

**PDC Energy, Inc.**  
**First Quarter 2021 Groundwater Monitoring Summary**

April 12, 2021

Barrell 41-4 Tank Battery  
NENE Section 4 T6N R64W  
Remediation # 7846

This groundwater monitoring summary has been prepared by Tasman Geosciences, Inc. for the Barrell 41-4 tank battery. On February 3, 2021, groundwater monitoring was conducted at all 15 monitoring well locations (BH03 – BH16, and SS02A-R2). Fifteen groundwater samples were submitted to Summit Scientific Laboratory for analysis of benzene, toluene, ethylbenzene, total xylenes (BTEX), naphthalene, 1, 2, 4-trimethylbenzene (TMB) and 1, 3, 5-TMB by EPA Method 8260B. In addition, the samples were submitted for analysis of total dissolved solids (TDS) by Method SM 2540C, chloride and sulfate ions by EPA Method 300.0.

First quarter 2021 analytical results indicated that the benzene concentration was above the applicable COGCC Table 915-1 groundwater standards in monitoring well BH09. Organic compounds were below the applicable COGCC Table 915-1 regulatory standards in the remaining 14 sample locations. The chloride concentration in monitoring well BH13 was above the applicable regulatory standard and outside of the 1.25x concentration of up- and cross-gradient monitoring wells. Inorganic concentrations were within the 1.25x background in the remaining 14 sample locations.

Based on the inorganic concentrations recorded during the groundwater monitoring event conducted on February 3, 2021, monitoring well BH13 was re-sampled on April 1, 2021. The sample was submitted for laboratory analysis of chloride, sulfate, and TDS by Method SM 2450C and EPA Method 300.0. Analytical results confirmed that the chloride concentration remains in exceedance of the applicable COGCC Table 915-1 groundwater standards. Sample locations and corresponding analytical results are illustrated on Figure 1. Groundwater elevation data is illustrated on Figure 2. Historical analytical results under COGCC Table 910-1 regulatory standards are summarized in Table 1. Analytical results under COGCC Table 915-1 regulatory standards are summarized in Table 2 and Table 3. The laboratory report is included as Attachment A.

Monitored natural attenuation (MNA) was selected as the remediation strategy for this site during the fourth quarter 2017 and will remain as the selected remediation strategy through the Second quarter 2021.

Second quarter 2021 groundwater sampling will be conducted during May 2021.

BH05		
Compound (µg/L)	11/25/2020	2/3/2021
Benzene	1.4	<1.0
Toluene	<1.0	<1.0
Ethylbenzene	<1.0	<1.0
Total Xylenes	<2.0	<2.0
Naphthalene	NA	<1.0
TMB-1, 24, 4	NA	<1.0
TMB-1, 3, 5	NA	<1.0
Depth to Water (ft. bgs)	35.28	35.48

BH04		
Compound (µg/L)	11/25/2020	2/3/2021
Benzene	<1.0	<1.0
Toluene	<1.0	<1.0
Ethylbenzene	<1.0	<1.0
Total Xylenes	<2.0	<2.0
Naphthalene	NA	<1.0
TMB-1, 2, 4	NA	<1.0
TMB-1, 3, 5	NA	<1.0
Depth to Water (ft. bgs)	35.41	35.66

BH03		
Compound (µg/L)	11/25/2020	2/3/2021
Benzene	<1.0	<1.0
Toluene	<1.0	<1.0
Ethylbenzene	<1.0	<1.0
Total Xylenes	<2.0	<2.0
Naphthalene	NA	<1.0
TMB-1, 2, 4	NA	<1.0
TMB-1, 3, 5	NA	<1.0
Depth to Water (ft. bgs)	34.97	35.26

BH06		
Compound (µg/L)	11/25/2020	2/3/2021
Benzene	<1.0	<1.0
Toluene	<1.0	<1.0
Ethylbenzene	<1.0	<1.0
Total Xylenes	<2.0	<2.0
Naphthalene	NA	<1.0
TMB-1, 2, 4	NA	<1.0
TMB-1, 3, 5	NA	<1.0
Depth to Water (ft. bgs)	35.36	35.61

BH08		
Compound (µg/L)	11/25/2020	2/3/2021
Benzene	<1.0	<1.0
Toluene	<1.0	<1.0
Ethylbenzene	<1.0	<1.0
Total Xylenes	<2.0	<2.0
Naphthalene	NA	<1.0
TMB-1, 2, 4	NA	<1.0
TMB-1, 3, 5	NA	<1.0
Depth to Water (ft. bgs)	35.01	35.29

BH07		
Compound (µg/L)	11/25/2020	2/3/2021
Benzene	<1.0	<1.0
Toluene	<1.0	<1.0
Ethylbenzene	<1.0	<1.0
Total Xylenes	<2.0	<2.0
Naphthalene	NA	<1.0
TMB-1, 2, 4	NA	<1.0
TMB-1, 3, 5	NA	<1.0
Depth to Water (ft. bgs)	34.94	35.19

SS02A-R2		
Compound (µg/L)	11/25/2020	2/3/2021
Benzene	<1.0	<1.0
Toluene	<1.0	<1.0
Ethylbenzene	<1.0	<1.0
Total Xylenes	<2.0	<2.0
Naphthalene	NA	<1.0
TMB-1, 2, 4	NA	<1.0
TMB-1, 3, 5	NA	<1.0
Depth to Water (ft. bgs) <sup>(1)</sup>	38.17	38.42

BH12		
Compound (µg/L)	11/25/2020	2/3/2021
Benzene	<1.0	<1.0
Toluene	<1.0	<1.0
Ethylbenzene	<1.0	<1.0
Total Xylenes	<2.0	<2.0
Naphthalene	NA	1.4
TMB-1, 2, 4	NA	<1.0
TMB-1, 3, 5	NA	<1.0
Depth to Water (ft. bgs)	35.30	35.44

BH13		
Compound (µg/L)	11/25/2020	2/3/2021
Benzene	<1.0	1.2
Toluene	<1.0	<1.0
Ethylbenzene	<1.0	<1.0
Total Xylenes	<2.0	<2.0
Naphthalene	NA	5.0
TMB-1, 2, 4	NA	<1.0
TMB-1, 3, 5	NA	<1.0
Depth to Water (ft. bgs)	35.35	35.52

BH14		
Compound (µg/L)	11/25/2020	2/3/2021
Benzene	<1.0	<1.0
Toluene	<1.0	<1.0
Ethylbenzene	<1.0	<1.0
Total Xylenes	<2.0	<2.0
Naphthalene	NA	<1.0
TMB-1, 2, 4	NA	<1.0
TMB-1, 3, 5	NA	<1.0
Depth to Water (ft. bes)	35.33	35.44

BH15		
Compound (µg/L)	11/25/2020	2/3/2021
Benzene	<1.0	<1.0
Toluene	<1.0	<1.0
Ethylbenzene	<1.0	<1.0
Total Xylenes	<2.0	<2.0
Naphthalene	NA	<1.0
TMB-1, 2, 4	NA	<1.0
TMB-1, 3, 5	NA	<1.0
Depth to Water (ft. bgs)	35.34	35.44

BH10		
Compound (µg/L)	11/25/2020	2/3/2021
Benzene	<1.0	<1.0
Toluene	<1.0	<1.0
Ethylbenzene	<1.0	<1.0
Total Xylenes	<2.0	<2.0
Naphthalene	NA	<1.0
TMB-1, 2, 4	NA	<1.0
TMB-1, 3, 5	NA	<1.0
Depth to Water (ft. bgs)	34.73	34.94







BH11		
Compound (µg/L)	11/25/2020	2/3/2021
Benzene	<1.0	<1.0
Toluene	<1.0	<1.0
Ethylbenzene	<1.0	<1.0
Total Xylenes	<2.0	<2.0
Naphthalene	NA	<1.0
TMB-1, 2, 4	NA	<1.0
TMB-1, 3, 5	NA	<1.0
Depth to Water (ft. bgs)	35.14	35.31

BH09		
Compound (µg/L)	11/25/2020	2/3/2021
Benzene	<1.0	110
Toluene	<1.0	<1.0
Ethylbenzene	<1.0	<1.0
Total Xylenes	<2.0	<2.0
Naphthalene	NA	1.8
TMB-1, 2, 4	NA	<1.0
TMB-1, 3, 5	NA	<1.0
Depth to Water (ft. bgs)	34.97	35.19

BH16		
Compound (µg/L)	11/25/2020	2/3/2021
Benzene	<1.0	<1.0
Toluene	<1.0	<1.0
Ethylbenzene	<1.0	<1.0
Total Xylenes	<2.0	<2.0
Naphthalene	NA	<1.0
TMB-1, 2, 4	NA	<1.0
TMB-1, 3, 5	NA	<1.0
Depth to Water (ft. bgs)	35.22	35.30



### Legend

- |   |   |
|---|---|
|  | Excavation Extent – LTE (2011)                                  |
|  | Point of Release  |
|  | Angled Remediation Well Location<br>(Collected via Trimble GPS) |
|  | Monitoring Well Location<br>(Collected via Trimble GPS)         |
|  | Angled Monitoring Well Location<br>(Collected via Trimble GPS)  |
|  | Groundwater Flow Direction (1Q21)                               |

## Notes

All locations are approximate unless otherwise noted.

Monitoring well SS02A-R2 is an angled monitoring well with the terminus located southwest of the well monument, beneath the above ground storage tank.

