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March 15, 2023

Jenifer Hakkarinen  
PDC Energy  
1775 Sherman Street  
Suite 3000  
Denver, CO 80203

Work Order: **HS23030062**

Laboratory Results for: **Johnson 17-1**

Dear Jenifer Hakkarinen,

ALS Environmental received 1 sample(s) on Mar 01, 2023 for the analysis presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested. Results are expressed as "as received" unless otherwise noted.

QC sample results for this data met EPA or laboratory specifications except as noted in the Case Narrative or as noted with qualifiers in the QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained by ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

If you have any questions regarding this report, please feel free to call me.

Sincerely,

Generated By: JUMOKE.LAWAL  
Tyler Monroe

**Client:** PDC Energy  
**Project:** Johnson 17-1  
**Work Order:** HS23030062

**SAMPLE SUMMARY**

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS23030062-01	Johnson 17-1	Water		27-Feb-2023 11:50	01-Mar-2023 10:00	<input type="checkbox"/>

**Client:** PDC Energy  
**Project:** Johnson 17-1  
**Work Order:** HS23030062

**CASE NARRATIVE**

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**GC Semivolatiles by Method RSK-175****Batch ID: R429849**

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

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**GC Semivolatiles by Method SW8015M****Batch ID: 190413****Sample ID: Johnson 17-1 (HS23030062-01)**

- Surrogate recoveries were outside of the control limits due to matrix interference.

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**GC Volatiles by Method SW8015****Batch ID: R429176****Sample ID: Johnson 17-1 (HS23030062-01)**

- Surrogate failed outside of control limits high due to sample matrix interference. This was confirmed by sample reanalysis.

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**GCMS Volatiles by Method SW8260****Batch ID: R429323****Sample ID: Johnson 17-1 (HS23030062-01)**

- Lowest practical dilution due to matrix. Sample is oily.

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**Metals by Method E200.8****Batch ID: 190742****Sample ID: HS23030051-01MS**

- MS and MSD are for an unrelated sample

**Sample ID: Johnson 17-1 (HS23030062-01MS)**

- The MS and/or MSD recovery was outside of the control; however, the result in the parent sample is greater than 4x the spike amount.  
Barium, Potassium, Sodium

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**WetChemistry by Method SM2320B****Batch ID: R429892**

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

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**WetChemistry by Method E300****Batch ID: R429623****Sample ID: HS23030410-02MS**

- MS and MSD are for an unrelated sample (Chloride,Sulfate)

**Sample ID: Johnson 17-1 (HS23030062-01)**

- The reporting limit is elevated due to dilution for high concentrations of non-target analytes. (Sulfate)

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**Client:** PDC Energy  
**Project:** Johnson 17-1  
**Work Order:** HS23030062

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**CASE NARRATIVE**

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**WetChemistry by Method M2540C**

**Batch ID: R429250**

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.
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Client: PDC Energy  
 Project: Johnson 17-1  
 Sample ID: Johnson 17-1  
 Collection Date: 27-Feb-2023 11:50

