

TABLE 1
CHARLES 1 TANK BATTERY
SOIL ANALYTICAL RESULTS SUMMARY TABLE

Sample ID	Date Sampled	Depth (feet bgs)	Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	Total Xylenes (mg/kg)	Naphthalene (mg/kg)	TPH ⁽²⁾ (mg/kg)	EC (mmhos/cm)	pH (units)
COGCC standards for soil (mg/kg) ⁽¹⁾			0.17	85	100	175	23	500	<4	6-9
SS01 @ 11'	2/25/2016	11	<0.0020	<0.0050	<0.0050	<0.010	<0.010	<50	6.26	7.55
SS02 @ 11'	2/25/2016	11	<0.0020	<0.0050	<0.0050	<0.010	<0.010	<50	4.08	7.73
SS03 @ 11'	2/25/2016	11	<0.0020	<0.0050	<0.0050	<0.010	<0.010	<50	3.75	7.71
SS04 @ 11'	2/25/2016	11	<0.0020	<0.0050	<0.0050	<0.010	<0.010	<50	1.10	8.13

Notes:

- Standards for soil are taken from 2 CCR 404-1, Table 910-1, effective January 30, 2015.
- TPH - Total volatile and extractable petroleum hydrocarbons. Value calculated by adding GRO and DRO concentrations.

COGCC = Colorado Oil and Gas Conservation Commission

(<) = Analytical result is less than the indicated laboratory reporting limit.

GRO = Total volatile petroleum hydrocarbons - gasoline range organics

DRO = Total extractable petroleum hydrocarbons - diesel range organics

mg/kg = Milligrams per kilogram

bgs = Below ground surface

EC = Electrical conductivity

mmhos/cm = millimhos per centimeter

BOLD = Analytical result is in exceedance of COGCC soil standards.

TABLE 2
CHARLES 1 TANK BATTERY
GROUNDWATER ANALYTICAL RESULTS SUMMARY TABLE

Sample ID	Date Sampled	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Total Xylenes (µg/L)	Depth to Water (feet bgs)
COGCC Table 910-1 Groundwater Standard (µg/L) ⁽¹⁾		5	560	700	1,400	
GW01	3/7/2016	1.9	9.3	1.2	15	~ 13

Notes:

1. Groundwater standards referenced from 2 CCR 404-1, Table 910-1, effective January 30, 2015.

COGCC = Colorado Oil and Gas Conservation Commission

µg/L= Micrograms per liter

bgs = Below ground surface

(<) = Analytical result is less than the indicated laboratory reporting limit.

BOLD = Analytical result is in exceedance of COGCC groundwater standards.

ATTACHMENT A

Summit Scientific

741 Corporate Circle – Suite I ♦ Golden, Colorado 80401

303.277.9310 - laboratory ♦ 303.277.9531 - fax

March 03, 2016

Mark Longhurst
PDC Energy
1775 Sherman St. STE. 3000
Denver, CO 80203
RE: Charles 1

Enclosed are the results of analyses for samples received by Summit Scientific on 02/25/16 17:00. If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Paul Shrewsbury
President



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

Project: Charles 1

Project Number: [none]
Project Manager: Mark Longhurst

Reported:
03/03/16 10:37

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
SS01@11'	1602206-01	Soil	02/25/16 09:15	02/25/16 17:00
SS02@11'	1602206-02	Soil	02/25/16 09:22	02/25/16 17:00
SS03@11'	1602206-03	Soil	02/25/16 09:31	02/25/16 17:00
SS04@11'	1602206-04	Soil	02/25/16 09:40	02/25/16 17:00

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

Project: Charles 1

Project Number: [none]
Project Manager: Mark Longhurst

Reported:
03/03/16 10:37

Summit Scientific

1602206

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

Page 1 of 1

Client: PDC
Address: _____
City/State/Zip: _____
Phone: _____ Fax: _____
Sampler Name: Matt P

