

TABLE 1
FORMER GUTTERSEN 11, 22-25 & 25E TANK BATTERY
SOIL ANALYTICAL RESULTS SUMMARY TABLE

Sample ID	Date Sampled	Depth (feet bgs)	Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	Total Xylenes (mg/kg)	Naphthalene (mg/kg)	TPH ⁽²⁾ (mg/kg)	pH (units)	EC (mmhos/cm)
COGCC standards for soil (mg/kg) ⁽¹⁾			0.17	85	100	175	23	500	6-9	<4
SS01@4'	1/4/2019	4	<0.0020	<0.0050	<0.0050	<0.010	<0.010	<50	9.49	0.757
SS02@3'	1/4/2019	3	NA	NA	NA	NA	NA	NA	8.38	0.478
SS03@3'	1/4/2019	3	NA	NA	NA	NA	NA	NA	9.06	0.458
SS04@3'	1/4/2019	3	NA	NA	NA	NA	NA	NA	9.11	0.506
SS05@3'	1/4/2019	3	NA	NA	NA	NA	NA	NA	8.46	0.466

Notes:

1. Standards for soil are taken from 2 CCR 404-1, Table 910-1, effective May 1, 2018.

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

COGCC = Colorado Oil and Gas Conservation Commission

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

GRO = Total volatile petroleum hydrocarbons - gasoline range organics

DRO = Total extractable petroleum hydrocarbons - diesel range organics

mg/kg = Milligrams per kilogram

bgs = Below ground surface

EC = Electrical conductivity

mmhos/cm = millimhos per centimeter

NA = Constituent not analyzed.

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

TABLE 2
FORMER GUTTERSEN 11, 22-25 & 25E TANK BATTERY
VOC CONCENTRATIONS SUMMARY TABLE

Sample ID	Date Sampled	Depth (feet bgs)	Sample Location ⁽¹⁾	Field Measured VOC Concentration ⁽²⁾ (ppm)
SS01@4'	1/4/2019	4	Excavation Base	10.7
SS02@3'	1/4/2019	3	North sidewall	5.8
SS03@3'	1/4/2019	3	West sidewall	1.3
SS04@3'	1/4/2019	3	South sidewall	2.4
SS05@3'	1/4/2019	3	East sidewall	0.8

Notes:

1. Refers to the sample location within the excavation area below the former produced water vessel.

2. Volatile organic compound (VOC) concentrations are measured in the field using a photoionization detector (PID).

bgs = Below ground surface

ppm = Parts per million

= Sample submitted for laboratory analysis.

ATTACHMENT A

Summit Scientific

4653 Table Mountain Drive, Golden, Colorado 80403

303.277.9310

January 11, 2019

Mark Longhurst

PDC Energy

1775 Sherman St. STE. 3000

Denver, CO 80203

RE: Guttersen 11,22-25 & 25E

Enclosed are the results of analyses for samples received by Summit Scientific on 01/04/19 19:20. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

A handwritten signature in black ink, appearing to be 'P. Shrewsbury', written in a cursive style.

Paul Shrewsbury For Ben Shrewsbury

Laboratory Manager



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

Project: Guttersen 11,22-25 & 25E

Project Number: [none]
Project Manager: Mark Longhurst

Reported:
01/11/19 11:58

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
SS01@4'	1901052-01	Soil	01/04/19 11:37	01/04/19 19:20
SS02@3'	1901052-02	Soil	01/04/19 11:40	01/04/19 19:20
SS03@3'	1901052-03	Soil	01/04/19 11:43	01/04/19 19:20
SS04@3'	1901052-04	Soil	01/04/19 11:46	01/04/19 19:20
SS05@3'	1901052-05	Soil	01/04/19 11:58	01/04/19 19:20

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.