Red text denotes an exceedance of COGCC standards

COGCC – Colorado Oil and Gas Conservation Commission

TMB - Trimethylbenzene

ft. bgs – Feet below ground surface

µg/L – Micrograms per liter

GPS – Global Positioning System

NA – Not analyzed



DATE:	March 15, 2021
DESIGNED BY:	C. Hamlin
DRAWN BY:	J. McCarver



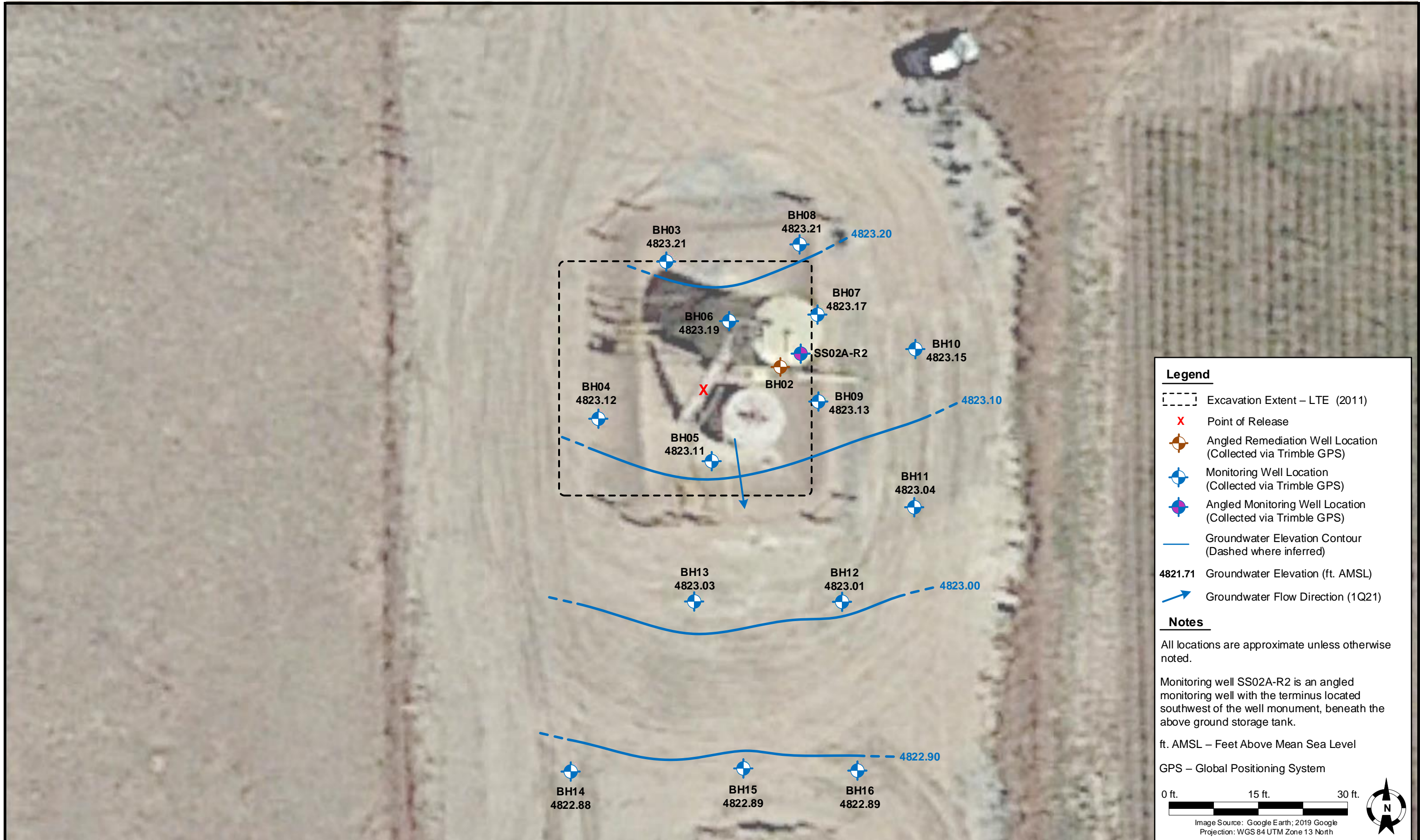
**Tasman Geosciences, Inc.**  
6855 W. 119<sup>th</sup> Ave.  
Broomfield, CO 80020

**PDC Energy, Inc. – DJ Basin**  
**Barrell 41-4 Tank Battery**  
 NENE, Section 4, Township 6 North, Range 64 West  
 Weld County, Colorado

## GROUNDWATER ANALYTICAL RESULTS MAP

FIGURE  
1





**TABLE 1**  
**BARRELL 41-4 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> (ft.)
<b>COGCC Table 910-1 Groundwater Standard (µg/L) <sup>(1)</sup></b>		<b>5</b>	<b>560</b>	<b>700</b>	<b>1,400</b>	
SS02A-R2 <sup>(3)</sup>	9/22/2017	120	150	120	1,200	39.08
SS02A-R2 <sup>(3)</sup>	11/16/2017	74	8.1	19	76	38.92
SS02A-R2 <sup>(3)</sup>	2/7/2018	9.0	<1.0	9.1	3.7	39.67
SS02A-R2 <sup>(3)</sup>	5/17/2018	6.6	<1.0	<1.0	7.4	40.03
SS02A-R2 <sup>(3)</sup>	8/9/2018	5.7	<1.0	2.1	3.3	39.54
SS02A-R2 <sup>(3)</sup>	11/15/2018	1.8	<1.0	<1.0	<2.0	39.00
SS02A-R2 <sup>(3)</sup>	2/18/2019	<1.0	<1.0	<1.0	<2.0	39.85
SS02A-R2 <sup>(3)</sup>	5/8/2019	<1.0	<1.0	<1.0	<2.0	40.00
SS02A-R2 <sup>(3)</sup>	8/5/2019	<1.0	<1.0	<1.0	<2.0	39.25
SS02A-R2 <sup>(3)</sup>	12/3/2019	<1.0	<1.0	<1.0	<2.0	38.78
SS02A-R2 <sup>(3)</sup>	2/5/2020	<1.0	<1.0	<1.0	<2.0	39.03
SS02A-R2 <sup>(3)</sup>	5/26/2020	<1.0	<1.0	<1.0	<2.0	39.69
SS02A-R2 <sup>(3)</sup>	8/18/2020	<1.0	<1.0	<1.0	<2.0	38.42
SS02A-R2 <sup>(3)</sup>	11/25/2020	<1.0	<1.0	<1.0	<2.0	38.17
BH03	10/16/2017	<1.0	<1.0	<1.0	<2.0	35.74
BH03	11/16/2017	<1.0	<1.0	<1.0	<2.0	35.68
BH03	2/7/2018	<1.0	<1.0	<1.0	12	36.47
BH03	5/17/2018	<1.0	<1.0	<1.0	<2.0	36.77
BH03	8/9/2018	<1.0	<1.0	<1.0	<2.0	36.21
BH03	11/15/2018	<1.0	<1.0	<1.0	<2.0	35.77
BH03	2/18/2019	<1.0	<1.0	<1.0	<2.0	36.56
BH03	5/8/2019	<1.0	<1.0	<1.0	<2.0	36.76
BH03	8/5/2019	<1.0	<1.0	<1.0	<2.0	35.92
BH03	12/3/2019	<1.0	<1.0	<1.0	<2.0	35.56
BH03	2/5/2020	<1.0	<1.0	<1.0	<2.0	35.84
BH03	5/26/2020	<1.0	<1.0	<1.0	<2.0	36.48
BH03	8/18/2020	<1.0	<1.0	<1.0	<2.0	35.10
BH03	11/25/2020	<1.0	<1.0	<1.0	<2.0	34.97
BH04	10/16/2017	<1.0	1.7	<1.0	<2.0	36.21
BH04	11/16/2017	<1.0	<1.0	<1.0	<2.0	36.10
BH04	2/7/2018	<1.0	<1.0	<1.0	<2.0	35.76
BH04	5/17/2018	<1.0	<1.0	<1.0	<2.0	37.08
BH04	8/9/2018	<1.0	<1.0	<1.0	<2.0	36.67
BH04	11/15/2018	<1.0	<1.0	<1.0	<2.0	36.19

**TABLE 1**  
**BARRELL 41-4 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> (ft.)
<b>COGCC Table 910-1 Groundwater Standard (µg/L) <sup>(1)</sup></b>		<b>5</b>	<b>560</b>	<b>700</b>	<b>1,400</b>	
BH04	2/18/2019	<1.0	<1.0	<1.0	<2.0	36.90
BH04	5/8/2019	<1.0	<1.0	<1.0	<2.0	37.19
BH04	8/5/2019	<1.0	<1.0	<1.0	<2.0	36.43
BH04	12/3/2019	<1.0	<1.0	<1.0	<2.0	35.97
BH04	2/5/2020	<1.0	<1.0	<1.0	<2.0	36.20
BH04	5/26/2020	<1.0	<1.0	<1.0	<2.0	36.81
BH04	8/18/2020	<1.0	<1.0	<1.0	<2.0	35.68
BH04	11/25/2020	<1.0	<1.0	<1.0	<2.0	35.41
BH05	10/16/2017	<1.0	<1.0	<1.0	<2.0	36.07
BH05	11/16/2017	17	<1.0	<1.0	<2.0	35.94
BH05	2/7/2018	130	<1.0	<1.0	<2.0	36.56
BH05	5/17/2018	51	<1.0	<1.0	<2.0	36.90
BH05	8/9/2018	150	<1.0	<1.0	<2.0	36.56
BH05	11/15/2018	46	<1.0	<1.0	7.6	36.03
BH05	2/18/2019	18	<1.0	<1.0	<2.0	36.73
BH05	5/8/2019	6.8	<1.0	<1.0	<2.0	36.90
BH05	8/5/2019	3.7	<1.0	<1.0	<2.0	36.34
BH05	12/3/2019	370	<1.0	<1.0	2.2	35.83
BH05	2/5/2020	6.6	<1.0	<1.0	<2.0	36.02
BH05	5/26/2020	3.0	<1.0	<1.0	<2.0	36.61
BH05	8/18/2020	1.4	<1.0	<1.0	<2.0	35.60
BH05	11/25/2020	<1.0	<1.0	<1.0	<2.0	35.28
BH06	10/16/2017	<1.0	<1.0	<1.0	<2.0	36.14
BH06	11/16/2017	<1.0	<1.0	<1.0	<2.0	36.04
BH06	2/7/2018	<1.0	<1.0	<1.0	<2.0	36.76
BH06	5/17/2018	<1.0	<1.0	<1.0	<2.0	37.12
BH06	8/9/2018	<1.0	<1.0	<1.0	<2.0	36.62
BH06	11/15/2018	<1.0	<1.0	<1.0	<2.0	36.15
BH06	2/18/2019	<1.0	<1.0	<1.0	<2.0	36.91
BH06	5/8/2019	<1.0	<1.0	<1.0	<2.0	37.09
BH06	8/5/2019	<1.0	<1.0	<1.0	<2.0	36.35
BH06	12/3/2019	<1.0	<1.0	<1.0	<2.0	35.95
BH06	2/5/2020	<1.0	<1.0	<1.0	<2.0	36.19
BH06	5/26/2020	<1.0	<1.0	<1.0	<2.0	36.80

