

## **ANALYTICAL TABLE**

**TABLE 1**  
**STATE 6525 13-32 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 <sup>(2)</sup> (mg/kg)
COGCC standards for soil (mg/kg) <sup>(1)</sup>			0.17	85	100	175	23	500
SB01 @ 6'	11/9/2016	6	<0.0020	<0.0050	<0.0050	<0.010	<0.010	<50
SB02 @ 6'	11/9/2016	6	<0.0020	<0.0050	<0.0050	<0.010	<0.010	<50
SB03 @ 6'	11/9/2016	6	<0.0020	<0.0050	<0.0050	<0.010	<0.010	<50
SB04 @ 6'	11/9/2016	6	<0.0020	<0.0050	<0.0050	<0.010	<0.010	<50
SB05 @ 6'	11/9/2016	6	<0.0020	<0.0050	<0.0050	<0.010	<0.010	<50

**Notes:**

1. Standards for soil are taken from 2 CCR 404-1, Table 910-1, effective January 30, 2015.

2. 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

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

## **LABORATORY ANALYTICAL REPORT**

# Summit Scientific

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741 Corporate Circle – Suite I ♦ Golden, Colorado 80401

303.277.9310 - laboratory ♦ 303.277.9531 - fax

November 15, 2016

Mark Longhurst  
PDC Energy  
1775 Sherman St. STE. 3000  
Denver, CO 80203  
RE: State 6525 13-32

Enclosed are the results of analyses for samples received by Summit Scientific on 11/09/16 16:30. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

A handwritten signature in black ink, appearing to read 'P. Shrewsbury', with a stylized, cursive script.

Paul Shrewsbury  
President



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

Project: State 6525 13-32  
Project Number: [none]  
Project Manager: Mark Longhurst

**Reported:**  
11/15/16 08:02

### ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
SB01@6'	1611076-01	Soil	11/09/16 10:21	11/09/16 16:30
SB02@6'	1611076-02	Soil	11/09/16 10:39	11/09/16 16:30
SB03@6'	1611076-03	Soil	11/09/16 10:54	11/09/16 16:30
SB04@6'	1611076-04	Soil	11/09/16 11:10	11/09/16 16:30
SB05@6'	1611076-05	Soil	11/09/16 11:28	11/09/16 16:30

Summit Scientific

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

Project: State 6525 13-32

Project Number: [none]  
Project Manager: Mark Longhurst

Reported:  
11/15/16 08:02

### Sample Receipt Checklist

S2 Work Order: 1611076

Client: PDC Energy

Client Project ID: State 652513-32

Shipped Via: P/U

(UPS, FedEx, Hand Delivered, Pick-up, etc.)

Airbill #:

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

Cooler ID					
Temp (°C)	<u>4.5</u>				

Thermometer ID: 61257155-K

	Yes	No	N/A	Comments (if any)
If samples require cooling, was the temperature just above 0°C to ≤ 6°C <sup>(1)</sup> ?				
NOTE: If samples are delivered the same day of sampling, this requirement is waived provided that there is evidence that cooling has begun.	<input checked="" type="checkbox"/>			
Were all samples received intact <sup>(1)</sup> ?	<input checked="" type="checkbox"/>			
Was adequate sample volume provided <sup>(1)</sup> ?	<input checked="" type="checkbox"/>			
If custody seals are present, are they intact <sup>(1)</sup> ?			<input checked="" type="checkbox"/>	
Are short holding time analytes or samples with HTs due within 48 hours present?			<input checked="" type="checkbox"/>	
Is a chain of custody (COC) form present and filled out completely?	<input checked="" type="checkbox"/>			
Does the COC agree with the number and type of sample bottles received?	<input checked="" type="checkbox"/>			
Do the sample IDs on the bottle labels match the COC <sup>(1)</sup> ?	<input checked="" type="checkbox"/>			
Is the COC properly relinquished by the client w/ date and time received?	<input checked="" type="checkbox"/>			
For volatile analytes – is there headspace present? If yes, contact client and note in narrative.			<input checked="" type="checkbox"/>	
Are samples preserved that require preservation (excluding cooling) <sup>(1)</sup> ?			<input checked="" type="checkbox"/>	
Note type of preservative in the Comments column – HCl, H <sub>2</sub> SO <sub>4</sub> , HNO <sub>3</sub> , ect			<input checked="" type="checkbox"/>	
If samples are preserved for metals, is the pH ≤ 2 <sup>(1)</sup> ?			<input checked="" type="checkbox"/>	
Record pH in Comments.			<input checked="" type="checkbox"/>	
If digestion requested, were samples field filtered?			<input checked="" type="checkbox"/>	
Add any Comments (if any):				

<sup>(1)</sup> If yes, the client must be contacted before proceeding with analysis and note in case narrative.

