

State of Colorado  
Oil and Gas Conservation Commission

1120 Lincoln Street, Suite 801, Denver, Colorado 80203 Phone: (303)894-2100 Fax:(303)894-2109



FOR OGCC USE ONLY

RECEIVED  
11/11/2012

SPILL/RELEASE REPORT

This form is to be submitted by the party responsible for the oil and gas spill or release. Any spill or release which may impact waters of the State must be reported as soon as practicable; any spill over 20 bbls must be reported within 24 hours and all spills over five bbls must be reported within ten days. Submit a Site Investigation and

Spill report taken by:

FACILITY ID:  
430821

OPERATOR INFORMATION

Name of Operator: <u>PDC Energy, Inc.</u> OGCC Operator No: <u>69175</u>	Phone Numbers
Address: <u>1775 Sherman Street, Suite 3000</u>	No: <u>(303) 831-3971</u>
City: <u>Denver</u> State: <u>CO</u> Zip: <u>80203</u>	Fax: <u>(303) 860-5838</u>
Contact Person: <u>Brandon Bruns</u>	Email: <u>brandon.bruns@pdce.com</u>

DESCRIPTION OF SPILL OR RELEASE

Date of Incident: <u>10/16/2012</u> Facility Name & No: <u>Patrick Anderson 1</u>	County: <u>Weld</u>
Type of Facility (well, tank battery, flow line, pit): <u>Tank Battery</u>	QtrQtr: <u>SESE</u> Section: <u>34</u>
Well Name and Number: <u>Patrick Anderson 1</u>	Township: <u>7N</u> Range: <u>66W</u>
API Number: <u>05-123-10803</u>	Meridian: <u>6th</u>
Specify volume spilled and recovered (in bbls) for the following materials:	
Oil spilled: <u>Unk</u> Oil recov'd: <u>0</u> Water spilled: <u>0</u> Water recov'd: <u>0</u> Other spilled: <u>0</u> Other recov'd <u>0</u>	
Ground Water impacted? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Surface Water impacted? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Contained within berm? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Area and vertical extent of spill: <u>~918 ft<sup>2</sup></u> x <u>~13' bgs</u>
Current land use: <u>Oil and Gas Production Facility/Agriculture</u> Weather conditions: <u>High 40s</u>	
Soil/geology description: <u>Tightly packed fine grained sands</u>	
IF LESS THAN A MILE, report distance IN FEET to nearest ... Surface water: <u>~1,290' W</u> Wetlands: <u>NA</u> Buildings: <u>~990' SE</u>	
Livestock: <u>NA</u> Water wells: <u>~2,610' W</u> Depth to shallowest ground water: <u>~10' bgs</u>	
Cause of spill (e.g. equipment failure, human error, etc.): <u>Equipment failure</u> Detailed description of the spill/release incident:	
A historical release was discovered while replacing production lines at the Patrick Anderson 1 (API # 05-123-10803) tank battery. A topographic map of the site is included as Figure 1.	

CORRECTIVE ACTION

Describe immediate response (how stopped, contained and recovered):  
Excavation of impacted soil began on October 16, 2012 and concluded on October 22, 2012. Approximately 370 cubic yards (yd3) of impacted material was removed and transported to the Waste Management Facility in Ault, Colorado. The location and extent of the excavation is illustrated on Figure 2.

Describe any emergency pits constructed: NA

How was the extent of contamination determined?  
On October 16, 2012, seven soil samples were collected to delineate the areas of impact within and around the initial excavation. Soil samples SS01 through SS05 were collected within the excavation on the floor and at each boundary wall. Two additional soil samples were collected in test pits located north and south of the excavation (SS06 and SS07, respectively) at 10 feet below ground surface (bgs). Soil samples were submitted to Summit Scientific Laboratories in Golden, Colorado for laboratory analysis of BTEX, TPH-GRO, and naphthalene by EPA Method 8260B and TPH-DRO by EPA Method 8015. Analytical results indicated elevated benzene and TPH concentrations in the five samples collected within the excavation. Subsequent excavation was conducted on October 17 and 18, 2012 to remove the remaining impacted material. Five confirmation soil samples were collected within the final extent of the excavation. One sample was collected on the floor of the excavation (SS08) at 12.5 feet bgs, one at the north wall (SS09) at 9 feet bgs, one at the east wall (SS10) at 7.5 feet bgs, one at the west wall (SS11) at 8.5 feet bgs, and one at the south wall (SS12) at 10 feet bgs. Soil sample locations were determined based on field screened photoionization detector (PID) readings. Soil analytical results are summarized in Table 1. Groundwater was encountered during the excavation activities at approximately 10 feet bgs. One groundwater sample was collected on October 16, 2012 in the south central area of the excavation and submitted for laboratory analysis of BTEX by EPA Method 8260B. Laboratory results indicated that benzene concentrations were in exceedance of COGCC regulatory standards. Following further excavation of the floor and south wall of the excavation and removal of impacted groundwater using a vacuum truck, a second groundwater sample was collected on October 18, 2012. Laboratory analytical results from the second groundwater sample indicate benzene concentrations above COGCC limits. Impacted groundwater was removed from the excavation seven more times using a vacuum truck between October 19, 2012 and October 22, 2012 with a third groundwater sample collected following the final event. Analytical results indicate that benzene concentrations continue to exceed regulatory standards. Groundwater analytical results are summarized in Table 2. The laboratory analytical reports are included as Attachment A. The extent of the excavation and test pit locations and soil and groundwater sample locations are illustrated on Figure 2.

Further remediation activities proposed (attach separate sheet if needed):  
PDC is currently evaluating in-situ remediation strategies to address residual impacts in groundwater. Future remediation activities will be outlined in a Form 27.

Describe measures taken to prevent problem from reoccurring:  
PDC will continue yearly production line testing once remediation activities are completed and the location is back to being operational.

OTHER NOTIFICATIONS

List the parties and agencies notified (County, BLM, EPA, DOT, Local Emergency Planning Coordinator or other).

Date	Agency	Contact	Phone	Response

Spill/Release Tracking No: 2231139



**Figure 1**

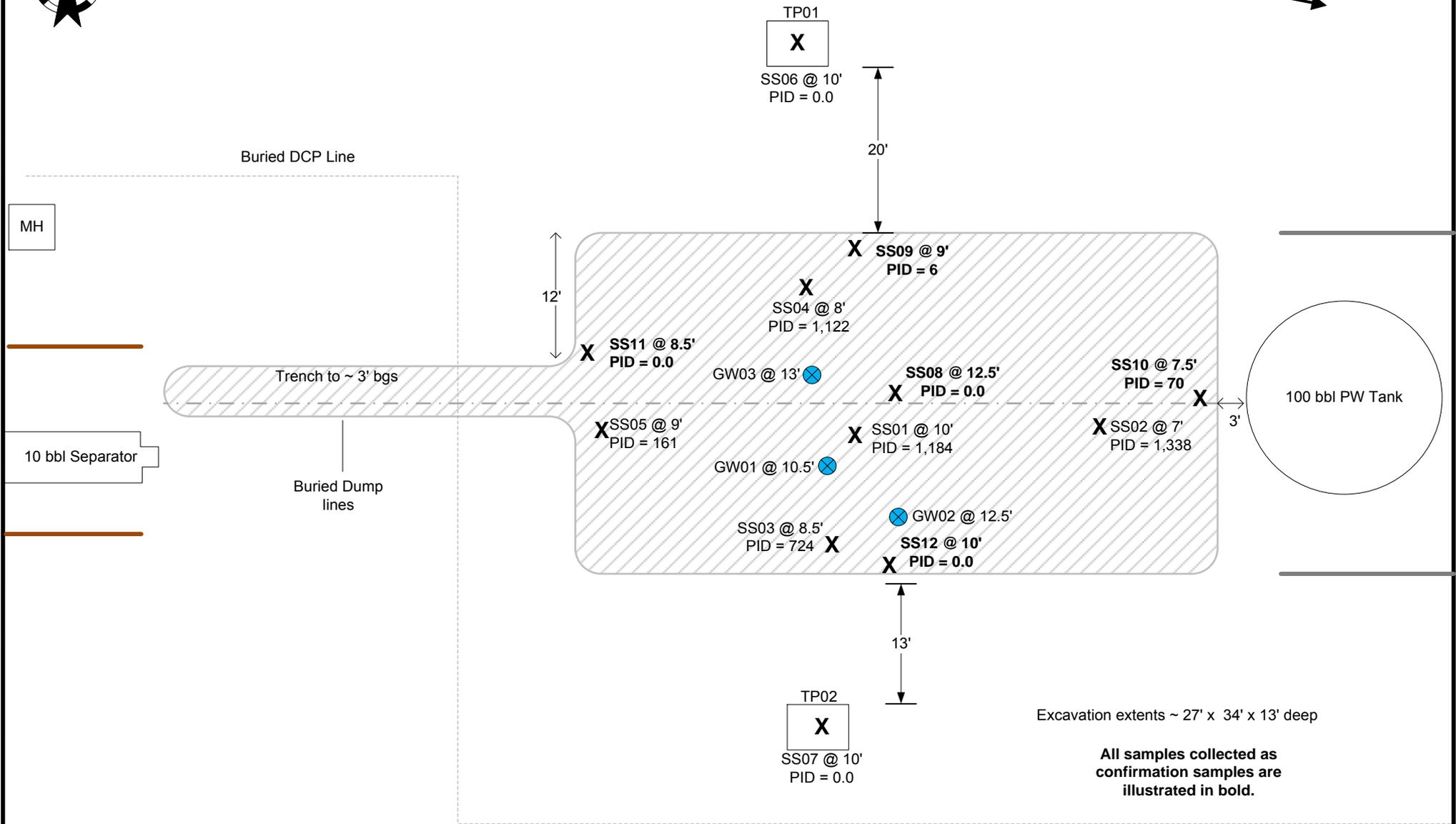
Site Location Map  
 Patrick Anderson 1  
 SESE S34 T7N R66W  
 Weld County, Colorado

