



PDC Energy, Inc.
Third Quarter 2016 Groundwater Monitoring Summary

October 25, 2016

Becker 5-1, 2, 14, 15 Tank Battery
SWSE Section 5 T3N R64W
Weld County, API # 05-123-12297
Facility ID # 322943
Remediation # 7693

This groundwater summary has been prepared by Tasman Geosciences, Inc. for the Becker 5-1, 2, 14, 15 tank battery. On September 12, 2016 groundwater sampling was conducted at all eight monitoring well locations (BH01 – BH08). Eight groundwater samples were submitted to Summit Scientific Laboratories for analysis of benzene, toluene, ethylbenzene, and total xylenes (BTEX) by USEPA Method 8260B. Analytical results are summarized in Table 1 and the laboratory analytical report is included as Attachment A. Sample locations and corresponding analytical results are illustrated on Figure 1. Third quarter 2016 analytical results indicate that BTEX concentrations are below applicable COGCC Table 910-1 groundwater standards at all eight well locations.

Tasman initiated enhanced fluid recovery (EFR) and air sparge (AS) events on site during the first quarter 2013. Tasman temporarily discontinued EFR/AS events after the fourth quarter 2013, until additional remediation wells could be installed. EFR/AS activities were resumed during the second quarter 2014, and continued through the end of third quarter 2016. A summary of the EFR/AS operational data is provided in Table 2. EFR/AS will remain the selected remediation strategy through fourth quarter 2016.

Fourth quarter 2016 groundwater sampling will be conducted in December 2016.

TABLE 1
BECKER 5-1, 2, 14, 15 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⁾ (feet)
COGCC Table 910-1 Groundwater Standard (µg/L) ⁽¹⁾		5	560	700	1,400	
GW01	11/29/2012	3,100	610	320	3,700	~ 16
BH01	12/20/2012	97	<1.0	180	1,200	13.24
BH01	3/19/2013	1.7	<1.0	4.9	48	13.27
BH01	6/21/2013	<1.0	<1.0	8.0	49	13.01
BH01	9/23/2013	<1.0	<1.0	<1.0	<1.0	12.52
BH01	12/18/2013	1.5	<1.0	<1.0	<1.0	12.80
BH01	3/28/2014	<1.0	<1.0	1.9	2.2	12.81
BH01	6/25/2014	<1.0	<1.0	15	8.9	11.44
BH01	9/17/2014	<1.0	<1.0	11	2.1	10.93
BH01	12/16/2014	7.4	<1.0	11	<1.0	11.45
BH01	3/27/2015	1.4	4.2	2.2	24	11.59
BH01	6/29/2015	<1.0	<1.0	<1.0	<1.0	8.67
BH01	9/25/2015	<1.0	<1.0	<1.0	<1.0	9.88*
BH01	12/14/2015	<1.0	<1.0	<1.0	<1.0	9.61
BH01	3/14/2016	<1.0	<1.0	<1.0	<1.0	6.95
BH01	6/7/2016	<1.0	<1.0	<1.0	<1.0	5.18
BH01	9/12/2016	<1.0	<1.0	<1.0	<1.0	8.57
BH02	12/20/2012	170	1.6	490	1,700	10.20
BH02	3/19/2013	<1.0	<1.0	<1.0	2.8	10.44
BH02	6/21/2013	82	<1.0	66	410	9.85
BH02	9/23/2013	35	<1.0	39	39	9.31
BH02	12/18/2013	550	<1.0	1.4	110	9.74
BH02	3/28/2014	660	1.0	150	280	9.78
BH02	6/25/2014	<1.0	<1.0	<1.0	<1.0	8.12
BH02	9/17/2014	110	<1.0	120	24	7.78
BH02	12/16/2014	<1.0	<1.0	<1.0	<1.0	8.41
BH02	3/27/2015	<1.0	1.8	<1.0	6.5	8.76
BH02	6/29/2015	<1.0	<1.0	<1.0	<1.0	5.51
BH02	9/25/2015	<1.0	<1.0	<1.0	<1.0	6.59*
BH02	12/14/2015	<1.0	<1.0	<1.0	<1.0	6.49
BH02	3/14/2016	<1.0	<1.0	<1.0	<1.0	4.05
BH02	6/7/2016	<1.0	<1.0	<1.0	<1.0	2.83
BH02	9/12/2016	<1.0	<1.0	<1.0	<1.0	5.30

