

PDC Energy, Inc.
Fourth Quarter 2021 Groundwater Monitoring Summary

November 30, 2021

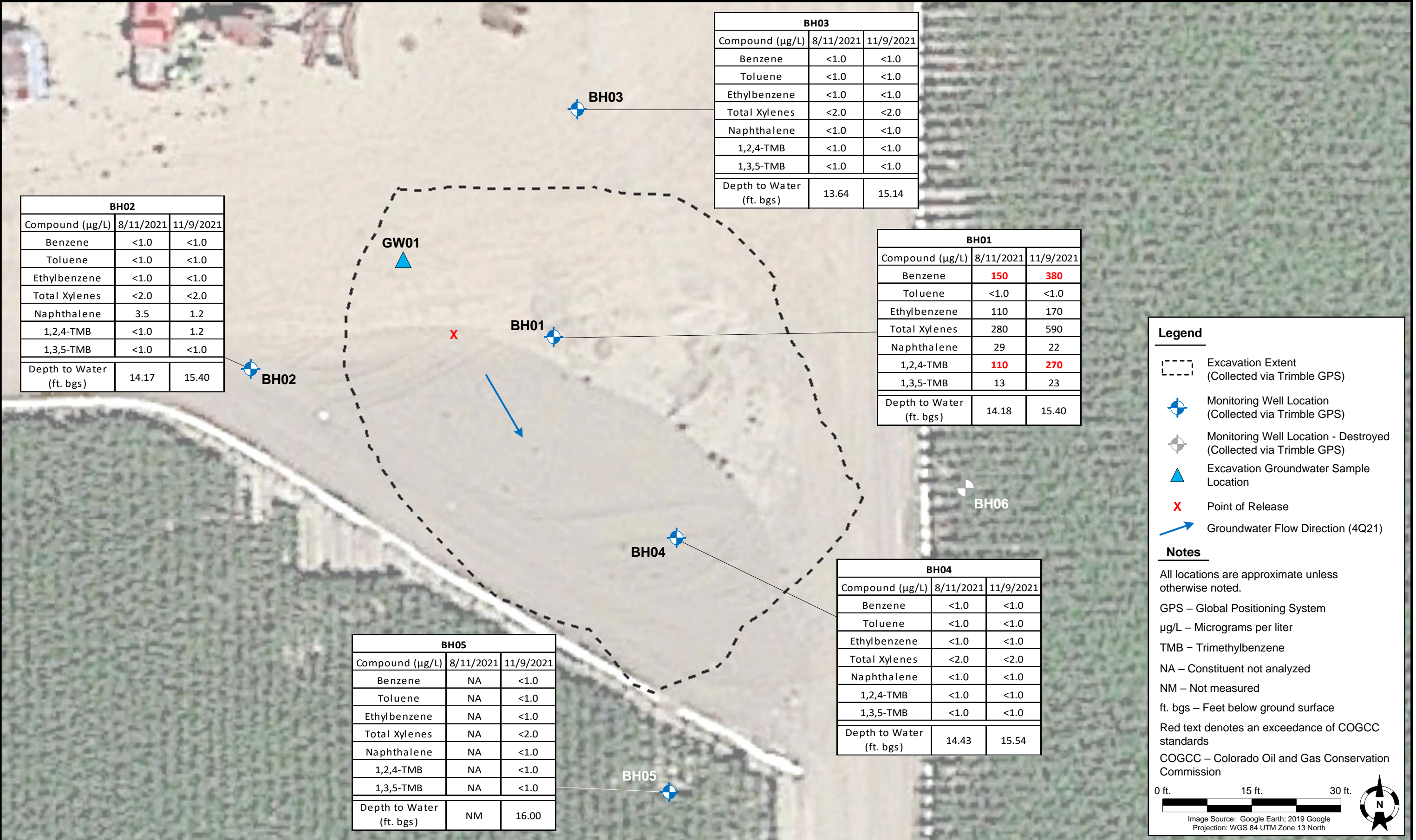
Former JR #1 Tank Battery
SESW Section 13 T6N R65W
Remediation # 12319

