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December 19, 2022

Max Trehus  
PDC Energy  
4000 Burlington Ave.  
Evans, CO 80620

Work Order: **HS22120213**

Laboratory Results for: **Bost 16N-8B-L**

Dear Max Trehus ,

ALS Environmental received 2 sample(s) on Dec 03, 2022 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:** Bost 16N-8B-L  
**Work Order:** HS22120213

**SAMPLE SUMMARY**

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Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS22120213-01	16N-8B-LA	Water		01-Dec-2022 08:44	03-Dec-2022 09:05	<input type="checkbox"/>
HS22120213-02	16N-8B-LB	Water		01-Dec-2022 08:44	03-Dec-2022 09:05	<input type="checkbox"/>

**Client:** PDC Energy  
**Project:** Bost 16N-8B-L  
**Work Order:** HS22120213

**CASE NARRATIVE**

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**GC Semivolatiles by Method RSK-175**

**Batch ID: R423567**

- 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: 186935**

**Sample ID: 16N-8B-LA (HS22120213-01)**

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

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**GC Volatiles by Method SW8015**

**Batch ID: R423243**

**Sample ID: 16N-8B-LA (HS22120213-01)**

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

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**GCMS Volatiles by Method SW8260**

**Batch ID: R423672**

**Sample ID: 16N-8B-LA (HS22120213-01)**

- Dilution required due to matrix interference.

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**Metals by Method E200.8**

**Batch ID: 187478**

**Sample ID: 16N-8B-LA (HS22120213-01)**

- Sample ran at a 5X dilution due to sample matrix.

**Sample ID: HS22120366-05MS**

- MS and MSD are for an unrelated sample

**Batch ID: 187498**

**Sample ID: 16N-8B-LB (HS22120213-02)**

- Sample ran at 5x due to high concentration of Calcium.

**Sample ID: HS22120313-01MS**

- MS and MSD are for an unrelated sample

**Sample ID: HS22120366-01MS**

- MS and MSD are for an unrelated sample

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**WetChemistry by Method SM2320B**

**Batch ID: R424086**

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

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**Client:** PDC Energy  
**Project:** Bost 16N-8B-L  
**Work Order:** HS22120213

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**CASE NARRATIVE**

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**WetChemistry by Method SM2320B**

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**WetChemistry by Method E300**

**Batch ID: R423808**

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.
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**WetChemistry by Method M2540C**

**Batch ID: R423644**

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.
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Client: PDC Energy  
 Project: Bost 16N-8B-L  
 Sample ID: 16N-8B-LA  
 Collection Date: 01-Dec-2022 08:44

**ANALYTICAL REPORT**  
 WorkOrder:HS22120213  
 Lab ID:HS22120213-01  
 Matrix:Water

ANALYSES	RESULT	QUAL	MDL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>LOW LEVEL VOLATILES BY SW8260C</b>		Method:SW8260		Analyst: FT			
Benzene	79		10	50	ug/L	50	10-Dec-2022 11:58
Ethylbenzene	33	J	15	50	ug/L	50	10-Dec-2022 11:58
m,p-Xylene	320		25	100	ug/L	50	10-Dec-2022 11:58
o-Xylene	110		15	50	ug/L	50	10-Dec-2022 11:58
Toluene	200		10	50	ug/L	50	10-Dec-2022 11:58
Xylenes, Total	430		15	50	ug/L	50	10-Dec-2022 11:58
Surr: 1,2-Dichloroethane-d4	110			70-126	%REC	50	10-Dec-2022 11:58
Surr: 4-Bromofluorobenzene	103			77-113	%REC	50	10-Dec-2022 11:58
Surr: Dibromofluoromethane	112			77-123	%REC	50	10-Dec-2022 11:58
Surr: Toluene-d8	84.2			82-127	%REC	50	10-Dec-2022 11:58
<b>GASOLINE RANGE ORGANICS BY SW8015C</b>		Method:SW8015		Analyst: FT			
Gasoline Range Organics	238		0.500	2.50	mg/L	50	05-Dec-2022 17:59
Surr: 4-Bromofluorobenzene	1300	S		70-123	%REC	50	05-Dec-2022 17:59
<b>DISSOLVED GASES BY RSK-175</b>		Method:RSK-175		Analyst: SAM			
Ethane	453		1.44	10.0	ug/L	10	06-Dec-2022 12:22
Methane	1,790		5.35	25.0	ug/L	50	06-Dec-2022 12:40
Propane	284		10.0	10.0	ug/L	10	06-Dec-2022 12:22
<b>TPH DRO/ORO BY SW8015C</b>		Method:SW8015M		Prep:SW3511 / 05-Dec-2022		Analyst: PPM	
DRO (>C10 - C28)	2,500		20	50	mg/L	1000	08-Dec-2022 15:03
Surr: 2-Fluorobiphenyl	0	JS		60-135	%REC	1000	08-Dec-2022 15:03
<b>TOTAL METALS BY E200.8, REV 5.4, 1994</b>		Method:E200.8		Prep:E200.8 / 16-Dec-2022		Analyst: JC	
Calcium	2,060		0.360	10.0	mg/L	20	19-Dec-2022 12:50
Magnesium	0.407	J	0.0390	2.50	mg/L	5	19-Dec-2022 12:48
Potassium	205		0.330	5.00	mg/L	10	16-Dec-2022 20:27
Sodium	270		0.210	2.00	mg/L	10	16-Dec-2022 20:27
<b>ANIONS BY E300.0, REV 2.1, 1993</b>		Method:E300		Analyst: TH			
Chloride	3,480		20.0	50.0	mg/L	100	13-Dec-2022 08:21
Sulfate	767		2.00	5.00	mg/L	10	12-Dec-2022 20:39
<b>TOTAL DISSOLVED SOLIDS BY SM2540C -2011</b>		Method:M2540C		Analyst: CWG			
Total Dissolved Solids (Residue, Filterable)	27,100		5.00	10.0	mg/L	1	08-Dec-2022 16:52
<b>ALKALINITY BY SM 2320B-2011</b>		Method:SM2320B		Analyst: JAC			
Alkalinity, Bicarbonate (As CaCO3)	74.0		5.00	5.00	mg/L	1	15-Dec-2022 03:33
Alkalinity, Carbonate (As CaCO3)	218		5.00	5.00	mg/L	1	15-Dec-2022 03:33
Alkalinity, Total (As CaCO3)	292		5.00	5.00	mg/L	1	15-Dec-2022 03:33