TABLE 1
BECKER 5-1, 2, 14, 15 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⁾ (feet)
COGCC Table 910-1 Groundwater Standard (µg/L) ⁽¹⁾		5	560	700	1,400	
BH03	12/20/2012	<1.0	<1.0	<1.0	<1.0	12.78
BH03	3/19/2013	<1.0	<1.0	<1.0	<1.0	12.60
BH03	6/21/2013	<1.0	<1.0	<1.0	<1.0	12.39
BH03	9/23/2013	<1.0	<1.0	<1.0	<1.0	12.18
BH03	12/18/2013	1.2	<1.0	<1.0	<1.0	12.09
BH03	3/28/2014	<1.0	<1.0	<1.0	<1.0	12.06
BH03	6/25/2014	<1.0	<1.0	<1.0	<1.0	10.92
BH03	9/17/2014	<1.0	<1.0	<1.0	<1.0	10.44
BH03	12/16/2014	<1.0	<1.0	<1.0	<1.0	10.79
BH03	3/27/2015	<1.0	<1.0	<1.0	<1.0	11.05
BH03	6/29/2015	<1.0	<1.0	<1.0	<1.0	8.19
BH03	9/25/2015	<1.0	<1.0	<1.0	<1.0	9.54*
BH03	12/14/2015	<1.0	<1.0	<1.0	<1.0	8.79
BH03	3/14/2016	<1.0	<1.0	<1.0	<1.0	6.25
BH03	6/7/2016	<1.0	<1.0	<1.0	<1.0	5.74
BH03	9/12/2016	<1.0	<1.0	<1.0	<1.0	8.19
BH04	6/25/2014	18	<1.0	53	130	8.72
BH04	9/17/2014	1.1	<1.0	<1.0	<1.0	8.13
BH04	12/16/2014	3.3	<1.0	6.0	21	8.73
BH04	3/27/2015	<1.0	<1.0	<1.0	20	8.88
BH04	6/29/2015	<1.0	<1.0	<1.0	2.2	5.73
BH04	9/25/2015	4.5	<1.0	1.2	4.6	7.15*
BH04	12/14/2015	5.4	<1.0	7.7	23	6.63
BH04	3/14/2016	31	<1.0	39	120	4.21
BH04	6/7/2016	<1.0	<1.0	<1.0	<1.0	3.31
BH04	9/12/2016	<1.0	<1.0	<1.0	<1.0	5.70
BH05	6/25/2014	<1.0	<1.0	<1.0	<1.0	10.55
BH05	9/17/2014	<1.0	<1.0	<1.0	<1.0	10.70
BH05	12/16/2014	<1.0	<1.0	<1.0	<1.0	10.78
BH05	3/27/2015	<1.0	<1.0	<1.0	<1.0	10.92
BH05	6/29/2015	<1.0	<1.0	<1.0	<1.0	6.64
BH05	9/25/2015	<1.0	<1.0	<1.0	<1.0	8.89*
BH05	12/14/2015	<1.0	<1.0	<1.0	<1.0	8.86

