



10450 Stancliff Rd. Suite 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887

June 13, 2024

Jessica Johannsen
PDC Energy
1775 Sherman Street
Suite 3000
Denver, CO 80203

Work Order: **HS24060009**

Laboratory Results for: **Fern 11U-434**

Dear Jessica Johannsen,

ALS Environmental received 1 sample(s) on Jun 01, 2024 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: Fern 11U-434
Work Order: HS24060009

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS24060009-01	Fern 11U-434	Water		31-May-2024 10:30	01-Jun-2024 09:20	<input type="checkbox"/>

Client: PDC Energy
Project: Fern 11U-434
Work Order: HS24060009

CASE NARRATIVE

GC Semivolatiles by Method RSK-175**Batch ID: R469143**

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

GC Semivolatiles by Method SW8015M**Batch ID: 212880****Sample ID: Fern 11U-434 (HS24060009-01)**

- The surrogate recoveries could not be determined due to dilution below the calibration range.

GC Volatiles by Method SW8015**Batch ID: R469260****Sample ID: Fern 11U-434 (HS24060009-01)**

- Lowest possible dilution due to sample matrix.

GCMS Volatiles by Method SW8260**Batch ID: R469037**

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

Metals by Method E200.8**Batch ID: 213206****Sample ID: Fern 11U-434 (HS24060009-01)**

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

Sample ID: HS24051854-02MS

- MS and MSD are for an unrelated sample

Sample ID: HS24051854-04MS

- MS and MSD are for an unrelated sample

WetChemistry by Method E300**Batch ID: R469019****Sample ID: HS24060278-01MS**

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

WetChemistry by Method M2540C**Batch ID: R468568**

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

Client: PDC Energy
Project: Fern 11U-434
Work Order: HS24060009

CASE NARRATIVE

WetChemistry by Method SM2320B

Batch ID: R468549

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

Client: PDC Energy
 Project: Fern 11U-434
 Sample ID: Fern 11U-434
 Collection Date: 31-May-2024 10:30