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

Client: PDC Energy  
 Project: Bost 16N-8B-L  
 Sample ID: 16N-8B-LB  
 Collection Date: 01-Dec-2022 08:44

**ANALYTICAL REPORT**  
 WorkOrder:HS22120213  
 Lab ID:HS22120213-02  
 Matrix:Water

ANALYSES	RESULT	QUAL	MDL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>DISSOLVED METALS BY E200.8, REV 5.4, Method:E200.8 (dissolved) 1994</b>					Prep:E200.8 / 16-Dec-2022		Analyst: JHD
Calcium	2,260		1.80	50.0	mg/L	100	19-Dec-2022 13:03
Magnesium	0.215	J	0.0390	2.50	mg/L	5	19-Dec-2022 13:19
Potassium	204		0.330	5.00	mg/L	10	16-Dec-2022 22:14
Sodium	278		0.210	2.00	mg/L	10	16-Dec-2022 22:14

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

Weight / Prep Log

**Client:** PDC Energy  
**Project:** Bost 16N-8B-L  
**WorkOrder:** HS22120213

<b>Batch ID:</b> 186935	<b>Start Date:</b> 05 Dec 2022 08:30	<b>End Date:</b> 05 Dec 2022 12:00
<b>Method:</b> SW3511	<b>Prep Code:</b> 3511_DRO	

Sample ID	Container	Sample Wt/Vol	Final Volume	Prep Factor	
HS22120213-01		32.94 (mL)	2 (mL)	0.06072	40 mL Amber

<b>Batch ID:</b> 186964	<b>Start Date:</b> 05 Dec 2022 18:30	<b>End Date:</b> 05 Dec 2022 19:00
<b>Method:</b> SAMPLE FILTRATION - 0.45 MICRON FILTER	<b>Prep Code:</b> FILTRATION	

Sample ID	Container	Sample Wt/Vol	Final Volume	Prep Factor	
HS22120213-02		100 (mL)	100 (mL)	1	120 ml Plastic, Neat

<b>Batch ID:</b> 187478	<b>Start Date:</b> 16 Dec 2022 09:00	<b>End Date:</b> 16 Dec 2022 13:00
<b>Method:</b> TOTAL METALS PREP BY E200.8, REV 5.4, 1994	<b>Prep Code:</b> 200.8PR	

Sample ID	Container	Sample Wt/Vol	Final Volume	Prep Factor	
HS22120213-01		10 (mL)	10 (mL)	1	250 mL plastic, HNO3 to pH <2

<b>Batch ID:</b> 187498	<b>Start Date:</b> 16 Dec 2022 10:00	<b>End Date:</b> 16 Dec 2022 14:00
<b>Method:</b> DISSOLVED METALS DIGESTION BY E200.8,REV 5.4,1994	<b>Prep Code:</b> 200.8_DISSPR	

Sample ID	Container	Sample Wt/Vol	Final Volume	Prep Factor	
HS22120213-02		10 (mL)	10 (mL)	1	120 ml Plastic, Neat

**Client:** PDC Energy  
**Project:** Bost 16N-8B-L  
**WorkOrder:** HS22120213

**DATES REPORT**

Sample ID	Client Samp ID	Collection Date	Leachate Date	Prep Date	Analysis Date	DF
<b>Batch ID:</b> 186935 ( 0 )		<b>Test Name :</b> TPH DRO/ORO BY SW8015C			<b>Matrix:</b> Water	
HS22120213-01	16N-8B-LA	01 Dec 2022 08:44		05 Dec 2022 08:30	08 Dec 2022 15:03	1000
<b>Batch ID:</b> 187478 ( 0 )		<b>Test Name :</b> TOTAL METALS BY E200.8, REV 5.4, 1994			<b>Matrix:</b> Water	
HS22120213-01	16N-8B-LA	01 Dec 2022 08:44		16 Dec 2022 09:00	19 Dec 2022 12:50	20
HS22120213-01	16N-8B-LA	01 Dec 2022 08:44		16 Dec 2022 09:00	19 Dec 2022 12:48	5
HS22120213-01	16N-8B-LA	01 Dec 2022 08:44		16 Dec 2022 09:00	16 Dec 2022 20:27	10
<b>Batch ID:</b> 187498 ( 0 )		<b>Test Name :</b> DISSOLVED METALS BY E200.8, REV 5.4, 1994			<b>Matrix:</b> Water	
HS22120213-02	16N-8B-LB	01 Dec 2022 08:44		16 Dec 2022 10:00	19 Dec 2022 13:19	5
HS22120213-02	16N-8B-LB	01 Dec 2022 08:44		16 Dec 2022 10:00	19 Dec 2022 13:03	100
HS22120213-02	16N-8B-LB	01 Dec 2022 08:44		16 Dec 2022 10:00	16 Dec 2022 22:14	10
<b>Batch ID:</b> R423243 ( 0 )		<b>Test Name :</b> GASOLINE RANGE ORGANICS BY SW8015C			<b>Matrix:</b> Water	
HS22120213-01	16N-8B-LA	01 Dec 2022 08:44			05 Dec 2022 17:59	50
<b>Batch ID:</b> R423567 ( 0 )		<b>Test Name :</b> DISSOLVED GASES BY RSK-175			<b>Matrix:</b> Water	
HS22120213-01	16N-8B-LA	01 Dec 2022 08:44			06 Dec 2022 12:40	50
HS22120213-01	16N-8B-LA	01 Dec 2022 08:44			06 Dec 2022 12:22	10
<b>Batch ID:</b> R423644 ( 0 )		<b>Test Name :</b> TOTAL DISSOLVED SOLIDS BY SM2540C-2011			<b>Matrix:</b> Water	
HS22120213-01	16N-8B-LA	01 Dec 2022 08:44			08 Dec 2022 16:52	1
<b>Batch ID:</b> R423672 ( 0 )		<b>Test Name :</b> LOW LEVEL VOLATILES BY SW8260C			<b>Matrix:</b> Water	
HS22120213-01	16N-8B-LA	01 Dec 2022 08:44			10 Dec 2022 11:58	50
<b>Batch ID:</b> R423808 ( 0 )		<b>Test Name :</b> ANIONS BY E300.0, REV 2.1, 1993			<b>Matrix:</b> Water	
HS22120213-01	16N-8B-LA	01 Dec 2022 08:44			12 Dec 2022 20:39	10
<b>Batch ID:</b> R423826 ( 0 )		<b>Test Name :</b> ANIONS BY E300.0, REV 2.1, 1993			<b>Matrix:</b> Water	
HS22120213-01	16N-8B-LA	01 Dec 2022 08:44			13 Dec 2022 08:21	100
<b>Batch ID:</b> R424086 ( 0 )		<b>Test Name :</b> ALKALINITY BY SM 2320B-2011			<b>Matrix:</b> Water	
HS22120213-01	16N-8B-LA	01 Dec 2022 08:44			15 Dec 2022 03:33	1

