

**PDC Energy, Inc.**  
**Fourth Quarter 2016 Groundwater Monitoring Summary**

January 23, 2017

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 December 16, 2016, groundwater monitoring 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. Fourth quarter 2016 analytical results indicate that BTEX concentrations are below applicable COGCC Table 910-1 groundwater standards at all eight well locations.

Enhanced fluid recovery (EFR) and air sparge (AS) events were initiated on site during the first quarter 2013. Tasman temporarily discontinued EFR/AS events after the fourth quarter 2013, until additional remediation wells were installed. EFR/AS activities were reinitiated during the second quarter 2014, and continued through the fourth quarter 2016. A summary of the EFR/AS operational data is provided in Table 2. Monitored natural attenuation (MNA) was selected as the remediation strategy for the site in the first quarter 2017.

First quarter 2017 groundwater sampling will be conducted in March 2017.

**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 <sup>(2)</sup> (feet)
<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>	
GW01	11/29/2012	<b>3,100</b>	<b>610</b>	320	<b>3,700</b>	~ 16
BH01	12/20/2012	<b>97</b>	<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	<b>7.4</b>	<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
BH01	12/16/2016	<1.0	<1.0	<1.0	<1.0	9.17
BH02	12/20/2012	<b>170</b>	1.6	490	<b>1,700</b>	10.20
BH02	3/19/2013	<1.0	<1.0	<1.0	2.8	10.44
BH02	6/21/2013	<b>82</b>	<1.0	66	410	9.85
BH02	9/23/2013	<b>35</b>	<1.0	39	39	9.31
BH02	12/18/2013	<b>550</b>	<1.0	1.4	110	9.74
BH02	3/28/2014	<b>660</b>	1.0	150	280	9.78
BH02	6/25/2014	<1.0	<1.0	<1.0	<1.0	8.12
BH02	9/17/2014	<b>110</b>	<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

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<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>	
BH02	9/12/2016	<1.0	<1.0	<1.0	<1.0	5.30
BH02	12/16/2016	<1.0	<1.0	<1.0	<1.0	6.17
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
BH03	12/16/2016	<1.0	<1.0	<1.0	<1.0	8.78
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
BH04	12/16/2016	<1.0	<1.0	<1.0	<1.0	7.52
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

**TABLE 1**  
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**GROUNDWATER ANALYTICAL RESULTS SUMMARY TABLE**

Sample ID	Date Sampled	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Total Xylenes (µg/L)	Depth to Water <sup>(2)</sup> (feet)
<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>	
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
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
BH05	12/16/2016	<1.0	<1.0	<1.0	<1.0	8.42
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
BH06	12/16/2016	<1.0	<1.0	<1.0	<1.0	7.65
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
BH07	12/16/2016	<1.0	<1.0	<1.0	<1.0	6.66
BH08	9/17/2014	<1.0	<1.0	<1.0	<1.0	8.40

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Sample ID	Date Sampled	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Total Xylenes (µg/L)	Depth to Water <sup>(2)</sup> (feet)
<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>	
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
BH08	9/12/2016	<1.0	<1.0	<1.0	<1.0	6.10
BH08	12/16/2016	<1.0	<1.0	<1.0	<1.0	6.92

**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 3Q2015 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)	Average Air Flow Rate (cfm)
First Quarter 2013						
1/28/2013	BH01, BH02	6	4.5	BH01, BH02	10	NR
2/16/2013		5.5	16		10	NR
3/3/2013		6	0		10	NR
3/18/2013		6	7		10	NR
Quarterly Totals		23.5	27.5		-	-
Second Quarter 2013						
4/15/2013	BH01, BH02	6	9	BH01, BH02	10	NR
5/3/2013		4	0		10	NR
5/20/2013		6	2		10	NR
Quarterly Totals		16	11		-	-
Third Quarter 2013						
7/8/2013	BH01, BH02	6	7	BH01, BH02	10	NR
7/23/2013		6.25	0		10	NR
8/9/2013		6.25	2		15	NR
8/22/2013		6	0		NR	NR
9/9/2013		6	13		10	NR
9/17/2013		6	NR		13.5	NR
9/24/2013		6	15		15	NR
Quarterly Totals		42.5	37		-	-
Fourth Quarter 2013						
10/7/2013	BH01, BH02	6	1	BH01, BH02	10	NR
10/15/2013		6.25	5		10	NR
10/29/2013		6	0		10	NR
11/13/2013		6	NR		10	NR
11/25/2013		5	0.5		10	NR
12/19/2013	None	6	0		10	NR
Quarterly Totals		35.25	6.5		-	-
Second Quarter 2014						
4/16/2014	BH02	6	0	BH02, BH04, BH05, BH06, BH07	10	10
5/1/2014		6	0		20	23
5/7/2014		6	0		10	13
5/21/2014		4.5	0		10	17.5
6/6/2014		6	0		10	14
6/19/2014		6	0		20	24
Quarterly Totals		34.5	0		-	-

