

PDC Energy, Inc.
Fourth Quarter 2019 Groundwater Monitoring Summary

December 10, 2019

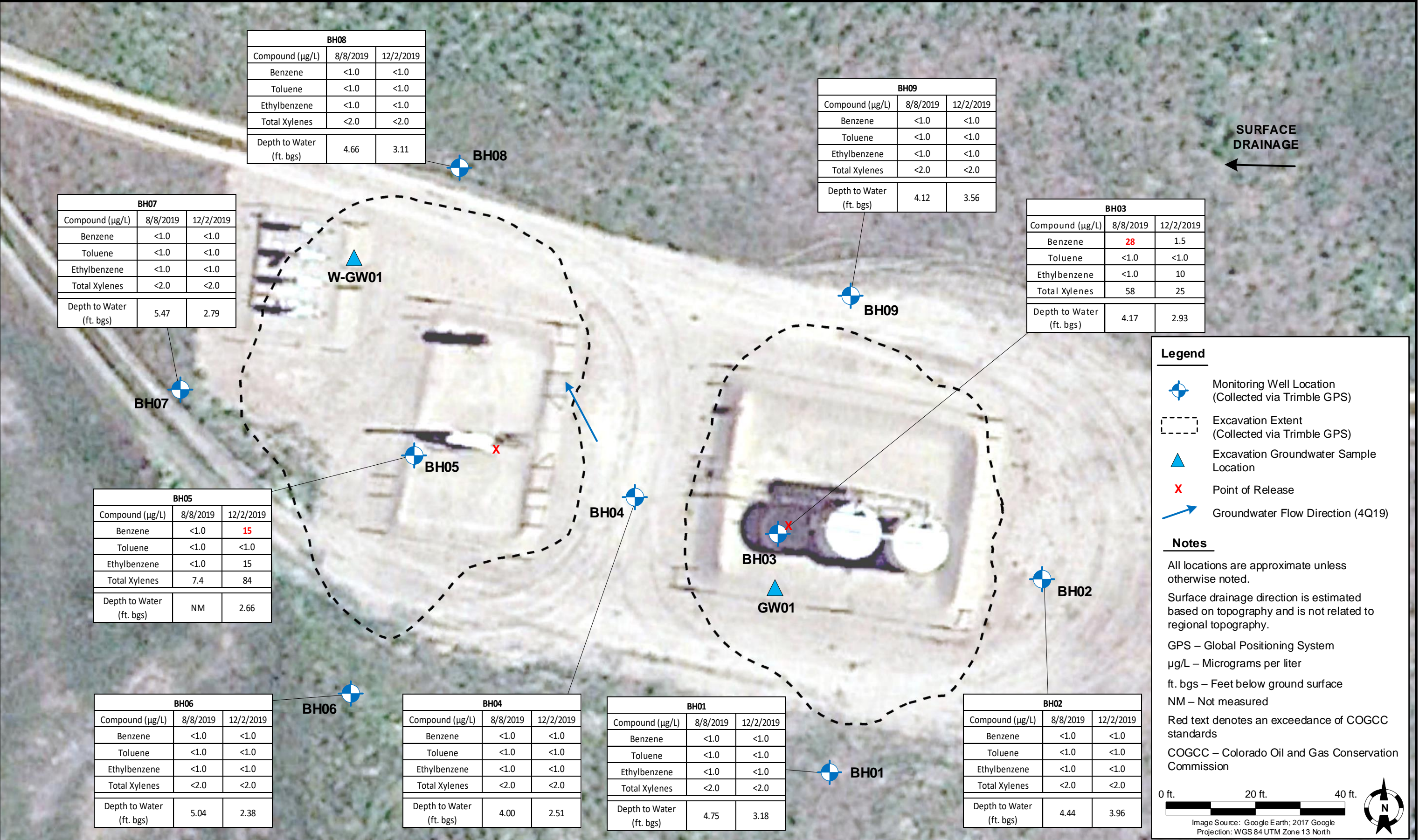
Former Mark 11, 12, 14-35 Tank Battery
NWSW Section 35 T4N R65W
Remediation # 12170

This groundwater monitoring summary has been prepared by Tasman Geosciences, Inc. for the former Mark 11, 12, 14-35 tank battery. On December 2, 2019, groundwater monitoring was conducted at all nine monitoring well locations (BH01 – BH09). Nine groundwater samples were submitted to Summit Scientific Laboratory for analysis of benzene, toluene, ethylbenzene, and total xylenes (BTEX) by USEPA Method 8260B.