Summit Scientific

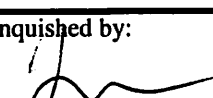
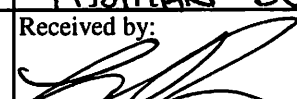
1901052

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

Page 1 of 1

Client: PDC
Address: _____
City/State/Zip: _____
Phone: _____ Fax: _____
Sampler Name: Jake McCarver

Project Manager: Mark Longhurst
E-Mail: Mark.Longhurst@pdce.com
Project Name: Guttersen 11, 22-25 & 25E
Project Number: _____

Sample Description	Date Sampled	Time Sampled	Number of Containers	Preservative				Matrix				Analyze For:								Special Instructions
				HCl	HNO ₃	None	Other (Specify)	Groundwater	Soil	Air - Canister Serial #	Other (Specify)	GBTEXN (8260)	TPH - DRO	EC / pH		HOLD				
SS01 @ 4'	1/4/2019	11:37	1			X		X				X	X	X						
SS02 @ 3'	1/4/2019	11:40	1			X		X								X				
SS03 @ 3'	1/4/2019	11:43	1			X		X								X				
SS04 @ 3'	1/4/2019	11:46	1			X		X								X				
SS06 @ 3' SS05 @ 3'	1/4/2019	11:58	1			X		X								X				
Relinquished by:  Date/Time: <u>1/04/19</u> <u>16:24</u>				Received by: <u>TASMAN BOX</u> Date/Time: <u>1.4.19</u> <u>1624</u>				Turn Around Time (Check) Same Day <input type="checkbox"/> 72 Hours <input type="checkbox"/> 24 Hours <input type="checkbox"/> Standard <input checked="" type="checkbox"/> 48 Hours <input type="checkbox"/>								Hold SS02-SS06				
Relinquished by: <u>TASMAN BOX</u> Date/Time: <u>1.4.19</u> <u>1920</u>				Received by:  Date/Time: <u>1.4.19</u> <u>1920</u>				Sample Integrity: Temperature Upon Receipt: <u>3.0</u> Intact: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>												
Relinquished by: _____ Date/Time: _____				Received in Lab by: _____ Date/Time: _____																

Sample Receipt Checklist

S2 Work Order 1901052

Client: PDC

Client Project ID: Gutteresen II, 22-25 & 25E

Shipped Via: H.D./P.U./FedEx/UPS/USPS/Other P-U Airbill #: _____

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

Temp (°C)	<u>3.0</u>
-----------	------------

Thermometer ID: 61857155-K

	Yes	No	N/A	Comments (if any)
If samples require cooling, was the temperature at 4°C +/- 2°C ⁽¹⁾ ? NOTE: If samples are delivered the same day of sampling, this requirement is met provided that there is evidence that cooling has begun.	<u>/</u>			
Were all samples received intact ⁽¹⁾ ?	<u>/</u>			
Was adequate sample volume provided ⁽¹⁾ ?	<u>/</u>			
If custody seals are present, are they intact ⁽¹⁾ ?			<u>/</u>	
Are samples with holding times due within 48 hours sample due within 48 hours present?			<u>/</u>	
Is a chain-of-custody (COC) form present and filled out completely ⁽¹⁾ ?	<u>/</u>			
Does the COC agree with the number and type of sample bottles received ⁽¹⁾ ?	<u>/</u>			
Do the sample IDs on the bottle labels match the COC ⁽¹⁾ ?	<u>/</u>			
Is the COC properly relinquished by the client w/ date and time recorded ⁽¹⁾ ?		<u>/</u>		<u>not signed to box</u>
For volatiles in water – is there headspace present? If yes, contact client and note in narrative.			<u>/</u>	
Are samples preserved that require preservation (excluding cooling) ⁽¹⁾ ? Note the type of preservative in the Comments column – HCl, H2SO4, NaOH, HNO3, ect			<u>/</u>	
If samples are acid preserved for metals, is the pH ≤ 2 ⁽¹⁾ ? Record the pH in Comments.			<u>/</u>	
If dissolved metals are requested, were samples field filtered?			<u>/</u>	

Additional Comments (if any):