**Client:** PDC Energy  
**Project:** Bost 16N-8B-L  
**WorkOrder:** HS22120213

**QC BATCH REPORT**

**Batch ID:** 186935 ( 0 )      **Instrument:** FID-16      **Method:** TPH DRO/ORO BY SW8015C

<b>MBLK</b>		Sample ID: <b>MBLK-186935</b>		Units: <b>mg/L</b>		Analysis Date: <b>08-Dec-2022 11:38</b>			
Client ID:		Run ID: <b>FID-16_423739</b>		SeqNo: <b>7026790</b>		PrepDate: <b>05-Dec-2022</b>		DF: <b>1</b>	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
DRO (>C10 - C28)	U	0.050							
<i>Surr: 2-Fluorobiphenyl</i>	<i>0.04747</i>	<i>0.0050</i>	<i>0.06</i>	<i>0</i>	<i>79.1</i>	<i>60 - 135</i>			

<b>LCS</b>		Sample ID: <b>LCS-186935</b>		Units: <b>mg/L</b>		Analysis Date: <b>08-Dec-2022 12:07</b>			
Client ID:		Run ID: <b>FID-16_423739</b>		SeqNo: <b>7026791</b>		PrepDate: <b>05-Dec-2022</b>		DF: <b>1</b>	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
DRO (>C10 - C28)	0.6381	0.050	0.6	0	106	70 - 130			
<i>Surr: 2-Fluorobiphenyl</i>	<i>0.06839</i>	<i>0.0050</i>	<i>0.06</i>	<i>0</i>	<i>114</i>	<i>60 - 135</i>			

<b>LCSD</b>		Sample ID: <b>LCSD-186935</b>		Units: <b>mg/L</b>		Analysis Date: <b>08-Dec-2022 12:36</b>			
Client ID:		Run ID: <b>FID-16_423739</b>		SeqNo: <b>7026792</b>		PrepDate: <b>05-Dec-2022</b>		DF: <b>1</b>	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
DRO (>C10 - C28)	0.5372	0.050	0.6	0	89.5	70 - 130	0.6381	17.2	20
<i>Surr: 2-Fluorobiphenyl</i>	<i>0.06142</i>	<i>0.0050</i>	<i>0.06</i>	<i>0</i>	<i>102</i>	<i>60 - 135</i>	<i>0.06839</i>	<i>10.7</i>	<i>20</i>

The following samples were analyzed in this batch: HS22120213-01

**Client:** PDC Energy  
**Project:** Bost 16N-8B-L  
**WorkOrder:** HS22120213

**QC BATCH REPORT**

**Batch ID:** R423567 ( 0 )      **Instrument:** FID-4      **Method:** DISSOLVED GASES BY RSK-175

<b>MBLK</b>		Sample ID: <b>MBLK-221206</b>		Units: <b>ug/L</b>		Analysis Date: <b>06-Dec-2022 07:13</b>			
Client ID:		Run ID: <b>FID-4_423567</b>		SeqNo: <b>7022582</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	U	1.00							
Methane	U	0.500							
Propane	U	1.00							

<b>LCS</b>		Sample ID: <b>LCS-221206</b>		Units: <b>ug/L</b>		Analysis Date: <b>06-Dec-2022 07:35</b>			
Client ID:		Run ID: <b>FID-4_423567</b>		SeqNo: <b>7022583</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	20.2	1.00	18.04	0	112	75 - 125			
Methane	9.46	0.500	9.647	0	98.1	75 - 125			
Propane	30.53	1.00	26.46	0	115	75 - 125			

<b>LCSD</b>		Sample ID: <b>LCSD-221206</b>		Units: <b>ug/L</b>		Analysis Date: <b>06-Dec-2022 07:51</b>			
Client ID:		Run ID: <b>FID-4_423567</b>		SeqNo: <b>7022584</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	19.74	1.00	18.04	0	109	75 - 125	20.2	2.3	30
Methane	8.209	0.500	9.647	0	85.1	75 - 125	9.46	14.2	30
Propane	29.85	1.00	26.46	0	113	75 - 125	30.53	2.25	30

The following samples were analyzed in this batch: HS22120213-01

**Client:** PDC Energy  
**Project:** Bost 16N-8B-L  
**WorkOrder:** HS22120213

**QC BATCH REPORT**

<b>Batch ID:</b> R423243 ( 0 )	<b>Instrument:</b> FID-20	<b>Method:</b> GASOLINE RANGE ORGANICS BY SW8015C
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<b>MBLK</b>	Sample ID: <b>MBLK-221205</b>	Units: <b>mg/L</b>	Analysis Date: <b>05-Dec-2022 15:42</b>							
Client ID:	Run ID: <b>FID-20_423243</b>	SeqNo: <b>7015421</b>	PrepDate: DF: <b>1</b>							
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
Gasoline Range Organics	U	0.0500								
<i>Surr: 4-Bromofluorobenzene</i>	<i>0.1173</i>	<i>0.00500</i>	<i>0.1</i>	<i>0</i>	<i>117</i>	<i>70 - 121</i>				

<b>LCS</b>	Sample ID: <b>LCS-221205</b>	Units: <b>mg/L</b>	Analysis Date: <b>05-Dec-2022 15:15</b>							
Client ID:	Run ID: <b>FID-20_423243</b>	SeqNo: <b>7015419</b>	PrepDate: DF: <b>1</b>							
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
Gasoline Range Organics	0.8695	0.0500	1	0	86.9	76 - 124				
<i>Surr: 4-Bromofluorobenzene</i>	<i>0.08642</i>	<i>0.00500</i>	<i>0.1</i>	<i>0</i>	<i>86.4</i>	<i>52 - 138</i>				