**TABLE 1**  
**BARRELL 41-4 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> (ft.)
<b>COGCC Table 910-1 Groundwater Standard (µg/L) <sup>(1)</sup></b>		<b>5</b>	<b>560</b>	<b>700</b>	<b>1,400</b>	
BH06	8/18/2020	<1.0	<1.0	<1.0	<2.0	35.57
BH06	11/25/2020	<1.0	<1.0	<1.0	<2.0	35.36
BH07	11/16/2017	<1.0	<1.0	<1.0	<2.0	32.63
BH07	2/7/2018	<1.0	<1.0	<1.0	<2.0	36.31
BH07	5/17/2018	<1.0	<1.0	<1.0	<2.0	36.63
BH07	8/9/2018	<1.0	<1.0	<1.0	<2.0	36.20
BH07	11/15/2018	<1.0	<1.0	<1.0	<2.0	35.71
BH07	2/18/2019	<1.0	<1.0	<1.0	<2.0	36.48
BH07	5/8/2019	<1.0	<1.0	<1.0	<2.0	36.65
BH07	8/5/2019	<1.0	<1.0	<1.0	<2.0	35.95
BH07	12/3/2019	<1.0	<1.0	<1.0	<2.0	35.52
BH07	2/5/2020	<1.0	<1.0	<1.0	<2.0	35.76
BH07	5/26/2020	<1.0	<1.0	<1.0	<2.0	36.35
BH07	8/18/2020	<1.0	<1.0	<1.0	<2.0	35.16
BH07	11/25/2020	<1.0	<1.0	<1.0	<2.0	34.94
BH08	11/16/2017	<1.0	<1.0	<1.0	<2.0	35.71
BH08	2/7/2018	<1.0	<1.0	<1.0	<2.0	36.45
BH08	5/17/2018	<1.0	<1.0	<1.0	<2.0	36.78
BH08	8/9/2018	<1.0	<1.0	<1.0	<2.0	36.27
BH08	11/15/2018	<1.0	<1.0	<1.0	<2.0	35.80
BH08	2/18/2019	<1.0	<1.0	<1.0	<2.0	36.61
BH08	5/8/2019	<1.0	<1.0	<1.0	<2.0	36.78
BH08	8/5/2019	<1.0	<1.0	<1.0	<2.0	35.99
BH08	12/3/2019	<1.0	<1.0	<1.0	<2.0	35.61
BH08	2/5/2020	<1.0	<1.0	<1.0	<2.0	35.87
BH08	5/26/2020	<1.0	<1.0	<1.0	<2.0	36.50
BH08	8/18/2020	<1.0	<1.0	<1.0	<2.0	35.18
BH08	11/25/2020	<1.0	<1.0	<1.0	<2.0	35.01
BH09	11/16/2017	<b>470</b>	<1.0	6.0	8.0	35.65
BH09	2/7/2018	<b>240</b>	<1.0	<1.0	<2.0	36.29
BH09	5/17/2018	<b>11</b>	<1.0	<1.0	<2.0	36.58
BH09	8/9/2018	<b>150</b>	<1.0	<1.0	<2.0	36.25
BH09	11/15/2018	<b>720</b>	<1.0	<1.0	<2.0	35.74



**TABLE 1**  
**BARRELL 41-4 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> (ft.)
<b>COGCC Table 910-1 Groundwater Standard (µg/L) <sup>(1)</sup></b>		<b>5</b>	<b>560</b>	<b>700</b>	<b>1,400</b>	
BH09	2/18/2019	10	<1.0	<1.0	<2.0	36.44
BH09	5/8/2019	<1.0	<1.0	<1.0	<2.0	36.61
BH09	8/5/2019	220	<1.0	<1.0	<2.0	36.02
BH09	12/3/2019	8.9	<1.0	<1.0	<2.0	35.55
BH09	2/5/2020	840	<1.0	3.1	12	35.73
BH09	5/26/2020	<1.0	<1.0	<1.0	<2.0	36.32
BH09	8/18/2020	660	<1.0	<1.0	19	35.27
BH09	11/25/2020	<1.0	<1.0	<1.0	<2.0	34.97
BH10	2/18/2019	<1.0	<1.0	<1.0	<2.0	36.19
BH10	5/8/2019	<1.0	<1.0	<1.0	<2.0	36.36
BH10	8/5/2019	<1.0	<1.0	<1.0	<2.0	35.77
BH10	12/3/2019	<1.0	<1.0	<1.0	<2.0	35.29
BH10	2/5/2020	<1.0	<1.0	<1.0	<2.0	35.49
BH10	5/26/2020	<1.0	<1.0	<1.0	<2.0	36.09
BH10	8/18/2020	<1.0	<1.0	<1.0	<2.0	35.02
BH10	11/25/2020	<1.0	<1.0	<1.0	<2.0	34.73
BH11	2/18/2019	<1.0	<1.0	<1.0	<2.0	36.47
BH11	5/8/2019	<1.0	<1.0	<1.0	<2.0	36.63
BH11	8/5/2019	<1.0	<1.0	<1.0	<2.0	36.21
BH11	12/3/2019	<1.0	<1.0	<1.0	<2.0	35.67
BH11	2/5/2020	<1.0	<1.0	<1.0	<2.0	35.82
BH11	5/26/2020	<1.0	<1.0	<1.0	<2.0	36.38
BH11	8/18/2020	<1.0	<1.0	<1.0	<2.0	35.53
BH11	11/25/2020	<1.0	<1.0	<1.0	<2.0	35.14
BH12	2/18/2019	<1.0	<1.0	<1.0	<2.0	36.60
BH12	5/8/2019	<1.0	<1.0	<1.0	<2.0	36.75
BH12	8/5/2019	<1.0	<1.0	<1.0	<2.0	36.38
BH12	12/3/2019	<1.0	<1.0	<1.0	<2.0	35.81
BH12	2/5/2020	<1.0	<1.0	<1.0	<2.0	35.94
BH12	5/26/2020	<1.0	<1.0	<1.0	<2.0	36.48
BH12	8/18/2020	<1.0	<1.0	<1.0	<2.0	36.72
BH12	11/25/2020	<1.0	<1.0	<1.0	<2.0	35.30
BH13	2/18/2019	<1.0	<1.0	<1.0	<2.0	36.69

**TABLE 1**  
**BARRELL 41-4 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> (ft.)
<b>COGCC Table 910-1 Groundwater Standard (µg/L) <sup>(1)</sup></b>		<b>5</b>	<b>560</b>	<b>700</b>	<b>1,400</b>	
BH13	5/8/2019	<1.0	<1.0	<1.0	<2.0	36.85
BH13	8/5/2019	<1.0	<1.0	<1.0	<2.0	36.43
BH13	12/3/2019	<b>73</b>	<1.0	<1.0	<2.0	35.87
BH13	2/5/2020	<b>45</b>	<1.0	<1.0	<2.0	36.03
BH13	5/26/2020	<b>27</b>	<1.0	<1.0	<2.0	36.58
BH13	8/18/2020	<1.0	<1.0	<1.0	<2.0	35.75
BH13	11/25/2020	<1.0	<1.0	<1.0	<2.0	35.35
BH14	2/5/2020	<1.0	<1.0	<1.0	<2.0	35.90
BH14	5/26/2020	<1.0	<1.0	<1.0	<2.0	36.43
BH14	8/18/2020	<1.0	<1.0	<1.0	<2.0	35.82
BH14	11/25/2020	<1.0	<1.0	<1.0	<2.0	35.33
BH15	2/5/2020	<1.0	<1.0	<1.0	<2.0	35.90
BH15	5/26/2020	<1.0	<1.0	<1.0	<2.0	36.41
BH15	8/18/2020	<1.0	<1.0	<1.0	<2.0	35.82
BH15	11/25/2020	<1.0	<1.0	<1.0	<2.0	35.34
BH16	2/5/2020	<1.0	<1.0	<1.0	<2.0	35.76
BH16	5/26/2020	<1.0	<1.0	<1.0	<2.0	36.27
BH16	8/18/2020	<1.0	<1.0	<1.0	<2.0	35.69
BH16	11/25/2020	<1.0	<1.0	<1.0	<2.0	35.22

**Notes:**

1. Groundwater standards referenced from 2 CCR 404-1, Table 910-1, effective May 1, 2018.

2. Depth to water measurements were measured from ground surface for excavation samples. Monitoring well measurements were collected from top of casing and adjusted using survey data and product thickness to reflect depth of water from ground surface.

3. Monitoring well SS02A-R2 was drilled as an angled remediation well. Depth to water does not represent true depth to water.

