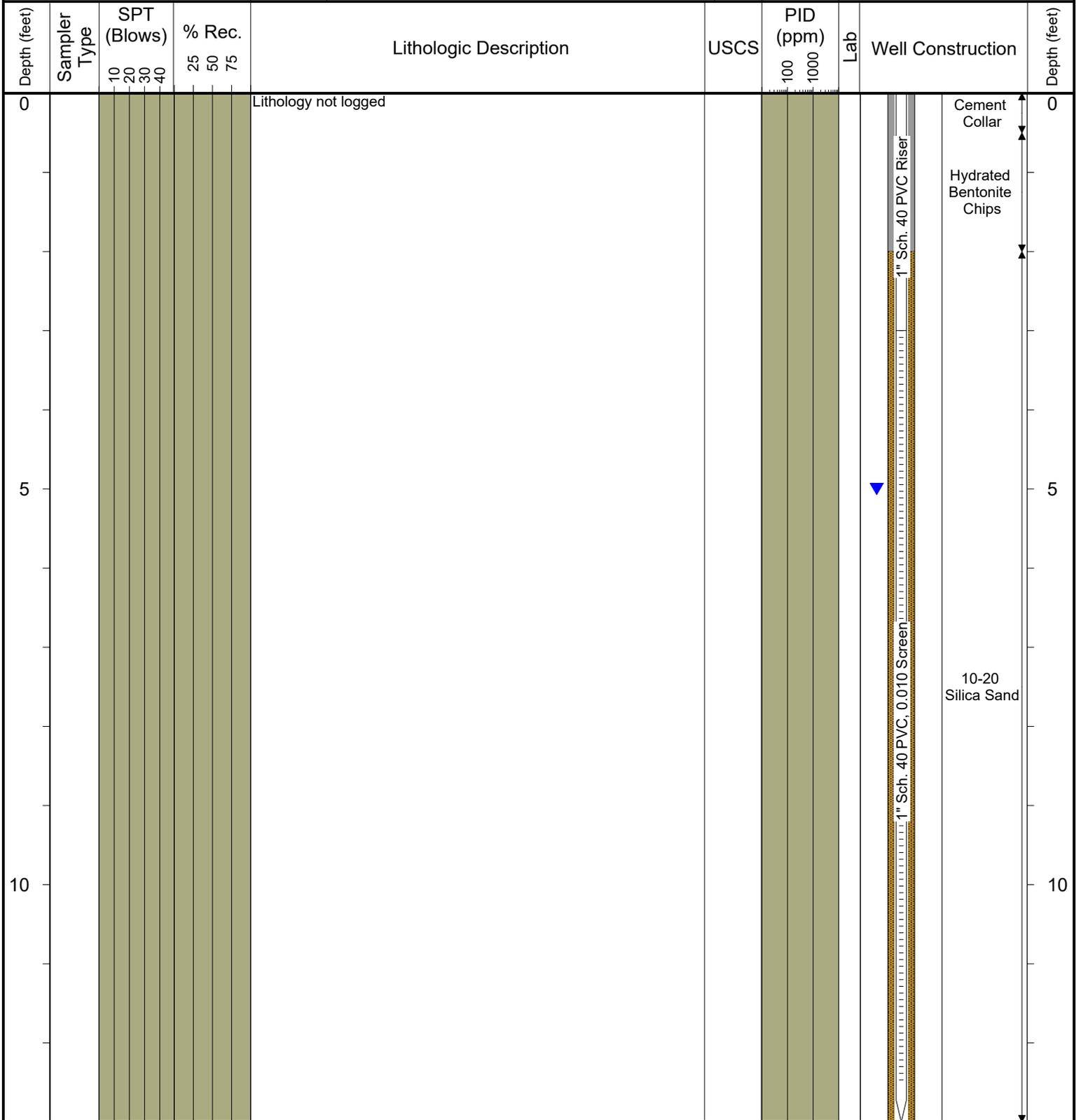
LOCATION: Greeley, CO

NORTHING (CO STATE PLANE): 4479712.1

EASTING (CO STATE PLANE): 516978.1

CASING ELEVATION (FT. AMSL): 4732.09

GROUND ELEVATION (FT. AMSL): 4731.46



Drilling / Sample Method:

- Solid Stem Auger
- Push Probe
- Push Probe Macro Liner

Laboratory Sample Types:

- Geotechnical Lab
- Analytical Chemistry Lab
- Geotechnical & Analytical Chemistry Lab



6899 Pecos Street, Unit C  
Denver, Colorado 80221

CLIENT: PDC Energy Inc.