<b>LCSD</b>	Sample ID: <b>LCSD-221205</b>	Units: <b>mg/L</b>	Analysis Date: <b>05-Dec-2022 15:29</b>							
Client ID:	Run ID: <b>FID-20_423243</b>	SeqNo: <b>7015420</b>	PrepDate: DF: <b>1</b>							
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
Gasoline Range Organics	0.8672	0.0500	1	0	86.7	76 - 124	0.8695	0.262	20	
<i>Surr: 4-Bromofluorobenzene</i>	<i>0.09026</i>	<i>0.00500</i>	<i>0.1</i>	<i>0</i>	<i>90.3</i>	<i>52 - 138</i>	<i>0.08642</i>	<i>4.34</i>	<i>20</i>	

The following samples were analyzed in this batch: HS22120213-01

**Client:** PDC Energy  
**Project:** Bost 16N-8B-L  
**WorkOrder:** HS22120213

**QC BATCH REPORT**

Batch ID: 187478 ( 0 )		Instrument: ICPMS06		Method: TOTAL METALS BY E200.8, REV 5.4, 1994						
<b>MBLK</b>	Sample ID: <b>MBLK-187478</b>	Units: <b>ug/L</b>		Analysis Date: <b>16-Dec-2022 20:05</b>						
Client ID:	Run ID: <b>ICPMS06_424172</b>	SeqNo: <b>7038406</b>		PrepDate: <b>16-Dec-2022</b>		DF: <b>1</b>				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Calcium	U	500								
Magnesium	15.65	500								J
Potassium	U	500								
Sodium	U	200								
<b>LCS</b>	Sample ID: <b>LCS-187478</b>	Units: <b>ug/L</b>		Analysis Date: <b>16-Dec-2022 20:07</b>						
Client ID:	Run ID: <b>ICPMS06_424172</b>	SeqNo: <b>7038407</b>		PrepDate: <b>16-Dec-2022</b>		DF: <b>1</b>				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Calcium	5425	500	5000	0	109	85 - 115				
Magnesium	5330	500	5000	0	107	85 - 115				
Potassium	5317	500	5000	0	106	85 - 115				
Sodium	5263	200	5000	0	105	85 - 115				
<b>MS</b>	Sample ID: <b>HS22120366-06MS</b>	Units: <b>ug/L</b>		Analysis Date: <b>16-Dec-2022 20:17</b>						
Client ID:	Run ID: <b>ICPMS06_424172</b>	SeqNo: <b>7038412</b>		PrepDate: <b>16-Dec-2022</b>		DF: <b>1</b>				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Calcium	17840	500	5000	12470	107	70 - 130				
Magnesium	6545	500	5000	1361	104	70 - 130				
Potassium	5586	500	5000	271.2	106	70 - 130				
Sodium	15980	200	5000	10770	104	70 - 130				
<b>MS</b>	Sample ID: <b>HS22120366-05MS</b>	Units: <b>ug/L</b>		Analysis Date: <b>16-Dec-2022 20:11</b>						
Client ID:	Run ID: <b>ICPMS06_424172</b>	SeqNo: <b>7038409</b>		PrepDate: <b>16-Dec-2022</b>		DF: <b>1</b>				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Calcium	304100	500	5000	280700	468	70 - 130				SEO
Magnesium	89780	500	5000	79670	202	70 - 130				SO
Potassium	6672	500	5000	1247	108	70 - 130				
Sodium	321000	200	5000	301200	396	70 - 130				SEO

**Client:** PDC Energy  
**Project:** Bost 16N-8B-L  
**WorkOrder:** HS22120213

**QC BATCH REPORT**

**Batch ID:** 187478 ( 0 )      **Instrument:** ICPMS06      **Method:** TOTAL METALS BY E200.8, REV 5.4, 1994

<b>MSD</b>		Sample ID: <b>HS22120366-06MSD</b>		Units: <b>ug/L</b>		Analysis Date: <b>16-Dec-2022 20:19</b>				
Client ID:		Run ID: <b>ICPMS06_424172</b>		SeqNo: <b>7038413</b>		PrepDate: <b>16-Dec-2022</b>		DF: <b>1</b>		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Calcium	18480	500	5000	12470	120	70 - 130	17840	3.5	20	
Magnesium	6784	500	5000	1361	108	70 - 130	6545	3.59	20	
Potassium	5614	500	5000	271.2	107	70 - 130	5586	0.5	20	
Sodium	16600	200	5000	10770	117	70 - 130	15980	3.82	20	

<b>MSD</b>		Sample ID: <b>HS22120366-05MSD</b>		Units: <b>ug/L</b>		Analysis Date: <b>16-Dec-2022 20:13</b>				
Client ID:		Run ID: <b>ICPMS06_424172</b>		SeqNo: <b>7038410</b>		PrepDate: <b>16-Dec-2022</b>		DF: <b>1</b>		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Calcium	301000	500	5000	280700	407	70 - 130	304100	1.01	20	SEO
Magnesium	89780	500	5000	79670	202	70 - 130	89780	0	20	SO
Potassium	7200	500	5000	1247	119	70 - 130	6672	7.62	20	
Sodium	319200	200	5000	301200	360	70 - 130	321000	0.553	20	SEO

The following samples were analyzed in this batch: HS22120213-01

**Client:** PDC Energy  
**Project:** Bost 16N-8B-L  
**WorkOrder:** HS22120213

**QC BATCH REPORT**

<b>Batch ID:</b> 187498 ( 0 )	<b>Instrument:</b> ICPMS07	<b>Method:</b> DISSOLVED METALS BY E200.8, REV 5.4, 1994 (DISSOLVED)								
<b>MBLK</b>	Sample ID: <b>MBLKF2-187498</b>	Units: <b>ug/L</b>	Analysis Date: <b>16-Dec-2022 21:48</b>							
Client ID:	Run ID: <b>ICPMS07_424168</b>	SeqNo: <b>7037410</b>	PrepDate: <b>16-Dec-2022</b> DF: <b>1</b>							
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

Calcium	U	500								
Magnesium	10.81	500								J
Potassium	U	500								
Sodium	U	200								