TABLE 1
BECKER 5-1, 2, 14, 15 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⁾ (feet)
COGCC Table 910-1 Groundwater Standard (µg/L) ⁽¹⁾		5	560	700	1,400	
BH05	3/14/2016	<1.0	<1.0	<1.0	<1.0	6.21
BH05	6/7/2016	<1.0	<1.0	<1.0	<1.0	5.31
BH05	9/12/2016	<1.0	<1.0	<1.0	<1.0	7.63
BH06	6/25/2014	<1.0	<1.0	<1.0	<1.0	8.67
BH06	9/17/2014	<1.0	<1.0	<1.0	<1.0	8.12
BH06	12/16/2014	<1.0	<1.0	<1.0	<1.0	8.77
BH06	3/27/2015	<1.0	<1.0	<1.0	<1.0	9.14
BH06	6/29/2015	<1.0	<1.0	<1.0	<1.0	5.83
BH06	9/25/2015	<1.0	<1.0	<1.0	<1.0	7.10*
BH06	12/14/2015	<1.0	<1.0	<1.0	<1.0	6.84
BH06	3/14/2016	<1.0	<1.0	<1.0	<1.0	4.40
BH06	6/7/2016	<1.0	<1.0	<1.0	<1.0	3.43
BH06	9/12/2016	1.4	<1.0	<1.0	<1.0	5.81
BH07	6/25/2014	<1.0	<1.0	<1.0	<1.0	8.94
BH07	9/17/2014	<1.0	<1.0	<1.0	<1.0	8.40
BH07	12/16/2014	<1.0	<1.0	<1.0	<1.0	8.17
BH07	3/27/2015	<1.0	<1.0	<1.0	<1.0	9.42
BH07	6/29/2015	<1.0	<1.0	<1.0	<1.0	6.14
BH07	9/25/2015	<1.0	<1.0	<1.0	<1.0	6.62*
BH07	12/14/2015	<1.0	<1.0	<1.0	<1.0	6.84
BH07	3/14/2016	<1.0	<1.0	<1.0	<1.0	4.40
BH07	6/7/2016	<1.0	<1.0	<1.0	<1.0	3.41
BH07	9/12/2016	<1.0	<1.0	<1.0	<1.0	5.82
BH08	6/25/2014	<1.0	<1.0	<1.0	<1.0	8.92
BH08	9/17/2014	<1.0	<1.0	<1.0	<1.0	8.40
BH08	12/16/2014	<1.0	<1.0	<1.0	<1.0	9.02
BH08	3/27/2015	<1.0	<1.0	<1.0	<1.0	9.39
BH08	6/29/2015	<1.0	<1.0	<1.0	<1.0	6.09
BH08	9/25/2015	<1.0	<1.0	<1.0	<1.0	7.41*
BH08	12/14/2015	<1.0	<1.0	<1.0	<1.0	7.10
BH08	3/14/2016	<1.0	<1.0	<1.0	<1.0	4.63
BH08	6/7/2016	<1.0	<1.0	<1.0	<1.0	3.68

TABLE 1
BECKER 5-1, 2, 14, 15 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⁾ (feet)
COGCC Table 910-1 Groundwater Standard (µg/L) ⁽¹⁾		5	560	700	1,400	
BH08	9/12/2016	<1.0	<1.0	<1.0	<1.0	6.10

Notes:

COGCC = Colorado Oil and Gas Conservation Commission

1. Groundwater standards referenced from 2 CCR 404-1, Table 910-1, effective January 30, 2015.

2. Depth to water measured from top of well casing or ground surface for monitoring well samples and excavation samples, respectively.

* Well repairs completed during 3rd Quarter 2015 resulted in a few inches of casing being cut off of each well.