Nakita  
Custodian Printed Name

MS  
Signature or Initials of Custodian

11/16/16 1700  
Date/Time



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

Project: State 6525 13-32  
Project Number: [none]  
Project Manager: Mark Longhurst

**Reported:**  
11/15/16 08:02

**SB01@6'**  
**1611076-01 (Soil)**

**Summit Scientific**

**Extractable Petroleum Hydrocarbons by 8015**

Date Sampled: **11/09/16 10:21**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	1611111	11/10/16	11/10/16	8015M	

Date Sampled: **11/09/16 10:21**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: o-Terphenyl		111 %	30-150		"	"	"	"	

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

Date Sampled: **11/09/16 10:21**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Naphthalene	ND	0.010	mg/kg	1	1611112	"	11/10/16	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: **11/09/16 10:21**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		99.4 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		106 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		99.9 %	21-167		"	"	"	"	

Summit Scientific

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

Project: State 6525 13-32  
Project Number: [none]  
Project Manager: Mark Longhurst

Reported:  
11/15/16 08:02

**SB02@6'**  
**1611076-02 (Soil)**

**Summit Scientific**

**Extractable Petroleum Hydrocarbons by 8015**

Date Sampled: **11/09/16 10:39**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	1611111	11/10/16	11/11/16	8015M	

Date Sampled: **11/09/16 10:39**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: o-Terphenyl		117 %	30-150		"	"	"	"	

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

Date Sampled: **11/09/16 10:39**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Naphthalene	ND	0.010	mg/kg	1	1611112	"	11/11/16	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: **11/09/16 10:39**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		95.8 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		103 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		99.8 %	21-167		"	"	"	"	

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Denver CO, 80203

Project: State 6525 13-32  
Project Number: [none]  
Project Manager: Mark Longhurst

Reported:  
11/15/16 08:02

**SB03@6'**  
**1611076-03 (Soil)**

**Summit Scientific**

**Extractable Petroleum Hydrocarbons by 8015**

Date Sampled: **11/09/16 10:54**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	1611111	11/10/16	11/11/16	8015M	

Date Sampled: **11/09/16 10:54**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: o-Terphenyl		112 %	30-150		"	"	"	"	

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

Date Sampled: **11/09/16 10:54**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Naphthalene	ND	0.010	mg/kg	1	1611112	"	11/11/16	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: **11/09/16 10:54**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		129 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		87.8 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		96.4 %	21-167		"	"	"	"	

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Project Number: [none]  
Project Manager: Mark Longhurst

Reported:  
11/15/16 08:02

**SB04@6'**  
**1611076-04 (Soil)**

**Summit Scientific**

**Extractable Petroleum Hydrocarbons by 8015**

Date Sampled: **11/09/16 11:10**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	1611111	11/10/16	11/11/16	8015M	

Date Sampled: **11/09/16 11:10**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: o-Terphenyl		113 %	30-150		"	"	"	"	

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

Date Sampled: **11/09/16 11:10**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Naphthalene	ND	0.010	mg/kg	1	1611112	"	11/11/16	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: **11/09/16 11:10**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		99.8 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		103 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		89.8 %	21-167		"	"	"	"	

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Project: State 6525 13-32  
Project Number: [none]  
Project Manager: Mark Longhurst

**Reported:**  
11/15/16 08:02

**SB05@6'**  
**1611076-05 (Soil)**

**Summit Scientific**

**Extractable Petroleum Hydrocarbons by 8015**

Date Sampled: **11/09/16 11:28**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	1611111	11/10/16	11/11/16	8015M	

Date Sampled: **11/09/16 11:28**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: o-Terphenyl		117 %	30-150		"	"	"	"	

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

Date Sampled: **11/09/16 11:28**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Naphthalene	ND	0.010	mg/kg	1	1611112	"	11/11/16	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: **11/09/16 11:28**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		101 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		103 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		93.4 %	21-167		"	"	"	"	

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1775 Sherman St. STE. 3000  
Denver CO, 80203

Project: State 6525 13-32  
Project Number: [none]  
Project Manager: Mark Longhurst

**Reported:**  
11/15/16 08:02

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

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

**Batch 1611111 - EPA 3550A**

**Blank (1611111-BLK1)**

Prepared & Analyzed: 11/10/16

C10-C28 (DRO)	ND	50	mg/kg							
Surrogate: o-Terphenyl	13.4		"	12.5		107	30-150			

**LCS (1611111-BS1)**

Prepared & Analyzed: 11/10/16

C10-C28 (DRO)	669	50	mg/kg	499		134	73-134			
Surrogate: o-Terphenyl	14.9		"	12.5		119	30-150			

**Matrix Spike (1611111-MS1)**

Source: 1611076-01

Prepared & Analyzed: 11/10/16

C10-C28 (DRO)	571	50	mg/kg	499	8.77	113	50-148			
Surrogate: o-Terphenyl	13.8		"	12.5		111	30-150			