ANALYTICAL REPORT

WorkOrder: HS24060009
 Lab ID: HS24060009-01
 Matrix: Water

ANALYSES	RESULT	QUAL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C			Method: SW8260		Analyst: AKP	
Benzene	430		100	ug/L	100	11-Jun-2024 06:25
Ethylbenzene	ND		100	ug/L	100	11-Jun-2024 06:25
m,p-Xylene	ND		200	ug/L	100	11-Jun-2024 06:25
o-Xylene	ND		100	ug/L	100	11-Jun-2024 06:25
Toluene	450		100	ug/L	100	11-Jun-2024 06:25
Xylenes, Total	ND		300	ug/L	100	11-Jun-2024 06:25
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>95.8</i>		<i>70-126</i>	<i>%REC</i>	<i>100</i>	<i>11-Jun-2024 06:25</i>
<i>Surr: 4-Bromofluorobenzene</i>	<i>94.9</i>		<i>77-113</i>	<i>%REC</i>	<i>100</i>	<i>11-Jun-2024 06:25</i>
<i>Surr: Dibromofluoromethane</i>	<i>101</i>		<i>77-123</i>	<i>%REC</i>	<i>100</i>	<i>11-Jun-2024 06:25</i>
<i>Surr: Toluene-d8</i>	<i>99.0</i>		<i>82-127</i>	<i>%REC</i>	<i>100</i>	<i>11-Jun-2024 06:25</i>
GASOLINE RANGE ORGANICS BY SW8015C			Method: SW8015		Analyst: TS	
Gasoline Range Organics	ND		25.0	mg/L	500	12-Jun-2024 22:05
<i>Surr: 4-Bromofluorobenzene</i>	<i>84.1</i>		<i>70-123</i>	<i>%REC</i>	<i>500</i>	<i>12-Jun-2024 22:05</i>
DISSOLVED GASES BY RSK-175			Method: RSK-175		Analyst: RG	
Ethane	818		100	ug/L	100	12-Jun-2024 12:58
Methane	3,130		50.0	ug/L	100	12-Jun-2024 12:58
Propane	325		100	ug/L	100	12-Jun-2024 12:58
TPH DRO/ORO BY SW8015C			Method: SW8015M		Prep: SW3511 / 01-Jun-2024	Analyst: SAM
TPH (Diesel Range)	25		0.52	mg/L	10	06-Jun-2024 17:20
<i>Surr: 2-Fluorobiphenyl</i>	<i>0</i>	<i>JS</i>	<i>60-135</i>	<i>%REC</i>	<i>10</i>	<i>06-Jun-2024 17:20</i>
TOTAL METALS BY E200.8, REV 5.4, 1994			Method: E200.8		Prep: E200.8 / 07-Jun-2024	Analyst: JC
Calcium	47.2		2.50	mg/L	5	11-Jun-2024 16:51
Magnesium	ND		2.50	mg/L	5	11-Jun-2024 16:51
Potassium	277		2.50	mg/L	5	11-Jun-2024 16:51
Sodium	2,020		10.0	mg/L	50	11-Jun-2024 18:18
ANIONS BY E300.0, REV 2.1, 1993			Method: E300		Analyst: TH	
Chloride	2,090		25.0	mg/L	50	10-Jun-2024 22:40
Sulfate	493		2.50	mg/L	5	10-Jun-2024 22:34
TOTAL DISSOLVED SOLIDS BY SM2540C -2011			Method: M2540C		Analyst: MH	
Total Dissolved Solids (Residue, Filterable)	6,270		10.0	mg/L	1	05-Jun-2024 09:30
ALKALINITY BY -2011			Method: SM2320B		Analyst: AR	
Alkalinity, Bicarbonate (As CaCO3)	335		50.0	mg/L	10	04-Jun-2024 16:59
Alkalinity, Carbonate (As CaCO3)	1,010		50.0	mg/L	10	04-Jun-2024 16:59
Alkalinity, Total (As CaCO3)	1,340		50.0	mg/L	10	04-Jun-2024 16:59

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

Weight / Prep Log

Client: PDC Energy
Project: Fern 11U-434
WorkOrder: HS24060009

Batch ID: 212880	Start Date: 01 Jun 2024 12:39	End Date: 01 Jun 2024 12:39
Method: SW3511	Prep Code: 3511_DRO	

Sample ID	Container	Sample Wt/Vol	Final Volume	Prep Factor	
HS24060009-01		31.81 (mL)	2 (mL)	0.06287	40 mL Amber

Batch ID: 213206	Start Date: 07 Jun 2024 14:00	End Date: 07 Jun 2024 14:00
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	
HS24060009-01		10 (mL)	10 (mL)	1	250 mL plastic, HNO3 to pH <2

Client: PDC Energy
Project: Fern 11U-434
WorkOrder: HS24060009

DATES REPORT

Sample ID	Client Samp ID	Collection Date	Leachate Date	Prep Date	Analysis Date	DF
Batch ID: 212880 (0)		Test Name : TPH DRO/ORO BY SW8015C			Matrix: Water	
HS24060009-01	Fern 11U-434	31 May 2024 10:30		01 Jun 2024 12:39	06 Jun 2024 17:20	10
Batch ID: 213206 (0)		Test Name : TOTAL METALS BY E200.8, REV 5.4, 1994			Matrix: Water	
HS24060009-01	Fern 11U-434	31 May 2024 10:30		07 Jun 2024 14:00	11 Jun 2024 18:18	50
HS24060009-01	Fern 11U-434	31 May 2024 10:30		07 Jun 2024 14:00	11 Jun 2024 16:51	5
Batch ID: R468549 (0)		Test Name : ALKALINITY BY -2011			Matrix: Water	
HS24060009-01	Fern 11U-434	31 May 2024 10:30			04 Jun 2024 16:59	10
Batch ID: R468568 (0)		Test Name : TOTAL DISSOLVED SOLIDS BY SM2540C-2011			Matrix: Water	
HS24060009-01	Fern 11U-434	31 May 2024 10:30			05 Jun 2024 09:30	1
Batch ID: R469019 (0)		Test Name : ANIONS BY E300.0, REV 2.1, 1993			Matrix: Water	
HS24060009-01	Fern 11U-434	31 May 2024 10:30			10 Jun 2024 22:40	50
HS24060009-01	Fern 11U-434	31 May 2024 10:30			10 Jun 2024 22:34	5
Batch ID: R469037 (0)		Test Name : LOW LEVEL VOLATILES BY SW8260C			Matrix: Water	
HS24060009-01	Fern 11U-434	31 May 2024 10:30			11 Jun 2024 06:25	100
Batch ID: R469143 (0)		Test Name : DISSOLVED GASES BY RSK-175			Matrix: Water	
HS24060009-01	Fern 11U-434	31 May 2024 10:30			12 Jun 2024 12:58	100
Batch ID: R469260 (0)		Test Name : GASOLINE RANGE ORGANICS BY SW8015C			Matrix: Water	
HS24060009-01	Fern 11U-434	31 May 2024 10:30			12 Jun 2024 22:05	500