COGCC = Colorado Oil and Gas Conservation Commission

µg/L = Micrograms per liter

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

ft. = Feet

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



**TABLE 2**  
**BARRELL 41-4 TANK BATTERY**  
**GROUNDWATER ANALYTICAL RESULTS SUMMARY TABLE**  
**ORGANIC COMPOUNDS**

Sample ID	Date Sampled	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Total Xylenes (µg/L)	Naphthalene (µg/L)	1,2,4-TMB (µg/L)	1,3,5-TMB (µg/L)	Depth to Water <sup>(2)</sup> (ft.)	Groundwater Elevation (ft. AMSL)
<b>COGCC Table 915-1 Groundwater Standard (µg/L) <sup>(1)</sup></b>		<b>5</b>	<b>560</b>	<b>700</b>	<b>1,400</b>	<b>140</b>	<b>67</b>	<b>67</b>	<b>-</b>	<b>-</b>
SS02A-R2	2/3/2021	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	38.42	4819.75
BH03	2/3/2021	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	35.26	4823.21
BH04	2/3/2021	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	35.66	4823.12
BH05	2/3/2021	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	35.48	4823.11
BH06	2/3/2021	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	35.61	4823.19
BH07	2/3/2021	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	35.19	4823.17
BH08	2/3/2021	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	35.29	4823.21
BH09	2/3/2021	<b>110</b>	<1.0	<1.0	<2.0	1.8	<1.0	<1.0	35.19	4823.13
BH10	2/3/2021	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	34.94	4823.15
BH11	2/3/2021	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	35.31	4823.04
BH12	2/3/2021	<1.0	<1.0	<1.0	<2.0	1.4	<1.0	<1.0	35.44	4823.01
BH13	2/3/2021	1.2	<1.0	<1.0	<2.0	5.0	<1.0	<1.0	35.52	4823.03
BH14	2/3/2021	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	35.44	4822.88
BH15	2/3/2021	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	35.44	4822.89
BH16	2/3/2021	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	35.30	4822.89

**Notes:**

- Groundwater standards referenced from 2 CCR 404-1, Table 915-1, January 15, 2021.
  - Depth to water measurements were measured from ground surface for excavation samples. Monitoring well measurements were collected from top of casing and adjusted using survey data to reflect depth of water from ground surface.
- TMB = Trimethylbenzene  
COGCC = Colorado Oil and Gas Conservation Commission  
µg/L = Micrograms per liter  
(<) = Analytical result is less than the indicated laboratory reporting limit.  
ft. = Feet  
AMSL = Above Mean Sea Level  
**BOLD** = Analytical result is in exceedance of applicable standard.

**TABLE 3**  
**BARRELL 41-4 TANK BATTERY**  
**GROUNDWATER ANALYTICAL RESULTS SUMMARY TABLE**  
**INORGANIC PARAMETERS**

Sample ID	Date Sampled	TDS (unit)	Chloride Ion (mg/L)	Sulfate Ion (mg/L)
<b>COGCC Table 915-1 Groundwater Standard (mg/L) <sup>(1)</sup></b>		<b>&lt;1.25 x BCKG</b>	<b>250 or &lt;1.25 x BCKG</b>	<b>250 or &lt;1.25 x BCKG</b>
SS02A-R2	2/3/2021	838	19.6	1,080
BH03	2/3/2021	849	25.6	1,080
BH04	2/3/2021	724	31.4	739
BH05	2/3/2021	799	41.4	932
BH06	2/3/2021	928	24.2	1,410
BH07	2/3/2021	1,110	44.8	1,890
BH08	2/3/2021	1,280	53.4	2,460
BH09	2/3/2021	1,030	44.6	1,750
BH10	2/3/2021	1,240	46.4	2,080
BH11	2/3/2021	1,160	71.4	1,660
BH12	2/3/2021	702	140	151
BH13	2/3/2021	1,420	<b>615</b>	989
BH13	4/1/2021	<b>4,010</b>	<b>344</b>	687
BH14	2/3/2021	733	13.4	820
BH15	2/3/2021	798	21.6	958
BH16	2/3/2021	924	23.2	1,190

**Notes:**

1. Groundwater standards referenced from 2 CCR 404-1, Table 915-1, January 15, 2021.

TDS = Total dissolved solids

COGCC = Colorado Oil and Gas Conservation Commission

mg/L = Milligrams per liter

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

**BOLD** = Analytical result is in exceedance of applicable standard.

## **ATTACHMENT A**

# Summit Scientific

---

4653 Table Mountain Drive, Golden, Colorado 80403


303.277.9310

February 11, 2021

Mark Longhurst  
PDC Energy  
1775 Sherman St. STE. 3000  
Denver, CO 80203  
RE: Barrell 41-4  
Work Order #2102055

Enclosed are the results of analyses for samples received by Summit Scientific on 02/03/21 17:40. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

A handwritten signature in black ink, appearing to read "Muri Premier", is shown on a light purple rectangular background.

Muri Premier For Paul Shrewsbury  
President





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

Project: Barrell 41-4  
Project Number: [none]  
Project Manager: Mark Longhurst

**Reported:**  
02/11/21 12:29

#### ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
SS02A-R2	2102055-01	Water	02/03/21 13:00	02/03/21 17:40
BH03	2102055-02	Water	02/03/21 13:46	02/03/21 17:40
BH04	2102055-03	Water	02/03/21 13:51	02/03/21 17:40
BH05	2102055-04	Water	02/03/21 14:08	02/03/21 17:40
BH06	2102055-05	Water	02/03/21 14:01	02/03/21 17:40
BH07	2102055-06	Water	02/03/21 12:47	02/03/21 17:40
BH08	2102055-07	Water	02/03/21 12:34	02/03/21 17:40
BH09	2102055-08	Water	02/03/21 14:13	02/03/21 17:40
BH10	2102055-09	Water	02/03/21 13:15	02/03/21 17:40
BH11	2102055-10	Water	02/03/21 13:31	02/03/21 17:40
BH12	2102055-11	Water	02/03/21 13:36	02/03/21 17:40
BH13	2102055-12	Water	02/03/21 13:20	02/03/21 17:40
BH14	2102055-13	Water	02/03/21 12:29	02/03/21 17:40
BH15	2102055-14	Water	02/03/21 12:50	02/03/21 17:40
BH16	2102055-15	Water	02/03/21 13:05	02/03/21 17:40

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.*

# Summit Scientific

S<sub>2</sub>

4653 Table Mountain Drive ♦ Golden, Colorado 80403

303-277-9310 ♦ 303-374-5933 (f)

Page 1 of 2

Client: PDC / Tasman

Project Manager: Mark Longhurst

Address: 6855 W 119th Ave.

E-Mail: mark.longhurst@pdce.com

City/State/Zip: Broomfield, CO 80020


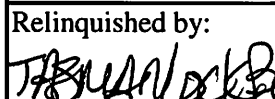
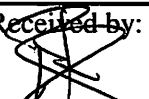
Phone: 303-487-1228

Project Name: Barrell 41-4

Sampler Name: Yianni Tsambis

Project Number: n/a

ID	Sample Description	Date Sampled	Time Sampled	# of containers	Preservative				Matrix				Analysis Requested								Special Instructions
					HCl	HNO <sub>3</sub>	None	Other	Water	Soil	Air-Canister #	Other	BTEX	Napthalene	1,2,4-trimethylbenzene	1,3,5-trimethylbenzene	TDS	Chloride	Sulfate		
1	SS02A-R2	2/3/2021	1300	4	3		1		X				X	X	X	X	X	X	X		
2	BH03	2/3/2021	1346	4	3		1		X				X	X	X	X	X	X	X		
3	BH04	2/3/2021	1351	4	3		1		X				X	X	X	X	X	X	X		
4	BH05	2/3/2021	1408	4	3		1		X				X	X	X	X	X	X	X		
5	BH06	2/3/2021	1401	4	3		1		X				X	X	X	X	X	X	X		
6	BH07	2/3/2021	1247	4	3		1		X				X	X	X	X	X	X	X		
7	BH08	2/3/2021	1234	4	3		1		X				X	X	X	X	X	X	X		
8	BH09	2/3/2021	1413	4	3		1		X				X	X	X	X	X	X	X		
9	BH10	2/3/2021	1315	4	3		1		X				X	X	X	X	X	X	X		
10	BH11	2/3/2021	1331	4	3		1		X				X	X	X	X	X	X	X		

Relinquished by: 	Date/Time: 2/3/21 1615	Received by: Tasman's Lock Box	Date/Time: 2/3/21 1615	<b>Turn Around Time</b> (Check) Same Day _____ 72 hours _____ 24 hours _____ Standard <u>X</u> 48 hours _____ <b>Sample Integrity:</b> 43 Temperature Upon Receipt: _____ Samples Intact: <u>Yes</u> No	<b>Notes:</b>
Relinquished by: 	Date/Time: 02/03/2021 1745	Received by: 	Date/Time: 02/03/2021 1740		
Relinquished by:	Date/Time:	Received by:	Date/Time:		
Relinquished by:	Date/Time:	Received by:	Date/Time:		

2/02055.2

# Summit Scientific

S<sub>2</sub>

4653 Table Mountain Drive ♦ Golden, Colorado 80403

303-277-9310 ♦ 303-374-5933 (f)

Page 2 of 2

Client: PDC / Tasman

Project Manager: Mark Longhurst

Address: 6855 W 119th Ave.

