

**PDC Energy, Inc.**  
First Quarter 2015 Groundwater Monitoring Summary

April 8, 2015

Jerke UP 8-7  
SENE S7 T4N R65W  
Weld County, API # 05-123-13481

This groundwater summary has been prepared by Tasman Geosciences for the Jerke UP 8- 7 tank battery. On January 22, 2015, groundwater samples were collected from nine monitoring wells (BH01 through BH09). 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 the laboratory report is included as Attachment A. Sample locations and corresponding analytical results are illustrated on Figure 1. First quarter analytical results indicated that BTEX concentrations were above COGCC Table 910-1 groundwater standards at monitoring wells BH02 and BH04. BTEX concentrations were below regulatory standards at the remaining seven sampling locations.

Tasman initiated enhanced fluid recovery (EFR) and air sparge (AS) events at the site during the first quarter 2014. A summary of the EFR/AS operational data is provided in Table 2. EFR/AS will remain the selected remediation strategy through the first quarter 2015 to address residual dissolved phase petroleum hydrocarbon impacts on site.

The second quarter 2015 groundwater sampling event will be conducted during April 2015.

**TABLE 1**  
**JERKE UP 8-7**  
**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	11/12/2013	230	370	160	2200	NA
BH01	1/10/2014	270	2,300	390	5,800	7.41
BH01	4/29/2014	19	130	160	3,100	7.52
BH01	7/29/2014	4.3	<1.0	54	450	5.12
BH01	10/27/2014	1.6	<1.0	9.0	43	4.80
BH01	1/22/2015	2.2	2.4	73	690	6.92
BH02	1/10/2014	920	4.8	54	2,300	6.98
BH02	4/29/2014	180	<1.0	67	370	7.13
BH02	7/29/2014	27	<1.0	8.0	49	5.07
BH02	10/27/2014	65	<1.0	20	140	4.42
BH02	1/22/2015	14	<1.0	8.8	65	6.20
BH03	1/10/2014	1.1	1.1	15	240	7.08
BH03	4/29/2014	<1.0	<1.0	2.0	22	7.37
BH03	7/29/2014	<1.0	<1.0	<1.0	3.9	4.59
BH03	10/27/2014	<1.0	<1.0	<1.0	<1.0	4.42
BH03	1/22/2015	<1.0	<1.0	<1.0	<1.0	6.58
BH04	1/10/2014	12,000	7,600	940	14,000	4.35
BH04	4/29/2014	150	1.4	33	330	4.64
BH04	7/29/2014	110	4.0	4.8	31	2.03
BH04	10/27/2014	NS	NS	NS	NS	NM
BH04	1/22/2015	9.5	<1.0	24	320	6.63
BH05	1/10/2014	1,800	240	230	3,100	4.13
BH05	4/29/2014	1.8	<1.0	<1.0	<1.0	4.47
BH05	7/29/2014	<1.0	<1.0	<1.0	<1.0	1.65
BH05	10/27/2014	<1.0	<1.0	<1.0	<1.0	1.52
BH05	1/22/2015	<1.0	<1.0	<1.0	<1.0	3.8
BH06	1/10/2014	<1.0	<1.0	<1.0	<1.0	4.63
BH06	4/29/2014	<1.0	<1.0	<1.0	<1.0	4.66
BH06	7/29/2014	1.3	<1.0	<1.0	<1.0	2.07
BH06	10/27/2014	1.3	<1.0	<1.0	<1.0	1.95
BH06	1/22/2015	<1.0	<1.0	<1.0	<1.0	3.83
BH07	4/29/2014	<1.0	<1.0	<1.0	<1.0	5.51
BH07	7/29/2014	<1.0	<1.0	<1.0	<1.0	2.9
BH07	10/27/2014	<1.0	<1.0	<1.0	<1.0	2.73
BH07	1/22/2015	<1.0	<1.0	<1.0	<1.0	5.51
BH08	4/29/2014	<1.0	<1.0	<1.0	<1.0	7.38

**TABLE 1**  
**JERKE UP 8-7**

**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)
BH08	7/29/2014	<1.0	<1.0	<1.0	<1.0	3.78
BH08	10/27/2014	<1.0	<1.0	<1.0	<1.0	3.04
BH08	1/22/2015	<1.0	<1.0	<1.0	<1.0	5.51
BH09	4/29/2014	<1.0	<1.0	<1.0	<1.0	4.59
BH09	7/29/2014	<1.0	<1.0	<1.0	<1.0	2.00
BH09	10/27/2014	<1.0	<1.0	<1.0	<1.0	1.85
BH09	1/22/2015	<1.0	<1.0	<1.0	<1.0	3.76
<b>COGCC standards for Groundwater (ug/L) <sup>(1)</sup></b>		<b>5</b>	<b>560</b>	<b>700</b>	<b>1,400</b>	

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.

