



PDC Energy, Inc.
Third Quarter 2013 Groundwater Monitoring Summary

November 21, 2013

Cottonwood #1 Tank Battery
NESE Section 13 T6N R66W
Weld County, API # 05-123-11801

This groundwater summary has been prepared by Tasman Geosciences, LLC for the Cottonwood #1 tank battery. On September 25, 2013 groundwater sampling was conducted at seven 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 laboratory reports are included as Attachment A. Sample locations and corresponding second and third quarter 2013 analytical results are illustrated on Figure 2. Third quarter analytical results indicate that benzene concentrations were in exceedance of COGCC regulatory standards in two of the seven monitoring well locations (BH02 and BH03).

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

The fourth quarter 2013 groundwater sampling event will be conducted during December 2013.

**TABLE 1
COTTONWOOD #1
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	8/21/2012	3,000	1.7	320	1,900	NM
BH01	9/24/2012	160	<1.0	40	<1.0	16.31
BH01	12/20/2012	5.0	<1.0	<1.0	6.8	16.13
BH01	3/18/2013	<1.0	<1.0	<1.0	<1.0	16.58
BH01	6/20/2013	<1.0	<1.0	<1.0	<1.0	11.16
BH01	9/25/2013	<1.0	<1.0	<1.0	<1.0	13.61
BH02	9/24/2012	1,300	<1.0	190	1,100	18.42
BH02	12/20/2012	24	<1.0	3.9	8.1	17.35
BH02	3/18/2013	18	<1.0	<1.0	<1.0	17.80
BH02	6/20/2013	15	<1.0	<1.0	<1.0	12.58
BH02	9/25/2013	8.6	<1.0	<1.0	<1.0	14.68
BH03	9/24/2012	350	<1.0	120	300	18.28
BH03	12/20/2012	15	<1.0	6.7	7.9	17.04
BH03	3/18/2013	14	<1.0	1.5	<1.0	17.46
BH03	6/20/2013	11	<1.0	2.1	<1.0	12.01
BH03	9/25/2013	39	<1.0	16	<1.0	14.26
BH04	9/24/2012	150	<1.0	96	400	16.58
BH04	12/20/2012	38	<1.0	40	170	13.95
BH04	3/18/2013	2.6	<1.0	<1.0	<1.0	14.38
BH04	6/20/2013	1.3	<1.0	5.4	19	8.70
BH04	9/25/2013	1.5	<1.0	2.5	<1.0	11.32
BH05	9/24/2012	<1.0	<1.0	<1.0	<1.0	15.42
BH05	12/20/2012	<1.0	<1.0	<1.0	<1.0	16.86
BH05	3/18/2013	<1.0	<1.0	<1.0	<1.0	17.31
BH05	6/20/2013	<1.0	<1.0	<1.0	<1.0	11.42
BH05	9/25/2013	<1.0	<1.0	<1.0	<1.0	14.02
BH06	9/24/2012	6.7	18	7.5	50	15.35
BH06	12/20/2012	<1.0	<1.0	<1.0	<1.0	16.79
BH06	3/18/2013	3.6	1.2	<1.0	<1.0	14.74
BH06	6/20/2013	<1.0	<1.0	<1.0	<1.0	11.72
BH06	9/25/2013	1.9	<1.0	<1.0	<1.0	14.05

**TABLE 1
COTTONWOOD #1
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)
BH07	9/24/2012	<1.0	<1.0	<1.0	<1.0	16.86
BH07	12/20/2012	<1.0	<1.0	<1.0	<1.0	18.32
BH07	3/18/2013	<1.0	<1.0	<1.0	<1.0	18.77
BH07	6/20/2013	1.6	<1.0	<1.0	<1.0	13.70
BH07	9/25/2013	<1.0	<1.0	<1.0	<1.0	15.95
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. NM - Not Measured

