



PDC Energy, Inc.
Second Quarter 2013 Groundwater Monitoring Summary

August 14, 2013

Becker 5-1, 2, 14, 15 Tank Battery
SE 1/4 Section 5 T3N R64W
Weld County, API # 05-123-12297

This groundwater summary has been prepared by Tasman Geosciences, LLC for the Becker 5-1, 2, 14, 15 tank battery. On June 21, 2013 groundwater sampling was conducted at three monitoring well locations. Groundwater samples were submitted for laboratory analysis of benzene, toluene, ethylbenzene, and total xylenes (BTEX) by USEPA Method 8260B. Analytical results are summarized in Table 1 below and a complete lab report is included as Attachment A. Sample locations and corresponding analytical results are illustrated on Figure 2. Second quarter 2013 analytical results indicate that benzene concentrations in BH02 were in exceedance of COGCC regulatory standards. BTEX concentrations were below regulatory standards at BH01 and BH03.

Tasman continued enhanced fluid recovery (EFR) and air sparge (AS) events at the site during the second quarter 2013. A summary of the EFR/AS operational data is provided in Table 2. EFR/AS activities will continue through the third quarter 2013.

The third quarter 2013 groundwater sampling event will be conducted in September 2013.

**TABLE 1
BECKER 5-1, 2, 14, 15
GROUNDWATER ANALYTICAL RESULTS SUMMARY TABLE**

Sample ID	Date Sampled	Benzene (ug/L)	Toluene (ug/L)	Ethylbenzene (ug/L)	Total Xylenes (ug/L)	Depth to Water (feet)
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
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
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
COGCC standards for groundwater (ug/L) ⁽¹⁾		5	560	700	1,400	

Notes:

1). The environmental cleanup standards for groundwater that are applicable to this site are the Colorado Oil and Gas Conservation Commission (COGCC) standards for contaminants in groundwater according to Table 910-1 of the COGCC 900 Series Rule for E&P Waste Management.

Bold red values indicate an exceedance of the COGCC groundwater standards for the Site.

ug/L= Micrograms per liter.

**TABLE 2
BECKER 5-1, 2, 14, 15
AIR SPARGE / EFR OPERATIONAL SUMMARY TABLE**

Date	EFR Wells	Total EFR/AS Duration (hours)	Approximate Gallons Extracted	AS Wells	Injection Pressure (psi)
FIRST QUARTER 2013					
1/28/2013	BH01, BH02	6	4.5	BH01, BH02	10
2/16/2013	BH01, BH02	5.5	16	BH01, BH02	10
3/3/2013	BH01, BH02	6	0	BH01, BH02	10
3/18/2013	BH01, BH02	6	7	BH01, BH02	10
SECOND QUARTER 2013					
4/15/2013	BH01, BH02	6	9	BH01, BH02	10
5/3/2013	BH01, BH02	4	0	BH01, BH02	10
5/20/2013	BH01, BH02	6.08	2	BH01, BH02	10

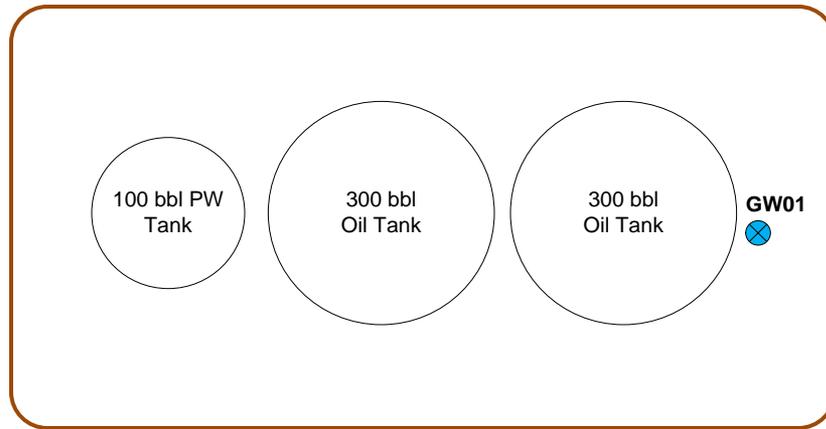
Notes:

psi = pounds per square inch



DCP / PDC Tank Battery

Property Fence



BH03



BH03		
Compound (ug/L)	3/19/2013	6/21/2013
Benzene	<1.0	<1.0
Toluene	<1.0	<1.0
Ethylbenzene	<1.0	<1.0
Total Xylenes	<1.0	<1.0

