

**TABLE 1**  
**FORMER WACKER 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 <sup>(2)</sup> (mg/kg)
<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>
SS01 @ 20'	3/20/2017	20	<b>0.16</b>	<0.0050	4.4	50	0.32	<b>1,640</b>
TP02 @ 16'	3/20/2017	16	<0.0020	<0.0050	0.018	0.23	0.022	128.3
SS02 @ 26'	3/21/2017	26	0.011	<0.0050	0.39	0.077	0.70	<b>1,940</b>
SB01 @ 28-29' <sup>(3)</sup>	4/10/2017	28-29	<0.0020	<0.0050	0.017	0.011	0.026	<b>749</b>
SB03 @ 17-18' <sup>(4)</sup>	4/10/2017	17-18	0.038	<0.0050	1.4	17	0.50	<b>860</b>
SS01 @ 18'	1/10/2018	18	<0.0020	<0.0050	<0.0050	<0.010	<0.010	<50
SS02 @ 28'	1/10/2018	28	<0.0020	<0.0050	<0.0050	<0.010	<0.010	<50
SS03 @ 18'	1/10/2018	18	<0.0020	<0.0050	<0.0050	<0.010	<0.010	<50
SS04 @ 28'	1/10/2018	28	<0.0020	<0.0050	<0.0050	<0.010	<0.010	<50
SS05 @ 18'	1/10/2018	18	<0.0020	<0.0050	<0.0050	<0.010	<0.010	<50
SS06 @ 28'	1/10/2018	28	<0.0020	<0.0050	<0.0050	<0.010	<0.010	<50
SS07 @ 18'	1/22/2018	18	<0.0020	<0.0050	<0.0050	<0.010	<0.010	<50
SS08 @ 28'	1/22/2018	28	<0.0020	<0.0050	<0.0050	<0.010	<0.010	<50
SS09 @ 18'	1/23/2018	18	<0.0020	<0.0050	<0.0050	<0.010	<0.010	<50
SS10 @ 28'	1/23/2018	28	<0.0020	<0.0050	<0.0050	<0.010	<0.010	<50
SS11 @ 18'	1/23/2018	18	<0.0020	<0.0050	<0.0050	<0.010	<0.010	<50
SS12 @ 28'	1/23/2018	28	<0.0020	<0.0050	<0.0050	<0.010	<0.010	<50
SS13 @ 18'	1/24/2018	18	<0.0020	<0.0050	<0.0050	<0.010	<0.010	<50
SS14 @ 28'	1/24/2018	28	<0.0020	<0.0050	<0.0050	<0.010	<0.010	<50
SS15 @ 18'	1/24/2018	18	<0.0020	<0.0050	<0.0050	<0.010	<0.010	<50
SS16 @ 28'	1/24/2018	28	<0.0020	<0.0050	<0.0050	<0.010	<0.010	0.73
SS17 @ 18'	1/25/2018	18	<0.0020	<0.0050	<0.0050	0.011	0.036	92
SS18 @ 28'	1/25/2018	28	<0.0020	<0.0050	<0.0050	<0.010	<0.010	<50
SS19 @ 18'	1/25/2018	18	<0.0020	<0.0050	<0.0050	<0.010	<0.010	<50
SS20 @ 28'	1/25/2018	28	<0.0020	<0.0050	<0.0050	<0.010	<0.010	<50

**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.
- Soil sample collected from BH01.
- Soil sample collected from BH03.

COGCC = Colorado Oil and Gas Conservation Commission

(<) = Analytical result is less than the 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.

**TABLE 2**  
**FORMER WACKER 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 <sup>(2)</sup> (feet)
COGCC Table 910-1 Groundwater Standard (µg/L) <sup>(1)</sup>		5	560	700	1,400	
GW01	1/29/2018	1.2	<1.0	5.1	23	~34
BH01 <sup>(4)</sup>	4/13/2017	<b>9.7</b>	1.2	1.8	<2.0	22.78 <sup>(3)</sup>
BH02 <sup>(4)</sup>	4/13/2017	<1.0	1.0	<1.0	<2.0	31.56
BH03 <sup>(4)</sup>	4/13/2017	<1.0	<1.0	<1.0	5.6	31.97
BH04 <sup>(4)</sup>	4/13/2017	<1.0	<1.0	<1.0	<2.0	31.48
BH05 <sup>(4)</sup>	4/13/2017	<1.0	<1.0	<1.0	<2.0	31.58
BH06 <sup>(4)</sup>	4/13/2017	<1.0	<1.0	<1.0	<2.0	31.23
BH07 <sup>(4)</sup>	4/13/2017	<1.0	<1.0	<1.0	<2.0	31.15
BH08	2/1/2018	<1.0	<1.0	<1.0	<2.0	32.52 <sup>(5)</sup>

**Notes:**

1. Groundwater standards referenced from 2 CCR 404-1, Table 910-1, effective January 30, 2015.
2. Depth to water measured from top of casing and adjusted using survey data to reflect depth to water from ground surface. Excavation groundwater samples were measured from ground surface.
3. The well was temporarily installed within the partially backfilled excavation area. Consequently, top of casing was measured approximately 8 feet below native ground surface.
4. Monitoring wells destroyed during January 2018 remediation activities.
5. Depth to water was measured from top of casing and has not been adjusted to ground surface.

COGCC = Colorado Oil and Gas Conservation Commission

µg/L = Micrograms per liter

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

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

## **ATTACHMENT A**

# Summit Scientific

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741 Corporate Circle – Suite I ♦ Golden, Colorado 80401

303.277.9310 - laboratory ♦ 303.277.9531 - fax

January 11, 2018

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

Enclosed are the results of analyses for samples received by Summit Scientific on 01/10/18 16:15. 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: Wacker #1

Project Number: [none]  
Project Manager: Mark Longhurst

**Reported:**  
01/11/18 06:42

### ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
SS01@18'	1801108-01	Soil	01/10/18 09:21	01/10/18 16:15
SS02@28'	1801108-02	Soil	01/10/18 09:27	01/10/18 16:15
SS03@18'	1801108-03	Soil	01/10/18 10:49	01/10/18 16:15
SS04@28'	1801108-04	Soil	01/10/18 10:51	01/10/18 16:15
SS05@18'	1801108-05	Soil	01/10/18 13:37	01/10/18 16:15
SS06@28'	1801108-06	Soil	01/10/18 13:41	01/10/18 16:15

Summit Scientific

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

Project: Wacker #1

Project Number: [none]  
Project Manager: Mark Longhurst

Reported:  
01/11/18 06:42

# Summit Scientific

741 Corporate Circle Suite I • Golden, Colorado 80401 1501108  
303-277-9310 • 303-374-5933 Fax

Page 1 of 1

Client: PDC Energy  
Address: \_\_\_\_\_  
City/State/Zip: \_\_\_\_\_  
Phone: \_\_\_\_\_ Fax: \_\_\_\_\_  
Sampler Name: Chris Armbruster  
Project Manager: Mark Longhurst  
E-Mail: \_\_\_\_\_  
Project Name: Wacker 1  
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)				
SS01@18'	1/10/18	9:21	1												
SS02@28'		9:27	1												
SS03@18'		10:49	1												
SS04@28'		10:51	1												
SS05@18'		1:37	1												
SS06@28'		1:41	1												
Relinquished by: <u>[Signature]</u> Date/Time: <u>1/10/18 4:15</u>				Received by: <u>[Signature]</u> Date/Time: <u>1/10/18 1615</u>				Turn Around Time (Check)				Notes:			
Relinquished by: _____ Date/Time: _____				Received by: _____ Date/Time: _____				Same Day <input checked="" type="checkbox"/> 72 Hours <input type="checkbox"/>				on ice			
Relinquished by: _____ Date/Time: _____				Received in Lab by: _____ Date/Time: _____				24 Hours <input type="checkbox"/> Standard <input type="checkbox"/>							
Relinquished by: _____ Date/Time: _____				Received in Lab by: _____ Date/Time: _____				48 Hours <input type="checkbox"/>				Sample Integrity:			
Relinquished by: _____ Date/Time: _____				Received in Lab by: _____ Date/Time: _____				Temperature Upon Receipt: <u>5.8°C</u>				Intact: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No			

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

Project: Wacker #1

Project Number: [none]  
 Project Manager: Mark Longhurst

Reported:  
 01/11/18 06:42

Sample Receipt Checklist

S2 Work Order: 1801108  
 Client: PDC Energy Client Project ID: Wacker 1  
 Shipped Via: Hand Airbill #: \_\_\_\_\_  
(UPS, FedEx, Hand Delivered, Pick-up, etc.)  
 Matrix (check all that apply):  Air  Soil/Solid  Water  Other: \_\_\_\_\_  
(Describe)

Cooler ID				
Temp (°C)	5.8			

Thermometer ID: 61857155-K

	Yes	No	N/A	Comments (if any)
If samples require cooling, was the temperature just above 0°C to ≤ 6°C <sup>(1)?</sup> 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 <sup>(1)?</sup>	<input checked="" type="checkbox"/>			
Does the COC agree with the number and type of sample bottles received <sup>(1)?</sup>	<input checked="" type="checkbox"/>			
Do the sample IDs on the bottle labels match the COC <sup>(1)?</sup>	<input checked="" type="checkbox"/>			
Is the COC properly relinquished by the client w/ date and time recorded <sup>(1)?</sup>	<input checked="" type="checkbox"/>			
For volatiles in water – is there headspace present? If yes, contact client and note in narrative.			<input checked="" type="checkbox"/>	
Are samples preserved that require preservation (excluding cooling) <sup>(1)?</sup> Note the type of preservative in the Comments column – HCl, H2SO4, NaOH, HNO3, ect			<input checked="" type="checkbox"/>	
If samples are acid preserved for metals, is the pH ≤ 2 <sup>(1)?</sup> Record the pH in Comments.			<input checked="" type="checkbox"/>	
If dissolved metals are requested, were samples field filtered?			<input checked="" type="checkbox"/>	
Additional Comments (if any):				
<sup>(1)</sup> If NO, then contact the client before proceeding with analysis and note in case narrative.				