**ANALYTICAL REPORT**

WorkOrder:HS23030062  
 Lab ID:HS23030062-01  
 Matrix:Water

ANALYSES	RESULT	QUAL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>LOW LEVEL VOLATILES BY SW8260C</b>		<b>Method:SW8260</b>		Analyst: PC		
<b>Benzene</b>	<b>1,500</b>		<b>1000</b>	<b>ug/L</b>	1000	04-Mar-2023 03:32
Ethylbenzene	ND		1000	ug/L	1000	04-Mar-2023 03:32
<b>m,p-Xylene</b>	<b>3,100</b>		<b>2000</b>	<b>ug/L</b>	1000	04-Mar-2023 03:32
o-Xylene	ND		1000	ug/L	1000	04-Mar-2023 03:32
<b>Toluene</b>	<b>5,600</b>		<b>1000</b>	<b>ug/L</b>	1000	04-Mar-2023 03:32
<b>Xylenes, Total</b>	<b>3,900</b>		<b>1000</b>	<b>ug/L</b>	1000	04-Mar-2023 03:32
<i>Surr: 1,2-Dichloroethane-d4</i>	92.5		70-126	%REC	1000	04-Mar-2023 03:32
<i>Surr: 4-Bromofluorobenzene</i>	103		77-113	%REC	1000	04-Mar-2023 03:32
<i>Surr: Dibromofluoromethane</i>	87.2		77-123	%REC	1000	04-Mar-2023 03:32
<i>Surr: Toluene-d8</i>	108		82-127	%REC	1000	04-Mar-2023 03:32
<b>GASOLINE RANGE ORGANICS BY SW8015C</b>		<b>Method:SW8015</b>		Analyst: PJM		
<b>Gasoline Range Organics</b>	<b>68.5</b>		<b>25.0</b>	<b>mg/L</b>	500	02-Mar-2023 14:01
<i>Surr: 4-Bromofluorobenzene</i>	851	S	70-123	%REC	500	02-Mar-2023 14:01
<b>DISSOLVED GASES BY RSK-175</b>		<b>Method:RSK-175</b>		Analyst: SAM		
<b>Ethane</b>	<b>2,940</b>		<b>500</b>	<b>ug/L</b>	500	08-Mar-2023 09:50
<b>Methane</b>	<b>8,930</b>		<b>250</b>	<b>ug/L</b>	500	08-Mar-2023 09:50
<b>Propane</b>	<b>2,590</b>		<b>500</b>	<b>ug/L</b>	500	08-Mar-2023 09:50
<b>TPH DRO/ORO BY SW8015C</b>		<b>Method:SW8015M</b>		Prep:SW3511 / 06-Mar-2023 Analyst: PPM		
<b>TPH (Diesel Range)</b>	<b>41</b>		<b>0.51</b>	<b>mg/L</b>	10	07-Mar-2023 18:33
<i>Surr: 2-Fluorobiphenyl</i>	1830	S	60-135	%REC	10	07-Mar-2023 18:33
<b>TOTAL METALS BY E200.8, REV 5.4, 1994</b>		<b>Method:E200.8</b>		Prep:E200.8 / 14-Mar-2023 Analyst: MSC		
<b>Calcium</b>	<b>142</b>		<b>0.500</b>	<b>mg/L</b>	1	14-Mar-2023 17:41
<b>Magnesium</b>	<b>0.554</b>		<b>0.500</b>	<b>mg/L</b>	1	14-Mar-2023 17:41
<b>Potassium</b>	<b>25.1</b>		<b>0.500</b>	<b>mg/L</b>	1	14-Mar-2023 17:41
<b>Sodium</b>	<b>2,210</b>		<b>20.0</b>	<b>mg/L</b>	100	15-Mar-2023 13:09
<b>ANIONS BY E300.0, REV 2.1, 1993</b>		<b>Method:E300</b>		Analyst: TH		
<b>Chloride</b>	<b>3,350</b>		<b>50.0</b>	<b>mg/L</b>	100	08-Mar-2023 19:55
Sulfate	ND		5.00	mg/L	10	08-Mar-2023 19:50
<b>TOTAL DISSOLVED SOLIDS BY SM2540C -2011</b>		<b>Method:M2540C</b>		Analyst: DC		
<b>Total Dissolved Solids (Residue, Filterable)</b>	<b>6,080</b>		<b>10.0</b>	<b>mg/L</b>	1	02-Mar-2023 08:00
<b>ALKALINITY BY SM 2320B-2011</b>		<b>Method:SM2320B</b>		Analyst: JAC		
<b>Alkalinity, Bicarbonate (As CaCO3)</b>	<b>25.9</b>		<b>5.00</b>	<b>mg/L</b>	1	11-Mar-2023 13:37
<b>Alkalinity, Carbonate (As CaCO3)</b>	<b>30.0</b>		<b>5.00</b>	<b>mg/L</b>	1	11-Mar-2023 13:37
<b>Alkalinity, Total (As CaCO3)</b>	<b>55.9</b>		<b>5.00</b>	<b>mg/L</b>	1	11-Mar-2023 13:37

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Weight / Prep Log

Client: PDC Energy  
Project: Johnson 17-1  
WorkOrder: HS23030062

Batch ID: 190413	Start Date: 06 Mar 2023 08:54	End Date: 07 Mar 2023 14:00
Method: SW3511		Prep Code: 3511_DRO

Sample ID	Container	Sample Wt/Vol	Final Volume	Prep Factor	
HS23030062-01		32.46 (mL)	2 (mL)	0.06161	40 mL Amber

Batch ID: 190742	Start Date: 14 Mar 2023 08:30	End Date: 14 Mar 2023 12:30
Method: TOTAL METALS PREP BY E200.8, REV 5.4, 1994		Prep Code: 200.8PR

Sample ID	Container	Sample Wt/Vol	Final Volume	Prep Factor	
HS23030062-01		10 (mL)	10 (mL)	1	250 mL plastic, HNO3 to pH <2