Project Manager: Mark Longhurst
E-Mail: mark.longhurst@pdc.com
Project Name: Charles 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)	GBS EX N (2015)	DOO (2015)	EC		pH
SS01 @ 11'	2/25/16	9:15	1			X		X				X	X	X	X	
SS02 @ 11'		9:22	1			X		X				X	X	X	X	
SS03 @ 11'		9:31	1			X		X				X	X	X	X	
SS04 @ 11'		9:40	1			X		X				X	X	X	X	
Relinquished by: <u>[Signature]</u> Date/Time: <u>2/25/16 17:00</u>				Received by: _____ Date/Time: _____				Turn Around Time (Check)				Notes:				
Relinquished by: <u>[Signature]</u> Date/Time: <u>2/25/16 1700</u>				Received by: <u>[Signature]</u> Date/Time: <u>2/25/16 1700</u>				Same Day <input type="checkbox"/> 72 Hours <input type="checkbox"/>				on ice				
Relinquished by: <u>[Signature]</u> Date/Time: <u>2/25/16 1745</u>				Received in Lab by: <u>[Signature]</u> Date/Time: <u>2/25 1745</u>				48 Hours <input type="checkbox"/> Standard <input checked="" type="checkbox"/>								
								Sample Integrity: Temperature Upon Receipt: <u>4.8°C</u>								
								Intact: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>								

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

Project: Charles 1
Project Number: [none]
Project Manager: Mark Longhurst

Reported:
03/03/16 10:37

SS01@11'
1602206-01 (Soil)

Summit Scientific

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: **02/25/16 09:15**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	1602274	02/29/16	02/29/16	8015M	

Date Sampled: **02/25/16 09:15**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: <i>o</i> -Terphenyl		97.3 %	30-150		"	"	"	"	

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **02/25/16 09:15**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Naphthalene	ND	0.010	mg/kg	1	1602275	02/29/16	03/01/16	EPA 8260B	
Benzene	ND	0.0020	"	"	"	"	"	"	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	ND	0.0050	"	"	"	"	"	"	
Xylenes (total)	ND	0.010	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	0.50	"	"	"	"	"	"	

Date Sampled: **02/25/16 09:15**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		114 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		100 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		104 %	21-167		"	"	"	"	

Physical Parameters by APHA/ASTM/EPA Methods

Date Sampled: **02/25/16 09:15**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Specific Conductance (EC)	6.26	0.0100	mmhos/cm	1	1603024	03/02/16	03/02/16	SM 2510B	

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

Project: Charles 1

Project Number: [none]
 Project Manager: Mark Longhurst

Reported:
 03/03/16 10:37

SS01@11'
1602206-01 (Soil)

Summit Scientific

Physical Parameters by APHA/ASTM/EPA Methods

Date Sampled: **02/25/16 09:15**

Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
pH	7.55	0.100	pH Units	1	1603023	03/02/16	03/02/16	EPA 9045	

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

Project: Charles 1
Project Number: [none]
Project Manager: Mark Longhurst

Reported:
03/03/16 10:37

SS02@11'
1602206-02 (Soil)

Summit Scientific

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: **02/25/16 09:22**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	1602274	02/29/16	02/29/16	8015M	

Date Sampled: **02/25/16 09:22**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: <i>o</i> -Terphenyl		99.7 %	30-150		"	"	"	"	

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **02/25/16 09:22**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Naphthalene	ND	0.010	mg/kg	1	1602275	02/29/16	03/01/16	EPA 8260B	
Benzene	ND	0.0020	"	"	"	"	"	"	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	ND	0.0050	"	"	"	"	"	"	
Xylenes (total)	ND	0.010	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	0.50	"	"	"	"	"	"	

Date Sampled: **02/25/16 09:22**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		114 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		99.5 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		103 %	21-167		"	"	"	"	

Physical Parameters by APHA/ASTM/EPA Methods

Date Sampled: **02/25/16 09:22**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Specific Conductance (EC)	4.08	0.0100	mmhos/cm	1	1603024	03/02/16	03/02/16	SM 2510B	