µg/L = Micrograms per liter

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

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

TABLE 2
BECKER 5-1, 2, 14, 15 TANK BATTERY
EFR / AS OPERATIONAL SUMMARY TABLE

Date	EFR Wells	Total EFR/AS Duration (hours)	Approximate Gallons Extracted	AS Wells	Air Injection Pressure (psi)
First Quarter 2013					
1/28/2013	BH01, BH02	6	4.5	BH01, BH02	10
2/16/2013		5.5	16		10
3/3/2013		6	0		10
3/18/2013		6	7		10
Quarterly Totals		23.5	27.5		-
Second Quarter 2013					
4/15/2013	BH01, BH02	6	9	BH01, BH02	10
5/3/2013		4	0		10
5/20/2013		6	2		10
Quarterly Totals		16	11		-
Third Quarter 2013					
7/8/2013	BH01, BH02	6	7	BH01, BH02	10
7/23/2013		6.25	0		10
8/9/2013		6.25	2		15
8/22/2013		6	0		NR
9/9/2013		6	13		10
9/17/2013		6	NR		13.5
9/24/2013		6	15		15
Quarterly Totals		42.5	37		-
Fourth Quarter 2013					
10/7/2013	BH01, BH02	6	1	BH01, BH02	10
10/15/2013		6.25	5		10
10/29/2013		6	0		10
11/13/2013		6	NR		10
11/25/2013		5	0.5		10
12/19/2013	None	6	0		10
Quarterly Totals		35.25	6.5		-
Second Quarter 2014					
4/16/2014	BH02	6	0	BH02, BH04, BH05, BH06, BH07	10
5/1/2014		6	0		20
5/7/2014		6	0		10
5/21/2014		4.5	0		10
6/6/2014		6	0		10
6/19/2014		6	0		20
Quarterly Totals		34.5	0		
Third Quarter 2014					
7/9/2014	BH02	6	0	BH02, BH04, BH05, BH06, BH07	20
7/14/2014		6	0		20
8/5/2014		6	42		20
8/22/2014		6	0		20
9/11/2014		6	20	BH04, BH05, BH06	20
Quarterly Totals		30	62		

TABLE 2
BECKER 5-1, 2, 14, 15 TANK BATTERY
EFR / AS OPERATIONAL SUMMARY TABLE

Date	EFR Wells	Total EFR/AS Duration (hours)	Approximate Gallons Extracted	AS Wells	Air Injection Pressure (psi)
Fourth Quarter 2014					
10/1/2014	BH02	6	0	BH02, BH03, BH04, BH06, BH07	20
10/20/2014	BH04, BH05, BH06, BH07	6	50	BH02, BH04, BH05, BH06, BH07	20
11/3/2014		6	18		20
11/20/2014	BH02, BH04, BH05, BH06, BH07	6	10	BH04, BH05, BH06, BH07	20
12/8/2014	BH04, BH05, BH06, BH07	6	0	BH02, BH04, BH05, BH06, BH07	30
12/19/2014		6	10		30
Quarterly Totals		36	88		
First Quarter 2015					
1/8/2015	BH01, BH02, BH04, BH06	6	0	BH01, BH02, BH04, BH06	20
1/21/2015		6	0		20
2/6/2015		6	0		20
2/19/2015		6	5		20
3/10/2015		6	0		20
3/23/2015		6	25		20
3/31/2015		6	25		20
Quarterly Totals		42	55		
Second Quarter 2015					
4/10/2015	BH01, BH02, BH04, BH06	6	27	BH01, BH02, BH04, BH06	20
4/17/2015		6	18		20
4/28/2015		6	20		30
5/11/2015		6	50		20
5/26/2015		6	35		20
6/9/2015		6	20		25
6/25/2015	BH04, BH06	3	10	BH01, BH02	20
Quarterly Totals		39	180		
Third Quarter 2015					
7/7/2015	BH01, BH02, BH04, BH06	6	0	BH01, BH02, BH04, BH06	20
7/21/2015		6	0		20
8/4/2015		6	10		20
9/1/2015		6	80		20
9/14/2015		6	0		20
9/29/2015		6	60		20
Quarterly Totals		36	150		
Fourth Quarter 2015					
10/12/2015	BH01, BH02, BH04, BH06	6	20	BH01, BH02, BH04, BH06	20
10/26/2015		6	0		14
11/9/2015		6	70		20
12/8/2015	BH01, BH02, BH07	6	70	BH01, BH02, BH04	20
12/18/2015		6	20		20
Quarterly Totals		30	180		