Nakita  
 Custodian Printed Name

[Signature]  
 Signature or Initials of Custodian

1/10/18 1615  
 Date/Time

[Signature]



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

Project: Wacker #1  
Project Number: [none]  
Project Manager: Mark Longhurst

**Reported:**  
01/11/18 06:42

**SS01@18'**  
**1801108-01 (Soil)**

**Summit Scientific**

**Extractable Petroleum Hydrocarbons by 8015**

Date Sampled: **01/10/18 09:21**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	1801104	01/10/18	01/10/18	8015M	

Date Sampled: **01/10/18 09:21**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: <i>o</i> -Terphenyl		91.9 %	30-150		"	"	"	"	

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

Date Sampled: **01/10/18 09:21**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Naphthalene	ND	0.010	mg/kg	1	1801103	01/10/18	01/10/18	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: **01/10/18 09:21**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		87.8 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		97.0 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		99.4 %	21-167		"	"	"	"	

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

Project: Wacker #1  
Project Number: [none]  
Project Manager: Mark Longhurst

**Reported:**  
01/11/18 06:42

**SS02@28'**  
**1801108-02 (Soil)**

**Summit Scientific**

**Extractable Petroleum Hydrocarbons by 8015**

Date Sampled: **01/10/18 09:27**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	1801104	01/10/18	01/10/18	8015M	

Date Sampled: **01/10/18 09:27**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: <i>o</i> -Terphenyl		100 %	30-150		"	"	"	"	

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

Date Sampled: **01/10/18 09:27**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Naphthalene	ND	0.010	mg/kg	1	1801103	01/10/18	01/10/18	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: **01/10/18 09:27**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		86.9 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		100 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		98.4 %	21-167		"	"	"	"	

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

Project: Wacker #1  
Project Number: [none]  
Project Manager: Mark Longhurst

**Reported:**  
01/11/18 06:42

**SS03@18'**  
**1801108-03 (Soil)**

**Summit Scientific**

**Extractable Petroleum Hydrocarbons by 8015**

Date Sampled: **01/10/18 10:49**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	1801104	01/10/18	01/10/18	8015M	

Date Sampled: **01/10/18 10:49**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: <i>o</i> -Terphenyl		104 %	30-150		"	"	"	"	

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

Date Sampled: **01/10/18 10:49**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Naphthalene	ND	0.010	mg/kg	1	1801103	01/10/18	01/10/18	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: **01/10/18 10:49**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		89.8 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		98.8 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		98.0 %	21-167		"	"	"	"	

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

Project: Wacker #1  
Project Number: [none]  
Project Manager: Mark Longhurst

**Reported:**  
01/11/18 06:42

**SS04@28'**  
**1801108-04 (Soil)**

**Summit Scientific**

**Extractable Petroleum Hydrocarbons by 8015**

Date Sampled: **01/10/18 10:51**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	1801104	01/10/18	01/10/18	8015M	

Date Sampled: **01/10/18 10:51**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: <i>o</i> -Terphenyl		100 %	30-150		"	"	"	"	

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

Date Sampled: **01/10/18 10:51**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Naphthalene	ND	0.010	mg/kg	1	1801103	01/10/18	01/10/18	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: **01/10/18 10:51**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		88.7 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		98.2 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		102 %	21-167		"	"	"	"	

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

Project: Wacker #1  
Project Number: [none]  
Project Manager: Mark Longhurst

**Reported:**  
01/11/18 06:42

**SS05@18'**  
**1801108-05 (Soil)**

**Summit Scientific**

**Extractable Petroleum Hydrocarbons by 8015**

Date Sampled: **01/10/18 13:37**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	1801104	01/10/18	01/10/18	8015M	

Date Sampled: **01/10/18 13:37**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: <i>o</i> -Terphenyl		96.5 %	30-150		"	"	"	"	

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

Date Sampled: **01/10/18 13:37**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Naphthalene	ND	0.010	mg/kg	1	1801103	01/10/18	01/10/18	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: **01/10/18 13:37**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		89.6 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		98.2 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		99.6 %	21-167		"	"	"	"	

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1775 Sherman St. STE. 3000  
Denver CO, 80203

Project: Wacker #1  
Project Number: [none]  
Project Manager: Mark Longhurst

**Reported:**  
01/11/18 06:42

**SS06@28'**  
**1801108-06 (Soil)**

**Summit Scientific**

**Extractable Petroleum Hydrocarbons by 8015**

Date Sampled: **01/10/18 13:41**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	1801104	01/10/18	01/10/18	8015M	

Date Sampled: **01/10/18 13:41**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: <i>o</i> -Terphenyl		102 %	30-150		"	"	"	"	

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

Date Sampled: **01/10/18 13:41**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Naphthalene	ND	0.010	mg/kg	1	1801103	01/10/18	01/10/18	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: **01/10/18 13:41**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		88.5 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		98.2 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		98.2 %	21-167		"	"	"	"	

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: Wacker #1  
 Project Number: [none]  
 Project Manager: Mark Longhurst

**Reported:**  
 01/11/18 06:42

**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 1801104 - EPA 3550A**

<b>Blank (1801104-BLK1)</b>				Prepared & Analyzed: 01/10/18							
C10-C28 (DRO)	ND	50	mg/kg								
<i>Surrogate: o-Terphenyl</i>	13.6		"	12.5		109	30-150				
<b>LCS (1801104-BS1)</b>				Prepared & Analyzed: 01/10/18							
C10-C28 (DRO)	469	50	mg/kg	499		94.0	73-134				
<i>Surrogate: o-Terphenyl</i>	12.8		"	12.5		103	30-150				
<b>Matrix Spike (1801104-MS1)</b>				<b>Source: 1801082-01</b>		Prepared & Analyzed: 01/10/18					
C10-C28 (DRO)	556	50	mg/kg	499	22.9	107	50-148				
<i>Surrogate: o-Terphenyl</i>	16.1		"	12.5		129	30-150				
<b>Matrix Spike Dup (1801104-MSD1)</b>				<b>Source: 1801082-01</b>		Prepared & Analyzed: 01/10/18					
C10-C28 (DRO)	455	50	mg/kg	499	22.9	86.6	50-148	19.9	20		
<i>Surrogate: o-Terphenyl</i>	10.3		"	12.5		82.8	30-150				

Summit Scientific

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

Project: Wacker #1  
Project Number: [none]  
Project Manager: Mark Longhurst

Reported:  
01/11/18 06:42

**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 1801103 - EPA 5030 Soil MS**

**Blank (1801103-BLK1)**

Prepared & Analyzed: 01/10/18

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>0.0347</i>		<i>"</i>	<i>0.0400</i>		<i>86.8</i>		<i>23-173</i>		
<i>Surrogate: Toluene-d8</i>	<i>0.0386</i>		<i>"</i>	<i>0.0400</i>		<i>96.6</i>		<i>20-170</i>		
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>0.0391</i>		<i>"</i>	<i>0.0400</i>		<i>97.6</i>		<i>21-167</i>		

**LCS (1801103-BS1)**

Prepared & Analyzed: 01/10/18

Naphthalene	ND	0.010	mg/kg					66-138		
Benzene	0.108	0.0020	"	0.100		108		58-130		
Toluene	0.113	0.0050	"	0.100		113		61-134		
Ethylbenzene	0.125	0.0050	"	0.0992		126		74-139		
m,p-Xylene	0.238	0.010	"	0.200		119		73-137		
o-Xylene	0.119	0.0050	"	0.0980		121		73-141		
Xylenes (total)	0.357	0.010	"					0-200		
Gasoline Range Hydrocarbons	3.14	0.50	"					30-150		
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>0.0374</i>		<i>"</i>	<i>0.0400</i>		<i>93.6</i>		<i>23-173</i>		
<i>Surrogate: Toluene-d8</i>	<i>0.0402</i>		<i>"</i>	<i>0.0400</i>		<i>101</i>		<i>20-170</i>		
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>0.0393</i>		<i>"</i>	<i>0.0400</i>		<i>98.2</i>		<i>21-167</i>		

**Matrix Spike (1801103-MS1)**

Source: 1801082-01

Prepared & Analyzed: 01/10/18

Naphthalene	ND	0.010	mg/kg		ND			10-158		
Benzene	0.106	0.0020	"	0.100	ND	106		30-131		
Toluene	0.108	0.0050	"	0.100	ND	108		30-134		
Ethylbenzene	0.126	0.0050	"	0.0992	ND	127		22-153		
m,p-Xylene	0.241	0.010	"	0.200	ND	121		10-159		
o-Xylene	0.119	0.0050	"	0.0980	ND	122		31-151		
Xylenes (total)	0.360	0.010	"		ND			30-160		
Gasoline Range Hydrocarbons	3.98	0.50	"		1.02			30-160		
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>0.0375</i>		<i>"</i>	<i>0.0400</i>		<i>93.8</i>		<i>23-173</i>		
<i>Surrogate: Toluene-d8</i>	<i>0.0400</i>		<i>"</i>	<i>0.0400</i>		<i>100</i>		<i>20-170</i>		
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>0.0410</i>		<i>"</i>	<i>0.0400</i>		<i>103</i>		<i>21-167</i>		

Summit Scientific

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

Project: Wacker #1  
 Project Number: [none]  
 Project Manager: Mark Longhurst

**Reported:**  
 01/11/18 06:42

**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 1801103 - EPA 5030 Soil MS**

<b>Matrix Spike Dup (1801103-MSD1)</b>	<b>Source: 1801082-01</b>			<b>Prepared &amp; Analyzed: 01/10/18</b>						
Naphthalene	ND	0.010	mg/kg	ND	ND	104	30-131	1.88	42	
Benzene	0.104	0.0020	"	0.100	ND	107	30-134	1.01	30	
Toluene	0.107	0.0050	"	0.100	ND	126	22-153	1.43	24	
Ethylbenzene	0.125	0.0050	"	0.0992	ND	119	10-159	1.59	68	
m,p-Xylene	0.237	0.010	"	0.200	ND	120	31-151	1.50	38	
o-Xylene	0.117	0.0050	"	0.0980	ND		30-160	1.56	30	
Xylenes (total)	0.354	0.010	"		ND		30-160	14.7	30	
Gasoline Range Hydrocarbons	3.44	0.50	"	1.02			30-160			
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>0.0367</i>		<i>"</i>	<i>0.0400</i>		<i>91.7</i>	<i>23-173</i>			
<i>Surrogate: Toluene-d8</i>	<i>0.0393</i>		<i>"</i>	<i>0.0400</i>		<i>98.2</i>	<i>20-170</i>			
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>0.0406</i>		<i>"</i>	<i>0.0400</i>		<i>102</i>	<i>21-167</i>			

Summit Scientific

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

Project: Wacker #1  
Project Number: [none]  
Project Manager: Mark Longhurst

**Reported:**  
01/11/18 06:42

### 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

January 23, 2018

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

Enclosed are the results of analyses for samples received by Summit Scientific on 01/22/18 16:30. 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: Wacker #1

Project Number: [none]  
Project Manager: Mark Longhurst

**Reported:**  
01/23/18 06:36

### ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
SS07@18'	1801224-01	Soil	01/22/18 09:07	01/22/18 16:30
SS08@28'	1801224-02	Soil	01/22/18 09:17	01/22/18 16:30

Summit Scientific

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

Project: Wacker #1

Project Number: [none]  
 Project Manager: Mark Longhurst

Reported:  
 01/23/18 06:36

Summit Scientific

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

1801224

Page 1 of 1

Client: PDC  
 Address: \_\_\_\_\_  
 City/State/Zip: \_\_\_\_\_  
 Phone: \_\_\_\_\_ Fax: \_\_\_\_\_  
 Sampler Name: Chris Armbruster