E-Mail: mark.longhurst@pdce.com

City/State/Zip: Broomfield, CO 80020

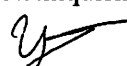
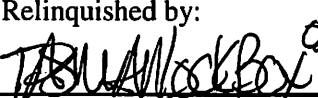
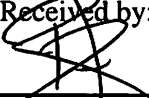
Phone: 303-487-1228

Project Name: Barrell 41-4

Sampler Name: Yianni Tsambis

Project Number: n/a

ID	Sample Description	Date Sampled	Time Sampled	# of containers	Preservative				Matrix				Analysis Requested								Special Instructions
					HCl	HNO <sub>3</sub>	None	Other	Water	Soil	Air-Canister #	Other	BTEX	Napthalene	1,2,4-trimethylbenzene	1,3,5-trimethylbenzene	TDS	Chloride	Sulfate		
1	BH12	2/3/2021	1336	4	3		1		X				X	X	X	X	X	X	X	X	
2	BH13	2/3/2021	1320	4	3		1		X				X	X	X	X	X	X	X	X	
3	BH14	2/3/2021	1229	4	3		1		X				X	X	X	X	X	X	X	X	
4	BH15	2/3/2021	1250	4	3		1		X				X	X	X	X	X	X	X	X	
5	BH16	2/3/2021	1305	4	3		1		X				X	X	X	X	X	X	X	X	
6																					
7																					
8																					
9																					
10																					

Relinquished by: 	Date/Time: 2/3/21 1615	Received by: Tasman's Lock Box	Date/Time: 2/3/21 1615	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"/>	Notes:
Relinquished by: 	Date/Time: 2/03/2021 1740	Received by: 	Date/Time: 2/03/2021 1740	Sample Integrity: <u>4.3</u>	
Relinquished by:	Date/Time:	Received by:	Date/Time:	Temperature Upon Receipt: <u>4.3</u> Samples Intact: <input checked="" type="radio"/> Yes <input type="radio"/> No	

# Sample Receipt Checklist

S2 Work Order 2102055

Client: POC/TASMAN Client Project ID: BARREU41-4

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

☐ ☒ ☐ ☐ ☐

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

Temp (°C) 4.3

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> ?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
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> ?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Was adequate sample volume provided <sup>(1)</sup> ?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
If custody seals are present, are they intact <sup>(1)</sup> ?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Are samples with holding times due within 48 hours sample due within 48 hours present?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Is a chain-of-custody (COC) form present and filled out completely <sup>(1)</sup> ?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Does the COC agree with the number and type of sample bottles received <sup>(1)</sup> ?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Do the sample IDs on the bottle labels match the COC <sup>(1)</sup> ?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Is the COC properly relinquished by the client w/ date and time recorded <sup>(1)</sup> ?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
For volatiles in water – is there headspace present? If yes, contact client and note in narrative.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Are samples preserved that require preservation (excluding cooling) <sup>(1)</sup> ?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
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 <sup>(1)</sup> ?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Record the pH in Comments.				
If dissolved metals are requested, were samples field filtered?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	

Additional Comments (if any):

<sup>(1)</sup> If NO, then contact the client before proceeding with analysis and note in case narrative.

PC  
Custodian Printed Name or Initials

[Signature]  
Signature of Custodian

02/03/2021  
Date/Time





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

Project: Barrell 41-4  
Project Number: [none]  
Project Manager: Mark Longhurst

**Reported:**  
02/11/21 12:29

**SS02A-R2**  
**2102055-01 (Water)**

**Summit Scientific**

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

Date Sampled: **02/03/21 13:00**

Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
Benzene	ND	1.0	ug/l	1	BEB0077	02/04/21	02/05/21	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	2.0	"	"	"	"	"	"	
Naphthalene	ND	1.0	"	"	"	"	"	"	
1,2,4-Trimethylbenzene	ND	1.0	"	"	"	"	"	"	
1,3,5-Trimethylbenzene	ND	1.0	"	"	"	"	"	"	

Date Sampled: **02/03/21 13:00**

Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
Surrogate: 1,2-Dichloroethane-d4		157 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		93.4 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		103 %	21-167		"	"	"	"	

**Anions by EPA Method 300.0**

Date Sampled: **02/03/21 13:00**

Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
Chloride	19.6	12.0	mg/L	200	BEB0093	02/05/21	02/05/21	EPA 300.0	
Sulfate	1080	60.0	"	"	"	"	"	"	

**Total Dissolved Solids by SM2540C**

Date Sampled: **02/03/21 13:00**

Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
Total Dissolved Solids	838	10.0	mg/L	1	BEB0068	02/04/21	02/04/21	SM2540C	

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: Barrell 41-4  
Project Number: [none]  
Project Manager: Mark Longhurst

**Reported:**  
02/11/21 12:29

**BH03**  
**2102055-02 (Water)**

**Summit Scientific**

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

Date Sampled: **02/03/21 13:46**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Benzene	ND	1.0		ug/l	1	BEB0077	02/04/21	02/05/21	EPA 8260B	
Toluene	ND	1.0		"	"	"	"	"	"	
Ethylbenzene	ND	1.0		"	"	"	"	"	"	
Xylenes (total)	ND	2.0		"	"	"	"	"	"	
Naphthalene	ND	1.0		"	"	"	"	"	"	
1,2,4-Trimethylbenzene	ND	1.0		"	"	"	"	"	"	
1,3,5-Trimethylbenzene	ND	1.0		"	"	"	"	"	"	

Date Sampled: **02/03/21 13:46**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Surrogate: 1,2-Dichloroethane-d4		159 %		23-173		"	"	"	"	
Surrogate: Toluene-d8		87.8 %		20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		105 %		21-167		"	"	"	"	

**Anions by EPA Method 300.0**

Date Sampled: **02/03/21 13:46**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Chloride	<b>25.6</b>	12.0		mg/L	200	BEB0093	02/05/21	02/05/21	EPA 300.0	
Sulfate	<b>1080</b>	60.0		"	"	"	"	"	"	

**Total Dissolved Solids by SM2540C**

Date Sampled: **02/03/21 13:46**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Total Dissolved Solids	<b>849</b>	10.0		mg/L	1	BEB0068	02/04/21	02/04/21	SM2540C	

Summit Scientific

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

Project: Barrell 41-4  
Project Number: [none]  
Project Manager: Mark Longhurst

**Reported:**  
02/11/21 12:29

**BH04**  
**2102055-03 (Water)**

**Summit Scientific**

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

Date Sampled: **02/03/21 13:51**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Benzene	ND	1.0		ug/l	1	BEB0077	02/04/21	02/05/21	EPA 8260B	
Toluene	ND	1.0		"	"	"	"	"	"	
Ethylbenzene	ND	1.0		"	"	"	"	"	"	
Xylenes (total)	ND	2.0		"	"	"	"	"	"	
Naphthalene	ND	1.0		"	"	"	"	"	"	
1,2,4-Trimethylbenzene	ND	1.0		"	"	"	"	"	"	
1,3,5-Trimethylbenzene	ND	1.0		"	"	"	"	"	"	

Date Sampled: **02/03/21 13:51**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Surrogate: 1,2-Dichloroethane-d4		158 %		23-173		"	"	"	"	
Surrogate: Toluene-d8		90.7 %		20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		102 %		21-167		"	"	"	"	

**Anions by EPA Method 300.0**

Date Sampled: **02/03/21 13:51**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Sulfate	739	60.0		mg/L	200	BEB0093	02/05/21	02/05/21	EPA 300.0	
Chloride	31.4	12.0		"	"	"	"	"	"	

**Total Dissolved Solids by SM2540C**

Date Sampled: **02/03/21 13:51**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Total Dissolved Solids	724	10.0		mg/L	1	BEB0068	02/04/21	02/04/21	SM2540C	

Summit Scientific

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

Project: Barrell 41-4  
Project Number: [none]  
Project Manager: Mark Longhurst

**Reported:**  
02/11/21 12:29

**BH05**  
**2102055-04 (Water)**

**Summit Scientific**

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

Date Sampled: **02/03/21 14:08**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Benzene	ND	1.0		ug/l	1	BEB0077	02/04/21	02/05/21	EPA 8260B	
Toluene	ND	1.0		"	"	"	"	"	"	
Ethylbenzene	ND	1.0		"	"	"	"	"	"	
Xylenes (total)	ND	2.0		"	"	"	"	"	"	
Naphthalene	ND	1.0		"	"	"	"	"	"	
1,2,4-Trimethylbenzene	ND	1.0		"	"	"	"	"	"	
1,3,5-Trimethylbenzene	ND	1.0		"	"	"	"	"	"	

Date Sampled: **02/03/21 14:08**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Surrogate: 1,2-Dichloroethane-d4		162 %		23-173		"	"	"	"	
Surrogate: Toluene-d8		91.8 %		20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		102 %		21-167		"	"	"	"	

**Anions by EPA Method 300.0**

Date Sampled: **02/03/21 14:08**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Sulfate	<b>932</b>	60.0		mg/L	200	BEB0093	02/05/21	02/05/21	EPA 300.0	
Chloride	<b>41.4</b>	12.0		"	"	"	"	"	"	

**Total Dissolved Solids by SM2540C**

Date Sampled: **02/03/21 14:08**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Total Dissolved Solids	<b>799</b>	10.0		mg/L	1	BEB0068	02/04/21	02/04/21	SM2540C	

Summit Scientific

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

Project: Barrell 41-4  
Project Number: [none]  
Project Manager: Mark Longhurst

**Reported:**  
02/11/21 12:29

**BH06**  
**2102055-05 (Water)**

**Summit Scientific**

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

Date Sampled: **02/03/21 14:01**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Benzene	ND	1.0		ug/l	1	BEB0077	02/04/21	02/05/21	EPA 8260B	
Toluene	ND	1.0		"	"	"	"	"	"	
Ethylbenzene	ND	1.0		"	"	"	"	"	"	
Xylenes (total)	ND	2.0		"	"	"	"	"	"	
Naphthalene	ND	1.0		"	"	"	"	"	"	
1,2,4-Trimethylbenzene	ND	1.0		"	"	"	"	"	"	
1,3,5-Trimethylbenzene	ND	1.0		"	"	"	"	"	"	

Date Sampled: **02/03/21 14:01**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Surrogate: 1,2-Dichloroethane-d4		160 %		23-173		"	"	"	"	
Surrogate: Toluene-d8		91.1 %		20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		101 %		21-167		"	"	"	"	

**Anions by EPA Method 300.0**

Date Sampled: **02/03/21 14:01**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Sulfate	1410	60.0		mg/L	200	BEB0093	02/05/21	02/05/21	EPA 300.0	
Chloride	24.2	12.0		"	"	"	"	"	"	

**Total Dissolved Solids by SM2540C**

Date Sampled: **02/03/21 14:01**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Total Dissolved Solids	928	10.0		mg/L	1	BEB0068	02/04/21	02/04/21	SM2540C	

Summit Scientific

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

Project: Barrell 41-4  
Project Number: [none]  
Project Manager: Mark Longhurst

**Reported:**  
02/11/21 12:29

**BH07**  
**2102055-06 (Water)**

**Summit Scientific**

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

Date Sampled: **02/03/21 12:47**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Benzene	ND	1.0		ug/l	1	BEB0077	02/04/21	02/05/21	EPA 8260B	
Toluene	ND	1.0		"	"	"	"	"	"	
Ethylbenzene	ND	1.0		"	"	"	"	"	"	
Xylenes (total)	ND	2.0		"	"	"	"	"	"	
Naphthalene	ND	1.0		"	"	"	"	"	"	
1,2,4-Trimethylbenzene	ND	1.0		"	"	"	"	"	"	
1,3,5-Trimethylbenzene	ND	1.0		"	"	"	"	"	"	

Date Sampled: **02/03/21 12:47**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Surrogate: 1,2-Dichloroethane-d4		106 %		23-173		"	"	"	"	
Surrogate: Toluene-d8		96.5 %		20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		105 %		21-167		"	"	"	"	

**Anions by EPA Method 300.0**

Date Sampled: **02/03/21 12:47**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Sulfate	1890	60.0		mg/L	200	BEB0093	02/05/21	02/05/21	EPA 300.0	
Chloride	44.8	12.0		"	"	"	"	"	"	

**Total Dissolved Solids by SM2540C**

Date Sampled: **02/03/21 12:47**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Total Dissolved Solids	1110	10.0		mg/L	1	BEB0068	02/04/21	02/04/21	SM2540C	

Summit Scientific

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

Project: Barrell 41-4  
Project Number: [none]  
Project Manager: Mark Longhurst

**Reported:**  
02/11/21 12:29

**BH08**  
**2102055-07 (Water)**

**Summit Scientific**

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

Date Sampled: **02/03/21 12:34**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Benzene	ND	1.0	ug/l	1	BEB0077	02/04/21	02/05/21	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	2.0	"	"	"	"	"	"	
Naphthalene	ND	1.0	"	"	"	"	"	"	
1,2,4-Trimethylbenzene	ND	1.0	"	"	"	"	"	"	
1,3,5-Trimethylbenzene	ND	1.0	"	"	"	"	"	"	

Date Sampled: **02/03/21 12:34**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Surrogate: 1,2-Dichloroethane-d4		153 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		89.8 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		103 %	21-167		"	"	"	"	

**Anions by EPA Method 300.0**

Date Sampled: **02/03/21 12:34**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Sulfate	<b>2460</b>	60.0	mg/L	200	BEB0093	02/05/21	02/05/21	EPA 300.0	
Chloride	<b>53.4</b>	12.0	"	"	"	"	"	"	

**Total Dissolved Solids by SM2540C**

Date Sampled: **02/03/21 12:34**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Total Dissolved Solids	<b>1280</b>	10.0	mg/L	1	BEB0068	02/04/21	02/04/21	SM2540C	

Summit Scientific

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

Project: Barrell 41-4  
Project Number: [none]  
Project Manager: Mark Longhurst

**Reported:**  
02/11/21 12:29

**BH09**  
**2102055-08 (Water)**

**Summit Scientific**

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

Date Sampled: **02/03/21 14:13**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
<b>Benzene</b>	<b>110</b>	1.0	ug/l	1	BEB0077	02/04/21	02/05/21	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	2.0	"	"	"	"	"	"	
<b>Naphthalene</b>	<b>1.8</b>	1.0	"	"	"	"	"	"	
1,2,4-Trimethylbenzene	ND	1.0	"	"	"	"	"	"	
1,3,5-Trimethylbenzene	ND	1.0	"	"	"	"	"	"	

Date Sampled: **02/03/21 14:13**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Surrogate: 1,2-Dichloroethane-d4		132 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		87.1 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		103 %	21-167		"	"	"	"	

**Anions by EPA Method 300.0**

Date Sampled: **02/03/21 14:13**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
<b>Chloride</b>	<b>44.6</b>	12.0	mg/L	200	BEB0093	02/05/21	02/05/21	EPA 300.0	
<b>Sulfate</b>	<b>1750</b>	60.0	"	"	"	"	"	"	

**Total Dissolved Solids by SM2540C**

Date Sampled: **02/03/21 14:13**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
<b>Total Dissolved Solids</b>	<b>1030</b>	10.0	mg/L	1	BEB0068	02/04/21	02/04/21	SM2540C	

Summit Scientific

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

Project: Barrell 41-4  
Project Number: [none]  
Project Manager: Mark Longhurst

**Reported:**  
02/11/21 12:29

**BH10**  
**2102055-09 (Water)**

**Summit Scientific**

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

Date Sampled: **02/03/21 13:15**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Benzene	ND	1.0		ug/l	1	BEB0077	02/04/21	02/05/21	EPA 8260B	
Toluene	ND	1.0		"	"	"	"	"	"	
Ethylbenzene	ND	1.0		"	"	"	"	"	"	
Xylenes (total)	ND	2.0		"	"	"	"	"	"	
Naphthalene	ND	1.0		"	"	"	"	"	"	
1,2,4-Trimethylbenzene	ND	1.0		"	"	"	"	"	"	
1,3,5-Trimethylbenzene	ND	1.0		"	"	"	"	"	"	

Date Sampled: **02/03/21 13:15**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Surrogate: 1,2-Dichloroethane-d4		151 %		23-173		"	"	"	"	
Surrogate: Toluene-d8		89.9 %		20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		101 %		21-167		"	"	"	"	

**Anions by EPA Method 300.0**

Date Sampled: **02/03/21 13:15**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Sulfate	<b>2080</b>	60.0		mg/L	200	BEB0093	02/05/21	02/05/21	EPA 300.0	
Chloride	<b>46.4</b>	12.0		"	"	"	"	"	"	

**Total Dissolved Solids by SM2540C**

Date Sampled: **02/03/21 13:15**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Total Dissolved Solids	<b>1240</b>	10.0		mg/L	1	BEB0068	02/04/21	02/04/21	SM2540C	

Summit Scientific

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

Project: Barrell 41-4  
Project Number: [none]  
Project Manager: Mark Longhurst

**Reported:**  
02/11/21 12:29

**BH11**  
**2102055-10 (Water)**

**Summit Scientific**

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

Date Sampled: **02/03/21 13:31**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Benzene	ND	1.0	ug/l	1	BEB0077	02/04/21	02/05/21	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	2.0	"	"	"	"	"	"	
Naphthalene	ND	1.0	"	"	"	"	"	"	
1,2,4-Trimethylbenzene	ND	1.0	"	"	"	"	"	"	
1,3,5-Trimethylbenzene	ND	1.0	"	"	"	"	"	"	

Date Sampled: **02/03/21 13:31**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Surrogate: 1,2-Dichloroethane-d4		139 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		88.9 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		101 %	21-167		"	"	"	"	

**Anions by EPA Method 300.0**

Date Sampled: **02/03/21 13:31**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Chloride	71.4	12.0	mg/L	200	BEB0093	02/05/21	02/05/21	EPA 300.0	
Sulfate	1660	60.0	"	"	"	"	"	"	

**Total Dissolved Solids by SM2540C**

Date Sampled: **02/03/21 13:31**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Total Dissolved Solids	1160	10.0	mg/L	1	BEB0068	02/04/21	02/04/21	SM2540C	

Summit Scientific

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

Project: Barrell 41-4  
Project Number: [none]  
Project Manager: Mark Longhurst

**Reported:**  
02/11/21 12:29

**BH12**  
**2102055-11 (Water)**

**Summit Scientific**

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

Date Sampled: **02/03/21 13:36**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Benzene	ND	1.0		ug/l	1	BEB0077	02/04/21	02/05/21	EPA 8260B	
Toluene	ND	1.0		"	"	"	"	"	"	
Ethylbenzene	ND	1.0		"	"	"	"	"	"	
Xylenes (total)	ND	2.0		"	"	"	"	"	"	
<b>Naphthalene</b>	<b>1.4</b>	1.0		"	"	"	"	"	"	
1,2,4-Trimethylbenzene	ND	1.0		"	"	"	"	"	"	
1,3,5-Trimethylbenzene	ND	1.0		"	"	"	"	"	"	

Date Sampled: **02/03/21 13:36**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Surrogate: 1,2-Dichloroethane-d4		150 %		23-173		"	"	"	"	
Surrogate: Toluene-d8		94.2 %		20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		102 %		21-167		"	"	"	"	

**Anions by EPA Method 300.0**

Date Sampled: **02/03/21 13:36**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
<b>Sulfate</b>	<b>151</b>	60.0		mg/L	200	BEB0093	02/05/21	02/05/21	EPA 300.0	
<b>Chloride</b>	<b>140</b>	12.0		"	"	"	"	"	"	

**Total Dissolved Solids by SM2540C**

Date Sampled: **02/03/21 13:36**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
<b>Total Dissolved Solids</b>	<b>702</b>	10.0		mg/L	1	BEB0068	02/04/21	02/04/21	SM2540C	

Summit Scientific

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

Project: Barrell 41-4  
Project Number: [none]  
Project Manager: Mark Longhurst

**Reported:**  
02/11/21 12:29

**BH13**  
**2102055-12 (Water)**

**Summit Scientific**

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

Date Sampled: **02/03/21 13:20**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>Benzene</b>	<b>1.2</b>	1.0	ug/l	1	BEB0077	02/04/21	02/05/21	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	2.0	"	"	"	"	"	"	
<b>Naphthalene</b>	<b>5.0</b>	1.0	"	"	"	"	"	"	
1,2,4-Trimethylbenzene	ND	1.0	"	"	"	"	"	"	
1,3,5-Trimethylbenzene	ND	1.0	"	"	"	"	"	"	

Date Sampled: **02/03/21 13:20**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		171 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		96.3 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		105 %	21-167		"	"	"	"	

**Anions by EPA Method 300.0**

Date Sampled: **02/03/21 13:20**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>Sulfate</b>	<b>989</b>	60.0	mg/L	200	BEB0093	02/05/21	02/05/21	EPA 300.0	
<b>Chloride</b>	<b>615</b>	12.0	"	"	"	"	"	"	

**Total Dissolved Solids by SM2540C**

Date Sampled: **02/03/21 13:20**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>Total Dissolved Solids</b>	<b>1420</b>	10.0	mg/L	1	BEB0068	02/04/21	02/04/21	SM2540C	

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: Barrell 41-4  
Project Number: [none]  
Project Manager: Mark Longhurst

**Reported:**  
02/11/21 12:29

**BH14**  
**2102055-13 (Water)**

**Summit Scientific**

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

Date Sampled: **02/03/21 12:29**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Benzene	ND	1.0	ug/l	1	BEB0077	02/04/21	02/05/21	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	2.0	"	"	"	"	"	"	
Naphthalene	ND	1.0	"	"	"	"	"	"	
1,2,4-Trimethylbenzene	ND	1.0	"	"	"	"	"	"	
1,3,5-Trimethylbenzene	ND	1.0	"	"	"	"	"	"	

Date Sampled: **02/03/21 12:29**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Surrogate: 1,2-Dichloroethane-d4		144 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		91.7 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		97.3 %	21-167		"	"	"	"	

**Anions by EPA Method 300.0**

Date Sampled: **02/03/21 12:29**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Sulfate	<b>820</b>	60.0	mg/L	200	BEB0093	02/05/21	02/05/21	EPA 300.0	
Chloride	<b>13.4</b>	6.00	"	100	"	"	"	"	

**Total Dissolved Solids by SM2540C**

Date Sampled: **02/03/21 12:29**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Total Dissolved Solids	<b>733</b>	10.0	mg/L	1	BEB0068	02/04/21	02/04/21	SM2540C	

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: Barrell 41-4  
Project Number: [none]  
Project Manager: Mark Longhurst

**Reported:**  
02/11/21 12:29

**BH15**  
**2102055-14 (Water)**

**Summit Scientific**

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

Date Sampled: **02/03/21 12:50**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	1.0	ug/l	1	BEB0077	02/04/21	02/05/21	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	2.0	"	"	"	"	"	"	
Naphthalene	ND	1.0	"	"	"	"	"	"	
1,2,4-Trimethylbenzene	ND	1.0	"	"	"	"	"	"	
1,3,5-Trimethylbenzene	ND	1.0	"	"	"	"	"	"	

Date Sampled: **02/03/21 12:50**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		164 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		88.4 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		103 %	21-167		"	"	"	"	

**Anions by EPA Method 300.0**

Date Sampled: **02/03/21 12:50**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Sulfate	<b>958</b>	60.0	mg/L	200	BEB0093	02/05/21	02/05/21	EPA 300.0	
Chloride	<b>21.6</b>	12.0	"	"	"	"	"	"	

**Total Dissolved Solids by SM2540C**

Date Sampled: **02/03/21 12:50**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Total Dissolved Solids	<b>798</b>	10.0	mg/L	1	BEB0068	02/04/21	02/04/21	SM2540C	

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: Barrell 41-4  
Project Number: [none]  
Project Manager: Mark Longhurst

**Reported:**  
02/11/21 12:29

**BH16**  
**2102055-15 (Water)**

**Summit Scientific**

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

Date Sampled: **02/03/21 13:05**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Benzene	ND	1.0		ug/l	1	BEB0077	02/04/21	02/05/21	EPA 8260B	
Toluene	ND	1.0		"	"	"	"	"	"	
Ethylbenzene	ND	1.0		"	"	"	"	"	"	
Xylenes (total)	ND	2.0		"	"	"	"	"	"	
Naphthalene	ND	1.0		"	"	"	"	"	"	
1,2,4-Trimethylbenzene	ND	1.0		"	"	"	"	"	"	
1,3,5-Trimethylbenzene	ND	1.0		"	"	"	"	"	"	

Date Sampled: **02/03/21 13:05**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Surrogate: 1,2-Dichloroethane-d4		160 %		23-173		"	"	"	"	
Surrogate: Toluene-d8		89.7 %		20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		105 %		21-167		"	"	"	"	

**Anions by EPA Method 300.0**

Date Sampled: **02/03/21 13:05**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Sulfate	1190	60.0		mg/L	200	BEB0093	02/05/21	02/05/21	EPA 300.0	
Chloride	23.2	12.0		"	"	"	"	"	"	

**Total Dissolved Solids by SM2540C**

Date Sampled: **02/03/21 13:05**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Total Dissolved Solids	924	10.0		mg/L	1	BEB0068	02/04/21	02/04/21	SM2540C	

Summit Scientific

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

Project: Barrell 41-4  
Project Number: [none]  
Project Manager: Mark Longhurst

**Reported:**  
02/11/21 12:29

## 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 BEB0077 - EPA 5030 Water MS

##### Blank (BEB0077-BLK1)

Prepared: 02/04/21 Analyzed: 02/05/21

Benzene	ND	1.0	ug/l							
Toluene	ND	1.0	"							
Ethylbenzene	ND	1.0	"							
Xylenes (total)	ND	2.0	"							
Naphthalene	ND	1.0	"							
1,2,4-Trimethylbenzene	ND	1.0	"							
1,3,5-Trimethylbenzene	ND	1.0	"							
Surrogate: 1,2-Dichloroethane-d4	12.7		"	13.3		95.5	23-173			
Surrogate: Toluene-d8	13.5		"	13.3		101	20-170			
Surrogate: 4-Bromofluorobenzene	13.3		"	13.3		100	21-167			

##### LCS (BEB0077-BS1)

Prepared: 02/04/21 Analyzed: 02/05/21

Benzene	42.2	1.0	ug/l	50.0		84.4	51-132			
Toluene	45.2	1.0	"	50.0		90.4	51-138			
Ethylbenzene	44.4	1.0	"	50.0		88.9	58-146			
m,p-Xylene	87.4	2.0	"	100		87.4	57-144			
o-Xylene	45.0	1.0	"	50.0		90.0	53-146			
Naphthalene	53.7	1.0	"	50.0		107	70-130			
1,2,4-Trimethylbenzene	44.6	1.0	"	50.0		89.1	70-130			
1,3,5-Trimethylbenzene	44.8	1.0	"	50.0		89.6	70-130			
Surrogate: 1,2-Dichloroethane-d4	13.2		"	13.3		98.9	23-173			
Surrogate: Toluene-d8	13.7		"	13.3		103	20-170			
Surrogate: 4-Bromofluorobenzene	14.0		"	13.3		105	21-167			

##### Matrix Spike (BEB0077-MS1)

Source: 2102049-15

Prepared: 02/04/21 Analyzed: 02/05/21

Benzene	44.6	1.0	ug/l	50.0	ND	89.2	34-141			
Toluene	47.6	1.0	"	50.0	ND	95.1	27-151			
Ethylbenzene	47.4	1.0	"	50.0	ND	94.7	29-160			
m,p-Xylene	92.7	2.0	"	100	ND	92.7	20-166			
o-Xylene	47.1	1.0	"	50.0	ND	94.2	33-159			
Naphthalene	51.3	1.0	"	50.0	ND	103	70-130			
1,2,4-Trimethylbenzene	48.3	1.0	"	50.0	ND	96.6	70-130			
1,3,5-Trimethylbenzene	48.6	1.0	"	50.0	ND	97.2	70-130			
Surrogate: 1,2-Dichloroethane-d4	12.5		"	13.3		94.0	23-173			
Surrogate: Toluene-d8	13.6		"	13.3		102	20-170			
Surrogate: 4-Bromofluorobenzene	13.2		"	13.3		98.9	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: Barrell 41-4  
Project Number: [none]  
Project Manager: Mark Longhurst

**Reported:**  
02/11/21 12:29

**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 BEB0077 - EPA 5030 Water MS**

Matrix Spike Dup (BEB0077-MSD1)	Source: 2102049-15			Prepared: 02/04/21 Analyzed: 02/05/21						
Benzene	42.7	1.0	ug/l	50.0	ND	85.4	34-141	4.44	30	
Toluene	45.9	1.0	"	50.0	ND	91.9	27-151	3.44	30	
Ethylbenzene	46.5	1.0	"	50.0	ND	93.1	29-160	1.77	30	
m,p-Xylene	91.6	2.0	"	100	ND	91.6	20-166	1.28	30	
o-Xylene	46.2	1.0	"	50.0	ND	92.4	33-159	1.93	30	
Naphthalene	50.6	1.0	"	50.0	ND	101	70-130	1.37	30	
1,2,4-Trimethylbenzene	47.1	1.0	"	50.0	ND	94.2	70-130	2.58	30	
1,3,5-Trimethylbenzene	47.1	1.0	"	50.0	ND	94.2	70-130	3.14	30	
Surrogate: 1,2-Dichloroethane-d4	12.1		"	13.3		90.8	23-173			
Surrogate: Toluene-d8	13.6		"	13.3		102	20-170			
Surrogate: 4-Bromofluorobenzene	13.7		"	13.3		103	21-167			