Drawn By: CAW  
 Date: 10/24/2012





Surface  
Drainage



Excavation extents ~ 27' x 34' x 13' deep

**All samples collected as confirmation samples are illustrated in bold.**

PROJECT NO:	
DRAWN BY:	CAW
DATE:	10/18//2012

**Facility Diagram**  
 PDC Energy – DJ Basin  
 Patrick Anderson 1  
 SESE Qtr S34 T7N R66W  
 Weld County, CO



5690 Webster Avenue  
 Arvada CO 80002

LEGEND	
	Earthen Berm
	Steel Berm
	Approximate extent of excavation
	Soil Sample Location
	Groundwater Sample Location

FIGURE 2  
 Not to Scale

**TABLE 1  
PATRICK ANDERSON 1  
SOIL ANALYTICAL RESULTS SUMMARY TABLE**

Sample ID	Date Sampled	Depth (Feet bgs)	PID Readings (ppm)	Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	Total Xylenes (mg/kg)	Naphthalene (mg/kg)	TPH <sup>(2)</sup> (mg/kg)
SS01	10/16/2012	10	1,184	<b>4.6</b>	<0.005	5.4	21	2.0	<b>1,020</b>
SS02	10/16/2012	7	1,338	<b>0.29</b>	0.043	1.8	11	0.35	<b>1,150</b>
SS03	10/16/2012	8.5	724	0.098	<0.005	0.77	6.5	4.0	<b>1,810</b>
SS04	10/16/2012	8	1,122	<b>0.37</b>	<0.005	13	47	7.4	<b>5,300</b>
SS05	10/16/2012	9	161	<0.005	<0.005	0.0092	<0.010	<0.005	<b>710</b>
SS06	10/16/2012	10	0	<0.005	<0.005	<0.005	<0.010	<0.005	<50
SS07	10/16/2012	10	0	<0.005	<0.005	<0.005	<0.010	<0.005	<50
SS08	10/17/2012	12.5	0	<0.005	<0.005	<0.005	<0.010	<0.005	<50
SS09	10/17/2012	9	6	<0.005	<0.005	<0.005	<0.010	<0.005	<50
SS10	10/17/2012	7.5	70	<0.005	<0.005	<0.005	0.021	<0.005	0.55
SS11	10/18/2012	8.5	0	<0.005	<0.005	<0.005	<0.010	<0.005	<50
SS12	10/18/2012	10	0	<0.005	<0.005	<0.005	<0.010	<0.005	<50
<b>COGCC standards for Soil (mg/kg) <sup>(1)</sup></b>				<b>0.17</b>	<b>85</b>	<b>100</b>	<b>175</b>	<b>23</b>	<b>500</b>

Notes:

1). Standards for Soil are taken from 2 CCR 404-1, Table 910-1, effective April 1, 2009.

2). TPH - Total volatile and extractable petroleum hydrocarbons. Value calculated by adding GRO and DRO concentrations.

GRO - Gasoline range organics.

DRO - Diesel range organics.

mg/kg= Milligrams per kilogram.

bgs - Below ground surface.

ppm - Parts per million

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

**TABLE 2  
PATRICK ANDERSON 1  
GROUNDWATER ANALYTICAL RESULTS SUMMARY TABLE**

Sample ID	Date Sampled	Benzene (ug/L)	Toluene (ug/L)	Ethylbenzene (ug/L)	Total Xylenes (ug/L)
GW01	10/16/2012	<b>10</b>	<1.0	80	280
GW02	10/18/2012	<b>10</b>	6.3	29	120
GW03 <sup>(2)</sup>	10/22/2012	<b>8.8</b>	<1.0	4.3	20
<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.

2). GW03 is reported as AW03 in the laboratory analytical report.

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

ug/L= Micrograms per liter.

**ATTACHMENT A**

# Summit Scientific

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741 Corporate Circle – Suite I ♦ Golden, Colorado 80401

303.277.9310 - laboratory ♦ 303.277.9531 - fax

October 17, 2012

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

Enclosed are the results of analyses for samples received by Summit Scientific on 10/16/12 16:15. If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Joseph J Egry IV  
Laboratory Director



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

Project: Patrick Anderson 1

Project Number: [none]  
Project Manager: Brandon Bruns

**Reported:**  
10/17/12 14:48

### ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
SS01	R210138-01	Soil	10/16/12 12:45	10/16/12 16:15
GW01	R210138-02	Water	10/16/12 14:30	10/16/12 16:15

Summit Scientific

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

Project: Patrick Anderson 1

Project Number: [none]  
Project Manager: Brandon Brunns

**Reported:**  
10/17/12 14:48

**SS01**  
**R210138-01 (Soil)**

**Summit Scientific**

**Total Petroleum Hydrocarbons by 8015**

Date Sampled: **10/16/12 12:45**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>C10-C28 (DRO)</b>	<b>110</b>	50	mg/kg	1	2101606	10/16/12	10/16/12	8015 DRO	

Date Sampled: **10/16/12 12:45**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<i>Surrogate: o-Terphenyl</i>		87.4 %	30-150		"	"	"	"	

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

Date Sampled: **10/16/12 12:45**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>Naphthalene</b>	<b>2.0</b>	0.050	mg/kg	10	2101605	10/16/12	10/16/12	EPA 8260B	
<b>Benzene</b>	<b>4.6</b>	0.050	"	"	"	"	"	"	
Toluene	ND	0.0050	"	1	"	"	"	"	
<b>Ethylbenzene</b>	<b>5.4</b>	0.050	"	10	"	"	"	"	
<b>Xylenes (total)</b>	<b>21</b>	0.10	"	"	"	"	"	"	
<b>Gasoline Range Hydrocarbons</b>	<b>910</b>	5.0	"	"	"	"	"	"	E

Date Sampled: **10/16/12 12:45**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<i>Surrogate: 1,2-Dichloroethane-d4</i>		88.0 %	30-150		"	"	"	"	
<i>Surrogate: Toluene-d8</i>		97.6 %	30-150		"	"	"	"	
<i>Surrogate: 4-Bromofluorobenzene</i>		66.5 %	30-150		"	"	"	"	

Summit Scientific

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

Project: Patrick Anderson 1

Project Number: [none]  
 Project Manager: Brandon Brunns

**Reported:**  
 10/17/12 14:48

**GW01**  
**R210138-02 (Water)**

**Summit Scientific**

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

Date Sampled: **10/16/12 14:30**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>Benzene</b>	<b>10</b>	1.0	ug/l	1	2101604	10/16/12	10/16/12	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
<b>Ethylbenzene</b>	<b>80</b>	1.0	"	"	"	"	"	"	
<b>Xylenes (total)</b>	<b>280</b>	1.0	"	"	"	"	"	"	

Date Sampled: **10/16/12 14:30**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<i>Surrogate: 1,2-Dichloroethane-d4</i>		137 %	49.7-150		"	"	"	"	
<i>Surrogate: Toluene-d8</i>		145 %	51-150		"	"	"	"	
<i>Surrogate: 4-Bromofluorobenzene</i>		86.4 %	50.1-150		"	"	"	"	

Summit Scientific

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

Project: Patrick Anderson 1

Project Number: [none]  
 Project Manager: Brandon Brunns

**Reported:**  
 10/17/12 14:48

**Total Petroleum Hydrocarbons by 8015 - Quality Control**  
**Summit Scientific**

Analyte	Result	Reporting		Spike Level	Source		%REC		RPD		Notes
		Limit	Units		Result	%REC	Limits	RPD	Limit		

**Batch 2101606 - EPA 3550A**

<b>Blank (2101606-BLK1)</b>		Prepared: 10/16/12 Analyzed: 10/17/12									
C10-C28 (DRO)	ND	50	mg/kg								
<b>LCS (2101606-BS1)</b>		Prepared: 10/16/12 Analyzed: 10/17/12									
C10-C28 (DRO)	555	50	mg/kg	501	111	73-134					
<b>LCS Dup (2101606-BSD1)</b>		Prepared: 10/16/12 Analyzed: 10/17/12									
C10-C28 (DRO)	538	50	mg/kg	501	107	73-134	3.07	11			
<b>Matrix Spike (2101606-MS1)</b>		<b>Source: R210139-05</b>		Prepared: 10/16/12 Analyzed: 10/17/12							
C10-C28 (DRO)	518	50	mg/kg	498	9.96	102	50-148				
<b>Matrix Spike Dup (2101606-MSD1)</b>		<b>Source: R210139-05</b>		Prepared: 10/16/12 Analyzed: 10/17/12							
C10-C28 (DRO)	523	50	mg/kg	500	9.96	103	50-148	0.859	13		

Summit Scientific

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

Project: Patrick Anderson 1

Project Number: [none]  
Project Manager: Brandon Brunns

Reported:  
10/17/12 14:48

**Volatile Organic Compounds by EPA Method 8260B - Quality Control**  
**Summit Scientific**

Analyte	Result	Reporting		Spike Level	Source Result	%REC		RPD		Notes
		Limit	Units			%REC	Limits	RPD	Limit	

**Batch 2101604 - EPA 5030 Water MS**

**Blank (2101604-BLK1)**

Prepared & Analyzed: 10/16/12

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>15.1</i>		<i>"</i>	<i>13.2</i>		<i>114</i>	<i>49.7-150</i>			
<i>Surrogate: Toluene-d8</i>	<i>13.0</i>		<i>"</i>	<i>13.3</i>		<i>97.7</i>	<i>51-150</i>			
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>14.1</i>		<i>"</i>	<i>13.3</i>		<i>106</i>	<i>50.1-150</i>			