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

LP
Custodian Printed Name or Initials

[Signature]
Signature of Custodian

1.4.19 1920
Date/Time



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

Project: Gutttersen 11,22-25 & 25E

Project Number: [none]
Project Manager: Mark Longhurst

Reported:
01/11/19 11:58

SS01@4'
1901052-01 (Soil)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **01/04/19 11:37**

Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
Benzene	ND	0.0020	mg/kg	1	1901048	01/07/19	01/08/19	EPA 8260B	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	ND	0.0050	"	"	"	"	"	"	
Xylenes (total)	ND	0.010	"	"	"	"	"	"	
Naphthalene	ND	0.010	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	0.50	"	"	"	"	"	"	

Date Sampled: **01/04/19 11:37**

Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
Surrogate: 1,2-Dichloroethane-d4		118 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		99.1 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		105 %	21-167		"	"	"	"	

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: **01/04/19 11:37**

Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
C10-C28 (DRO)	ND	50	mg/kg	1	1901047	01/07/19	01/08/19	EPA 8015M	

Date Sampled: **01/04/19 11:37**

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

Physical Parameters by APHA/ASTM/EPA Methods

Date Sampled: **01/04/19 11:37**

Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
pH	9.49		pH Units	1	1901094	01/09/19	01/09/19	EPA 9045D	

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Denver CO, 80203

Project: Guttersen 11,22-25 & 25E

Project Number: [none]
Project Manager: Mark Longhurst

Reported:
01/11/19 11:58

SS01@4'
1901052-01 (Soil)

Summit Scientific

Physical Parameters by APHA/ASTM/EPA Methods

Specific Conductance by EPA Method 120.1

Date Sampled: **01/04/19 11:37**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Specific Conductance (EC)	0.757	0.0100		mmhos/cm	1	1901093	01/09/19	01/09/19	EPA 120.1	

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Denver CO, 80203

Project: Guttersen 11,22-25 & 25E

Project Number: [none]

Project Manager: Mark Longhurst

Reported:
01/11/19 11:58

SS02@3'
1901052-02 (Soil)

Summit Scientific

Physical Parameters by APHA/ASTM/EPA Methods

Date Sampled: **01/04/19 11:40**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
pH	8.38			pH Units	1	1901112	01/10/19	01/10/19	EPA 9045D	

Specific Conductance by EPA Method 120.1

Date Sampled: **01/04/19 11:40**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Specific Conductance (EC)	0.478	0.0100		mmhos/cm	1	1901113	01/10/19	01/10/19	EPA 120.1	

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Denver CO, 80203

Project: Guttersen 11,22-25 & 25E

Project Number: [none]
Project Manager: Mark Longhurst

Reported:
01/11/19 11:58

SS03@3'
1901052-03 (Soil)

Summit Scientific

Physical Parameters by APHA/ASTM/EPA Methods

Date Sampled: **01/04/19 11:43**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
pH	9.06			pH Units	1	1901112	01/10/19	01/10/19	EPA 9045D	

Specific Conductance by EPA Method 120.1

Date Sampled: **01/04/19 11:43**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Specific Conductance (EC)	0.458	0.0100		mmhos/cm	1	1901113	01/10/19	01/10/19	EPA 120.1	

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Denver CO, 80203

Project: Guttersen 11,22-25 & 25E

Project Number: [none]
Project Manager: Mark Longhurst

Reported:
01/11/19 11:58

SS04@3'
1901052-04 (Soil)

Summit Scientific

Physical Parameters by APHA/ASTM/EPA Methods

Date Sampled: **01/04/19 11:46**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
pH	9.11			pH Units	1	1901112	01/10/19	01/10/19	EPA 9045D	

Specific Conductance by EPA Method 120.1

Date Sampled: **01/04/19 11:46**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Specific Conductance (EC)	0.506	0.0100		mmhos/cm	1	1901113	01/10/19	01/10/19	EPA 120.1	