<b>MBLK</b>	Sample ID: <b>MBLKF3-187498</b>	Units: <b>ug/L</b>	Analysis Date: <b>16-Dec-2022 21:49</b>							
Client ID:	Run ID: <b>ICPMS07_424168</b>	SeqNo: <b>7037411</b>	PrepDate: <b>16-Dec-2022</b> DF: <b>1</b>							
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

Calcium	36.83	500								J
Magnesium	18.42	500								J
Potassium	U	500								
Sodium	U	200								

<b>MBLK</b>	Sample ID: <b>MBLKF1-187498</b>	Units: <b>ug/L</b>	Analysis Date: <b>16-Dec-2022 21:46</b>							
Client ID:	Run ID: <b>ICPMS07_424168</b>	SeqNo: <b>7037409</b>	PrepDate: <b>16-Dec-2022</b> DF: <b>1</b>							
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

Calcium	U	500								
Magnesium	12.8	500								J
Potassium	U	500								
Sodium	U	200								

<b>MBLK</b>	Sample ID: <b>MBLK-187498</b>	Units: <b>ug/L</b>	Analysis Date: <b>16-Dec-2022 21:44</b>							
Client ID:	Run ID: <b>ICPMS07_424168</b>	SeqNo: <b>7037408</b>	PrepDate: <b>16-Dec-2022</b> DF: <b>1</b>							
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

Calcium	U	500								
Magnesium	U	500								
Potassium	U	500								
Sodium	U	200								

**Client:** PDC Energy  
**Project:** Bost 16N-8B-L  
**WorkOrder:** HS22120213

**QC BATCH REPORT**

**Batch ID:** 187498 ( 0 )      **Instrument:** ICPMS07      **Method:** DISSOLVED METALS BY E200.8, REV 5.4, 1994 (DISSOLVED)

<b>LCS</b>		Sample ID: <b>LCS-187498</b>	Units: <b>ug/L</b>		Analysis Date: <b>16-Dec-2022 21:51</b>					
Client ID:		Run ID: <b>ICPMS07_424168</b>	SeqNo: <b>7037412</b>		PrepDate: <b>16-Dec-2022</b>		DF: <b>1</b>			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Calcium	4840	500	5000	0	96.8	85 - 115				
Magnesium	4960	500	5000	0	99.2	85 - 115				
Potassium	4902	500	5000	0	98.0	85 - 115				
Sodium	4774	200	5000	0	95.5	85 - 115				

<b>MS</b>		Sample ID: <b>HS22120366-01MS</b>	Units: <b>ug/L</b>		Analysis Date: <b>16-Dec-2022 22:04</b>					
Client ID:		Run ID: <b>ICPMS07_424168</b>	SeqNo: <b>7037416</b>		PrepDate: <b>16-Dec-2022</b>		DF: <b>1</b>			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Calcium	88260	500	5000	76730	231	85 - 115				SO
Magnesium	38390	500	5000	31130	145	85 - 115				SO
Potassium	7559	500	5000	2434	102	85 - 115				
Sodium	408000	200	5000	373300	693	85 - 115				SEO

<b>MS</b>		Sample ID: <b>HS22120313-01MS</b>	Units: <b>ug/L</b>		Analysis Date: <b>16-Dec-2022 21:59</b>					
Client ID:		Run ID: <b>ICPMS07_424168</b>	SeqNo: <b>7037438</b>		PrepDate: <b>16-Dec-2022</b>		DF: <b>1</b>			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Calcium	72440	500	5000	68660	75.6	85 - 115				SO
Magnesium	13950	500	5000	9225	94.4	85 - 115				
Potassium	9549	500	5000	4816	94.7	85 - 115				
Sodium	85600	200	5000	80870	94.7	85 - 115				O

<b>MSD</b>		Sample ID: <b>HS22120366-01MSD</b>	Units: <b>ug/L</b>		Analysis Date: <b>16-Dec-2022 22:06</b>					
Client ID:		Run ID: <b>ICPMS07_424168</b>	SeqNo: <b>7037417</b>		PrepDate: <b>16-Dec-2022</b>		DF: <b>1</b>			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Calcium	83870	500	5000	76730	143	85 - 115	88260	5.1	20	SO
Magnesium	36450	500	5000	31130	106	85 - 115	38390	5.2	20	O
Potassium	7245	500	5000	2434	96.2	85 - 115	7559	4.24	20	
Sodium	391700	200	5000	373300	366	85 - 115	408000	4.09	20	SEO

**Client:** PDC Energy  
**Project:** Bost 16N-8B-L  
**WorkOrder:** HS22120213

**QC BATCH REPORT**

<b>Batch ID:</b> 187498 ( 0 )		<b>Instrument:</b> ICPMS07		<b>Method:</b> DISSOLVED METALS BY E200.8, REV 5.4, 1994 (DISSOLVED)						
<b>MSD</b>	Sample ID: <b>HS22120313-01MSD</b>	Units: <b>ug/L</b>			Analysis Date: <b>16-Dec-2022 22:01</b>					
Client ID:	Run ID: <b>ICPMS07_424168</b>	SeqNo: <b>7037439</b>		PrepDate: <b>16-Dec-2022</b>		DF: <b>1</b>				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Calcium	70870	500	5000	68660	44.1	85 - 115	72440	2.2	20	SO
Magnesium	13620	500	5000	9225	87.9	85 - 115	13950	2.37	20	
Potassium	9349	500	5000	4816	90.6	85 - 115	9549	2.12	20	
Sodium	82120	200	5000	80870	25.0	85 - 115	85600	4.16	20	SO

The following samples were analyzed in this batch: HS22120213-02

**Client:** PDC Energy  
**Project:** Bost 16N-8B-L  
**WorkOrder:** HS22120213

**QC BATCH REPORT**

<b>Batch ID:</b> R423672 ( 0 )	<b>Instrument:</b> VOA10	<b>Method:</b> LOW LEVEL VOLATILES BY SW8260C
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<b>MBLK</b>		Sample ID: <b>VBLKW-221210</b>			Units: <b>ug/L</b>		Analysis Date: <b>10-Dec-2022 05:49</b>			
Client ID:		Run ID: <b>VOA10_423672</b>			SeqNo: <b>7025132</b>		PrepDate:		DF: <b>1</b>	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	U	1.0								
Ethylbenzene	U	1.0								
m,p-Xylene	U	2.0								
o-Xylene	U	1.0								
Toluene	U	1.0								
Xylenes, Total	U	1.0								
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>53.13</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>106</i>	<i>70 - 123</i>				
<i>Surr: 4-Bromofluorobenzene</i>	<i>51.04</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>102</i>	<i>77 - 113</i>				
<i>Surr: Dibromofluoromethane</i>	<i>51.52</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>103</i>	<i>73 - 126</i>				
<i>Surr: Toluene-d8</i>	<i>47.87</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>95.7</i>	<i>81 - 120</i>				