Client: PDC Energy
Project: Fern 11U-434
WorkOrder: HS24060009

QC BATCH REPORT

Batch ID: 212880 (0)		Instrument: FID-16		Method: TPH DRO/ORO BY SW8015C						
MBLK	Sample ID: MBLK-212880	Units: mg/L		Analysis Date: 04-Jun-2024 14:19						
Client ID:		Run ID: FID-16_468847		SeqNo: 8054874	PrepDate: 01-Jun-2024		DF: 1			
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	0.06182	0.0050	0.06	0	103	60 - 135				
LCS	Sample ID: LCS-212880	Units: mg/L		Analysis Date: 04-Jun-2024 13:21						
Client ID:		Run ID: FID-16_468847		SeqNo: 8054872	PrepDate: 01-Jun-2024		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
TPH (Diesel Range)	0.5736	0.050	0.6	0	95.6	70 - 130				
Surr: 2-Fluorobiphenyl	0.06892	0.0050	0.06	0	115	60 - 135				
LCSD	Sample ID: LCSD-212880	Units: mg/L		Analysis Date: 04-Jun-2024 13:50						
Client ID:		Run ID: FID-16_468847		SeqNo: 8054873	PrepDate: 01-Jun-2024		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
TPH (Diesel Range)	0.6319	0.050	0.6	0	105	70 - 130	0.5736	9.67	20	
Surr: 2-Fluorobiphenyl	0.07469	0.0050	0.06	0	124	60 - 135	0.06892	8.04	20	
The following samples were analyzed in this batch: HS24060009-01										

Client: PDC Energy
 Project: Fern 11U-434
 WorkOrder: HS24060009

QC BATCH REPORT

Batch ID: R469143 (0)		Instrument: FID-4		Method: DISSOLVED GASES BY RSK-175					
MBLK	Sample ID: MBLK-240612	Units: ug/L		Analysis Date: 12-Jun-2024 11:30					
Client ID:	Run ID: FID-4_469143	SeqNo: 8065649		PrepDate:		DF: 1			
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	1.50							

LCS	Sample ID: LCS-240612	Units: ug/L		Analysis Date: 12-Jun-2024 11:44					
Client ID:	Run ID: FID-4_469143	SeqNo: 8065650		PrepDate:		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
Ethane	17.33	1.00	18.04	0	96.1	75 - 125			
Methane	11.1	0.500	9.647	0	115	75 - 125			
Propane	21.87	1.50	26.46	0	82.7	75 - 125			

LCSD	Sample ID: LCSD-240612	Units: ug/L		Analysis Date: 12-Jun-2024 12:00					
Client ID:	Run ID: FID-4_469143	SeqNo: 8065651		PrepDate:		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
Ethane	16.09	1.00	18.04	0	89.2	75 - 125	17.33	7.43	30
Methane	9.247	0.500	9.647	0	95.9	75 - 125	11.1	18.2	30
Propane	20.93	1.50	26.46	0	79.1	75 - 125	21.87	4.41	30