Fourth quarter 2019 analytical results indicated that the benzene concentration was above the applicable COGCC Table 910-1 groundwater standard in monitoring well BH05. BTEX concentrations were below regulatory standards in the remaining eight monitoring well locations. Sample locations and corresponding analytical results are illustrated on Figure 1. Groundwater elevation data is illustrated in Figure 2. Analytical results are summarized in Table 1 and the laboratory report is included as Attachment A.

Monitored natural attenuation (MNA) was selected as the remediation strategy for this site during the first quarter 2019 and continued through fourth quarter 2019. Based on the analytical results and persisting benzene concentrations, air sparge (AS) and enhanced fluid recovery (EFR) was initiated as the remediation strategy during December 2019 and will continue as the selected remediation strategy through the first quarter 2020. A summary of the EFR/AS operational data is provided in Table 2.

First quarter 2020 groundwater sampling will be conducted during February 2020.



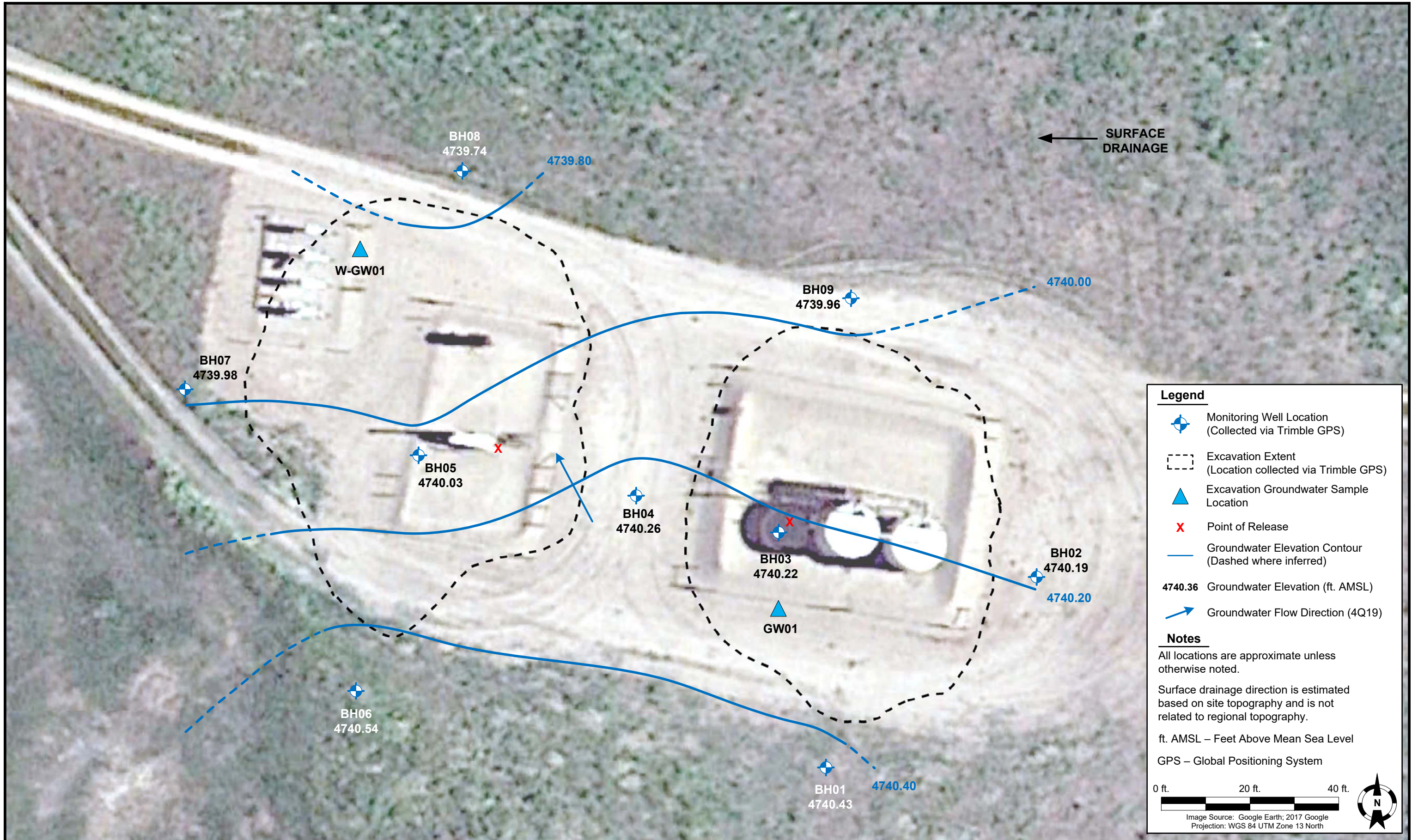


TABLE 1
FORMER MARK 11, 12, 14-35 TANK BATTERY
GROUNDWATER ANALYTICAL RESULTS SUMMARY TABLE

Sample ID	Date Sampled	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Total Xylenes (µg/L)	Depth to Water ⁽²⁾ (ft.)	Groundwater Elevation (ft. AMSL)
COGCC Table 910-1 Groundwater Standard (µg/L) ⁽¹⁾		5	560	700	1,400		
GW01	11/19/2018	21	4.5	3.6	710	~ 7	NM