**Client:** PDC Energy  
**Project:** Johnson 17-1  
**WorkOrder:** HS23030062

**DATES REPORT**

Sample ID	Client Samp ID	Collection Date	Leachate Date	Prep Date	Analysis Date	DF
<b>Batch ID:</b> 190413 ( 0 )		<b>Test Name :</b> TPH DRO/ORO BY SW8015C			<b>Matrix:</b> Water	
HS23030062-01	Johnson 17-1	27 Feb 2023 11:50		06 Mar 2023 08:54	07 Mar 2023 18:33	10
<b>Batch ID:</b> 190742 ( 0 )		<b>Test Name :</b> TOTAL METALS BY E200.8, REV 5.4, 1994			<b>Matrix:</b> Water	
HS23030062-01	Johnson 17-1	27 Feb 2023 11:50		14 Mar 2023 08:30	15 Mar 2023 13:09	100
HS23030062-01	Johnson 17-1	27 Feb 2023 11:50		14 Mar 2023 08:30	14 Mar 2023 17:41	1
<b>Batch ID:</b> R429176 ( 0 )		<b>Test Name :</b> GASOLINE RANGE ORGANICS BY SW8015C			<b>Matrix:</b> Water	
HS23030062-01	Johnson 17-1	27 Feb 2023 11:50			02 Mar 2023 14:01	500
<b>Batch ID:</b> R429250 ( 0 )		<b>Test Name :</b> TOTAL DISSOLVED SOLIDS BY SM2540C-2011			<b>Matrix:</b> Water	
HS23030062-01	Johnson 17-1	27 Feb 2023 11:50			02 Mar 2023 08:00	1
<b>Batch ID:</b> R429323 ( 0 )		<b>Test Name :</b> LOW LEVEL VOLATILES BY SW8260C			<b>Matrix:</b> Water	
HS23030062-01	Johnson 17-1	27 Feb 2023 11:50			04 Mar 2023 03:32	1000
<b>Batch ID:</b> R429623 ( 0 )		<b>Test Name :</b> ANIONS BY E300.0, REV 2.1, 1993			<b>Matrix:</b> Water	
HS23030062-01	Johnson 17-1	27 Feb 2023 11:50			08 Mar 2023 19:55	100
HS23030062-01	Johnson 17-1	27 Feb 2023 11:50			08 Mar 2023 19:50	10
<b>Batch ID:</b> R429849 ( 0 )		<b>Test Name :</b> DISSOLVED GASES BY RSK-175			<b>Matrix:</b> Water	
HS23030062-01	Johnson 17-1	27 Feb 2023 11:50			08 Mar 2023 09:50	500
<b>Batch ID:</b> R429892 ( 0 )		<b>Test Name :</b> ALKALINITY BY SM 2320B-2011			<b>Matrix:</b> Water	
HS23030062-01	Johnson 17-1	27 Feb 2023 11:50			11 Mar 2023 13:37	1

**Client:** PDC Energy  
**Project:** Johnson 17-1  
**WorkOrder:** HS23030062

**QC BATCH REPORT**

Batch ID: 190413 ( 0 )		Instrument: FID-17		Method: TPH DRO/ORO BY SW8015C					
<b>MBLK</b>	Sample ID: <b>MBLK-190413</b>	Units: <b>mg/L</b>		Analysis Date: <b>07-Mar-2023 12:11</b>					
Client ID:	Run ID: <b>FID-17_429665</b>		SeqNo: <b>7163807</b>		PrepDate: <b>06-Mar-2023</b>		DF: <b>1</b>		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual

TPH (Diesel Range) ND 0.050

Surr: 2-Fluorobiphenyl 0.04962 0.0050 0.06 0 82.7 60 - 135

<b>LCS</b>	Sample ID: <b>LCS-190413</b>	Units: <b>mg/L</b>		Analysis Date: <b>07-Mar-2023 12:40</b>					
Client ID:	Run ID: <b>FID-17_429665</b>		SeqNo: <b>7163808</b>		PrepDate: <b>06-Mar-2023</b>		DF: <b>1</b>		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual

TPH (Diesel Range) 0.5085 0.050 0.6 0 84.8 70 - 130

Surr: 2-Fluorobiphenyl 0.07398 0.0050 0.06 0 123 60 - 135

<b>MS</b>	Sample ID: <b>HS23030265-01MS</b>	Units: <b>mg/L</b>		Analysis Date: <b>07-Mar-2023 15:37</b>					
Client ID:	Run ID: <b>FID-17_429665</b>		SeqNo: <b>7163810</b>		PrepDate: <b>06-Mar-2023</b>		DF: <b>1</b>		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual

TPH (Diesel Range) 0.5308 0.052 0.6203 0 85.6 70 - 130

Surr: 2-Fluorobiphenyl 0.07487 0.0052 0.06203 0 121 60 - 135

<b>MSD</b>	Sample ID: <b>HS23030265-01MSD</b>	Units: <b>mg/L</b>		Analysis Date: <b>07-Mar-2023 16:06</b>					
Client ID:	Run ID: <b>FID-17_429665</b>		SeqNo: <b>7163819</b>		PrepDate: <b>06-Mar-2023</b>		DF: <b>1</b>		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual

TPH (Diesel Range) 0.5247 0.051 0.6105 0 85.9 70 - 130 0.5308 1.16 20

Surr: 2-Fluorobiphenyl 0.07377 0.0051 0.06105 0 121 60 - 135 0.07487 1.48 20

The following samples were analyzed in this batch: HS23030062-01



Client: PDC Energy  
 Project: Johnson 17-1  
 WorkOrder: HS23030062

## QC BATCH REPORT

Batch ID: R429849 ( 0 )		Instrument: FID-4		Method: DISSOLVED GASES BY RSK-175					
<b>MBLK</b>	Sample ID: <b>MBLK-230308</b>	Units: <b>ug/L</b>		Analysis Date: <b>08-Mar-2023 08:08</b>					
Client ID:	Run ID: <b>FID-4_429849</b>	SeqNo: <b>7168015</b>		PrepDate:		DF: <b>1</b>			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
Ethane	ND	1.00							
Methane	ND	0.500							
Propane	ND	1.00							