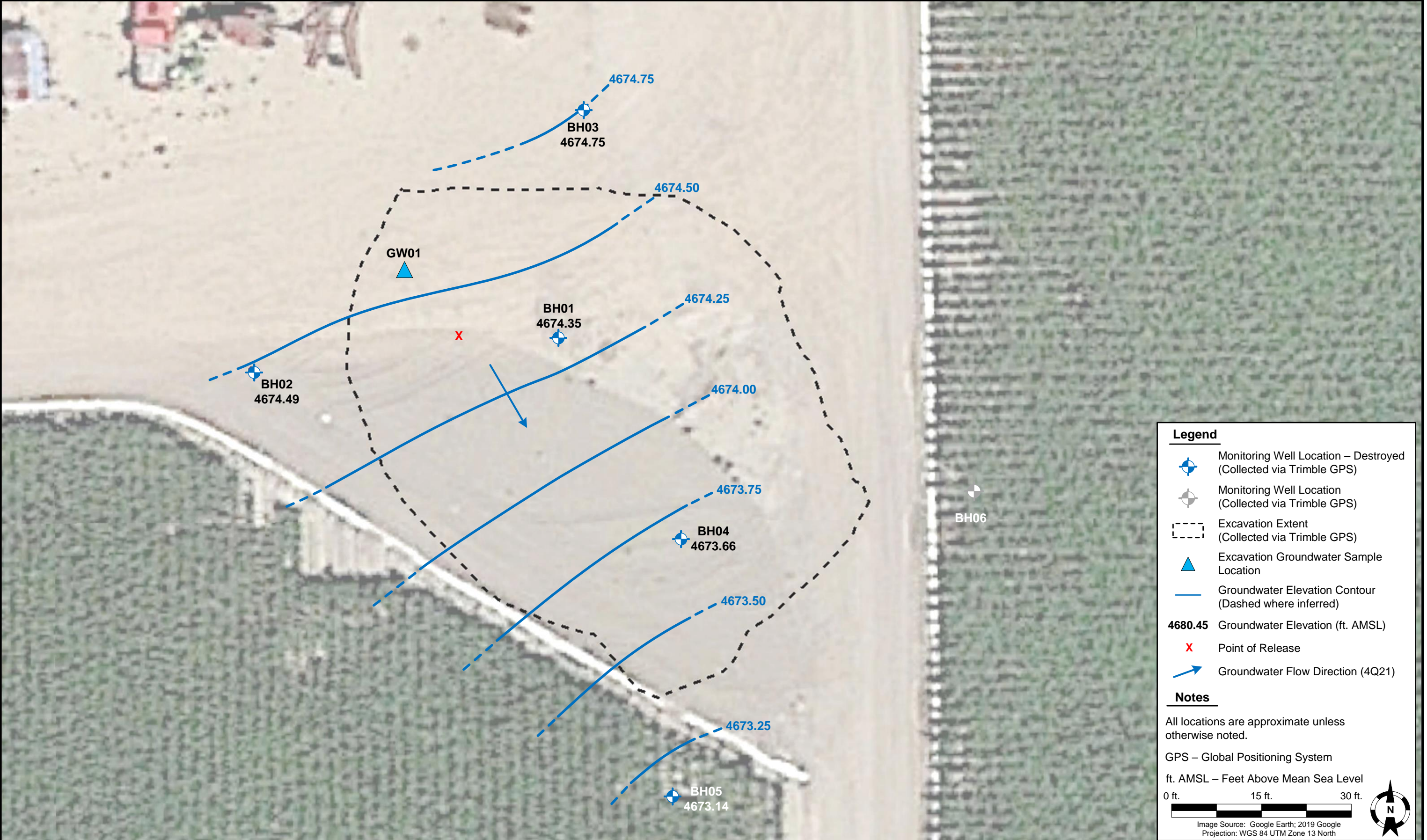
This groundwater monitoring summary has been prepared by Tasman, Inc. for the former JR #1 tank battery. On November 9, 2021, groundwater monitoring was conducted at five monitoring well locations (BH01 – BH05). Five groundwater samples were submitted to Summit Scientific Laboratory for analysis of benzene, toluene, ethylbenzene, total xylenes (BTEX), naphthalene, 1, 2, 4-trimethylbenzene (TMB) and 1, 3, 5-TMB by EPA Method 8260B.