Project Manager: Mark Longhurst  
 E-Mail: Mark.Longhurst@pdce.com  
 Project Name: Wacker #1  
 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)	GBTEXN (9260)	DRO (TPH)								
SS07 @ 18'	1/22/2018	9:07	1		X			X				X	X								
SS08 @ 28'	1/22/2018	9:17	1		X			X				X	X								
Relinquished by:	Date/Time:	Received by:	Date/Time:	Turn Around Time (Check)																	
CA A	1-22-18 10:30	BA	1-22-18 16:30	Same Day	<input checked="" type="checkbox"/>	72 Hours	<input type="checkbox"/>														
				24 Hours	<input type="checkbox"/>	Standard	<input type="checkbox"/>														
Relinquished by:	Date/Time:	Received by:	Date/Time:	48 Hours	<input type="checkbox"/>																
Relinquished by:	Date/Time:	Received in Lab by:	Date/Time:	Sample Integrity:																	
				Temperature Upon Receipt:	3.7																
				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: Wacker #1

Project Number: [none]  
 Project Manager: Mark Longhurst

Reported:  
 01/23/18 06:36

**Sample Receipt Checklist**

S2 Work Order: 1801224

Client: PDC Client Project ID: Wacker #1

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

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

Cooler ID					
Temp (°C)	<u>3.7</u>				

Thermometer ID: 61857155-K

	Yes	No	N/A	Comments (if any)
If samples require cooling, was the temperature at 4°C +/- 2°C <sup>(1)</sup> ?	<input checked="" type="checkbox"/>			
NOTE: If samples are delivered the same day of sampling, this requirement is met provided that there is evidence that cooling has begun.				
Were all samples received intact <sup>(1)</sup> ?	<input checked="" type="checkbox"/>			
Was adequate sample volume provided <sup>(1)</sup> ?	<input checked="" type="checkbox"/>			
If custody seals are present, are they intact <sup>(1)</sup> ?			<input checked="" type="checkbox"/>	
Are short holding time analytes or samples with HTs due within 48 hours present?	<input checked="" type="checkbox"/>			
Is a chain-of-custody (COC) form present and filled out completely <sup>(1)</sup> ?	<input checked="" type="checkbox"/>			
Does the COC agree with the number and type of sample bottles received <sup>(1)</sup> ?	<input checked="" type="checkbox"/>			
Do the sample IDs on the bottle labels match the COC <sup>(1)</sup> ?	<input checked="" type="checkbox"/>			
Is the COC properly relinquished by the client w/ date and time recorded <sup>(1)</sup> ?	<input checked="" type="checkbox"/>			
For volatiles in water – is there headspace present? <b>If yes, contact client and note in narrative.</b>			<input checked="" type="checkbox"/>	
Are samples preserved that require preservation (excluding cooling) <sup>(1)</sup> ?			<input checked="" type="checkbox"/>	
Note the type of preservative in the Comments column – HCl, H2SO4, NaOH, HNO3, ect				
If samples are acid preserved for metals, is the pH ≤ 2 <sup>(1)</sup> ?			<input checked="" type="checkbox"/>	
Record the pH in Comments.				
If dissolved metals are requested, were samples field filtered?			<input checked="" type="checkbox"/>	
Additional Comments (if any):				
_____				
_____				

<sup>(1)</sup> If NO, then contact the client before proceeding with analysis and note in case narrative.

Muri P.  
 Custodian Printed Name

MA 1-22-18  
 Signature or Initials of Custodian

17:00  
 Date/Time



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

Project: Wacker #1  
Project Number: [none]  
Project Manager: Mark Longhurst

**Reported:**  
01/23/18 06:36

**SS07@18'**  
**1801224-01 (Soil)**

**Summit Scientific**

**Extractable Petroleum Hydrocarbons by 8015**

Date Sampled: **01/22/18 09:07**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	1801225	01/22/18	01/22/18	8015M	

Date Sampled: **01/22/18 09:07**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: <i>o</i> -Terphenyl		102 %	30-150		"	"	"	"	

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

Date Sampled: **01/22/18 09:07**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Naphthalene	ND	0.010	mg/kg	1	1801224	"	01/22/18	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: **01/22/18 09:07**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		102 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		99.0 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		103 %	21-167		"	"	"	"	

Summit Scientific

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

Project: Wacker #1

Project Number: [none]  
Project Manager: Mark Longhurst

**Reported:**  
01/23/18 06:36

**SS08@28'**  
**1801224-02 (Soil)**

**Summit Scientific**

**Extractable Petroleum Hydrocarbons by 8015**

Date Sampled: **01/22/18 09:17**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	1801225	01/22/18	01/22/18	8015M	

Date Sampled: **01/22/18 09:17**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: <i>o</i> -Terphenyl		97.1 %	30-150		"	"	"	"	

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

Date Sampled: **01/22/18 09:17**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Naphthalene	ND	0.010	mg/kg	1	1801224	"	01/22/18	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: **01/22/18 09:17**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		107 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		99.6 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		103 %	21-167		"	"	"	"	

Summit Scientific

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

Project: Wacker #1  
Project Number: [none]  
Project Manager: Mark Longhurst

**Reported:**  
01/23/18 06:36

**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 1801225 - EPA 3550A**

<b>Blank (1801225-BLK1)</b>				Prepared & Analyzed: 01/22/18							
C10-C28 (DRO)	ND	50	mg/kg								
<i>Surrogate: o-Terphenyl</i>	12.5		"	12.5		100	30-150				
<b>LCS (1801225-BS1)</b>				Prepared & Analyzed: 01/22/18							
C10-C28 (DRO)	592	50	mg/kg	499		119	73-134				
<i>Surrogate: o-Terphenyl</i>	11.2		"	12.5		89.9	30-150				
<b>Matrix Spike (1801225-MS1)</b>				<b>Source: 1801218-01</b>		Prepared & Analyzed: 01/22/18					
C10-C28 (DRO)	1940	50	mg/kg	499	1220	145	50-148				
<i>Surrogate: o-Terphenyl</i>	15.2		"	12.5		122	30-150				
<b>Matrix Spike Dup (1801225-MSD1)</b>				<b>Source: 1801218-01</b>		Prepared & Analyzed: 01/22/18					
C10-C28 (DRO)	1540	50	mg/kg	499	1220	64.4	50-148	23.3	20		QM-07
<i>Surrogate: o-Terphenyl</i>	15.9		"	12.5		127	30-150				

Summit Scientific

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

Project: Wacker #1  
Project Number: [none]  
Project Manager: Mark Longhurst

Reported:  
01/23/18 06:36

**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 1801224 - EPA 5030 Soil MS**

**Blank (1801224-BLK1)**

Prepared & Analyzed: 01/22/18

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>0.0404</i>		<i>"</i>	<i>0.0400</i>		<i>101</i>	<i>23-173</i>			
<i>Surrogate: Toluene-d8</i>	<i>0.0392</i>		<i>"</i>	<i>0.0400</i>		<i>98.0</i>	<i>20-170</i>			
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>0.0416</i>		<i>"</i>	<i>0.0400</i>		<i>104</i>	<i>21-167</i>			

**LCS (1801224-BS1)**

Prepared & Analyzed: 01/22/18

Naphthalene	ND	0.010	mg/kg				66-138			
Benzene	0.109	0.0020	"	0.100		109	58-130			
Toluene	0.116	0.0050	"	0.100		116	61-134			
Ethylbenzene	0.124	0.0050	"	0.0992		125	74-139			
m,p-Xylene	0.242	0.010	"	0.200		121	73-137			
o-Xylene	0.115	0.0050	"	0.0980		118	73-141			
Xylenes (total)	0.357	0.010	"				0-200			
Gasoline Range Hydrocarbons	ND	0.50	"				30-150			
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>0.0402</i>		<i>"</i>	<i>0.0400</i>		<i>100</i>	<i>23-173</i>			
<i>Surrogate: Toluene-d8</i>	<i>0.0414</i>		<i>"</i>	<i>0.0400</i>		<i>104</i>	<i>20-170</i>			
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>0.0410</i>		<i>"</i>	<i>0.0400</i>		<i>102</i>	<i>21-167</i>			

**Matrix Spike (1801224-MS1)**

Source: 1801218-01

Prepared & Analyzed: 01/22/18

Naphthalene	ND	0.010	mg/kg		ND		10-158			
Benzene	0.115	0.0020	"	0.100	ND	115	30-131			
Toluene	0.118	0.0050	"	0.100	ND	118	30-134			
Ethylbenzene	0.130	0.0050	"	0.0992	ND	131	22-153			
m,p-Xylene	0.252	0.010	"	0.200	ND	126	10-159			
o-Xylene	0.121	0.0050	"	0.0980	ND	123	31-151			
Xylenes (total)	0.373	0.010	"		ND		30-160			
Gasoline Range Hydrocarbons	ND	0.50	"		ND		30-160			
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>0.0436</i>		<i>"</i>	<i>0.0400</i>		<i>109</i>	<i>23-173</i>			
<i>Surrogate: Toluene-d8</i>	<i>0.0398</i>		<i>"</i>	<i>0.0400</i>		<i>99.4</i>	<i>20-170</i>			
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>0.0401</i>		<i>"</i>	<i>0.0400</i>		<i>100</i>	<i>21-167</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: Wacker #1

Project Number: [none]  
 Project Manager: Mark Longhurst

**Reported:**  
 01/23/18 06:36

**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 1801224 - EPA 5030 Soil MS**

<b>Matrix Spike Dup (1801224-MSD1)</b>	<b>Source: 1801218-01</b>			<b>Prepared &amp; Analyzed: 01/22/18</b>						
Naphthalene	ND	0.010	mg/kg	ND	ND	115	10-158		0.0524	42
Benzene	0.115	0.0020	"	0.100	ND	122	30-134		3.28	34
Toluene	0.122	0.0050	"	0.100	ND	134	22-153		2.49	24
Ethylbenzene	0.133	0.0050	"	0.0992	ND	129	10-159		2.05	68
m,p-Xylene	0.126	0.0050	"	0.0980	ND	128	31-151		3.84	38
o-Xylene	0.383	0.010	"		ND		30-160		2.63	30
Xylenes (total)	ND	0.50	"		ND		30-160			30
Gasoline Range Hydrocarbons										
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>0.0439</i>		<i>"</i>	<i>0.0400</i>		<i>110</i>	<i>23-173</i>			
<i>Surrogate: Toluene-d8</i>	<i>0.0401</i>		<i>"</i>	<i>0.0400</i>		<i>100</i>	<i>20-170</i>			
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>0.0403</i>		<i>"</i>	<i>0.0400</i>		<i>101</i>	<i>21-167</i>			