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

Project: Charles 1

Project Number: [none]
 Project Manager: Mark Longhurst

Reported:
 03/03/16 10:37

SS02@11'
1602206-02 (Soil)

Summit Scientific

Physical Parameters by APHA/ASTM/EPA Methods

Date Sampled: **02/25/16 09:22**

Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
pH	7.73	0.100	pH Units	1	1603023	03/02/16	03/02/16	EPA 9045	

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

Project: Charles 1
Project Number: [none]
Project Manager: Mark Longhurst

Reported:
03/03/16 10:37

SS03@11'
1602206-03 (Soil)

Summit Scientific

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: **02/25/16 09:31**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	1602274	02/29/16	02/29/16	8015M	

Date Sampled: **02/25/16 09:31**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: <i>o</i> -Terphenyl		97.8 %	30-150		"	"	"	"	

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **02/25/16 09:31**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Naphthalene	ND	0.010	mg/kg	1	1602275	02/29/16	03/01/16	EPA 8260B	
Benzene	ND	0.0020	"	"	"	"	"	"	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	ND	0.0050	"	"	"	"	"	"	
Xylenes (total)	ND	0.010	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	0.50	"	"	"	"	"	"	

Date Sampled: **02/25/16 09:31**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		115 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		99.7 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		105 %	21-167		"	"	"	"	

Physical Parameters by APHA/ASTM/EPA Methods

Date Sampled: **02/25/16 09:31**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Specific Conductance (EC)	3.75	0.0100	mmhos/cm	1	1603024	03/02/16	03/02/16	SM 2510B	

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

Project: Charles 1

Project Number: [none]
 Project Manager: Mark Longhurst

Reported:
 03/03/16 10:37

SS03@11'
1602206-03 (Soil)

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Physical Parameters by APHA/ASTM/EPA Methods

Date Sampled: **02/25/16 09:31**

Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
pH	7.71	0.100	pH Units	1	1603023	03/02/16	03/02/16	EPA 9045	

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

Project: Charles 1
Project Number: [none]
Project Manager: Mark Longhurst

Reported:
03/03/16 10:37

SS04@11'
1602206-04 (Soil)

Summit Scientific

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: **02/25/16 09:40**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	1602274	02/29/16	02/29/16	8015M	

Date Sampled: **02/25/16 09:40**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: <i>o</i> -Terphenyl		99.7 %	30-150		"	"	"	"	

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **02/25/16 09:40**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Naphthalene	ND	0.010	mg/kg	1	1602275	02/29/16	03/01/16	EPA 8260B	
Benzene	ND	0.0020	"	"	"	"	"	"	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	ND	0.0050	"	"	"	"	"	"	
Xylenes (total)	ND	0.010	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	0.50	"	"	"	"	"	"	

Date Sampled: **02/25/16 09:40**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		110 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		101 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		104 %	21-167		"	"	"	"	

Physical Parameters by APHA/ASTM/EPA Methods

Date Sampled: **02/25/16 09:40**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Specific Conductance (EC)	1.10	0.0100	mmhos/cm	1	1603024	03/02/16	03/02/16	SM 2510B	

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

Project: Charles 1
 Project Number: [none]
 Project Manager: Mark Longhurst

Reported:
 03/03/16 10:37

SS04@11'
1602206-04 (Soil)

Summit Scientific

Physical Parameters by APHA/ASTM/EPA Methods

Date Sampled: **02/25/16 09:40**

Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
pH	8.13	0.100	pH Units	1	1603023	03/02/16	03/02/16	EPA 9045	

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

Project: Charles 1
 Project Number: [none]
 Project Manager: Mark Longhurst

Reported:
 03/03/16 10:37

Extractable 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 1602274 - EPA 3550A