W-GW01	11/27/2018	2.9	<1.0	<1.0	22	~ 7	NM
BH01	2/11/2019	<1.0	<1.0	<1.0	<2.0	3.28	4740.33
BH01	5/1/2019	<1.0	<1.0	<1.0	<2.0	3.25	4740.36
BH01	8/8/2019	<1.0	<1.0	<1.0	<2.0	4.75	4738.86
BH01	12/2/2019	<1.0	<1.0	<1.0	<2.0	3.18	4740.43
BH02	2/11/2019	<1.0	<1.0	<1.0	<2.0	4.08	4740.07
BH02	5/1/2019	<1.0	<1.0	<1.0	<2.0	4.04	4740.11
BH02	8/8/2019	<1.0	<1.0	<1.0	<2.0	4.44	4739.71
BH02	12/2/2019	<1.0	<1.0	<1.0	<2.0	3.96	4740.19
BH03	2/11/2019	18	<1.0	8.3	76	2.96	4740.19
BH03	5/1/2019	8.6	<1.0	5.9	23	2.97	4740.18
BH03	8/8/2019	28	<1.0	<1.0	58	4.17	4738.98
BH03	12/2/2019	1.5	<1.0	10	25	2.93	4740.22
BH04	2/11/2019	<1.0	<1.0	<1.0	<2.0	2.59	4740.18
BH04	5/1/2019	<1.0	<1.0	<1.0	<2.0	2.56	4740.21
BH04	8/8/2019	<1.0	<1.0	<1.0	<2.0	4.00	4738.77
BH04	12/2/2019	<1.0	<1.0	<1.0	<2.0	2.51	4740.26
BH05	2/11/2019	420	<1.0	50	360	2.62	4740.07
BH05	5/1/2019	190	<1.0	15	100	2.60	4740.09
BH05 ⁽³⁾	8/8/2019	<1.0	<1.0	<1.0	7.4	NM	NM
BH05	12/2/2019	15	<1.0	15	84	2.66	4740.03
BH06	2/11/2019	<1.0	<1.0	<1.0	<2.0	2.42	4740.50
BH06	5/1/2019	<1.0	<1.0	<1.0	<2.0	2.33	4740.59
BH06	8/8/2019	<1.0	<1.0	<1.0	<2.0	5.04	4737.88
BH06	12/2/2019	<1.0	<1.0	<1.0	<2.0	2.38	4740.54
BH07	2/11/2019	<1.0	<1.0	<1.0	<2.0	2.79	4739.98
BH07	5/1/2019	<1.0	<1.0	<1.0	<2.0	2.65	4740.12
BH07	8/8/2019	<1.0	<1.0	<1.0	<2.0	5.47	4737.30
BH07	12/2/2019	<1.0	<1.0	<1.0	<2.0	2.79	4739.98
BH08	2/11/2019	<1.0	<1.0	<1.0	<2.0	3.10	4739.75
BH08	5/1/2019	<1.0	<1.0	<1.0	<2.0	3.05	4739.80
BH08	8/8/2019	<1.0	<1.0	<1.0	<2.0	4.66	4738.19

