

State of Colorado  
Oil and Gas Conservation Commission

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



DE	ET	OE	ES
RECEIVED 12/11/2013			

Submit original plus one copy. This form is to be used for general, technical and environmental sundry Information. For proposed or completed operations, describe in full on Technical Information Page (Page 2 of this form.) Identify well or other facility by API Number or by OGCC Facility ID. Operator shall send an informational copy of all sundry notices for wells located in High Density Areas to the Local Government Designee (Rule 603b.)

1. OGCC Operator Number: 69175	4. Contact Name Brandon Bruns	Complete the Attachment Checklist  OP OGCC
2. Name of Operator: PDC Energy, Inc.	Phone: (303) 831-3971	
3. Address: 1775 Sherman Street, Suite 300 City Denver State: CO Zip 80203	Fax: (303) 860-5838	
5. API Number 05-123-13483	OGCC Facility ID Number	Survey Plat
6. Well/Facility Name: Lundvall 2-19	7. Well/Facility Number Lundvall 2-19	Directional Survey
8. Location (QtrQtr, Sec, Twp, Rng, Meridian): NWNE S19 T5N R66W 6th PM		Surface Eqpmt Diagram
9. County: Weld	10. Field Name: Wattenberg	Technical Info Page
11. Federal, Indian or State Lease Number:		Other

General Notice

☐ CHANGE OF LOCATION: Attach New Survey Plat (a change of surface qtr/qtr is substantive and requires a new permit)

Change of Surface Footage from Exterior Section Lines:

Change of Surface Footage to Exterior Section Lines:

Change of Bottomhole Footage from Exterior Section Lines:

Change of Bottomhole Footage to Exterior Section Lines:

Bottomhole location Qtr/Qtr, Sec, Twp, Rng, Mer

Latitude

Longitude

Ground Elevation

Distance to nearest property line

Distance to nearest bldg, public rd, utility or RR

Distance to nearest lease line

Is location in a High Density Area (rule 603b)? Yes/No

Distance to nearest well same formation

Surface owner consultation date:

FNL/FSL

FEL/FWL

attach directional survey

GPS DATA:  
Date of Measurement PDOP Reading Instrument Operator's Name

☐ CHANGE SPACING UNIT

Formation Formation Code Spacing order number Unit Acreage Unit configuration

☐ Remove from surface bond  
Signed surface use agreement attached

☐ CHANGE OF OPERATOR (prior to drilling):  
Effective Date:  
Plugging Bond: Blanket Individual

☐ CHANGE WELL NAME  
From:  
To:  
Effective Date:

☐ ABANDONED LOCATION:  
Was location ever built? Yes No  
Is site ready for Inspection? Yes No  
Date Ready for Inspection:

☐ NOTICE OF CONTINUED SHUT IN STATUS  
Date well shut in or temporarily abandoned:  
Has Production Equipment been removed from site? Yes No  
MIT required if shut in longer than two years. Date of last MIT

☐ SPUD DATE:

☐ REQUEST FOR CONFIDENTIAL STATUS (6 mos from date casing set)

☐ SUBSEQUENT REPORT OF STAGE, SQUEEZE OR REMEDIAL CEMENT WORK

Method used Cementing tool setting/perf depth Cement volume Cement top Cement bottom Date

☐ RECLAMATION: Attach technical page describing final reclamation procedures per Rule 1004.  
Final reclamation will commence on approximately

☐ Final reclamation is completed and site is ready for inspection.

Technical Engineering/Environmental Notice

☐ Notice of Intent  
Approximate Start Date:

☒ Report of Work Done  
Date Work Completed: 9/27/2013

Details of work must be described in full on Technical Information Page (Page 2 must be submitted.)

☐ Intent to Recomplete (submit form 2)

☐ Request to Vent or Flare

☐ E&P Waste Disposal

☐ Change Drilling Plans

☐ Repair Well

☐ Beneficial Reuse of E&P Waste

☐ Gross Interval Changed?

☐ Rule 502 variance requested

☒ Status Update/Change of Remediation Plans

☐ Casing/Cementing Program Change

☒ Other: Remediation Complete

for Spills and Releases

I hereby certify that the statements made in this form are, to the best of my knowledge, true, correct and complete.

Signed: Brandon Bruns Date: 11-25-13 Email: brandon.bruns@pdce.com  
Print Name: Brandon Bruns Title: EHS Professional

COGCC Approved: Title Date:

CONDITIONS OF APPROVAL, IF ANY:

TECHNICAL INFORMATION PAGE



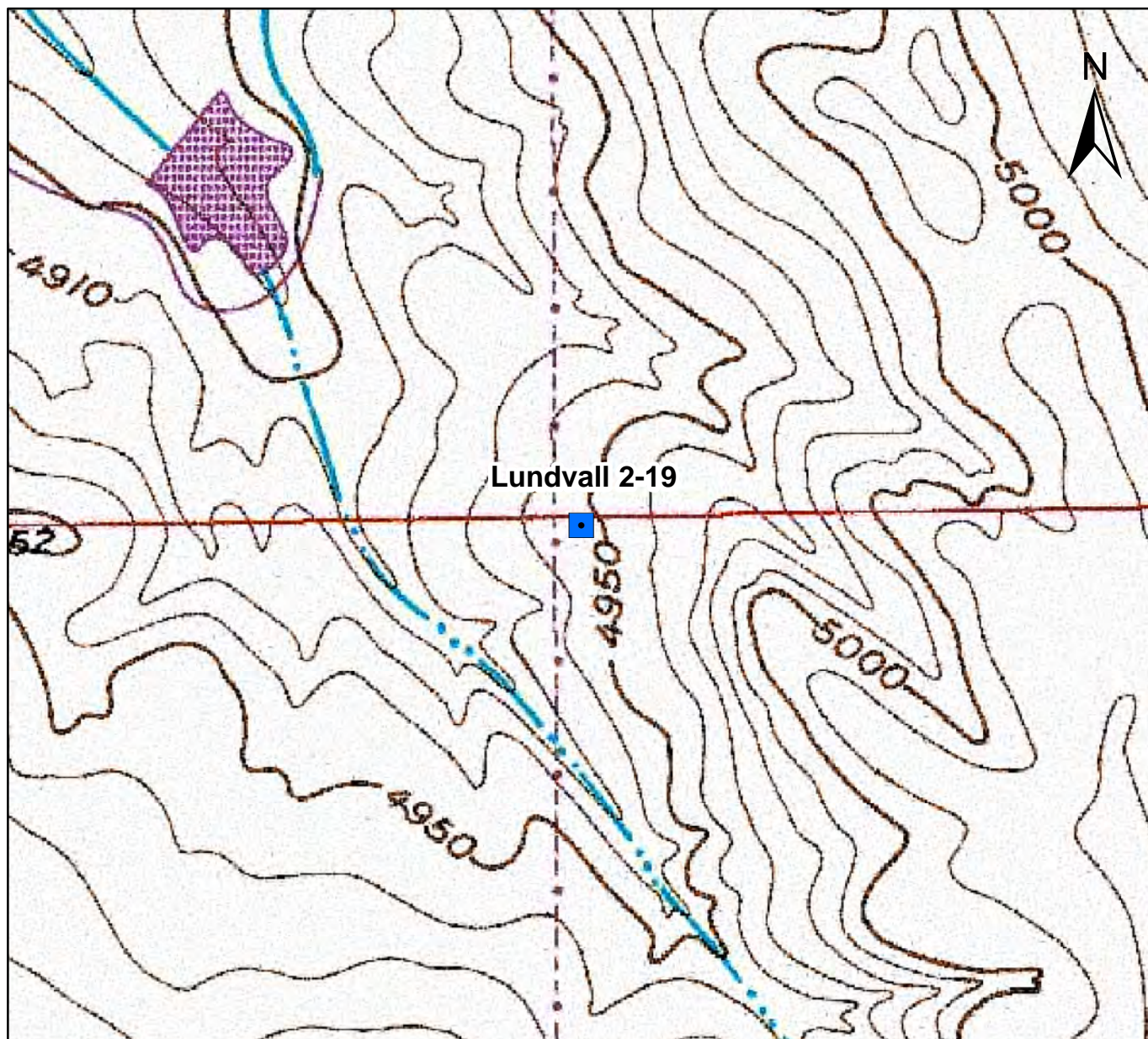
FOR OGCC USE ONLY

1. OGCC Operator Number:	69175	API Number:	05-123-13483
2. Name of Operator:	PDC Energy, Inc.	OGCC Facility ID #	
3. Well/Facility Name:	Lundvall 2-19	Well/Facility Number:	05-123-13483
4. Location (QtrQtr, Sec, Twp, Rng, Meridian):	NWNE S19 T5N R66W 6th PM		

This form is to be completed whenever a Sundry Notice is submitted requiring detailed report of work to be performed or completed. This form shall be transmitted within 30 days of work completed as a "subsequent" report and must accompany Form 4, page 1.

5. **DESCRIBE PROPOSED OR COMPLETED OPERATIONS**

Between March 20, 2013 and March 22, 2013, PDC conducted excavation activities at the Lundvall 2-19 (API # 05-123-13483, COGC Spill Tracking # 2145966, COGCC Remediation # 7953) tank battery located in the NWNE Quarter of Section 19, Township 5 North, Range 66 West, as illustrated on Figure 1. Approximately 340 cubic yards of impacted soil were removed and transported to the Waste Management Facility in Ault, Colorado under PDC waste manifests. Analytical results from excavation activities indicated petroleum hydrocarbon impacts were present in soil sample SS02 collected at 12 feet below ground surface (bgs) at concentrations above COGCC Table 910-1 soil standards. Soil sample locations from excavation activities are illustrated on Figure 2. Prior to backfilling, chemical oxidant (chemox) mixing activities were conducted at the base of the excavation area (between 13-15 feet bgs) to address residual impacted material. On March 25, 2013, a subsequent soil sample (SS09) was collected adjacent to SS02 from the treated depth and exhibited elevated benzene and total petroleum hydrocarbon (TPH) concentrations. An immediate decrease in constituent concentrations was not expected as chemox persists within the soil matrix. Following a 6-month period where continued oxidation occurred of impacted soil within the treatment zone, two boreholes (BH01 and BH02) were installed on September 27, 2013 to confirm remedial activities successfully mitigated residual impacts. Soil samples were collected from each borehole at a composite depth of 13 to 15 feet bgs which coincided with previously detected soil impacts. Soil analytical results indicated constituent concentrations were below COGCC regulatory standards at both borehole locations. Soil analytical data is summarized in Table 1 and the soil boring locations relative to the excavation area are illustrated on Figure 3. Based on the soil analytical results from the confirmation soil samples collected within the treatment zone, PDC is requesting a No Further Action determination from the COGCC. Groundwater was not impacted as a result of this release.