BH01

BH01		
Compound (ug/L)	3/19/2013	6/21/2013
Benzene	1.7	<1.0
Toluene	<1.0	<1.0
Ethylbenzene	4.9	8
Total Xylenes	48	49

BH02

BH02		
Compound (ug/L)	3/19/2013	6/21/2013
Benzene	<1.0	82
Toluene	<1.0	<1.0
Ethylbenzene	<1.0	66
Total Xylenes	2.8	410

Separator 10 bbl

Separator 10 bbl

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

DRAWN BY: ESS

Facility Diagram
 PDC Energy – DJ Basin
 Becker 5-1, 2, 14, 15
 SE 1/4 S5 T3N R64W
 Weld County, CO



6899 Pecos Street
 Unit C
 Denver, CO 80221

LEGEND

- Earthen Berm
- Temporary Monitoring Well
- Groundwater Sample Location Collected During Excavation Activities

FIGURE 2
GROUNDWATER
ANALYTICAL RESULTS
 Not to Scale

DATE: 7/11/2013

ATTACHMENT A

Summit Scientific

741 Corporate Circle – Suite I ♦ Golden, Colorado 80401

303.277.9310 - laboratory ♦ 303.277.9531 - fax

June 28, 2013

Brandon Bruns
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 06/21/13 17:00. If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Joseph J Egry IV
Laboratory Director

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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: Brandon Bruns

Reported:
06/28/13 09:07

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
BH01	R306177-01	Water	06/21/13 13:15	06/21/13 17:00
BH02	R306177-02	Water	06/21/13 13:20	06/21/13 17:00
BH03	R306177-03	Water	06/21/13 13:25	06/21/13 17:00

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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: Brandon Bruns

Reported:
 06/28/13 09:07

BH01
R306177-01 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **06/21/13 13:15**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	1.0	ug/l	1	3062610	06/27/13	06/27/13	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	8.0	1.0	"	"	"	"	"	"	
Xylenes (total)	49	1.0	"	"	"	"	"	"	

Date Sampled: **06/21/13 13:15**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<i>Surrogate: 1,2-Dichloroethane-d4</i>		99.7 %	37-154		"	"	"	"	
<i>Surrogate: Toluene-d8</i>		99.1 %	45-149		"	"	"	"	
<i>Surrogate: 4-Bromofluorobenzene</i>		99.4 %	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: Brandon Bruns

Reported:
 06/28/13 09:07

BH02
R306177-02 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **06/21/13 13:20**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	82	20	ug/l	20	3062610	06/27/13	06/27/13	EPA 8260B	
Toluene	ND	1.0	"	1	"	"	"	"	
Ethylbenzene	66	20	"	20	"	"	"	"	
Xylenes (total)	410	1.0	"	1	"	"	"	"	

Date Sampled: **06/21/13 13:20**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		105 %	37-154		"	"	"	"	
Surrogate: Toluene-d8		99.2 %	45-149		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		96.5 %	45-146		"	"	"	"	

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 Denver CO, 80203

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

Project Number: [none]
 Project Manager: Brandon Brunns

Reported:
 06/28/13 09:07

BH03
R306177-03 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **06/21/13 13:25**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	1.0	ug/l	1	3062610	06/27/13	06/27/13	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	1.0	"	"	"	"	"	"	

Date Sampled: **06/21/13 13:25**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		97.2 %	37-154		"	"	"	"	
Surrogate: Toluene-d8		96.3 %	45-149		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		97.4 %	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: Brandon Bruns