TABLE 1
FORMER MARK 11, 12, 14-35 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 ⁽²⁾ (ft.)	Groundwater Elevation (ft. AMSL)
COGCC Table 910-1 Groundwater Standard (µg/L) ⁽¹⁾		5	560	700	1,400		
BH08	12/2/2019	<1.0	<1.0	<1.0	<2.0	3.11	4739.74
BH09	2/11/2019	<1.0	<1.0	<1.0	<2.0	3.63	4739.89
BH09	5/1/2019	<1.0	<1.0	<1.0	<2.0	3.64	4739.88
BH09	8/8/2019	<1.0	<1.0	<1.0	<2.0	4.12	4739.40
BH09	12/2/2019	<1.0	<1.0	<1.0	<2.0	3.56	4739.96

Notes:

1. Groundwater standards referenced from 2 CCR 404-1, Table 910-1, effective May 1, 2018.

2. Depth to water measurements were measured from ground surface for excavation samples. Monitoring well measurements were collected from top of casing and adjusted using survey data to reflect depth of water from ground surface.

3. Initial water level measurement prevented by obstruction. Purge volume calculation and sample collection performed following obstruction removal.

COGCC = Colorado Oil and Gas Conservation Commission

µg/L = Micrograms per liter

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

ft. = Feet

AMSL = Above Mean Sea Level

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

NM = Not measured

TABLE 2
FORMER MARK 11, 12, 14-35 TANK BATTERY
EFR / AS OPERATIONAL SUMMARY TABLE

Date	EFR Wells	Total EFR/AS Duration (hours)	Approximate Gallons Extracted	AS Wells	Air Injection Pressure (psi)	Average Air Flow Rate (cfm)
Fourth Quarter 2019						
11/6/2019	BH03, BH05	6	168	None	0	0
Quarterly Totals		6	168		-	-

Notes:

EFR = Enhanced fluid recovery

AS = Air sparge

psi = Pounds per square inch

cfm = Cubic feet per minute

Attachment A

Summit Scientific

4653 Table Mountain Drive, Golden, Colorado 80403

303.277.9310

December 09, 2019

Mark Longhurst

PDC Energy

1775 Sherman St. STE. 3000

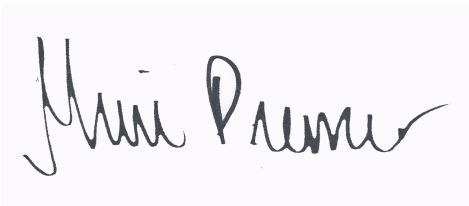
Denver, CO 80203

RE: Mark 11,12,14-35

Work Order # 1912016

Enclosed are the results of analyses for samples received by Summit Scientific on 12/02/19 17:30. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

A handwritten signature in black ink, reading "Muri Premier", on a light blue background.