**TABLE 2
COTTONWOOD #1
AIR SPARGE / EFR OPERATIONAL SUMMARY TABLE**

Date	EFR Wells	Total EFR/AS Duration (hours)	Approximate Gallons Extracted	AS Wells	Injection Pressure (psi)
FOURTH QUARTER 2012					
11/2/2012	BH01, BH02, BH03, BH04	6.75	13.8	BH01, BH02, BH03, BH04	8
11/14/2012		6	110		8
12/12/2012		6	400		8
FIRST QUARTER 2013					
1/4/2013	BH02, BH03	6.5	185	BH01, BH02	10
1/18/2013	BH01, BH02, BH03, BH04	6.25	272	BH01, BH02, BH03, BH04	10
2/2/2013		6	278		10
2/15/2013		7	180		9
3/5/2013		6.75	364		10
3/22/2013		4.25	360		10
SECOND QUARTER 2013					
4/3/2013	BH01, BH02, BH03, BH04	5	275	BH01, BH02, BH03, BH04	10
4/19/2013		6.5	373		10
5/13/2013		6.25	385		10
5/23/2013		6.25	151		10
6/6/2013		6	387		10
6/17/2013		5	300		10
THIRD QUARTER 2013					
7/16/2013	BH02, BH03, BH04, BH07	6	340	BH02, BH03, BH04, BH07	10
7/30/2013		6	320		10
8/13/2013		6	294		10
8/30/2013		5.5	182		10
9/12/2013		5.5	180		10
9/27/2013		6	80		10

Notes:

psi = pounds per square inch



Surface
Drainage

Private Land

BH07		
Compound (ug/L)	6/20/2013	9/25/2013
Benzene	1.6	<1.0
Toluene	<1.0	<1.0
Ethylbenzene	<1.0	<1.0
Total Xylenes	<1.0	<1.0

BH06		
Compound (ug/L)	6/20/2013	9/25/2013
Benzene	<1.0	1.9
Toluene	<1.0	<1.0
Ethylbenzene	<1.0	<1.0
Total Xylenes	<1.0	<1.0

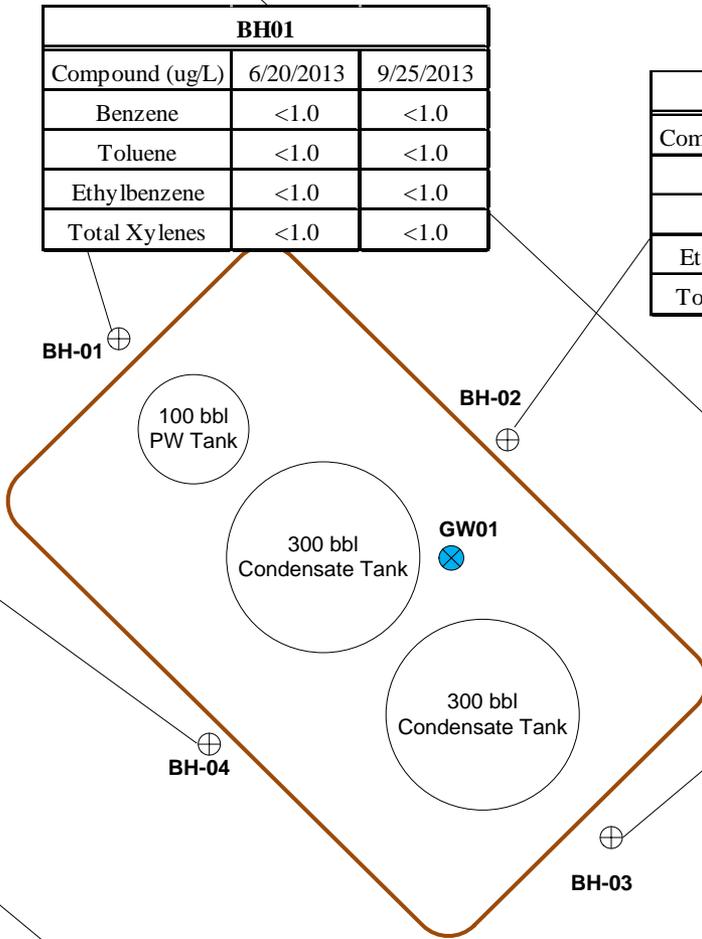
BH01		
Compound (ug/L)	6/20/2013	9/25/2013
Benzene	<1.0	<1.0
Toluene	<1.0	<1.0
Ethylbenzene	<1.0	<1.0
Total Xylenes	<1.0	<1.0