Reported:
06/28/13 09:07

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 3062610 - EPA 5030 Water MS

Blank (3062610-BLK1)

Prepared & Analyzed: 06/26/13

Benzene	ND	1.0	ug/l							
Toluene	ND	1.0	"							
Ethylbenzene	ND	1.0	"							
Xylenes (total)	ND	1.0	"							
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>13.0</i>		<i>"</i>	<i>13.2</i>		<i>98.0</i>	<i>37-154</i>			
<i>Surrogate: Toluene-d8</i>	<i>12.9</i>		<i>"</i>	<i>13.3</i>		<i>96.7</i>	<i>45-149</i>			
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>13.1</i>		<i>"</i>	<i>13.3</i>		<i>98.0</i>	<i>45-146</i>			

Blank (3062610-BLK2)

Prepared & Analyzed: 06/26/13

Benzene	ND	1.0	ug/l							
Toluene	ND	1.0	"							
Ethylbenzene	ND	1.0	"							
Xylenes (total)	ND	1.0	"							
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>13.3</i>		<i>"</i>	<i>13.2</i>		<i>101</i>	<i>37-154</i>			
<i>Surrogate: Toluene-d8</i>	<i>13.3</i>		<i>"</i>	<i>13.3</i>		<i>99.6</i>	<i>45-149</i>			
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>13.1</i>		<i>"</i>	<i>13.3</i>		<i>98.1</i>	<i>45-146</i>			

LCS (3062610-BS1)

Prepared & Analyzed: 06/26/13

Benzene	27.2	1.0	ug/l	33.3		81.5	51-132			
Toluene	27.5	1.0	"	33.3		82.6	51-138			
Ethylbenzene	29.1	1.0	"	33.3		87.3	58-146			
m,p-Xylene	59.0	2.0	"	66.7		88.6	57-144			
o-Xylene	29.0	1.0	"	33.3		87.0	53-146			
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>13.3</i>		<i>"</i>	<i>13.2</i>		<i>100</i>	<i>37-154</i>			
<i>Surrogate: Toluene-d8</i>	<i>12.9</i>		<i>"</i>	<i>13.3</i>		<i>96.8</i>	<i>45-149</i>			
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>13.0</i>		<i>"</i>	<i>13.3</i>		<i>97.3</i>	<i>45-146</i>			

LCS Dup (3062610-BSD1)

Prepared & Analyzed: 06/26/13

Benzene	25.6	1.0	ug/l	33.3		77.0	51-132	5.68	17	
Toluene	26.5	1.0	"	33.3		79.4	51-138	3.93	17	
Ethylbenzene	26.5	1.0	"	33.3		79.6	58-146	9.21	16	
m,p-Xylene	54.3	2.0	"	66.7		81.4	57-144	8.36	16	
o-Xylene	26.3	1.0	"	33.3		78.9	53-146	9.73	15	
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>13.2</i>		<i>"</i>	<i>13.2</i>		<i>100</i>	<i>37-154</i>			
<i>Surrogate: Toluene-d8</i>	<i>13.2</i>		<i>"</i>	<i>13.3</i>		<i>99.2</i>	<i>45-149</i>			
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>12.7</i>		<i>"</i>	<i>13.3</i>		<i>95.0</i>	<i>45-146</i>			

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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: Brandon Bruns

Reported:
06/28/13 09:07

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 3062610 - EPA 5030 Water MS

Matrix Spike (3062610-MS1)	Source: R306177-01			Prepared & Analyzed: 06/26/13								
Benzene	28.3	1.0	ug/l	33.3	ND	84.8	34-141					
Toluene	28.9	1.0	"	33.3	ND	86.6	27-151					
Ethylbenzene	36.4	1.0	"	33.3	8.03	85.2	29-160					
m,p-Xylene	95.5	2.0	"	66.7	44.4	76.7	20-166					
o-Xylene	32.9	1.0	"	33.3	4.44	85.4	33-159					
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>13.3</i>		<i>"</i>	<i>13.2</i>		<i>100</i>	<i>37-154</i>					
<i>Surrogate: Toluene-d8</i>	<i>13.0</i>		<i>"</i>	<i>13.3</i>		<i>97.7</i>	<i>45-149</i>					
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>13.3</i>		<i>"</i>	<i>13.3</i>		<i>100</i>	<i>45-146</i>					