<b>LCS</b>	Sample ID: <b>LCS-230308</b>	Units: <b>ug/L</b>		Analysis Date: <b>08-Mar-2023 08:26</b>					
Client ID:	Run ID: <b>FID-4_429849</b>	SeqNo: <b>7168016</b>		PrepDate:		DF: <b>1</b>			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
Ethane	20.18	1.00	18.04	0	112	75 - 125			
Methane	8.359	0.500	9.647	0	86.6	75 - 125			
Propane	30.07	1.00	26.46	0	114	75 - 125			

<b>LCSD</b>	Sample ID: <b>LCSD-230308</b>	Units: <b>ug/L</b>		Analysis Date: <b>08-Mar-2023 08:46</b>					
Client ID:	Run ID: <b>FID-4_429849</b>	SeqNo: <b>7168017</b>		PrepDate:		DF: <b>1</b>			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
Ethane	20.79	1.00	18.04	0	115	75 - 125	20.18	2.99	30
Methane	8.182	0.500	9.647	0	84.8	75 - 125	8.359	2.15	30
Propane	30.33	1.00	26.46	0	115	75 - 125	30.07	0.887	30

The following samples were analyzed in this batch: HS23030062-01

Client: PDC Energy  
 Project: Johnson 17-1  
 WorkOrder: HS23030062

## QC BATCH REPORT

Batch ID: R429176 ( 0 )		Instrument: FID-20		Method: GASOLINE RANGE ORGANICS BY SW8015C						
<b>MBLK</b>	Sample ID: MBLK-230302	Units: mg/L		Analysis Date: 02-Mar-2023 10:24						
Client ID:	Run ID: FID-20_429176		SeqNo: 7153614		PrepDate:		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Gasoline Range Organics	ND	0.0500								
Surr: 4-Bromofluorobenzene	0.08054	0.00500	0.1	0	80.5	70 - 121				
<b>LCS</b>	Sample ID: LCS-230302	Units: mg/L		Analysis Date: 02-Mar-2023 09:57						
Client ID:	Run ID: FID-20_429176		SeqNo: 7153612		PrepDate:		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Gasoline Range Organics	0.9124	0.0500	1	0	91.2	76 - 124				
Surr: 4-Bromofluorobenzene	0.08233	0.00500	0.1	0	82.3	52 - 138				
<b>LCSD</b>	Sample ID: LCSD-230302	Units: mg/L		Analysis Date: 02-Mar-2023 10:10						
Client ID:	Run ID: FID-20_429176		SeqNo: 7153613		PrepDate:		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Gasoline Range Organics	0.9315	0.0500	1	0	93.1	76 - 124	0.9124	2.07	20	
Surr: 4-Bromofluorobenzene	0.08305	0.00500	0.1	0	83.0	52 - 138	0.08233	0.867	20	
The following samples were analyzed in this batch: HS23030062-01										

**Client:** PDC Energy  
**Project:** Johnson 17-1  
**WorkOrder:** HS23030062

**QC BATCH REPORT**

Batch ID: 190742 ( 0 )		Instrument: ICPMS06		Method: TOTAL METALS BY E200.8, REV 5.4, 1994					
<b>MBLK</b>	Sample ID: <b>MBLK-190742</b>	Units: <b>ug/L</b>		Analysis Date: <b>15-Mar-2023 13:03</b>					
Client ID:	Run ID: <b>ICPMS06_430095</b>	SeqNo: <b>7173453</b>		PrepDate: <b>14-Mar-2023</b>		DF: <b>1</b>			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
Calcium	ND	500							
Magnesium	ND	500							
Potassium	ND	500							
Sodium	ND	200							

<b>LCS</b>	Sample ID: <b>LCS-190742</b>	Units: <b>ug/L</b>		Analysis Date: <b>14-Mar-2023 17:32</b>					
Client ID:	Run ID: <b>ICPMS06_429976</b>	SeqNo: <b>7171985</b>		PrepDate: <b>14-Mar-2023</b>		DF: <b>1</b>			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
Calcium	5189	500	5000	0	104	85 - 115			
Magnesium	5623	500	5000	0	112	85 - 115			
Potassium	5204	500	5000	0	104	85 - 115			
Sodium	5459	200	5000	0	109	85 - 115			

<b>MS</b>	Sample ID: <b>HS23030062-01MS</b>	Units: <b>ug/L</b>		Analysis Date: <b>14-Mar-2023 17:43</b>					
Client ID: <b>Johnson 17-1</b>	Run ID: <b>ICPMS06_429976</b>	SeqNo: <b>7171990</b>		PrepDate: <b>14-Mar-2023</b>		DF: <b>1</b>			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
Calcium	154100	500	5000	142200	239	70 - 130			SO
Magnesium	6120	500	5000	553.8	111	70 - 130			
Potassium	32200	500	5000	25110	142	70 - 130			SO
Sodium	2306000	200	5000	2209000	1940	70 - 130			SEO