Summit Scientific

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

Project: Wacker #1  
Project Number: [none]  
Project Manager: Mark Longhurst

**Reported:**  
01/23/18 06:36

### Notes and Definitions

- QM-07 The spike recovery was outside acceptance limits for the MS and/or MSD. The batch was accepted based on acceptable LCS/LCSD recovery.
- 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

January 24, 2018

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

Enclosed are the results of analyses for samples received by Summit Scientific on 01/23/18 16:15. 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: Wacker #1

Project Number: [none]  
Project Manager: Mark Longhurst

**Reported:**  
01/24/18 06:59

### ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
SS09@18'	1801233-01	Soil	01/23/18 10:11	01/23/18 16:15
SS10@28'	1801233-02	Soil	01/23/18 10:21	01/23/18 16:15
SS11@18'	1801233-03	Soil	01/23/18 12:46	01/23/18 16:15
SS12@28'	1801233-04	Soil	01/23/18 12:47	01/23/18 16:15

Summit Scientific

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

Project: Wacker #1

Project Number: [none]  
Project Manager: Mark Longhurst

Reported:  
01/24/18 06:59

# Summit Scientific

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

1801233

Page 1 of 1

Client: PDC Energy  
Address: \_\_\_\_\_  
City/State/Zip: \_\_\_\_\_  
Phone: \_\_\_\_\_ Fax: \_\_\_\_\_  
Sampler Name: Chris Ambuster

Project Manager: Mark Longhurst  
E-Mail: \_\_\_\_\_  
Project Name: Wacker 1  
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)				
SS09 @ 18'	1/23	10:11	1			X		X							
SS10 @ 23'		10:21	1			X		X							
SS11 @ 18'		12:46	1			X		X							
SS12 @ 28'	✓	12:47	1			X		X							
Relinquished by: <u>[Signature]</u>	Date/Time: <u>1/23/18 4:15pm</u>	Received by: <u>[Signature]</u>	Date/Time: <u>1-23-18 16:15</u>	Turn Around Time (Check)				Notes:							
				Same Day <input checked="" type="checkbox"/>				72 Hours <input type="checkbox"/>							
				24 Hours <input type="checkbox"/>				Standard <input type="checkbox"/>							
				48 Hours <input type="checkbox"/>											
Relinquished by:	Date/Time:	Received in Lab by:	Date/Time:	Sample Integrity:											
				Temperature Upon Receipt: <u>5.3</u>											
				Intact: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>											

www.s2scientific.com



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

Project: Wacker #1

Project Number: [none]  
Project Manager: Mark Longhurst

Reported:  
01/24/18 06:59

Sample Receipt Checklist

S2 Work Order: 1801233  
Client: PDC Client Project ID: Wacker 1  
Shipped Via: P.U. Airbill #: \_\_\_\_\_  
(UPS, FedEx, Hand Delivered, Pick-up, etc.)  
Matrix (check all that apply): \_\_\_ Air  Soil/Solid \_\_\_ Water \_\_\_ Other: \_\_\_\_\_  
(Describe)

Cooler ID					
Temp (°C)	<u>5.3</u>				

Thermometer ID: 61857155-K

	Yes	No	N/A	Comments (if any)
If samples require cooling, was the temperature at 4°C +/- 2°C <sup>(1)</sup> ?	<input checked="" type="checkbox"/>			
NOTE: If samples are delivered the same day of sampling, this requirement is met provided that there is evidence that cooling has begun.				
Were all samples received intact <sup>(1)</sup> ?	<input checked="" type="checkbox"/>			
Was adequate sample volume provided <sup>(1)</sup> ?	<input checked="" type="checkbox"/>			
If custody seals are present, are they intact <sup>(1)</sup> ?			<input checked="" type="checkbox"/>	
Are short holding time analytes or samples with HTs due within 48 hours present?	<input checked="" type="checkbox"/>			
Is a chain-of-custody (COC) form present and filled out completely <sup>(1)</sup> ?	<input checked="" type="checkbox"/>			
Does the COC agree with the number and type of sample bottles received <sup>(1)</sup> ?	<input checked="" type="checkbox"/>			
Do the sample IDs on the bottle labels match the COC <sup>(1)</sup> ?	<input checked="" type="checkbox"/>			
Is the COC properly relinquished by the client w/ date and time recorded <sup>(1)</sup> ?	<input checked="" type="checkbox"/>			
For volatiles in water – is there headspace present? If yes, contact client and note in narrative.			<input checked="" type="checkbox"/>	
Are samples preserved that require preservation (excluding cooling) <sup>(1)</sup> ?			<input checked="" type="checkbox"/>	
Note the type of preservative in the Comments column – HCl, H2SO4, NaOH, HNO3, ect				
If samples are acid preserved for metals, is the pH ≤ 2 <sup>(1)</sup> ?			<input checked="" type="checkbox"/>	
Record the pH in Comments.				
If dissolved metals are requested, were samples field filtered?			<input checked="" type="checkbox"/>	
Additional Comments (if any):				
<sup>(1)</sup> If NO, then contact the client before proceeding with analysis and note in case narrative.				

Murip  
Custodian Printed Name

ML 1-23-18  
Signature or Initials of Custodian

17:00  
Date/Time



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

Project: Wacker #1  
Project Number: [none]  
Project Manager: Mark Longhurst

**Reported:**  
01/24/18 06:59

**SS09@18'**  
**1801233-01 (Soil)**

**Summit Scientific**

**Extractable Petroleum Hydrocarbons by 8015**

Date Sampled: **01/23/18 10:11**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	1801244	01/23/18	01/23/18	8015M	

Date Sampled: **01/23/18 10:11**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: <i>o</i> -Terphenyl		96.8 %	30-150		"	"	"	"	

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

Date Sampled: **01/23/18 10:11**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Naphthalene	ND	0.010	mg/kg	1	1801243	01/23/18	01/23/18	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: **01/23/18 10:11**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		106 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		101 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		101 %	21-167		"	"	"	"	

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: Wacker #1  
Project Number: [none]  
Project Manager: Mark Longhurst

**Reported:**  
01/24/18 06:59

**SS10@28'**  
**1801233-02 (Soil)**

**Summit Scientific**

**Extractable Petroleum Hydrocarbons by 8015**

Date Sampled: **01/23/18 10:21**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	1801244	01/23/18	01/23/18	8015M	

Date Sampled: **01/23/18 10:21**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: <i>o</i> -Terphenyl		91.1 %	30-150		"	"	"	"	

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

Date Sampled: **01/23/18 10:21**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Naphthalene	ND	0.010	mg/kg	1	1801243	01/23/18	01/23/18	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: **01/23/18 10:21**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		102 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		100 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		101 %	21-167		"	"	"	"	

Summit Scientific

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

Project: Wacker #1  
Project Number: [none]  
Project Manager: Mark Longhurst

**Reported:**  
01/24/18 06:59

**SS11@18'**  
**1801233-03 (Soil)**

**Summit Scientific**

**Extractable Petroleum Hydrocarbons by 8015**

Date Sampled: **01/23/18 12:46**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	1801244	01/23/18	01/23/18	8015M	

Date Sampled: **01/23/18 12:46**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: <i>o</i> -Terphenyl		102 %	30-150		"	"	"	"	

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

Date Sampled: **01/23/18 12:46**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Naphthalene	ND	0.010	mg/kg	1	1801243	01/23/18	01/23/18	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: **01/23/18 12:46**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		110 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		99.9 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		105 %	21-167		"	"	"	"	

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

Project: Wacker #1  
Project Number: [none]  
Project Manager: Mark Longhurst

**Reported:**  
01/24/18 06:59

**SS12@28'**  
**1801233-04 (Soil)**

**Summit Scientific**

**Extractable Petroleum Hydrocarbons by 8015**

Date Sampled: **01/23/18 12:47**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	1801244	01/23/18	01/23/18	8015M	

Date Sampled: **01/23/18 12:47**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: <i>o</i> -Terphenyl		102 %	30-150		"	"	"	"	

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

Date Sampled: **01/23/18 12:47**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Naphthalene	ND	0.010	mg/kg	1	1801243	01/23/18	01/23/18	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: **01/23/18 12:47**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		103 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		99.2 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		104 %	21-167		"	"	"	"	

Summit Scientific

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

Project: Wacker #1  
 Project Number: [none]  
 Project Manager: Mark Longhurst

**Reported:**  
 01/24/18 06:59

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

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

**Batch 1801244 - EPA 3550A**

<b>Blank (1801244-BLK1)</b>				Prepared & Analyzed: 01/23/18							
C10-C28 (DRO)	ND	50	mg/kg								
<i>Surrogate: o-Terphenyl</i>	12.1		"	12.5	96.7	30-150					
<b>LCS (1801244-BS1)</b>				Prepared & Analyzed: 01/23/18							
C10-C28 (DRO)	529	50	mg/kg	499	106	73-134					
<i>Surrogate: o-Terphenyl</i>	16.2		"	12.5	130	30-150					
<b>Matrix Spike (1801244-MS1)</b>				<b>Source: 1801233-01</b>		Prepared & Analyzed: 01/23/18					
C10-C28 (DRO)	533	50	mg/kg	499	12.8	104	50-148				
<i>Surrogate: o-Terphenyl</i>	15.0		"	12.5	120	30-150					
<b>Matrix Spike Dup (1801244-MSD1)</b>				<b>Source: 1801233-01</b>		Prepared & Analyzed: 01/23/18					
C10-C28 (DRO)	594	50	mg/kg	499	12.8	116	50-148	10.7		20	
<i>Surrogate: o-Terphenyl</i>	14.6		"	12.5	117	30-150					

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

Project: Wacker #1  
Project Number: [none]  
Project Manager: Mark Longhurst

Reported:  
01/24/18 06:59

**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 1801243 - EPA 5030 Soil MS**

**Blank (1801243-BLK1)**

Prepared & Analyzed: 01/23/18

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>0.0397</i>		<i>"</i>	<i>0.0400</i>		<i>99.2</i>	<i>23-173</i>			
<i>Surrogate: Toluene-d8</i>	<i>0.0389</i>		<i>"</i>	<i>0.0400</i>		<i>97.3</i>	<i>20-170</i>			
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>0.0413</i>		<i>"</i>	<i>0.0400</i>		<i>103</i>	<i>21-167</i>			

**LCS (1801243-BS1)**

Prepared & Analyzed: 01/23/18

Naphthalene	ND	0.010	mg/kg				66-138			
Benzene	0.109	0.0020	"	0.100		109	58-130			
Toluene	0.116	0.0050	"	0.100		116	61-134			
Ethylbenzene	0.125	0.0050	"	0.0992		126	74-139			
m,p-Xylene	0.244	0.010	"	0.200		122	73-137			
o-Xylene	0.118	0.0050	"	0.0980		120	73-141			
Xylenes (total)	0.362	0.010	"				0-200			
Gasoline Range Hydrocarbons	ND	0.50	"				30-150			
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>0.0411</i>		<i>"</i>	<i>0.0400</i>		<i>103</i>	<i>23-173</i>			
<i>Surrogate: Toluene-d8</i>	<i>0.0409</i>		<i>"</i>	<i>0.0400</i>		<i>102</i>	<i>20-170</i>			
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>0.0416</i>		<i>"</i>	<i>0.0400</i>		<i>104</i>	<i>21-167</i>			