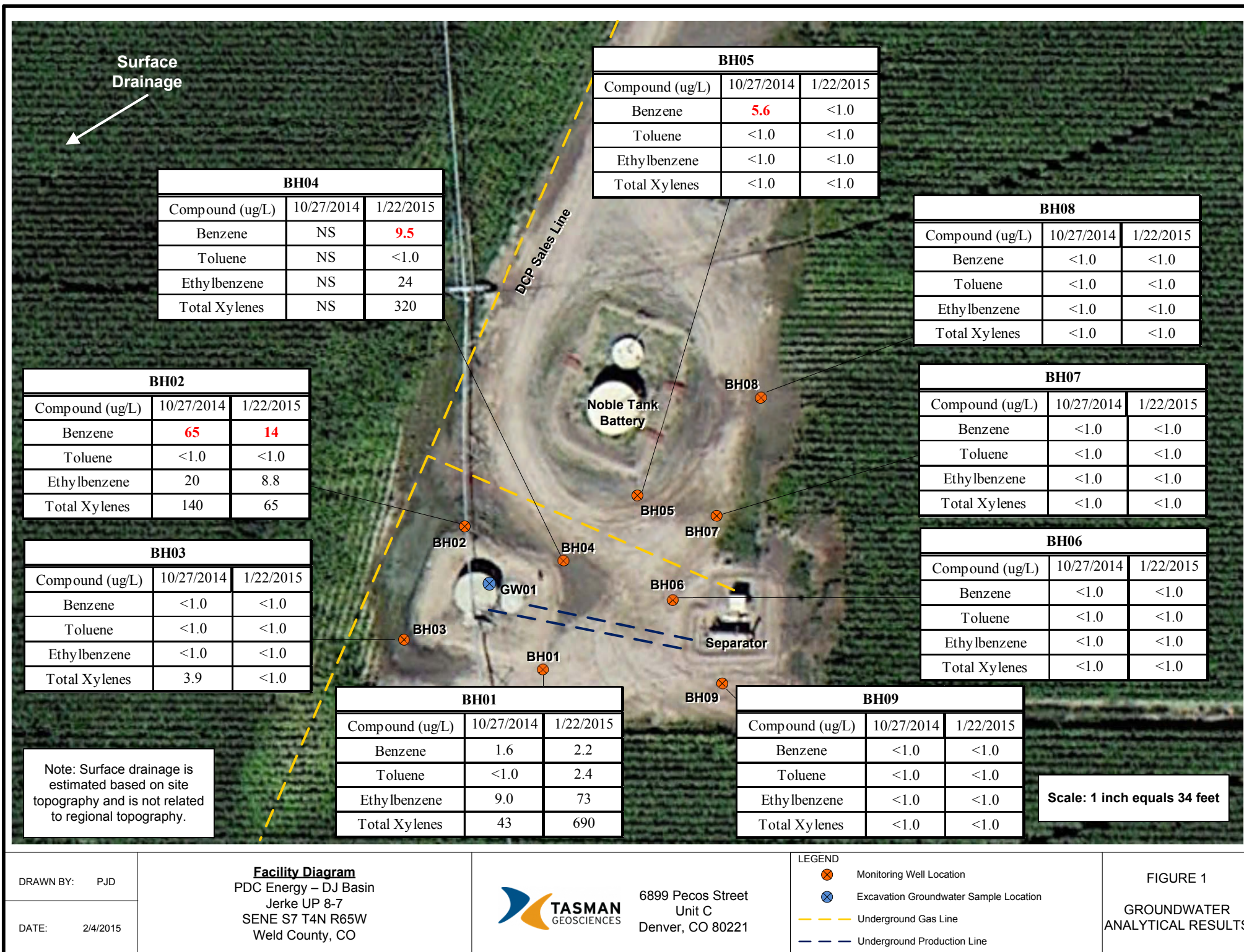
ug/L= Micrograms per liter

NM - Not Measured

NS - Not Sampled

**TABLE 2**  
**JERKE UP 8-7**  
**AIR SPARGE / EFR 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 2014						
1/30/2014	BH01, BH02, BH04, BH05	6	90	BH01, BH02, BH04, BH05	10	8.3333333
2/25/2014		5	0		10	
Quarterly Totals		11	90		-	
Second Quarter 2014						
4/7/2014	BH01, BH02, BH03, BH04, BH05	6	120	BH01, BH02, BH03, BH04, BH05	10	37
4/21/2014		6.5	120		20	47
5/9/2014		8	90		20	35
5/23/2014		6	20		20	24
6/9/2014		6	20		20	20
Quarterly Totals		32.5	370		-	
Third Quarter 2014						
7/2/2014	BH01, BH02, BH03, BH04, BH05	7	150	BH01, BH02, BH03, BH04, BH05	25	42
7/18/2014		6	0		15	13.5
9/25/2014		6	100		20	20
Quarterly Totals		19	250		-	
Fourth Quarter 2014						
10/17/2014	BH01, BH02, BH03, BH04, BH05	6	225	BH01, BH02, BH03, BH04, BH05	15	17.5
11/3/2014		6	50		20	30
11/18/2014		6	80		0	30
12/7/2014		6	100		20	31.2
12/20/2014		6	75		20	26
Quarterly Totals		30	530		-	
First Quarter 2015						
1/9/2015	BH01, BH02, BH03, BH04, BH05	6	0	BH01, BH02, BH03, BH04, BH05	20	25
Quarterly Totals		6	0		-	



## **ATTACHMENT A**

# Summit Scientific

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741 Corporate Circle – Suite J ♦ Golden, Colorado 80401

303.277.9310 - laboratory ♦ 303.374.5933 - fax

January 26, 2015

Brandon Bruns  
PDC Energy  
1775 Sherman St. STE. 3000  
Denver, CO 80203  
RE: Jerke Up 8-7

Enclosed are the results of analyses for samples received by Summit Scientific on 01/22/15 17:30. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