BH02		
Compound (ug/L)	6/20/2013	9/25/2013
Benzene	15	8.6
Toluene	<1.0	<1.0
Ethylbenzene	<1.0	<1.0
Total Xylenes	<1.0	<1.0

BH04		
Compound (ug/L)	6/20/2013	9/25/2013
Benzene	1.3	1.5
Toluene	<1.0	<1.0
Ethylbenzene	5.4	2.5
Total Xylenes	19	<1.0

BH03		
Compound (ug/L)	6/20/2013	9/25/2013
Benzene	11	39
Toluene	<1.0	<1.0
Ethylbenzene	2.1	16
Total Xylenes	<1.0	<1.0

BH05		
Compound (ug/L)	6/20/2013	9/25/2013
Benzene	<1.0	<1.0
Toluene	<1.0	<1.0
Ethylbenzene	<1.0	<1.0
Total Xylenes	<1.0	<1.0



Separator
Secondary
Containment

Native
Vegetation

Irrigation Canal

Flow

Note: Surface drainage is approximated based on visual observation of the tank battery. It is not based on regional topography.

DRAWN BY: ESS
DATE: 10/4/2013

Facility Diagram
PDC Energy – DJ Basin
Cottonwood #1
NESE S13 T6N R66W
Weld County, CO

 6899 Pecos Street
Unit C
Denver, CO 80221

LEGEND
 Earthen Berm
 Temporary Monitoring Well
 Surface Water Sample Location Collected During Excavation Activities
 Groundwater Sample Location Collected During Excavation Activities

FIGURE 2
GROUNDWATER ANALYTICAL RESULTS
Not to Scale

ATTACHMENT A

Summit Scientific

741 Corporate Circle – Suite I ♦ Golden, Colorado 80401

303.277.9310 - laboratory ♦ 303.277.9531 - fax

October 02, 2013

Brandon Bruns
PDC Energy
1775 Sherman St. STE. 3000
Denver, CO 80203
RE: Cottonwood #1

Enclosed are the results of analyses for samples received by Summit Scientific on 09/25/13 16:40. 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: Cottonwood #1
Project Number: [none]
Project Manager: Brandon Bruns

Reported:
10/02/13 11:59

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
BH01	R309219-01	Water	09/25/13 11:40	09/25/13 16:40
BH02	R309219-02	Water	09/25/13 11:45	09/25/13 16:40
BH03	R309219-03	Water	09/25/13 11:50	09/25/13 16:40
BH04	R309219-04	Water	09/25/13 11:55	09/25/13 16:40
BH05	R309219-05	Water	09/25/13 12:00	09/25/13 16:40
BH06	R309219-06	Water	09/25/13 12:05	09/25/13 16:40
BH07	R309219-07	Water	09/25/13 12:10	09/25/13 16:40

Summit Scientific

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

Project: Cottonwood #1

Project Number: [none]
 Project Manager: Brandon Bruns

Reported:
 10/02/13 11:59

R309219
 Summit Scientific

741 Corporate Circle Suite 14 Golden, Colorado 80401
 303-277-8910 • 303-374-9933 Fax

Client: PDC TAsman Page 1 of 1
 Address: _____
 City/State/Zip: _____
 Project Manager: Brandon Bruns
 E-Mail: _____
 Phone: _____
 Project Name: Cottonwood #1
 Fax: _____
 Sampler Name: Eric Siegel
 Project Number: _____

Sample Description	Date Sampled	Time Sampled	Number of Containers	Preservative					Matrix			Analyze For	Special Instructions	Notes	
				HCl	HNO ₃	None	Other (Specify)	Groundwater	Soil	Air - Canister Serial #	Other (Specify)				
BH01	9/25/13	1140	3	X					X						
BH02		1145													
BH03		1150													
BH04		1155													
BH05		1200													
BH06		1205													
BH07		1210													

