



PDC Energy, Inc.
Fourth Quarter 2013 Groundwater Monitoring Summary

January 10, 2014

H&S (Mineral) #1 Tank Battery
NWSW S6 T4N R65W
Weld County, API # 05-123-14802

This groundwater summary has been prepared by Tasman Geosciences, LLC for the H&S (Mineral) #1 tank battery. On July 11, 2013, eight temporary wells were installed for groundwater monitoring and remediation purposes. Fourth quarter groundwater sampling was conducted on October 31, 2013 at the eight 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 fourth quarter 2013 analytical results are illustrated on Figure 1. Fourth quarter analytical results indicate that BTEX concentrations are in exceedance of COGCC regulatory limits at three of the eight monitoring well locations. Constituent concentrations remain below detection limits at the two point of compliance (POC) well locations.

Tasman initiated 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 will remain the selected remediation strategy through the first quarter 2014 to address residual dissolved phase petroleum hydrocarbon impacts on site.

The first quarter 2014 groundwater sampling event will be conducted during January 2014.

TABLE 1
H&S (MINERAL) #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)
BH01	7/25/2013	6700	6200	1100	19000	16.53
BH01	8/31/2013	1700	1800	170	4400	15.65
BH02	7/25/2013	3300	4700	2100	36000	17.63
BH02	8/31/2013	770	24	39	3300	16.75
BH03	7/25/2013	760	4400	1300	23000	15.98
BH03	8/31/2013	3.6	8.6	2.2	100	15.15
BH04	7/25/2013	1700	170	1200	19000	15.91
BH04	8/31/2013	2500	140	620	13000	15.09
BH05	7/25/2013	17	3300	930	15000	13.07
BH05	8/31/2013	<1.0	<1.0	2	85	12.01
BH06	7/25/2013	1.9	12	3100	46000	13.47
BH06	8/31/2013	<1.0	<1.0	1.9	57	12.46
BH07	7/25/2013	<1.0	<1.0	<1.0	<1.0	15.33
BH07	8/31/2013	<1.0	<1.0	<1.0	<1.0	14.31
BH08	7/25/2013	<1.0	<1.0	<1.0	<1.0	13.47
BH08	8/31/2013	<1.0	<1.0	<1.0	<1.0	12.41
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

NR - Not Recorded

TABLE 2
H&S (MINERAL) #1
AIR SPARGE/ EFR OPERATIONAL SUMMARY TABLE

Third Quarter 2013					
Date	EFR Wells	Total EFR/AS Duration (hours)	Approximate Gallons Extracted	AS Wells	Injection Pressure (psi)
8/6/2013	BH01, BH02, BH03, BH04, BH05, BH06	6	50	BH01, BH02, BH03, BH05, BH06	10
8/19/2013		6	80		10
9/8/2013		6	21		10
9/16/2013		6	80		10
9/30/2013		5	90		15
Totals		29	321		-
Fourth Quarter 2013					
10/11/2013	BH01, BH02, BH03,	6	80	BH01, BH02, BH03,	10
10/24/2013	BH04, BH05, BH06	6	110	BH05, BH06	12
Totals		12	190		-



BH03		
Compound (ug/L)	7/25/2013	10/31/2013
Benzene	760	3.6
Toluene	4,400	8.6
Ethylbenzene	1,300	2.2
Total Xylenes	23,000	100

BH02		
Compound (ug/L)	7/25/2013	10/31/2013
Benzene	3,300	770
Toluene	4,700	24
Ethylbenzene	2,100	39
Total Xylenes	36,000	3300

Surface
Drainage

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

Fence Line

Steep Grade

Immobile Magna Equipment

BH02

Above Ground Gas Line

M

Separator 10 bbl

100 bbl
PW tank

300 bbl Oil
Tank

BH03

BH01

BH04

DCP Buried Gas Line

Flow Line

BH07

BH01		
Compound (ug/L)	7/25/2013	10/31/2013
Benzene	6,700	1700
Toluene	6,200	1800
Ethylbenzene	1,100	170
Total Xylenes	19,000	4400

BH05

BH06

BH04		
Compound (ug/L)	7/25/2013	10/31/2013
Benzene	1,700	2500
Toluene	170	140
Ethylbenzene	1,200	620
Total Xylenes	19,000	13000

BH05		
Compound (ug/L)	7/25/2013	10/31/2013
Benzene	17	<1.0
Toluene	3,300	<1.0
Ethylbenzene	930	2
Total Xylenes	15,000	85