LOGGED BY: Alex Chapin

PROJECT MANAGER: Brock Nelson

DRILLING CONTRACTOR: Tasman Geosciences, Inc.

DRILLING EQUIPMENT: Direct Push

DRILL BIT SIZE (INCHES): 2.375"

DATE STARTED - COMPLETED: 9/26/2018

TOTAL WELL DEPTH (FT. BGS): 13

DEPTH TO WATER (FT. BGS): 5

Swanson 34-20

BORING / WELL ID: BH05

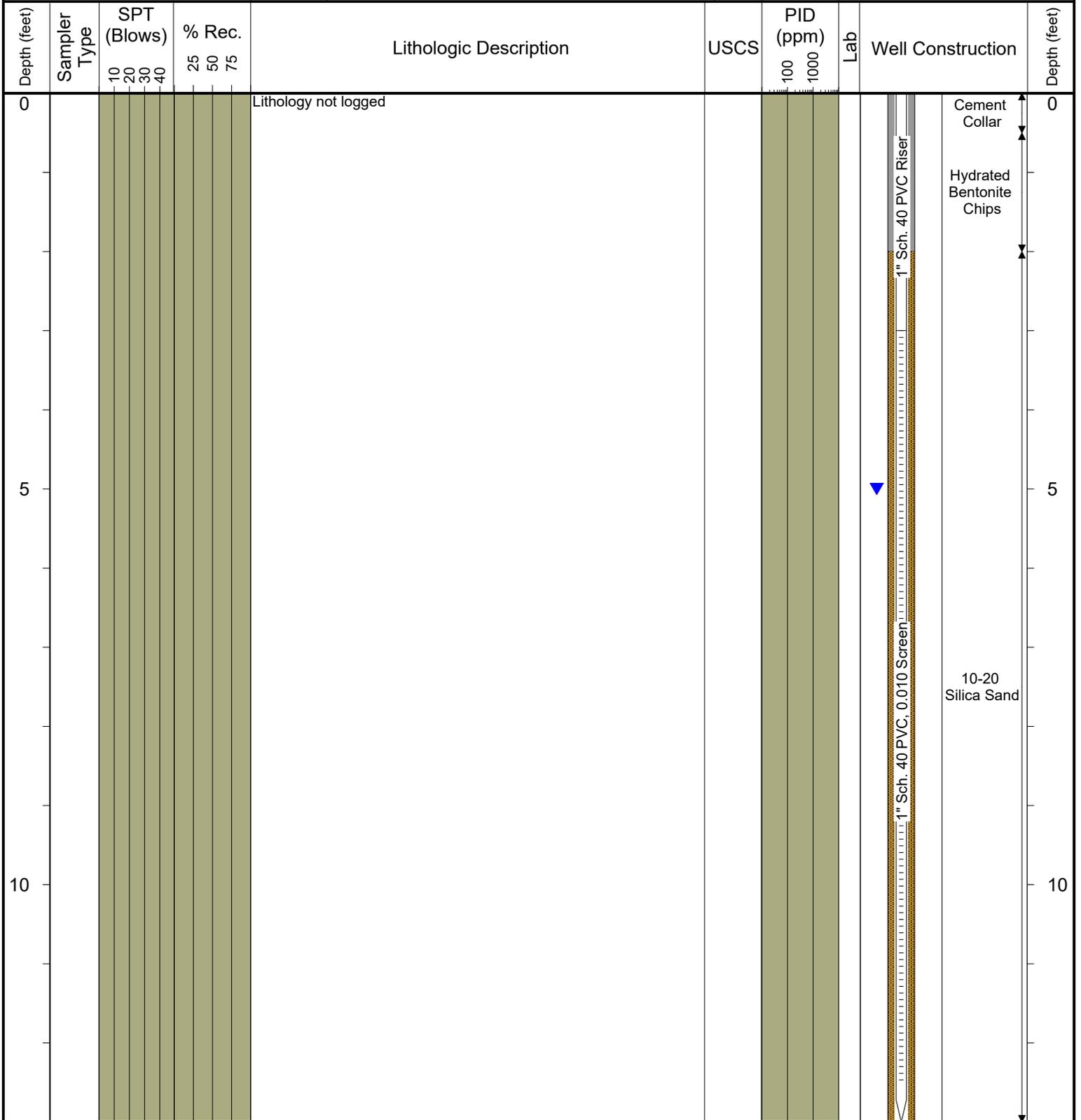
LOCATION: Greeley, CO

NORTHING (CO STATE PLANE): 4479703.1

EASTING (CO STATE PLANE): 516993.8

CASING ELEVATION (FT. AMSL): 4732.01

GROUND ELEVATION (FT. AMSL): 4730.85



Drilling / Sample Method:

- Solid Stem Auger
- Push Probe
- Push Probe Macro Liner

Laboratory Sample Types:

- Geotechnical Lab
- Analytical Chemistry Lab
- Geotechnical & Analytical Chemistry Lab

## **ATTACHMENT B**

# Summit Scientific

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4653 Table Mountain Drive, Golden, Colorado 80403

303.277.9310

December 26, 2018

Mark Longhurst

PDC Energy

1775 Sherman St. STE. 3000

Denver, CO 80203

RE: Swanson 34-20

Enclosed are the results of analyses for samples received by Summit Scientific on 12/17/18 18:40. 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', written in a cursive style.

Paul Shrewsbury

President



PDC Energy  
1775 Sherman St. STE. 3000  
Denver CO, 80203

Project: Swanson 34-20

Project Number: [none]  
Project Manager: Mark Longhurst

**Reported:**  
12/26/18 08:19

### ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
BH01	1812210-01	Water	12/17/18 10:42	12/17/18 18:40
BH02	1812210-02	Water	12/17/18 10:35	12/17/18 18:40
BH03	1812210-03	Water	12/17/18 10:25	12/17/18 18:40
BH04	1812210-04	Water	12/17/18 10:24	12/17/18 18:40
BH05	1812210-05	Water	12/17/18 10:33	12/17/18 18:40

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.*

1812210