The following samples were analyzed in this batch: HS24060009-01

Client: PDC Energy
 Project: Fern 11U-434
 WorkOrder: HS24060009

QC BATCH REPORT

Batch ID: R469260 (0)		Instrument: FID-20		Method: GASOLINE RANGE ORGANICS BY SW8015C						
MBLK	Sample ID: MBLK-240612	Units: mg/L		Analysis Date: 12-Jun-2024 16:25						
Client ID:	Run ID: FID-20_469260		SeqNo: 8067639		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	0.08361	0.00500	0.1	0	83.6	70 - 121				
LCS	Sample ID: LCS-240612	Units: mg/L		Analysis Date: 12-Jun-2024 15:57						
Client ID:	Run ID: FID-20_469260		SeqNo: 8067637		PrepDate:		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Gasoline Range Organics	0.8135	0.0500	1	0	81.4	76 - 124				
Surr: 4-Bromofluorobenzene	0.08624	0.00500	0.1	0	86.2	52 - 138				
LCSD	Sample ID: LCSD-240612	Units: mg/L		Analysis Date: 12-Jun-2024 16:11						
Client ID:	Run ID: FID-20_469260		SeqNo: 8067638		PrepDate:		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Gasoline Range Organics	0.8075	0.0500	1	0	80.8	76 - 124	0.8135	0.744	20	
Surr: 4-Bromofluorobenzene	0.08745	0.00500	0.1	0	87.4	52 - 138	0.08624	1.39	20	
The following samples were analyzed in this batch: HS24060009-01										

Client: PDC Energy
Project: Fern 11U-434
WorkOrder: HS24060009

QC BATCH REPORT

Batch ID: 213206 (0)		Instrument: ICPMS06		Method: TOTAL METALS BY E200.8, REV 5.4, 1994					
MBLK	Sample ID: MBLK-213206	Units: ug/L		Analysis Date: 11-Jun-2024 17:27					
Client ID:	Run ID: ICPMS06_469052	SeqNo: 8064068		PrepDate: 07-Jun-2024		DF: 1			
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							

LCS	Sample ID: LCS-213206	Units: ug/L		Analysis Date: 11-Jun-2024 14:08					
Client ID:	Run ID: ICPMS06_469052	SeqNo: 8063554		PrepDate: 07-Jun-2024		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
Calcium	4774	500	5000	0	95.5	85 - 115			
Magnesium	4452	500	5000	0	89.0	85 - 115			
Potassium	4477	500	5000	0	89.5	85 - 115			
Sodium	4588	200	5000	0	91.8	85 - 115			

MS	Sample ID: HS24051854-04MS	Units: ug/L		Analysis Date: 11-Jun-2024 14:22					
Client ID:	Run ID: ICPMS06_469052	SeqNo: 8063560		PrepDate: 07-Jun-2024		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
Calcium	38180	500	5000	37590	11.8	70 - 130			SO
Magnesium	6559	500	5000	2434	82.5	70 - 130			
Potassium	10010	500	5000	6131	77.5	70 - 130			
Sodium	14760	200	5000	11180	71.5	70 - 130			

MS	Sample ID: HS24051854-02MS	Units: ug/L		Analysis Date: 11-Jun-2024 14:14					
Client ID:	Run ID: ICPMS06_469052	SeqNo: 8063556		PrepDate: 07-Jun-2024		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
Calcium	39980	500	5000	38600	27.6	70 - 130			SO
Magnesium	6611	500	5000	2695	78.3	70 - 130			
Potassium	7799	500	5000	3876	78.5	70 - 130			