BH08		
Compound (ug/L)	7/25/2013	10/31/2013
Benzene	<1.0	<1.0
Toluene	<1.0	<1.0
Ethylbenzene	<1.0	<1.0
Total Xylenes	<1.0	<1.0

Wellhead

BH08

BH06		
Compound (ug/L)	7/25/2013	10/31/2013
Benzene	1.9	<1.0
Toluene	12	<1.0
Ethylbenzene	3,100	1.9
Total Xylenes	46,000	57

BH07		
Compound (ug/L)	7/25/2013	10/31/2013
Benzene	<1.0	<1.0
Toluene	<1.0	<1.0
Ethylbenzene	<1.0	<1.0
Total Xylenes	<1.0	<1.0

DRAWN BY: BAM

DATE: 11/20/2013

Facility Diagram
PDC Energy – DJ Basin
H&S (Mineral) #1
NWSW S6 T4N R65W
Weld County, CO



6899 Pecos Street
Unit C
Denver, CO 80221

LEGEND

- Earthen Berm
- Approximate Area of Excavation
- Temporary Monitoring Well
- Temporary Monitoring Well – SVE Screen
- Horizontal Remediation Pipe
- M Meter House

FIGURE 1

GROUNDWATER
ANALYTICAL RESULTS
MAP
Not to Scale

ATTACHMENT A

Summit Scientific

741 Corporate Circle – Suite I ♦ Golden, Colorado 80401

303.277.9310 - laboratory ♦ 303.277.9531 - fax

November 07, 2013

Brandon Bruns
PDC Energy
1775 Sherman St. STE. 3000
Denver, CO 80203
RE: H&S Mineral #1

Enclosed are the results of analyses for samples received by Summit Scientific on 10/31/13 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 be 'BS' with a long, sweeping horizontal line extending to the right.

Ben Shrewsbury
President / Laboratory Manager



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

Project: H&S Mineral #1
Project Number: [none]
Project Manager: Brandon Brunns

Reported:
11/07/13 18:22

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
BH01	R310334-01	Water	10/31/13 13:15	10/31/13 17:00
BH02	R310334-02	Water	10/31/13 13:20	10/31/13 17:00
BH03	R310334-03	Water	10/31/13 13:25	10/31/13 17:00
BH04	R310334-04	Water	10/31/13 13:30	10/31/13 17:00
BH05	R310334-05	Water	10/31/13 13:35	10/31/13 17:00
BH06	R310334-06	Water	10/31/13 13:40	10/31/13 17:00
BH07	R310334-07	Water	10/31/13 13:45	10/31/13 17:00
BH08	R310334-08	Water	10/31/13 13:50	10/31/13 17:00

Summit Scientific

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

Project: H&S Mineral #1

Project Number: [none]
Project Manager: Brandon Bruns

Reported:
11/07/13 18:22

R310334

Summit Scientific

741 Corporate Circle Suite 1 • Golden, Colorado 80401
303-277-9310 • 303-374-9333 Fax

Client: PDC/Tasman Page 1 of 1
Address: _____
City/State/Zip: _____
Phone: _____
Fax: _____
Project Manager: Brandon Bruns
E-Mail: _____
Project Name: H&S (Mineral) #1
Project Number: _____

Sample Description	Date Sampled	Time Sampled	Number of Containers	Preservative				Matrix				Analyze For:	Special Instructions	
				HCl	HNO ₃	None	Other (Specify)	Groundwater	Soil	Air - Canister Serial #	Other (Specify)			
B401	10/31/13	1315	3	X										
B402	10/31/13	1320												
B403	10/31/13	1325												
B404	10/31/13	1330												
B405	10/31/13	1335												
B406	10/31/13	1340												
B407	10/31/13	1345												
B408	10/31/13	1350	1											
Retransmitted by: <u>G. J. Taylor</u> Date/Time: <u>10/31/13 1700</u>				Received by: <u>[Signature]</u> Date/Time: <u>10/31/13 1700</u>				Turn Around Time (Check): <input type="checkbox"/> Same Day <input type="checkbox"/> 24 Hours <input checked="" type="checkbox"/> 72 Hours				Notes:		
Retransmitted by: _____ Date/Time: _____				Received in Lab by: _____ Date/Time: _____				Sample Integrity: <input checked="" type="checkbox"/> Intact <input type="checkbox"/> No						

www.summitscientific.com

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

Project: H&S Mineral #1
Project Number: [none]
Project Manager: Brandon Bruns

Reported:
11/07/13 18:22

BH01
R310334-01 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **10/31/13 13:15**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Benzene	1700	100		ug/l	100	3110508	11/06/13	11/06/13	EPA 8260B	
Toluene	1800	100		"	"	"	"	"	"	
Ethylbenzene	170	100		"	"	"	"	"	"	
Xylenes (total)	4400	100		"	"	"	"	"	"	