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Date	EFR Wells	Total EFR/AS Duration (hours)	Approximate Gallons Extracted	AS Wells	Air Injection Pressure (psi)	Average Air Flow Rate (cfm)
Third Quarter 2014						
7/9/2014	BH02	6	0	BH02, BH04, BH05, BH06, BH07	20	16
7/14/2014		6	0		20	15
8/5/2014		6	42		20	17
8/22/2014		6	0		20	18
9/11/2014		6	20	BH04, BH05, BH06	20	20
Quarterly Totals		30	62		-	-
Fourth Quarter 2014						
10/1/2014	BH02	6	0	BH02, BH03, BH04, BH06, BH07	20	20
10/20/2014	BH04, BH05, BH06, BH07	6	50	BH02, BH04, BH05, BH06, BH07	20	19
11/3/2014		6	18		20	10
11/20/2014	BH02, BH04, BH05, BH06, BH07	6	10	BH04, BH05, BH06, BH07	20	30
12/8/2014	BH04, BH05, BH06, BH07	6	0	BH02, BH04, BH05, BH06, BH07	30	23
12/19/2014		6	10		30	29
Quarterly Totals		36	88		-	-
First Quarter 2015						
1/8/2015	BH01, BH02, BH04, BH06	6	0	BH01, BH02, BH04, BH06	20	25
1/21/2015		6	0		20	22
2/6/2015		6	0		20	18
2/19/2015		6	5		20	16.5
3/10/2015		6	0		20	21.5
3/23/2015		6	25		20	15.5
3/31/2015		6	25		20	15
Quarterly Totals		42	55			-
Second Quarter 2015						
4/10/2015	BH01, BH02, BH04, BH06	6	27	BH01, BH02, BH04, BH06	20	27.5
4/17/2015		6	18		20	16.25
4/28/2015		6	20		30	30
5/11/2015		6	50		20	21.3
5/26/2015		6	35		20	32.5
6/9/2015		6	20		25	10
6/25/2015	BH04, BH06	3	10	BH01, BH02	20	34
Quarterly Totals		39	180		-	-

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Date	EFR Wells	Total EFR/AS Duration (hours)	Approximate Gallons Extracted	AS Wells	Air Injection Pressure (psi)	Average Air Flow Rate (cfm)
Third Quarter 2015						
7/7/2015	BH01, BH02, BH04, BH06	6	0	BH01, BH02, BH04, BH06	20	22.5
7/21/2015		6	0		20	20
8/4/2015		6	10		20	20
9/1/2015		6	80		20	22.5
9/14/2015		6	0		20	22
9/29/2015		6	60		20	20
Quarterly Totals		36	150		-	-
Fourth Quarter 2015						
10/12/2015	BH01, BH02, BH04, BH06	6	20	BH01, BH02, BH04, BH06	20	20
10/26/2015		6	0		14	14
11/9/2015		6	70		20	20
12/8/2015	BH01, BH02, BH07	6	70	BH01, BH02, BH04	20	20
12/18/2015		6	20		20	30
Quarterly Totals		30	180		-	-
First Quarter 2016						
1/6/2016	BH01, BH02, BH07	6	50	BH01, BH04	20	25
1/21/2016		6	30		20	12.5
2/3/2016		6	30		20	15
2/18/2016		6	122		20	25
3/3/2016		6	30		20	21.7
Quarterly Totals		30	262		-	-
Second Quarter 2016						
4/1/2016	BH01, BH02, BH07	6	5	BH01, BH04	23	26.7
4/14/2016	BH01, BH02, BH05, BH07	6	20		25	24.6
4/29/2016		5	40	BH01, BH02, BH04, BH05	30	18
5/12/2016		6	64		20	13
5/26/2016		6	90		20	16.3
6/9/2016		BH01, BH02, BH05, BH07	6		45	20
6/24/2016		6	10		20	19
Quarterly Totals		41	274		-	-



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Date	EFR Wells	Total EFR/AS Duration (hours)	Approximate Gallons Extracted	AS Wells	Air Injection Pressure (psi)	Average Air Flow Rate (cfm)
Third Quarter 2016						
7/7/2016	BH01, BH02, BH05, BH07	6	25	BH01, BH02, BH04, BH05	20	15.4
8/15/2016		6	50		20	17.3
8/20/2016		6	20		20	19
9/1/2016		6	42		12.5	11
9/29/2016		6	30		20	22.5
Quarterly Totals		30	167		-	-
Fourth Quarter 2016						
10/12/2016	BH01, BH02, BH05, BH07	6	84	BH01, BH02, BH04, BH05	18	18
10/26/2016	BH02, BH07	6	84	None	20	17.5
11/11/2016	BH01, BH02, BH05, BH07	1	8		0	0
12/10/2016		6	0		20	22
Quarterly Totals		19	176		-	-