0 375 750 1,500  
Feet

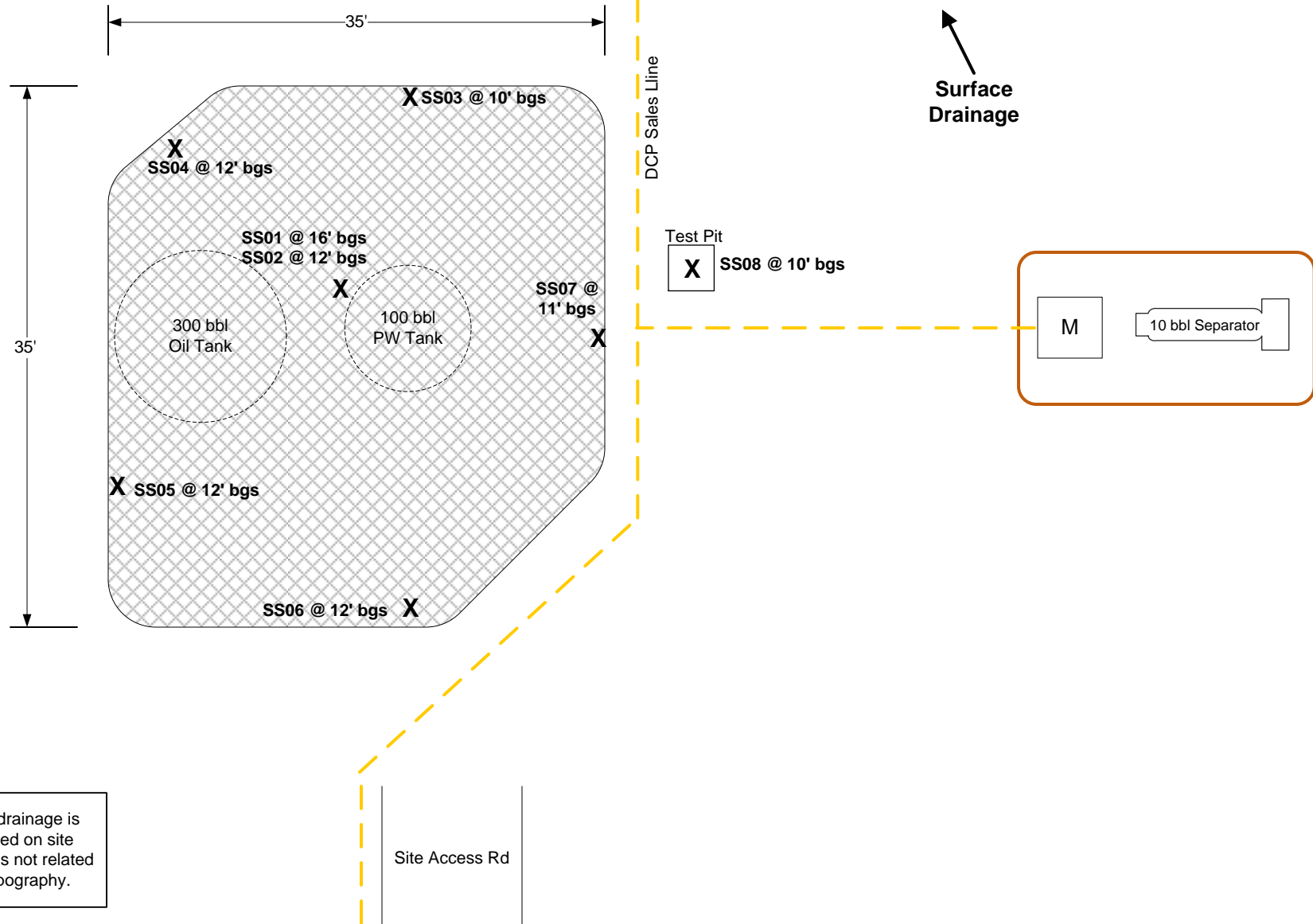


**Figure 1**  
Site Location Map  
Lundvall 2-19  
NWNE S19 T5N R66W  
Weld County, Colorado

Drawn By: ESS  
Date: 04/09/2013







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

DRAWN BY: ESS

DATE: 9/30/2013

**Facility Diagram**  
PDC Energy – DJ Basin  
Lundvall 2-19  
NWNE S19 T5N R66W  
Weld County, CO

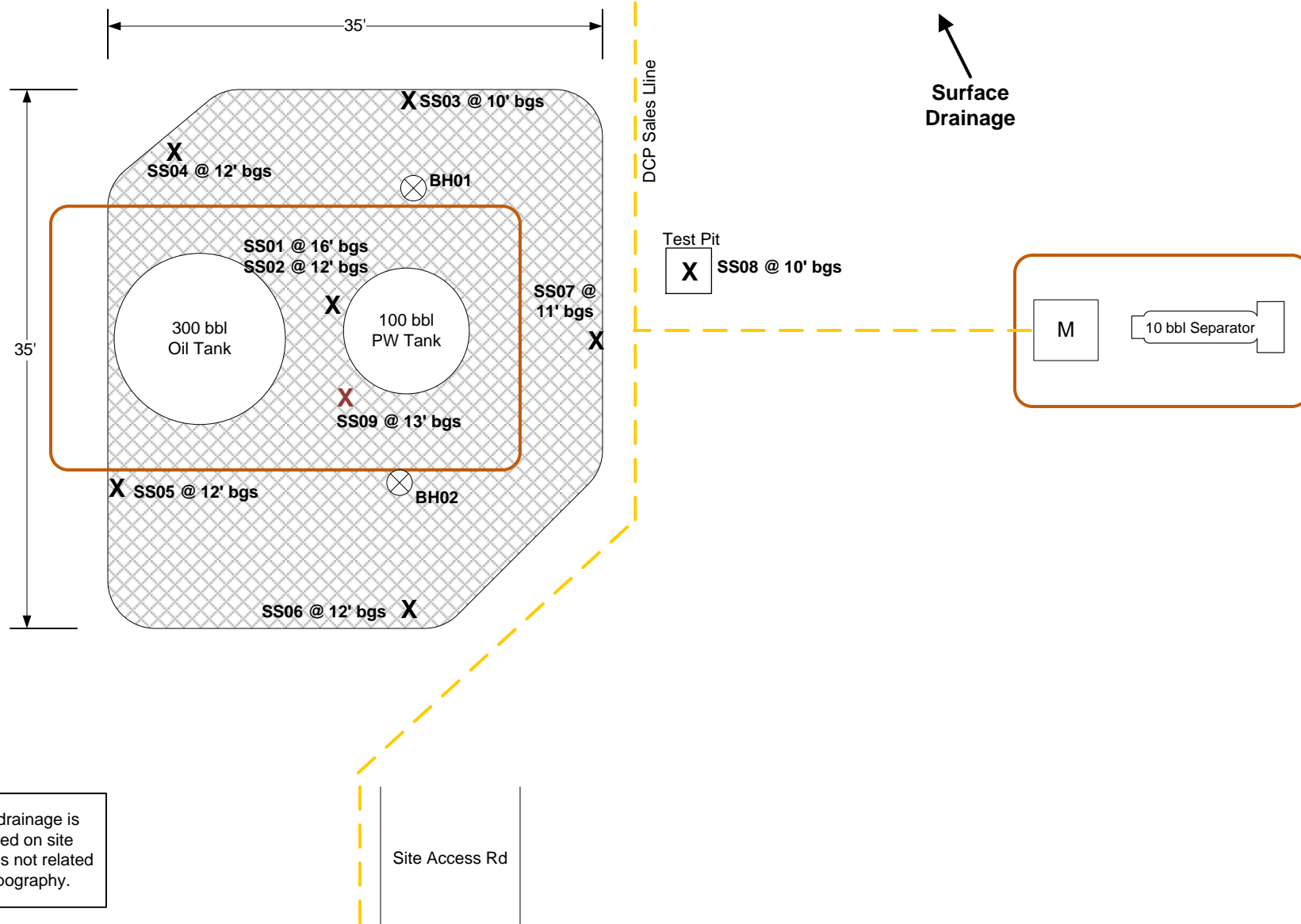


6899 Pecos Street  
Unit C  
Denver, CO 80221

**LEGEND**

- Approximate Area of Excavation
- Soil Sample Location
- Underground Gas Line
- Meter House

**FIGURE 2**  
**EXCAVATION SITE MAP**  
  
Not to Scale



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

DRAWN BY: ESS

DATE: 9/30/2013

**Facility Diagram**  
PDC Energy – DJ Basin  
Lundvall 2-19  
NWNE S19 T5N R66W  
Weld County, CO



6899 Pecos Street  
Unit C  
Denver, CO 80221

**LEGEND**

- Approximate Area of Excavation
- Soil Sample Location Collected During Excavation Activities
- Soil Sample Location Collected Following ChemOx Activities
- Soil Boring Sample Location
- Underground Gas Line
- Meter House

**FIGURE 3**  
**SOIL SAMPLE**  
**LOCATION MAP**  
  
Not to Scale

**TABLE 1**  
**LUNDVALL 2-19**  
**SOIL ANALYTICAL RESULTS SUMMARY TABLE**

Sample ID	Date Sampled	Depth (Feet bgs)	PID Readings (ppm)	Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	Total Xylenes (mg/kg)	Naphthalene (mg/kg)	TPH <sup>(2)</sup> (mg/kg)
SS01	3/20/2013	16	1,242	<0.005	0.055	0.072	0.55	0.11	288
SS02	3/20/2013	12	1,822	0.85	15	4.6	67	1.5	<b>2,750</b>
SS03	3/21/2013	10	0.0	<0.005	<0.005	<0.005	<0.01	<0.005	<50
SS04	3/22/2013	12	12.6	<0.005	<0.005	<0.005	<0.01	<0.005	<50
SS05	3/22/2013	12	3.5	<0.005	<0.005	<0.005	<0.01	<0.005	<50
SS06	3/22/2013	12	5.8	<0.005	<0.005	<0.005	<0.01	<0.005	<50
SS07	3/22/2013	11	14.7	<0.005	<0.005	<0.005	<0.01	<0.005	<50
SS08	3/22/2013	10	5.6	<0.005	<0.005	<0.005	<0.01	<0.005	<50
<b>Post Chemical Oxidant Remediation Activities</b>									
SS09	3/25/2013	13	7.4	<b>0.27</b>	1.1	0.51	9.2	0.21	<b>2,100</b>
BH01 13-15	9/27/2013	13-15	28.2	0.0073	<0.005	<0.005	<0.010	<0.010	<50
BH02 13-15	9/27/2013	13-15	5.8	<0.002	<0.005	<0.005	<0.010	<0.010	<50
<b>COGCC standards for Soil (mg/kg) <sup>(1)</sup></b>				<b>0.17</b>	<b>85</b>	<b>100</b>	<b>175</b>	<b>23</b>	<b>500</b>

Notes:

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

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

GRO - Gasoline range organics.