**LCS (2101604-BS1)**

Prepared & Analyzed: 10/16/12

Benzene	30.6	1.0	ug/l	33.3		91.7	51-132			
Toluene	30.6	1.0	"	33.3		91.9	51-138			
Ethylbenzene	29.6	1.0	"	33.3		88.8	58-146			
m,p-Xylene	58.0	2.0	"	66.7		87.0	57-144			
o-Xylene	29.8	1.0	"	33.3		89.4	53-146			
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>19.5</i>		<i>"</i>	<i>13.2</i>		<i>147</i>	<i>49.7-150</i>			
<i>Surrogate: Toluene-d8</i>	<i>13.2</i>		<i>"</i>	<i>13.3</i>		<i>98.9</i>	<i>51-150</i>			
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>14.1</i>		<i>"</i>	<i>13.3</i>		<i>106</i>	<i>50.1-150</i>			

**LCS Dup (2101604-BSD1)**

Prepared & Analyzed: 10/16/12

Benzene	29.0	1.0	ug/l	33.3		87.1	51-132	5.20	17	
Toluene	29.0	1.0	"	33.3		87.1	51-138	5.33	17	
Ethylbenzene	27.7	1.0	"	33.3		83.0	58-146	6.81	16	
m,p-Xylene	55.1	2.0	"	66.7		82.6	57-144	5.25	16	
o-Xylene	28.3	1.0	"	33.3		84.8	53-146	5.30	15	
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>19.6</i>		<i>"</i>	<i>13.2</i>		<i>148</i>	<i>49.7-150</i>			
<i>Surrogate: Toluene-d8</i>	<i>13.0</i>		<i>"</i>	<i>13.3</i>		<i>97.2</i>	<i>51-150</i>			
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>13.7</i>		<i>"</i>	<i>13.3</i>		<i>103</i>	<i>50.1-150</i>			

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

Project: Patrick Anderson 1

Project Number: [none]  
Project Manager: Brandon Bruns

Reported:  
10/17/12 14:48

**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 2101604 - EPA 5030 Water MS**

**Matrix Spike (2101604-MS1)**

Source: R210126-05

Prepared & Analyzed: 10/16/12

Benzene	28.4	1.0	ug/l	33.3	ND	85.3	34-141			
Toluene	28.5	1.0	"	33.3	ND	85.6	27-151			
Ethylbenzene	27.1	1.0	"	33.3	ND	81.4	29-160			
m,p-Xylene	53.0	2.0	"	66.7	ND	79.5	20-166			
o-Xylene	27.2	1.0	"	33.3	ND	81.7	33-159			
Surrogate: 1,2-Dichloroethane-d4	19.4		"	13.2		147	49.7-150			
Surrogate: Toluene-d8	13.0		"	13.3		97.3	51-150			
Surrogate: 4-Bromofluorobenzene	13.8		"	13.3		104	50.1-150			

**Matrix Spike Dup (2101604-MSD1)**

Source: R210126-05

Prepared & Analyzed: 10/16/12

Benzene	29.5	1.0	ug/l	33.3	ND	88.5	34-141	3.69	32	
Toluene	29.8	1.0	"	33.3	ND	89.4	27-151	4.36	25	
Ethylbenzene	29.2	1.0	"	33.3	ND	87.7	29-160	7.38	50	
m,p-Xylene	57.4	2.0	"	66.7	ND	86.1	20-166	7.86	36	
o-Xylene	29.5	1.0	"	33.3	ND	88.4	33-159	7.94	26	
Surrogate: 1,2-Dichloroethane-d4	15.2		"	13.2		115	49.7-150			
Surrogate: Toluene-d8	13.0		"	13.3		97.7	51-150			
Surrogate: 4-Bromofluorobenzene	14.2		"	13.3		106	50.1-150			

**Batch 2101605 - EPA 5030 Soil MS**

**Blank (2101605-BLK1)**

Prepared: 10/16/12 Analyzed: 10/17/12

Naphthalene	ND	0.0050	mg/kg							
Benzene	ND	0.0050	"							
Toluene	ND	0.0050	"							
Ethylbenzene	ND	0.0050	"							
Xylenes (total)	ND	0.010	"							
Gasoline Range Hydrocarbons	ND	0.50	"							
Surrogate: 1,2-Dichloroethane-d4	0.0342		"	0.0397		86.1	30-150			
Surrogate: Toluene-d8	0.0386		"	0.0400		96.5	30-150			
Surrogate: 4-Bromofluorobenzene	0.0383		"	0.0400		95.7	30-150			

Summit Scientific

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

Project: Patrick Anderson 1

Project Number: [none]  
Project Manager: Brandon Bruns

Reported:  
10/17/12 14:48

**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 2101605 - EPA 5030 Soil MS**

**LCS (2101605-BS1)**

Prepared: 10/16/12 Analyzed: 10/17/12

Naphthalene	ND	0.0050	mg/kg				66-138			
Benzene	0.0965	0.0050	"	0.100		96.5	58-130			
Toluene	0.105	0.0050	"	0.100		105	61-134			
Ethylbenzene	0.110	0.0050	"	0.100		110	74-139			
m,p-Xylene	0.228	0.010	"	0.200		114	73-137			
o-Xylene	0.111	0.0050	"	0.100		111	73-141			
Surrogate: 1,2-Dichloroethane-d4	0.0338		"	0.0397		85.1	30-150			
Surrogate: Toluene-d8	0.0395		"	0.0400		98.7	30-150			
Surrogate: 4-Bromofluorobenzene	0.0395		"	0.0400		98.7	30-150			

**LCS Dup (2101605-BSD1)**

Prepared: 10/16/12 Analyzed: 10/17/12

Naphthalene	ND	0.0050	mg/kg				66-138			12
Benzene	0.107	0.0050	"	0.100		107	58-130		10.3	13
Toluene	0.109	0.0050	"	0.100		109	61-134		3.95	16
Ethylbenzene	0.114	0.0050	"	0.100		114	74-139		3.56	12
m,p-Xylene	0.228	0.010	"	0.200		114	73-137		0.0658	14
o-Xylene	0.111	0.0050	"	0.100		111	73-141		0.135	12
Surrogate: 1,2-Dichloroethane-d4	0.0338		"	0.0397		85.2	30-150			
Surrogate: Toluene-d8	0.0392		"	0.0400		98.1	30-150			
Surrogate: 4-Bromofluorobenzene	0.0381		"	0.0400		95.2	30-150			

**Matrix Spike (2101605-MS1)**

Source: R210139-05

Prepared: 10/16/12 Analyzed: 10/17/12

Naphthalene	ND	0.0050	mg/kg		ND		10-158			
Benzene	0.0746	0.0050	"	0.0969	0.00	77.0	30-131			
Toluene	0.0801	0.0050	"	0.0969	0.00	82.6	30-134			
Ethylbenzene	0.0770	0.0050	"	0.0969	0.00	79.5	22-153			
m,p-Xylene	0.161	0.010	"	0.194	0.00	83.2	10-159			
o-Xylene	0.0835	0.0050	"	0.0969	0.00	86.2	31-151			
Surrogate: 1,2-Dichloroethane-d4	0.0378		"	0.0385		98.2	30-150			
Surrogate: Toluene-d8	0.0378		"	0.0388		97.5	30-150			
Surrogate: 4-Bromofluorobenzene	0.0374		"	0.0388		96.5	30-150			

Summit Scientific

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

Project: Patrick Anderson 1

Project Number: [none]  
 Project Manager: Brandon Bruns

**Reported:**  
 10/17/12 14:48

**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 2101605 - EPA 5030 Soil MS**

<b>Matrix Spike Dup (2101605-MSD1)</b>	<b>Source: R210139-05</b>			Prepared: 10/16/12		Analyzed: 10/17/12				
Naphthalene	ND	0.0050	mg/kg		ND		10-158			42
Benzene	0.0722	0.0050	"	0.0954	0.00	75.7	30-131	3.27		34
Toluene	0.0777	0.0050	"	0.0954	0.00	81.5	30-134	2.96		30
Ethylbenzene	0.0805	0.0050	"	0.0954	0.00	84.4	22-153	4.43		24
m,p-Xylene	0.164	0.010	"	0.191	0.00	85.8	10-159	1.52		68
o-Xylene	0.0954	0.0050	"	0.0954	0.00	100	31-151	13.4		38
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>0.0354</i>		<i>"</i>	<i>0.0379</i>		<i>93.4</i>	<i>30-150</i>			
<i>Surrogate: Toluene-d8</i>	<i>0.0374</i>		<i>"</i>	<i>0.0382</i>		<i>97.9</i>	<i>30-150</i>			
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>0.0387</i>		<i>"</i>	<i>0.0382</i>		<i>101</i>	<i>30-150</i>			

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

Project: Patrick Anderson 1

Project Number: [none]  
Project Manager: Brandon Bruns

**Reported:**  
10/17/12 14:48

### Notes and Definitions

- E The concentration indicated for this analyte is an estimated value above the calibration range of the instrument.
- 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

# Summit Scientific

---

741 Corporate Circle – Suite I ♦ Golden, Colorado 80401

303.277.9310 - laboratory ♦ 303.277.9531 - fax

October 17, 2012

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

Enclosed are the results of analyses for samples received by Summit Scientific on 10/16/12 16:15. 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 stylized and cursive.