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

Project: Gutttersen 11,22-25 & 25E

Project Number: [none]
Project Manager: Mark Longhurst

Reported:
01/11/19 11:58

SS05@3'
1901052-05 (Soil)

Summit Scientific

Physical Parameters by APHA/ASTM/EPA Methods

Date Sampled: **01/04/19 11:58**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
pH	8.46			pH Units	1	1901112	01/10/19	01/10/19	EPA 9045D	

Specific Conductance by EPA Method 120.1

Date Sampled: **01/04/19 11:58**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Specific Conductance (EC)	0.466	0.0100		mmhos/cm	1	1901113	01/10/19	01/10/19	EPA 120.1	

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

Project: Gutttersen 11,22-25 & 25E

Project Number: [none]
Project Manager: Mark Longhurst

Reported:
01/11/19 11:58

Volatile Organic Compounds by EPA Method 8260B - Quality Control

Summit Scientific

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

Batch 1901048 - EPA 5030 Soil MS

Blank (1901048-BLK1)

Prepared: 01/07/19 Analyzed: 01/08/19

Benzene	ND	0.0020	mg/kg							
Toluene	ND	0.0050	"							
Ethylbenzene	ND	0.0050	"							
Xylenes (total)	ND	0.010	"							
Naphthalene	ND	0.010	"							
Gasoline Range Hydrocarbons	ND	0.50	"							
Surrogate: 1,2-Dichloroethane-d4	0.0392		"	0.0396	98.9	23-173				
Surrogate: Toluene-d8	0.0404		"	0.0400	101	20-170				
Surrogate: 4-Bromofluorobenzene	0.0387		"	0.0400	96.7	21-167				

LCS (1901048-BS1)

Prepared: 01/07/19 Analyzed: 01/08/19

Benzene	0.117	0.0020	mg/kg	0.100	117	70-130				
Toluene	0.127	0.0050	"	0.100	127	70-130				
Ethylbenzene	0.107	0.0050	"	0.100	107	70-130				
m,p-Xylene	0.172	0.010	"	0.200	86.2	70-130				
o-Xylene	0.124	0.0050	"	0.100	124	70-130				
Surrogate: 1,2-Dichloroethane-d4	0.0400		"	0.0396	101	23-173				
Surrogate: Toluene-d8	0.0404		"	0.0400	101	20-170				
Surrogate: 4-Bromofluorobenzene	0.0401		"	0.0400	100	21-167				

Matrix Spike (1901048-MS1)

Source: 1901046-01

Prepared: 01/07/19 Analyzed: 01/08/19

Benzene	0.108	0.0020	mg/kg	0.100	ND	108	70-130			
Toluene	0.115	0.0050	"	0.100	ND	115	70-130			
Ethylbenzene	0.127	0.0050	"	0.100	0.00465	122	70-130			
m,p-Xylene	0.249	0.010	"	0.200	0.00945	120	70-130			
o-Xylene	0.117	0.0050	"	0.100	0.00501	112	70-130			
Surrogate: 1,2-Dichloroethane-d4	0.0425		"	0.0396	107	23-173				
Surrogate: Toluene-d8	0.0402		"	0.0400	101	20-170				
Surrogate: 4-Bromofluorobenzene	0.0395		"	0.0400	98.8	21-167				

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

Project: Gutttersen 11,22-25 & 25E

Project Number: [none]
Project Manager: Mark Longhurst

Reported:
01/11/19 11:58

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 1901048 - EPA 5030 Soil MS

Matrix Spike Dup (1901048-MSD1)		Source: 1901046-01			Prepared: 01/07/19 Analyzed: 01/08/19					
Benzene	0.117	0.0020	mg/kg	0.100	ND	117	70-130	8.03	30	
Toluene	0.127	0.0050	"	0.100	ND	127	70-130	9.76	30	
Ethylbenzene	0.108	0.0050	"	0.100	0.00465	103	70-130	16.4	30	
m,p-Xylene	0.266	0.010	"	0.200	0.00945	128	70-130	6.91	30	
o-Xylene	0.126	0.0050	"	0.100	0.00501	121	70-130	7.46	30	
Surrogate: 1,2-Dichloroethane-d4		0.0413	"	0.0396		104	23-173			
Surrogate: Toluene-d8		0.0390	"	0.0400		97.5	20-170			
Surrogate: 4-Bromofluorobenzene		0.0388	"	0.0400		97.0	21-167			

Summit Scientific

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

Project: Gutttersen 11,22-25 & 25E

Project Number: [none]
Project Manager: Mark Longhurst

Reported:
01/11/19 11:58

Extractable Petroleum Hydrocarbons by 8015 - Quality Control
Summit Scientific

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

Batch 1901047 - EPA 5030 Soil GC

Blank (1901047-BLK1)

Prepared: 01/07/19 Analyzed: 01/08/19

C10-C28 (DRO) ND 50 mg/kg

LCS (1901047-BS1)

Prepared: 01/07/19 Analyzed: 01/08/19

C10-C28 (DRO) 599 50 mg/kg 500 120 70-130

Matrix Spike (1901047-MS1)

Source: 1901046-01

Prepared: 01/07/19 Analyzed: 01/08/19

C10-C28 (DRO) 604 50 mg/kg 500 37.7 113 70-130

Matrix Spike Dup (1901047-MSD1)

Source: 1901046-01

Prepared: 01/07/19 Analyzed: 01/08/19

C10-C28 (DRO) 595 50 mg/kg 500 37.7 111 70-130 1.49 20

Summit Scientific

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

Project: Gutttersen 11,22-25 & 25E

Project Number: [none]
Project Manager: Mark Longhurst

Reported:
01/11/19 11:58

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

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

Batch 1901094 - General Preparation

LCS (1901094-BS1)

Prepared & Analyzed: 01/09/19

pH	9.25		pH Units	9.23	100	95-105
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Duplicate (1901094-DUP1)

Source: 1901051-01

Prepared & Analyzed: 01/09/19

pH	8.21		pH Units	8.23		0.243	20
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Batch 1901112 - General Preparation

LCS (1901112-BS1)

Prepared & Analyzed: 01/10/19

pH	9.23		pH Units	9.23	100	95-105
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Duplicate (1901112-DUP1)

Source: 1901046-01

Prepared & Analyzed: 01/10/19

pH	8.51		pH Units	8.50		0.118	20
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Summit Scientific

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

Project: Gutttersen 11,22-25 & 25E

Project Number: [none]
Project Manager: Mark Longhurst

Reported:
01/11/19 11:58

Specific Conductance by EPA Method 120.1 - Quality Control
Summit Scientific

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

Batch 1901093 - General Preparation

Blank (1901093-BLK1)

Prepared & Analyzed: 01/09/19

Specific Conductance (EC) ND 0.0100 mmhos/cm

LCS (1901093-BS1)

Prepared & Analyzed: 01/09/19

Specific Conductance (EC) 0.794 0.0100 mmhos/cm 0.750 106 90-110

Duplicate (1901093-DUP1)

Source: 1901051-01

Prepared & Analyzed: 01/09/19

Specific Conductance (EC) 5.16 0.0100 mmhos/cm 5.14 0.291 20

Batch 1901113 - General Preparation

Blank (1901113-BLK1)

Prepared & Analyzed: 01/10/19

Specific Conductance (EC) ND 0.0100 mmhos/cm

LCS (1901113-BS1)

Prepared & Analyzed: 01/10/19

Specific Conductance (EC) 0.793 0.0100 mmhos/cm 0.750 106 90-110

Duplicate (1901113-DUP1)

Source: 1901046-01

Prepared & Analyzed: 01/10/19

Specific Conductance (EC) 0.441 0.0100 mmhos/cm 0.438 0.501 20

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

Project: Guttersen 11,22-25 & 25E

Project Number: [none]
Project Manager: Mark Longhurst

Reported:
01/11/19 11:58

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