<b>LCS</b>		Sample ID: <b>VLCSW-221210</b>			Units: <b>ug/L</b>		Analysis Date: <b>10-Dec-2022 05:08</b>			
Client ID:		Run ID: <b>VOA10_423672</b>			SeqNo: <b>7025131</b>		PrepDate:		DF: <b>1</b>	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	21.7	1.0	20	0	109	74 - 120				
Ethylbenzene	20.4	1.0	20	0	102	77 - 117				
m,p-Xylene	40.23	2.0	40	0	101	77 - 122				
o-Xylene	20.12	1.0	20	0	101	75 - 119				
Toluene	18.73	1.0	20	0	93.6	77 - 118				
Xylenes, Total	60.35	1.0	60	0	101	75 - 122				
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>53.72</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>107</i>	<i>70 - 123</i>				
<i>Surr: 4-Bromofluorobenzene</i>	<i>53.08</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>106</i>	<i>77 - 113</i>				
<i>Surr: Dibromofluoromethane</i>	<i>48.95</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>97.9</i>	<i>73 - 126</i>				
<i>Surr: Toluene-d8</i>	<i>50.55</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>101</i>	<i>81 - 120</i>				

**Client:** PDC Energy  
**Project:** Bost 16N-8B-L  
**WorkOrder:** HS22120213

**QC BATCH REPORT**

**Batch ID:** R423672 ( 0 )      **Instrument:** VOA10      **Method:** LOW LEVEL VOLATILES BY SW8260C

<b>MS</b>		Sample ID: <b>HS22120528-04MS</b>			Units: <b>ug/L</b>		Analysis Date: <b>10-Dec-2022 07:11</b>			
Client ID:		Run ID: <b>VOA10_423672</b>			SeqNo: <b>7025136</b>		PrepDate:		DF: <b>1</b>	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	20.87	1.0	20	0	104	70 - 127				
Ethylbenzene	22.74	1.0	20	0	114	70 - 124				
m,p-Xylene	44.67	2.0	40	0	112	70 - 130				
o-Xylene	21.88	1.0	20	0	109	70 - 124				
Toluene	20.83	1.0	20	0	104	70 - 123				
Xylenes, Total	66.55	1.0	60	0	111	70 - 130				
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>51.05</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>102</i>	<i>70 - 126</i>				
<i>Surr: 4-Bromofluorobenzene</i>	<i>55.52</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>111</i>	<i>77 - 113</i>				
<i>Surr: Dibromofluoromethane</i>	<i>48.62</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>97.2</i>	<i>77 - 123</i>				
<i>Surr: Toluene-d8</i>	<i>54.11</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>108</i>	<i>82 - 127</i>				

<b>MSD</b>		Sample ID: <b>HS22120528-04MSD</b>			Units: <b>ug/L</b>		Analysis Date: <b>10-Dec-2022 07:32</b>			
Client ID:		Run ID: <b>VOA10_423672</b>			SeqNo: <b>7025137</b>		PrepDate:		DF: <b>1</b>	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	20.1	1.0	20	0	101	70 - 127	20.87	3.76	20	
Ethylbenzene	20.03	1.0	20	0	100	70 - 124	22.74	12.7	20	
m,p-Xylene	38.37	2.0	40	0	95.9	70 - 130	44.67	15.2	20	
o-Xylene	18.86	1.0	20	0	94.3	70 - 124	21.88	14.8	20	
Toluene	18.43	1.0	20	0	92.1	70 - 123	20.83	12.3	20	
Xylenes, Total	57.23	1.0	60	0	95.4	70 - 130	66.55	15.1	20	
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>52.14</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>104</i>	<i>70 - 126</i>	<i>51.05</i>	<i>2.12</i>	<i>20</i>	
<i>Surr: 4-Bromofluorobenzene</i>	<i>49.62</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>99.2</i>	<i>77 - 113</i>	<i>55.52</i>	<i>11.2</i>	<i>20</i>	
<i>Surr: Dibromofluoromethane</i>	<i>47.42</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>94.8</i>	<i>77 - 123</i>	<i>48.62</i>	<i>2.5</i>	<i>20</i>	
<i>Surr: Toluene-d8</i>	<i>50.27</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>101</i>	<i>82 - 127</i>	<i>54.11</i>	<i>7.36</i>	<i>20</i>	

The following samples were analyzed in this batch: HS22120213-01

**Client:** PDC Energy  
**Project:** Bost 16N-8B-L  
**WorkOrder:** HS22120213

**QC BATCH REPORT**

Batch ID: R423644 ( 0 )		Instrument: Balance1		Method: TOTAL DISSOLVED SOLIDS BY SM2540C-2011						
<b>MBLK</b>	Sample ID: <b>WBLK-120822</b>	Units: <b>mg/L</b>		Analysis Date: <b>08-Dec-2022 16:52</b>						
Client ID:	Run ID: <b>Balance1_423644</b>	SeqNo: <b>7024416</b>		PrepDate:			DF: <b>1</b>			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual	
Total Dissolved Solids (Residue, Filterable)		U	10.0							
<b>LCS</b>	Sample ID: <b>WLCS-120822</b>	Units: <b>mg/L</b>		Analysis Date: <b>08-Dec-2022 16:52</b>						
Client ID:	Run ID: <b>Balance1_423644</b>	SeqNo: <b>7024417</b>		PrepDate:			DF: <b>1</b>			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual	
Total Dissolved Solids (Residue, Filterable)		1066	10.0	1000	0	107	85 - 115			
<b>DUP</b>	Sample ID: <b>HS22120414-29DUP</b>	Units: <b>mg/L</b>		Analysis Date: <b>08-Dec-2022 16:52</b>						
Client ID:	Run ID: <b>Balance1_423644</b>	SeqNo: <b>7024415</b>		PrepDate:			DF: <b>1</b>			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual	
Total Dissolved Solids (Residue, Filterable)		210	10.0				210	0	5	
<b>DUP</b>	Sample ID: <b>HS22120044-01DUP</b>	Units: <b>mg/L</b>		Analysis Date: <b>08-Dec-2022 16:52</b>						
Client ID:	Run ID: <b>Balance1_423644</b>	SeqNo: <b>7024395</b>		PrepDate:			DF: <b>1</b>			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual	
Total Dissolved Solids (Residue, Filterable)		328	10.0				332	1.21	5	