Joseph J Egry IV  
Laboratory Director



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

Project: Patrick Anderson 1

Project Number: [none]  
Project Manager: Brandon Bruns

**Reported:**  
10/17/12 14:53

### ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
SS02	R210139-01	Soil	10/16/12 12:55	10/16/12 16:15
SS03	R210139-02	Soil	10/16/12 13:05	10/16/12 16:15
SS04	R210139-03	Soil	10/16/12 13:15	10/16/12 16:15
SS05	R210139-04	Soil	10/16/12 13:25	10/16/12 16:15
SS06	R210139-05	Soil	10/16/12 13:30	10/16/12 16:15
SS07	R210139-06	Soil	10/16/12 13:50	10/16/12 16:15

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

Project: Patrick Anderson 1

Project Number: [none]  
Project Manager: Brandon Bruns

Reported:  
10/17/12 14:53

R210139  
Summit Scientific

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

Client: PDC Energy, Inc S: \_\_\_\_\_ Page 1 of 1  
Address: 1775 Sherman St. #3000 Project Manager: Brandon Bruns  
City/State/Zip: Denver, CO 80203 E-Mail: brun.br@pdc.com  
Phone: \_\_\_\_\_ Project Name: Patrick Anderson 1  
Sampler Name: Brandon Humphrey 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)	Other (Specify)		Other (Specify)
S902	10/16/12	1255	1	X				X						
S903		1305												
S904		1315												
S905		1325												
S906		1330												
S907		1350												
				Received by: _____ Date/Time: _____				Turn Around Time (Check)				Notes:		
				Received by: _____ Date/Time: 10/12-1615				<input type="checkbox"/> Same Day <input checked="" type="checkbox"/> 24 Hours <input type="checkbox"/> 48 Hours <input type="checkbox"/> 72 Hours <input type="checkbox"/> Standard						
				Received in Lab by: _____ Date/Time: 10-16-12				Sample Integrity:				www.s2scientific.com		
				Received by: _____ Date/Time: 1615				Temperature Upon Receipt: <u>6.0</u> Instat: <u>Yes</u> / No						



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

Project: Patrick Anderson 1

Project Number: [none]  
Project Manager: Brandon Brunns

Reported:  
10/17/12 14:53

**SS02**  
**R210139-01 (Soil)**

**Summit Scientific**

**Total Petroleum Hydrocarbons by 8015**

Date Sampled: 10/16/12 12:55

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	900	50	mg/kg	1	2101606	10/16/12	10/16/12	8015 DRO	

Date Sampled: 10/16/12 12:55

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: <i>o</i> -Terphenyl		90.5 %	30-150		"	"	"	"	

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

Date Sampled: 10/16/12 12:55

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Naphthalene	0.35	0.0050	mg/kg	1	2101605	10/16/12	10/16/12	EPA 8260B	
Benzene	0.29	0.0050	"	"	"	"	"	"	
Toluene	0.043	0.0050	"	"	"	"	"	"	
Ethylbenzene	1.8	0.050	"	10	"	"	"	"	
Xylenes (total)	11	0.10	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	250	5.0	"	"	"	"	"	"	

Date Sampled: 10/16/12 12:55

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		94.7 %	30-150		"	"	"	"	
Surrogate: Toluene-d8		94.7 %	30-150		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		88.1 %	30-150		"	"	"	"	

Summit Scientific

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

Project: Patrick Anderson 1

Project Number: [none]  
Project Manager: Brandon Brunns

Reported:  
10/17/12 14:53

**SS03**  
**R210139-02 (Soil)**

**Summit Scientific**

**Total Petroleum Hydrocarbons by 8015**

Date Sampled: **10/16/12 13:05**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>C10-C28 (DRO)</b>	<b>810</b>	50	mg/kg	1	2101606	10/16/12	10/16/12	8015 DRO	

Date Sampled: **10/16/12 13:05**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<i>Surrogate: o-Terphenyl</i>		83.3 %	30-150		"	"	"	"	

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

Date Sampled: **10/16/12 13:05**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>Naphthalene</b>	<b>4.0</b>	0.050	mg/kg	10	2101605	10/16/12	10/16/12	EPA 8260B	
<b>Benzene</b>	<b>0.098</b>	0.0050	"	1	"	"	"	"	
Toluene	ND	0.0050	"	"	"	"	"	"	
<b>Ethylbenzene</b>	<b>0.77</b>	0.0050	"	"	"	"	"	"	
<b>Xylenes (total)</b>	<b>6.5</b>	0.10	"	10	"	"	"	"	
<b>Gasoline Range Hydrocarbons</b>	<b>1000</b>	5.0	"	"	"	"	"	"	E

Date Sampled: **10/16/12 13:05**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<i>Surrogate: 1,2-Dichloroethane-d4</i>		97.7 %	30-150		"	"	"	"	
<i>Surrogate: Toluene-d8</i>		101 %	30-150		"	"	"	"	
<i>Surrogate: 4-Bromofluorobenzene</i>		108 %	30-150		"	"	"	"	

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

Project: Patrick Anderson 1

Project Number: [none]  
Project Manager: Brandon Bruns

**Reported:**  
10/17/12 14:53

**SS04**  
**R210139-03 (Soil)**

**Summit Scientific**

**Total Petroleum Hydrocarbons by 8015**

Date Sampled: **10/16/12 13:15**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>C10-C28 (DRO)</b>	<b>2700</b>	50	mg/kg	1	2101606	10/16/12	10/16/12	8015 DRO	

Date Sampled: **10/16/12 13:15**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<i>Surrogate: o-Terphenyl</i>		83.2 %	30-150		"	"	"	"	

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

Date Sampled: **10/16/12 13:15**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>Naphthalene</b>	<b>7.4</b>	0.050	mg/kg	10	2101605	10/16/12	10/17/12	EPA 8260B	
<b>Benzene</b>	<b>0.37</b>	0.0050	"	1	"	"	"	"	
Toluene	ND	0.0050	"	"	"	"	"	"	
<b>Ethylbenzene</b>	<b>13</b>	0.050	"	10	"	"	"	"	E
<b>Xylenes (total)</b>	<b>47</b>	0.10	"	"	"	"	"	"	E
<b>Gasoline Range Hydrocarbons</b>	<b>2600</b>	5.0	"	"	"	"	"	"	E

Date Sampled: **10/16/12 13:15**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<i>Surrogate: 1,2-Dichloroethane-d4</i>		103 %	30-150		"	"	"	"	
<i>Surrogate: Toluene-d8</i>		103 %	30-150		"	"	"	"	
<i>Surrogate: 4-Bromofluorobenzene</i>		94.3 %	30-150		"	"	"	"	

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

Project: Patrick Anderson 1

Project Number: [none]  
Project Manager: Brandon Bruns

**Reported:**  
10/17/12 14:53

**SS05**  
**R210139-04 (Soil)**

**Summit Scientific**

**Total Petroleum Hydrocarbons by 8015**

Date Sampled: **10/16/12 13:25**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>C10-C28 (DRO)</b>	<b>240</b>	50	mg/kg	1	2101606	10/16/12	10/16/12	8015 DRO	

Date Sampled: **10/16/12 13:25**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<i>Surrogate: o-Terphenyl</i>		79.9 %	30-150		"	"	"	"	

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

Date Sampled: **10/16/12 13:25**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Naphthalene	ND	0.0050	mg/kg	1	2101605	10/16/12	10/17/12	EPA 8260B	
Benzene	ND	0.0050	"	"	"	"	"	"	
Toluene	ND	0.0050	"	"	"	"	"	"	
<b>Ethylbenzene</b>	<b>0.0092</b>	0.0050	"	"	"	"	"	"	
Xylenes (total)	ND	0.010	"	"	"	"	"	"	
<b>Gasoline Range Hydrocarbons</b>	<b>470</b>	5.0	"	10	"	"	"	"	

Date Sampled: **10/16/12 13:25**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<i>Surrogate: 1,2-Dichloroethane-d4</i>		104 %	30-150		"	"	"	"	
<i>Surrogate: Toluene-d8</i>		91.9 %	30-150		"	"	"	"	
<i>Surrogate: 4-Bromofluorobenzene</i>		94.0 %	30-150		"	"	"	"	

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

Project: Patrick Anderson 1

Project Number: [none]  
Project Manager: Brandon Bruns

**Reported:**  
10/17/12 14:53

**SS06**  
**R210139-05 (Soil)**

**Summit Scientific**

**Total Petroleum Hydrocarbons by 8015**

Date Sampled: **10/16/12 13:30**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	2101606	10/16/12	10/16/12	8015 DRO	

Date Sampled: **10/16/12 13:30**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: <i>o</i> -Terphenyl		75.4 %	30-150		"	"	"	"	

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

Date Sampled: **10/16/12 13:30**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Naphthalene	ND	0.0050	mg/kg	1	2101605	10/16/12	10/16/12	EPA 8260B	
Benzene	ND	0.0050	"	"	"	"	"	"	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	ND	0.0050	"	"	"	"	"	"	
Xylenes (total)	ND	0.010	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	0.50	"	"	"	"	"	"	

Date Sampled: **10/16/12 13:30**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		93.2 %	30-150		"	"	"	"	
Surrogate: Toluene-d8		97.2 %	30-150		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		96.1 %	30-150		"	"	"	"	

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

Project: Patrick Anderson 1

Project Number: [none]  
Project Manager: Brandon Bruns

Reported:  
10/17/12 14:53

**SS07**  
**R210139-06 (Soil)**

**Summit Scientific**

**Total Petroleum Hydrocarbons by 8015**

Date Sampled: **10/16/12 13:50**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	2101606	10/16/12	10/16/12	8015 DRO	

Date Sampled: **10/16/12 13:50**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: <i>o</i> -Terphenyl		74.5 %	30-150		"	"	"	"	

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

Date Sampled: **10/16/12 13:50**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Naphthalene	ND	0.0050	mg/kg	1	2101605	10/16/12	10/16/12	EPA 8260B	
Benzene	ND	0.0050	"	"	"	"	"	"	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	ND	0.0050	"	"	"	"	"	"	
Xylenes (total)	ND	0.010	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	0.50	"	"	"	"	"	"	

Date Sampled: **10/16/12 13:50**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		83.9 %	30-150		"	"	"	"	
Surrogate: Toluene-d8		97.6 %	30-150		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		95.0 %	30-150		"	"	"	"	