**Matrix Spike (1801243-MS1)**

Source: 1801233-01

Prepared & Analyzed: 01/23/18

Naphthalene	ND	0.010	mg/kg		ND		10-158			
Benzene	0.111	0.0020	"	0.100	ND	111	30-131			
Toluene	0.123	0.0050	"	0.100	ND	123	30-134			
Ethylbenzene	0.131	0.0050	"	0.0992	ND	132	22-153			
m,p-Xylene	0.257	0.010	"	0.200	ND	129	10-159			
o-Xylene	0.124	0.0050	"	0.0980	ND	126	31-151			
Xylenes (total)	0.380	0.010	"		ND		30-160			
Gasoline Range Hydrocarbons	ND	0.50	"		ND		30-160			
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>0.0432</i>		<i>"</i>	<i>0.0400</i>		<i>108</i>	<i>23-173</i>			
<i>Surrogate: Toluene-d8</i>	<i>0.0422</i>		<i>"</i>	<i>0.0400</i>		<i>105</i>	<i>20-170</i>			
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>0.0411</i>		<i>"</i>	<i>0.0400</i>		<i>103</i>	<i>21-167</i>			

Summit Scientific

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

Project: Wacker #1  
Project Number: [none]  
Project Manager: Mark Longhurst

**Reported:**  
01/24/18 06:59

**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 1801243 - EPA 5030 Soil MS**

<b>Matrix Spike Dup (1801243-MSD1)</b>	<b>Source: 1801233-01</b>			<b>Prepared &amp; Analyzed: 01/23/18</b>						
Naphthalene	ND	0.010	mg/kg	ND	ND	106	23-173			42
Benzene	0.116	0.0020	"	0.100	ND	116	30-131	3.89		34
Toluene	0.121	0.0050	"	0.100	ND	121	30-134	1.23		30
Ethylbenzene	0.137	0.0050	"	0.0992	ND	138	22-153	4.58		24
m,p-Xylene	0.266	0.010	"	0.200	ND	133	10-159	3.60		68
o-Xylene	0.130	0.0050	"	0.0980	ND	132	31-151	4.88		38
Xylenes (total)	0.396	0.010	"		ND		30-160	4.02		30
Gasoline Range Hydrocarbons	ND	0.50	"		ND		30-160			30
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>0.0425</i>		<i>"</i>	<i>0.0400</i>		<i>106</i>	<i>23-173</i>			
<i>Surrogate: Toluene-d8</i>	<i>0.0402</i>		<i>"</i>	<i>0.0400</i>		<i>100</i>	<i>20-170</i>			
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>0.0413</i>		<i>"</i>	<i>0.0400</i>		<i>103</i>	<i>21-167</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: Wacker #1  
Project Number: [none]  
Project Manager: Mark Longhurst

**Reported:**  
01/24/18 06:59

### 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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741 Corporate Circle – Suite I ♦ Golden, Colorado 80401

303.277.9310 - laboratory ♦ 303.277.9531 - fax

January 25, 2018

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

Enclosed are the results of analyses for samples received by Summit Scientific on 01/24/18 16:45. 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: Wacker #1

Project Number: [none]  
Project Manager: Mark Longhurst

**Reported:**  
01/25/18 06:36

### ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
SS13@18'	1801254-01	Soil	01/24/18 10:07	01/24/18 16:45
SS14@28'	1801254-02	Soil	01/24/18 10:15	01/24/18 16:45
SS15@18'	1801254-03	Soil	01/24/18 12:31	01/24/18 16:45
SS16@28'	1801254-04	Soil	01/24/18 12:35	01/24/18 16:45

Summit Scientific

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

Project: Wacker #1

Project Number: [none]  
Project Manager: Mark Longhurst

Reported:  
01/25/18 06:36

# Summit Scientific

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

1851254

Page 1 of 1

Client: PDC Energy  
Address: \_\_\_\_\_  
City/State/Zip: \_\_\_\_\_  
Phone: \_\_\_\_\_ Fax: \_\_\_\_\_  
Sampler Name: Chris Ambrose  
Project Manager: Mark Longhurst  
E-Mail: \_\_\_\_\_  
Project Name: Wacker 1  
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)					
SS13@18'	↓ 12/18	10:07	1		X				X							
SS14@23'		10:15	1		X				X							
SS15@18'		12:31	1		X				X							
SS16@28'		12:35	1		X				X							
Relinquished by: <u>CA</u>	Date/Time: <u>12/18/18 1645</u>	Received by: <u>ML</u>	Date/Time: <u>12/18/18 1645</u>	Turn Around Time (Check)				Notes:								
				Same Day	<input checked="" type="checkbox"/>	72 Hours	<input type="checkbox"/>	on ice								
				24 Hours	<input type="checkbox"/>	Standard	<input type="checkbox"/>									
				48 Hours	<input type="checkbox"/>		<input type="checkbox"/>									
Relinquished by:	Date/Time:	Received by:	Date/Time:	Sample Integrity:												
				Temperature Upon Receipt:	6.7°C											
				Intact:	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No										

www.s2scientific.com



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

Project: Wacker #1

Project Number: [none]  
Project Manager: Mark Longhurst

Reported:  
01/25/18 06:36

**Sample Receipt Checklist**

S2 Work Order: 1801254  
Client: PDC Energy Client Project ID: Wacker 1  
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>6.7</u>				

Thermometer ID: 61857155-K

	Yes	No	N/A	Comments (if any)
If samples require cooling, was the temperature at 4°C +/- 2°C <sup>(1)</sup> ?	<input checked="" type="checkbox"/>			
NOTE: If samples are delivered the same day of sampling, this requirement is met provided that there is evidence that cooling has begun.				
Were all samples received intact <sup>(1)</sup> ?	<input checked="" type="checkbox"/>			
Was adequate sample volume provided <sup>(1)</sup> ?	<input checked="" type="checkbox"/>			
If custody seals are present, are they intact <sup>(1)</sup> ?			<input checked="" type="checkbox"/>	
Are short holding time analytes or samples with HTs due within 48 hours present?			<input checked="" type="checkbox"/>	
Is a chain-of-custody (COC) form present and filled out completely <sup>(1)</sup> ?	<input checked="" type="checkbox"/>			
Does the COC agree with the number and type of sample bottles received <sup>(1)</sup> ?	<input checked="" type="checkbox"/>			
Do the sample IDs on the bottle labels match the COC <sup>(1)</sup> ?	<input checked="" type="checkbox"/>			
Is the COC properly relinquished by the client w/ date and time recorded <sup>(1)</sup> ?	<input checked="" type="checkbox"/>			
For volatiles in water – is there headspace present? If yes, contact client and note in narrative.			<input checked="" type="checkbox"/>	
Are samples preserved that require preservation (excluding cooling) <sup>(1)</sup> ?			<input checked="" type="checkbox"/>	
Note the type of preservative in the Comments column – HCl, H2SO4, NaOH, HNO3, ect			<input checked="" type="checkbox"/>	
If samples are acid preserved for metals, is the pH ≤ 2 <sup>(1)</sup> ?			<input checked="" type="checkbox"/>	
Record the pH in Comments.			<input checked="" type="checkbox"/>	
If dissolved metals are requested, were samples field filtered?			<input checked="" type="checkbox"/>	
Additional Comments (if any):				

<sup>(1)</sup> If NO, then contact the client before proceeding with analysis and note in case narrative.

Mark Longhurst  
Custodian Printed Name

ML  
Signature or Initials of Custodian

1/24/18 1715  
Date/Time



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

Project: Wacker #1  
Project Number: [none]  
Project Manager: Mark Longhurst

**Reported:**  
01/25/18 06:36

**SS13@18'**  
**1801254-01 (Soil)**

**Summit Scientific**

**Extractable Petroleum Hydrocarbons by 8015**

Date Sampled: **01/24/18 10:07**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	1801264	01/24/18	01/24/18	8015M	

Date Sampled: **01/24/18 10:07**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: <i>o</i> -Terphenyl		71.2 %	30-150		"	"	"	"	

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

Date Sampled: **01/24/18 10:07**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Naphthalene	ND	0.010	mg/kg	1	1801263	01/24/18	01/24/18	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: **01/24/18 10:07**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		96.9 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		105 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		94.4 %	21-167		"	"	"	"	

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: Wacker #1  
Project Number: [none]  
Project Manager: Mark Longhurst

**Reported:**  
01/25/18 06:36

**SS14@28'**  
**1801254-02 (Soil)**

**Summit Scientific**

**Extractable Petroleum Hydrocarbons by 8015**

Date Sampled: **01/24/18 10:15**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	1801264	01/24/18	01/24/18	8015M	

Date Sampled: **01/24/18 10:15**

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: **01/24/18 10:15**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Naphthalene	ND	0.010	mg/kg	1	1801263	01/24/18	01/24/18	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: **01/24/18 10:15**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		97.3 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		104 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		96.2 %	21-167		"	"	"	"	

Summit Scientific

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

Project: Wacker #1

Project Number: [none]  
Project Manager: Mark Longhurst

**Reported:**  
01/25/18 06:36

**SS15@18'**  
**1801254-03 (Soil)**

**Summit Scientific**

**Extractable Petroleum Hydrocarbons by 8015**

Date Sampled: **01/24/18 12:31**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	1801264	01/24/18	01/24/18	8015M	

Date Sampled: **01/24/18 12:31**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: <i>o</i> -Terphenyl		101 %	30-150		"	"	"	"	

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

Date Sampled: **01/24/18 12:31**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Naphthalene	ND	0.010	mg/kg	1	1801263	01/24/18	01/24/18	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: **01/24/18 12:31**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		97.6 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		103 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		95.8 %	21-167		"	"	"	"	

Summit Scientific

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

Project: Wacker #1  
Project Number: [none]  
Project Manager: Mark Longhurst

**Reported:**  
01/25/18 06:36

**SS16@28'**  
**1801254-04 (Soil)**

**Summit Scientific**

**Extractable Petroleum Hydrocarbons by 8015**

Date Sampled: **01/24/18 12:35**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	1801264	01/24/18	01/24/18	8015M	

Date Sampled: **01/24/18 12:35**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: <i>o</i> -Terphenyl		98.8 %	30-150		"	"	"	"	

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

Date Sampled: **01/24/18 12:35**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Naphthalene	ND	0.010	mg/kg	1	1801263	01/24/18	01/24/18	EPA 8260B	
Benzene	ND	0.0020	"	"	"	"	"	"	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	ND	0.0050	"	"	"	"	"	"	
Xylenes (total)	ND	0.010	"	"	"	"	"	"	
<b>Gasoline Range Hydrocarbons</b>	<b>0.73</b>	0.50	"	"	"	"	"	"	