Requisitioned by: Eric Siegel Date/Time: 9/25/13 1145
 Date/Time Received by: PKS 9/25/13 1614
 Date/Time: _____ Date/Time: _____
 Turn Around Time (Check) Same Day 72 Hours Standard
 48 Hours
 Requisitioned by: _____ Date/Time: _____
 Received in Lab by: _____ Date/Time: _____
 Sample Integrity: Yes No
 Temperature Upon Receipt: 5.2
 Inlet: Yes No

www.SummitScientific.com



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

Project: Cottonwood #1
 Project Number: [none]
 Project Manager: Brandon Bruns

Reported:
 10/02/13 11:59

BH01
R309219-01 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **09/25/13 11:40**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	1.0	ug/l	1	3092803	10/01/13	10/01/13	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	1.0	"	"	"	"	"	"	

Date Sampled: **09/25/13 11:40**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		93.6 %	37-154		"	"	"	"	
Surrogate: Toluene-d8		100 %	45-149		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		102 %	45-146		"	"	"	"	

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

Project: Cottonwood #1

Project Number: [none]
 Project Manager: Brandon Brunns

Reported:
 10/02/13 11:59

BH02
R309219-02 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **09/25/13 11:45**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	8.6	1.0	ug/l	1	3092803	10/01/13	10/01/13	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	1.0	"	"	"	"	"	"	

Date Sampled: **09/25/13 11:45**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<i>Surrogate: 1,2-Dichloroethane-d4</i>		92.0 %	37-154		"	"	"	"	
<i>Surrogate: Toluene-d8</i>		99.7 %	45-149		"	"	"	"	
<i>Surrogate: 4-Bromofluorobenzene</i>		101 %	45-146		"	"	"	"	

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

Project: Cottonwood #1

Project Number: [none]
 Project Manager: Brandon Brunns

Reported:
 10/02/13 11:59

BH03
R309219-03 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **09/25/13 11:50**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	39	1.0	ug/l	1	3092803	10/01/13	10/01/13	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	16	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	1.0	"	"	"	"	"	"	

Date Sampled: **09/25/13 11:50**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		93.5 %	37-154		"	"	"	"	
Surrogate: Toluene-d8		100 %	45-149		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		101 %	45-146		"	"	"	"	

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

Project: Cottonwood #1

Project Number: [none]
 Project Manager: Brandon Bruns

Reported:
 10/02/13 11:59

BH04
R309219-04 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **09/25/13 11:55**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	1.5	1.0	ug/l	1	3092803	10/01/13	10/01/13	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	2.5	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	1.0	"	"	"	"	"	"	

Date Sampled: **09/25/13 11:55**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		92.8 %	37-154		"	"	"	"	
Surrogate: Toluene-d8		100 %	45-149		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		99.1 %	45-146		"	"	"	"	

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

Project: Cottonwood #1

Project Number: [none]
 Project Manager: Brandon Brunns

Reported:
 10/02/13 11:59

BH05
R309219-05 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **09/25/13 12:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	1.0	ug/l	1	3092803	10/01/13	10/01/13	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	1.0	"	"	"	"	"	"	

Date Sampled: **09/25/13 12:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		91.6 %	37-154		"	"	"	"	
Surrogate: Toluene-d8		99.5 %	45-149		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		102 %	45-146		"	"	"	"	

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

Project: Cottonwood #1

Project Number: [none]
 Project Manager: Brandon Brunns

Reported:
 10/02/13 11:59

BH06
R309219-06 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **09/25/13 12:05**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	1.9	1.0	ug/l	1	3092803	10/01/13	10/01/13	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	1.0	"	"	"	"	"	"	

Date Sampled: **09/25/13 12:05**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<i>Surrogate: 1,2-Dichloroethane-d4</i>		92.5 %	37-154		"	"	"	"	
<i>Surrogate: Toluene-d8</i>		101 %	45-149		"	"	"	"	
<i>Surrogate: 4-Bromofluorobenzene</i>		101 %	45-146		"	"	"	"	

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

Project: Cottonwood #1

Project Number: [none]
 Project Manager: Brandon Brunns

Reported:
 10/02/13 11:59

BH07
R309219-07 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **09/25/13 12:10**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	1.0	ug/l	1	3092803	10/01/13	10/01/13	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	1.0	"	"	"	"	"	"	

Date Sampled: **09/25/13 12:10**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		91.8 %	37-154		"	"	"	"	
Surrogate: Toluene-d8		99.5 %	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: Cottonwood #1
Project Number: [none]
Project Manager: Brandon Bruns