Client: PDC Energy
Project: Fern 11U-434
WorkOrder: HS24060009

QC BATCH REPORT

Batch ID: 213206 (0)		Instrument: ICPMS06		Method: TOTAL METALS BY E200.8, REV 5.4, 1994						
MS	Sample ID: HS24051854-02MS	Units: ug/L		Analysis Date: 11-Jun-2024 17:33						
Client ID:	Run ID: ICPMS06_469052	SeqNo: 8064071		PrepDate: 07-Jun-2024		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sodium	14820	200	5000	10350	89.4	70 - 130				
MSD	Sample ID: HS24051854-04MSD	Units: ug/L		Analysis Date: 11-Jun-2024 14:24						
Client ID:	Run ID: ICPMS06_469052	SeqNo: 8063561		PrepDate: 07-Jun-2024		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Calcium	42150	500	5000	37590	91.3	70 - 130	38180	9.9	20	O
Magnesium	7010	500	5000	2434	91.5	70 - 130	6559	6.66	20	
Potassium	10740	500	5000	6131	92.2	70 - 130	10010	7.09	20	
Sodium	16020	200	5000	11180	96.7	70 - 130	14760	8.18	20	
MSD	Sample ID: HS24051854-02MSD	Units: ug/L		Analysis Date: 11-Jun-2024 14:16						
Client ID:	Run ID: ICPMS06_469052	SeqNo: 8063557		PrepDate: 07-Jun-2024		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Calcium	44560	500	5000	38600	119	70 - 130	39980	10.9	20	O
Magnesium	7391	500	5000	2695	93.9	70 - 130	6611	11.1	20	
Potassium	8710	500	5000	3876	96.7	70 - 130	7799	11	20	
Sodium	15290	200	5000	10350	98.9	70 - 130	13640	11.4	20	
The following samples were analyzed in this batch: HS24060009-01										

Client: PDC Energy
Project: Fern 11U-434
WorkOrder: HS24060009

QC BATCH REPORT

Batch ID: R469037 (0)		Instrument: VOA4		Method: LOW LEVEL VOLATILES BY SW8260C					
MBLK	Sample ID: VBLKW-240610	Units: ug/L		Analysis Date: 10-Jun-2024 22:40					
Client ID:	Run ID: VOA4_469037	SeqNo: 8062095		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	3.0							
Surr: 1,2-Dichloroethane-d4	48.2	1.0	50	0	96.4	70 - 123			
Surr: 4-Bromofluorobenzene	48.4	1.0	50	0	96.8	77 - 113			
Surr: Dibromofluoromethane	51.26	1.0	50	0	103	73 - 126			
Surr: Toluene-d8	49.1	1.0	50	0	98.2	81 - 120			

LCS	Sample ID: VLCSW-240610	Units: ug/L		Analysis Date: 10-Jun-2024 21:32					
Client ID:	Run ID: VOA4_469037	SeqNo: 8062093		PrepDate:		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
Benzene	18.25	1.0	20	0	91.3	74 - 120			
Ethylbenzene	18.8	1.0	20	0	94.0	77 - 117			
m,p-Xylene	37.68	2.0	40	0	94.2	77 - 122			
o-Xylene	18.32	1.0	20	0	91.6	75 - 119			
Toluene	18.5	1.0	20	0	92.5	77 - 118			
Xylenes, Total	56	3.0	60	0	93.3	75 - 122			
Surr: 1,2-Dichloroethane-d4	48.27	1.0	50	0	96.5	70 - 123			
Surr: 4-Bromofluorobenzene	49.06	1.0	50	0	98.1	77 - 113			
Surr: Dibromofluoromethane	50.08	1.0	50	0	100	73 - 126			
Surr: Toluene-d8	50.52	1.0	50	0	101	81 - 120			