**Matrix Spike Dup (1611111-MSD1)**

Source: 1611076-01

Prepared & Analyzed: 11/10/16

C10-C28 (DRO)	543	50	mg/kg	499	8.77	107	50-148	4.90	20	
Surrogate: o-Terphenyl	12.8		"	12.5		102	30-150			

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1775 Sherman St. STE. 3000  
Denver CO, 80203

Project: State 6525 13-32  
Project Number: [none]  
Project Manager: Mark Longhurst

Reported:  
11/15/16 08:02

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

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

**Batch 1611112 - EPA 5030 Soil MS**

**Blank (1611112-BLK1)**

Prepared & Analyzed: 11/10/16

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>0.0459</i>		<i>"</i>	<i>0.0400</i>		<i>115</i>	<i>23-173</i>			
<i>Surrogate: Toluene-d8</i>	<i>0.0415</i>		<i>"</i>	<i>0.0400</i>		<i>104</i>	<i>20-170</i>			
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>0.0394</i>		<i>"</i>	<i>0.0400</i>		<i>98.6</i>	<i>21-167</i>			

**LCS (1611112-BS1)**

Prepared & Analyzed: 11/10/16

Naphthalene	ND	0.010	mg/kg				66-138			
Benzene	0.0713	0.0020	"	0.100		71.3	58-130			
Toluene	0.0826	0.0050	"	0.100		82.6	61-134			
Ethylbenzene	0.101	0.0050	"	0.0992		102	74-139			
m,p-Xylene	0.190	0.010	"	0.200		95.4	73-137			
o-Xylene	0.0948	0.0050	"	0.0980		96.8	73-141			
Xylenes (total)	0.285	0.010	"				0-200			
Gasoline Range Hydrocarbons	3.20	0.50	"				30-150			
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>0.0431</i>		<i>"</i>	<i>0.0400</i>		<i>108</i>	<i>23-173</i>			
<i>Surrogate: Toluene-d8</i>	<i>0.0421</i>		<i>"</i>	<i>0.0400</i>		<i>105</i>	<i>20-170</i>			
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>0.0365</i>		<i>"</i>	<i>0.0400</i>		<i>91.3</i>	<i>21-167</i>			

**Matrix Spike (1611112-MS1)**

Source: 1611076-01

Prepared & Analyzed: 11/10/16

Naphthalene	ND	0.010	mg/kg		ND		10-158			
Benzene	0.0724	0.0020	"	0.100	ND	72.4	30-131			
Toluene	0.0787	0.0050	"	0.100	ND	78.7	30-134			
Ethylbenzene	0.101	0.0050	"	0.0992	ND	102	22-153			
m,p-Xylene	0.184	0.010	"	0.200	ND	92.1	10-159			
o-Xylene	0.0937	0.0050	"	0.0980	ND	95.6	31-151			
Xylenes (total)	0.277	0.010	"		ND		30-160			
Gasoline Range Hydrocarbons	2.70	0.50	"		ND		30-160			
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>0.0414</i>		<i>"</i>	<i>0.0400</i>		<i>103</i>	<i>23-173</i>			
<i>Surrogate: Toluene-d8</i>	<i>0.0396</i>		<i>"</i>	<i>0.0400</i>		<i>98.9</i>	<i>20-170</i>			
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>0.0366</i>		<i>"</i>	<i>0.0400</i>		<i>91.6</i>	<i>21-167</i>			

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

Project: State 6525 13-32  
Project Number: [none]  
Project Manager: Mark Longhurst

**Reported:**  
11/15/16 08:02

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

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

**Batch 1611112 - EPA 5030 Soil MS**

Matrix Spike Dup (1611112-MSD1)		Source: 1611076-01			Prepared & Analyzed: 11/10/16					
Naphthalene	ND	0.010	mg/kg		ND		10-158		42	
Benzene	0.0728	0.0020	"	0.100	ND	72.8	30-131	0.496	34	
Toluene	0.0808	0.0050	"	0.100	ND	80.8	30-134	2.60	30	
Ethylbenzene	0.103	0.0050	"	0.0992	ND	104	22-153	1.91	24	
m,p-Xylene	0.192	0.010	"	0.200	ND	96.0	10-159	4.14	68	
o-Xylene	0.100	0.0050	"	0.0980	ND	102	31-151	6.65	38	
Xylenes (total)	0.292	0.010	"		ND		30-160	5.00	30	
Gasoline Range Hydrocarbons	2.57	0.50	"		ND		30-160	4.85	30	
Surrogate: 1,2-Dichloroethane-d4	0.0457		"	0.0400		114	23-173			
Surrogate: Toluene-d8	0.0404		"	0.0400		101	20-170			
Surrogate: 4-Bromofluorobenzene	0.0401		"	0.0400		100	21-167			

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1775 Sherman St. STE. 3000  
Denver CO, 80203

Project: State 6525 13-32

Project Number: [none]  
Project Manager: Mark Longhurst

**Reported:**  
11/15/16 08:02

### 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