Muri Premier For Paul Shrewsbury

President



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

Project: Mark 11,12,14-35

Project Number: [none]

Project Manager: Mark Longhurst

Reported:
12/09/19 15:04

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
BH01	1912016-01	Water	12/02/19 13:03	12/02/19 17:30
BH02	1912016-02	Water	12/02/19 13:13	12/02/19 17:30
BH03	1912016-03	Water	12/02/19 13:43	12/02/19 17:30
BH04	1912016-04	Water	12/02/19 12:33	12/02/19 17:30
BH05	1912016-05	Water	12/02/19 13:33	12/02/19 17:30
BH06	1912016-06	Water	12/02/19 12:23	12/02/19 17:30
BH07	1912016-07	Water	12/02/19 12:04	12/02/19 17:30
BH08	1912016-08	Water	12/02/19 12:45	12/02/19 17:30
BH09	1912016-09	Water	12/02/19 13:22	12/02/19 17:30

Summit Scientific

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1912016

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

Page 4 of 1

Client: PDC/Tasman
Address: 6855 W 119th Ave
City/State/Zip: Broomfield / CO / 80020
Phone: 303-467-1228 Fax:
Sampler Name: J Marcus

Project Manager: Mark Longhurst
E-Mail: mark.longhurst@PDXE.com
Project Name: Mark 11,12,14-35
Project Number: 1/4

				Preservative				Matrix				Analyze For:										
Sample Description	Date Sampled	Time Sampled	Number of Containers	HCl	HNO ₃	None	Other (Specify)	Groundwater	Soil	Air - Canister Serial #	Other (Specify)										Special Instructions	
BH01	12/02/19	1303	3	X				X				X										
BH02	12/02/19	1313	3	X				X				X										
BH03	12/02/19	1343	3	X				X				X										
BH04	12/02/19	1233	3	X				X				X										
BH05	12/02/19	1333	3	X				X				X										
BH06	12/02/19	1223	3	X				X				X										
BH07	12/02/19	1204	3	X				X				X										
BH08	12/02/19	1245	3	X				X				X										
BH09	12/02/19	1322	3	X				X				X										
Relinquished by:  Date/Time: 12/2/19 1530				Received by: Tasman Lock Box Date/Time: 12/2/19 1530				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"/>										Notes:				
Relinquished by: Tasman Lock Box Date/Time: 12/02/19 1730				Received by:  Date/Time: 12/02/19 1730				Sample Integrity: Temperature Upon Receipt: 3.7 Intact: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>														
Relinquished by:				Received in Lab by:																		

1912016

Sample Receipt Checklist

S2 Work Order _____

Client: PDC / TASMAN

Client Project ID: MARK 11,12,14-35

Shipped Via: ☐ H.D./P.U./FedEx/UPS/USPS/Other _____ Airbill #: _____Matrix (check all that apply): ☐ Air ☐ Soil/Solid ☒ Water ☐ Other: _____
(Describe)

Temp (°C)

3.7

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.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Were all samples received intact ⁽¹⁾ ?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Was adequate sample volume provided ⁽¹⁾ ?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
If custody seals are present, are they intact ⁽¹⁾ ?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Are samples with holding times due within 48 hours sample due within 48 hours present?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Is a chain-of-custody (COC) form present and filled out completely ⁽¹⁾ ?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Does the COC agree with the number and type of sample bottles received ⁽¹⁾ ?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Do the sample IDs on the bottle labels match the COC ⁽¹⁾ ?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Is the COC properly relinquished by the client w/ date and time recorded ⁽¹⁾ ?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
For volatiles in water – is there headspace present? If yes, contact client and note in narrative.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Are samples preserved that require preservation (excluding cooling) ⁽¹⁾ ? Note the type of preservative in the Comments column – HCl, H ₂ SO ₄ , NaOH, HNO ₃ , ect	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	HCL
If samples are acid preserved for metals, is the pH ≤ 2 ⁽¹⁾ ? Record the pH in Comments.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
If dissolved metals are requested, were samples field filtered?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	

Additional Comments (if any):

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

RZ

Custodian Printed Name or Initials

Signature of Custodian

12/2/19

Date/Time



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

Project: Mark 11,12,14-35

Project Number: [none]
Project Manager: Mark Longhurst

Reported:
12/09/19 15:04

BH01
1912016-01 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **12/02/19 13:03**

Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
Benzene	ND	1.0	ug/l	1	1912025	12/03/19	12/04/19	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	2.0	"	"	"	"	"	"	

Date Sampled: **12/02/19 13:03**

Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
Surrogate: 1,2-Dichloroethane-d4		109 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		97.7 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		99.6 %	21-167		"	"	"	"	