Date Sampled: **01/24/18 12:35**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		100 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		104 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		98.8 %	21-167		"	"	"	"	

Summit Scientific

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

Project: Wacker #1  
 Project Number: [none]  
 Project Manager: Mark Longhurst

**Reported:**  
 01/25/18 06:36

**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 1801264 - EPA 3550A**

<b>Blank (1801264-BLK1)</b>				Prepared: 01/24/18 Analyzed: 01/25/18							
C10-C28 (DRO)	ND	50	mg/kg								
<i>Surrogate: o-Terphenyl</i>	12.6		"	12.5		101	30-150				
<b>LCS (1801264-BS1)</b>				Prepared: 01/24/18 Analyzed: 01/25/18							
C10-C28 (DRO)	519	50	mg/kg	499		104	73-134				
<i>Surrogate: o-Terphenyl</i>	13.1		"	12.5		105	30-150				
<b>Matrix Spike (1801264-MS1)</b>				Source: 1801254-01 Prepared: 01/24/18 Analyzed: 01/25/18							
C10-C28 (DRO)	494	50	mg/kg	499	10.2	96.9	50-148				
<i>Surrogate: o-Terphenyl</i>	14.5		"	12.5		116	30-150				
<b>Matrix Spike Dup (1801264-MSD1)</b>				Source: 1801254-01 Prepared: 01/24/18 Analyzed: 01/25/18							
C10-C28 (DRO)	589	50	mg/kg	499	10.2	116	50-148	17.6		20	
<i>Surrogate: o-Terphenyl</i>	15.3		"	12.5		122	30-150				

Summit Scientific

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

Project: Wacker #1  
Project Number: [none]  
Project Manager: Mark Longhurst

Reported:  
01/25/18 06:36

**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 1801263 - EPA 5030 Soil MS**

**Blank (1801263-BLK1)**

Prepared: 01/24/18 Analyzed: 01/25/18

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>0.0399</i>		<i>"</i>	<i>0.0400</i>		<i>99.8</i>		<i>23-173</i>		
<i>Surrogate: Toluene-d8</i>	<i>0.0418</i>		<i>"</i>	<i>0.0400</i>		<i>104</i>		<i>20-170</i>		
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>0.0382</i>		<i>"</i>	<i>0.0400</i>		<i>95.6</i>		<i>21-167</i>		

**LCS (1801263-BS1)**

Prepared: 01/24/18 Analyzed: 01/25/18

Naphthalene	ND	0.010	mg/kg					66-138		
Benzene	0.125	0.0020	"	0.100		125		58-130		
Toluene	0.122	0.0050	"	0.100		122		61-134		
Ethylbenzene	0.132	0.0050	"	0.0992		133		74-139		
m,p-Xylene	0.255	0.010	"	0.200		128		73-137		
o-Xylene	0.121	0.0050	"	0.0980		124		73-141		
Xylenes (total)	0.376	0.010	"					0-200		
Gasoline Range Hydrocarbons	3.13	0.50	"					30-150		
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>0.0397</i>		<i>"</i>	<i>0.0400</i>		<i>99.3</i>		<i>23-173</i>		
<i>Surrogate: Toluene-d8</i>	<i>0.0418</i>		<i>"</i>	<i>0.0400</i>		<i>105</i>		<i>20-170</i>		
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>0.0381</i>		<i>"</i>	<i>0.0400</i>		<i>95.3</i>		<i>21-167</i>		

**Matrix Spike (1801263-MS1)**

Source: 1801254-01

Prepared: 01/24/18 Analyzed: 01/25/18

Naphthalene	ND	0.010	mg/kg		ND			10-158		
Benzene	0.128	0.0020	"	0.100	ND	128		30-131		
Toluene	0.127	0.0050	"	0.100	ND	127		30-134		
Ethylbenzene	0.138	0.0050	"	0.0992	ND	139		22-153		
m,p-Xylene	0.267	0.010	"	0.200	ND	134		10-159		
o-Xylene	0.125	0.0050	"	0.0980	ND	127		31-151		
Xylenes (total)	0.392	0.010	"		ND			30-160		
Gasoline Range Hydrocarbons	3.21	0.50	"		ND			30-160		
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>0.0401</i>		<i>"</i>	<i>0.0400</i>		<i>100</i>		<i>23-173</i>		
<i>Surrogate: Toluene-d8</i>	<i>0.0422</i>		<i>"</i>	<i>0.0400</i>		<i>105</i>		<i>20-170</i>		
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>0.0382</i>		<i>"</i>	<i>0.0400</i>		<i>95.6</i>		<i>21-167</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: Wacker #1  
 Project Number: [none]  
 Project Manager: Mark Longhurst

**Reported:**  
 01/25/18 06:36

**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 1801263 - EPA 5030 Soil MS**

<b>Matrix Spike Dup (1801263-MSD1)</b>	<b>Source: 1801254-01</b>			Prepared: 01/24/18		Analyzed: 01/25/18				
Naphthalene	ND	0.010	mg/kg	ND	ND	10-158				42
Benzene	0.128	0.0020	"	0.100	ND	128	30-131	0.773		34
Toluene	0.128	0.0050	"	0.100	ND	128	30-134	0.825		30
Ethylbenzene	0.138	0.0050	"	0.0992	ND	139	22-153	0.131		24
m,p-Xylene	0.265	0.010	"	0.200	ND	133	10-159	0.744		68
o-Xylene	0.126	0.0050	"	0.0980	ND	128	31-151	0.864		38
Xylenes (total)	0.391	0.010	"		ND		30-160	0.230		30
Gasoline Range Hydrocarbons	3.20	0.50	"		ND		30-160	0.259		30
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>0.0404</i>		<i>"</i>	<i>0.0400</i>		<i>101</i>	<i>23-173</i>			
<i>Surrogate: Toluene-d8</i>	<i>0.0424</i>		<i>"</i>	<i>0.0400</i>		<i>106</i>	<i>20-170</i>			
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>0.0379</i>		<i>"</i>	<i>0.0400</i>		<i>94.7</i>	<i>21-167</i>			

Summit Scientific

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

Project: Wacker #1  
Project Number: [none]  
Project Manager: Mark Longhurst

**Reported:**  
01/25/18 06:36

### 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

January 26, 2018

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

Enclosed are the results of analyses for samples received by Summit Scientific on 01/25/18 15:15. 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: Wacker #1

Project Number: [none]  
Project Manager: Mark Longhurst

**Reported:**  
01/26/18 06:33

### ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
SS17@18'	1801276-01	Soil	01/25/18 11:17	01/25/18 15:15
SS18@28'	1801276-02	Soil	01/25/18 11:20	01/25/18 15:15
SS19@18'	1801276-03	Soil	01/25/18 12:37	01/25/18 15:15
SS20@28'	1801276-04	Soil	01/25/18 12:41	01/25/18 15:15

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.*



### Sample Receipt Checklist

S2 Work Order: 1801276

Client: PDC Client Project ID: Wacker 1

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

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

Cooler ID					
Temp (°C)	28				

Thermometer ID: 61857155-K

	Yes	No	N/A	Comments (if any)
If samples require cooling, was the temperature at 4°C +/- 2°C <sup>(1)</sup> ? NOTE: If samples are delivered the same day of sampling, this requirement is met provided that there is evidence that cooling has begun.	x			
Were all samples received intact <sup>(1)</sup> ?	x			
Was adequate sample volume provided <sup>(1)</sup> ?	x			
If custody seals are present, are they intact <sup>(1)</sup> ?			x	
Are short holding time analytes or samples with HTs due within 48 hours present?	x			
Is a chain-of-custody (COC) form present and filled out completely <sup>(1)</sup> ?	x			
Does the COC agree with the number and type of sample bottles received <sup>(1)</sup> ?	x			
Do the sample IDs on the bottle labels match the COC <sup>(1)</sup> ?	x			
Is the COC properly relinquished by the client w/ date and time recorded <sup>(1)</sup> ?	x			
For volatiles in water – is there headspace present? <b>If yes, contact client and note in narrative.</b>			x	
Are samples preserved that require preservation (excluding cooling) <sup>(1)</sup> ? Note the type of preservative in the Comments column – HCl, H2SO4, NaOH, HNO3, ect			x	
If samples are acid preserved for metals, is the pH ≤ 2 <sup>(1)</sup> ? Record the pH in Comments.			x	
If dissolved metals are requested, were samples field filtered?			x	
Additional Comments (if any):				

<sup>(1)</sup> If NO, then contact the client before proceeding with analysis and note in case narrative.

Murphy  
Custodian Printed Name

1-25-18  
Signature or Initials of Custodian

17:10  
Date/Time



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

Project: Wacker #1  
Project Number: [none]  
Project Manager: Mark Longhurst

**Reported:**  
01/26/18 06:33

**SS17@18'**  
**1801276-01 (Soil)**

**Summit Scientific**

**Extractable Petroleum Hydrocarbons by 8015**

Date Sampled: **01/25/18 11:17**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>C10-C28 (DRO)</b>	<b>79</b>	50	mg/kg	1	1801275	01/25/18	01/25/18	8015M	

Date Sampled: **01/25/18 11:17**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<i>Surrogate: o-Terphenyl</i>		127 %	30-150		"	"	"	"	

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

Date Sampled: **01/25/18 11:17**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>Naphthalene</b>	<b>0.036</b>	0.010	mg/kg	1	1801274	01/25/18	01/25/18	EPA 8260B	
Benzene	ND	0.0020	"	"	"	"	"	"	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	ND	0.0050	"	"	"	"	"	"	
<b>Xylenes (total)</b>	<b>0.011</b>	0.010	"	"	"	"	"	"	
<b>Gasoline Range Hydrocarbons</b>	<b>13</b>	0.50	"	"	"	"	"	"	

Date Sampled: **01/25/18 11:17**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<i>Surrogate: 1,2-Dichloroethane-d4</i>		104 %	23-173		"	"	"	"	
<i>Surrogate: Toluene-d8</i>		99.1 %	20-170		"	"	"	"	
<i>Surrogate: 4-Bromofluorobenzene</i>		105 %	21-167		"	"	"	"	

Summit Scientific

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

Project: Wacker #1  
Project Number: [none]  
Project Manager: Mark Longhurst

**Reported:**  
01/26/18 06:33

**SS18@28'**  
**1801276-02 (Soil)**

**Summit Scientific**

**Extractable Petroleum Hydrocarbons by 8015**

Date Sampled: **01/25/18 11:20**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	1801275	01/25/18	01/25/18	8015M	

Date Sampled: **01/25/18 11:20**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: <i>o</i> -Terphenyl		120 %	30-150		"	"	"	"	

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

Date Sampled: **01/25/18 11:20**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Naphthalene	ND	0.010	mg/kg	1	1801274	01/25/18	01/25/18	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: **01/25/18 11:20**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		104 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		98.8 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		102 %	21-167		"	"	"	"	