**Notes:**

EFR = Enhanced fluid recovery

AS = Air sparge

psi = Pounds per square inch

cfm = Cubic feet per minute

NR = Not recorded



Surface  
Drainage

BH03		
Compound (µg/L)	9/12/2016	12/16/2016
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)	9/12/2016	12/16/2016
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)	9/12/2016	12/16/2016
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)	9/12/2016	12/16/2016
Benzene	<1.0	<1.0
Toluene	<1.0	<1.0
Ethylbenzene	<1.0	<1.0
Total Xylenes	<1.0	<1.0

BH02

BH06		
Compound (µg/L)	9/12/2016	12/16/2016
Benzene	1.4	<1.0
Toluene	<1.0	<1.0
Ethylbenzene	<1.0	<1.0
Total Xylenes	<1.0	<1.0

BH06

BH07

BH08

BH04		
Compound (µg/L)	9/12/2016	12/16/2016
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)	9/12/2016	12/16/2016
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)	9/12/2016	12/16/2016
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: 1/3/2017

**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
- Point of Release
- Groundwater Flow Direction

- Excavation Groundwater Sample Location

All locations are approximate unless otherwise noted

**FIGURE 1**  
GROUNDWATER ANALYTICAL RESULTS MAP

## **ATTACHMENT A**

# Summit Scientific

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741 Corporate Circle – Suite I ♦ Golden, Colorado 80401

303.277.9310 - laboratory ♦ 303.277.9531 - fax

December 23, 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 12/16/16 16:30. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

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

Paul Shrewsbury  
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:**  
12/23/16 10:42

### ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
BH01	1612121-01	Water	12/16/16 13:15	12/16/16 16:30
BH02	1612121-02	Water	12/16/16 13:31	12/16/16 16:30
BH03	1612121-03	Water	12/16/16 13:34	12/16/16 16:30
BH04	1612121-04	Water	12/16/16 13:43	12/16/16 16:30
BH05	1612121-05	Water	12/16/16 13:46	12/16/16 16:30
BH06	1612121-06	Water	12/16/16 13:49	12/16/16 16:30
BH07	1612121-07	Water	12/16/16 13:53	12/16/16 16:30
BH08	1612121-08	Water	12/16/16 13:59	12/16/16 16:30

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:  
12/23/16 10:42

### Sample Receipt Checklist

S2 Work Order: 1612121

Client: PDC Energy

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

Shipped Via: P/U

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

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

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

Cooler ID					
Temp (°C)	<u>4.5</u>				

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

Nakita  
Custodian Printed Name

[Signature]  
Signature or Initials of Custodian

12/16/16 1:20  
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:**  
12/23/16 10:42

**BH01**  
**1612121-01 (Water)**

**Summit Scientific**

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

Date Sampled: **12/16/16 13:15**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	1.0	ug/l	1	1612205	12/20/16	12/20/16	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	1.0	"	"	"	"	"	"	

Date Sampled: **12/16/16 13:15**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		96.8 %	37-154		"	"	"	"	
Surrogate: Toluene-d8		104 %	45-149		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		95.1 %	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:**  
12/23/16 10:42

**BH02**  
**1612121-02 (Water)**

**Summit Scientific**

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

Date Sampled: **12/16/16 13:31**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	1.0	ug/l	1	1612205	12/20/16	12/20/16	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	1.0	"	"	"	"	"	"	

Date Sampled: **12/16/16 13:31**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		96.6 %	37-154		"	"	"	"	
Surrogate: Toluene-d8		104 %	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:**  
12/23/16 10:42

**BH03**  
**1612121-03 (Water)**

**Summit Scientific**

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

Date Sampled: **12/16/16 13:34**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	1.0	ug/l	1	1612205	12/20/16	12/20/16	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	1.0	"	"	"	"	"	"	

Date Sampled: **12/16/16 13:34**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		96.9 %	37-154		"	"	"	"	
Surrogate: Toluene-d8		104 %	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:**  
12/23/16 10:42

**BH04**  
**1612121-04 (Water)**

**Summit Scientific**

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

Date Sampled: **12/16/16 13:43**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	1.0	ug/l	1	1612205	12/20/16	12/20/16	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	1.0	"	"	"	"	"	"	

Date Sampled: **12/16/16 13:43**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		96.1 %	37-154		"	"	"	"	
Surrogate: Toluene-d8		103 %	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:**  
12/23/16 10:42