# Summit Scientific

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

Client: PDC / Tasman Geosciences  
 Address: 6899 Pecos St, Unit C  
 City/State/Zip: Denver, CO 80221  
 Phone: 303-487-1228 Fax:  
 Sampler Name: Alison Dahl, Brian Gabel

Project Manager: Mark Longhurst  
 E-Mail: mark.longhurst@pdce.com  
 Project Name: Swanson 34-20  
 Project Number: N/A

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 - 8260									
BH01	12/17/2018	1042	3	X				X					X								
BH02		1035																			
BH03		1025																			
BH04		1024																			
BH05		1033																			
Relinquished by: <u>Alison Dahl</u>				Date/Time: <u>12/17/2018 1345</u>				Received by: <u>Tasman Drop Box</u>				Date/Time: <u>12/17/2018 1345</u>				Turn Around Time (Check)				Notes:	
Relinquished by: <u>Tasman Drop Box</u>				Date/Time: <u>12-17-18 1840</u>				Received by: <u>[Signature]</u>				Date/Time: <u>12-17-18 1840</u>				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>5.1</u> Intact: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>					

**Sample Receipt Checklist**

S2 Work Order 1812210

Client: POC/Tasman Client Project ID: Swanson 34-20

Shipped Via: H.D./P.U./FedEx/UPS/USPS/Other P-U Airbill #: \_\_\_\_\_

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

Temp (°C)	5.1
-----------	-----

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 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 <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? <b>If yes, contact client and note in narrative.</b>		/		
Are samples preserved that require preservation (excluding cooling) <sup>(1)</sup> ? Note the type of preservative in the Comments column – HCl, H2SO4, NaOH, HNO3, ect	/			HCl
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.