DRO - Diesel range organics

mg/kg - Milligrams per kilogram.

bgs - Below ground surface.

ppm - Parts per million

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

## **ATTACHMENT A**

# Summit Scientific

---

741 Corporate Circle – Suite I ♦ Golden, Colorado 80401

303.277.9310 - laboratory ♦ 303.277.9531 - fax

March 21, 2013

Brandon Bruns  
PDC Energy  
1775 Sherman St. STE. 3000  
Denver, CO 80203  
RE: Lundvall 2-19

Enclosed are the results of analyses for samples received by Summit Scientific on 03/20/13 17:35. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

A handwritten signature in black ink, appearing to read 'Paul Shrewsbury', is written over a light gray circular background.

Paul Shrewsbury For Ben Shrewsbury  
President / Laboratory Manager





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

Project: Lundvall 2-19  
Project Number: [none]  
Project Manager: Brandon Bruns

**Reported:**  
03/21/13 06:43

### ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
SS01@16'	R303143-01	Soil	03/20/13 15:15	03/20/13 17:35
SS02@12'	R303143-02	Soil	03/20/13 15:30	03/20/13 17:35

Summit Scientific

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

*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: Lundvall 2-19  
Project Number: [none]  
Project Manager: Brandon Bruns

**Reported:**  
03/21/13 06:43

**SS01@16'**  
**R303143-01 (Soil)**

**Summit Scientific**

**Total Petroleum Hydrocarbons by 8015**

Date Sampled: **03/20/13 15:15**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>C10-C28 (DRO)</b>	<b>270</b>	50	mg/kg	1	3032014	03/20/13	03/20/13	8015 DRO	

Date Sampled: **03/20/13 15:15**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<i>Surrogate: o-Terphenyl</i>		103 %	30-150		"	"	"	"	

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

Date Sampled: **03/20/13 15:15**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>Naphthalene</b>	<b>0.11</b>	0.050	mg/kg	10	3032013	03/20/13	03/20/13	EPA 8260B	
Benzene	ND	0.050	"	"	"	"	"	"	
<b>Toluene</b>	<b>0.055</b>	0.050	"	"	"	"	"	"	
<b>Ethylbenzene</b>	<b>0.072</b>	0.050	"	"	"	"	"	"	
<b>Xylenes (total)</b>	<b>0.55</b>	0.10	"	"	"	"	"	"	
<b>Gasoline Range Hydrocarbons</b>	<b>18</b>	5.0	"	"	"	"	"	"	

Date Sampled: **03/20/13 15:15**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<i>Surrogate: 1,2-Dichloroethane-d4</i>		119 %	23-173		"	"	"	"	
<i>Surrogate: Toluene-d8</i>		102 %	20-170		"	"	"	"	
<i>Surrogate: 4-Bromofluorobenzene</i>		102 %	21-167		"	"	"	"	

Summit Scientific

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

Project: Lundvall 2-19  
Project Number: [none]  
Project Manager: Brandon Bruns

**Reported:**  
03/21/13 06:43

**SS02@12'**  
**R303143-02 (Soil)**

**Summit Scientific**

**Total Petroleum Hydrocarbons by 8015**

Date Sampled: **03/20/13 15:30**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>C10-C28 (DRO)</b>	<b>1900</b>	50	mg/kg	1	3032014	03/20/13	03/20/13	8015 DRO	

Date Sampled: **03/20/13 15:30**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<i>Surrogate: o-Terphenyl</i>		118 %	30-150		"	"	"	"	

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

Date Sampled: **03/20/13 15:30**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>Naphthalene</b>	<b>1.5</b>	0.050	mg/kg	10	3032013	03/20/13	03/20/13	EPA 8260B	
<b>Benzene</b>	<b>0.85</b>	0.050	"	"	"	"	"	"	
<b>Toluene</b>	<b>15</b>	0.050	"	"	"	"	"	"	E
<b>Ethylbenzene</b>	<b>4.6</b>	0.050	"	"	"	"	"	"	
<b>Xylenes (total)</b>	<b>67</b>	0.10	"	"	"	"	"	"	
<b>Gasoline Range Hydrocarbons</b>	<b>850</b>	5.0	"	"	"	"	"	"	E

Date Sampled: **03/20/13 15:30**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<i>Surrogate: 1,2-Dichloroethane-d4</i>		117 %	23-173		"	"	"	"	
<i>Surrogate: Toluene-d8</i>		143 %	20-170		"	"	"	"	
<i>Surrogate: 4-Bromofluorobenzene</i>		110 %	21-167		"	"	"	"	

Summit Scientific

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

Project: Lundvall 2-19  
Project Number: [none]  
Project Manager: Brandon Bruns

**Reported:**  
03/21/13 06:43

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

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

**Batch 3032014 - EPA 3550A**

**Blank (3032014-BLK1)**

Prepared: 03/20/13 Analyzed: 03/21/13

C10-C28 (DRO) ND 50 mg/kg

**LCS (3032014-BS1)**

Prepared: 03/20/13 Analyzed: 03/21/13

C10-C28 (DRO) 599 50 mg/kg 501 120 73-134

**LCS Dup (3032014-BSD1)**

Prepared: 03/20/13 Analyzed: 03/21/13

C10-C28 (DRO) 612 50 mg/kg 501 122 73-134 2.10 11

**Matrix Spike (3032014-MS1)**

**Source: R303144-01**

Prepared: 03/20/13 Analyzed: 03/21/13

C10-C28 (DRO) 647 50 mg/kg 501 ND 129 50-148

**Matrix Spike Dup (3032014-MSD1)**

**Source: R303144-01**

Prepared: 03/20/13 Analyzed: 03/21/13

C10-C28 (DRO) 654 50 mg/kg 501 ND 131 50-148 1.10 13

Summit Scientific

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

Project: Lundvall 2-19  
Project Number: [none]  
Project Manager: Brandon Bruns

**Reported:**  
03/21/13 06:43

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

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

**Batch 3032013 - EPA 5030 Soil MS**

**Blank (3032013-BLK1)**

Prepared: 03/20/13 Analyzed: 03/21/13

Naphthalene	ND	0.0050	mg/kg							
Benzene	ND	0.0050	"							
Toluene	ND	0.0050	"							
Ethylbenzene	ND	0.0050	"							
Xylenes (total)	ND	0.010	"							
Gasoline Range Hydrocarbons	ND	0.50	"							
Surrogate: 1,2-Dichloroethane-d4	0.0425		"	0.0397	107	23-173				
Surrogate: Toluene-d8	0.0410		"	0.0400	102	20-170				
Surrogate: 4-Bromofluorobenzene	0.0409		"	0.0400	102	21-167				

**LCS (3032013-BS1)**

Prepared: 03/20/13 Analyzed: 03/21/13

Naphthalene	ND	0.0050	mg/kg			66-138				
Benzene	0.109	0.0050	"	0.100	109	58-130				
Toluene	0.115	0.0050	"	0.100	115	61-134				
Ethylbenzene	0.134	0.0050	"	0.100	134	74-139				
m,p-Xylene	0.259	0.010	"	0.200	129	73-137				
o-Xylene	0.128	0.0050	"	0.100	128	73-141				
Surrogate: 1,2-Dichloroethane-d4	0.0398		"	0.0397	100	23-173				
Surrogate: Toluene-d8	0.0404		"	0.0400	101	20-170				
Surrogate: 4-Bromofluorobenzene	0.0391		"	0.0400	97.7	21-167				

**LCS Dup (3032013-BS1)**

Prepared: 03/20/13 Analyzed: 03/21/13

Naphthalene	ND	0.0050	mg/kg			66-138			12	
Benzene	0.110	0.0050	"	0.100	110	58-130	1.10		13	
Toluene	0.118	0.0050	"	0.100	118	61-134	2.96		16	
Ethylbenzene	0.137	0.0050	"	0.100	137	74-139	1.93		12	
m,p-Xylene	0.264	0.010	"	0.200	132	73-137	1.84		14	
o-Xylene	0.128	0.0050	"	0.100	128	73-141	0.469		12	
Surrogate: 1,2-Dichloroethane-d4	0.0419		"	0.0397	106	23-173				
Surrogate: Toluene-d8	0.0409		"	0.0400	102	20-170				
Surrogate: 4-Bromofluorobenzene	0.0392		"	0.0400	98.0	21-167				

Summit Scientific

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

Project: Lundvall 2-19  
Project Number: [none]  
Project Manager: Brandon Bruns

**Reported:**  
03/21/13 06:43

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

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

**Batch 3032013 - EPA 5030 Soil MS**

**Matrix Spike (3032013-MS1)**

**Source: R303144-01**

Prepared: 03/20/13

Analyzed: 03/21/13

Naphthalene	ND	0.0050	mg/kg		ND		10-158			
Benzene	0.108	0.0050	"	0.100	0.00	108	30-131			
Toluene	0.117	0.0050	"	0.100	0.00	117	30-134			
Ethylbenzene	0.129	0.0050	"	0.100	0.00	129	22-153			
m,p-Xylene	0.249	0.010	"	0.200	0.00	125	10-159			
o-Xylene	0.124	0.0050	"	0.100	0.00	124	31-151			
Surrogate: 1,2-Dichloroethane-d4	0.0472		"	0.0397		119	23-173			
Surrogate: Toluene-d8	0.0416		"	0.0400		104	20-170			
Surrogate: 4-Bromofluorobenzene	0.0392		"	0.0400		98.0	21-167			

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

Project: Lundvall 2-19  
Project Number: [none]  
Project Manager: Brandon Bruns

**Reported:**  
03/21/13 06:43

### Notes and Definitions

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

DET Analyte DETECTED

ND Analyte NOT DETECTED at or above the reporting limit

NR Not Reported

dry Sample results reported on a dry weight basis

RPD Relative Percent Difference

---

Summit Scientific

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A handwritten signature in black ink, appearing to read 'MSM'.