Fourth quarter 2021 analytical results indicated that organic constituent concentrations were above the applicable COGCC Table 915-1 groundwater standards in monitoring well BH01. Organic compound concentrations were below the applicable regulatory standards in the four remaining monitoring well locations. Sample locations and corresponding analytical results are illustrated on Figure 1. Groundwater elevation data is illustrated on Figure 2. Analytical results are summarized in Tables 1 and 2. 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 will remain the selected remediation strategy for the first quarter 2022.

First quarter 2022 groundwater sampling will be conducted during February 2022.





DATE:	November 12, 2021
DESIGNED BY:	B. Nelson
DRAWN BY:	A. Dahl



Tasman, Inc.
6855 W. 119th Ave
Broomfield, CO 80020

PDC Energy, Inc. – DJ Basin
Former JR #1 Tank Battery
SESW, Section 13, Township 6 North, Range 65 West
Weld County, Colorado

**GROUNDWATER
ELEVATION CONTOUR
MAP (11/09/2021)**

**FIGURE
2**

TABLE 1
FORMER JR #1 TANK BATTERY
GROUNDWATER ANALYTICAL RESULTS SUMMARY TABLE
ORGANIC COMPOUNDS

Sample ID	Date Sampled	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Total Xylenes (µg/L)	Naphthalene (µg/L)	1,2,4-TMB (µg/L)	1,3,5-TMB (µg/L)	Depth to Water ⁽²⁾ (ft.)	Groundwater Elevation (ft. AMSL)
COGCC Table 915-1 Groundwater Standard (µg/L) ⁽¹⁾		5	560	700	1,400	140	67	67	-	-
BH01	5/14/2021	310	<1.0	180	730	27	160	120	16.68	4673.07
BH01	8/11/2021	150	<1.0	110	280	29	110	13	14.18	4675.57
BH01	11/9/2021	380	<1.0	170	590	22	270	23	15.40	4674.35
BH02	5/14/2021	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	16.68	4673.21
BH02	8/11/2021	<1.0	<1.0	<1.0	<2.0	3.5	<1.0	<1.0	14.17	4675.72
BH02	11/9/2021	<1.0	<1.0	<1.0	<2.0	1.2	1.2	<1.0	15.40	4674.49
BH03	5/14/2021	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	16.49	4673.40
BH03	8/11/2021	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	13.64	4676.25
BH03	11/9/2021	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	15.14	4674.75
BH04	5/14/2021	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	17.58	4671.62
BH04	8/11/2021	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	14.43	4674.77
BH04	11/9/2021	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	15.54	4673.66
BH05	5/14/2021	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	17.85	4671.29
BH05	8/11/2021	Not Sampled							NM	NM
BH05	11/9/2021	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	16.00	4673.14

Notes:

- Groundwater standards referenced from 2 CCR 404-1, Table 915-1, January 15, 2021.
 - 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.
- TMB = Trimethylbenzene
COGCC = Colorado Oil and Gas Conservation Commission
µg/L = Micrograms per liter
(<) = Analytical result is less than the indicated laboratory reporting limit.
NM = Not measured
ft. = Feet
AMSL = Above Mean Sea Level
BOLD = Analytical result is in exceedance of applicable standard.