CP  
Custodian Printed Name or Initials

[Signature]  
Signature of Custodian

12.17.18 1845  
Date/Time



PDC Energy  
 1775 Sherman St. STE. 3000  
 Denver CO, 80203

Project: Swanson 34-20

Project Number: [none]  
 Project Manager: Mark Longhurst

**Reported:**  
 12/26/18 08:19

**BH01**  
**1812210-01 (Water)**

**Summit Scientific**

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

Date Sampled: **12/17/18 10:42**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Benzene	ND	1.0		ug/l	1	1812242	12/18/18	12/19/18	EPA 8260B	
Toluene	ND	1.0		"	"	"	"	"	"	
Ethylbenzene	ND	1.0		"	"	"	"	"	"	
Xylenes (total)	ND	2.0		"	"	"	"	"	"	

Date Sampled: **12/17/18 10:42**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Surrogate: 1,2-Dichloroethane-d4		110 %		23-173		"	"	"	"	
Surrogate: Toluene-d8		95.7 %		20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		94.3 %		21-167		"	"	"	"	

Summit Scientific

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



PDC Energy  
 1775 Sherman St. STE. 3000  
 Denver CO, 80203

Project: Swanson 34-20

Project Number: [none]  
 Project Manager: Mark Longhurst

**Reported:**  
 12/26/18 08:19

**BH02**  
**1812210-02 (Water)**

**Summit Scientific**

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

Date Sampled: **12/17/18 10:35**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Benzene	ND	1.0		ug/l	1	1812242	12/18/18	12/19/18	EPA 8260B	
Toluene	ND	1.0		"	"	"	"	"	"	
Ethylbenzene	ND	1.0		"	"	"	"	"	"	
Xylenes (total)	ND	2.0		"	"	"	"	"	"	

Date Sampled: **12/17/18 10:35**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
<i>Surrogate: 1,2-Dichloroethane-d4</i>		119 %		23-173		"	"	"	"	
<i>Surrogate: Toluene-d8</i>		100 %		20-170		"	"	"	"	
<i>Surrogate: 4-Bromofluorobenzene</i>		88.6 %		21-167		"	"	"	"	

Summit Scientific

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PDC Energy  
 1775 Sherman St. STE. 3000  
 Denver CO, 80203

Project: Swanson 34-20

Project Number: [none]  
 Project Manager: Mark Longhurst

**Reported:**  
 12/26/18 08:19

**BH03**  
**1812210-03 (Water)**

**Summit Scientific**

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

Date Sampled: **12/17/18 10:25**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Benzene	ND	1.0		ug/l	1	1812242	12/18/18	12/19/18	EPA 8260B	
Toluene	ND	1.0		"	"	"	"	"	"	
Ethylbenzene	ND	1.0		"	"	"	"	"	"	
Xylenes (total)	ND	2.0		"	"	"	"	"	"	

Date Sampled: **12/17/18 10:25**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Surrogate: 1,2-Dichloroethane-d4		115 %		23-173		"	"	"	"	
Surrogate: Toluene-d8		98.5 %		20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		98.6 %		21-167		"	"	"	"	

Summit Scientific

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PDC Energy  
 1775 Sherman St. STE. 3000  
 Denver CO, 80203

Project: Swanson 34-20

Project Number: [none]  
 Project Manager: Mark Longhurst

**Reported:**  
 12/26/18 08:19

**BH04**  
**1812210-04 (Water)**

**Summit Scientific**

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

Date Sampled: **12/17/18 10:24**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Benzene	ND	1.0		ug/l	1	1812242	12/18/18	12/19/18	EPA 8260B	
Toluene	ND	1.0		"	"	"	"	"	"	
Ethylbenzene	ND	1.0		"	"	"	"	"	"	
Xylenes (total)	ND	2.0		"	"	"	"	"	"	

Date Sampled: **12/17/18 10:24**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Surrogate: 1,2-Dichloroethane-d4		108 %		23-173		"	"	"	"	
Surrogate: Toluene-d8		98.9 %		20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		77.6 %		21-167		"	"	"	"	

Summit Scientific

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



PDC Energy  
 1775 Sherman St. STE. 3000  
 Denver CO, 80203

Project: Swanson 34-20

Project Number: [none]  
 Project Manager: Mark Longhurst

**Reported:**  
 12/26/18 08:19

**BH05**  
**1812210-05 (Water)**

**Summit Scientific**

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

Date Sampled: **12/17/18 10:33**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Benzene	ND	1.0		ug/l	1	1812242	12/18/18	12/19/18	EPA 8260B	
Toluene	ND	1.0		"	"	"	"	"	"	
Ethylbenzene	ND	1.0		"	"	"	"	"	"	
Xylenes (total)	ND	2.0		"	"	"	"	"	"	

Date Sampled: **12/17/18 10:33**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Surrogate: 1,2-Dichloroethane-d4		113 %		23-173		"	"	"	"	
Surrogate: Toluene-d8		96.2 %		20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		89.8 %		21-167		"	"	"	"	

Summit Scientific

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



PDC Energy  
1775 Sherman St. STE. 3000  
Denver CO, 80203

Project: Swanson 34-20

Project Number: [none]  
Project Manager: Mark Longhurst

**Reported:**  
12/26/18 08:19

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

#### Summit Scientific

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

#### Batch 1812242 - EPA 5030 Water MS

##### Blank (1812242-BLK1)

Prepared: 12/18/18 Analyzed: 12/19/18

Benzene	ND	1.0	ug/l							
Toluene	ND	1.0	"							
Ethylbenzene	ND	1.0	"							
Xylenes (total)	ND	2.0	"							
Surrogate: 1,2-Dichloroethane-d4	14.5		"	13.2		110		23-173		
Surrogate: Toluene-d8	13.3		"	13.3		99.9		20-170		
Surrogate: 4-Bromofluorobenzene	12.5		"	13.3		93.9		21-167		

##### LCS (1812242-BS1)

Prepared: 12/18/18 Analyzed: 12/19/18

Benzene	36.8	1.0	ug/l	33.3		111		70-130		
Toluene	33.8	1.0	"	33.3		101		70-130		
Ethylbenzene	39.3	1.0	"	33.3		118		70-130		
m,p-Xylene	75.0	2.0	"	66.7		113		70-130		
o-Xylene	38.3	1.0	"	33.3		115		70-130		
Surrogate: 1,2-Dichloroethane-d4	13.9		"	13.2		105		23-173		
Surrogate: Toluene-d8	12.4		"	13.3		92.9		20-170		
Surrogate: 4-Bromofluorobenzene	12.7		"	13.3		95.2		21-167		

##### Matrix Spike (1812242-MS1)

Source: 1812220-02

Prepared: 12/18/18 Analyzed: 12/19/18

Benzene	35.6	1.0	ug/l	33.3	1.44	102		70-130		
Toluene	35.3	1.0	"	33.3	3.11	96.5		70-130		
Ethylbenzene	38.6	1.0	"	33.3	ND	116		70-130		
m,p-Xylene	74.0	2.0	"	66.7	2.34	108		70-130		
o-Xylene	37.2	1.0	"	33.3	ND	112		70-130		
Surrogate: 1,2-Dichloroethane-d4	14.2		"	13.2		108		23-173		
Surrogate: Toluene-d8	13.3		"	13.3		99.5		20-170		
Surrogate: 4-Bromofluorobenzene	12.4		"	13.3		93.4		21-167		

Summit Scientific

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PDC Energy  
 1775 Sherman St. STE. 3000  
 Denver CO, 80203

Project: Swanson 34-20

Project Number: [none]  
 Project Manager: Mark Longhurst

**Reported:**  
 12/26/18 08:19

**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 1812242 - EPA 5030 Water MS**

<b>Matrix Spike Dup (1812242-MSD1)</b>	<b>Source: 1812220-02</b>			Prepared: 12/18/18		Analyzed: 12/19/18				
Benzene	37.5	1.0	ug/l	33.3	1.44	108	70-130	5.15	30	
Toluene	37.1	1.0	"	33.3	3.11	102	70-130	5.11	30	
Ethylbenzene	39.9	1.0	"	33.3	ND	120	70-130	3.23	30	
m,p-Xylene	75.4	2.0	"	66.7	2.34	110	70-130	1.75	30	
o-Xylene	39.2	1.0	"	33.3	ND	118	70-130	5.36	30	
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>14.8</i>		<i>"</i>	<i>13.2</i>		<i>112</i>	<i>23-173</i>			
<i>Surrogate: Toluene-d8</i>	<i>13.1</i>		<i>"</i>	<i>13.3</i>		<i>98.2</i>	<i>20-170</i>			
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>12.8</i>		<i>"</i>	<i>13.3</i>		<i>95.6</i>	<i>21-167</i>			

Summit Scientific

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PDC Energy  
1775 Sherman St. STE. 3000  
Denver CO, 80203

Project: Swanson 34-20

Project Number: [none]  
Project Manager: Mark Longhurst

**Reported:**  
12/26/18 08:19

### 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