The following samples were analyzed in this batch: HS22120213-01

**Client:** PDC Energy  
**Project:** Bost 16N-8B-L  
**WorkOrder:** HS22120213

**QC BATCH REPORT**

Batch ID: R423808 ( 0 )		Instrument: ICS-Integrion		Method: ANIONS BY E300.0, REV 2.1, 1993						
<b>MBLK</b>	Sample ID: <b>MBLK</b>	Units: <b>mg/L</b>			Analysis Date: <b>12-Dec-2022 11:29</b>					
Client ID:		Run ID: <b>ICS-Integrion_423808</b>		SeqNo: <b>7028476</b>		PrepDate:		DF: <b>1</b>		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual	
Sulfate	U	0.500								
<b>LCS</b>	Sample ID: <b>LCS</b>	Units: <b>mg/L</b>			Analysis Date: <b>12-Dec-2022 11:34</b>					
Client ID:		Run ID: <b>ICS-Integrion_423808</b>		SeqNo: <b>7028477</b>		PrepDate:		DF: <b>1</b>		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual	
Sulfate	21.94	0.500	20	0	110	90 - 110				
<b>MS</b>	Sample ID: <b>HS22120674-01MS</b>	Units: <b>mg/L</b>			Analysis Date: <b>12-Dec-2022 21:41</b>					
Client ID:		Run ID: <b>ICS-Integrion_423808</b>		SeqNo: <b>7028514</b>		PrepDate:		DF: <b>1</b>		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual	
Sulfate	24.87	0.500	10	14.54	103	80 - 120				
<b>MS</b>	Sample ID: <b>HS22120521-01MS</b>	Units: <b>mg/L</b>			Analysis Date: <b>12-Dec-2022 11:44</b>					
Client ID:		Run ID: <b>ICS-Integrion_423808</b>		SeqNo: <b>7028479</b>		PrepDate:		DF: <b>1</b>		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual	
Sulfate	23.11	0.500	10	13.25	98.6	80 - 120				
<b>MSD</b>	Sample ID: <b>HS22120674-01MSD</b>	Units: <b>mg/L</b>			Analysis Date: <b>12-Dec-2022 21:47</b>					
Client ID:		Run ID: <b>ICS-Integrion_423808</b>		SeqNo: <b>7028515</b>		PrepDate:		DF: <b>1</b>		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual	
Sulfate	24.65	0.500	10	14.54	101	80 - 120	24.87	0.868	20	
<b>MSD</b>	Sample ID: <b>HS22120521-01MSD</b>	Units: <b>mg/L</b>			Analysis Date: <b>12-Dec-2022 12:08</b>					
Client ID:		Run ID: <b>ICS-Integrion_423808</b>		SeqNo: <b>7028480</b>		PrepDate:		DF: <b>1</b>		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual	
Sulfate	23.29	0.500	10	13.25	100	80 - 120	23.11	0.771	20	

The following samples were analyzed in this batch: HS22120213-01

**Client:** PDC Energy  
**Project:** Bost 16N-8B-L  
**WorkOrder:** HS22120213

**QC BATCH REPORT**

<b>Batch ID:</b> R423826 ( 0 )	<b>Instrument:</b> ICS-Integrion	<b>Method:</b> ANIONS BY E300.0, REV 2.1, 1993
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<b>MBLK</b>	Sample ID: <b>MBLK</b>	Units: <b>mg/L</b>	Analysis Date: <b>13-Dec-2022 06:57</b>							
Client ID:	Run ID: <b>ICS-Integrion_423826</b>	SeqNo: <b>7028975</b>	PrepDate: DF: <b>1</b>							
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual

Chloride U 0.500

<b>LCS</b>	Sample ID: <b>LCS</b>	Units: <b>mg/L</b>	Analysis Date: <b>13-Dec-2022 07:08</b>							
Client ID:	Run ID: <b>ICS-Integrion_423826</b>	SeqNo: <b>7028976</b>	PrepDate: DF: <b>1</b>							
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual

Chloride 20.06 0.500 20 0 100 90 - 110

<b>MS</b>	Sample ID: <b>HS22120678-02MS</b>	Units: <b>mg/L</b>	Analysis Date: <b>13-Dec-2022 07:18</b>							
Client ID:	Run ID: <b>ICS-Integrion_423826</b>	SeqNo: <b>7028978</b>	PrepDate: DF: <b>1</b>							
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual

Chloride 13.82 0.500 10 4.006 98.1 80 - 120

<b>MSD</b>	Sample ID: <b>HS22120678-02MSD</b>	Units: <b>mg/L</b>	Analysis Date: <b>13-Dec-2022 07:24</b>							
Client ID:	Run ID: <b>ICS-Integrion_423826</b>	SeqNo: <b>7028979</b>	PrepDate: DF: <b>1</b>							
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual

Chloride 13.8 0.500 10 4.006 97.9 80 - 120 13.82 0.145 20

The following samples were analyzed in this batch: HS22120213-01

**Client:** PDC Energy  
**Project:** Bost 16N-8B-L  
**WorkOrder:** HS22120213

**QC BATCH REPORT**

<b>Batch ID:</b> R424086 ( 0 )	<b>Instrument:</b> ManTech01	<b>Method:</b> ALKALINITY BY SM 2320B-2011
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<b>MBLK</b>	Sample ID: <b>WBLKW2-121422</b>	Units: <b>mg/L</b>	Analysis Date: <b>15-Dec-2022 01:31</b>							
Client ID:	Run ID: <b>ManTech01_424086</b>	SeqNo: <b>7034282</b>	PrepDate: DF: <b>1</b>							
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
Alkalinity, Bicarbonate (As CaCO3)	U	5.00								
Alkalinity, Carbonate (As CaCO3)	U	5.00								
Alkalinity, Total (As CaCO3)	U	5.00								