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

Project: Patrick Anderson 1

Project Number: [none]  
 Project Manager: Brandon Brunns

**Reported:**  
 10/17/12 14:53

**Total Petroleum Hydrocarbons by 8015 - Quality Control**  
**Summit Scientific**

Analyte	Result	Reporting		Spike Level	Source		%REC		RPD		Notes
		Limit	Units		Result	%REC	Limits	RPD	Limit		

**Batch 2101606 - EPA 3550A**

<b>Blank (2101606-BLK1)</b>				Prepared: 10/16/12 Analyzed: 10/17/12							
C10-C28 (DRO)	ND	50	mg/kg								
<b>LCS (2101606-BS1)</b>				Prepared: 10/16/12 Analyzed: 10/17/12							
C10-C28 (DRO)	555	50	mg/kg	501	111	73-134					
<b>LCS Dup (2101606-BSD1)</b>				Prepared: 10/16/12 Analyzed: 10/17/12							
C10-C28 (DRO)	538	50	mg/kg	501	107	73-134	3.07		11		
<b>Matrix Spike (2101606-MS1)</b>				<b>Source: R210139-05</b>		Prepared: 10/16/12 Analyzed: 10/17/12					
C10-C28 (DRO)	518	50	mg/kg	498	9.96	102	50-148				
<b>Matrix Spike Dup (2101606-MSD1)</b>				<b>Source: R210139-05</b>		Prepared: 10/16/12 Analyzed: 10/17/12					
C10-C28 (DRO)	523	50	mg/kg	500	9.96	103	50-148	0.859		13	

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

Project: Patrick Anderson 1

Project Number: [none]  
Project Manager: Brandon Bruns

Reported:  
10/17/12 14:53

**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 2101605 - EPA 5030 Soil MS**

**Blank (2101605-BLK1)**

Prepared: 10/16/12 Analyzed: 10/17/12

Naphthalene	ND	0.0050	mg/kg							
Benzene	ND	0.0050	"							
Toluene	ND	0.0050	"							
Ethylbenzene	ND	0.0050	"							
Xylenes (total)	ND	0.010	"							
Gasoline Range Hydrocarbons	ND	0.50	"							
Surrogate: 1,2-Dichloroethane-d4	0.0342		"	0.0397	86.1	30-150				
Surrogate: Toluene-d8	0.0386		"	0.0400	96.5	30-150				
Surrogate: 4-Bromofluorobenzene	0.0383		"	0.0400	95.7	30-150				

**LCS (2101605-BS1)**

Prepared: 10/16/12 Analyzed: 10/17/12

Naphthalene	ND	0.0050	mg/kg			66-138				
Benzene	0.0965	0.0050	"	0.100	96.5	58-130				
Toluene	0.105	0.0050	"	0.100	105	61-134				
Ethylbenzene	0.110	0.0050	"	0.100	110	74-139				
m,p-Xylene	0.228	0.010	"	0.200	114	73-137				
o-Xylene	0.111	0.0050	"	0.100	111	73-141				
Surrogate: 1,2-Dichloroethane-d4	0.0338		"	0.0397	85.1	30-150				
Surrogate: Toluene-d8	0.0395		"	0.0400	98.7	30-150				
Surrogate: 4-Bromofluorobenzene	0.0395		"	0.0400	98.7	30-150				

**LCS Dup (2101605-BSD1)**

Prepared: 10/16/12 Analyzed: 10/17/12

Naphthalene	ND	0.0050	mg/kg			66-138			12	
Benzene	0.107	0.0050	"	0.100	107	58-130	10.3		13	
Toluene	0.109	0.0050	"	0.100	109	61-134	3.95		16	
Ethylbenzene	0.114	0.0050	"	0.100	114	74-139	3.56		12	
m,p-Xylene	0.228	0.010	"	0.200	114	73-137	0.0658		14	
o-Xylene	0.111	0.0050	"	0.100	111	73-141	0.135		12	
Surrogate: 1,2-Dichloroethane-d4	0.0338		"	0.0397	85.2	30-150				
Surrogate: Toluene-d8	0.0392		"	0.0400	98.1	30-150				
Surrogate: 4-Bromofluorobenzene	0.0381		"	0.0400	95.2	30-150				

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: Patrick Anderson 1

Project Number: [none]  
Project Manager: Brandon Bruns

Reported:  
10/17/12 14:53

**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 2101605 - EPA 5030 Soil MS**

**Matrix Spike (2101605-MS1)**

Source: R210139-05

Prepared: 10/16/12 Analyzed: 10/17/12

Naphthalene	ND	0.0050	mg/kg		ND		10-158			
Benzene	0.0746	0.0050	"	0.0969	0.00	77.0	30-131			
Toluene	0.0801	0.0050	"	0.0969	0.00	82.6	30-134			
Ethylbenzene	0.0770	0.0050	"	0.0969	0.00	79.5	22-153			
m,p-Xylene	0.161	0.010	"	0.194	0.00	83.2	10-159			
o-Xylene	0.0835	0.0050	"	0.0969	0.00	86.2	31-151			
Surrogate: 1,2-Dichloroethane-d4	0.0378		"	0.0385		98.2	30-150			
Surrogate: Toluene-d8	0.0378		"	0.0388		97.5	30-150			
Surrogate: 4-Bromofluorobenzene	0.0374		"	0.0388		96.5	30-150			

**Matrix Spike Dup (2101605-MSD1)**

Source: R210139-05

Prepared: 10/16/12 Analyzed: 10/17/12

Naphthalene	ND	0.0050	mg/kg		ND		10-158		42	
Benzene	0.0722	0.0050	"	0.0954	0.00	75.7	30-131	3.27	34	
Toluene	0.0777	0.0050	"	0.0954	0.00	81.5	30-134	2.96	30	
Ethylbenzene	0.0805	0.0050	"	0.0954	0.00	84.4	22-153	4.43	24	
m,p-Xylene	0.164	0.010	"	0.191	0.00	85.8	10-159	1.52	68	
o-Xylene	0.0954	0.0050	"	0.0954	0.00	100	31-151	13.4	38	
Surrogate: 1,2-Dichloroethane-d4	0.0354		"	0.0379		93.4	30-150			
Surrogate: Toluene-d8	0.0374		"	0.0382		97.9	30-150			
Surrogate: 4-Bromofluorobenzene	0.0387		"	0.0382		101	30-150			

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: Patrick Anderson 1

Project Number: [none]  
Project Manager: Brandon Bruns

**Reported:**  
10/17/12 14:53

### Notes and Definitions

- E The concentration indicated for this analyte is an estimated value above the calibration range of the instrument.
- 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

# Summit Scientific

---

741 Corporate Circle – Suite I ♦ Golden, Colorado 80401

303.277.9310 - laboratory ♦ 303.277.9531 - fax

October 18, 2012

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

Enclosed are the results of analyses for samples received by Summit Scientific on 10/17/12 17:25. 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 stylized and cursive.

Joseph J Egry IV  
Laboratory Director



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

Project: Patrick Anderson 1

Project Number: [none]  
Project Manager: Brandon Bruns

**Reported:**  
10/18/12 16:46

### ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
SS08@12.5'	R210152-01	Soil	10/17/12 11:45	10/17/12 17:25
SS09@9'	R210152-02	Soil	10/17/12 12:45	10/17/12 17:25
SS10@7.5'	R210152-03	Soil	10/17/12 15:20	10/17/12 17:25

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: Patrick Anderson 1

Project Number: [none]  
Project Manager: Brandon Bruns

**Reported:**  
10/18/12 16:46

**SS08@12.5'**  
**R210152-01 (Soil)**

**Summit Scientific**

**Total Petroleum Hydrocarbons by 8015**

Date Sampled: 10/17/12 11:45

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	2101712	10/17/12	10/17/12	8015 DRO	

Date Sampled: 10/17/12 11:45

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: o-Terphenyl		74.8 %	30-150		"	"	"	"	

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

Date Sampled: 10/17/12 11:45

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Naphthalene	ND	0.0050	mg/kg	1	2101711	10/17/12	10/17/12	EPA 8260B	
Benzene	ND	0.0050	"	"	"	"	"	"	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	ND	0.0050	"	"	"	"	"	"	
Xylenes (total)	ND	0.010	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	0.50	"	"	"	"	"	"	

Date Sampled: 10/17/12 11:45

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		95.2 %	30-150		"	"	"	"	
Surrogate: Toluene-d8		96.9 %	30-150		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		95.7 %	30-150		"	"	"	"	

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: Patrick Anderson 1

Project Number: [none]  
Project Manager: Brandon Bruns

**Reported:**  
10/18/12 16:46

**SS09@9'**  
**R210152-02 (Soil)**

**Summit Scientific**

**Total Petroleum Hydrocarbons by 8015**

Date Sampled: **10/17/12 12:45**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	2101712	10/17/12	10/17/12	8015 DRO	

Date Sampled: **10/17/12 12:45**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: <i>o</i> -Terphenyl		74.8 %	30-150		"	"	"	"	

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

Date Sampled: **10/17/12 12:45**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Naphthalene	ND	0.0050	mg/kg	1	2101711	10/17/12	10/17/12	EPA 8260B	
Benzene	ND	0.0050	"	"	"	"	"	"	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	ND	0.0050	"	"	"	"	"	"	
Xylenes (total)	ND	0.010	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	0.50	"	"	"	"	"	"	

Date Sampled: **10/17/12 12:45**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		95.9 %	30-150		"	"	"	"	
Surrogate: Toluene-d8		96.0 %	30-150		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		93.8 %	30-150		"	"	"	"	

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: Patrick Anderson 1

Project Number: [none]  
Project Manager: Brandon Brunns

**Reported:**  
10/18/12 16:46

**SS10@7.5'**  
**R210152-03 (Soil)**

**Summit Scientific**

**Total Petroleum Hydrocarbons by 8015**

Date Sampled: **10/17/12 15:20**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	2101712	10/17/12	10/17/12	8015 DRO	