<b>MS</b>	Sample ID: <b>HS23030051-01MS</b>	Units: <b>ug/L</b>		Analysis Date: <b>14-Mar-2023 17:36</b>					
Client ID:	Run ID: <b>ICPMS06_429976</b>	SeqNo: <b>7171987</b>		PrepDate: <b>14-Mar-2023</b>		DF: <b>1</b>			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
Calcium	207300	500	5000	185000	448	70 - 130			SEO
Magnesium	562800	500	5000	514600	964	70 - 130			SEO
Potassium	179700	500	5000	159500	402	70 - 130			SO
Sodium	4960000	200	5000	4658000	6050	70 - 130			SEO

**Client:** PDC Energy  
**Project:** Johnson 17-1  
**WorkOrder:** HS23030062

**QC BATCH REPORT**

Batch ID: 190742 ( 0 )		Instrument: ICPMS06		Method: TOTAL METALS BY E200.8, REV 5.4, 1994						
<b>MSD</b>		Sample ID: HS23030062-01MSD		Units: ug/L		Analysis Date: 14-Mar-2023 17:45				
Client ID: Johnson 17-1		Run ID: ICPMS06_429976		SeqNo: 7171991		PrepDate: 14-Mar-2023		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Calcium	146400	500	5000	142200	83.9	70 - 130	154100	5.15	20	O
Magnesium	5963	500	5000	553.8	108	70 - 130	6120	2.59	20	
Potassium	30610	500	5000	25110	110	70 - 130	32200	5.08	20	O
Sodium	2180000	200	5000	2209000	-572	70 - 130	2306000	5.6	20	SEO

<b>MSD</b>		Sample ID: HS23030051-01MSD		Units: ug/L		Analysis Date: 14-Mar-2023 17:39				
Client ID:		Run ID: ICPMS06_429976		SeqNo: 7171988		PrepDate: 14-Mar-2023		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Calcium	204400	500	5000	185000	389	70 - 130	207300	1.42	20	SEO
Magnesium	551000	500	5000	514600	728	70 - 130	562800	2.11	20	SEO
Potassium	177000	500	5000	159500	349	70 - 130	179700	1.5	20	SO
Sodium	4872000	200	5000	4658000	4280	70 - 130	4960000	1.8	20	SEO

The following samples were analyzed in this batch: HS23030062-01

Client: PDC Energy  
 Project: Johnson 17-1  
 WorkOrder: HS23030062

## QC BATCH REPORT

Batch ID: R429323 ( 0 )		Instrument: VOA6		Method: LOW LEVEL VOLATILES BY SW8260C					
<b>MBLK</b>	Sample ID: VBLKW-230303	Units: ug/L		Analysis Date: 03-Mar-2023 23:41					
Client ID:	Run ID: VOA6_429323	SeqNo: 7156734		PrepDate:		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
Benzene	ND	1.0							
Ethylbenzene	ND	1.0							
m,p-Xylene	ND	2.0							
o-Xylene	ND	1.0							
Toluene	ND	1.0							
Xylenes, Total	ND	1.0							
Surr: 1,2-Dichloroethane-d4	45.81	1.0	50	0	91.6	70 - 123			
Surr: 4-Bromofluorobenzene	52.22	1.0	50	0	104	77 - 113			
Surr: Dibromofluoromethane	43	1.0	50	0	86.0	73 - 126			
Surr: Toluene-d8	53.61	1.0	50	0	107	81 - 120			

<b>LCS</b>	Sample ID: VLCSW-230303	Units: ug/L		Analysis Date: 03-Mar-2023 22:59					
Client ID:	Run ID: VOA6_429323	SeqNo: 7156733		PrepDate:		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
Benzene	19.52	1.0	20	0	97.6	74 - 120			
Ethylbenzene	18.25	1.0	20	0	91.3	77 - 117			
m,p-Xylene	35.87	2.0	40	0	89.7	77 - 122			
o-Xylene	18.72	1.0	20	0	93.6	75 - 119			
Toluene	18.81	1.0	20	0	94.1	77 - 118			
Xylenes, Total	54.59	1.0	60	0	91.0	75 - 122			
Surr: 1,2-Dichloroethane-d4	55.16	1.0	50	0	110	70 - 123			
Surr: 4-Bromofluorobenzene	52.47	1.0	50	0	105	77 - 113			
Surr: Dibromofluoromethane	49.83	1.0	50	0	99.7	73 - 126			
Surr: Toluene-d8	49.54	1.0	50	0	99.1	81 - 120			