Summit Scientific

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

Project: Barrell 41-4  
Project Number: [none]  
Project Manager: Mark Longhurst

**Reported:**  
02/11/21 12:29

**Anions by EPA Method 300.0 - Quality Control**  
**Summit Scientific**

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

**Batch BEB0093 - General Preparation**

**Blank (BEB0093-BLK1)**

Prepared & Analyzed: 02/05/21

Chloride	ND	0.0600	mg/L
Sulfate	ND	0.300	"

**LCS (BEB0093-BS1)**

Prepared & Analyzed: 02/05/21

Sulfate	16.0	0.300	mg/L	15.0	107	90-110
Chloride	3.25	0.0600	"	3.00	108	90-110

**Duplicate (BEB0093-DUP1)**

Source: 2102055-01

Prepared & Analyzed: 02/05/21

Sulfate	997	60.0	mg/L	1080	7.60	20
Chloride	18.4	12.0	"	19.6	6.32	20

**Matrix Spike (BEB0093-MS1)**

Source: 2102055-01

Prepared & Analyzed: 02/05/21

Chloride	682	12.0	mg/L	600	19.6	110	80-120
Sulfate	4470	60.0	"	3000	1080	113	80-120

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: Barrell 41-4  
Project Number: [none]  
Project Manager: Mark Longhurst

**Reported:**  
02/11/21 12:29

**Total Dissolved Solids by SM2540C - Quality Control**  
**Summit Scientific**

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

**Batch BEB0068 - General Preparation**

**Blank (BEB0068-BLK1)**

Prepared & Analyzed: 02/04/21

Total Dissolved Solids ND 10.0 mg/L

**Duplicate (BEB0068-DUP1)**

Source: 2102055-01

Prepared & Analyzed: 02/04/21

Total Dissolved Solids 840 10.0 mg/L 838 0.250 20

Summit Scientific

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

Project: Barrell 41-4  
Project Number: [none]  
Project Manager: Mark Longhurst

**Reported:**  
02/11/21 12:29

### Notes and Definitions

DET	Analyte DETECTED
ND	Analyte NOT DETECTED at or above the reporting limit
NR	Not Reported
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference

# Summit Scientific

---

4653 Table Mountain Drive, Golden, Colorado 80403

303.277.9310

April 05, 2021

Mark Longhurst

PDC Energy

1775 Sherman St. STE. 3000

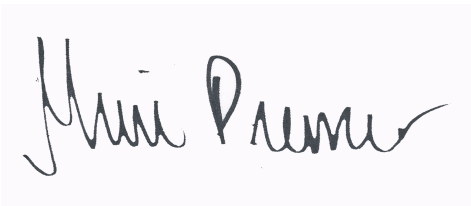
Denver, CO 80203

RE: Barrell 41-4

Work Order #2104017

Enclosed are the results of analyses for samples received by Summit Scientific on 04/01/21 18:30. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

A handwritten signature in black ink on a light purple background. The signature is written in a cursive style and appears to read "Muri Premer".

Muri Premer For Paul Shrewsbury  
President



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

Project: Barrell 41-4  
Project Number: [none]  
Project Manager: Mark Longhurst

**Reported:**  
04/05/21 16:38

**ANALYTICAL REPORT FOR SAMPLES**

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
BH13	2104017-01	Water	04/01/21 09:52	04/01/21 18:30

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.*



# Summit Scientific

S<sub>2</sub>

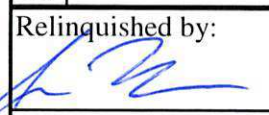

2104017

4653 Table Mountain Drive ♦ Golden, Colorado 80403  
303-277-9310

Page 1 of 1

Client: PDC / Tasman	Project Manager: Mark Longhurst
Address: 6855 W 119th Ave	E-Mail: mark.longhurst@PDCE.com
City/State/Zip: Broomfield/ CO/ 80020	
Phone: 303-487-1228	Project Name: Barrell 4/4
Sampler Name:	Project Number: 1/a

ID	Sample Description	Date Sampled	Time Sampled	# of containers	Preservative				Matrix				Analysis Requested								Special Instructions	
					HCl	HNO <sub>3</sub>	None	Other	Water	Soil	Air-Canister #	Other	BTEXN - 8260B	TPH - (C6 - C36)	1,2,4 & 1,3,5-TMB	Boron - HWS	pH, EC, SAR	TDS	Sulfate	Chloride		
1	BH13	4/1/21	0952	1			X		X										X	X	X	pH, EC, SAR by saturated paste
2																						
3																						
4																						
5																						
6																						
7																						
8																						
9																						
10																						

Relinquished by: 	Date/Time: 4/1/21 1745	Received by: Tasman's Lock Box	Date/Time: 4/1/21 1745	<b>Turn Around Time</b> (Check) Same Day <input checked="" type="checkbox"/> 72 hours ___ 24 hours ___ Standard ___ 48 hours ___ <b>Sample Integrity:</b> Temperature Upon Receipt: 13.2 Samples Intact: <input checked="" type="radio"/> Yes <input type="radio"/> No	<b>Notes:</b>
Relinquished by: Tasman's Lock Box	Date/Time:	Received by: 	Date/Time: 4/1/21 18:30		
Relinquished by:	Date/Time:	Received by:	Date/Time:		

# Sample Receipt Checklist

S2 Work Order 2104017

Client: PDC / Tasman Client Project ID: Barrell 41-4

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

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

Temp (°C)	<u>13.2</u>
-----------	-------------

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.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>On ice.</u>
Were all samples received intact <sup>(1)</sup> ?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Was adequate sample volume provided <sup>(1)</sup> ?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
If custody seals are present, are they intact <sup>(1)</sup> ?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Are samples with holding times due within 48 hours sample due within 48 hours present?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>Same day.</u>
Is a chain-of-custody (COC) form present and filled out completely <sup>(1)</sup> ?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Does the COC agree with the number and type of sample bottles received <sup>(1)</sup> ?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Do the sample IDs on the bottle labels match the COC <sup>(1)</sup> ?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Is the COC properly relinquished by the client w/ date and time recorded <sup>(1)</sup> ?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
For volatiles in water – is there headspace present? If yes, contact client and note in narrative.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
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	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
If samples are acid preserved for metals, is the pH ≤ 2 <sup>(1)</sup> ? Record the pH in Comments.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
If dissolved metals are requested, were samples field filtered?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	

Additional Comments (if any):

<sup>(1)</sup> If NO, then contact the client before proceeding with analysis and note in case narrative.

JB  
Custodian Printed Name or Initials

John Brown  
Signature of Custodian

4/1/21  
Date/Time

19:34



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

Project: Barrell 41-4  
Project Number: [none]  
Project Manager: Mark Longhurst

**Reported:**  
04/05/21 16:38

**BH13**  
**2104017-01 (Water)**

**Summit Scientific**

**Anions by EPA Method 300.0**

Date Sampled: **04/01/21 09:52**

Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
<b>Sulfate</b>	<b>617</b>	60.0	mg/L	200	BED0009	04/01/21	04/02/21	EPA 300.0	
<b>Chloride</b>	<b>344</b>	12.0	"	"	"	"	"	"	

**Total Dissolved Solids by SM2540C**

Date Sampled: **04/01/21 09:52**

Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
<b>Total Dissolved Solids</b>	<b>4010</b>	10.0	mg/L	1	BED0034	04/02/21	04/02/21	SM2540C	

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: Barrell 41-4  
Project Number: [none]  
Project Manager: Mark Longhurst

**Reported:**  
04/05/21 16:38

### Anions by EPA Method 300.0 - Quality Control

#### Summit Scientific

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

#### Batch BED0009 - General Preparation

##### Blank (BED0009-BLK1)

Prepared: 04/01/21 Analyzed: 04/02/21

Sulfate	ND	0.300	mg/L
Chloride	ND	0.0600	"

##### LCS (BED0009-BS1)

Prepared: 04/01/21 Analyzed: 04/02/21

Sulfate	15.3	0.300	mg/L	15.0	102	90-110
Chloride	2.91	0.0600	"	3.00	97.0	90-110

##### Duplicate (BED0009-DUP1)

Source: 2104017-01

Prepared: 04/01/21 Analyzed: 04/02/21

Sulfate	588	60.0	mg/L	617	4.78	20
Chloride	327	12.0	"	344	5.01	20

##### Matrix Spike (BED0009-MS1)

Source: 2104017-01

Prepared: 04/01/21 Analyzed: 04/02/21

Sulfate	3940	60.0	mg/L	3000	617	111	80-120
Chloride	1010	12.0	"	600	344	111	80-120

Summit Scientific

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

Project: Barrell 41-4  
Project Number: [none]  
Project Manager: Mark Longhurst

**Reported:**  
04/05/21 16:38

**Total Dissolved Solids by SM2540C - Quality Control**  
**Summit Scientific**

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

**Batch BED0034 - General Preparation**

**Blank (BED0034-BLK1)**

Prepared & Analyzed: 04/02/21

Total Dissolved Solids ND 10.0 mg/L

**Duplicate (BED0034-DUP1)**

**Source: 2104017-01**

Prepared & Analyzed: 04/02/21

Total Dissolved Solids 4010 10.0 mg/L 4010 0.0748 20

Summit Scientific

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

Project: Barrell 41-4  
Project Number: [none]  
Project Manager: Mark Longhurst

**Reported:**  
04/05/21 16:38

### 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