**BH05**  
**1612121-05 (Water)**

**Summit Scientific**

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

Date Sampled: **12/16/16 13:46**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	1.0	ug/l	1	1612205	12/20/16	12/20/16	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	1.0	"	"	"	"	"	"	

Date Sampled: **12/16/16 13:46**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		99.9 %	37-154		"	"	"	"	
Surrogate: Toluene-d8		105 %	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:**  
12/23/16 10:42

**BH06**  
**1612121-06 (Water)**

**Summit Scientific**

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

Date Sampled: **12/16/16 13:49**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	1.0	ug/l	1	1612205	12/20/16	12/20/16	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	1.0	"	"	"	"	"	"	

Date Sampled: **12/16/16 13:49**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		95.9 %	37-154		"	"	"	"	
Surrogate: Toluene-d8		104 %	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:**  
12/23/16 10:42

**BH07**  
**1612121-07 (Water)**

**Summit Scientific**

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

Date Sampled: **12/16/16 13:53**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	1.0	ug/l	1	1612205	12/20/16	12/20/16	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	1.0	"	"	"	"	"	"	

Date Sampled: **12/16/16 13:53**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		93.9 %	37-154		"	"	"	"	
Surrogate: Toluene-d8		102 %	45-149		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		98.5 %	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:**  
12/23/16 10:42

**BH08**  
**1612121-08 (Water)**

**Summit Scientific**

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

Date Sampled: **12/16/16 13:59**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	1.0	ug/l	1	1612205	12/20/16	12/20/16	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	1.0	"	"	"	"	"	"	

Date Sampled: **12/16/16 13:59**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		90.8 %	37-154		"	"	"	"	
Surrogate: Toluene-d8		104 %	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:  
12/23/16 10:42

## 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 1612205 - EPA 5030 Water MS

##### Blank (1612205-BLK1)

Prepared & Analyzed: 12/20/16

Benzene	ND	1.0	ug/l							
Toluene	ND	1.0	"							
Ethylbenzene	ND	1.0	"							
Xylenes (total)	ND	1.0	"							
Surrogate: 1,2-Dichloroethane-d4	15.2		"	13.3	114	37-154				
Surrogate: Toluene-d8	13.8		"	13.3	103	45-149				
Surrogate: 4-Bromofluorobenzene	13.7		"	13.3	103	45-146				

##### LCS (1612205-BS1)

Prepared & Analyzed: 12/20/16

Benzene	39.3	1.0	ug/l	33.3	118	51-132				
Toluene	38.0	1.0	"	33.3	114	51-138				
Ethylbenzene	38.2	1.0	"	33.1	116	58-146				
m,p-Xylene	75.1	2.0	"	66.5	113	57-144				
o-Xylene	37.8	1.0	"	32.7	116	53-146				
Surrogate: 1,2-Dichloroethane-d4	13.0		"	13.3	97.7	37-154				
Surrogate: Toluene-d8	14.4		"	13.3	108	45-149				
Surrogate: 4-Bromofluorobenzene	14.0		"	13.3	105	45-146				

##### Matrix Spike (1612205-MS1)

Source: 1612121-01

Prepared & Analyzed: 12/20/16

Benzene	44.0	1.0	ug/l	33.3	ND	132	34-141			
Toluene	42.8	1.0	"	33.3	ND	128	27-151			
Ethylbenzene	43.3	1.0	"	33.1	ND	131	29-160			
m,p-Xylene	83.8	2.0	"	66.5	ND	126	20-166			
o-Xylene	41.8	1.0	"	32.7	ND	128	33-159			
Surrogate: 1,2-Dichloroethane-d4	11.6		"	13.3	87.2	37-154				
Surrogate: Toluene-d8	14.4		"	13.3	108	45-149				
Surrogate: 4-Bromofluorobenzene	13.6		"	13.3	102	45-146				

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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:  
12/23/16 10:42

**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 1612205 - EPA 5030 Water MS**

Matrix Spike Dup (1612205-MSD1)	Source: 1612121-01			Prepared & Analyzed: 12/20/16						
Benzene	41.3	1.0	ug/l	33.3	ND	124	34-141	6.33	32	
Toluene	39.9	1.0	"	33.3	ND	120	27-151	6.92	25	
Ethylbenzene	41.7	1.0	"	33.1	ND	126	29-160	3.74	50	
m,p-Xylene	81.1	2.0	"	66.5	ND	122	20-166	3.28	36	
o-Xylene	40.1	1.0	"	32.7	ND	123	33-159	4.06	26	
Surrogate: 1,2-Dichloroethane-d4	11.7		"	13.3		87.7	37-154			
Surrogate: Toluene-d8	14.2		"	13.3		107	45-149			
Surrogate: 4-Bromofluorobenzene	13.6		"	13.3		102	45-146			

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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:**  
12/23/16 10:42

### 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