Reported:
10/02/13 11:59

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 3092803 - EPA 5030 Water MS

Blank (3092803-BLK1)

Prepared & Analyzed: 09/28/13

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>12.5</i>		<i>"</i>	<i>13.2</i>		<i>94.8</i>	<i>37-154</i>			
<i>Surrogate: Toluene-d8</i>	<i>12.8</i>		<i>"</i>	<i>13.3</i>		<i>96.3</i>	<i>45-149</i>			
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>14.2</i>		<i>"</i>	<i>13.3</i>		<i>107</i>	<i>45-146</i>			

Blank (3092803-BLK2)

Prepared & Analyzed: 09/28/13

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>12.7</i>		<i>"</i>	<i>13.2</i>		<i>96.0</i>	<i>37-154</i>			
<i>Surrogate: Toluene-d8</i>	<i>12.8</i>		<i>"</i>	<i>13.3</i>		<i>95.8</i>	<i>45-149</i>			
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>14.2</i>		<i>"</i>	<i>13.3</i>		<i>106</i>	<i>45-146</i>			

LCS (3092803-BS1)

Prepared & Analyzed: 09/28/13

Benzene	31.7	1.0	ug/l	33.3		95.2	51-132			
Toluene	36.4	1.0	"	33.3		109	51-138			
Ethylbenzene	40.3	1.0	"	33.3		121	58-146			
m,p-Xylene	76.3	2.0	"	66.7		114	57-144			
o-Xylene	39.5	1.0	"	33.3		119	53-146			
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>12.8</i>		<i>"</i>	<i>13.2</i>		<i>96.9</i>	<i>37-154</i>			
<i>Surrogate: Toluene-d8</i>	<i>12.9</i>		<i>"</i>	<i>13.3</i>		<i>96.6</i>	<i>45-149</i>			
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>14.1</i>		<i>"</i>	<i>13.3</i>		<i>106</i>	<i>45-146</i>			

LCS (3092803-BS2)

Prepared: 09/28/13 Analyzed: 09/29/13

Benzene	31.9	1.0	ug/l	33.3		95.8	51-132			
Toluene	37.2	1.0	"	33.3		112	51-138			
Ethylbenzene	40.9	1.0	"	33.3		123	58-146			
m,p-Xylene	77.4	2.0	"	66.7		116	57-144			
o-Xylene	40.0	1.0	"	33.3		120	53-146			
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>12.7</i>		<i>"</i>	<i>13.2</i>		<i>96.3</i>	<i>37-154</i>			
<i>Surrogate: Toluene-d8</i>	<i>12.6</i>		<i>"</i>	<i>13.3</i>		<i>94.9</i>	<i>45-149</i>			
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>14.1</i>		<i>"</i>	<i>13.3</i>		<i>106</i>	<i>45-146</i>			

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

Project: Cottonwood #1

Project Number: [none]
Project Manager: Brandon Bruns

Reported:
10/02/13 11:59

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 3092803 - EPA 5030 Water MS

LCS Dup (3092803-BSD1)

Prepared & Analyzed: 09/28/13

Benzene	32.0	1.0	ug/l	33.3	95.9	51-132	0.816	17	
Toluene	36.8	1.0	"	33.3	110	51-138	1.15	17	
Ethylbenzene	40.1	1.0	"	33.3	120	58-146	0.572	16	
m,p-Xylene	76.4	2.0	"	66.7	115	57-144	0.131	16	
o-Xylene	39.3	1.0	"	33.3	118	53-146	0.635	15	
Surrogate: 1,2-Dichloroethane-d4	13.0		"	13.2	98.2	37-154			
Surrogate: Toluene-d8	12.7		"	13.3	95.3	45-149			
Surrogate: 4-Bromofluorobenzene	14.0		"	13.3	105	45-146			

LCS Dup (3092803-BSD2)

Prepared: 09/28/13 Analyzed: 09/29/13

Benzene	35.0	1.0	ug/l	33.3	105	51-132	9.12	17	
Toluene	40.0	1.0	"	33.3	120	51-138	7.18	17	
Ethylbenzene	40.1	1.0	"	33.3	120	58-146	1.95	16	
m,p-Xylene	76.8	2.0	"	66.7	115	57-144	0.830	16	
o-Xylene	39.1	1.0	"	33.3	117	53-146	2.25	15	
Surrogate: 1,2-Dichloroethane-d4	13.9		"	13.2	105	37-154			
Surrogate: Toluene-d8	13.8		"	13.3	104	45-149			
Surrogate: 4-Bromofluorobenzene	13.8		"	13.3	104	45-146			