Attachment A

Summit Scientific

4653 Table Mountain Drive, Golden, Colorado 80403

303.277.9310

November 16, 2021

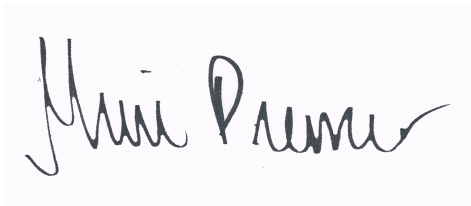
Mark Longhurst
PDC Energy
1775 Sherman St. STE. 3000
Denver, CO 80203

RE: JR #1

Work Order #2111171

Enclosed are the results of analyses for samples received by Summit Scientific on 11/09/21 16:01. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

A handwritten signature in black ink, reading "Muri Premier", is displayed on a light purple rectangular background.

Muri Premier For Paul Shrewsbury
President



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

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

Reported:
11/16/21 14:08

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
BH01	2111171-01	Water	11/09/21 12:22	11/09/21 16:01
BH02	2111171-02	Water	11/09/21 12:40	11/09/21 16:01
BH03	2111171-03	Water	11/09/21 12:09	11/09/21 16:01
BH04	2111171-04	Water	11/09/21 11:55	11/09/21 16:01
BH05	2111171-05	Water	11/09/21 13:39	11/09/21 16:01

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

2111171

S₂

4653 Table Mountain Drive ♦ Golden, Colorado 80403
303-277-9310 ♦ 303-374-5933 (F)

Page 1 of 1

Client: PDC /Tasman Geosciences

Project Manager: Mark Longhurst

Address: 6855 W. 119th St.

E-Mail: Mark.Longhurst@PDCE.com

City/State/Zip: Broomfield CO 80020

Phone: 303-487-1228

Project Name: JR #1

Sampler Name: Aaron O'Keller

Project Number:

					Preservative				Matrix				Analysis Requested								Special Instructions
ID	Sample Description	Date Sampled	Time Sampled	# of containers	HCl	HNO3	None	Other	Water	Soil	Air-Canister #	Other	8260 BTEX	Napthalene	1,2,4 TMB	1,3,5 TMB	TDS	Chloride	Sulphate		
1	BH01	11/9/21	1222	3			3		X				X	X	X	X					
2	BH02	I	1240	I			I		I				I	I	I	I					
3	BH03	I	1209	I			I		I				I	I	I	I					
4	BH04	I	1155	I			I		I				I	I	I	I					
5	BH05	I	1339	I			I		I				I	I	I	I					
6																					
7																					
8																					
9																					
10																					

Relinquished by: *Aaron O'Keller* Date/Time: 11/9/21 16:00

Received by: Tasman Lockbox Date/Time: 11/9/21 16:01

Turn Around Time (Check)
Same Day — 72 hours
24 hours — Standard ☒
48 hours —

Notes:

Relinquished by: Tasman LockBox Date/Time: 11/9/21 16:00

Received by: *[Signature]* Date/Time: 11/9/21 16:01

Sample Integrity:
Temperature Upon Receipt: 2.3
Samples Intact: ☒ Yes ☐ No

Relinquished by: Date/Time:

Received by: Date/Time:

S₂

Sample Receipt Checklist

S2 Work Order# 2111171

Client: Doc Tasmann Client Project ID: JR#1

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

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

Temp (°C) 2.3

Thermometer ID: G86A9201901378

	Yes	No	N/A	Comments (if any)
If samples require cooling, was the temperature at 4°C +/- 2°C ⁽¹⁾ ?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>on ICE</u>
NOTE: If samples are delivered the same day of sampling, this requirement is met if there is evidence that cooling has begun.				
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 checked="" type="checkbox"/>	<input type="checkbox"/>	<input 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⁾ ?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Note the type of preservative in the Comments column – HCl, H ₂ SO ₄ , NaOH, HNO ₃ , etc.				
If samples are acid preserved for metals, is the pH ≤ 2 ⁽¹⁾ ?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Record the pH in Comments.				
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.				

