

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, 2, 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) ⁽¹⁾	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. bgs)	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 (Collected via Trimble GPS)
- Monitoring Well Location (Collected via Trimble GPS)
- Angled Monitoring Well Location (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

0 ft. 15 ft. 30 ft.

Image Source: Google Earth; 2019 Google

Projection: WGS 84 UTM Zone 13 North



DATE: March 15, 2021

DESIGNED BY: C. Hamlin

DRAWN BY: J. McCarver



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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



- Legend**
- Excavation Extent – LTE (2011)
 - Point of Release
 - Angled Remediation Well Location (Collected via Trimble GPS)
 - Monitoring Well Location (Collected via Trimble GPS)
 - Angled Monitoring Well Location (Collected via Trimble GPS)
 - Groundwater Elevation Contour (Dashed where inferred)
 - Groundwater Flow Direction (1Q21)
- 4821.71 Groundwater Elevation (ft. AMSL)

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.

ft. AMSL – Feet Above Mean Sea Level

GPS – Global Positioning System

0 ft. 15 ft. 30 ft.

Image Source: Google Earth; 2019 Google
Projection: WGS 84 UTM Zone 13 North

DATE: February 24, 2021

DESIGNED BY: C. Hamlin

DRAWN BY: A. Dahl



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Barrell 41-4 Tank Battery
NENE, Section 4, Township 6 North, Range 64 West
Weld County, Colorado

GROUNDWATER ELEVATION CONTOUR MAP (02/03/2021)

FIGURE 2

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 ⁽²⁾ (ft.)
COGCC Table 910-1 Groundwater Standard (µg/L) ⁽¹⁾		5	560	700	1,400	
SS02A-R2 ⁽³⁾	9/22/2017	120	150	120	1,200	39.08
SS02A-R2 ⁽³⁾	11/16/2017	74	8.1	19	76	38.92
SS02A-R2 ⁽³⁾	2/7/2018	9.0	<1.0	9.1	3.7	39.67
SS02A-R2 ⁽³⁾	5/17/2018	6.6	<1.0	<1.0	7.4	40.03
SS02A-R2 ⁽³⁾	8/9/2018	5.7	<1.0	2.1	3.3	39.54
SS02A-R2 ⁽³⁾	11/15/2018	1.8	<1.0	<1.0	<2.0	39.00
SS02A-R2 ⁽³⁾	2/18/2019	<1.0	<1.0	<1.0	<2.0	39.85
SS02A-R2 ⁽³⁾	5/8/2019	<1.0	<1.0	<1.0	<2.0	40.00
SS02A-R2 ⁽³⁾	8/5/2019	<1.0	<1.0	<1.0	<2.0	39.25
SS02A-R2 ⁽³⁾	12/3/2019	<1.0	<1.0	<1.0	<2.0	38.78
SS02A-R2 ⁽³⁾	2/5/2020	<1.0	<1.0	<1.0	<2.0	39.03
SS02A-R2 ⁽³⁾	5/26/2020	<1.0	<1.0	<1.0	<2.0	39.69
SS02A-R2 ⁽³⁾	8/18/2020	<1.0	<1.0	<1.0	<2.0	38.42
SS02A-R2 ⁽³⁾	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 ⁽²⁾ (ft.)
COGCC Table 910-1 Groundwater Standard (µg/L) ⁽¹⁾		5	560	700	1,400	
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 ⁽²⁾ (ft.)
COGCC Table 910-1 Groundwater Standard (µg/L) ⁽¹⁾		5	560	700	1,400	
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	470	<1.0	6.0	8.0	35.65
BH09	2/7/2018	240	<1.0	<1.0	<2.0	36.29
BH09	5/17/2018	11	<1.0	<1.0	<2.0	36.58
BH09	8/9/2018	150	<1.0	<1.0	<2.0	36.25
BH09	11/15/2018	720	<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 ⁽²⁾ (ft.)
COGCC Table 910-1 Groundwater Standard (µg/L) ⁽¹⁾		5	560	700	1,400	
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 ⁽²⁾ (ft.)
COGCC Table 910-1 Groundwater Standard (µg/L) ⁽¹⁾		5	560	700	1,400	
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	73	<1.0	<1.0	<2.0	35.87
BH13	2/5/2020	45	<1.0	<1.0	<2.0	36.03
BH13	5/26/2020	27	<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 ⁽²⁾ (ft.)	Groundwater Elevation (ft. AMSL)
COGCC Table 915-1 Groundwater Standard (µg/L) ⁽¹⁾		5	560	700	1,400	140	67	67	-	-
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	110	<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:

1. Groundwater standards referenced from 2 CCR 404-1, Table 915-1, January 15, 2021.
 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 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)
COGCC Table 915-1 Groundwater Standard (mg/L) ⁽¹⁾		<1.25 x BCKG	250 or <1.25 x BCKG	250 or <1.25 x BCKG
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	615	989
BH13	4/1/2021	4,010	344	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

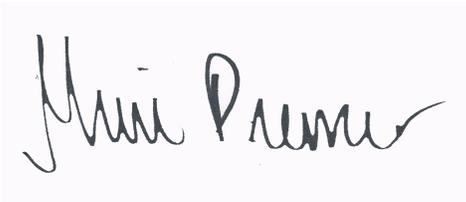
Denver, CO 80203

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 that reads "Muri Premer". The signature is written in a cursive style with a large initial "M" and a long, sweeping underline.

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:
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

S₂

4653 Table Mountain Drive ♦ Golden, Colorado 80403
303-277-9310 ♦ 303-374-5933 (f)

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	HNO3	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	X	
2	BH03	2/3/2021	1346	4	3		1		X				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	X	
4	BH05	2/3/2021	1408	4	3		1		X				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	X	
6	BH07	2/3/2021	1247	4	3		1		X				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	X	
8	BH09	2/3/2021	1413	4	3		1		X				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	X	
10	BH11	2/3/2021	1331	4	3		1		X				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	Turn Around Time (Check) Same Day _____ 72 hours _____ 24 hours _____ Standard <input checked="" type="checkbox"/> 48 hours _____	Notes: Sample Integrity: 4.8 Temperature Upon Receipt: _____ Samples Intact: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Relinquished by: Date/Time: 02/03/2021 1745	Received by: Date/Time: 02/03/2021 1740	Sample Integrity: 4.8	
Relinquished by: _____ Date/Time: _____	Received by: Date/Time: _____	Temperature Upon Receipt: _____ Samples Intact: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	

Summit Scientific

S₂

4653 Table Mountain Drive ♦ Golden, Colorado 80403
303-277-9310 ♦ 303-374-5933 (f)

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	HNO3	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 72 hours
24 hours Standard
48 hours

Notes:

Relinquished by:  Date/Time: 2/03/2021 1740

Received by:  Date/Time: 2/03/2021 1740

Sample Integrity:
Temperature Upon Receipt: 4.3
Samples Intact: Yes 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 #: _____
 H.D. P.U. FedEx UPS USPS Other

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

Additional Comments (if any):

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

POC
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		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 13:00**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
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		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
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		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
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	25.6	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 13:46**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Total Dissolved Solids	849	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

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

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

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	932	60.0		mg/L	200	BEB0093	02/05/21	02/05/21	EPA 300.0	
Chloride	41.4	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	799	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

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	2460	60.0		mg/L	200	BEB0093	02/05/21	02/05/21	EPA 300.0	
Chloride	53.4	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	1280	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 Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	110	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	1.8	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 Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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 Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Chloride	44.6	12.0	mg/L	200	BEB0093	02/05/21	02/05/21	EPA 300.0	
Sulfate	1750	60.0	"	"	"	"	"	"	