TABLE 2
BECKER 5-1, 2, 14, 15 TANK BATTERY
EFR / AS OPERATIONAL SUMMARY TABLE

Date	EFR Wells	Total EFR/AS Duration (hours)	Approximate Gallons Extracted	AS Wells	Air Injection Pressure (psi)
First Quarter 2016					
1/6/2016	BH01, BH02, BH07	6	50	BH01, BH04	20
1/21/2016		6	30		20
2/3/2016		6	30		20
2/18/2016		6	122		20
3/3/2016		6	30		20
Quarterly Totals		30	262		
Second Quarter 2016					
4/1/2016	BH01, BH02, BH07	6	5	BH01, BH04	23
4/14/2016	BH01, BH02, BH05, BH07	6	20		25
4/29/2016		5	40	BH01, BH02, BH04, BH05	30
5/12/2016		6	64		20
5/26/2016		6	90		20
6/9/2016		BH01, BH02, BH05, BH07	6		45
6/24/2016	6		10		20
Quarterly Totals		41	274		-
Third Quarter 2016					
7/7/2016	BH01, BH02, BH05, BH07	6	25	BH01, BH02, BH04, BH05	20
8/15/2016		6	50		20
8/20/2016		6	20		20
9/1/2016		6	42		12.5
9/29/2016		6	30		20
Quarterly Totals		30	167		-

Notes:

EFR = Enhanced fluid recovery

AS = Air sparge

psi = Pounds per square inch

NR = Not recorded



Surface
Drainage

BH03		
Compound (µg/L)	6/7/2016	9/12/2016
Benzene	<1.0	<1.0
Toluene	<1.0	<1.0
Ethylbenzene	<1.0	<1.0
Total Xylenes	<1.0	<1.0

BH03

BH01		
Compound (µg/L)	6/7/2016	9/12/2016
Benzene	<1.0	<1.0
Toluene	<1.0	<1.0
Ethylbenzene	<1.0	<1.0
Total Xylenes	<1.0	<1.0

BH01

BH05		
Compound (µg/L)	6/7/2016	9/12/2016
Benzene	<1.0	<1.0
Toluene	<1.0	<1.0
Ethylbenzene	<1.0	<1.0
Total Xylenes	<1.0	<1.0

BH05

BH02		
Compound (µg/L)	6/7/2016	9/12/2016
Benzene	<1.0	<1.0
Toluene	<1.0	<1.0
Ethylbenzene	<1.0	<1.0
Total Xylenes	<1.0	<1.0

BH06

BH06		
Compound (µg/L)	6/7/2016	9/12/2016
Benzene	<1.0	1.4
Toluene	<1.0	<1.0
Ethylbenzene	<1.0	<1.0
Total Xylenes	<1.0	<1.0

BH08

BH04		
Compound (µg/L)	6/7/2016	9/12/2016
Benzene	<1.0	<1.0
Toluene	<1.0	<1.0
Ethylbenzene	<1.0	<1.0
Total Xylenes	<1.0	<1.0

BH07		
Compound (µg/L)	6/7/2016	9/12/2016
Benzene	<1.0	<1.0
Toluene	<1.0	<1.0
Ethylbenzene	<1.0	<1.0
Total Xylenes	<1.0	<1.0

BH08		
Compound (µg/L)	6/7/2016	9/12/2016
Benzene	<1.0	<1.0
Toluene	<1.0	<1.0
Ethylbenzene	<1.0	<1.0
Total Xylenes	<1.0	<1.0

County Road 36

0 ft 30 ft 60 ft

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

DRAWN BY: BRN

DATE: 9/20/2016

Facility Diagram
PDC Energy – DJ Basin
Becker 5-1, 2, 14, 15 Tank Battery
SWSE S5 T3N R64W
Weld County, CO



6899 Pecos Street
Unit C
Denver, CO 80221

LEGEND

- Excavation Area
- Monitoring Well Location
- Point of Release
- Groundwater Flow Direction