[Signature]
Custodian Printed Name or Initials11.9.21
Date/Time



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

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

Reported:
11/16/21 14:08

BH01
2111171-01 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **11/09/21 12:22**

Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
Benzene	380	10	ug/l	10	BEK0237	11/10/21	11/12/21	EPA 8260B	
Toluene	ND	1.0	"	1	"	"	"	"	
Ethylbenzene	170	1.0	"	"	"	"	"	"	
Xylenes (total)	590	20	"	10	"	"	"	"	
Naphthalene	22	1.0	"	1	"	"	"	"	
1,2,4-Trimethylbenzene	270	1.0	"	"	"	"	"	"	
1,3,5-Trimethylbenzene	23	1.0	"	"	"	"	"	"	

Date Sampled: **11/09/21 12:22**

Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
Surrogate: 1,2-Dichloroethane-d4		100 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		101 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		113 %	21-167		"	"	"	"	

Summit Scientific

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

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

Reported:
11/16/21 14:08

BH02
2111171-02 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **11/09/21 12:40**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Benzene	ND	1.0	ug/l	1	BEK0237	11/10/21	11/12/21	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	2.0	"	"	"	"	"	"	
Naphthalene	1.2	1.0	"	"	"	"	"	"	
1,2,4-Trimethylbenzene	1.2	1.0	"	"	"	"	"	"	
1,3,5-Trimethylbenzene	ND	1.0	"	"	"	"	"	"	

Date Sampled: **11/09/21 12:40**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
<i>Surrogate: 1,2-Dichloroethane-d4</i>		98.0 %	23-173		"	"	"	"	
<i>Surrogate: Toluene-d8</i>		102 %	20-170		"	"	"	"	
<i>Surrogate: 4-Bromofluorobenzene</i>		103 %	21-167		"	"	"	"	

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

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

Reported:
11/16/21 14:08

BH03
2111171-03 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **11/09/21 12:09**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Benzene	ND	1.0	ug/l	1	BEK0237	11/10/21	11/12/21	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	2.0	"	"	"	"	"	"	
Naphthalene	ND	1.0	"	"	"	"	"	"	
1,2,4-Trimethylbenzene	ND	1.0	"	"	"	"	"	"	
1,3,5-Trimethylbenzene	ND	1.0	"	"	"	"	"	"	

Date Sampled: **11/09/21 12:09**

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

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

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

Reported:
11/16/21 14:08

BH04
2111171-04 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **11/09/21 11:55**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Benzene	ND	1.0		ug/l	1	BEK0237	11/10/21	11/12/21	EPA 8260B	
Toluene	ND	1.0		"	"	"	"	"	"	
Ethylbenzene	ND	1.0		"	"	"	"	"	"	
Xylenes (total)	ND	2.0		"	"	"	"	"	"	
Naphthalene	ND	1.0		"	"	"	"	"	"	
1,2,4-Trimethylbenzene	ND	1.0		"	"	"	"	"	"	
1,3,5-Trimethylbenzene	ND	1.0		"	"	"	"	"	"	

Date Sampled: **11/09/21 11:55**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Surrogate: 1,2-Dichloroethane-d4		98.3 %		23-173		"	"	"	"	
Surrogate: Toluene-d8		103 %		20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		101 %		21-167		"	"	"	"	

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

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

Reported:
11/16/21 14:08

BH05
2111171-05 (Water)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **11/09/21 13:39**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Benzene	ND	1.0	ug/l	1	BEK0237	11/10/21	11/12/21	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	2.0	"	"	"	"	"	"	
Naphthalene	ND	1.0	"	"	"	"	"	"	
1,2,4-Trimethylbenzene	ND	1.0	"	"	"	"	"	"	
1,3,5-Trimethylbenzene	ND	1.0	"	"	"	"	"	"	

Date Sampled: **11/09/21 13:39**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Surrogate: 1,2-Dichloroethane-d4		97.1 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		101 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		102 %	21-167		"	"	"	"	

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

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

Reported:
11/16/21 14:08

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 BEK0237 - EPA 5030 Water MS

Blank (BEK0237-BLK1)