# Summit Scientific

---

741 Corporate Circle – Suite I ♦ Golden, Colorado 80401

303.277.9310 - laboratory ♦ 303.277.9531 - fax

March 25, 2013

Brandon Bruns  
PDC Energy  
1775 Sherman St. STE. 3000  
Denver, CO 80203  
RE: Lundvall 2-19

Enclosed are the results of analyses for samples received by Summit Scientific on 03/21/13 17:00. If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Joseph J Egry IV  
Laboratory Director

This report shall not be reproduced, except in its entirety, without the written approval of Summit Scientific. Test results relate only to samples analyzed.

Summit Scientific is the sole authority for authorizing edits or modifications to this document. Unauthorized modification of this report is strictly prohibited.

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

Project: Lundvall 2-19

Project Number: [none]  
Project Manager: Brandon Bruns

**Reported:**  
03/25/13 13:25

## ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
SS03@10'	R303153-01	Soil	03/21/13 13:00	03/21/13 17:00

R303/53

Summit Scientific

52

741 Corporate Circle Suite I ♦ Golden, Colorado 80401  
303-277-9310 ♦ 303-277-9531 Fax

Page 1 of 1

Client: Tasman Geosciences

Address: 6899 Pecos Street

Project Manager: Brandon Bruns

City/State/Zip Denver, CO 80221

E-Mail: [Branden.Vincent@pcc.edu](mailto:Branden.Vincent@pcc.edu)

Phone: (720) 988-2024

Project Name: Lundvall 2-19

Sampler Name: Vito | Chile

Project Number:

[illegible]

www.s2scientific.com

Summit Scientific

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*Legal Eagle IV*



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

Project: Lundvall 2-19  
Project Number: [none]  
Project Manager: Brandon Brunns

**Reported:**  
03/25/13 13:25

**SS03@10'**  
**R303153-01 (Soil)**

**Summit Scientific**

**Total Petroleum Hydrocarbons by 8015**

Date Sampled: **03/21/13 13:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	3032108	03/21/13	03/21/13	8015 DRO	

Date Sampled: **03/21/13 13:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: o-Terphenyl		93.8 %	30-150		"	"	"	"	

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

Date Sampled: **03/21/13 13:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Naphthalene	ND	0.0050	mg/kg	1	3032107	03/21/13	03/21/13	EPA 8260B	
Benzene	ND	0.0050	"	"	"	"	"	"	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	ND	0.0050	"	"	"	"	"	"	
Xylenes (total)	ND	0.010	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	0.50	"	"	"	"	"	"	

Date Sampled: **03/21/13 13:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		99.4 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		94.8 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		89.8 %	21-167		"	"	"	"	

Summit Scientific

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

Project: Lundvall 2-19  
Project Number: [none]  
Project Manager: Brandon Brunns

**Reported:**  
03/25/13 13:25

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

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

**Batch 3032108 - EPA 3550A**

<b>Blank (3032108-BLK1)</b>				Prepared: 03/21/13 Analyzed: 03/23/13						
C10-C28 (DRO)	ND	50	mg/kg							
<b>Blank (3032108-BLK2)</b>				Prepared: 03/21/13 Analyzed: 03/23/13						
C10-C28 (DRO)	ND	50	mg/kg							
<b>LCS (3032108-BS1)</b>				Prepared: 03/21/13 Analyzed: 03/23/13						
C10-C28 (DRO)	553	50	mg/kg	501		110	73-134			
<b>LCS (3032108-BS2)</b>				Prepared: 03/21/13 Analyzed: 03/23/13						
C10-C28 (DRO)	565	50	mg/kg	501		113	73-134			
<b>LCS Dup (3032108-BSD1)</b>				Prepared: 03/21/13 Analyzed: 03/23/13						
C10-C28 (DRO)	583	50	mg/kg	501		116	73-134	5.28	11	
<b>LCS Dup (3032108-BSD2)</b>				Prepared: 03/21/13 Analyzed: 03/23/13						
C10-C28 (DRO)	569	50	mg/kg	501		113	73-134	0.573	11	
<b>Matrix Spike (3032108-MS1)</b>				<b>Source: R303152-03</b>		Prepared: 03/21/13 Analyzed: 03/23/13				
C10-C28 (DRO)	568	50	mg/kg	501	ND	113	50-148			
<b>Matrix Spike (3032108-MS2)</b>				<b>Source: R303152-02</b>		Prepared: 03/21/13 Analyzed: 03/23/13				
C10-C28 (DRO)	544	50	mg/kg	501	ND	109	50-148			
<b>Matrix Spike Dup (3032108-MSD1)</b>				<b>Source: R303152-03</b>		Prepared: 03/21/13 Analyzed: 03/23/13				
C10-C28 (DRO)	569	50	mg/kg	501	ND	114	50-148	0.140	13	
<b>Matrix Spike Dup (3032108-MSD2)</b>				<b>Source: R303152-02</b>		Prepared: 03/21/13 Analyzed: 03/23/13				
C10-C28 (DRO)	557	50	mg/kg	501	ND	111	50-148	2.26	13	

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

Project: Lundvall 2-19  
Project Number: [none]  
Project Manager: Brandon Bruns

Reported:  
03/25/13 13:25

**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 3032107 - EPA 5030 Soil MS**

**Blank (3032107-BLK1)**

Prepared: 03/21/13 Analyzed: 03/22/13

Naphthalene	ND	0.0050	mg/kg							
Benzene	ND	0.0050	"							
Toluene	ND	0.0050	"							
Ethylbenzene	ND	0.0050	"							
Xylenes (total)	ND	0.010	"							
Gasoline Range Hydrocarbons	ND	0.50	"							
Surrogate: 1,2-Dichloroethane-d4	0.0379		"	0.0397		95.4	23-173			
Surrogate: Toluene-d8	0.0382		"	0.0400		95.6	20-170			
Surrogate: 4-Bromofluorobenzene	0.0367		"	0.0400		91.6	21-167			

**Blank (3032107-BLK2)**

Prepared: 03/21/13 Analyzed: 03/22/13

Naphthalene	ND	0.0050	mg/kg							
Benzene	ND	0.0050	"							
Toluene	ND	0.0050	"							
Ethylbenzene	ND	0.0050	"							
Xylenes (total)	ND	0.010	"							
Gasoline Range Hydrocarbons	ND	0.50	"							
Surrogate: 1,2-Dichloroethane-d4	0.0389		"	0.0397		98.1	23-173			
Surrogate: Toluene-d8	0.0385		"	0.0400		96.2	20-170			
Surrogate: 4-Bromofluorobenzene	0.0368		"	0.0400		92.0	21-167			

**LCS (3032107-BS1)**

Prepared: 03/21/13 Analyzed: 03/22/13

Naphthalene	ND	0.0050	mg/kg				66-138			
Benzene	0.108	0.0050	"	0.100		108	58-130			
Toluene	0.110	0.0050	"	0.100		110	61-134			
Ethylbenzene	0.110	0.0050	"	0.100		110	74-139			
m,p-Xylene	0.219	0.010	"	0.200		110	73-137			
o-Xylene	0.111	0.0050	"	0.100		111	73-141			
Surrogate: 1,2-Dichloroethane-d4	0.0363		"	0.0397		91.4	23-173			
Surrogate: Toluene-d8	0.0384		"	0.0400		95.9	20-170			
Surrogate: 4-Bromofluorobenzene	0.0368		"	0.0400		92.0	21-167			

Summit Scientific

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

Project: Lundvall 2-19  
Project Number: [none]  
Project Manager: Brandon Bruns

Reported:  
03/25/13 13:25

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

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

**Batch 3032107 - EPA 5030 Soil MS**

**LCS (3032107-BS2)**

Prepared: 03/21/13 Analyzed: 03/22/13

Naphthalene	ND	0.0050	mg/kg				66-138			
Benzene	0.105	0.0050	"	0.100		105	58-130			
Toluene	0.109	0.0050	"	0.100		109	61-134			
Ethylbenzene	0.105	0.0050	"	0.100		105	74-139			
m,p-Xylene	0.209	0.010	"	0.200		104	73-137			
o-Xylene	0.105	0.0050	"	0.100		105	73-141			
Surrogate: 1,2-Dichloroethane-d4	0.0386		"	0.0397		97.1	23-173			
Surrogate: Toluene-d8	0.0394		"	0.0400		98.6	20-170			
Surrogate: 4-Bromofluorobenzene	0.0356		"	0.0400		89.1	21-167			

**LCS Dup (3032107-BSD1)**

Prepared: 03/21/13 Analyzed: 03/22/13

Naphthalene	ND	0.0050	mg/kg				66-138		12	
Benzene	0.0986	0.0050	"	0.100		98.6	58-130	9.28	13	
Toluene	0.103	0.0050	"	0.100		103	61-134	6.09	16	
Ethylbenzene	0.105	0.0050	"	0.100		105	74-139	4.62	12	
m,p-Xylene	0.208	0.010	"	0.200		104	73-137	5.10	14	
o-Xylene	0.107	0.0050	"	0.100		107	73-141	3.89	12	
Surrogate: 1,2-Dichloroethane-d4	0.0375		"	0.0397		94.5	23-173			
Surrogate: Toluene-d8	0.0377		"	0.0400		94.3	20-170			
Surrogate: 4-Bromofluorobenzene	0.0367		"	0.0400		91.7	21-167			

**LCS Dup (3032107-BSD2)**

Prepared: 03/21/13 Analyzed: 03/22/13

Naphthalene	ND	0.0050	mg/kg				66-138		12	
Benzene	0.0975	0.0050	"	0.100		97.5	58-130	7.66	13	
Toluene	0.0992	0.0050	"	0.100		99.2	61-134	9.64	16	
Ethylbenzene	0.0997	0.0050	"	0.100		99.7	74-139	4.93	12	
m,p-Xylene	0.200	0.010	"	0.200		100	73-137	4.01	14	
o-Xylene	0.0995	0.0050	"	0.100		99.5	73-141	5.80	12	
Surrogate: 1,2-Dichloroethane-d4	0.0370		"	0.0397		93.3	23-173			
Surrogate: Toluene-d8	0.0388		"	0.0400		97.1	20-170			
Surrogate: 4-Bromofluorobenzene	0.0370		"	0.0400		92.6	21-167			

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

Project: Lundvall 2-19  
Project Number: [none]  
Project Manager: Brandon Brunns

Reported:  
03/25/13 13:25

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

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

**Batch 3032107 - EPA 5030 Soil MS**

Matrix Spike (3032107-MS1)				Source: R303152-01		Prepared: 03/21/13		Analyzed: 03/22/13		
Naphthalene	ND	0.0050	mg/kg		0.00384			10-158		
Benzene	0.0994	0.0050	"	0.100	0.00	99.4		30-131		
Toluene	0.101	0.0050	"	0.100	0.00	101		30-134		
Ethylbenzene	0.0967	0.0050	"	0.100	0.00	96.7		22-153		
m,p-Xylene	0.193	0.010	"	0.200	0.00	96.5		10-159		
o-Xylene	0.0990	0.0050	"	0.100	0.00	99.0		31-151		
Surrogate: 1,2-Dichloroethane-d4	0.0411		"	0.0397		104		23-173		
Surrogate: Toluene-d8	0.0382		"	0.0400		95.4		20-170		
Surrogate: 4-Bromofluorobenzene	0.0359		"	0.0400		89.8		21-167		