<b>LCS</b>	Sample ID: <b>LCS2-121422</b>	Units: <b>mg/L</b>	Analysis Date: <b>15-Dec-2022 01:01</b>							
Client ID:	Run ID: <b>ManTech01_424086</b>	SeqNo: <b>7034278</b>	PrepDate: DF: <b>1</b>							
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
Alkalinity, Carbonate (As CaCO3)	1054	5.00	1000	0	105	85 - 115				
Alkalinity, Total (As CaCO3)	1057	5.00	1000	0	106	85 - 115				

<b>LCSD</b>	Sample ID: <b>LCSD2-121422</b>	Units: <b>mg/L</b>	Analysis Date: <b>15-Dec-2022 01:10</b>							
Client ID:	Run ID: <b>ManTech01_424086</b>	SeqNo: <b>7034279</b>	PrepDate: DF: <b>1</b>							
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
Alkalinity, Carbonate (As CaCO3)	998.8	5.00	1000	0	99.9	85 - 115	1054	5.39	20	
Alkalinity, Total (As CaCO3)	1038	5.00	1000	0	104	85 - 115	1057	1.88	20	

<b>DUP</b>	Sample ID: <b>HS22120526-04DUP</b>	Units: <b>mg/L</b>	Analysis Date: <b>15-Dec-2022 01:45</b>							
Client ID:	Run ID: <b>ManTech01_424086</b>	SeqNo: <b>7034284</b>	PrepDate: DF: <b>1</b>							
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
Alkalinity, Bicarbonate (As CaCO3)	335.5	5.00					356.2	5.98	20	
Alkalinity, Carbonate (As CaCO3)	U	5.00					0	0	20	
Alkalinity, Total (As CaCO3)	335.5	5.00					356.2	5.98	20	

The following samples were analyzed in this batch: HS22120213-01

**Client:** PDC Energy  
**Project:** Bost 16N-8B-L  
**WorkOrder:** HS22120213

**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>
Date	
mg/L	Milligrams per Liter

**CERTIFICATIONS,ACCREDITATIONS & LICENSES**

<b>Agency</b>	<b>Number</b>	<b>Expire Date</b>
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	624-2022	31-Dec-2022
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: HS22120213

Date/Time Received: **03-Dec-2022 09:05**

Client Name: PDC Energy 80620

Received by: **Paresh M. Giga**

<b>Completed By:</b> <u>/S/ Nilesch D. Ranchod</u>	05-Dec-2022 10:09	<b>Reviewed by:</b> <u>/S/ Tyler Monroe</u>	06-Dec-2022 11:33
eSignature	Date/Time	eSignature	Date/Time

Matrices: **W**

Carrier 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 type="checkbox"/>            | No <input checked="" 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):	1.9uc/1.4c	IR31
Cooler(s)/Kit(s):	Blue	
Date/Time sample(s) sent to storage:	12/03/2022 13:00	
Water - VOA vials have zero headspace?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/> No VOA vials submitted <input type="checkbox"/>
Water - pH acceptable upon receipt?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/> N/A <input type="checkbox"/>
pH adjusted?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/> N/A <input type="checkbox"/>
pH adjusted by:	<input style="width: 100%;" type="text"/>	

Login Notes:

Client Contacted: \_\_\_\_\_ Date Contacted: \_\_\_\_\_ Person Contacted: \_\_\_\_\_

Contacted By: \_\_\_\_\_ Regarding: \_\_\_\_\_

Comments:

Corrective Action:



# Chain of Custody Form

Page \_\_\_\_\_ of \_\_\_\_\_

HS22120213

PDC Energy  
Bost 16N-8B-L

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12



ALS Project Manager: \_\_\_\_\_

Customer Information		Project Information			
Purchase Order		Project Name	Bost 16N-8B-L	A	Dissolved Gases (Methane, Ethane, Propane)
Work Order		Project Number		B	BTEX 8260
Company Name	PDC Energy	Bill To Company	PDC Energy	C	DRO 8015
Send Report To	Max Trehus	Invoice Attn.	Max Trehus	D	GRO 8015
Address	4000 Burlington Ave	Address	1775 Sherman St #3000	E	Anions (Cl,SO4), Alk (T, CO3, HCO3), TDS
				F	Dissolved Ca, Mg, K, Na - need to lab filter
City/State/Zip	Evans, CO 80620	City/State/Zip	Denver, CO 80203	G	Total Ca, Mg, K, Na
Phone	720-762-3569	Phone	303-860-5800	H	
Fax		Fax		I	
e-Mail Address	max.trehus@pdce.com	e-Mail Address		J	
	Jenifer.Hakkarinen@pdce.com				
	Jessica.Johannsen@pdce.com				

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	16N-8B-L A	12/1	8:44	W	8	3	X										
2	16N-8B-L A			W	1	3		X									
3	16N-8B-L A			W	1	3			X								
4	16N-8B-L A			W	1	3				X							
5	16N-8B-L A			W	8	1					X						
6	16N-8B-L B			W	8	1						X					
7	16N-8B-L A			W	2	1							X				
8																	
9																	
10																	

Sampler(s): Please Print & Sign Max Trehus      Shipment Method: \_\_\_\_\_      Required Turnaround Time:  STD 10 Wk Days     5 Wk Days     2 Wk Days     24 Hour     Other \_\_\_\_\_      Results Due Date: \_\_\_\_\_

Relinquished by: <u>[Signature]</u>	Date: <u>12/1</u>	Time: <u>16:25</u>	Received by: <u>[Signature]</u>	Notes: <u>Facility ID: 478983</u>
Relinquished by: <u>[Signature]</u>	Date: <u>12/2/22</u>	Time: <u>16:30</u>	Received by (Laboratory): <u>X 12/3/22 09:05</u>	QC Package: (Check Box Below)
Logged by (Laboratory): _____	Date: _____	Time: _____	Checked by (Laboratory): <u>Blue</u>	<input checked="" type="checkbox"/> Level II: Standard QC      TRRP-Checklist <input type="checkbox"/> Level III: Std QC + Raw Data      TRRP Level IV <input type="checkbox"/> Level IV: SW846 CLP-Like Other: _____
Preservative Key: 1-HCL 2-HNO3 3-H2SO4 4-NaOH 5-Na2S2O3 6-NaHSO4 7-Other 8-4 degrees C 9-5035				

Note: Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental. Copyright 2013 by ALS Environmental