Blank (1602274-BLK1)				Prepared & Analyzed: 02/29/16							
C10-C28 (DRO)	ND	50	mg/kg								
Surrogate: o-Terphenyl	12.5		"	12.5		100	30-150				
LCS (1602274-BS1)				Prepared & Analyzed: 02/29/16							
C10-C28 (DRO)	435	50	mg/kg	499		87.2	73-134				
Surrogate: o-Terphenyl	12.7		"	12.5		101	30-150				
Matrix Spike (1602274-MS1)				Source: 1602206-01		Prepared & Analyzed: 02/29/16					
C10-C28 (DRO)	434	50	mg/kg	494	18.1	84.3	50-148				
Surrogate: o-Terphenyl	12.5		"	12.4		101	30-150				
Matrix Spike Dup (1602274-MSD1)				Source: 1602206-01		Prepared & Analyzed: 02/29/16					
C10-C28 (DRO)	448	50	mg/kg	497	18.1	86.6	50-148	3.15		13	
Surrogate: o-Terphenyl	12.7		"	12.5		102	30-150				

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

Project: Charles 1
Project Number: [none]
Project Manager: Mark Longhurst

Reported:
03/03/16 10:37

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 1602275 - EPA 5030 Soil MS

Blank (1602275-BLK1)

Prepared & Analyzed: 02/29/16

Naphthalene	ND	0.010	mg/kg							
Benzene	ND	0.0020	"							
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>0.0433</i>		<i>"</i>	<i>0.0400</i>		<i>108</i>	<i>23-173</i>			
<i>Surrogate: Toluene-d8</i>	<i>0.0397</i>		<i>"</i>	<i>0.0400</i>		<i>99.2</i>	<i>20-170</i>			
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>0.0400</i>		<i>"</i>	<i>0.0400</i>		<i>100</i>	<i>21-167</i>			

LCS (1602275-BS1)

Prepared: 02/29/16 Analyzed: 03/01/16

Naphthalene	ND	0.010	mg/kg				66-138			
Benzene	0.104	0.0020	"	0.100		104	58-130			
Toluene	0.0992	0.0050	"	0.100		99.2	61-134			
Ethylbenzene	0.111	0.0050	"	0.0992		112	74-139			
m,p-Xylene	0.216	0.010	"	0.200		108	73-137			
o-Xylene	0.105	0.0050	"	0.0980		108	73-141			
Xylenes (total)	0.321	0.010	"				0-200			
Gasoline Range Hydrocarbons	2.60	0.50	"				30-150			
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>0.0434</i>		<i>"</i>	<i>0.0400</i>		<i>108</i>	<i>23-173</i>			
<i>Surrogate: Toluene-d8</i>	<i>0.0413</i>		<i>"</i>	<i>0.0400</i>		<i>103</i>	<i>20-170</i>			
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>0.0388</i>		<i>"</i>	<i>0.0400</i>		<i>97.0</i>	<i>21-167</i>			

Matrix Spike (1602275-MS1)

Source: 1602206-01

Prepared: 02/29/16 Analyzed: 03/01/16

Naphthalene	ND	0.010	mg/kg		ND		10-158			
Benzene	0.0904	0.0020	"	0.0998	ND	90.6	30-131			
Toluene	0.0857	0.0050	"	0.0998	ND	85.9	30-134			
Ethylbenzene	0.0969	0.0050	"	0.0990	ND	97.9	22-153			
m,p-Xylene	0.189	0.010	"	0.199	ND	94.7	10-159			
o-Xylene	0.0924	0.0050	"	0.0978	ND	94.4	31-151			
Xylenes (total)	0.281	0.010	"		ND		30-160			
Gasoline Range Hydrocarbons	2.16	0.50	"		ND		30-160			
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>0.0462</i>		<i>"</i>	<i>0.0399</i>		<i>116</i>	<i>23-173</i>			
<i>Surrogate: Toluene-d8</i>	<i>0.0410</i>		<i>"</i>	<i>0.0399</i>		<i>103</i>	<i>20-170</i>			
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>0.0392</i>		<i>"</i>	<i>0.0399</i>		<i>98.1</i>	<i>21-167</i>			