Client: PDC Energy
Project: Fern 11U-434
WorkOrder: HS24060009

QC BATCH REPORT

Batch ID: R469037 (0)		Instrument: VOA4		Method: LOW LEVEL VOLATILES BY SW8260C					
LCSD		Sample ID: VLCS DW-240610		Units: ug/L		Analysis Date: 10-Jun-2024 21:55			
Client ID:		Run ID: VOA4_469037		SeqNo: 8062094		PrepDate:		DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
Benzene	18.19	1.0	20	0	91.0	74 - 120	18.25	0.33	20
Ethylbenzene	18.25	1.0	20	0	91.3	77 - 117	18.8	2.95	20
m,p-Xylene	37.78	2.0	40	0	94.4	77 - 122	37.68	0.265	20
o-Xylene	17.86	1.0	20	0	89.3	75 - 119	18.32	2.55	20
Toluene	17.74	1.0	20	0	88.7	77 - 118	18.5	4.15	20
Xylenes, Total	55.63	3.0	60	0	92.7	75 - 122	56	0.648	20
Surr: 1,2-Dichloroethane-d4	47.85	1.0	50	0	95.7	70 - 123	48.27	0.875	20
Surr: 4-Bromofluorobenzene	50.15	1.0	50	0	100	77 - 113	49.06	2.19	20
Surr: Dibromofluoromethane	50.94	1.0	50	0	102	73 - 126	50.08	1.7	20
Surr: Toluene-d8	51.01	1.0	50	0	102	81 - 120	50.52	0.955	20

MS		Sample ID: HS24060414-03MS		Units: ug/L		Analysis Date: 11-Jun-2024 06:48			
Client ID:		Run ID: VOA4_469037		SeqNo: 8062120		PrepDate:		DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
Benzene	17.59	1.0	20	0	87.9	70 - 127			
Ethylbenzene	17.65	1.0	20	0	88.2	70 - 124			
m,p-Xylene	36.29	2.0	40	0	90.7	70 - 130			
o-Xylene	17.9	1.0	20	0	89.5	70 - 124			
Toluene	17.7	1.0	20	0	88.5	70 - 123			
Xylenes, Total	54.18	3.0	60	0	90.3	70 - 130			
Surr: 1,2-Dichloroethane-d4	47.45	1.0	50	0	94.9	70 - 126			
Surr: 4-Bromofluorobenzene	50.55	1.0	50	0	101	77 - 113			
Surr: Dibromofluoromethane	50.5	1.0	50	0	101	77 - 123			
Surr: Toluene-d8	50.95	1.0	50	0	102	82 - 127			

Client: PDC Energy
Project: Fern 11U-434
WorkOrder: HS24060009

QC BATCH REPORT

Batch ID: R469037 (0)		Instrument: VOA4		Method: LOW LEVEL VOLATILES BY SW8260C						
MSD		Sample ID: HS24060414-03MSD		Units: ug/L		Analysis Date: 11-Jun-2024 07:11				
Client ID:		Run ID: VOA4_469037		SeqNo: 8062121		PrepDate:		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	16.64	1.0	20	0	83.2	70 - 127	17.59	5.55	20	
Ethylbenzene	17	1.0	20	0	85.0	70 - 124	17.65	3.75	20	
m,p-Xylene	34.16	2.0	40	0	85.4	70 - 130	36.29	6.03	20	
o-Xylene	16.4	1.0	20	0	82.0	70 - 124	17.9	8.71	20	
Toluene	16.41	1.0	20	0	82.1	70 - 123	17.7	7.58	20	
Xylenes, Total	50.57	3.0	60	0	84.3	70 - 130	54.18	6.91	20	
Surr: 1,2-Dichloroethane-d4	49.6	1.0	50	0	99.2	70 - 126	47.45	4.45	20	
Surr: 4-Bromofluorobenzene	48.78	1.0	50	0	97.6	77 - 113	50.55	3.57	20	
Surr: Dibromofluoromethane	52.44	1.0	50	0	105	77 - 123	50.5	3.78	20	
Surr: Toluene-d8	49.15	1.0	50	0	98.3	82 - 127	50.95	3.6	20	
The following samples were analyzed in this batch: HS24060009-01										

Client: PDC Energy
Project: Fern 11U-434
WorkOrder: HS24060009

QC BATCH REPORT

Batch ID: R468549 (0)		Instrument: Skalar 03		Method: ALKALINITY BY -2011					
MBLK	Sample ID: MBLK-06042024	Units: mg/L		Analysis Date: 04-Jun-2024 15:52					
Client ID:	Run ID: Skalar 03_468549	SeqNo: 8048144		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							