Date Sampled: **10/17/12 15:20**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: <i>o</i> -Terphenyl		72.2 %	30-150		"	"	"	"	

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

Date Sampled: **10/17/12 15:20**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Naphthalene	ND	0.0050	mg/kg	1	2101711	10/17/12	10/18/12	EPA 8260B	
Benzene	ND	0.0050	"	"	"	"	"	"	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	ND	0.0050	"	"	"	"	"	"	
<b>Xylenes (total)</b>	<b>0.021</b>	0.010	"	"	"	"	"	"	
<b>Gasoline Range Hydrocarbons</b>	<b>0.55</b>	0.50	"	"	"	"	"	"	

Date Sampled: **10/17/12 15:20**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		94.7 %	30-150		"	"	"	"	
Surrogate: Toluene-d8		97.3 %	30-150		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		98.0 %	30-150		"	"	"	"	

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: Patrick Anderson 1

Project Number: [none]  
 Project Manager: Brandon Brunns

**Reported:**  
 10/18/12 16:46

**Total Petroleum Hydrocarbons by 8015 - Quality Control**  
**Summit Scientific**

Analyte	Reporting			Spike	Source	%REC			RPD	Notes
	Result	Limit	Units	Level	Result	%REC	Limits	RPD	Limit	

**Batch 2101712 - EPA 3550A**

<b>Blank (2101712-BLK1)</b>				Prepared & Analyzed: 10/17/12						
C10-C28 (DRO)	ND	50	mg/kg							
<b>LCS (2101712-BS1)</b>				Prepared & Analyzed: 10/17/12						
C10-C28 (DRO)	520	50	mg/kg	501	104	73-134				
<b>LCS Dup (2101712-BSD1)</b>				Prepared & Analyzed: 10/17/12						
C10-C28 (DRO)	497	50	mg/kg	501	99.3	73-134	4.39	11		
<b>Matrix Spike (2101712-MS1)</b>				Source: R210152-01 Prepared & Analyzed: 10/17/12						
C10-C28 (DRO)	496	50	mg/kg	501	13.4	96.3	50-148			
<b>Matrix Spike Dup (2101712-MSD1)</b>				Source: R210152-01 Prepared & Analyzed: 10/17/12						
C10-C28 (DRO)	494	50	mg/kg	501	13.4	95.9	50-148	0.473	13	

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: Patrick Anderson 1

Project Number: [none]  
Project Manager: Brandon Bruns

Reported:  
10/18/12 16:46

**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 2101711 - EPA 5030 Soil MS**

**Blank (2101711-BLK1)**

Prepared: 10/17/12 Analyzed: 10/18/12

Naphthalene	ND	0.0050	mg/kg							
Benzene	ND	0.0050	"							
Toluene	ND	0.0050	"							
Ethylbenzene	ND	0.0050	"							
Xylenes (total)	ND	0.010	"							
Gasoline Range Hydrocarbons	ND	0.50	"							
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>0.0341</i>		<i>"</i>	<i>0.0397</i>		<i>86.0</i>	<i>30-150</i>			
<i>Surrogate: Toluene-d8</i>	<i>0.0385</i>		<i>"</i>	<i>0.0400</i>		<i>96.2</i>	<i>30-150</i>			
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>0.0372</i>		<i>"</i>	<i>0.0400</i>		<i>93.0</i>	<i>30-150</i>			

**LCS (2101711-BS1)**

Prepared: 10/17/12 Analyzed: 10/18/12

Naphthalene	ND	0.0050	mg/kg				66-138			
Benzene	0.0940	0.0050	"	0.100		94.0	58-130			
Toluene	0.102	0.0050	"	0.100		102	61-134			
Ethylbenzene	0.105	0.0050	"	0.100		105	74-139			
m,p-Xylene	0.217	0.010	"	0.200		108	73-137			
o-Xylene	0.107	0.0050	"	0.100		107	73-141			
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>0.0339</i>		<i>"</i>	<i>0.0397</i>		<i>85.5</i>	<i>30-150</i>			
<i>Surrogate: Toluene-d8</i>	<i>0.0390</i>		<i>"</i>	<i>0.0400</i>		<i>97.5</i>	<i>30-150</i>			
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>0.0377</i>		<i>"</i>	<i>0.0400</i>		<i>94.4</i>	<i>30-150</i>			

**LCS Dup (2101711-BSD1)**

Prepared: 10/17/12 Analyzed: 10/18/12

Naphthalene	ND	0.0050	mg/kg				66-138		12	
Benzene	0.0987	0.0050	"	0.100		98.7	58-130	4.92	13	
Toluene	0.107	0.0050	"	0.100		107	61-134	5.06	16	
Ethylbenzene	0.109	0.0050	"	0.100		109	74-139	3.25	12	
m,p-Xylene	0.222	0.010	"	0.200		111	73-137	2.69	14	
o-Xylene	0.111	0.0050	"	0.100		111	73-141	3.00	12	
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>0.0346</i>		<i>"</i>	<i>0.0397</i>		<i>87.3</i>	<i>30-150</i>			
<i>Surrogate: Toluene-d8</i>	<i>0.0390</i>		<i>"</i>	<i>0.0400</i>		<i>97.6</i>	<i>30-150</i>			
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>0.0368</i>		<i>"</i>	<i>0.0400</i>		<i>92.0</i>	<i>30-150</i>			

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: Patrick Anderson 1

Project Number: [none]  
Project Manager: Brandon Brunns

Reported:  
10/18/12 16:46

**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 2101711 - EPA 5030 Soil MS**

**Matrix Spike (2101711-MS1)**

Source: R210152-01 Prepared: 10/17/12 Analyzed: 10/18/12

Naphthalene	ND	0.0050	mg/kg	ND	ND		10-158			
Benzene	0.0794	0.0050	"	0.0975	0.00	81.5	30-131			
Toluene	0.0862	0.0050	"	0.0975	0.00	88.4	30-134			
Ethylbenzene	0.0848	0.0050	"	0.0975	0.00	87.0	22-153			
m,p-Xylene	0.172	0.010	"	0.195	0.00	88.3	10-159			
o-Xylene	0.0859	0.0050	"	0.0975	0.00	88.2	31-151			
Surrogate: 1,2-Dichloroethane-d4	0.0370		"	0.0387		95.7	30-150			
Surrogate: Toluene-d8	0.0384		"	0.0390		98.6	30-150			
Surrogate: 4-Bromofluorobenzene	0.0352		"	0.0390		90.4	30-150			

**Matrix Spike Dup (2101711-MSD1)**

Source: R210152-01 Prepared: 10/17/12 Analyzed: 10/18/12

Naphthalene	ND	0.0050	mg/kg	ND	ND		10-158		42	
Benzene	0.0759	0.0050	"	0.0956	0.00	79.4	30-131	4.50	34	
Toluene	0.0819	0.0050	"	0.0956	0.00	85.6	30-134	5.13	30	
Ethylbenzene	0.0831	0.0050	"	0.0956	0.00	86.9	22-153	2.10	24	
m,p-Xylene	0.171	0.010	"	0.191	0.00	89.5	10-159	0.547	68	
o-Xylene	0.0861	0.0050	"	0.0956	0.00	90.1	31-151	0.190	38	
Surrogate: 1,2-Dichloroethane-d4	0.0352		"	0.0380		92.8	30-150			
Surrogate: Toluene-d8	0.0370		"	0.0382		96.8	30-150			
Surrogate: 4-Bromofluorobenzene	0.0362		"	0.0382		94.7	30-150			

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: Patrick Anderson 1

Project Number: [none]  
Project Manager: Brandon Bruns

**Reported:**  
10/18/12 16:46

### 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

# Summit Scientific

---

741 Corporate Circle – Suite I ♦ Golden, Colorado 80401

303.277.9310 - laboratory ♦ 303.277.9531 - fax

October 19, 2012

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

Enclosed are the results of analyses for samples received by Summit Scientific on 10/18/12 13:15. 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 distinct "IV" at the end.

Joseph J Egry IV  
Laboratory Director



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

Project: Patrick Anderson 1

Project Number: [none]  
Project Manager: Brandon Bruns

**Reported:**  
10/19/12 08:59

### ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
SS11@8.5'	R210156-01	Soil	10/18/12 08:15	10/18/12 13:15
SS12@10'	R210156-02	Soil	10/18/12 11:25	10/18/12 13:15
GW02	R210156-03	Water	10/18/12 10:00	10/18/12 13:15

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: Patrick Anderson 1

Project Number: [none]  
 Project Manager: Brandon Bruns

Reported:  
 10/19/12 08:59

Summit Scientific  
 5: 2010156

741 Corporate Circle Suite 1 • Golden, Colorado 80401  
 303-277-9310 • 303-574-5933 Fax

Page 1 of 1

Client: PDC Energy  
 Address:   
 City/State/Zip:   
 Project Manager: Brandon Bruns  
 E-Mail:   
 Project Name: Patrick Anderson 1  
 Phone:   
 Fax:   
 Sample Name: Positive 10/19/12

Sample Description	Date Sampled	Time Sampled	Number of Containers	Preservative				Matrix				Analyze For:				Special Instructions		
				HCl	HNO <sub>3</sub>	Zone	Other (Specify)	Groundwater	Soil	Air - Canister Serial #	Other (Specify)	Other (Specify)	Other (Specify)	Other (Specify)	Other (Specify)		Other (Specify)	
5/1/05	10/18/12	8:55	1															
5/2/05	10/18/12	11:05	1															
5/2/05	10/18/12	10:00	1															STAIN DAY TAT
Requested by: [Signature]	Date/Time: 10/18/12 13:15	Received by: [Signature]	Date/Time: 10/19/12 13:15	Turn Around Time (Check):	Same Day	24 Hours	48 Hours	72 Hours	Standard	Notes:	PLEASE CC [Signature]							
Requested by:	Date/Time:	Received in Lab by:	Date/Time:	Sample Integrity:	Temperature Upon Receipt:	Inact:	Yes	No										