Summit Scientific

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

Project: Wacker #1  
Project Number: [none]  
Project Manager: Mark Longhurst

**Reported:**  
01/26/18 06:33

**SS19@18'**  
**1801276-03 (Soil)**

**Summit Scientific**

**Extractable Petroleum Hydrocarbons by 8015**

Date Sampled: **01/25/18 12:37**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	1801275	01/25/18	01/26/18	8015M	

Date Sampled: **01/25/18 12:37**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: <i>o</i> -Terphenyl		114 %	30-150		"	"	"	"	

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

Date Sampled: **01/25/18 12:37**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Naphthalene	ND	0.010	mg/kg	1	1801274	01/25/18	01/25/18	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: **01/25/18 12:37**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		104 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		99.6 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		103 %	21-167		"	"	"	"	

Summit Scientific

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

Project: Wacker #1  
Project Number: [none]  
Project Manager: Mark Longhurst

**Reported:**  
01/26/18 06:33

**SS20@28'**  
**1801276-04 (Soil)**

**Summit Scientific**

**Extractable Petroleum Hydrocarbons by 8015**

Date Sampled: **01/25/18 12:41**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	1801275	01/25/18	01/26/18	8015M	

Date Sampled: **01/25/18 12:41**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: <i>o</i> -Terphenyl		107 %	30-150		"	"	"	"	

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

Date Sampled: **01/25/18 12:41**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Naphthalene	ND	0.010	mg/kg	1	1801274	01/25/18	01/25/18	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: **01/25/18 12:41**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		103 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		98.1 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		105 %	21-167		"	"	"	"	

Summit Scientific

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

Project: Wacker #1  
Project Number: [none]  
Project Manager: Mark Longhurst

**Reported:**  
01/26/18 06:33

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

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

**Batch 1801275 - EPA 3550A**

<b>Blank (1801275-BLK1)</b>				Prepared: 01/25/18 Analyzed: 01/26/18							
C10-C28 (DRO)	ND	50	mg/kg								
Surrogate: <i>o</i> -Terphenyl	15.7		"	12.5		125	30-150				
<b>LCS (1801275-BS1)</b>				Prepared: 01/25/18 Analyzed: 01/26/18							
C10-C28 (DRO)	538	50	mg/kg	499		108	73-134				
Surrogate: <i>o</i> -Terphenyl	18.7		"	12.5		150	30-150				
<b>Matrix Spike (1801275-MS1)</b>				<b>Source: 1801276-01</b>		Prepared: 01/25/18 Analyzed: 01/26/18					
C10-C28 (DRO)	568	50	mg/kg	499	78.8	98.0	50-148				
Surrogate: <i>o</i> -Terphenyl	15.1		"	12.5		121	30-150				
<b>Matrix Spike Dup (1801275-MSD1)</b>				<b>Source: 1801276-01</b>		Prepared: 01/25/18 Analyzed: 01/26/18					
C10-C28 (DRO)	556	50	mg/kg	499	78.8	95.6	50-148	2.18		20	
Surrogate: <i>o</i> -Terphenyl	17.7		"	12.5		142	30-150				

Summit Scientific

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

Project: Wacker #1  
Project Number: [none]  
Project Manager: Mark Longhurst

Reported:  
01/26/18 06:33

**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 1801274 - EPA 5030 Soil MS**

**Blank (1801274-BLK1)**

Prepared: 01/25/18 Analyzed: 01/26/18

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>0.0398</i>		<i>"</i>	<i>0.0400</i>		<i>99.5</i>	<i>23-173</i>			
<i>Surrogate: Toluene-d8</i>	<i>0.0389</i>		<i>"</i>	<i>0.0400</i>		<i>97.4</i>	<i>20-170</i>			
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>0.0413</i>		<i>"</i>	<i>0.0400</i>		<i>103</i>	<i>21-167</i>			

**LCS (1801274-BS1)**

Prepared: 01/25/18 Analyzed: 01/26/18

Naphthalene	ND	0.010	mg/kg				66-138			
Benzene	0.113	0.0020	"	0.100		113	58-130			
Toluene	0.118	0.0050	"	0.100		118	61-134			
Ethylbenzene	0.129	0.0050	"	0.0992		130	74-139			
m,p-Xylene	0.251	0.010	"	0.200		126	73-137			
o-Xylene	0.120	0.0050	"	0.0980		123	73-141			
Xylenes (total)	0.371	0.010	"				0-200			
Gasoline Range Hydrocarbons	3.04	0.50	"				30-150			
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>0.0412</i>		<i>"</i>	<i>0.0400</i>		<i>103</i>	<i>23-173</i>			
<i>Surrogate: Toluene-d8</i>	<i>0.0404</i>		<i>"</i>	<i>0.0400</i>		<i>101</i>	<i>20-170</i>			
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>0.0410</i>		<i>"</i>	<i>0.0400</i>		<i>102</i>	<i>21-167</i>			

**Matrix Spike (1801274-MS1)**

Source: 1801276-01

Prepared: 01/25/18 Analyzed: 01/26/18

Naphthalene	ND	0.010	mg/kg		0.0363		10-158			
Benzene	0.113	0.0020	"	0.100	ND	113	30-131			
Toluene	0.119	0.0050	"	0.100	ND	119	30-134			
Ethylbenzene	0.130	0.0050	"	0.0992	ND	131	22-153			
m,p-Xylene	0.256	0.010	"	0.200	0.0114	123	10-159			
o-Xylene	0.123	0.0050	"	0.0980	ND	125	31-151			
Xylenes (total)	0.379	0.010	"		0.0114		30-160			
Gasoline Range Hydrocarbons	3.13	0.50	"		13.5		30-160			
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>0.0424</i>		<i>"</i>	<i>0.0400</i>		<i>106</i>	<i>23-173</i>			
<i>Surrogate: Toluene-d8</i>	<i>0.0398</i>		<i>"</i>	<i>0.0400</i>		<i>99.5</i>	<i>20-170</i>			
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>0.0415</i>		<i>"</i>	<i>0.0400</i>		<i>104</i>	<i>21-167</i>			

Summit Scientific

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

Project: Wacker #1  
 Project Number: [none]  
 Project Manager: Mark Longhurst

**Reported:**  
 01/26/18 06:33

**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 1801274 - EPA 5030 Soil MS**

<b>Matrix Spike Dup (1801274-MSD1)</b>	<b>Source: 1801276-01</b>			Prepared: 01/25/18		Analyzed: 01/26/18			
Naphthalene	ND	0.010	mg/kg		0.0363		10-158		42
Benzene	0.114	0.0020	"	0.100	ND	114	30-131	0.816	34
Toluene	0.119	0.0050	"	0.100	ND	119	30-134	0.0251	30
Ethylbenzene	0.133	0.0050	"	0.0992	ND	135	22-153	2.43	24
m,p-Xylene	0.261	0.010	"	0.200	0.0114	125	10-159	1.77	68
o-Xylene	0.124	0.0050	"	0.0980	ND	127	31-151	1.31	38
Xylenes (total)	0.385	0.010	"		0.0114		30-160	1.62	30
Gasoline Range Hydrocarbons	3.13	0.50	"		13.5		30-160	0.280	30
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>0.0432</i>		<i>"</i>	<i>0.0400</i>		<i>108</i>	<i>23-173</i>		
<i>Surrogate: Toluene-d8</i>	<i>0.0401</i>		<i>"</i>	<i>0.0400</i>		<i>100</i>	<i>20-170</i>		
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>0.0416</i>		<i>"</i>	<i>0.0400</i>		<i>104</i>	<i>21-167</i>		

Summit Scientific

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

Project: Wacker #1  
Project Number: [none]  
Project Manager: Mark Longhurst

**Reported:**  
01/26/18 06:33

### 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

January 30, 2018

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

Enclosed are the results of analyses for samples received by Summit Scientific on 01/29/18 12:22. 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: Wacker #1

Project Number: [none]  
Project Manager: Mark Longhurst

**Reported:**  
01/30/18 06:46

### ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
GW01	1801304-01	Water	01/29/18 10:45	01/29/18 12:22

---

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.*



### Sample Receipt Checklist

S2 Work Order: 1801304

Client: PDC Energy Client Project ID: Wacker 1

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

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

Cooler ID					
Temp (°C)	4.6				

Thermometer ID: 61857155-K

	Yes	No	N/A	Comments (if any)
If samples require cooling, was the temperature at 4°C +/- 2°C <sup>(1)</sup> ?	✓			
<small>NOTE: If samples are delivered the same day of sampling, this requirement is met provided that there is evidence that cooling has begun.</small>				
Were all samples received intact <sup>(1)</sup> ?	✓			
Was adequate sample volume provided <sup>(1)</sup> ?	✓			
If custody seals are present, are they intact <sup>(1)</sup> ?	✓			
Are short holding time analytes or samples with HTs due within 48 hours present?			✓	
Is a chain-of-custody (COC) form present and filled out completely <sup>(1)</sup> ?			✓	
Does the COC agree with the number and type of sample bottles received <sup>(1)</sup> ?	✓			
Do the sample IDs on the bottle labels match the COC <sup>(1)</sup> ?	✓			
Is the COC properly relinquished by the client w/ date and time recorded <sup>(1)</sup> ?	✓			
For volatiles in water – is there headspace present? <b>If yes, contact client and note in narrative.</b>				
Are samples preserved that require preservation <b>(excluding cooling)</b> <sup>(1)</sup> ?	✓	✓		HCl
<small>Note the type of preservative in the Comments column – HCl, H2SO4, NaOH, HNO3, ect</small>				
If samples are acid preserved for metals, is the pH ≤ 2 <sup>(1)</sup> ?			✓	
<small>Record the pH in Comments.</small>				
If dissolved metals are requested, were samples field filtered?			✓	
Additional Comments (if any):				

<sup>(1)</sup> If NO, then contact the client before proceeding with analysis and note in case narrative.