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

Project: Charles 1
 Project Number: [none]
 Project Manager: Mark Longhurst

Reported:
 03/03/16 10:37

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 1602275 - EPA 5030 Soil MS

Matrix Spike Dup (1602275-MSD1)	Source: 1602206-01			Prepared: 02/29/16		Analyzed: 03/01/16				
Naphthalene	ND	0.010	mg/kg		ND		10-158			42
Benzene	0.0902	0.0020	"	0.0951	ND	94.9	30-131	0.242		34
Toluene	0.0862	0.0050	"	0.0951	ND	90.7	30-134	0.602		30
Ethylbenzene	0.0971	0.0050	"	0.0943	ND	103	22-153	0.220		24
m,p-Xylene	0.188	0.010	"	0.190	ND	99.0	10-159	0.492		68
o-Xylene	0.0925	0.0050	"	0.0932	ND	99.3	31-151	0.125		38
Xylenes (total)	0.280	0.010	"		ND		30-160	0.289		30
Gasoline Range Hydrocarbons	2.18	0.50	"		ND		30-160	1.04		30
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>0.0440</i>		<i>"</i>	<i>0.0380</i>		<i>116</i>	<i>23-173</i>			
<i>Surrogate: Toluene-d8</i>	<i>0.0396</i>		<i>"</i>	<i>0.0380</i>		<i>104</i>	<i>20-170</i>			
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>0.0377</i>		<i>"</i>	<i>0.0380</i>		<i>99.2</i>	<i>21-167</i>			

Summit Scientific

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

Project: Charles 1
 Project Number: [none]
 Project Manager: Mark Longhurst

Reported:
 03/03/16 10:37

Physical Parameters by APHA/ASTM/EPA Methods - Quality Control
Summit Scientific

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

Batch 1603023 - General Preparation

LCS (1603023-BS1)					Prepared & Analyzed: 03/02/16					
pH	8.00	0.100	pH Units	8.00	100	95-105				
Duplicate (1603023-DUP1)					Source: 1602206-01		Prepared & Analyzed: 03/02/16			
pH	7.55	0.100	pH Units	7.55				0.00	20	

Batch 1603024 - General Preparation

Blank (1603024-BLK1)					Prepared & Analyzed: 03/02/16					
Specific Conductance (EC)	ND	0.0100	mmhos/cm							
LCS (1603024-BS1)					Prepared & Analyzed: 03/02/16					
Specific Conductance (EC)	0.505	0.0100	mmhos/cm	0.500	101	90-110				
Duplicate (1603024-DUP1)					Source: 1602206-01		Prepared & Analyzed: 03/02/16			
Specific Conductance (EC)	3.74	0.0100	mmhos/cm	6.26				50.4	20	QR-03

Summit Scientific

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

Project: Charles 1

Project Number: [none]
Project Manager: Mark Longhurst

Reported:
03/03/16 10:37

Notes and Definitions

- QR-03 The RPD value for the sample duplicate or MS/MSD was outside of QC acceptance limits due to matrix interference. QC batch accepted based on LCS and/or LCSD recovery and/or RPD values.
- 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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Summit Scientific

741 Corporate Circle – Suite I ♦ Golden, Colorado 80401

303.277.9310 - laboratory ♦ 303.277.9531 - fax

March 08, 2016

Mark Longhurst
PDC Energy
1775 Sherman St. STE. 3000
Denver, CO 80203
RE: Charles 1

Enclosed are the results of analyses for samples received by Summit Scientific on 03/07/16 17:00. If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Paul Shrewsbury
President



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

Project: Charles I
 Project Number: [none]
 Project Manager: Mark Longhurst

Reported:
 03/08/16 06:20

GW01
1603049-01 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **03/07/16 12:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	1.9	1.0	ug/l	1	1603064	03/07/16	03/07/16	EPA 8260B	
Toluene	9.3	1.0	"	"	"	"	"	"	
Ethylbenzene	1.2	1.0	"	"	"	"	"	"	
Xylenes (total)	15	1.0	"	"	"	"	"	"	