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

Project: Patrick Anderson 1

Project Number: [none]  
Project Manager: Brandon Brunns

Reported:  
10/19/12 08:59

**SS11@8.5'**  
**R210156-01 (Soil)**

**Summit Scientific**

**Total Petroleum Hydrocarbons by 8015**

Date Sampled: 10/18/12 08:15

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	2101814	10/18/12	10/18/12	8015 DRO	

Date Sampled: 10/18/12 08:15

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: o-Terphenyl		105 %	30-150		"	"	"	"	

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

Date Sampled: 10/18/12 08:15

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Naphthalene	ND	0.0050	mg/kg	1	2101813	10/18/12	10/18/12	EPA 8260B	
Benzene	ND	0.0050	"	"	"	"	"	"	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	ND	0.0050	"	"	"	"	"	"	
Xylenes (total)	ND	0.010	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	0.50	"	"	"	"	"	"	

Date Sampled: 10/18/12 08:15

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		98.0 %	30-150		"	"	"	"	
Surrogate: Toluene-d8		95.6 %	30-150		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		92.0 %	30-150		"	"	"	"	

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: Patrick Anderson 1

Project Number: [none]  
Project Manager: Brandon Bruns

Reported:  
10/19/12 08:59

**SS12@10'**  
**R210156-02 (Soil)**

**Summit Scientific**

**Total Petroleum Hydrocarbons by 8015**

Date Sampled: **10/18/12 11:25**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	2101814	10/18/12	10/18/12	8015 DRO	

Date Sampled: **10/18/12 11:25**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: <i>o</i> -Terphenyl		96.3 %	30-150		"	"	"	"	

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

Date Sampled: **10/18/12 11:25**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Naphthalene	ND	0.0050	mg/kg	1	2101813	10/18/12	10/18/12	EPA 8260B	
Benzene	ND	0.0050	"	"	"	"	"	"	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	ND	0.0050	"	"	"	"	"	"	
Xylenes (total)	ND	0.010	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	0.50	"	"	"	"	"	"	

Date Sampled: **10/18/12 11:25**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		95.7 %	30-150		"	"	"	"	
Surrogate: Toluene-d8		96.2 %	30-150		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		96.2 %	30-150		"	"	"	"	

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

Project: Patrick Anderson 1

Project Number: [none]  
 Project Manager: Brandon Bruns

**Reported:**  
 10/19/12 08:59

**GW02**  
**R210156-03 (Water)**

**Summit Scientific**

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

Date Sampled: **10/18/12 10:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>Benzene</b>	<b>10</b>	1.0	ug/l	1	2101811	10/18/12	10/18/12	EPA 8260B	
<b>Toluene</b>	<b>6.3</b>	1.0	"	"	"	"	"	"	
<b>Ethylbenzene</b>	<b>29</b>	1.0	"	"	"	"	"	"	
<b>Xylenes (total)</b>	<b>120</b>	1.0	"	"	"	"	"	"	

Date Sampled: **10/18/12 10:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<i>Surrogate: 1,2-Dichloroethane-d4</i>		100 %	49.7-150		"	"	"	"	
<i>Surrogate: Toluene-d8</i>		114 %	51-150		"	"	"	"	
<i>Surrogate: 4-Bromofluorobenzene</i>		164 %	50.1-150		"	"	"	"	S-02

Summit Scientific

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

Project: Patrick Anderson 1

Project Number: [none]  
 Project Manager: Brandon Brunns

**Reported:**  
 10/19/12 08:59

**Total Petroleum Hydrocarbons by 8015 - Quality Control**  
**Summit Scientific**

Analyte	Result	Reporting		Spike Level	Source		%REC		RPD		Notes
		Limit	Units		Result	%REC	Limits	RPD	Limit		

**Batch 2101814 - EPA 3550A**

**Blank (2101814-BLK1)**

Prepared: 10/18/12 Analyzed: 10/19/12

C10-C28 (DRO) ND 50 mg/kg

**LCS (2101814-BS1)**

Prepared: 10/18/12 Analyzed: 10/19/12

C10-C28 (DRO) 543 50 mg/kg 501 108 73-134

**LCS Dup (2101814-BSD1)**

Prepared: 10/18/12 Analyzed: 10/19/12

C10-C28 (DRO) 531 50 mg/kg 501 106 73-134 2.24 11

**Matrix Spike (2101814-MS1)**

**Source: R210156-01**

Prepared: 10/18/12 Analyzed: 10/19/12

C10-C28 (DRO) 479 50 mg/kg 485 25.9 93.6 50-148

**Matrix Spike Dup (2101814-MSD1)**

**Source: R210156-01**

Prepared: 10/18/12 Analyzed: 10/19/12

C10-C28 (DRO) 512 50 mg/kg 495 25.9 98.1 50-148 6.50 13



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

Project: Patrick Anderson 1

Project Number: [none]  
Project Manager: Brandon Brunns

Reported:  
10/19/12 08:59

**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 2101811 - EPA 5030 Water MS**

**Blank (2101811-BLK1)**

Prepared & Analyzed: 10/18/12

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>94.2</i>	<i>49.7-150</i>			
<i>Surrogate: Toluene-d8</i>	<i>13.0</i>		<i>"</i>	<i>13.3</i>		<i>97.4</i>	<i>51-150</i>			
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>14.0</i>		<i>"</i>	<i>13.3</i>		<i>105</i>	<i>50.1-150</i>			

**LCS (2101811-BS1)**

Prepared & Analyzed: 10/18/12

Benzene	21.3	1.0	ug/l	33.3		63.9	51-132			
Toluene	21.4	1.0	"	33.3		64.2	51-138			
Ethylbenzene	22.2	1.0	"	33.3		66.6	58-146			
m,p-Xylene	45.1	2.0	"	66.7		67.6	57-144			
o-Xylene	22.0	1.0	"	33.3		66.2	53-146			
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>13.0</i>		<i>"</i>	<i>13.2</i>		<i>98.4</i>	<i>49.7-150</i>			
<i>Surrogate: Toluene-d8</i>	<i>13.3</i>		<i>"</i>	<i>13.3</i>		<i>99.9</i>	<i>51-150</i>			
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>13.6</i>		<i>"</i>	<i>13.3</i>		<i>102</i>	<i>50.1-150</i>			

**Matrix Spike (2101811-MS1)**

Source: R210135-01

Prepared & Analyzed: 10/18/12

Benzene	20.2	1.0	ug/l	33.3	ND	60.6	34-141			
Toluene	18.6	1.0	"	33.3	ND	55.7	27-151			
Ethylbenzene	19.9	1.0	"	33.3	ND	59.6	29-160			
m,p-Xylene	39.5	2.0	"	66.7	ND	59.3	20-166			
o-Xylene	19.3	1.0	"	33.3	ND	57.8	33-159			
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>12.7</i>		<i>"</i>	<i>13.2</i>		<i>95.7</i>	<i>49.7-150</i>			
<i>Surrogate: Toluene-d8</i>	<i>13.4</i>		<i>"</i>	<i>13.3</i>		<i>100</i>	<i>51-150</i>			
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>13.1</i>		<i>"</i>	<i>13.3</i>		<i>98.0</i>	<i>50.1-150</i>			

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

Project: Patrick Anderson 1  
Project Number: [none]  
Project Manager: Brandon Brunns

Reported:  
10/19/12 08:59

**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 2101811 - EPA 5030 Water MS**

Matrix Spike Dup (2101811-MSD1)	Source: R210135-01			Prepared & Analyzed: 10/18/12						
Benzene	24.8	1.0	ug/l	33.3	ND	74.3	34-141	20.3	32	
Toluene	21.7	1.0	"	33.3	ND	65.0	27-151	15.5	25	
Ethylbenzene	23.7	1.0	"	33.3	ND	71.2	29-160	17.6	50	
m,p-Xylene	46.4	2.0	"	66.7	ND	69.5	20-166	16.0	36	
o-Xylene	22.7	1.0	"	33.3	ND	68.0	33-159	16.2	26	
Surrogate: 1,2-Dichloroethane-d4	12.8		"	13.2		96.5	49.7-150			
Surrogate: Toluene-d8	13.4		"	13.3		101	51-150			
Surrogate: 4-Bromofluorobenzene	13.1		"	13.3		98.4	50.1-150			

**Batch 2101813 - EPA 5030 Soil MS**

Blank (2101813-BLK1)	Prepared & Analyzed: 10/18/12								
Naphthalene	ND	0.0050	mg/kg						
Benzene	ND	0.0050	"						
Toluene	ND	0.0050	"						
Ethylbenzene	ND	0.0050	"						
Xylenes (total)	ND	0.010	"						
Gasoline Range Hydrocarbons	ND	0.50	"						
Surrogate: 1,2-Dichloroethane-d4	0.0355		"	0.0397		89.4	30-150		
Surrogate: Toluene-d8	0.0393		"	0.0400		98.2	30-150		
Surrogate: 4-Bromofluorobenzene	0.0376		"	0.0400		93.9	30-150		

LCS (2101813-BS1)	Prepared: 10/18/12 Analyzed: 10/19/12								
Naphthalene	ND	0.0050	mg/kg					66-138	
Benzene	0.0956	0.0050	"	0.100		95.6	58-130		
Toluene	0.0988	0.0050	"	0.100		98.8	61-134		
Ethylbenzene	0.102	0.0050	"	0.100		102	74-139		
m,p-Xylene	0.209	0.010	"	0.200		105	73-137		
o-Xylene	0.104	0.0050	"	0.100		104	73-141		
Surrogate: 1,2-Dichloroethane-d4	0.0357		"	0.0397		89.8	30-150		
Surrogate: Toluene-d8	0.0386		"	0.0400		96.4	30-150		
Surrogate: 4-Bromofluorobenzene	0.0364		"	0.0400		91.0	30-150		