A handwritten signature in black ink, appearing to read "Joseph J. Egry IV". The signature is fluid and cursive, with a small "IV" at the end.

Joseph J Egry IV For Paul Shrewsbury  
President

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

Project: Jerke Up 8-7  
Project Number: [none]  
Project Manager: Brandon Bruns

**Reported:**  
01/26/15 14:49

### ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
BH01	1501149-01	Water	01/22/15 14:00	01/22/15 17:30
BH02	1501149-02	Water	01/22/15 14:10	01/22/15 17:30
BH03	1501149-03	Water	01/22/15 14:16	01/22/15 17:30
BH04	1501149-04	Water	01/22/15 14:22	01/22/15 17:30
BH05	1501149-05	Water	01/22/15 14:30	01/22/15 17:30
BH06	1501149-06	Water	01/22/15 14:40	01/22/15 17:30
BH07	1501149-07	Water	01/22/15 14:48	01/22/15 17:30
BH08	1501149-08	Water	01/22/15 14:55	01/22/15 17:30
BH09	1501149-09	Water	01/22/15 15:00	01/22/15 17:30

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Summit Scientific

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Joseph J Egry IV For Paul Shrewsbury, President



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

Project: Jerke Up 8-7  
Project Number: [none]  
Project Manager: Brandon Bruns

Reported:  
01/26/15 14:49

# Summit Scientific

1501149

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

Client: PDC Energy  
Address: \_\_\_\_\_  
City/State/Zip: \_\_\_\_\_  
Phone: \_\_\_\_\_ Fax: \_\_\_\_\_  
Sampler Name: DON BRUNS

Page 1 of 1

Project Manager: Brandon Bruns  
E-Mail: Brandon.Bruns@PDC.com  
Project Name: Jerke Up 8-7  
Project Number: \_\_\_\_\_