Summit Scientific

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

Project: Mark 11,12,14-35

Project Number: [none]

Project Manager: Mark Longhurst

Reported:
12/09/19 15:04

BH02
1912016-02 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **12/02/19 13:13**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Benzene	ND	1.0	ug/l	1	1912025	12/03/19	12/04/19	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	2.0	"	"	"	"	"	"	

Date Sampled: **12/02/19 13:13**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Surrogate: 1,2-Dichloroethane-d4		107 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		105 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		101 %	21-167		"	"	"	"	

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

Project: Mark 11,12,14-35

Project Number: [none]
Project Manager: Mark Longhurst

Reported:
12/09/19 15:04

BH03
1912016-03 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **12/02/19 13:43**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Benzene	1.5	1.0	ug/l	1	1912025	12/03/19	12/04/19	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	10	1.0	"	"	"	"	"	"	
Xylenes (total)	25	2.0	"	"	"	"	"	"	

Date Sampled: **12/02/19 13:43**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Surrogate: 1,2-Dichloroethane-d4		112 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		104 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		105 %	21-167		"	"	"	"	

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

Project: Mark 11,12,14-35

Project Number: [none]

Project Manager: Mark Longhurst

Reported:
12/09/19 15:04

BH04
1912016-04 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **12/02/19 12:33**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Benzene	ND	1.0	ug/l	1	1912025	12/03/19	12/04/19	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	2.0	"	"	"	"	"	"	

Date Sampled: **12/02/19 12:33**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Surrogate: 1,2-Dichloroethane-d4		107 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		100 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		97.6 %	21-167		"	"	"	"	

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

Project: Mark 11,12,14-35

Project Number: [none]
Project Manager: Mark Longhurst

Reported:
12/09/19 15:04

BH05
1912016-05 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **12/02/19 13:33**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Benzene	15	1.0		ug/l	1	1912025	12/03/19	12/04/19	EPA 8260B	
Toluene	ND	1.0		"	"	"	"	"	"	
Ethylbenzene	15	1.0		"	"	"	"	"	"	
Xylenes (total)	84	2.0		"	"	"	"	"	"	

Date Sampled: **12/02/19 13:33**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Surrogate: 1,2-Dichloroethane-d4		106 %		23-173		"	"	"	"	
Surrogate: Toluene-d8		99.5 %		20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		101 %		21-167		"	"	"	"	

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

Project: Mark 11,12,14-35

Project Number: [none]
Project Manager: Mark Longhurst

Reported:
12/09/19 15:04

BH06
1912016-06 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **12/02/19 12:23**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Benzene	ND	1.0	ug/l	1	1912025	12/03/19	12/04/19	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	2.0	"	"	"	"	"	"	

Date Sampled: **12/02/19 12:23**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Surrogate: 1,2-Dichloroethane-d4		106 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		105 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		100 %	21-167		"	"	"	"	

Summit Scientific

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

Project: Mark 11,12,14-35

Project Number: [none]
Project Manager: Mark Longhurst

Reported:
12/09/19 15:04

BH07
1912016-07 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **12/02/19 12:04**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Benzene	ND	1.0	ug/l	1	1912025	12/03/19	12/04/19	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	2.0	"	"	"	"	"	"	

Date Sampled: **12/02/19 12:04**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Surrogate: 1,2-Dichloroethane-d4		111 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		99.9 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		94.1 %	21-167		"	"	"	"	

Summit Scientific

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

Project: Mark 11,12,14-35

Project Number: [none]
Project Manager: Mark Longhurst

Reported:
12/09/19 15:04

BH08
1912016-08 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **12/02/19 12:45**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Benzene	ND	1.0	ug/l	1	1912025	12/03/19	12/04/19	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	2.0	"	"	"	"	"	"	

Date Sampled: **12/02/19 12:45**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Surrogate: 1,2-Dichloroethane-d4		105 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		101 %	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: Mark 11,12,14-35