Matrix Spike (3032107-MS2)				Source: R303152-02		Prepared: 03/21/13		Analyzed: 03/22/13		
Naphthalene	ND	0.0050	mg/kg		ND			10-158		
Benzene	0.0917	0.0050	"	0.100	0.00	91.7		30-131		
Toluene	0.0908	0.0050	"	0.100	0.00	90.8		30-134		
Ethylbenzene	0.0881	0.0050	"	0.100	0.00	88.1		22-153		
m,p-Xylene	0.174	0.010	"	0.200	0.00	87.0		10-159		
o-Xylene	0.0914	0.0050	"	0.100	0.00	91.4		31-151		
Surrogate: 1,2-Dichloroethane-d4	0.0427		"	0.0397		108		23-173		
Surrogate: Toluene-d8	0.0391		"	0.0400		97.6		20-170		
Surrogate: 4-Bromofluorobenzene	0.0368		"	0.0400		92.1		21-167		

Matrix Spike Dup (3032107-MSD1)				Source: R303152-01		Prepared: 03/21/13		Analyzed: 03/22/13		
Naphthalene	ND	0.0050	mg/kg		0.00384			10-158		42
Benzene	0.0997	0.0050	"	0.100	0.00	99.7		30-131	0.271	34
Toluene	0.102	0.0050	"	0.100	0.00	102		30-134	0.914	30
Ethylbenzene	0.100	0.0050	"	0.100	0.00	100		22-153	3.56	24
m,p-Xylene	0.199	0.010	"	0.200	0.00	99.5		10-159	3.08	68
o-Xylene	0.104	0.0050	"	0.100	0.00	104		31-151	5.14	38
Surrogate: 1,2-Dichloroethane-d4	0.0401		"	0.0397		101		23-173		
Surrogate: Toluene-d8	0.0388		"	0.0400		96.9		20-170		
Surrogate: 4-Bromofluorobenzene	0.0365		"	0.0400		91.3		21-167		

Summit Scientific

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

Project: Lundvall 2-19  
Project Number: [none]  
Project Manager: Brandon Brunns

Reported:  
03/25/13 13:25

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

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

**Batch 3032107 - EPA 5030 Soil MS**

Matrix Spike Dup (3032107-MSD2)	Source: R303152-02			Prepared: 03/21/13		Analyzed: 03/22/13			
Naphthalene	ND	0.0050	mg/kg		ND		10-158		42
Benzene	0.0941	0.0050	"	0.100	0.00	94.1	30-131	2.62	34
Toluene	0.0931	0.0050	"	0.100	0.00	93.1	30-134	2.48	30
Ethylbenzene	0.0925	0.0050	"	0.100	0.00	92.5	22-153	4.92	24
m,p-Xylene	0.182	0.010	"	0.200	0.00	91.0	10-159	4.52	68
o-Xylene	0.0955	0.0050	"	0.100	0.00	95.5	31-151	4.40	38
Surrogate: 1,2-Dichloroethane-d4	0.0405		"	0.0397		102	23-173		
Surrogate: Toluene-d8	0.0386		"	0.0400		96.5	20-170		
Surrogate: 4-Bromofluorobenzene	0.0372		"	0.0400		92.9	21-167		

Summit Scientific

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

Project: Lundvall 2-19

Project Number: [none]  
Project Manager: Brandon Bruns

**Reported:**  
03/25/13 13:25

### Notes and Definitions

DET Analyte DETECTED  
ND Analyte NOT DETECTED at or above the reporting limit  
NR Not Reported  
dry Sample results reported on a dry weight basis  
RPD Relative Percent Difference

A handwritten signature in black ink, appearing to read 'Daniel A. Bruns IV'.

# Summit Scientific

---

741 Corporate Circle – Suite I ♦ Golden, Colorado 80401

303.277.9310 - laboratory ♦ 303.277.9531 - fax

March 27, 2013

Brandon Bruns  
PDC Energy  
1775 Sherman St. STE. 3000  
Denver, CO 80203  
RE: Lundvall 2-19

Enclosed are the results of analyses for samples received by Summit Scientific on 03/25/13 08:45. If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Joseph J Egry IV  
Laboratory Director

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

Project: Lundvall 2-19  
Project Number: [none]  
Project Manager: Brandon Bruns

**Reported:**  
03/27/13 09:17

### ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
SS04@12'	R303164-01	Soil	03/22/13 08:30	03/25/13 08:45
SS05@12'	R303164-02	Soil	03/22/13 10:30	03/25/13 08:45
SS06@12'	R303164-03	Soil	03/22/13 11:15	03/25/13 08:45
SS07@11'	R303164-04	Soil	03/22/13 12:30	03/25/13 08:45
SS08@10'	R303164-05	Soil	03/22/13 12:30	03/25/13 08:45

Summit Scientific

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

Project: Lundvall 2-19  
Project Number: [none]  
Project Manager: Brandon Bruns

Reported:  
03/27/13 09:17

**SS04@12'**  
**R303164-01 (Soil)**

**Summit Scientific**

**Total Petroleum Hydrocarbons by 8015**

Date Sampled: **03/22/13 08:30**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	3032506	03/25/13	03/25/13	8015 DRO	

Date Sampled: **03/22/13 08:30**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: o-Terphenyl		90.9 %	30-150		"	"	"	"	

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

Date Sampled: **03/22/13 08:30**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Naphthalene	ND	0.0050	mg/kg	1	3032507	03/25/13	03/25/13	EPA 8260B	
Benzene	ND	0.0050	"	"	"	"	"	"	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	ND	0.0050	"	"	"	"	"	"	
Xylenes (total)	ND	0.010	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	0.50	"	"	"	"	"	"	

Date Sampled: **03/22/13 08:30**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		123 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		102 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		106 %	21-167		"	"	"	"	

Summit Scientific

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

Project: Lundvall 2-19  
Project Number: [none]  
Project Manager: Brandon Bruns

Reported:  
03/27/13 09:17

**SS05@12'**  
**R303164-02 (Soil)**

**Summit Scientific**

**Total Petroleum Hydrocarbons by 8015**

Date Sampled: **03/22/13 10:30**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	3032506	03/25/13	03/25/13	8015 DRO	

Date Sampled: **03/22/13 10:30**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: o-Terphenyl		92.1 %	30-150		"	"	"	"	

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

Date Sampled: **03/22/13 10:30**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Naphthalene	ND	0.0050	mg/kg	1	3032507	03/25/13	03/25/13	EPA 8260B	
Benzene	ND	0.0050	"	"	"	"	"	"	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	ND	0.0050	"	"	"	"	"	"	
Xylenes (total)	ND	0.010	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	0.50	"	"	"	"	"	"	

Date Sampled: **03/22/13 10:30**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		128 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		103 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		111 %	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: Lundvall 2-19  
Project Number: [none]  
Project Manager: Brandon Bruns

Reported:  
03/27/13 09:17

**SS06@12'**  
**R303164-03 (Soil)**

**Summit Scientific**

**Total Petroleum Hydrocarbons by 8015**

Date Sampled: **03/22/13 11:15**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	3032506	03/25/13	03/25/13	8015 DRO	

Date Sampled: **03/22/13 11:15**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: o-Terphenyl		86.9 %	30-150		"	"	"	"	

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

Date Sampled: **03/22/13 11:15**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Naphthalene	ND	0.0050	mg/kg	1	3032507	03/25/13	03/25/13	EPA 8260B	
Benzene	ND	0.0050	"	"	"	"	"	"	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	ND	0.0050	"	"	"	"	"	"	
Xylenes (total)	ND	0.010	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	0.50	"	"	"	"	"	"	

Date Sampled: **03/22/13 11:15**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		122 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		106 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		104 %	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: Lundvall 2-19  
Project Number: [none]  
Project Manager: Brandon Bruns

Reported:  
03/27/13 09:17

**SS07@11'**  
**R303164-04 (Soil)**

**Summit Scientific**

**Total Petroleum Hydrocarbons by 8015**

Date Sampled: **03/22/13 12:30**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	3032506	03/25/13	03/25/13	8015 DRO	

Date Sampled: **03/22/13 12:30**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: o-Terphenyl		84.2 %	30-150		"	"	"	"	

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

Date Sampled: **03/22/13 12:30**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Naphthalene	ND	0.0050	mg/kg	1	3032507	03/25/13	03/25/13	EPA 8260B	
Benzene	ND	0.0050	"	"	"	"	"	"	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	ND	0.0050	"	"	"	"	"	"	
Xylenes (total)	ND	0.010	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	0.50	"	"	"	"	"	"	

Date Sampled: **03/22/13 12:30**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		119 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		98.2 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		108 %	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: Lundvall 2-19  
Project Number: [none]  
Project Manager: Brandon Bruns

**Reported:**  
03/27/13 09:17

**SS08@10'**  
**R303164-05 (Soil)**

**Summit Scientific**

**Total Petroleum Hydrocarbons by 8015**

Date Sampled: **03/22/13 12:30**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	3032506	03/25/13	03/25/13	8015 DRO	

Date Sampled: **03/22/13 12:30**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: o-Terphenyl		83.7 %	30-150		"	"	"	"	

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

Date Sampled: **03/22/13 12:30**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Naphthalene	ND	0.0050	mg/kg	1	3032507	03/25/13	03/25/13	EPA 8260B	
Benzene	ND	0.0050	"	"	"	"	"	"	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	ND	0.0050	"	"	"	"	"	"	
Xylenes (total)	ND	0.010	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	0.50	"	"	"	"	"	"	

Date Sampled: **03/22/13 12:30**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		111 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		97.4 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		108 %	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: Lundvall 2-19  
Project Number: [none]  
Project Manager: Brandon Bruns