Client: PDC Energy  
 Project: Johnson 17-1  
 WorkOrder: HS23030062

## QC BATCH REPORT

Batch ID: R429323 ( 0 )		Instrument: VOA6		Method: LOW LEVEL VOLATILES BY SW8260C					
<b>MS</b>		Sample ID: HS23021376-06MS		Units: ug/L		Analysis Date: 04-Mar-2023 01:26			
Client ID:		Run ID: VOA6_429323		SeqNo: 7156738		PrepDate:		DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
Benzene	20.52	1.0	20	0	103	70 - 127			
Ethylbenzene	21.68	1.0	20	0	108	70 - 124			
m,p-Xylene	41.83	2.0	40	0	105	70 - 130			
o-Xylene	21.34	1.0	20	0	107	70 - 124			
Toluene	20.84	1.0	20	0	104	70 - 123			
Xylenes, Total	63.17	1.0	60	0	105	70 - 130			
Surr: 1,2-Dichloroethane-d4	46.54	1.0	50	0	93.1	70 - 126			
Surr: 4-Bromofluorobenzene	53.28	1.0	50	0	107	77 - 113			
Surr: Dibromofluoromethane	42.22	1.0	50	0	84.4	77 - 123			
Surr: Toluene-d8	53.57	1.0	50	0	107	82 - 127			

<b>MSD</b>		Sample ID: HS23021376-06MSD		Units: ug/L		Analysis Date: 04-Mar-2023 01:47			
Client ID:		Run ID: VOA6_429323		SeqNo: 7156739		PrepDate:		DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
Benzene	20.12	1.0	20	0	101	70 - 127	20.52	1.99	20
Ethylbenzene	21.32	1.0	20	0	107	70 - 124	21.68	1.65	20
m,p-Xylene	41.9	2.0	40	0	105	70 - 130	41.83	0.174	20
o-Xylene	21.02	1.0	20	0	105	70 - 124	21.34	1.54	20
Toluene	20.75	1.0	20	0	104	70 - 123	20.84	0.421	20
Xylenes, Total	62.92	1.0	60	0	105	70 - 130	63.17	0.4	20
Surr: 1,2-Dichloroethane-d4	46.01	1.0	50	0	92.0	70 - 126	46.54	1.14	20
Surr: 4-Bromofluorobenzene	52.69	1.0	50	0	105	77 - 113	53.28	1.12	20
Surr: Dibromofluoromethane	42.06	1.0	50	0	84.1	77 - 123	42.22	0.376	20
Surr: Toluene-d8	53.87	1.0	50	0	108	82 - 127	53.57	0.561	20

The following samples were analyzed in this batch: HS23030062-01

**Client:** PDC Energy  
**Project:** Johnson 17-1  
**WorkOrder:** HS23030062

**QC BATCH REPORT**

Batch ID: R429250 ( 0 )		Instrument: Balance1		Method: TOTAL DISSOLVED SOLIDS BY SM2540C-2011						
MBLK	Sample ID: WBLK-03022023	Units: mg/L		Analysis Date: 02-Mar-2023 08:00						
Client ID:	Run ID: Balance1_429250	SeqNo: 7155319		PrepDate:		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Total Dissolved Solids (Residue, Filterable)		ND	10.0							

LCS	Sample ID: LCS-030223	Units: mg/L		Analysis Date: 02-Mar-2023 08:00						
Client ID:	Run ID: Balance1_429250	SeqNo: 7155318		PrepDate:		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Total Dissolved Solids (Residue, Filterable)		1098	10.0	1000	0	110	85 - 115			

DUP	Sample ID: HS23030067-01DUP	Units: mg/L		Analysis Date: 02-Mar-2023 08:00						
Client ID:	Run ID: Balance1_429250	SeqNo: 7155317		PrepDate:		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Total Dissolved Solids (Residue, Filterable)		494	10.0				494	0	20	

DUP	Sample ID: HS23021399-02DUP	Units: mg/L		Analysis Date: 02-Mar-2023 08:00						
Client ID:	Run ID: Balance1_429250	SeqNo: 7155308		PrepDate:		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Total Dissolved Solids (Residue, Filterable)		1046	10.0				1046	0	20	

The following samples were analyzed in this batch:		HS23030062-01
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**Client:** PDC Energy  
**Project:** Johnson 17-1  
**WorkOrder:** HS23030062

**QC BATCH REPORT**

Batch ID: R429623 ( 0 )		Instrument: ICS-Integrion		Method: ANIONS BY E300.0, REV 2.1, 1993						
<b>MBLK</b>	Sample ID: MBLK	Units: mg/L		Analysis Date: 08-Mar-2023 18:28						
Client ID:	Run ID: ICS-Integrion_429623		SeqNo: 7163130		PrepDate:		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	ND	0.500								
Sulfate	ND	0.500								

<b>LCS</b>	Sample ID: LCS	Units: mg/L		Analysis Date: 08-Mar-2023 18:34						
Client ID:	Run ID: ICS-Integrion_429623		SeqNo: 7163131		PrepDate:		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	19.25	0.500	20	0	96.2	90 - 110				
Sulfate	19.72	0.500	20	0	98.6	90 - 110				