Date Sampled: **03/07/16 12:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<i>Surrogate: 1,2-Dichloroethane-d4</i>		112 %	37-154		"	"	"	"	
<i>Surrogate: Toluene-d8</i>		101 %	45-149		"	"	"	"	
<i>Surrogate: 4-Bromofluorobenzene</i>		102 %	45-146		"	"	"	"	

Summit Scientific

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

Project: Charles 1
Project Number: [none]
Project Manager: Mark Longhurst

Reported:
03/08/16 06:20

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 1603064 - EPA 5030 Water MS

Blank (1603064-BLK1)

Prepared & Analyzed: 03/08/16

Benzene	ND	1.0	ug/l							
Toluene	ND	1.0	"							
Ethylbenzene	ND	1.0	"							
Xylenes (total)	ND	1.0	"							
Surrogate: 1,2-Dichloroethane-d4	14.4		"	13.3		108	37-154			
Surrogate: Toluene-d8	13.4		"	13.3		100	45-149			
Surrogate: 4-Bromofluorobenzene	13.1		"	13.3		98.0	45-146			

LCS (1603064-BS1)

Prepared & Analyzed: 03/08/16

Benzene	30.7	1.0	ug/l	33.3		92.2	51-132			
Toluene	31.4	1.0	"	33.3		94.1	51-138			
Ethylbenzene	32.2	1.0	"	33.1		97.3	58-146			
m,p-Xylene	63.7	2.0	"	66.5		95.7	57-144			
o-Xylene	33.6	1.0	"	32.7		103	53-146			
Surrogate: 1,2-Dichloroethane-d4	14.3		"	13.3		107	37-154			
Surrogate: Toluene-d8	13.2		"	13.3		99.2	45-149			
Surrogate: 4-Bromofluorobenzene	13.9		"	13.3		104	45-146			

Matrix Spike (1603064-MS1)

Source: 1603034-02

Prepared & Analyzed: 03/08/16

Benzene	31.8	1.0	ug/l	33.3	ND	95.5	34-141			
Toluene	32.2	1.0	"	33.3	ND	96.6	27-151			
Ethylbenzene	32.7	1.0	"	33.1	ND	99.0	29-160			
m,p-Xylene	65.0	2.0	"	66.5	ND	97.7	20-166			
o-Xylene	33.4	1.0	"	32.7	ND	102	33-159			
Surrogate: 1,2-Dichloroethane-d4	13.4		"	13.3		100	37-154			
Surrogate: Toluene-d8	13.5		"	13.3		101	45-149			
Surrogate: 4-Bromofluorobenzene	13.0		"	13.3		97.7	45-146			

Summit Scientific

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

Project: Charles 1
 Project Number: [none]
 Project Manager: Mark Longhurst

Reported:
 03/08/16 06:20

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 1603064 - EPA 5030 Water MS

Matrix Spike Dup (1603064-MSD1)	Source: 1603034-02			Prepared & Analyzed: 03/08/16						
Benzene	31.8	1.0	ug/l	33.3	ND	95.5	34-141	0.0628	32	
Toluene	32.7	1.0	"	33.3	ND	98.1	27-151	1.60	25	
Ethylbenzene	33.4	1.0	"	33.1	ND	101	29-160	1.91	50	
m,p-Xylene	65.9	2.0	"	66.5	ND	99.1	20-166	1.34	36	
o-Xylene	34.0	1.0	"	32.7	ND	104	33-159	1.81	26	
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>13.2</i>		<i>"</i>	<i>13.3</i>		<i>98.7</i>	<i>37-154</i>			
<i>Surrogate: Toluene-d8</i>	<i>13.5</i>		<i>"</i>	<i>13.3</i>		<i>101</i>	<i>45-149</i>			
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>13.3</i>		<i>"</i>	<i>13.3</i>		<i>100</i>	<i>45-146</i>			

Summit Scientific

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

Project: Charles 1
Project Number: [none]
Project Manager: Mark Longhurst

Reported:
03/08/16 06:20

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

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