**Reported:**  
03/27/13 09:17

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

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

**Batch 3032506 - EPA 3550A**

**Blank (3032506-BLK1)**

Prepared & Analyzed: 03/25/13

C10-C28 (DRO) ND 50 mg/kg

**LCS (3032506-BS1)**

Prepared & Analyzed: 03/25/13

C10-C28 (DRO) 541 50 mg/kg 501 108 73-134

**LCS Dup (3032506-BSD1)**

Prepared & Analyzed: 03/25/13

C10-C28 (DRO) 489 50 mg/kg 501 97.6 73-134 10.1 11

**Matrix Spike (3032506-MS1)**

**Source: R303159-29**

Prepared & Analyzed: 03/25/13

C10-C28 (DRO) 4230 50 mg/kg 501 843 50-148 QM-4X

**Matrix Spike Dup (3032506-MSD1)**

**Source: R303159-29**

Prepared & Analyzed: 03/25/13

C10-C28 (DRO) 3390 50 mg/kg 501 676 50-148 22.0 13 QM-4X

Summit Scientific

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

Project: Lundvall 2-19  
Project Number: [none]  
Project Manager: Brandon Bruns

Reported:  
03/27/13 09:17

**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 3032507 - EPA 5030 Soil MS**

**Blank (3032507-BLK1)**

Prepared & Analyzed: 03/25/13

Naphthalene	ND	0.0050	mg/kg							
Benzene	ND	0.0050	"							
Toluene	ND	0.0050	"							
Ethylbenzene	ND	0.0050	"							
Xylenes (total)	ND	0.010	"							
Gasoline Range Hydrocarbons	ND	0.50	"							
Surrogate: 1,2-Dichloroethane-d4	0.0416		"	0.0397	105	23-173				
Surrogate: Toluene-d8	0.0394		"	0.0400	98.4	20-170				
Surrogate: 4-Bromofluorobenzene	0.0372		"	0.0400	93.0	21-167				

**Blank (3032507-BLK2)**

Prepared & Analyzed: 03/25/13

Naphthalene	ND	0.0050	mg/kg							
Benzene	ND	0.0050	"							
Toluene	ND	0.0050	"							
Ethylbenzene	ND	0.0050	"							
Xylenes (total)	ND	0.010	"							
Gasoline Range Hydrocarbons	ND	0.50	"							
Surrogate: 1,2-Dichloroethane-d4	0.0384		"	0.0397	96.8	23-173				
Surrogate: Toluene-d8	0.0384		"	0.0400	96.1	20-170				
Surrogate: 4-Bromofluorobenzene	0.0364		"	0.0400	91.0	21-167				

**LCS (3032507-BS1)**

Prepared & Analyzed: 03/25/13

Naphthalene	ND	0.0050	mg/kg			66-138				
Benzene	0.101	0.0050	"	0.100	101	58-130				
Toluene	0.105	0.0050	"	0.100	105	61-134				
Ethylbenzene	0.101	0.0050	"	0.100	101	74-139				
m,p-Xylene	0.202	0.010	"	0.200	101	73-137				
o-Xylene	0.102	0.0050	"	0.100	102	73-141				
Surrogate: 1,2-Dichloroethane-d4	0.0413		"	0.0397	104	23-173				
Surrogate: Toluene-d8	0.0385		"	0.0400	96.2	20-170				
Surrogate: 4-Bromofluorobenzene	0.0377		"	0.0400	94.3	21-167				

Summit Scientific

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

Project: Lundvall 2-19  
Project Number: [none]  
Project Manager: Brandon Bruns

Reported:  
03/27/13 09:17

**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 3032507 - EPA 5030 Soil MS**

**LCS (3032507-BS2)**

Prepared & Analyzed: 03/25/13

Naphthalene	ND	0.0050	mg/kg				66-138			
Benzene	0.103	0.0050	"	0.100		103	58-130			
Toluene	0.108	0.0050	"	0.100		108	61-134			
Ethylbenzene	0.107	0.0050	"	0.100		107	74-139			
m,p-Xylene	0.214	0.010	"	0.200		107	73-137			
o-Xylene	0.106	0.0050	"	0.100		106	73-141			
Surrogate: 1,2-Dichloroethane-d4	0.0370		"	0.0397		93.1	23-173			
Surrogate: Toluene-d8	0.0387		"	0.0400		96.7	20-170			
Surrogate: 4-Bromofluorobenzene	0.0368		"	0.0400		91.9	21-167			

**LCS Dup (3032507-BSD1)**

Prepared & Analyzed: 03/25/13

Naphthalene	ND	0.0050	mg/kg				66-138		12	
Benzene	0.106	0.0050	"	0.100		106	58-130	5.56	13	
Toluene	0.111	0.0050	"	0.100		111	61-134	5.36	16	
Ethylbenzene	0.109	0.0050	"	0.100		109	74-139	7.37	12	
m,p-Xylene	0.216	0.010	"	0.200		108	73-137	6.71	14	
o-Xylene	0.110	0.0050	"	0.100		110	73-141	7.40	12	
Surrogate: 1,2-Dichloroethane-d4	0.0403		"	0.0397		102	23-173			
Surrogate: Toluene-d8	0.0393		"	0.0400		98.3	20-170			
Surrogate: 4-Bromofluorobenzene	0.0365		"	0.0400		91.2	21-167			

**LCS Dup (3032507-BSD2)**

Prepared & Analyzed: 03/25/13

Naphthalene	ND	0.0050	mg/kg				66-138		12	
Benzene	0.109	0.0050	"	0.100		109	58-130	5.88	13	
Toluene	0.115	0.0050	"	0.100		115	61-134	5.74	16	
Ethylbenzene	0.114	0.0050	"	0.100		114	74-139	6.17	12	
m,p-Xylene	0.227	0.010	"	0.200		113	73-137	5.48	14	
o-Xylene	0.113	0.0050	"	0.100		113	73-141	6.20	12	
Surrogate: 1,2-Dichloroethane-d4	0.0391		"	0.0397		98.5	23-173			
Surrogate: Toluene-d8	0.0387		"	0.0400		96.7	20-170			
Surrogate: 4-Bromofluorobenzene	0.0363		"	0.0400		90.8	21-167			

Summit Scientific

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

Project: Lundvall 2-19  
Project Number: [none]  
Project Manager: Brandon Bruns

Reported:  
03/27/13 09:17

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

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

**Batch 3032507 - EPA 5030 Soil MS**

**Matrix Spike (3032507-MS1)**

Source: R303164-01

Prepared & Analyzed: 03/25/13

Naphthalene	ND	0.0050	mg/kg		ND		10-158			
Benzene	0.0969	0.0050	"	0.100	0.00	96.9	30-131			
Toluene	0.102	0.0050	"	0.100	0.00	102	30-134			
Ethylbenzene	0.0993	0.0050	"	0.100	0.00	99.3	22-153			
m,p-Xylene	0.198	0.010	"	0.200	0.00	99.1	10-159			
o-Xylene	0.100	0.0050	"	0.100	0.00	100	31-151			
Surrogate: 1,2-Dichloroethane-d4	0.0413		"	0.0397		104	23-173			
Surrogate: Toluene-d8	0.0386		"	0.0400		96.6	20-170			
Surrogate: 4-Bromofluorobenzene	0.0373		"	0.0400		93.3	21-167			

**Matrix Spike (3032507-MS2)**

Source: R303164-02

Prepared & Analyzed: 03/25/13

Naphthalene	ND	0.0050	mg/kg		ND		10-158			
Benzene	0.101	0.0050	"	0.100	0.00	101	30-131			
Toluene	0.107	0.0050	"	0.100	0.00	107	30-134			
Ethylbenzene	0.103	0.0050	"	0.100	0.00	103	22-153			
m,p-Xylene	0.205	0.010	"	0.200	0.00	102	10-159			
o-Xylene	0.107	0.0050	"	0.100	0.00	107	31-151			
Surrogate: 1,2-Dichloroethane-d4	0.0401		"	0.0397		101	23-173			
Surrogate: Toluene-d8	0.0382		"	0.0400		95.4	20-170			
Surrogate: 4-Bromofluorobenzene	0.0352		"	0.0400		88.1	21-167			

**Matrix Spike Dup (3032507-MSD1)**

Source: R303164-01

Prepared & Analyzed: 03/25/13

Naphthalene	ND	0.0050	mg/kg		ND		10-158		42	
Benzene	0.0958	0.0050	"	0.100	0.00	95.8	30-131	1.06	34	
Toluene	0.101	0.0050	"	0.100	0.00	101	30-134	1.65	30	
Ethylbenzene	0.100	0.0050	"	0.100	0.00	100	22-153	0.662	24	
m,p-Xylene	0.199	0.010	"	0.200	0.00	99.4	10-159	0.333	68	
o-Xylene	0.101	0.0050	"	0.100	0.00	101	31-151	0.387	38	
Surrogate: 1,2-Dichloroethane-d4	0.0414		"	0.0397		104	23-173			
Surrogate: Toluene-d8	0.0387		"	0.0400		96.7	20-170			
Surrogate: 4-Bromofluorobenzene	0.0370		"	0.0400		92.5	21-167			

Summit Scientific

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

Project: Lundvall 2-19  
Project Number: [none]  
Project Manager: Brandon Bruns

Reported:  
03/27/13 09:17

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

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

**Batch 3032507 - EPA 5030 Soil MS**

Matrix Spike Dup (3032507-MSD2)			Source: R303164-02		Prepared & Analyzed: 03/25/13					
Naphthalene	ND	0.0050	mg/kg		ND		10-158		42	
Benzene	0.0982	0.0050	"	0.100	0.00	98.2	30-131	2.77	34	
Toluene	0.103	0.0050	"	0.100	0.00	103	30-134	3.90	30	
Ethylbenzene	0.0998	0.0050	"	0.100	0.00	99.8	22-153	3.40	24	
m,p-Xylene	0.200	0.010	"	0.200	0.00	99.8	10-159	2.57	68	
o-Xylene	0.101	0.0050	"	0.100	0.00	101	31-151	5.10	38	
Surrogate: 1,2-Dichloroethane-d4	0.0406		"	0.0397		102	23-173			
Surrogate: Toluene-d8	0.0390		"	0.0400		97.6	20-170			
Surrogate: 4-Bromofluorobenzene	0.0363		"	0.0400		90.8	21-167			

Summit Scientific

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

Project: Lundvall 2-19  
Project Number: [none]  
Project Manager: Brandon Bruns

**Reported:**  
03/27/13 09:17

### Notes and Definitions

QM-4X The spike recovery was outside of QC acceptance limits for the MS and/or MSD due to analyte concentration at 4 times or greater the spike concentration. The QC batch was accepted based on LCS and/or LCSD recoveries within the acceptance limits.