Sample Description	Date Sampled	Time Sampled	Number of Containers	Preservative					Matrix			Analyze For:				Special Instructions
				HCl	HNO <sub>3</sub>	None	Other (Specify)	Groundwater	Soil	Air - Canister Serial #	Other (Specify)					
BNO1	1/22	1400	3	X				X			X	BTEX (9260B)				
BNO2		1410														
BNO3		1416														
BNO4		1422														
BNO5		1430														
BNO6		1440														
BNO7		1448														
BNO8		1455														
BNO9	↓	1500	↓	↓				↓			↓					

Relinquished by: <u>[Signature]</u>	Date/Time: <u>1/22/15 1730</u>	Received by: <u>[Signature]</u>	Date/Time: <u>1/22/15 1730</u>	Turn Around Time (Check)	Notes:
Relinquished by:	Date/Time:	Received by:	Date/Time:	Same Day <input type="checkbox"/>	72 Hours <input type="checkbox"/> 24 Hours <input type="checkbox"/> 48 Hours <input type="checkbox"/> Standard <input checked="" type="checkbox"/>
Relinquished by:	Date/Time:	Received in Lab by:	Date/Time:	Sample Integrity:	
				Temperature Upon Receipt: _____ Intact: Yes No	

Soil samples reported on a wet-weight basis unless otherwise indicated on results page.

Summit Scientific

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Joseph J Egry IV For Paul Shrewsbury, President



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

Project: Jerke Up 8-7  
Project Number: [none]  
Project Manager: Brandon Bruns

Reported:  
01/26/15 14:49

# Sample Receipt Checklist

S2 Work Order: 1501149

Client: PDC Energy Client Project ID: Jerke up 8-7

Shipped Via: Pick-up (UPS, FedEx, Hand Delivered, Pick-up, etc.) Airbill #: \_\_\_\_\_

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

Cooler ID	<u>1</u>				
Temp (°C)	<u>5.2°C</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"/>			HCl
Note the type of preservative in the Comments column – HCl, H2SO4, NaOH, etc.				
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.

Mindy MacL  
Custodian Printed Name

[Signature]  
Signature or Initials of Custodian

1/23/15  
Date/Time

Soil samples reported on a wet-weight basis unless otherwise indicated on results page.

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[Signature]

Joseph J Egry IV For Paul Shrewsbury, President



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

Project: Jerke Up 8-7  
Project Number: [none]  
Project Manager: Brandon Brunns

**Reported:**  
01/26/15 14:49

**BH01**  
**1501149-01 (Water)**

**Summit Scientific**

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

Date Sampled: **01/22/15 14:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>Benzene</b>	<b>2.2</b>	1.0	ug/l	1	1501221	01/23/15	01/23/15 21:28	EPA 8260B	
<b>Toluene</b>	<b>2.4</b>	1.0	"	"	"	"	"	"	
<b>Ethylbenzene</b>	<b>73</b>	1.0	"	"	"	"	"	"	
<b>Xylenes (total)</b>	<b>690</b>	1.0	"	"	"	"	"	"	

Date Sampled: **01/22/15 14:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4	104 %	37-154			"	"	"	"	
Surrogate: Toluene-d8	95.4 %	45-149			"	"	"	"	
Surrogate: 4-Bromofluorobenzene	93.8 %	45-146			"	"	"	"	

Summit Scientific

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

Project: Jerke Up 8-7  
Project Number: [none]  
Project Manager: Brandon Bruns

**Reported:**  
01/26/15 14:49

**BH02**  
**1501149-02 (Water)**

**Summit Scientific**

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

Date Sampled: **01/22/15 14:10**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>Benzene</b>	<b>14</b>	1.0	ug/l	1	1501221	01/24/15	01/24/15 00:43	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
<b>Ethylbenzene</b>	<b>8.8</b>	1.0	"	"	"	"	"	"	
<b>Xylenes (total)</b>	<b>65</b>	1.0	"	"	"	"	"	"	

Date Sampled: **01/22/15 14:10**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4	104 %	37-154			"	"	"	"	
Surrogate: Toluene-d8	97.0 %	45-149			"	"	"	"	
Surrogate: 4-Bromofluorobenzene	96.0 %	45-146			"	"	"	"	