<b>MS</b>	Sample ID: HS23030410-02MS	Units: mg/L		Analysis Date: 08-Mar-2023 18:46						
Client ID:	Run ID: ICS-Integrion_429623		SeqNo: 7163133		PrepDate:		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	57.18	0.500	10	50.38	68.0	80 - 120				SO
Sulfate	56.04	0.500	10	49.39	66.5	80 - 120				SO

<b>MSD</b>	Sample ID: HS23030410-02MSD	Units: mg/L		Analysis Date: 08-Mar-2023 18:52						
Client ID:	Run ID: ICS-Integrion_429623		SeqNo: 7163134		PrepDate:		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	57.49	0.500	10	50.38	71.2	80 - 120	57.18	0.546	20	SO
Sulfate	56.26	0.500	10	49.39	68.7	80 - 120	56.04	0.392	20	SO

The following samples were analyzed in this batch: HS23030062-01



**Client:** PDC Energy  
**Project:** Johnson 17-1  
**WorkOrder:** HS23030062

**QC BATCH REPORT**

Batch ID: R429892 ( 0 )		Instrument: Skalar 03		Method: ALKALINITY BY SM 2320B-2011					
<b>MBLK</b>	Sample ID: MBLK-R429892	Units: mg/L		Analysis Date: 11-Mar-2023 13:37					
Client ID:	Run ID: Skalar 03_429892	SeqNo: 7169103		PrepDate:		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
Alkalinity, Bicarbonate (As CaCO3)	ND	5.00							
Alkalinity, Carbonate (As CaCO3)	ND	5.00							
Alkalinity, Total (As CaCO3)	ND	5.00							

<b>LCS</b>	Sample ID: LCS-R429892	Units: mg/L		Analysis Date: 11-Mar-2023 13:37					
Client ID:	Run ID: Skalar 03_429892	SeqNo: 7169102		PrepDate:		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
Alkalinity, Carbonate (As CaCO3)	909.8	5.00	1000	0	91.0	85 - 115			
Alkalinity, Total (As CaCO3)	948.2	5.00	1000	0	94.8	85 - 115			

<b>LCSD</b>	Sample ID: LCSD-R429892	Units: mg/L		Analysis Date: 11-Mar-2023 13:37					
Client ID:	Run ID: Skalar 03_429892	SeqNo: 7169101		PrepDate:		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
Alkalinity, Carbonate (As CaCO3)	923	5.00	1000	0	92.3	85 - 115	909.8	1.44	20
Alkalinity, Total (As CaCO3)	956.5	5.00	1000	0	95.6	85 - 115	948.2	0.872	20

<b>DUP</b>	Sample ID: HS23030195-10DUP	Units: mg/L		Analysis Date: 11-Mar-2023 13:37					
Client ID:	Run ID: Skalar 03_429892	SeqNo: 7169104		PrepDate:		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
Alkalinity, Bicarbonate (As CaCO3)	652	5.00					770	16.6	20
Alkalinity, Carbonate (As CaCO3)	ND	5.00					0	0	20
Alkalinity, Total (As CaCO3)	652	5.00					770	16.6	20

The following samples were analyzed in this batch: HS23030062-01

**Client:** PDC Energy  
**Project:** Johnson 17-1  
**WorkOrder:** HS23030062

**QUALIFIERS,  
ACRONYMS, UNITS**

<b>Qualifier</b>	<b>Description</b>
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
M	Manually integrated, see raw data for justification
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL/SDL

<b>Acronym</b>	<b>Description</b>
DCS	Detectability Check Study
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitation Limit
SD	Serial Dilution
SDL	Sample Detection Limit
TRRP	Texas Risk Reduction Program

<b>Unit Reported</b>	<b>Description</b>
mg/L	Milligrams per Liter

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**CERTIFICATIONS,ACCREDITATIONS & LICENSES**

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Agency	Number	Expire Date
Arkansas	22-041-0	27-Mar-2023
California	2919 2022-2023	30-Apr-2023
Dept of Defense	L21-682	31-Dec-2023
Florida	E87611-36	30-Jun-2023
Illinois	2000322022-9	09-May-2023
Kansas	E-10352; 2022-2023	31-Jul-2023
Kentucky	123043, 2022-2023	30-Apr-2023
Louisiana	03087, 2022-2023	30-Jun-2023
Maryland	343, 2022-2023	30-Jun-2023
North Carolina	624-2023	31-Dec-2023
North Dakota	R-193 2022-2023	30-Apr-2023
Oklahoma	2022-141	31-Aug-2023
Texas	T104704231-22-29	30-Apr-2023
Utah	TX026932022-13	31-Jul-2023

## Sample Receipt Checklist

Work Order ID: HS23030062

Date/Time Received: 01-Mar-2023 10:00

Client Name: PDC Energy 80203

Received by: Corey Grandits

Completed By: /S/ Corey Grandits

01-Mar-2023 16:16

Reviewed by: /S/ Tyler Monroe

02-Mar-2023 09:28

eSignature

Date/Time

eSignature

Date/Time

Matrices: WCarrier name: FedEx

Shipping container/cooler in good condition?