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

March 27, 2013

Brandon Bruns  
PDC Energy  
1775 Sherman St. STE. 3000  
Denver, CO 80203  
RE: Lundvall 2-19

Enclosed are the results of analyses for samples received by Summit Scientific on 03/26/13 10:00. If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Joseph J Egry IV  
Laboratory Director

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

Project: Lundvall 2-19  
Project Number: [none]  
Project Manager: Brandon Brunns

Reported:  
03/27/13 10:42

**SS09**  
**R303175-01 (Soil)**

**Summit Scientific**

**Total Petroleum Hydrocarbons by 8015**

Date Sampled: **03/25/13 09:15**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>C10-C28 (DRO)</b>	<b>1100</b>	50	mg/kg	1	3032610	03/26/13	03/27/13	8015 DRO	

Date Sampled: **03/25/13 09:15**

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

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

Date Sampled: **03/25/13 09:15**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>Naphthalene</b>	<b>0.21</b>	0.0050	mg/kg	1	3032609	03/26/13	03/27/13	EPA 8260B	
<b>Benzene</b>	<b>0.27</b>	0.0050	"	"	"	"	"	"	
<b>Toluene</b>	<b>1.1</b>	0.050	"	10	"	"	"	"	
<b>Ethylbenzene</b>	<b>0.51</b>	0.0050	"	1	"	"	"	"	
<b>Xylenes (total)</b>	<b>9.2</b>	0.10	"	10	"	"	"	"	
<b>Gasoline Range Hydrocarbons</b>	<b>1000</b>	5.0	"	"	"	"	"	"	

Date Sampled: **03/25/13 09:15**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		106 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		92.6 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		74.9 %	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: Lundvall 2-19  
Project Number: [none]  
Project Manager: Brandon Bruns

**Reported:**  
03/27/13 10:42

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

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

**Batch 3032610 - EPA 3550A**

**Blank (3032610-BLK1)**

Prepared & Analyzed: 03/26/13

C10-C28 (DRO) ND 50 mg/kg

**LCS (3032610-BS1)**

Prepared & Analyzed: 03/26/13

C10-C28 (DRO) 638 50 mg/kg 501 127 73-134

**LCS Dup (3032610-BSD1)**

Prepared & Analyzed: 03/26/13

C10-C28 (DRO) 635 50 mg/kg 501 127 73-134 0.480 11

**Matrix Spike (3032610-MS1)**

Source: R303176-01

Prepared: 03/26/13 Analyzed: 03/27/13

C10-C28 (DRO) 665 50 mg/kg 501 ND 133 50-148

**Matrix Spike Dup (3032610-MSD1)**

Source: R303176-01

Prepared: 03/26/13 Analyzed: 03/27/13

C10-C28 (DRO) 671 50 mg/kg 501 ND 134 50-148 0.926 13

Summit Scientific

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



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

Project: Lundvall 2-19  
Project Number: [none]  
Project Manager: Brandon Bruns

Reported:  
03/27/13 10:42

**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 3032609 - EPA 5030 Soil MS**

**Blank (3032609-BLK1)**

Prepared & Analyzed: 03/26/13

Naphthalene	ND	0.0050	mg/kg							
Benzene	ND	0.0050	"							
Toluene	ND	0.0050	"							
Ethylbenzene	ND	0.0050	"							
Xylenes (total)	ND	0.010	"							
Gasoline Range Hydrocarbons	ND	0.50	"							
Surrogate: 1,2-Dichloroethane-d4	0.0399		"	0.0397		101	23-173			
Surrogate: Toluene-d8	0.0383		"	0.0400		95.8	20-170			
Surrogate: 4-Bromofluorobenzene	0.0360		"	0.0400		90.0	21-167			

**LCS (3032609-BS1)**

Prepared & Analyzed: 03/26/13

Naphthalene	ND	0.0050	mg/kg				66-138			
Benzene	0.102	0.0050	"	0.100		102	58-130			
Toluene	0.107	0.0050	"	0.100		107	61-134			
Ethylbenzene	0.104	0.0050	"	0.100		104	74-139			
m,p-Xylene	0.207	0.010	"	0.200		104	73-137			
o-Xylene	0.107	0.0050	"	0.100		107	73-141			
Surrogate: 1,2-Dichloroethane-d4	0.0403		"	0.0397		102	23-173			
Surrogate: Toluene-d8	0.0390		"	0.0400		97.6	20-170			
Surrogate: 4-Bromofluorobenzene	0.0368		"	0.0400		91.9	21-167			

**LCS Dup (3032609-BSD1)**

Prepared & Analyzed: 03/26/13

Naphthalene	ND	0.0050	mg/kg				66-138		12	
Benzene	0.0988	0.0050	"	0.100		98.8	58-130	3.46	13	
Toluene	0.104	0.0050	"	0.100		104	61-134	3.33	16	
Ethylbenzene	0.102	0.0050	"	0.100		102	74-139	2.80	12	
m,p-Xylene	0.201	0.010	"	0.200		101	73-137	2.97	14	
o-Xylene	0.103	0.0050	"	0.100		103	73-141	3.92	12	
Surrogate: 1,2-Dichloroethane-d4	0.0397		"	0.0397		99.9	23-173			
Surrogate: Toluene-d8	0.0386		"	0.0400		96.5	20-170			
Surrogate: 4-Bromofluorobenzene	0.0374		"	0.0400		93.5	21-167			

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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: Lundvall 2-19  
Project Number: [none]  
Project Manager: Brandon Bruns

Reported:  
03/27/13 10:42

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

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

**Batch 3032609 - EPA 5030 Soil MS**

Matrix Spike (3032609-MS1)				Source: R303176-01		Prepared & Analyzed: 03/26/13				
Naphthalene	ND	0.0050	mg/kg		ND		10-158			
Benzene	0.0913	0.0050	"	0.100	0.00	91.3	30-131			
Toluene	0.0949	0.0050	"	0.100	0.00	94.9	30-134			
Ethylbenzene	0.0836	0.0050	"	0.100	0.00	83.6	22-153			
m,p-Xylene	0.168	0.010	"	0.200	0.00	84.1	10-159			
o-Xylene	0.0859	0.0050	"	0.100	0.00	85.9	31-151			
Surrogate: 1,2-Dichloroethane-d4	0.0419		"	0.0397		105	23-173			
Surrogate: Toluene-d8	0.0386		"	0.0400		96.4	20-170			
Surrogate: 4-Bromofluorobenzene	0.0350		"	0.0400		87.4	21-167			

Matrix Spike Dup (3032609-MSD1)				Source: R303176-01		Prepared & Analyzed: 03/26/13				
Naphthalene	ND	0.0050	mg/kg		ND		10-158			42
Benzene	0.0930	0.0050	"	0.100	0.00	93.0	30-131	1.92		34
Toluene	0.0954	0.0050	"	0.100	0.00	95.4	30-134	0.536		30
Ethylbenzene	0.0867	0.0050	"	0.100	0.00	86.7	22-153	3.66		24
m,p-Xylene	0.172	0.010	"	0.200	0.00	85.8	10-159	2.08		68
o-Xylene	0.0883	0.0050	"	0.100	0.00	88.3	31-151	2.72		38
Surrogate: 1,2-Dichloroethane-d4	0.0425		"	0.0397		107	23-173			
Surrogate: Toluene-d8	0.0393		"	0.0400		98.2	20-170			
Surrogate: 4-Bromofluorobenzene	0.0353		"	0.0400		88.4	21-167			

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

Project: Lundvall 2-19

Project Number: [none]  
Project Manager: Brandon Bruns

**Reported:**  
03/27/13 10:42

### 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

A handwritten signature in black ink, appearing to read 'Daniel A. Bruns IV'.

# Summit Scientific

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741 Corporate Circle – Suite I ♦ Golden, Colorado 80401

303.277.9310 - laboratory ♦ 303.277.9531 - fax

October 03, 2013

Brandon Bruns  
PDC Energy  
1775 Sherman St. STE. 3000  
Denver, CO 80203  
RE: Lundvall 2-19

Enclosed are the results of analyses for samples received by Summit Scientific on 09/27/13 16:55. If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Joseph J Egry IV  
Laboratory Director

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

Project: Lundvall 2-19  
Project Number: [none]  
Project Manager: Brandon Bruns

**Reported:**  
10/03/13 15:54

### ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
BH01-13-15	R309253-01	Soil	09/27/13 10:40	09/27/13 16:55
BH02-13-15	R309253-02	Soil	09/27/13 11:20	09/27/13 16:55

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

Project: Lundvall 2-19  
Project Number: [none]  
Project Manager: Brandon Brunns

Reported:  
10/03/13 15:54

**BH01-13-15**  
**R309253-01 (Soil)**

**Summit Scientific**

**Extractable Petroleum Hydrocarbons by 8015**

Date Sampled: **09/27/13 10:40**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	3093015	09/30/13	10/02/13	8015M	

Date Sampled: **09/27/13 10:40**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: o-Terphenyl		83.7 %	30-150		"	"	"	"	

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

Date Sampled: **09/27/13 10:40**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Naphthalene	ND	0.010	mg/kg	1	3093014	09/30/13	10/03/13	EPA 8260B	
<b>Benzene</b>	<b>0.0073</b>	0.0020	"	"	"	"	"	"	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	ND	0.0050	"	"	"	"	"	"	
Xylenes (total)	ND	0.010	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	0.50	"	"	"	"	"	"	

Date Sampled: **09/27/13 10:40**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		119 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		99.2 %	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: Lundvall 2-19  
Project Number: [none]  
Project Manager: Brandon Bruns

Reported:  
10/03/13 15:54

**BH02-13-15**  
**R309253-02 (Soil)**

**Summit Scientific**

**Extractable Petroleum Hydrocarbons by 8015**

Date Sampled: **09/27/13 11:20**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	3093015	09/30/13	10/02/13	8015M	

Date Sampled: **09/27/13 11:20**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: o-Terphenyl		96.0 %	30-150		"	"	"	"	

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

Date Sampled: **09/27/13 11:20**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Naphthalene	ND	0.010	mg/kg	1	3093014	09/30/13	10/03/13	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: **09/27/13 11:20**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		120 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		99.3 %	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: Lundvall 2-19  
Project Number: [none]  
Project Manager: Brandon Bruns