Project Number: [none]
Project Manager: Mark Longhurst

Reported:
12/09/19 15:04

BH09
1912016-09 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **12/02/19 13:22**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Benzene	ND	1.0	ug/l	1	1912025	12/03/19	12/04/19	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	2.0	"	"	"	"	"	"	

Date Sampled: **12/02/19 13:22**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Surrogate: 1,2-Dichloroethane-d4		109 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		100 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		97.0 %	21-167		"	"	"	"	

Summit Scientific

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

Project: Mark 11,12,14-35

Project Number: [none]
Project Manager: Mark Longhurst

Reported:
12/09/19 15:04

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 1912025 - EPA 5030 Water MS

Blank (1912025-BLK1)

Prepared: 12/03/19 Analyzed: 12/04/19

Benzene	ND	1.0	ug/l							
Toluene	ND	1.0	"							
Ethylbenzene	ND	1.0	"							
Xylenes (total)	ND	2.0	"							
Surrogate: 1,2-Dichloroethane-d4	14.1		"	13.3		106	23-173			
Surrogate: Toluene-d8	13.4		"	13.3		101	20-170			
Surrogate: 4-Bromofluorobenzene	13.9		"	13.3		105	21-167			

LCS (1912025-BS1)

Prepared: 12/03/19 Analyzed: 12/04/19

Benzene	25.8	1.0	ug/l	33.3		77.3	51-132			
Toluene	26.1	1.0	"	33.3		78.2	51-138			
Ethylbenzene	28.7	1.0	"	33.3		86.1	58-146			
m,p-Xylene	55.6	2.0	"	66.7		83.4	57-144			
o-Xylene	26.6	1.0	"	33.3		79.8	53-146			
Surrogate: 1,2-Dichloroethane-d4	14.2		"	13.3		107	23-173			
Surrogate: Toluene-d8	13.4		"	13.3		101	20-170			
Surrogate: 4-Bromofluorobenzene	13.5		"	13.3		101	21-167			

Matrix Spike (1912025-MS1)

Source: 1912016-01

Prepared: 12/03/19 Analyzed: 12/04/19

Benzene	27.2	1.0	ug/l	33.3	ND	81.5	34-141			
Toluene	27.2	1.0	"	33.3	ND	81.7	27-151			
Ethylbenzene	27.9	1.0	"	33.3	ND	83.7	29-160			
m,p-Xylene	53.1	2.0	"	66.7	ND	79.6	20-166			
o-Xylene	26.0	1.0	"	33.3	ND	77.9	33-159			
Surrogate: 1,2-Dichloroethane-d4	15.1		"	13.3		113	23-173			
Surrogate: Toluene-d8	13.9		"	13.3		104	20-170			
Surrogate: 4-Bromofluorobenzene	12.9		"	13.3		96.8	21-167			

Summit Scientific

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

Project: Mark 11,12,14-35

Project Number: [none]
Project Manager: Mark Longhurst

Reported:
12/09/19 15:04

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 1912025 - EPA 5030 Water MS

Matrix Spike Dup (1912025-MSD1)	Source: 1912016-01			Prepared: 12/03/19 Analyzed: 12/04/19						
Benzene	25.8	1.0	ug/l	33.3	ND	77.5	34-141	5.02	30	
Toluene	26.8	1.0	"	33.3	ND	80.4	27-151	1.63	30	
Ethylbenzene	26.8	1.0	"	33.3	ND	80.6	29-160	3.87	30	
m,p-Xylene	52.7	2.0	"	66.7	ND	79.1	20-166	0.737	30	
o-Xylene	26.0	1.0	"	33.3	ND	77.9	33-159	0.0385	30	
Surrogate: 1,2-Dichloroethane-d4	14.9		"	13.3		112	23-173			
Surrogate: Toluene-d8	13.4		"	13.3		101	20-170			
Surrogate: 4-Bromofluorobenzene	13.6		"	13.3		102	21-167			

Summit Scientific

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PDC Energy

1775 Sherman St. STE. 3000

Denver CO, 80203

Project: Mark 11,12,14-35

Project Number: [none]

Project Manager: Mark Longhurst

Reported:

12/09/19 15:04

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