Yes ☒No ☐Not Present ☐

Custody seals intact on shipping container/cooler?

Yes ☐No ☐Not Present ☒

Custody seals intact on sample bottles?

Yes ☐No ☐Not Present ☒

VOA/TX1005/TX1006 Solids in hermetically sealed vials?

Yes ☐No ☐Not Present ☒

Chain of custody present?

Yes ☒No ☐

1 Page(s)

Chain of custody signed when relinquished and received?

Yes ☒No ☐

Samplers name present on COC?

Yes ☒No ☐

Chain of custody agrees with sample labels?

Yes ☒No ☐

Samples in proper container/bottle?

Yes ☒No ☐

Sample containers intact?

Yes ☒No ☐

Sufficient sample volume for indicated test?

Yes ☒No ☐

All samples received within holding time?

Yes ☒No ☐

Container/Temp Blank temperature in compliance?

Yes ☒No ☐

Temperature(s)/Thermometer(s):

2.9UC/2.4C

IR31

Cooler(s)/Kit(s):

Sm Blue

Date/Time sample(s) sent to storage:

3/1/23

Water - VOA vials have zero headspace?

Yes ☒No ☐No VOA vials submitted ☐

Water - pH acceptable upon receipt?

Yes ☒No ☐N/A ☐

pH adjusted?

Yes ☐No ☒N/A ☐

pH adjusted by:

Login Notes:

Client Contacted:

Date Contacted:

Person Contacted:

Contacted By:

Regarding:

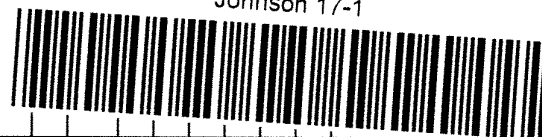
Comments:

Corrective Action:

**ALS Environmental**965 E 11th St, Loveland, CO 80537  
Phone: 970-305-1648**Chain-of-Custody**

WORKORDER #	
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PROJECT NAME Johnson 17-1		SAMPLER Jeff Braden		DATE 2/27/23		PAGE 1 of 1										
PROJECT No. 09C2073336		FACILITY ID 123 - 10669		TURNAROUND Standard		DISPOSAL By Lab or Return to Client										
PDCE Bradenhead Sampling		EDD FORMAT COGCC EDD, LTE														
COMPANY NAME PDCE Energy		PURCHASE ORDER N/A														
SEND REPORT TO Jenifer Hakkarinen		BILL TO COMPANY PDCE Energy														
ADDRESS 1775 Sherman Street, Suite 3000		INVOICE ATTN TO Jenifer Hakkarinen														
CITY / STATE / ZIP Denver, Colorado 80203		ADDRESS 1775 Sherman Street, Suite 3000														
PHONE 303.860.5815		CITY / STATE / ZIP Denver, Colorado 80203														
E-MAIL jenifer.hakkarinen@pdce.com		PHONE 303.860.5815														
jessica.johannsen@pdce.com		E-MAIL jenifer.hakkarinen@pdce.com														
jbraden@ensolum.com																
Lab ID	Field ID	Matrix	Sample Date	Sample Time	# Bottles	Pres.	QC	RSK 175	SW8260.2	SW8015M	SM2320B	EPA200.7/2	EPA 300.0	SM2540C		
	Johnson 17-1	W	2/27/23	1150	11	1,3		X	X	X	X	X	X	X		

**HS23030062**PDC Energy  
Johnson 17-1

\*Time Zone (Circle): EST CST PST Matrix: O = oil S = soil NS = non-soil solid W = water L = liquid E = extract F = filter

For metals or anions, please detail analytes below.

Comments:	Cations/Anions:	QC PACKAGE (check below)
Calcium, Chloride, Magnesium, Potassium, Sodium, Sulfate		LEVEL II (Standard QC)
Samples analyzed per		LEVEL III (Std QC + forms)
COGCC Bradenhead Sampling Program	1231 2.96	LEVEL IV (Std QC + forms + raw data)
	5M BWE	
Preservative Key: 1-HCl 2-HNO3 3-H2SO4 4-HaOH 5-NaHSO4 7-Cmer 8-4 degrees C 9-5035		

	SIGNATURE	PRINTED NAME	DATE	TIME
RELINQUISHED BY		Jeff Braden	2-28-23	1200
RECEIVED BY		Tyler Monroe	2/28/23	1200
RELINQUISHED BY		Tyler Monroe	2/28/23	1600
RECEIVED BY		ch	3-1-23	1000
RELINQUISHED BY				
RECEIVED BY				

TRK# 6182 5243 5864  
0201  
FedEx  
TRK# 6182 5243 5864  
0201  
WED - 01 MAR 10:30A  
PRIORITY OVERNIGHT  
WED - 01 MAR AA  
PRIORITY OVERNIGHT  
VA SCRA 77099