All locations are approximate unless otherwise noted

FIGURE 1
GROUNDWATER ANALYTICAL RESULTS MAP

ATTACHMENT A

Summit Scientific

741 Corporate Circle – Suite I ♦ Golden, Colorado 80401

303.277.9310 - laboratory ♦ 303.277.9531 - fax

September 16, 2016

Mark Longhurst
PDC Energy
1775 Sherman St. STE. 3000
Denver, CO 80203
RE: Becker 5-1,2,14,15

Enclosed are the results of analyses for samples received by Summit Scientific on 09/12/16 17:00. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

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

Paul Shrewsbury
President



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

Project: Becker 5-1,2,14,15

Project Number: [none]
Project Manager: Mark Longhurst

Reported:
09/16/16 13:16

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
BH01	1609072-01	Water	09/12/16 12:10	09/12/16 17:00
BH02	1609072-02	Water	09/12/16 12:18	09/12/16 17:00
BH03	1609072-03	Water	09/12/16 12:00	09/12/16 17:00
BH04	1609072-04	Water	09/12/16 12:52	09/12/16 17:00
BH05	1609072-05	Water	09/12/16 12:28	09/12/16 17:00
BH06	1609072-06	Water	09/12/16 12:30	09/12/16 17:00
BH07	1609072-07	Water	09/12/16 12:41	09/12/16 17:00
BH08	1609072-08	Water	09/12/16 12:45	09/12/16 17:00

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: Becker 5-1,2,14,15

Project Number: [none]
Project Manager: Mark Longhurst

Reported:
09/16/16 13:16

Summit Scientific 1609072

741 Corporate Circle Suite 1 • Golden, Colorado 80401
303-277-9310 • 303-374-5933 Fax

Page 1 of 1

Client: PDC / Tasman Geosciences

Address: 6899 Pecos St. Unit C

City/State/Zip: Denver, CO 80221

Phone: 303-487-1228 Fax:

Sampler Name:

Project Manager: Mark Longhurst

E-Mail: mark.longhurst@pdce.com

Project Name: Boxen 5.1.2.14.15

Project Number:

N/A

[illegible]

www.s2scientific.com

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: Becker 5-1,2,14,15

Project Number: [none]
Project Manager: Mark Longhurst

Reported:
09/16/16 13:16

Sample Receipt Checklist

S2 Work Order: 1609072

Client: PDC/Tasman

Client Project ID: Loloff 35-546

Shipped Via: PIV

(UPS, FedEx, Hand Delivered, Pick-up, etc.)

Airbill #: _____

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

Cooler ID					
Temp (°C)	13.1				

Thermometer ID: 61857155-K

	Yes	No	N/A	Comments (if any)
If samples require cooling, was the temperature just above 0°C to ≤ 6°C ⁽¹⁾ ?		✓		
NOTE: If samples are delivered the same day of sampling, this requirement is waived provided that there is evidence that cooling has begun.				
Were all samples received intact ⁽¹⁾ ?	✓			
Was adequate sample volume provided ⁽¹⁾ ?	✓			
If custody seals are present, are they intact ⁽¹⁾ ?			✓	
Are short holding time analytes or samples with HTs due within 48 hours present?			✓	
Is a chain-of-custody (COC) form present and filled out completely ⁽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.