Matrix Spike (3092803-MS1)

Source: R309214-03

Prepared: 09/28/13 Analyzed: 09/29/13

Benzene	34.8	1.0	ug/l	33.3	ND	104	34-141		
Toluene	40.2	1.0	"	33.3	ND	120	27-151		
Ethylbenzene	40.2	1.0	"	33.3	ND	121	29-160		
m,p-Xylene	77.2	2.0	"	66.7	ND	116	20-166		
o-Xylene	39.5	1.0	"	33.3	ND	119	33-159		
Surrogate: 1,2-Dichloroethane-d4	13.8		"	13.2	105	37-154			
Surrogate: Toluene-d8	13.7		"	13.3	103	45-149			
Surrogate: 4-Bromofluorobenzene	14.0		"	13.3	105	45-146			

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

Project: Cottonwood #1
Project Number: [none]
Project Manager: Brandon Bruns

Reported:
10/02/13 11:59

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		

Batch 3092803 - EPA 5030 Water MS

Matrix Spike (3092803-MS2)	Source: R309214-04			Prepared: 09/28/13		Analyzed: 09/29/13	
Benzene	32.5	1.0	ug/l	33.3	ND	97.4	34-141
Toluene	37.7	1.0	"	33.3	ND	113	27-151
Ethylbenzene	40.7	1.0	"	33.3	ND	122	29-160
m,p-Xylene	78.0	2.0	"	66.7	ND	117	20-166
o-Xylene	39.8	1.0	"	33.3	ND	119	33-159
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>12.6</i>		<i>"</i>	<i>13.2</i>		<i>95.1</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>14.0</i>		<i>"</i>	<i>13.3</i>		<i>105</i>	<i>45-146</i>

Matrix Spike Dup (3092803-MSD1)	Source: R309214-03			Prepared: 09/28/13		Analyzed: 09/29/13	
Benzene	34.7	1.0	ug/l	33.3	ND	104	34-141 0.230 32
Toluene	40.1	1.0	"	33.3	ND	120	27-151 0.150 25
Ethylbenzene	40.1	1.0	"	33.3	ND	120	29-160 0.299 50
m,p-Xylene	76.4	2.0	"	66.7	ND	115	20-166 0.977 36
o-Xylene	39.0	1.0	"	33.3	ND	117	33-159 1.35 26
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>13.5</i>		<i>"</i>	<i>13.2</i>		<i>102</i>	<i>37-154</i>
<i>Surrogate: Toluene-d8</i>	<i>13.7</i>		<i>"</i>	<i>13.3</i>		<i>103</i>	<i>45-149</i>
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>13.9</i>		<i>"</i>	<i>13.3</i>		<i>104</i>	<i>45-146</i>

Matrix Spike Dup (3092803-MSD2)	Source: R309214-04			Prepared: 09/28/13		Analyzed: 09/29/13	
Benzene	35.6	1.0	ug/l	33.3	ND	107	34-141 9.06 32
Toluene	37.9	1.0	"	33.3	ND	114	27-151 0.555 25
Ethylbenzene	40.4	1.0	"	33.3	ND	121	29-160 0.617 50
m,p-Xylene	77.0	2.0	"	66.7	ND	116	20-166 1.17 36
o-Xylene	39.6	1.0	"	33.3	ND	119	33-159 0.453 26
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>13.7</i>		<i>"</i>	<i>13.2</i>		<i>104</i>	<i>37-154</i>
<i>Surrogate: Toluene-d8</i>	<i>12.8</i>		<i>"</i>	<i>13.3</i>		<i>95.6</i>	<i>45-149</i>
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>14.0</i>		<i>"</i>	<i>13.3</i>		<i>105</i>	<i>45-146</i>

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

Project: Cottonwood #1

Project Number: [none]
Project Manager: Brandon Bruns

Reported:
10/02/13 11:59

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