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

Project: Patrick Anderson 1

Project Number: [none]  
Project Manager: Brandon Bruns

Reported:  
10/19/12 08:59

**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 2101813 - EPA 5030 Soil MS**

**LCS Dup (2101813-BSD1)**

Prepared: 10/18/12 Analyzed: 10/19/12

Naphthalene	ND	0.0050	mg/kg				66-138		12	
Benzene	0.112	0.0050	"	0.100		112	58-130	15.5	13	
Toluene	0.0956	0.0050	"	0.100		95.6	61-134	3.30	16	
Ethylbenzene	0.106	0.0050	"	0.100		106	74-139	3.52	12	
m,p-Xylene	0.215	0.010	"	0.200		108	73-137	2.77	14	
o-Xylene	0.107	0.0050	"	0.100		107	73-141	2.24	12	
Surrogate: 1,2-Dichloroethane-d4	0.0393		"	0.0397		99.1	30-150			
Surrogate: Toluene-d8	0.0356		"	0.0400		89.1	30-150			
Surrogate: 4-Bromofluorobenzene	0.0362		"	0.0400		90.4	30-150			

**Matrix Spike (2101813-MS1)**

Source: R210156-01

Prepared: 10/18/12 Analyzed: 10/19/12

Naphthalene	ND	0.0050	mg/kg		ND		10-158			
Benzene	0.0486	0.0050	"	0.0996	0.00	48.8	30-131			
Toluene	0.0549	0.0050	"	0.0996	0.00	55.1	30-134			
Ethylbenzene	0.0745	0.0050	"	0.0996	0.00	74.8	22-153			
m,p-Xylene	0.150	0.010	"	0.199	0.00	75.4	10-159			
o-Xylene	0.0774	0.0050	"	0.0996	0.00	77.7	31-151			
Surrogate: 1,2-Dichloroethane-d4	0.0367		"	0.0395		92.8	30-150			
Surrogate: Toluene-d8	0.0372		"	0.0398		93.5	30-150			
Surrogate: 4-Bromofluorobenzene	0.0386		"	0.0398		96.8	30-150			

**Matrix Spike Dup (2101813-MSD1)**

Source: R210156-01

Prepared: 10/18/12 Analyzed: 10/19/12

Naphthalene	ND	0.0050	mg/kg		ND		10-158		42	
Benzene	0.0443	0.0050	"	0.0978	0.00	45.3	30-131	9.17	34	
Toluene	0.0500	0.0050	"	0.0978	0.00	51.1	30-134	9.23	30	
Ethylbenzene	0.0696	0.0050	"	0.0978	0.00	71.2	22-153	6.79	24	
m,p-Xylene	0.140	0.010	"	0.196	0.00	71.5	10-159	7.09	68	
o-Xylene	0.0717	0.0050	"	0.0978	0.00	73.3	31-151	7.66	38	
Surrogate: 1,2-Dichloroethane-d4	0.0373		"	0.0388		96.0	30-150			
Surrogate: Toluene-d8	0.0372		"	0.0391		95.1	30-150			
Surrogate: 4-Bromofluorobenzene	0.0381		"	0.0391		97.4	30-150			

Summit Scientific

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

Project: Patrick Anderson 1

Project Number: [none]  
Project Manager: Brandon Bruns

**Reported:**  
10/19/12 08:59

### Notes and Definitions

- S-02 The surrogate recovery for this sample cannot be accurately quantified due to interference from coeluting organic compounds present in the sample extract.
- 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

# Summit Scientific

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741 Corporate Circle – Suite I ♦ Golden, Colorado 80401

303.277.9310 - laboratory ♦ 303.277.9531 - fax

October 23, 2012

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

Enclosed are the results of analyses for samples received by Summit Scientific on 10/22/12 09:45. 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 distinct "IV" at the end.

Joseph J Egry IV  
Laboratory Director





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

Project: Patrick Anderson 1

Project Number: [none]  
 Project Manager: Brandon Bruns

**Reported:**  
 10/23/12 13:56

**AW03  
 R210176-01 (Water)**

**Summit Scientific**

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

Date Sampled: **10/22/12 07:50**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>Benzene</b>	<b>8.8</b>	1.0	ug/l	1	2102210	10/22/12	10/22/12	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
<b>Ethylbenzene</b>	<b>4.3</b>	1.0	"	"	"	"	"	"	
<b>Xylenes (total)</b>	<b>20</b>	1.0	"	"	"	"	"	"	

Date Sampled: **10/22/12 07:50**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<i>Surrogate: 1,2-Dichloroethane-d4</i>		91.2 %	49.7-150		"	"	"	"	
<i>Surrogate: Toluene-d8</i>		92.9 %	51-150		"	"	"	"	
<i>Surrogate: 4-Bromofluorobenzene</i>		89.6 %	50.1-150		"	"	"	"	

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

Project: Patrick Anderson 1

Project Number: [none]  
Project Manager: Brandon Bruns

Reported:  
10/23/12 13:56

### Volatile Organic Compounds by EPA Method 8260B - Quality Control

#### Summit Scientific

Analyte	Reporting			Spike Level	Source		%REC		RPD		Notes
	Result	Limit	Units		Result	%REC	Limits	RPD	Limit		

#### Batch 2102210 - EPA 5030 Water MS

##### Blank (2102210-BLK1)

Prepared & Analyzed: 10/22/12

Benzene	ND	1.0	ug/l								
Toluene	ND	1.0	"								
Ethylbenzene	ND	1.0	"								
Xylenes (total)	ND	1.0	"								
Surrogate: 1,2-Dichloroethane-d4	11.7		"	13.2		88.7	49.7-150				
Surrogate: Toluene-d8	12.7		"	13.3		95.1	51-150				
Surrogate: 4-Bromofluorobenzene	13.2		"	13.3		99.3	50.1-150				

##### LCS (2102210-BS1)

Prepared & Analyzed: 10/22/12

Benzene	43.3	1.0	ug/l	66.7		64.9	51-132				
Toluene	44.8	1.0	"	66.7		67.2	51-138				
Ethylbenzene	54.6	1.0	"	66.7		81.9	58-146				
m,p-Xylene	108	2.0	"	133		80.6	57-144				
o-Xylene	53.9	1.0	"	66.7		80.8	53-146				
Surrogate: 1,2-Dichloroethane-d4	12.0		"	13.2		90.3	49.7-150				
Surrogate: Toluene-d8	12.4		"	13.3		92.6	51-150				
Surrogate: 4-Bromofluorobenzene	12.3		"	13.3		92.2	50.1-150				

##### LCS Dup (2102210-BSD1)

Prepared & Analyzed: 10/22/12

Benzene	44.6	1.0	ug/l	66.7		66.9	51-132	2.98	17		
Toluene	46.2	1.0	"	66.7		69.4	51-138	3.21	17		
Ethylbenzene	55.8	1.0	"	66.7		83.6	58-146	2.12	16		
m,p-Xylene	111	2.0	"	133		83.0	57-144	2.82	16		
o-Xylene	55.2	1.0	"	66.7		82.8	53-146	2.42	15		
Surrogate: 1,2-Dichloroethane-d4	12.0		"	13.2		90.7	49.7-150				
Surrogate: Toluene-d8	12.5		"	13.3		94.0	51-150				
Surrogate: 4-Bromofluorobenzene	12.6		"	13.3		94.4	50.1-150				

Summit Scientific

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

Project: Patrick Anderson 1

Project Number: [none]  
Project Manager: Brandon Bruns

Reported:  
10/23/12 13:56

**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 2102210 - EPA 5030 Water MS**

<b>Matrix Spike (2102210-MS1)</b>	<b>Source: R210150-02</b>			<b>Prepared &amp; Analyzed: 10/22/12</b>								
Benzene	44.2	1.0	ug/l	66.7	ND	66.2	34-141					
Toluene	45.6	1.0	"	66.7	ND	68.5	27-151					
Ethylbenzene	55.9	1.0	"	66.7	ND	83.9	29-160					
m,p-Xylene	111	2.0	"	133	1.00	82.4	20-166					
o-Xylene	55.6	1.0	"	66.7	ND	83.4	33-159					
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>12.0</i>		<i>"</i>	<i>13.2</i>		<i>90.8</i>	<i>49.7-150</i>					
<i>Surrogate: Toluene-d8</i>	<i>12.4</i>		<i>"</i>	<i>13.3</i>		<i>93.2</i>	<i>51-150</i>					
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>10.8</i>		<i>"</i>	<i>13.3</i>		<i>81.0</i>	<i>50.1-150</i>					

<b>Matrix Spike Dup (2102210-MSD1)</b>	<b>Source: R210150-02</b>			<b>Prepared &amp; Analyzed: 10/22/12</b>								
Benzene	43.7	1.0	ug/l	66.7	ND	65.5	34-141	1.14	32			
Toluene	45.4	1.0	"	66.7	ND	68.1	27-151	0.549	25			
Ethylbenzene	55.2	1.0	"	66.7	ND	82.8	29-160	1.30	50			
m,p-Xylene	110	2.0	"	133	1.00	81.6	20-166	0.924	36			
o-Xylene	55.4	1.0	"	66.7	ND	83.1	33-159	0.397	26			
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>12.1</i>		<i>"</i>	<i>13.2</i>		<i>91.5</i>	<i>49.7-150</i>					
<i>Surrogate: Toluene-d8</i>	<i>12.6</i>		<i>"</i>	<i>13.3</i>		<i>94.3</i>	<i>51-150</i>					
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>11.9</i>		<i>"</i>	<i>13.3</i>		<i>89.4</i>	<i>50.1-150</i>					

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.*



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**Reported:**  
10/23/12 13:56

### 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