Nakita
Custodian Printed Name

MA
Signature or Initials of Custodian

9/12/16 1730
Date/Time



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

Project: Becker 5-1,2,14,15

Project Number: [none]
Project Manager: Mark Longhurst

Reported:
09/16/16 13:16

BH01
1609072-01 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **09/12/16 12:10**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	1.0	ug/l	1	1609100	09/15/16	09/15/16	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	1.0	"	"	"	"	"	"	

Date Sampled: **09/12/16 12:10**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		110 %	37-154		"	"	"	"	
Surrogate: Toluene-d8		98.9 %	45-149		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		98.9 %	45-146		"	"	"	"	

Summit Scientific

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

Project: Becker 5-1,2,14,15
Project Number: [none]
Project Manager: Mark Longhurst

Reported:
09/16/16 13:16

BH02
1609072-02 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **09/12/16 12:18**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	1.0	ug/l	1	1609100	09/15/16	09/15/16	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	1.0	"	"	"	"	"	"	

Date Sampled: **09/12/16 12:18**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		112 %	37-154		"	"	"	"	
Surrogate: Toluene-d8		101 %	45-149		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		103 %	45-146		"	"	"	"	

Summit Scientific

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

Project: Becker 5-1,2,14,15
Project Number: [none]
Project Manager: Mark Longhurst

Reported:
09/16/16 13:16

BH03
1609072-03 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **09/12/16 12:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	1.0	ug/l	1	1609100	09/15/16	09/15/16	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	1.0	"	"	"	"	"	"	

Date Sampled: **09/12/16 12:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		105 %	37-154		"	"	"	"	
Surrogate: Toluene-d8		100 %	45-149		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		105 %	45-146		"	"	"	"	

Summit Scientific

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

Project: Becker 5-1,2,14,15
Project Number: [none]
Project Manager: Mark Longhurst

Reported:
09/16/16 13:16

BH04
1609072-04 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **09/12/16 12:52**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	1.0	ug/l	1	1609100	09/15/16	09/15/16	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	1.0	"	"	"	"	"	"	

Date Sampled: **09/12/16 12:52**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		109 %	37-154		"	"	"	"	
Surrogate: Toluene-d8		102 %	45-149		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		102 %	45-146		"	"	"	"	

Summit Scientific

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

Project: Becker 5-1,2,14,15
Project Number: [none]
Project Manager: Mark Longhurst

Reported:
09/16/16 13:16

BH05
1609072-05 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **09/12/16 12:28**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	1.0	ug/l	1	1609100	09/15/16	09/15/16	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	1.0	"	"	"	"	"	"	

Date Sampled: **09/12/16 12:28**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		109 %	37-154		"	"	"	"	
Surrogate: Toluene-d8		101 %	45-149		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		104 %	45-146		"	"	"	"	

Summit Scientific

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

Project: Becker 5-1,2,14,15
Project Number: [none]
Project Manager: Mark Longhurst

Reported:
09/16/16 13:16

BH06
1609072-06 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **09/12/16 12:30**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	1.4	1.0	ug/l	1	1609100	09/15/16	09/15/16	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	1.0	"	"	"	"	"	"	

Date Sampled: **09/12/16 12:30**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<i>Surrogate: 1,2-Dichloroethane-d4</i>		<i>106 %</i>	<i>37-154</i>		<i>"</i>	<i>"</i>	<i>"</i>	<i>"</i>	
<i>Surrogate: Toluene-d8</i>		<i>99.1 %</i>	<i>45-149</i>		<i>"</i>	<i>"</i>	<i>"</i>	<i>"</i>	
<i>Surrogate: 4-Bromofluorobenzene</i>		<i>105 %</i>	<i>45-146</i>		<i>"</i>	<i>"</i>	<i>"</i>	<i>"</i>	

Summit Scientific

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

Project: Becker 5-1,2,14,15
Project Number: [none]
Project Manager: Mark Longhurst

Reported:
09/16/16 13:16

BH07
1609072-07 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **09/12/16 12:41**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	1.0	ug/l	1	1609100	09/15/16	09/15/16	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	1.0	"	"	"	"	"	"	

Date Sampled: **09/12/16 12:41**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		102 %	37-154		"	"	"	"	
Surrogate: Toluene-d8		100 %	45-149		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		103 %	45-146		"	"	"	"	

Summit Scientific

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

Project: Becker 5-1,2,14,15
Project Number: [none]
Project Manager: Mark Longhurst