Total Dissolved Solids by SM2540C

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

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Total Dissolved Solids	1030	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	2080	60.0		mg/L	200	BEB0093	02/05/21	02/05/21	EPA 300.0	
Chloride	46.4	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	1240	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		"	"	"	"	"	"	
Naphthalene	1.4	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								
Sulfate	151	60.0		mg/L	200	BEB0093	02/05/21	02/05/21	EPA 300.0	
Chloride	140	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								
Total Dissolved Solids	702	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
Benzene	1.2	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	5.0	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
Sulfate	989	60.0	mg/L	200	BEB0093	02/05/21	02/05/21	EPA 300.0	
Chloride	615	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
Total Dissolved Solids	1420	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

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	820	60.0		mg/L	200	BEB0093	02/05/21	02/05/21	EPA 300.0	
Chloride	13.4	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	733	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

BH15
2102055-14 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

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

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 12:50**

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

Total Dissolved Solids by SM2540C

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

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Total Dissolved Solids	798	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	Result	Reporting		Spike Level	Source		%REC		RPD		Notes
		Limit	Units		Result	%REC	Limits	RPD	Limit		

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	"								
<i>Surrogate: 1,2-Dichloroethane-d4</i>	12.7		"	13.3		95.5		23-173			
<i>Surrogate: Toluene-d8</i>	13.5		"	13.3		101		20-170			
<i>Surrogate: 4-Bromofluorobenzene</i>	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			
<i>Surrogate: 1,2-Dichloroethane-d4</i>	13.2		"	13.3		98.9		23-173			
<i>Surrogate: Toluene-d8</i>	13.7		"	13.3		103		20-170			
<i>Surrogate: 4-Bromofluorobenzene</i>	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			
<i>Surrogate: 1,2-Dichloroethane-d4</i>	12.5		"	13.3		94.0		23-173			
<i>Surrogate: Toluene-d8</i>	13.6		"	13.3		102		20-170			
<i>Surrogate: 4-Bromofluorobenzene</i>	13.2		"	13.3		98.9		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

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

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

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	
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>12.1</i>		<i>"</i>	<i>13.3</i>		<i>90.8</i>	<i>23-173</i>			
<i>Surrogate: Toluene-d8</i>	<i>13.6</i>		<i>"</i>	<i>13.3</i>		<i>102</i>	<i>20-170</i>			
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>13.7</i>		<i>"</i>	<i>13.3</i>		<i>103</i>	<i>21-167</i>			

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

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 Level	Source		%REC		RPD		Notes
		Limit	Units		Result	%REC	Limits	RPD	Limit		

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

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

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 that reads "Muri Premer". The signature is written in a cursive style with a large initial "M" and a long, sweeping underline.

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.

2109017

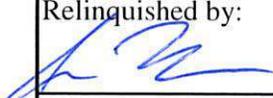
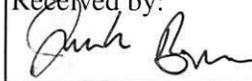
Summit Scientific

S₂

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

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	HNO3	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	Turn Around Time (Check) Same Day <input checked="" type="checkbox"/> 72 hours ___ 24 hours ___ Standard ___ 48 hours ___ Sample Integrity: Temperature Upon Receipt: 13.2 Samples Intact: <input checked="" type="checkbox"/> Yes No	Notes:
Relinquished by: Tasman's Lock Box	Received by:  Date/Time: 4/1/21 18:30		
Relinquished by:	Received by:		

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)	13.2
-----------	------

Thermometer ID: 61857155-K

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

Additional Comments (if any):

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

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

Total Dissolved Solids by SM2540C

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

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Total Dissolved Solids	4010	10.0	mg/L	1	BED0034	04/02/21	04/02/21	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:
 04/05/21 16:38

Anions by EPA Method 300.0 - Quality Control

Summit Scientific

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

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

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

Total Dissolved Solids by SM2540C - Quality Control
Summit Scientific

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



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

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