Matrix Spike (3062610-MS2)	Source: R306177-02			Prepared & Analyzed: 06/27/13								
Benzene	532	1.0	ug/l	33.3	82.4	NR	34-141					QM-4X
Toluene	29.5	1.0	"	33.3	ND	88.5	27-151					
Ethylbenzene	508	1.0	"	33.3	65.8	NR	29-160					
m,p-Xylene	536	2.0	"	66.7	405	196	20-166					QM-4X
o-Xylene	33.1	1.0	"	33.3	5.87	81.6	33-159					
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>13.8</i>		<i>"</i>	<i>13.2</i>		<i>104</i>	<i>37-154</i>					
<i>Surrogate: Toluene-d8</i>	<i>13.4</i>		<i>"</i>	<i>13.3</i>		<i>100</i>	<i>45-149</i>					
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>12.8</i>		<i>"</i>	<i>13.3</i>		<i>95.8</i>	<i>45-146</i>					

Matrix Spike Dup (3062610-MSD1)	Source: R306177-01			Prepared & Analyzed: 06/26/13								
Benzene	28.2	1.0	ug/l	33.3	ND	84.5	34-141	0.461	32			
Toluene	29.0	1.0	"	33.3	ND	87.1	27-151	0.518	25			
Ethylbenzene	30.3	1.0	"	33.3	8.03	66.8	29-160	18.4	50			
m,p-Xylene	78.0	2.0	"	66.7	44.4	50.4	20-166	20.2	36			
o-Xylene	32.1	1.0	"	33.3	4.44	82.9	33-159	2.56	26			
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>13.6</i>		<i>"</i>	<i>13.2</i>		<i>103</i>	<i>37-154</i>					
<i>Surrogate: Toluene-d8</i>	<i>13.1</i>		<i>"</i>	<i>13.3</i>		<i>98.4</i>	<i>45-149</i>					
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>13.0</i>		<i>"</i>	<i>13.3</i>		<i>97.4</i>	<i>45-146</i>					

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 1775 Sherman St. STE. 3000
 Denver CO, 80203

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

Project Number: [none]
 Project Manager: Brandon Brunns

Reported:
 06/28/13 09:07

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 3062610 - EPA 5030 Water MS

Matrix Spike Dup (3062610-MSD2)	Source: R306177-02			Prepared & Analyzed: 06/27/13						
Benzene	752	1.0	ug/l	33.3	82.4	NR	34-141	34.3	32	QM-4X
Toluene	29.0	1.0	"	33.3	ND	87.1	27-151	1.54	25	
Ethylbenzene	439	1.0	"	33.3	65.8	NR	29-160	14.7	50	QM-4X
m,p-Xylene	356	2.0	"	66.7	405	NR	20-166	40.3	36	QM-4X
o-Xylene	34.1	1.0	"	33.3	5.87	84.6	33-159	3.04	26	
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>13.2</i>		<i>"</i>	<i>13.2</i>		<i>100</i>	<i>37-154</i>			
<i>Surrogate: Toluene-d8</i>	<i>13.4</i>		<i>"</i>	<i>13.3</i>		<i>100</i>	<i>45-149</i>			
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>12.8</i>		<i>"</i>	<i>13.3</i>		<i>95.9</i>	<i>45-146</i>			

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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: Brandon Bruns

Reported:
06/28/13 09:07

Notes and Definitions

- QM-4X The spike recovery was outside of QC acceptance limits for the MS and/or MSD due to analyte concentration at 4 times or greater the spike concentration. The QC batch was accepted based on LCS and/or LCSD recoveries within the acceptance limits.
- 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