Reported:
09/16/16 13:16

BH08
1609072-08 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **09/12/16 12:45**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	1.0	ug/l	1	1609100	09/15/16	09/15/16	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	1.0	"	"	"	"	"	"	

Date Sampled: **09/12/16 12:45**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		109 %	37-154		"	"	"	"	
Surrogate: Toluene-d8		103 %	45-149		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		106 %	45-146		"	"	"	"	

Summit Scientific

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

Project: Becker 5-1,2,14,15
Project Number: [none]
Project Manager: Mark Longhurst

Reported:
09/16/16 13:16

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 1609100 - EPA 5030 Water MS

Blank (1609100-BLK1)

Prepared & Analyzed: 09/14/16

Benzene	ND	1.0	ug/l							
Toluene	ND	1.0	"							
Ethylbenzene	ND	1.0	"							
Xylenes (total)	ND	1.0	"							
Surrogate: 1,2-Dichloroethane-d4	14.6		"	13.3	110	37-154				
Surrogate: Toluene-d8	13.4		"	13.3	100	45-149				
Surrogate: 4-Bromofluorobenzene	14.1		"	13.3	106	45-146				

LCS (1609100-BS1)

Prepared & Analyzed: 09/15/16

Benzene	32.3	1.0	ug/l	33.3	96.8	51-132				
Toluene	34.2	1.0	"	33.3	103	51-138				
Ethylbenzene	38.2	1.0	"	33.1	115	58-146				
m,p-Xylene	77.3	2.0	"	66.5	116	57-144				
o-Xylene	41.4	1.0	"	32.7	127	53-146				
Surrogate: 1,2-Dichloroethane-d4	15.0		"	13.3	113	37-154				
Surrogate: Toluene-d8	13.0		"	13.3	97.5	45-149				
Surrogate: 4-Bromofluorobenzene	13.6		"	13.3	102	45-146				

Matrix Spike (1609100-MS1)

Source: 1609071-01

Prepared & Analyzed: 09/15/16

Benzene	32.0	1.0	ug/l	33.3	ND	96.1	34-141			
Toluene	33.7	1.0	"	33.3	ND	101	27-151			
Ethylbenzene	38.1	1.0	"	33.1	ND	115	29-160			
m,p-Xylene	76.5	2.0	"	66.5	ND	115	20-166			
o-Xylene	41.7	1.0	"	32.7	ND	128	33-159			
Surrogate: 1,2-Dichloroethane-d4	14.9		"	13.3	112	37-154				
Surrogate: Toluene-d8	13.1		"	13.3	98.1	45-149				
Surrogate: 4-Bromofluorobenzene	13.9		"	13.3	105	45-146				

Summit Scientific

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

Project: Becker 5-1,2,14,15
Project Number: [none]
Project Manager: Mark Longhurst

Reported:
09/16/16 13:16

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 1609100 - EPA 5030 Water MS

Matrix Spike Dup (1609100-MSD1)	Source: 1609071-01			Prepared & Analyzed: 09/15/16						
Benzene	33.0	1.0	ug/l	33.3	ND	98.9	34-141	2.86	32	
Toluene	34.0	1.0	"	33.3	ND	102	27-151	0.915	25	
Ethylbenzene	38.3	1.0	"	33.1	ND	116	29-160	0.550	50	
m,p-Xylene	77.8	2.0	"	66.5	ND	117	20-166	1.72	36	
o-Xylene	41.8	1.0	"	32.7	ND	128	33-159	0.383	26	
Surrogate: 1,2-Dichloroethane-d4	15.1		"	13.3		113	37-154			
Surrogate: Toluene-d8	13.0		"	13.3		97.6	45-149			
Surrogate: 4-Bromofluorobenzene	13.8		"	13.3		104	45-146			

Summit Scientific

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

Project: Becker 5-1,2,14,15

Project Number: [none]
Project Manager: Mark Longhurst

Reported:
09/16/16 13:16

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

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