Makita  
Custodian Printed Name

[Signature]  
Signature or Initials of Custodian

1/29/18 1230  
Date/Time



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

Project: Wacker #1  
 Project Number: [none]  
 Project Manager: Mark Longhurst

**Reported:**  
 01/30/18 06:46

**GW01**  
**1801304-01 (Water)**

**Summit Scientific**

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

Date Sampled: **01/29/18 10:45**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>Benzene</b>	<b>1.2</b>	1.0	ug/l	1	1801303	01/29/18	01/29/18	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
<b>Ethylbenzene</b>	<b>5.1</b>	1.0	"	"	"	"	"	"	
<b>Xylenes (total)</b>	<b>23</b>	2.0	"	"	"	"	"	"	

Date Sampled: **01/29/18 10:45**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		77.2 %	37-154		"	"	"	"	
Surrogate: Toluene-d8		94.6 %	45-149		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		96.5 %	45-146		"	"	"	"	

Summit Scientific

*The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.*



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

Project: Wacker #1  
Project Number: [none]  
Project Manager: Mark Longhurst

Reported:  
01/30/18 06:46

**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 1801303 - EPA 5030 Water MS**

**Blank (1801303-BLK1)**

Prepared & Analyzed: 01/29/18

Benzene	ND	1.0	ug/l							
Toluene	ND	1.0	"							
Ethylbenzene	ND	1.0	"							
Xylenes (total)	ND	2.0	"							
Surrogate: 1,2-Dichloroethane-d4	13.4		"	13.3		100	37-154			
Surrogate: Toluene-d8	13.3		"	13.3		99.5	45-149			
Surrogate: 4-Bromofluorobenzene	13.6		"	13.3		102	45-146			

**LCS (1801303-BS1)**

Prepared & Analyzed: 01/29/18

Benzene	36.7	1.0	ug/l	33.3		110	51-132			
Toluene	38.5	1.0	"	33.3		115	51-138			
Ethylbenzene	41.9	1.0	"	33.1		127	58-146			
m,p-Xylene	81.7	2.0	"	66.5		123	57-144			
o-Xylene	39.3	1.0	"	32.7		120	53-146			
Surrogate: 1,2-Dichloroethane-d4	13.4		"	13.3		101	37-154			
Surrogate: Toluene-d8	13.5		"	13.3		101	45-149			
Surrogate: 4-Bromofluorobenzene	13.8		"	13.3		103	45-146			

**Matrix Spike (1801303-MS1)**

Source: 1801304-01

Prepared & Analyzed: 01/29/18

Benzene	40.2	1.0	ug/l	33.3	1.15	117	34-141			
Toluene	44.3	1.0	"	33.3	ND	133	27-151			
Ethylbenzene	47.4	1.0	"	33.1	5.13	128	29-160			
m,p-Xylene	104	2.0	"	66.5	23.0	121	20-166			
o-Xylene	51.6	1.0	"	32.7	ND	158	33-159			
Surrogate: 1,2-Dichloroethane-d4	13.7		"	13.3		103	37-154			
Surrogate: Toluene-d8	13.6		"	13.3		102	45-149			
Surrogate: 4-Bromofluorobenzene	13.4		"	13.3		101	45-146			

Summit Scientific

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

Project: Wacker #1  
 Project Number: [none]  
 Project Manager: Mark Longhurst

**Reported:**  
 01/30/18 06:46

**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 1801303 - EPA 5030 Water MS**

<b>Matrix Spike Dup (1801303-MSD1)</b>	<b>Source: 1801304-01</b>			<b>Prepared &amp; Analyzed: 01/29/18</b>						
Benzene	40.9	1.0	ug/l	33.3	1.15	119	34-141	1.75	32	
Toluene	46.8	1.0	"	33.3	ND	140	27-151	5.58	25	
Ethylbenzene	49.6	1.0	"	33.1	5.13	134	29-160	4.54	50	
m,p-Xylene	110	2.0	"	66.5	23.0	131	20-166	6.04	36	
o-Xylene	44.3	1.0	"	32.7	ND	136	33-159	15.2	26	
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>14.1</i>		<i>"</i>	<i>13.3</i>		<i>106</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>13.5</i>		<i>"</i>	<i>13.3</i>		<i>102</i>	<i>45-146</i>			

Summit Scientific

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

Project: Wacker #1  
Project Number: [none]  
Project Manager: Mark Longhurst

**Reported:**  
01/30/18 06:46

### 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

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741 Corporate Circle – Suite I ♦ Golden, Colorado 80401

303.277.9310 - laboratory ♦ 303.277.9531 - fax

February 02, 2018

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

Enclosed are the results of analyses for samples received by Summit Scientific on 02/01/18 15:00. 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: Wacker #1

Project Number: [none]  
Project Manager: Mark Longhurst

**Reported:**  
02/02/18 06:28

### ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
BH08	1802002-01	Water	02/01/18 11:21	02/01/18 15:00

Summit Scientific

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

Project: Wacker #1

Project Number: [none]  
 Project Manager: Mark Longhurst

Reported:  
 02/02/18 06:28

**Sample Receipt Checklist**

S2 Work Order: 1802002  
 Client: PDC Client Project ID: Wacker #1  
 Shipped Via: \_\_\_\_\_ Airbill #: \_\_\_\_\_  
(UPS, FedEx, Hand Delivered, Pick-up, etc.)  
 Matrix (check all that apply):  Air  Soil/Solid  Water  Other: \_\_\_\_\_  
(Describe)

Cooler ID					
Temp (°C)	4.0				

Thermometer ID: 61857155-K

	Yes	No	N/A	Comments (if any)
If samples require cooling, was the temperature at 4°C +/- 2°C <sup>(1)</sup> ?				
NOTE: If samples are delivered the same day of sampling, this requirement is met provided that there is evidence that cooling has begun.				
Were all samples received intact <sup>(1)</sup> ?	<input checked="" type="checkbox"/>			
Was adequate sample volume provided <sup>(1)</sup> ?	<input checked="" type="checkbox"/>			
If custody seals are present, are they intact <sup>(1)</sup> ?			<input checked="" type="checkbox"/>	
Are short holding time analytes or samples with HTs due within 48 hours present?	<input checked="" type="checkbox"/>			
Is a chain-of-custody (COC) form present and filled out completely <sup>(1)</sup> ?	<input checked="" type="checkbox"/>			
Does the COC agree with the number and type of sample bottles received <sup>(1)</sup> ?	<input checked="" type="checkbox"/>			
Do the sample IDs on the bottle labels match the COC <sup>(1)</sup> ?	<input checked="" type="checkbox"/>			
Is the COC properly relinquished by the client w/ date and time recorded <sup>(1)</sup> ?	<input checked="" type="checkbox"/>			
For volatiles in water – is there headspace present? If yes, contact client and note in narrative.		<input checked="" type="checkbox"/>		
Are samples preserved that require preservation (excluding cooling) <sup>(1)</sup> ? Note the type of preservative in the Comments column – HCl, H2SO4, NaOH, HNO3, ect		<input checked="" type="checkbox"/>		HCL
If samples are acid preserved for metals, is the pH ≤ 2 <sup>(1)</sup> ? Record the pH in Comments.			<input checked="" type="checkbox"/>	
If dissolved metals are requested, were samples field filtered?			<input checked="" type="checkbox"/>	
Additional Comments (if any):				

<sup>(1)</sup> If NO, then contact the client before proceeding with analysis and note in case narrative.

Longhurst  
 Custodian Printed Name

[Signature]  
 Signature or Initials of Custodian

2-1-18 1500  
 Date/Time

[Signature]



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

Project: Wacker #1  
 Project Number: [none]  
 Project Manager: Mark Longhurst

**Reported:**  
 02/02/18 06:28

**BH08**  
**1802002-01 (Water)**

**Summit Scientific**

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

Date Sampled: **02/01/18 11:21**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	1.0	ug/l	1	1802011	02/01/18	02/01/18	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	2.0	"	"	"	"	"	"	

Date Sampled: **02/01/18 11:21**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		103 %	37-154		"	"	"	"	
Surrogate: Toluene-d8		97.7 %	45-149		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		104 %	45-146		"	"	"	"	

Summit Scientific

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

Project: Wacker #1  
Project Number: [none]  
Project Manager: Mark Longhurst

Reported:  
02/02/18 06:28

**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 1802011 - EPA 5030 Water MS**

**Blank (1802011-BLK1)**

Prepared & Analyzed: 02/01/18

Benzene	ND	1.0	ug/l							
Toluene	ND	1.0	"							
Ethylbenzene	ND	1.0	"							
Xylenes (total)	ND	2.0	"							
Surrogate: 1,2-Dichloroethane-d4	12.6		"	13.3		94.7	37-154			
Surrogate: Toluene-d8	13.0		"	13.3		97.6	45-149			
Surrogate: 4-Bromofluorobenzene	13.8		"	13.3		104	45-146			

**LCS (1802011-BS1)**

Prepared & Analyzed: 02/01/18

Benzene	36.1	1.0	ug/l	33.3		108	51-132			
Toluene	37.6	1.0	"	33.3		113	51-138			
Ethylbenzene	40.1	1.0	"	33.1		121	58-146			
m,p-Xylene	78.5	2.0	"	66.5		118	57-144			
o-Xylene	37.9	1.0	"	32.7		116	53-146			
Surrogate: 1,2-Dichloroethane-d4	13.8		"	13.3		103	37-154			
Surrogate: Toluene-d8	13.4		"	13.3		100	45-149			
Surrogate: 4-Bromofluorobenzene	13.8		"	13.3		104	45-146			

**Matrix Spike (1802011-MS1)**

Source: 1801322-01

Prepared & Analyzed: 02/01/18

Benzene	38.0	1.0	ug/l	33.3	ND	114	34-141			
Toluene	39.8	1.0	"	33.3	ND	120	27-151			
Ethylbenzene	42.6	1.0	"	33.1	ND	129	29-160			
m,p-Xylene	83.6	2.0	"	66.5	ND	126	20-166			
o-Xylene	40.7	1.0	"	32.7	ND	124	33-159			
Surrogate: 1,2-Dichloroethane-d4	14.2		"	13.3		106	37-154			
Surrogate: Toluene-d8	13.4		"	13.3		100	45-149			
Surrogate: 4-Bromofluorobenzene	13.9		"	13.3		104	45-146			

Summit Scientific

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

Project: Wacker #1  
 Project Number: [none]  
 Project Manager: Mark Longhurst

**Reported:**  
 02/02/18 06:28

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

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

**Batch 1802011 - EPA 5030 Water MS**

<b>Matrix Spike Dup (1802011-MSD1)</b>	<b>Source: 1801322-01</b>			<b>Prepared &amp; Analyzed: 02/01/18</b>					
Benzene	38.0	1.0	ug/l	33.3	ND	114	34-141	0.105	32
Toluene	39.6	1.0	"	33.3	ND	119	27-151	0.604	25
Ethylbenzene	43.6	1.0	"	33.1	ND	132	29-160	2.28	50
m,p-Xylene	84.3	2.0	"	66.5	ND	127	20-166	0.822	36
o-Xylene	41.2	1.0	"	32.7	ND	126	33-159	1.34	26
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>13.8</i>		<i>"</i>	<i>13.3</i>		<i>104</i>	<i>37-154</i>		
<i>Surrogate: Toluene-d8</i>	<i>13.3</i>		<i>"</i>	<i>13.3</i>		<i>99.8</i>	<i>45-149</i>		
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>13.8</i>		<i>"</i>	<i>13.3</i>		<i>103</i>	<i>45-146</i>		

Summit Scientific

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

Project: Wacker #1  
Project Number: [none]  
Project Manager: Mark Longhurst

**Reported:**  
02/02/18 06:28

### 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