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

Project: Jerke Up 8-7  
Project Number: [none]  
Project Manager: Brandon Brunns

**Reported:**  
01/26/15 14:49

**BH03**  
**1501149-03 (Water)**

**Summit Scientific**

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

Date Sampled: **01/22/15 14:16**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	1.0	ug/l	1	1501221	01/24/15	01/24/15 01:08	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	1.0	"	"	"	"	"	"	

Date Sampled: **01/22/15 14:16**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4	102 %	37-154			"	"	"	"	
Surrogate: Toluene-d8	94.3 %	45-149			"	"	"	"	
Surrogate: 4-Bromofluorobenzene	97.1 %	45-146			"	"	"	"	

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

Project: Jerke Up 8-7  
Project Number: [none]  
Project Manager: Brandon Bruns

**Reported:**  
01/26/15 14:49

**BH04**  
**1501149-04 (Water)**

**Summit Scientific**

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

Date Sampled: **01/22/15 14:22**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>Benzene</b>	<b>9.5</b>	1.0	ug/l	1	1501221	01/24/15	01/24/15 01:32	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
<b>Ethylbenzene</b>	<b>24</b>	1.0	"	"	"	"	"	"	
<b>Xylenes (total)</b>	<b>320</b>	1.0	"	"	"	"	"	"	

Date Sampled: **01/22/15 14:22**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4	103 %	37-154			"	"	"	"	
Surrogate: Toluene-d8	97.5 %	45-149			"	"	"	"	
Surrogate: 4-Bromofluorobenzene	93.0 %	45-146			"	"	"	"	

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

Project: Jerke Up 8-7  
Project Number: [none]  
Project Manager: Brandon Brunns

**Reported:**  
01/26/15 14:49

**BH05**  
**1501149-05 (Water)**

**Summit Scientific**

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

Date Sampled: **01/22/15 14:30**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	1.0	ug/l	1	1501221	01/24/15	01/24/15 01:57	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	1.0	"	"	"	"	"	"	

Date Sampled: **01/22/15 14:30**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4	99.6 %	37-154			"	"	"	"	
Surrogate: Toluene-d8	93.5 %	45-149			"	"	"	"	
Surrogate: 4-Bromofluorobenzene	98.0 %	45-146			"	"	"	"	

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

Project: Jerke Up 8-7  
Project Number: [none]  
Project Manager: Brandon Brunns

**Reported:**  
01/26/15 14:49

**BH06**  
**1501149-06 (Water)**

**Summit Scientific**

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

Date Sampled: **01/22/15 14:40**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	1.0	ug/l	1	1501221	01/24/15	01/24/15 02:21	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	1.0	"	"	"	"	"	"	

Date Sampled: **01/22/15 14:40**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4	110 %	37-154			"	"	"	"	
Surrogate: Toluene-d8	94.1 %	45-149			"	"	"	"	
Surrogate: 4-Bromofluorobenzene	98.2 %	45-146			"	"	"	"	

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

Project: Jerke Up 8-7  
Project Number: [none]  
Project Manager: Brandon Bruns

**Reported:**  
01/26/15 14:49

**BH07**  
**1501149-07 (Water)**

**Summit Scientific**

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

Date Sampled: **01/22/15 14:48**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	1.0	ug/l	1	1501221	01/24/15	01/24/15 02:46	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	1.0	"	"	"	"	"	"	

Date Sampled: **01/22/15 14:48**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4	111 %	37-154			"	"	"	"	
Surrogate: Toluene-d8	94.9 %	45-149			"	"	"	"	
Surrogate: 4-Bromofluorobenzene	98.0 %	45-146			"	"	"	"	

Summit Scientific

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Joseph J Egry IV For Paul Shrewsbury, President



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

Project: Jerke Up 8-7  
Project Number: [none]  
Project Manager: Brandon Bruns

**Reported:**  
01/26/15 14:49

**BH08**  
**1501149-08 (Water)**

**Summit Scientific**

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

Date Sampled: **01/22/15 14:55**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	1.0	ug/l	1	1501221	01/24/15	01/24/15 03:10	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	1.0	"	"	"	"	"	"	

Date Sampled: **01/22/15 14:55**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4	107 %	37-154			"	"	"	"	
Surrogate: Toluene-d8	95.0 %	45-149			"	"	"	"	
Surrogate: 4-Bromofluorobenzene	98.5 %	45-146			"	"	"	"	

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PDC Energy  
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Denver CO, 80203

Project: Jerke Up 8-7  
Project Number: [none]  
Project Manager: Brandon Bruns

**Reported:**  
01/26/15 14:49

**BH09**  
**1501149-09 (Water)**

**Summit Scientific**

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

Date Sampled: **01/22/15 15:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	1.0	ug/l	1	1501221	01/24/15	01/24/15 03:35	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	1.0	"	"	"	"	"	"	

Date Sampled: **01/22/15 15:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4	102 %	37-154			"	"	"	"	
Surrogate: Toluene-d8	93.6 %	45-149			"	"	"	"	
Surrogate: 4-Bromofluorobenzene	97.7 %	45-146			"	"	"	"	

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

Project: Jerke Up 8-7  
Project Number: [none]  
Project Manager: Brandon Bruns

Reported:  
01/26/15 14:49

**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 1501221 - EPA 5030 Water MS**

**Blank (1501221-BLK1)**

Prepared & Analyzed: 01/23/15

Benzene	ND	1.0	ug/l							
Toluene	ND	1.0	"							
Ethylbenzene	ND	1.0	"							
Xylenes (total)	ND	1.0	"							
Surrogate: 1,2-Dichloroethane-d4	13.2		"	13.2		99.8	37-154			
Surrogate: Toluene-d8	12.6		"	13.3		94.6	45-149			
Surrogate: 4-Bromofluorobenzene	13.2		"	13.3		98.8	45-146			

**LCS (1501221-BS1)**

Prepared & Analyzed: 01/23/15

Benzene	24.5	1.0	ug/l	33.3		73.5	51-132			
Toluene	28.2	1.0	"	33.3		84.6	51-138			
Ethylbenzene	32.7	1.0	"	33.1		98.9	58-146			
m,p-Xylene	64.6	2.0	"	66.5		97.0	57-144			
o-Xylene	34.0	1.0	"	32.8		104	53-146			
Surrogate: 1,2-Dichloroethane-d4	13.4		"	13.2		102	37-154			
Surrogate: Toluene-d8	12.7		"	13.3		95.2	45-149			
Surrogate: 4-Bromofluorobenzene	12.7		"	13.3		95.0	45-146			

**Matrix Spike (1501221-MS1)**

Source: 1501149-01

Prepared & Analyzed: 01/23/15

Benzene	27.1	1.0	ug/l	33.3	2.21	74.7	34-141			
Toluene	30.8	1.0	"	33.3	2.45	85.1	27-151			
Ethylbenzene	97.5	1.0	"	33.1	72.8	74.8	29-160			
m,p-Xylene	635	2.0	"	66.5	620	22.7	20-166			
o-Xylene	100	1.0	"	32.8	73.6	80.4	33-159			
Surrogate: 1,2-Dichloroethane-d4	13.6		"	13.2		103	37-154			
Surrogate: Toluene-d8	13.1		"	13.3		98.2	45-149			
Surrogate: 4-Bromofluorobenzene	12.4		"	13.3		92.8	45-146			

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Project: Jerke Up 8-7  
Project Number: [none]  
Project Manager: Brandon Bruns

Reported:  
01/26/15 14:49

**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 1501221 - EPA 5030 Water MS**

Matrix Spike Dup (1501221-MSD1)	Source: 1501149-01			Prepared & Analyzed: 01/23/15						
Benzene	26.7	1.0	ug/l	33.3	2.21	73.5	34-141	1.52	32	
Toluene	30.8	1.0	"	33.3	2.45	85.2	27-151	0.130	25	
Ethylbenzene	92.7	1.0	"	33.1	72.8	60.3	29-160	5.03	50	
m,p-Xylene	618	2.0	"	66.5	620	NR	20-166	2.75	36	QM-4X
o-Xylene	96.2	1.0	"	32.8	73.6	68.9	33-159	3.85	26	
Surrogate: 1,2-Dichloroethane-d4	13.3		"	13.2		101	37-154			
Surrogate: Toluene-d8	13.0		"	13.3		97.5	45-149			
Surrogate: 4-Bromofluorobenzene	12.6		"	13.3		94.3	45-146			

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Project: Jerke Up 8-7  
Project Number: [none]  
Project Manager: Brandon Bruns

**Reported:**  
01/26/15 14:49

### 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

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