Prepared: 11/10/21 Analyzed: 11/11/21

Benzene	ND	1.0	ug/l							
Toluene	ND	1.0	"							
Ethylbenzene	ND	1.0	"							
Xylenes (total)	ND	2.0	"							
Naphthalene	ND	1.0	"							
1,2,4-Trimethylbenzene	ND	1.0	"							
1,3,5-Trimethylbenzene	ND	1.0	"							
Surrogate: 1,2-Dichloroethane-d4	13.8		"	13.3		103	23-173			
Surrogate: Toluene-d8	13.0		"	13.3		97.5	20-170			
Surrogate: 4-Bromofluorobenzene	13.5		"	13.3		101	21-167			

LCS (BEK0237-BS1)

Prepared: 11/10/21 Analyzed: 11/11/21

Benzene	46.8	1.0	ug/l	50.0		93.6	51-132			
Toluene	46.9	1.0	"	50.0		93.7	51-138			
Ethylbenzene	46.1	1.0	"	50.0		92.3	58-146			
m,p-Xylene	92.8	2.0	"	100		92.8	57-144			
o-Xylene	47.4	1.0	"	50.0		94.7	53-146			
Naphthalene	50.5	1.0	"	50.0		101	70-130			
1,2,4-Trimethylbenzene	47.1	1.0	"	50.0		94.2	70-130			
1,3,5-Trimethylbenzene	46.7	1.0	"	50.0		93.4	70-130			
Surrogate: 1,2-Dichloroethane-d4	13.6		"	13.3		102	23-173			
Surrogate: Toluene-d8	13.2		"	13.3		99.3	20-170			
Surrogate: 4-Bromofluorobenzene	13.4		"	13.3		101	21-167			

Matrix Spike (BEK0237-MS1)

Source: 2111128-01

Prepared: 11/10/21 Analyzed: 11/11/21

Benzene	51.4	1.0	ug/l	50.0	ND	103	34-141			
Toluene	51.4	1.0	"	50.0	ND	103	27-151			
Ethylbenzene	52.3	1.0	"	50.0	ND	105	29-160			
m,p-Xylene	106	2.0	"	100	ND	106	20-166			
o-Xylene	52.4	1.0	"	50.0	ND	105	33-159			
Naphthalene	46.6	1.0	"	50.0	ND	93.2	70-130			
1,2,4-Trimethylbenzene	53.4	1.0	"	50.0	ND	107	70-130			
1,3,5-Trimethylbenzene	53.2	1.0	"	50.0	ND	106	70-130			
Surrogate: 1,2-Dichloroethane-d4	12.2		"	13.3		91.5	23-173			
Surrogate: Toluene-d8	13.2		"	13.3		98.6	20-170			
Surrogate: 4-Bromofluorobenzene	13.2		"	13.3		99.2	21-167			

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

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

Reported:
11/16/21 14:08

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 BEK0237 - EPA 5030 Water MS

Matrix Spike Dup (BEK0237-MSD1)	Source: 2111128-01			Prepared: 11/10/21 Analyzed: 11/11/21						
Benzene	51.5	1.0	ug/l	50.0	ND	103	34-141	0.253	30	
Toluene	51.2	1.0	"	50.0	ND	102	27-151	0.429	30	
Ethylbenzene	52.8	1.0	"	50.0	ND	106	29-160	0.895	30	
m,p-Xylene	106	2.0	"	100	ND	106	20-166	0.707	30	
o-Xylene	53.2	1.0	"	50.0	ND	106	33-159	1.57	30	
Naphthalene	49.0	1.0	"	50.0	ND	98.0	70-130	4.96	30	
1,2,4-Trimethylbenzene	54.9	1.0	"	50.0	ND	110	70-130	2.81	30	
1,3,5-Trimethylbenzene	54.8	1.0	"	50.0	ND	110	70-130	3.06	30	
Surrogate: 1,2-Dichloroethane-d4	12.2		"	13.3		91.4	23-173			
Surrogate: Toluene-d8	13.2		"	13.3		99.0	20-170			
Surrogate: 4-Bromofluorobenzene	13.2		"	13.3		98.7	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
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Project: JR #1
Project Number: [none]
Project Manager: Mark Longhurst

Reported:
11/16/21 14:08

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