LCS	Sample ID: LCS-06042024	Units: mg/L		Analysis Date: 04-Jun-2024 15:59					
Client ID:	Run ID: Skalar 03_468549	SeqNo: 8048145		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)	931.2	5.00	1000	0	93.1	85 - 115			
Alkalinity, Total (As CaCO3)	957	5.00	1000	0	95.7	85 - 115			

LCSD	Sample ID: LCSD-06042024	Units: mg/L		Analysis Date: 04-Jun-2024 16:05					
Client ID:	Run ID: Skalar 03_468549	SeqNo: 8048146		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)	930.2	5.00	1000	0	93.0	85 - 115	931.2	0.107	20
Alkalinity, Total (As CaCO3)	956.4	5.00	1000	0	95.6	85 - 115	957	0.0627	20

DUP	Sample ID: HS24051538-12DUP	Units: mg/L		Analysis Date: 04-Jun-2024 16:43					
Client ID:	Run ID: Skalar 03_468549	SeqNo: 8048153		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)	98.8	5.00					96.9	1.94	20
Alkalinity, Carbonate (As CaCO3)	ND	5.00					0	0	20
Alkalinity, Total (As CaCO3)	98.8	5.00					96.9	1.94	20

The following samples were analyzed in this batch: HS24060009-01

Client: PDC Energy
Project: Fern 11U-434
WorkOrder: HS24060009

QC BATCH REPORT

Batch ID: R468568 (0)		Instrument: Balance1		Method: TOTAL DISSOLVED SOLIDS BY SM2540C-2011					
MBLK	Sample ID: WMBLK-06052024	Units: mg/L		Analysis Date: 05-Jun-2024 09:30					
Client ID:	Run ID: Balance1_468568	SeqNo: 8048535		PrepDate:		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Total Dissolved Solids (Residue, Filterable)		ND	10.0						
LCS	Sample ID: WLCS-06052024	Units: mg/L		Analysis Date: 05-Jun-2024 09:30					
Client ID:	Run ID: Balance1_468568	SeqNo: 8048534		PrepDate:		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Total Dissolved Solids (Residue, Filterable)		940	10.0	1000	0	94.0	85 - 115		
DUP	Sample ID: HS24060062-01 DUP	Units: mg/L		Analysis Date: 05-Jun-2024 09:30					
Client ID:	Run ID: Balance1_468568	SeqNo: 8048527		PrepDate:		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Total Dissolved Solids (Residue, Filterable)		1676	10.0				1636	2.42	20
DUP	Sample ID: HS24051881-12 DUP	Units: mg/L		Analysis Date: 05-Jun-2024 09:30					
Client ID:	Run ID: Balance1_468568	SeqNo: 8048513		PrepDate:		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Total Dissolved Solids (Residue, Filterable)		4004	10.0				3996	0.2	20
The following samples were analyzed in this batch:		HS24060009-01							

Client: PDC Energy
Project: Fern 11U-434
WorkOrder: HS24060009

QC BATCH REPORT

Batch ID: R469019 (0)		Instrument: ICS-Integrion		Method: ANIONS BY E300.0, REV 2.1, 1993					
MBLK	Sample ID: MBLK	Units: mg/L		Analysis Date: 10-Jun-2024 19:43					
Client ID:	Run ID: ICS-Integrion_469019		SeqNo: 8061575		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							
LCS	Sample ID: LCS	Units: mg/L		Analysis Date: 10-Jun-2024 19:49					
Client ID:	Run ID: ICS-Integrion_469019		SeqNo: 8061576		PrepDate:		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
Chloride	21.23	0.500	20	0	106	90 - 110			
Sulfate	20.4	0.500	20	0	102	90 - 110			
MS	Sample ID: HS24060538-01MS	Units: mg/L		Analysis Date: 10-Jun-2024 21:12					
Client ID:	Run ID: ICS-Integrion_469019		SeqNo: 8061587		PrepDate:		DF: 20		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
Chloride	950.3	10.0	200	746.3	102	80 - 120			
Sulfate	598	10.0	200	408.2	94.9	80 - 120			
MS	Sample ID: HS24060278-01MS	Units: mg/L		Analysis Date: 10-Jun-2024 20:07					
Client ID:	Run ID: ICS-Integrion_469019		SeqNo: 8061578		PrepDate:		DF: 100		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
Chloride	6486	50.0	1000	5580	90.6	80 - 120			O
Sulfate	2912	50.0	1000	2122	79.1	80 - 120			S
MSD	Sample ID: HS24060538-01MSD	Units: mg/L		Analysis Date: 10-Jun-2024 21:17					
Client ID:	Run ID: ICS-Integrion_469019		SeqNo: 8061588		PrepDate:		DF: 20		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
Chloride	945.5	10.0	200	746.3	99.6	80 - 120	950.3	0.511	20
Sulfate	606.5	10.0	200	408.2	99.2	80 - 120	598	1.42	20