**Reported:**  
10/03/13 15:54

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

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

**Batch 3093015 - EPA 3550A**

<b>Blank (3093015-BLK1)</b>				Prepared: 09/30/13 Analyzed: 10/02/13						
C10-C28 (DRO)	ND	50	mg/kg							
<b>LCS (3093015-BS1)</b>				Prepared: 09/30/13 Analyzed: 10/02/13						
C10-C28 (DRO)	474	50	mg/kg	501		94.6	73-134			
<b>LCS (3093015-BS2)</b>				Prepared: 09/30/13 Analyzed: 10/02/13						
C10-C28 (DRO)	504	50	mg/kg	501		101	73-134			
<b>LCS Dup (3093015-BSD1)</b>				Prepared: 09/30/13 Analyzed: 10/02/13						
C10-C28 (DRO)	484	50	mg/kg	501		96.6	73-134	2.12	11	
<b>LCS Dup (3093015-BSD2)</b>				Prepared: 09/30/13 Analyzed: 10/02/13						
C10-C28 (DRO)	478	50	mg/kg	501		95.4	73-134	5.30	11	
<b>Matrix Spike (3093015-MS1)</b>				<b>Source: R309251-02</b>		Prepared: 09/30/13 Analyzed: 10/02/13				
C10-C28 (DRO)	580	50	mg/kg	498	ND	116	50-148			
<b>Matrix Spike (3093015-MS2)</b>				<b>Source: R309251-03</b>		Prepared: 09/30/13 Analyzed: 10/02/13				
C10-C28 (DRO)	465	50	mg/kg	430	ND	108	50-148			
<b>Matrix Spike Dup (3093015-MSD1)</b>				<b>Source: R309251-02</b>		Prepared: 09/30/13 Analyzed: 10/02/13				
C10-C28 (DRO)	544	50	mg/kg	474	ND	115	50-148	6.37	13	
<b>Matrix Spike Dup (3093015-MSD2)</b>				<b>Source: R309251-03</b>		Prepared: 09/30/13 Analyzed: 10/02/13				
C10-C28 (DRO)	524	50	mg/kg	487	ND	107	50-148	11.9	13	

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

Project: Lundvall 2-19  
Project Number: [none]  
Project Manager: Brandon Bruns

Reported:  
10/03/13 15:54

**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 3093014 - EPA 5030 Soil MS**

**Blank (3093014-BLK1)**

Prepared: 09/30/13 Analyzed: 10/01/13

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	"							
Surrogate: 1,2-Dichloroethane-d4	0.0445		"	0.0397		112	23-173			
Surrogate: Toluene-d8	0.0383		"	0.0400		95.8	20-170			
Surrogate: 4-Bromofluorobenzene	0.0411		"	0.0400		103	21-167			

**Blank (3093014-BLK2)**

Prepared: 09/30/13 Analyzed: 10/01/13

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	"							
Surrogate: 1,2-Dichloroethane-d4	0.0457		"	0.0397		115	23-173			
Surrogate: Toluene-d8	0.0388		"	0.0400		97.0	20-170			
Surrogate: 4-Bromofluorobenzene	0.0411		"	0.0400		103	21-167			

**LCS (3093014-BS1)**

Prepared: 09/30/13 Analyzed: 10/01/13

Naphthalene	ND	0.010	mg/kg				66-138			
Benzene	0.0742	0.0020	"	0.100		74.2	58-130			
Toluene	0.0885	0.0050	"	0.100		88.5	61-134			
Ethylbenzene	0.120	0.0050	"	0.100		120	74-139			
m,p-Xylene	0.229	0.010	"	0.200		114	73-137			
o-Xylene	0.118	0.0050	"	0.100		118	73-141			
Surrogate: 1,2-Dichloroethane-d4	0.0449		"	0.0397		113	23-173			
Surrogate: Toluene-d8	0.0387		"	0.0400		96.8	20-170			
Surrogate: 4-Bromofluorobenzene	0.0401		"	0.0400		100	21-167			

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

Project: Lundvall 2-19  
Project Number: [none]  
Project Manager: Brandon Bruns

Reported:  
10/03/13 15:54

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

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

**Batch 3093014 - EPA 5030 Soil MS**

**LCS (3093014-BS2)**

Prepared: 09/30/13 Analyzed: 10/01/13

Naphthalene	ND	0.010	mg/kg				66-138			
Benzene	0.0738	0.0020	"	0.100		73.8	58-130			
Toluene	0.0873	0.0050	"	0.100		87.3	61-134			
Ethylbenzene	0.119	0.0050	"	0.100		119	74-139			
m,p-Xylene	0.228	0.010	"	0.200		114	73-137			
o-Xylene	0.119	0.0050	"	0.100		119	73-141			
Surrogate: 1,2-Dichloroethane-d4	0.0470		"	0.0397		118	23-173			
Surrogate: Toluene-d8	0.0384		"	0.0400		96.0	20-170			
Surrogate: 4-Bromofluorobenzene	0.0397		"	0.0400		99.3	21-167			

**LCS Dup (3093014-BSD1)**

Prepared: 09/30/13 Analyzed: 10/01/13

Naphthalene	ND	0.010	mg/kg				66-138		12	
Benzene	0.0754	0.0020	"	0.100		75.4	58-130	1.52	13	
Toluene	0.0880	0.0050	"	0.100		88.0	61-134	0.476	16	
Ethylbenzene	0.119	0.0050	"	0.100		119	74-139	0.777	12	
m,p-Xylene	0.230	0.010	"	0.200		115	73-137	0.340	14	
o-Xylene	0.119	0.0050	"	0.100		119	73-141	0.455	12	
Surrogate: 1,2-Dichloroethane-d4	0.0453		"	0.0397		114	23-173			
Surrogate: Toluene-d8	0.0383		"	0.0400		95.8	20-170			
Surrogate: 4-Bromofluorobenzene	0.0399		"	0.0400		99.8	21-167			

**LCS Dup (3093014-BSD2)**

Prepared: 09/30/13 Analyzed: 10/01/13

Naphthalene	ND	0.010	mg/kg				66-138		12	
Benzene	0.0729	0.0020	"	0.100		72.9	58-130	1.19	13	
Toluene	0.0860	0.0050	"	0.100		86.0	61-134	1.52	16	
Ethylbenzene	0.121	0.0050	"	0.100		121	74-139	2.02	12	
m,p-Xylene	0.234	0.010	"	0.200		117	73-137	2.78	14	
o-Xylene	0.120	0.0050	"	0.100		120	73-141	0.552	12	
Surrogate: 1,2-Dichloroethane-d4	0.0458		"	0.0397		115	23-173			
Surrogate: Toluene-d8	0.0384		"	0.0400		95.9	20-170			
Surrogate: 4-Bromofluorobenzene	0.0394		"	0.0400		98.5	21-167			

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

Project: Lundvall 2-19  
Project Number: [none]  
Project Manager: Brandon Bruns

Reported:  
10/03/13 15:54

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

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

**Batch 3093014 - EPA 5030 Soil MS**

Matrix Spike (3093014-MS1)				Source: R309255-01		Prepared: 09/30/13		Analyzed: 10/02/13		
Naphthalene	ND	0.010	mg/kg		ND			10-158		
Benzene	0.0906	0.0020	"	0.0926	ND	97.9		30-131		
Toluene	0.0928	0.0050	"	0.0926	ND	100		30-134		
Ethylbenzene	0.102	0.0050	"	0.0926	ND	111		22-153		
m,p-Xylene	0.203	0.010	"	0.185	ND	109		10-159		
o-Xylene	0.101	0.0050	"	0.0926	ND	109		31-151		
Surrogate: 1,2-Dichloroethane-d4	0.0395		"	0.0368		107		23-173		
Surrogate: Toluene-d8	0.0349		"	0.0370		94.3		20-170		
Surrogate: 4-Bromofluorobenzene	0.0375		"	0.0370		101		21-167		

Matrix Spike (3093014-MS2)				Source: R309255-02		Prepared: 09/30/13		Analyzed: 10/02/13		
Naphthalene	ND	0.010	mg/kg		ND			10-158		
Benzene	0.0920	0.0020	"	0.0909	ND	101		30-131		
Toluene	0.103	0.0050	"	0.0909	ND	113		30-134		
Ethylbenzene	0.105	0.0050	"	0.0909	ND	115		22-153		
m,p-Xylene	0.205	0.010	"	0.182	ND	113		10-159		
o-Xylene	0.105	0.0050	"	0.0909	ND	115		31-151		
Surrogate: 1,2-Dichloroethane-d4	0.0261		"	0.0361		72.4		23-173		
Surrogate: Toluene-d8	0.0373		"	0.0364		103		20-170		
Surrogate: 4-Bromofluorobenzene	0.0338		"	0.0364		93.1		21-167		

Matrix Spike Dup (3093014-MSD1)				Source: R309255-01		Prepared: 09/30/13		Analyzed: 10/02/13		
Naphthalene	ND	0.010	mg/kg		ND			10-158		42
Benzene	0.0868	0.0020	"	0.0870	ND	99.8		30-131	4.37	34
Toluene	0.0940	0.0050	"	0.0870	ND	108		30-134	1.27	30
Ethylbenzene	0.0979	0.0050	"	0.0870	ND	113		22-153	4.61	24
m,p-Xylene	0.194	0.010	"	0.174	ND	112		10-159	4.20	68
o-Xylene	0.0978	0.0050	"	0.0870	ND	112		31-151	2.75	38
Surrogate: 1,2-Dichloroethane-d4	0.0368		"	0.0345		107		23-173		
Surrogate: Toluene-d8	0.0346		"	0.0348		99.5		20-170		
Surrogate: 4-Bromofluorobenzene	0.0332		"	0.0348		95.3		21-167		

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

Project: Lundvall 2-19  
Project Number: [none]  
Project Manager: Brandon Brunns

Reported:  
10/03/13 15:54

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

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

**Batch 3093014 - EPA 5030 Soil MS**

Matrix Spike Dup (3093014-MSD2)		Source: R309255-02			Prepared: 09/30/13		Analyzed: 10/02/13			
Naphthalene	ND	0.010	mg/kg		ND		10-158		42	
Benzene	0.0895	0.0020	"	0.0907	ND	98.6	30-131	2.73	34	
Toluene	0.0957	0.0050	"	0.0907	ND	105	30-134	7.29	30	
Ethylbenzene	0.0988	0.0050	"	0.0907	ND	109	22-153	5.83	24	
m,p-Xylene	0.195	0.010	"	0.181	ND	107	10-159	5.19	68	
o-Xylene	0.0973	0.0050	"	0.0907	ND	107	31-151	7.41	38	
Surrogate: 1,2-Dichloroethane-d4	0.0411		"	0.0360		114	23-173			
Surrogate: Toluene-d8	0.0371		"	0.0363		102	20-170			
Surrogate: 4-Bromofluorobenzene	0.0365		"	0.0363		100	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: Lundvall 2-19  
Project Number: [none]  
Project Manager: Brandon Bruns

**Reported:**  
10/03/13 15:54

### Notes and Definitions

DET Analyte DETECTED  
ND Analyte NOT DETECTED at or above the reporting limit  
NR Not Reported  
dry Sample results reported on a dry weight basis  
RPD Relative Percent Difference

A handwritten signature in black ink, appearing to read 'Daniel A. Bruns IV'.