Date Sampled: **10/31/13 13:15**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
<i>Surrogate: 1,2-Dichloroethane-d4</i>		104 %		37-154		"	"	"	"	
<i>Surrogate: Toluene-d8</i>		101 %		45-149		"	"	"	"	
<i>Surrogate: 4-Bromofluorobenzene</i>		100 %		45-146		"	"	"	"	

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

Project: H&S Mineral #1
Project Number: [none]
Project Manager: Brandon Brunns

Reported:
11/07/13 18:22

BH02
R310334-02 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **10/31/13 13:20**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Benzene	770	100		ug/l	100	3110508	11/06/13	11/06/13	EPA 8260B	
Toluene	24	1.0		"	1	"	"	"	"	
Ethylbenzene	39	1.0		"	"	"	"	"	"	
Xylenes (total)	3300	100		"	100	"	"	"	"	

Date Sampled: **10/31/13 13:20**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
<i>Surrogate: 1,2-Dichloroethane-d4</i>		107 %		37-154		"	"	"	"	
<i>Surrogate: Toluene-d8</i>		104 %		45-149		"	"	"	"	
<i>Surrogate: 4-Bromofluorobenzene</i>		99.0 %		45-146		"	"	"	"	

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

Project: H&S Mineral #1
Project Number: [none]
Project Manager: Brandon Brunns

Reported:
11/07/13 18:22

BH03
R310334-03 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **10/31/13 13:25**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	3.6	1.0	ug/l	1	3110508	11/06/13	11/06/13	EPA 8260B	
Toluene	8.6	1.0	"	"	"	"	"	"	
Ethylbenzene	2.2	1.0	"	"	"	"	"	"	
Xylenes (total)	100	1.0	"	"	"	"	"	"	

Date Sampled: **10/31/13 13:25**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<i>Surrogate: 1,2-Dichloroethane-d4</i>		99.4 %	37-154		"	"	"	"	
<i>Surrogate: Toluene-d8</i>		99.4 %	45-149		"	"	"	"	
<i>Surrogate: 4-Bromofluorobenzene</i>		97.4 %	45-146		"	"	"	"	

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

Project: H&S Mineral #1
Project Number: [none]
Project Manager: Brandon Brunns

Reported:
11/07/13 18:22

BH04
R310334-04 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **10/31/13 13:30**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Benzene	2500	100		ug/l	100	3110508	11/06/13	11/06/13	EPA 8260B	
Toluene	140	100		"	"	"	"	"	"	
Ethylbenzene	620	100		"	"	"	"	"	"	
Xylenes (total)	13000	100		"	"	"	"	"	"	

Date Sampled: **10/31/13 13:30**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
<i>Surrogate: 1,2-Dichloroethane-d4</i>		103 %		37-154		"	"	"	"	
<i>Surrogate: Toluene-d8</i>		99.9 %		45-149		"	"	"	"	
<i>Surrogate: 4-Bromofluorobenzene</i>		97.4 %		45-146		"	"	"	"	

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

Project: H&S Mineral #1
Project Number: [none]
Project Manager: Brandon Brunns

Reported:
11/07/13 18:22

BH05
R310334-05 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **10/31/13 13:35**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Benzene	ND	1.0	ug/l	1	3110508	11/06/13	11/06/13	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	2.0	1.0	"	"	"	"	"	"	
Xylenes (total)	85	1.0	"	"	"	"	"	"	

Date Sampled: **10/31/13 13:35**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Surrogate: 1,2-Dichloroethane-d4		101 %	37-154		"	"	"	"	
Surrogate: Toluene-d8		99.8 %	45-149		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		97.1 %	45-146		"	"	"	"	

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

Project: H&S Mineral #1
Project Number: [none]
Project Manager: Brandon Brunns

Reported:
11/07/13 18:22

BH06
R310334-06 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **10/31/13 13:40**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Benzene	ND	1.0	ug/l	1	3110508	11/06/13	11/06/13	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	1.9	1.0	"	"	"	"	"	"	
Xylenes (total)	57	1.0	"	"	"	"	"	"	

Date Sampled: **10/31/13 13:40**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Surrogate: 1,2-Dichloroethane-d4		98.2 %	37-154		"	"	"	"	
Surrogate: Toluene-d8		98.6 %	45-149		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		98.0 %	45-146		"	"	"	"	

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1775 Sherman St. STE. 3000
Denver CO, 80203

Project: H&S Mineral #1
Project Number: [none]
Project Manager: Brandon Brunns

Reported:
11/07/13 18:22

BH07
R310334-07 (Water)

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Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **10/31/13 13:45**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Benzene	ND	1.0		ug/l	1	3110508	11/06/13	11/06/13	EPA 8260B	
Toluene	ND	1.0		"	"	"	"	"	"	
Ethylbenzene	ND	1.0		"	"	"	"	"	"	
Xylenes (total)	ND	1.0		"	"	"	"	"	"	

Date Sampled: **10/31/13 13:45**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Surrogate: 1,2-Dichloroethane-d4		106 %		37-154		"	"	"	"	
Surrogate: Toluene-d8		99.3 %		45-149		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		101 %		45-146		"	"	"	"	

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

Project: H&S Mineral #1
Project Number: [none]
Project Manager: Brandon Brunns

Reported:
11/07/13 18:22

BH08
R310334-08 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **10/31/13 13:50**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Benzene	ND	1.0		ug/l	1	3110508	11/06/13	11/06/13	EPA 8260B	
Toluene	ND	1.0		"	"	"	"	"	"	
Ethylbenzene	ND	1.0		"	"	"	"	"	"	
Xylenes (total)	ND	1.0		"	"	"	"	"	"	

Date Sampled: **10/31/13 13:50**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Surrogate: 1,2-Dichloroethane-d4		102 %		37-154		"	"	"	"	
Surrogate: Toluene-d8		99.8 %		45-149		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		99.4 %		45-146		"	"	"	"	

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

Project: H&S Mineral #1
Project Number: [none]
Project Manager: Brandon Bruns

Reported:
11/07/13 18:22

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 3110508 - EPA 5030 Water MS

Blank (3110508-BLK1)

Prepared & Analyzed: 11/05/13

Benzene	ND	1.0	ug/l							
Toluene	ND	1.0	"							
Ethylbenzene	ND	1.0	"							
Xylenes (total)	ND	1.0	"							
Surrogate: 1,2-Dichloroethane-d4	13.6		"	13.2	102	37-154				
Surrogate: Toluene-d8	13.0		"	13.3	97.7	45-149				
Surrogate: 4-Bromofluorobenzene	13.3		"	13.3	100	45-146				

LCS (3110508-BS1)

Prepared & Analyzed: 11/05/13

Benzene	32.9	1.0	ug/l	33.3	98.7	51-132				
Toluene	33.6	1.0	"	33.3	101	51-138				
Ethylbenzene	34.7	1.0	"	33.3	104	58-146				
m,p-Xylene	67.7	2.0	"	66.7	102	57-144				
o-Xylene	33.1	1.0	"	33.3	99.2	53-146				
Surrogate: 1,2-Dichloroethane-d4	13.6		"	13.2	102	37-154				
Surrogate: Toluene-d8	13.4		"	13.3	100	45-149				
Surrogate: 4-Bromofluorobenzene	13.1		"	13.3	98.0	45-146				

LCS (3110508-BS2)

Prepared & Analyzed: 11/05/13

Benzene	32.9	1.0	ug/l	33.3	98.8	51-132				
Toluene	33.6	1.0	"	33.3	101	51-138				
Ethylbenzene	35.3	1.0	"	33.3	106	58-146				
m,p-Xylene	69.1	2.0	"	66.7	104	57-144				
o-Xylene	34.0	1.0	"	33.3	102	53-146				
Surrogate: 1,2-Dichloroethane-d4	13.5		"	13.2	102	37-154				
Surrogate: Toluene-d8	13.4		"	13.3	101	45-149				
Surrogate: 4-Bromofluorobenzene	13.2		"	13.3	98.9	45-146				

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

Project: H&S Mineral #1
Project Number: [none]
Project Manager: Brandon Brunns

Reported:
11/07/13 18:22

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 3110508 - EPA 5030 Water MS

LCS Dup (3110508-BSD1)

Prepared & Analyzed: 11/05/13

Benzene	33.1	1.0	ug/l	33.3		99.3	51-132	0.606	17	
Toluene	33.6	1.0	"	33.3		101	51-138	0.0298	17	
Ethylbenzene	34.9	1.0	"	33.3		105	58-146	0.575	16	
m,p-Xylene	68.2	2.0	"	66.7		102	57-144	0.721	16	
o-Xylene	33.2	1.0	"	33.3		99.7	53-146	0.452	15	
Surrogate: 1,2-Dichloroethane-d4	13.4		"	13.2		101	37-154			
Surrogate: Toluene-d8	13.5		"	13.3		101	45-149			
Surrogate: 4-Bromofluorobenzene	13.0		"	13.3		97.5	45-146			

LCS Dup (3110508-BSD2)

Prepared & Analyzed: 11/05/13

Benzene	32.9	1.0	ug/l	33.3		98.7	51-132	0.152	17	
Toluene	33.6	1.0	"	33.3		101	51-138	0.0298	17	
Ethylbenzene	35.6	1.0	"	33.3		107	58-146	0.902	16	
m,p-Xylene	69.5	2.0	"	66.7		104	57-144	0.649	16	
o-Xylene	34.0	1.0	"	33.3		102	53-146	0.0294	15	
Surrogate: 1,2-Dichloroethane-d4	13.6		"	13.2		103	37-154			
Surrogate: Toluene-d8	13.4		"	13.3		100	45-149			
Surrogate: 4-Bromofluorobenzene	13.2		"	13.3		99.2	45-146			

Matrix Spike (3110508-MS1)

Source: R310336-03

Prepared & Analyzed: 11/05/13

Benzene	32.8	1.0	ug/l	33.3	ND	98.6	34-141			
Toluene	33.6	1.0	"	33.3	ND	101	27-151			
Ethylbenzene	35.3	1.0	"	33.3	ND	106	29-160			
m,p-Xylene	68.8	2.0	"	66.7	ND	103	20-166			
o-Xylene	33.6	1.0	"	33.3	ND	101	33-159			
Surrogate: 1,2-Dichloroethane-d4	13.6		"	13.2		103	37-154			
Surrogate: Toluene-d8	13.3		"	13.3		100	45-149			
Surrogate: 4-Bromofluorobenzene	13.1		"	13.3		98.1	45-146			

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: H&S Mineral #1
Project Number: [none]
Project Manager: Brandon Bruns

Reported:
11/07/13 18:22

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 3110508 - EPA 5030 Water MS

Matrix Spike (3110508-MS2)		Source: R310336-04			Prepared & Analyzed: 11/05/13					
Benzene	33.2	1.0	ug/l	33.3	ND	99.7	34-141			
Toluene	33.8	1.0	"	33.3	ND	101	27-151			
Ethylbenzene	35.3	1.0	"	33.3	ND	106	29-160			
m,p-Xylene	69.0	2.0	"	66.7	ND	104	20-166			
o-Xylene	33.2	1.0	"	33.3	ND	99.6	33-159			
Surrogate: 1,2-Dichloroethane-d4	13.6		"	13.2		102	37-154			
Surrogate: Toluene-d8	13.4		"	13.3		100	45-149			
Surrogate: 4-Bromofluorobenzene	13.1		"	13.3		98.3	45-146			

Matrix Spike Dup (3110508-MSD1)		Source: R310336-03			Prepared & Analyzed: 11/05/13					
Benzene	32.6	1.0	ug/l	33.3	ND	97.9	34-141	0.641	32	
Toluene	33.4	1.0	"	33.3	ND	100	27-151	0.626	25	
Ethylbenzene	35.1	1.0	"	33.3	ND	105	29-160	0.569	50	
m,p-Xylene	69.0	2.0	"	66.7	ND	103	20-166	0.232	36	
o-Xylene	33.3	1.0	"	33.3	ND	100	33-159	0.896	26	
Surrogate: 1,2-Dichloroethane-d4	13.9		"	13.2		105	37-154			
Surrogate: Toluene-d8	13.4		"	13.3		101	45-149			
Surrogate: 4-Bromofluorobenzene	13.1		"	13.3		98.4	45-146			

Matrix Spike Dup (3110508-MSD2)		Source: R310336-04			Prepared & Analyzed: 11/05/13					
Benzene	32.9	1.0	ug/l	33.3	ND	98.8	34-141	0.937	32	
Toluene	33.8	1.0	"	33.3	ND	101	27-151	0.0296	25	
Ethylbenzene	35.6	1.0	"	33.3	ND	107	29-160	1.04	50	
m,p-Xylene	69.8	2.0	"	66.7	ND	105	20-166	1.04	36	
o-Xylene	34.0	1.0	"	33.3	ND	102	33-159	2.29	26	
Surrogate: 1,2-Dichloroethane-d4	13.4		"	13.2		101	37-154			
Surrogate: Toluene-d8	13.4		"	13.3		100	45-149			
Surrogate: 4-Bromofluorobenzene	13.2		"	13.3		99.2	45-146			

Summit Scientific

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

Project: H&S Mineral #1
Project Number: [none]
Project Manager: Brandon Bruns

Reported:
11/07/13 18:22

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

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