Client:

Project:

WorkOrder:

PDC Energy

Fern 11U-434

HS24060009

QC BATCH REPORT

Batch ID: R469019 (0)		Instrument: ICS-Integrion		Method: ANIONS BY E300.0, REV 2.1, 1993						
MSD	Sample ID: HS24060278-01MSD	Units: mg/L		Analysis Date: 10-Jun-2024 20:13						
Client ID:	Run ID: ICS-Integrion_469019		SeqNo: 8061579		PrepDate:		DF: 100			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	6474	50.0	1000	5580	89.4	80 - 120	6486	0.176	20	O
Sulfate	2901	50.0	1000	2122	77.9	80 - 120	2912	0.398	20	S

The following samples were analyzed in this batch:

HS24060009-01

Client: PDC Energy
Project: Fern 11U-434
WorkOrder: HS24060009

**QUALIFIERS,
ACRONYMS, UNITS**

Qualifier	Description
*	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

Acronym	Description
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

Unit Reported	Description
mg/L	Milligrams per Liter

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Arkansas	88-00356_2024	27-Mar-2025
California	2919; 2025	30-Apr-2025
Florida	E87611-38	30-Jun-2024
Illinois	2000322023-11	30-Jun-2024
Kansas	E-10352 2023-2024	31-Jul-2024
Kentucky	123043	30-Apr-2025
Louisiana	03087 2023-2024	30-Jun-2024
Maryland	343; 2023-2024	30-Jun-2024
North Carolina	624 - 2024	31-Dec-2024
Oklahoma	2023-140	31-Aug-2024
Tennessee	04016	30-Apr-2025
Texas	T104704231 TX-C24-00130	30-Apr-2025
Utah	TX026932023-14	31-Jul-2024

Sample Receipt Checklist

Work Order ID: HS24060009

Date/Time Received: 01-Jun-2024 09:20

Client Name: PDC Energy 80203

Received by: Kaycee Rogers

Completed By: /S/ Kaycee Rogers	01-Jun-2024 12:40	Reviewed by: /S/ Tyler Monroe	05-Jun-2024 12:15
eSignature	Date/Time	eSignature	Date/Time

Matrices: WCarrier name: FedEx

Shipping container/cooler in good condition?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	Not Present <input type="checkbox"/>
Custody seals intact on shipping container/cooler?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	Not Present <input type="checkbox"/>
Custody seals intact on sample bottles?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	Not Present <input checked="" type="checkbox"/>
VOA/TX1005/TX1006 Solids in hermetically sealed vials?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	Not Present <input checked="" type="checkbox"/>
Chain of custody present?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	1 Page(s)
Chain of custody signed when relinquished and received?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Samplers name present on COC?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Chain of custody agrees with sample labels?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Samples in proper container/bottle?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Sample containers intact?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Sufficient sample volume for indicated test?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
All samples received within holding time?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Container/Temp Blank temperature in compliance?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	

Temperature(s)/Thermometer(s):

1.5UC/1.6C IR 31

Cooler(s)/Kit(s):

BLUE

Date/Time sample(s) sent to storage:

06/01/2024 1240

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:

