

**PERMIAN BASIN
ENVIRONMENTAL LAB, LP
1400 Rankin Hwy
Midland, TX 79701**



Analytical Report

Prepared for:

Christine Alderman
Cimarex
600 N. Marinfeld, Ste. 600
Midland, TX 79701

Project: Assault SWD

Project Number: [none]

Location:

Lab Order Number: 7H14006



NELAP/TCEQ # T104704516-16-7

Report Date: 08/22/17

Cimarex
600 N. Marinfeld, Ste. 600
Midland TX, 79701

Project: Assault SWD
Project Number: [none]
Project Manager: Christine Alderman

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ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
S-1	7H14006-01	Water	08/14/17 07:45	08-14-2017 15:15
S-2	7H14006-02	Water	08/14/17 09:25	08-14-2017 15:15
S-3	7H14006-03	Water	08/14/17 09:36	08-14-2017 15:15
S-3A	7H14006-04	Water	08/14/17 09:53	08-14-2017 15:15
S-3B	7H14006-05	Water	08/14/17 09:57	08-14-2017 15:15
S-4	7H14006-06	Water	08/14/17 10:11	08-14-2017 15:15
S-4A	7H14006-07	Water	08/14/17 10:20	08-14-2017 15:15
S-4B	7H14006-08	Water	08/14/17 10:29	08-14-2017 15:15
S-4C	7H14006-09	Water	08/14/17 10:50	08-14-2017 15:15
S-5	7H14006-10	Water	08/14/17 09:32	08-14-2017 15:15
S-5A	7H14006-11	Water	08/14/17 09:57	08-14-2017 15:15
S-5B	7H14006-12	Water	08/14/17 11:12	08-14-2017 15:15
S-6	7H14006-13	Water	08/14/17 10:11	08-14-2017 15:15
S-6A	7H14006-14	Water	08/14/17 10:31	08-14-2017 15:15
S-6C	7H14006-15	Water	08/14/17 10:50	08-14-2017 15:15
DUP-1	7H14006-16	Water	08/14/17 12:00	08-14-2017 15:15
DUP-2	7H14006-17	Water	08/14/17 12:00	08-14-2017 15:15

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Project: Assault SWD
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Project Manager: Christine Alderman

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S-1
7H14006-01 (Water)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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Permian Basin Environmental Lab, L.P.

Organics by GC

C6-C12	ND	2.50	mg/L	1	P7H1517	08/15/17	08/16/17	TX 1005	
>C12-C28	ND	2.50	mg/L	1	P7H1517	08/15/17	08/16/17	TX 1005	
>C28-C35	ND	2.50	mg/L	1	P7H1517	08/15/17	08/16/17	TX 1005	
Surrogate: 1-Chlorooctane		117 %	70-130		P7H1517	08/15/17	08/16/17	TX 1005	
Surrogate: o-Terphenyl		125 %	70-130		P7H1517	08/15/17	08/16/17	TX 1005	
Total Hydrocarbon nC6-nC35	ND	2.50	mg/L	1	[CALC]	08/15/17	08/16/17	[CALC]	

General Chemistry Parameters by EPA / Standard Methods

Total Alkalinity	132	10.0	mg/L	1	P7H1514	08/15/17	08/15/17	EPA 310.1M	
Carbonate Alkalinity	ND	10.0	mg/L	1	P7H1514	08/15/17	08/15/17	EPA 310.1M	
Bicarbonate Alkalinity	132	10.0	mg/L	1	P7H1514	08/15/17	08/15/17	EPA 310.1M	
Hydroxide Alkalinity	ND	10.0	mg/L	1	P7H1514	08/15/17	08/15/17	EPA 310.1M	
Bromide	0.199	0.0500	mg/L	1	P7H1505	08/15/17	08/17/17	EPA 300.0	
Chloride	92.8	12.5	mg/L	25	P7H1505	08/15/17	08/17/17	EPA 300.0	
Specific Conductance (EC)	3010	5.00	umhos/cm	1	P7H1703	08/17/17	08/17/17	EPA 120.1	
Dissolved Oxygen	6.00		mg/L	1	P7H1513	08/15/17	08/15/17	CHEMets	QAL1
pH	7.90		pH Units	1	P7H1515	08/15/17	08/15/17	EPA 150.1	
Temperature	22.00		pH Units	1	P7H1515	08/15/17	08/15/17	EPA 150.1	
Total Dissolved Solids	2750	20.0	mg/L	1	P7H1516	08/15/17	08/15/17	EPA 160.1	
Sulfate	1620	25.0	mg/L	25	P7H1505	08/15/17	08/17/17	EPA 300.0	

Total Metals by EPA / Standard Methods

Calcium	593	5.00	mg/L	1	P7H1412	08/14/17	08/16/17	EPA 6010B	QAL2
Magnesium	52.1	5.00	mg/L	1	P7H1412	08/14/17	08/16/17	EPA 6010B	QAL2
Potassium	3.16	5.00	mg/L	1	P7H1412	08/14/17	08/16/17	EPA 6010B	QAL2, J
Sodium	103	5.00	mg/L	1	P7H1412	08/14/17	08/16/17	EPA 6010B	QAL2
Hardness	1690	5.00	mg/L	1	P7H1412	08/14/17	08/16/17	EPA 6010B	QAL2

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S-2
7H14006-02 (Water)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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Permian Basin Environmental Lab, L.P.

Organics by GC

C6-C12	ND	2.50	mg/L	1	P7H1517	08/15/17	08/16/17	TX 1005	
>C12-C28	ND	2.50	mg/L	1	P7H1517	08/15/17	08/16/17	TX 1005	
>C28-C35	ND	2.50	mg/L	1	P7H1517	08/15/17	08/16/17	TX 1005	
Surrogate: 1-Chlorooctane		114 %	70-130		P7H1517	08/15/17	08/16/17	TX 1005	
Surrogate: o-Terphenyl		122 %	70-130		P7H1517	08/15/17	08/16/17	TX 1005	
Total Hydrocarbon nC6-nC35	ND	2.50	mg/L	1	[CALC]	08/15/17	08/16/17	[CALC]	

General Chemistry Parameters by EPA / Standard Methods

Total Alkalinity	122	10.0	mg/L	1	P7H1514	08/15/17	08/15/17	EPA 310.1M	
Carbonate Alkalinity	ND	10.0	mg/L	1	P7H1514	08/15/17	08/15/17	EPA 310.1M	
Bicarbonate Alkalinity	122	10.0	mg/L	1	P7H1514	08/15/17	08/15/17	EPA 310.1M	
Hydroxide Alkalinity	ND	10.0	mg/L	1	P7H1514	08/15/17	08/15/17	EPA 310.1M	
Bromide	0.197	0.0500	mg/L	1	P7H1505	08/15/17	08/17/17	EPA 300.0	
Chloride	93.2	12.5	mg/L	25	P7H1505	08/15/17	08/17/17	EPA 300.0	
Specific Conductance (EC)	2950	5.00	umhos/cm	1	P7H1703	08/17/17	08/17/17	EPA 120.1	
Dissolved Oxygen	6.00		mg/L	1	P7H1513	08/15/17	08/15/17	CHEMets	QAL1
pH	7.92		pH Units	1	P7H1515	08/15/17	08/15/17	EPA 150.1	
Temperature	21.90		pH Units	1	P7H1515	08/15/17	08/15/17	EPA 150.1	
Total Dissolved Solids	2920	20.0	mg/L	1	P7H1516	08/15/17	08/15/17	EPA 160.1	
Sulfate	1650	25.0	mg/L	25	P7H1505	08/15/17	08/17/17	EPA 300.0	

Total Metals by EPA / Standard Methods

Calcium	657	5.00	mg/L	1	P7H1412	08/14/17	08/16/17	EPA 6010B	QAL2
Magnesium	49.3	5.00	mg/L	1	P7H1412	08/14/17	08/16/17	EPA 6010B	QAL2
Potassium	6.29	5.00	mg/L	1	P7H1412	08/14/17	08/16/17	EPA 6010B	QAL2
Sodium	94.4	5.00	mg/L	1	P7H1412	08/14/17	08/16/17	EPA 6010B	QAL2
Hardness	1840	5.00	mg/L	1	P7H1412	08/14/17	08/16/17	EPA 6010B	QAL2

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S-3
7H14006-03 (Water)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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Permian Basin Environmental Lab, L.P.

Organics by GC

C6-C12	ND	2.50	mg/L	1	P7H1517	08/15/17	08/16/17	TX 1005	
>C12-C28	ND	2.50	mg/L	1	P7H1517	08/15/17	08/16/17	TX 1005	
>C28-C35	ND	2.50	mg/L	1	P7H1517	08/15/17	08/16/17	TX 1005	
Surrogate: 1-Chlorooctane		109 %	70-130		P7H1517	08/15/17	08/16/17	TX 1005	
Surrogate: o-Terphenyl		118 %	70-130		P7H1517	08/15/17	08/16/17	TX 1005	
Total Hydrocarbon nC6-nC35	ND	2.50	mg/L	1	[CALC]	08/15/17	08/16/17	[CALC]	

General Chemistry Parameters by EPA / Standard Methods

Total Alkalinity	120	10.0	mg/L	1	P7H1514	08/15/17	08/15/17	EPA 310.1M	
Carbonate Alkalinity	ND	10.0	mg/L	1	P7H1514	08/15/17	08/15/17	EPA 310.1M	
Bicarbonate Alkalinity	120	10.0	mg/L	1	P7H1514	08/15/17	08/15/17	EPA 310.1M	
Hydroxide Alkalinity	ND	10.0	mg/L	1	P7H1514	08/15/17	08/15/17	EPA 310.1M	
Bromide	0.198	0.0500	mg/L	1	P7H1505	08/15/17	08/17/17	EPA 300.0	
Chloride	86.6	12.5	mg/L	25	P7H1505	08/15/17	08/17/17	EPA 300.0	
Specific Conductance (EC)	2940	5.00	umhos/cm	1	P7H1703	08/17/17	08/17/17	EPA 120.1	
Dissolved Oxygen	6.00		mg/L	1	P7H1513	08/15/17	08/15/17	CHEMets	QAL1
pH	7.94		pH Units	1	P7H1515	08/15/17	08/15/17	EPA 150.1	
Temperature	21.80		pH Units	1	P7H1515	08/15/17	08/15/17	EPA 150.1	
Total Dissolved Solids	2690	20.0	mg/L	1	P7H1516	08/15/17	08/15/17	EPA 160.1	
Sulfate	1630	25.0	mg/L	25	P7H1505	08/15/17	08/17/17	EPA 300.0	

Total Metals by EPA / Standard Methods

Calcium	707	5.00	mg/L	1	P7H1412	08/14/17	08/16/17	EPA 6010B	QAL2
Magnesium	53.0	5.00	mg/L	1	P7H1412	08/14/17	08/16/17	EPA 6010B	QAL2
Potassium	4.30	5.00	mg/L	1	P7H1412	08/14/17	08/16/17	EPA 6010B	J, QAL2
Sodium	100	5.00	mg/L	1	P7H1412	08/14/17	08/16/17	EPA 6010B	QAL2
Hardness	1980	5.00	mg/L	1	P7H1412	08/14/17	08/16/17	EPA 6010B	QAL2

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S-3A

7H14006-04 (Water)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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Permian Basin Environmental Lab, L.P.

Organics by GC

C6-C12	ND	2.50	mg/L	1	P7H1517	08/15/17	08/16/17	TX 1005	
>C12-C28	ND	2.50	mg/L	1	P7H1517	08/15/17	08/16/17	TX 1005	
>C28-C35	ND	2.50	mg/L	1	P7H1517	08/15/17	08/16/17	TX 1005	
Surrogate: 1-Chlorooctane		104 %	70-130		P7H1517	08/15/17	08/16/17	TX 1005	
Surrogate: o-Terphenyl		111 %	70-130		P7H1517	08/15/17	08/16/17	TX 1005	
Total Hydrocarbon nC6-nC35	ND	2.50	mg/L	1	[CALC]	08/15/17	08/16/17	[CALC]	

General Chemistry Parameters by EPA / Standard Methods

Total Alkalinity	110	10.0	mg/L	1	P7H1514	08/15/17	08/15/17	EPA 310.1M	
Carbonate Alkalinity	ND	10.0	mg/L	1	P7H1514	08/15/17	08/15/17	EPA 310.1M	
Bicarbonate Alkalinity	110	10.0	mg/L	1	P7H1514	08/15/17	08/15/17	EPA 310.1M	
Hydroxide Alkalinity	ND	10.0	mg/L	1	P7H1514	08/15/17	08/15/17	EPA 310.1M	
Bromide	0.185	0.0500	mg/L	1	P7H1505	08/15/17	08/17/17	EPA 300.0	
Chloride	78.4	12.5	mg/L	25	P7H1505	08/15/17	08/17/17	EPA 300.0	
Specific Conductance (EC)	2880	5.00	umhos/cm	1	P7H1703	08/17/17	08/17/17	EPA 120.1	
Dissolved Oxygen	6.00		mg/L	1	P7H1513	08/15/17	08/15/17	CHEMets	QAL1
pH	7.97		pH Units	1	P7H1515	08/15/17	08/15/17	EPA 150.1	
Temperature	21.70		pH Units	1	P7H1515	08/15/17	08/15/17	EPA 150.1	
Total Dissolved Solids	2770	20.0	mg/L	1	P7H1516	08/15/17	08/15/17	EPA 160.1	
Sulfate	1610	25.0	mg/L	25	P7H1505	08/15/17	08/17/17	EPA 300.0	

Total Metals by EPA / Standard Methods

Calcium	773	5.00	mg/L	1	P7H1412	08/14/17	08/16/17	EPA 6010B	QAL2
Magnesium	46.1	5.00	mg/L	1	P7H1412	08/14/17	08/16/17	EPA 6010B	QAL2
Potassium	6.97	5.00	mg/L	1	P7H1412	08/14/17	08/16/17	EPA 6010B	QAL2
Sodium	87.0	5.00	mg/L	1	P7H1412	08/14/17	08/16/17	EPA 6010B	QAL2
Hardness	2120	5.00	mg/L	1	P7H1412	08/14/17	08/16/17	EPA 6010B	QAL2

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Project: Assault SWD
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S-3B

7H14006-05 (Water)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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Permian Basin Environmental Lab, L.P.

Organics by GC

C6-C12	ND	2.50	mg/L	1	P7H1517	08/15/17	08/16/17	TX 1005	
>C12-C28	ND	2.50	mg/L	1	P7H1517	08/15/17	08/16/17	TX 1005	
>C28-C35	ND	2.50	mg/L	1	P7H1517	08/15/17	08/16/17	TX 1005	
Surrogate: 1-Chlorooctane		109 %	70-130		P7H1517	08/15/17	08/16/17	TX 1005	
Surrogate: o-Terphenyl		115 %	70-130		P7H1517	08/15/17	08/16/17	TX 1005	
Total Hydrocarbon nC6-nC35	ND	2.50	mg/L	1	[CALC]	08/15/17	08/16/17	[CALC]	

General Chemistry Parameters by EPA / Standard Methods

Total Alkalinity	112	10.0	mg/L	1	P7H1514	08/15/17	08/15/17	EPA 310.1M	
Carbonate Alkalinity	ND	10.0	mg/L	1	P7H1514	08/15/17	08/15/17	EPA 310.1M	
Bicarbonate Alkalinity	112	10.0	mg/L	1	P7H1514	08/15/17	08/15/17	EPA 310.1M	
Hydroxide Alkalinity	ND	10.0	mg/L	1	P7H1514	08/15/17	08/15/17	EPA 310.1M	
Bromide	ND	0.0500	mg/L	1	P7H1505	08/15/17	08/17/17	EPA 300.0	
Chloride	70.8	12.5	mg/L	25	P7H1505	08/15/17	08/17/17	EPA 300.0	
Specific Conductance (EC)	2850	5.00	umhos/cm	1	P7H1703	08/17/17	08/17/17	EPA 120.1	
Dissolved Oxygen	6.00		mg/L	1	P7H1513	08/15/17	08/15/17	CHEMets	QAL1
pH	8.00		pH Units	1	P7H1515	08/15/17	08/15/17	EPA 150.1	
Temperature	21.60		pH Units	1	P7H1515	08/15/17	08/15/17	EPA 150.1	
Total Dissolved Solids	2790	20.0	mg/L	1	P7H1516	08/15/17	08/15/17	EPA 160.1	
Sulfate	1600	25.0	mg/L	25	P7H1505	08/15/17	08/17/17	EPA 300.0	

Total Metals by EPA / Standard Methods

Calcium	613	5.00	mg/L	1	P7H1606	08/16/17	08/16/17	EPA 6010B	QAL2
Magnesium	40.3	5.00	mg/L	1	P7H1606	08/16/17	08/16/17	EPA 6010B	QAL2
Potassium	5.99	5.00	mg/L	1	P7H1606	08/16/17	08/16/17	EPA 6010B	QAL2
Sodium	75.5	5.00	mg/L	1	P7H1606	08/16/17	08/16/17	EPA 6010B	QAL2
Hardness	1700	5.00	mg/L	1	P7H1606	08/16/17	08/16/17	EPA 6010B	QAL2

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S-4

7H14006-06 (Water)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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Permian Basin Environmental Lab, L.P.

Organics by GC

C6-C12	ND	2.50	mg/L	1	P7H1517	08/15/17	08/16/17	TX 1005	
>C12-C28	ND	2.50	mg/L	1	P7H1517	08/15/17	08/16/17	TX 1005	
>C28-C35	ND	2.50	mg/L	1	P7H1517	08/15/17	08/16/17	TX 1005	
Surrogate: 1-Chlorooctane		106 %	70-130		P7H1517	08/15/17	08/16/17	TX 1005	
Surrogate: o-Terphenyl		113 %	70-130		P7H1517	08/15/17	08/16/17	TX 1005	
Total Hydrocarbon nC6-nC35	ND	2.50	mg/L	1	[CALC]	08/15/17	08/16/17	[CALC]	

General Chemistry Parameters by EPA / Standard Methods

Total Alkalinity	102	10.0	mg/L	1	P7H1514	08/15/17	08/15/17	EPA 310.1M	
Carbonate Alkalinity	ND	10.0	mg/L	1	P7H1514	08/15/17	08/15/17	EPA 310.1M	
Bicarbonate Alkalinity	102	10.0	mg/L	1	P7H1514	08/15/17	08/15/17	EPA 310.1M	
Hydroxide Alkalinity	ND	10.0	mg/L	1	P7H1514	08/15/17	08/15/17	EPA 310.1M	
Bromide	ND	0.0500	mg/L	1	P7H1505	08/15/17	08/17/17	EPA 300.0	
Chloride	68.7	12.5	mg/L	25	P7H1505	08/15/17	08/17/17	EPA 300.0	
Specific Conductance (EC)	2800	5.00	umhos/cm	1	P7H1703	08/17/17	08/17/17	EPA 120.1	
Dissolved Oxygen	6.00		mg/L	1	P7H1513	08/15/17	08/15/17	CHEMets	QAL1
pH	7.88		pH Units	1	P7H1515	08/15/17	08/15/17	EPA 150.1	
Temperature	21.60		pH Units	1	P7H1515	08/15/17	08/15/17	EPA 150.1	
Total Dissolved Solids	2840	20.0	mg/L	1	P7H1516	08/15/17	08/15/17	EPA 160.1	
Sulfate	1530	25.0	mg/L	25	P7H1505	08/15/17	08/17/17	EPA 300.0	

Total Metals by EPA / Standard Methods

Calcium	558	5.00	mg/L	1	P7H1606	08/16/17	08/16/17	EPA 6010B	QAL2
Magnesium	35.4	5.00	mg/L	1	P7H1606	08/16/17	08/16/17	EPA 6010B	QAL2
Potassium	5.44	5.00	mg/L	1	P7H1606	08/16/17	08/16/17	EPA 6010B	QAL2
Sodium	66.4	5.00	mg/L	1	P7H1606	08/16/17	08/16/17	EPA 6010B	QAL2
Hardness	1540	5.00	mg/L	1	P7H1606	08/16/17	08/16/17	EPA 6010B	QAL2

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600 N. Marinfeld, Ste. 600
Midland TX, 79701

Project: Assault SWD
Project Number: [none]
Project Manager: Christine Alderman

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S-4A

7H14006-07 (Water)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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Permian Basin Environmental Lab, L.P.

Organics by GC

C6-C12	ND	2.50	mg/L	1	P7H1517	08/15/17	08/16/17	TX 1005	
>C12-C28	ND	2.50	mg/L	1	P7H1517	08/15/17	08/16/17	TX 1005	
>C28-C35	ND	2.50	mg/L	1	P7H1517	08/15/17	08/16/17	TX 1005	
Surrogate: 1-Chlorooctane		105 %	70-130		P7H1517	08/15/17	08/16/17	TX 1005	
Surrogate: o-Terphenyl		112 %	70-130		P7H1517	08/15/17	08/16/17	TX 1005	
Total Hydrocarbon nC6-nC35	ND	2.50	mg/L	1	[CALC]	08/15/17	08/16/17	[CALC]	

General Chemistry Parameters by EPA / Standard Methods

Total Alkalinity	100	10.0	mg/L	1	P7H1514	08/15/17	08/15/17	EPA 310.1M	
Carbonate Alkalinity	ND	10.0	mg/L	1	P7H1514	08/15/17	08/15/17	EPA 310.1M	
Bicarbonate Alkalinity	100	10.0	mg/L	1	P7H1514	08/15/17	08/15/17	EPA 310.1M	
Hydroxide Alkalinity	ND	10.0	mg/L	1	P7H1514	08/15/17	08/15/17	EPA 310.1M	
Bromide	ND	0.0500	mg/L	1	P7H1505	08/15/17	08/17/17	EPA 300.0	
Chloride	72.7	12.5	mg/L	25	P7H1505	08/15/17	08/17/17	EPA 300.0	
Specific Conductance (EC)	2830	5.00	umhos/cm	1	P7H1703	08/17/17	08/17/17	EPA 120.1	
Dissolved Oxygen	6.00		mg/L	1	P7H1513	08/15/17	08/15/17	CHEMets	QAL1
pH	7.93		pH Units	1	P7H1515	08/15/17	08/15/17	EPA 150.1	
Temperature	21.50		pH Units	1	P7H1515	08/15/17	08/15/17	EPA 150.1	
Total Dissolved Solids	2710	20.0	mg/L	1	P7H1516	08/15/17	08/15/17	EPA 160.1	
Sulfate	1560	25.0	mg/L	25	P7H1505	08/15/17	08/17/17	EPA 300.0	

Total Metals by EPA / Standard Methods

Calcium	565	5.00	mg/L	1	P7H1606	08/16/17	08/16/17	EPA 6010B	QAL2
Magnesium	36.4	5.00	mg/L	1	P7H1606	08/16/17	08/16/17	EPA 6010B	QAL2
Potassium	5.54	5.00	mg/L	1	P7H1606	08/16/17	08/16/17	EPA 6010B	QAL2
Sodium	67.4	5.00	mg/L	1	P7H1606	08/16/17	08/16/17	EPA 6010B	QAL2
Hardness	1560	5.00	mg/L	1	P7H1606	08/16/17	08/16/17	EPA 6010B	QAL2

Cimarex
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Midland TX, 79701

Project: Assault SWD
Project Number: [none]
Project Manager: Christine Alderman

Fax: (432) 571-7832

S-4B

7H14006-08 (Water)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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Permian Basin Environmental Lab, L.P.

Organics by GC

C6-C12	ND	2.50	mg/L	1	P7H1517	08/15/17	08/16/17	TX 1005	
>C12-C28	ND	2.50	mg/L	1	P7H1517	08/15/17	08/16/17	TX 1005	
>C28-C35	ND	2.50	mg/L	1	P7H1517	08/15/17	08/16/17	TX 1005	
Surrogate: 1-Chlorooctane		101 %	70-130		P7H1517	08/15/17	08/16/17	TX 1005	
Surrogate: o-Terphenyl		108 %	70-130		P7H1517	08/15/17	08/16/17	TX 1005	
Total Hydrocarbon nC6-nC35	ND	2.50	mg/L	1	[CALC]	08/15/17	08/16/17	[CALC]	

General Chemistry Parameters by EPA / Standard Methods

Total Alkalinity	100	10.0	mg/L	1	P7H1514	08/15/17	08/15/17	EPA 310.1M	
Carbonate Alkalinity	ND	10.0	mg/L	1	P7H1514	08/15/17	08/15/17	EPA 310.1M	
Bicarbonate Alkalinity	100	10.0	mg/L	1	P7H1514	08/15/17	08/15/17	EPA 310.1M	
Hydroxide Alkalinity	ND	10.0	mg/L	1	P7H1514	08/15/17	08/15/17	EPA 310.1M	
Bromide	ND	0.0500	mg/L	1	P7H1505	08/15/17	08/17/17	EPA 300.0	
Chloride	74.9	12.5	mg/L	25	P7H1505	08/15/17	08/17/17	EPA 300.0	
Specific Conductance (EC)	2840	5.00	umhos/cm	1	P7H1703	08/17/17	08/17/17	EPA 120.1	
Dissolved Oxygen	6.00		mg/L	1	P7H1513	08/15/17	08/15/17	CHEMets	QAL1
pH	8.01		pH Units	1	P7H1515	08/15/17	08/15/17	EPA 150.1	
Temperature	21.50		pH Units	1	P7H1515	08/15/17	08/15/17	EPA 150.1	
Total Dissolved Solids	2730	20.0	mg/L	1	P7H1516	08/15/17	08/15/17	EPA 160.1	
Sulfate	1550	25.0	mg/L	25	P7H1505	08/15/17	08/17/17	EPA 300.0	

Total Metals by EPA / Standard Methods

Calcium	552	5.00	mg/L	1	P7H1606	08/16/17	08/16/17	EPA 6010B	QAL2
Magnesium	35.7	5.00	mg/L	1	P7H1606	08/16/17	08/16/17	EPA 6010B	QAL2
Potassium	5.55	5.00	mg/L	1	P7H1606	08/16/17	08/16/17	EPA 6010B	QAL2
Sodium	66.3	5.00	mg/L	1	P7H1606	08/16/17	08/16/17	EPA 6010B	QAL2
Hardness	1520	5.00	mg/L	1	P7H1606	08/16/17	08/16/17	EPA 6010B	QAL2

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S-4C

7H14006-09 (Water)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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Permian Basin Environmental Lab, L.P.

Organics by GC

C6-C12	ND	2.50	mg/L	1	P7H1517	08/15/17	08/16/17	TX 1005	
>C12-C28	ND	2.50	mg/L	1	P7H1517	08/15/17	08/16/17	TX 1005	
>C28-C35	ND	2.50	mg/L	1	P7H1517	08/15/17	08/16/17	TX 1005	
Surrogate: 1-Chlorooctane		105 %	70-130		P7H1517	08/15/17	08/16/17	TX 1005	
Surrogate: o-Terphenyl		111 %	70-130		P7H1517	08/15/17	08/16/17	TX 1005	
Total Hydrocarbon nC6-nC35	ND	2.50	mg/L	1	[CALC]	08/15/17	08/16/17	[CALC]	

General Chemistry Parameters by EPA / Standard Methods

Total Alkalinity	92.0	10.0	mg/L	1	P7H1514	08/15/17	08/15/17	EPA 310.1M	
Carbonate Alkalinity	ND	10.0	mg/L	1	P7H1514	08/15/17	08/15/17	EPA 310.1M	
Bicarbonate Alkalinity	92.0	10.0	mg/L	1	P7H1514	08/15/17	08/15/17	EPA 310.1M	
Hydroxide Alkalinity	ND	10.0	mg/L	1	P7H1514	08/15/17	08/15/17	EPA 310.1M	
Bromide	ND	0.0500	mg/L	1	P7H1505	08/15/17	08/17/17	EPA 300.0	
Chloride	66.6	12.5	mg/L	25	P7H1505	08/15/17	08/17/17	EPA 300.0	
Specific Conductance (EC)	2610	5.00	umhos/cm	1	P7H1703	08/17/17	08/17/17	EPA 120.1	
Dissolved Oxygen	6.00		mg/L	1	P7H1513	08/15/17	08/15/17	CHEMets	QAL1
pH	7.93		pH Units	1	P7H1515	08/15/17	08/15/17	EPA 150.1	
Temperature	21.30		pH Units	1	P7H1515	08/15/17	08/15/17	EPA 150.1	
Total Dissolved Solids	2380	20.0	mg/L	1	P7H1516	08/15/17	08/15/17	EPA 160.1	
Sulfate	1390	25.0	mg/L	25	P7H1505	08/15/17	08/17/17	EPA 300.0	

Total Metals by EPA / Standard Methods

Calcium	466	5.00	mg/L	1	P7H1606	08/16/17	08/16/17	EPA 6010B	QAL2
Magnesium	30.8	5.00	mg/L	1	P7H1606	08/16/17	08/16/17	EPA 6010B	QAL2
Potassium	5.06	5.00	mg/L	1	P7H1606	08/16/17	08/16/17	EPA 6010B	QAL2
Sodium	57.8	5.00	mg/L	1	P7H1606	08/16/17	08/16/17	EPA 6010B	QAL2
Hardness	1290	5.00	mg/L	1	P7H1606	08/16/17	08/16/17	EPA 6010B	QAL2

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S-5
7H14006-10 (Water)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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Permian Basin Environmental Lab, L.P.

Organics by GC

C6-C12	ND	2.50	mg/L	1	P7H1517	08/15/17	08/16/17	TX 1005	
>C12-C28	ND	2.50	mg/L	1	P7H1517	08/15/17	08/16/17	TX 1005	
>C28-C35	ND	2.50	mg/L	1	P7H1517	08/15/17	08/16/17	TX 1005	
Surrogate: 1-Chlorooctane		101 %	70-130		P7H1517	08/15/17	08/16/17	TX 1005	
Surrogate: o-Terphenyl		107 %	70-130		P7H1517	08/15/17	08/16/17	TX 1005	
Total Hydrocarbon nC6-nC35	ND	2.50	mg/L	1	[CALC]	08/15/17	08/16/17	[CALC]	

General Chemistry Parameters by EPA / Standard Methods

Total Alkalinity	87.0	10.0	mg/L	1	P7H1514	08/15/17	08/15/17	EPA 310.1M	
Carbonate Alkalinity	ND	10.0	mg/L	1	P7H1514	08/15/17	08/15/17	EPA 310.1M	
Bicarbonate Alkalinity	87.0	10.0	mg/L	1	P7H1514	08/15/17	08/15/17	EPA 310.1M	
Hydroxide Alkalinity	ND	10.0	mg/L	1	P7H1514	08/15/17	08/15/17	EPA 310.1M	
Bromide	ND	0.0500	mg/L	1	P7H1505	08/15/17	08/17/17	EPA 300.0	
Chloride	75.3	12.5	mg/L	25	P7H1505	08/15/17	08/17/17	EPA 300.0	
Specific Conductance (EC)	2550	5.00	umhos/cm	1	P7H1703	08/17/17	08/17/17	EPA 120.1	
Dissolved Oxygen	6.00		mg/L	1	P7H1513	08/15/17	08/15/17	CHEMets	QAL1
pH	7.76		pH Units	1	P7H1515	08/15/17	08/15/17	EPA 150.1	
Temperature	21.30		pH Units	1	P7H1515	08/15/17	08/15/17	EPA 150.1	
Total Dissolved Solids	2330	20.0	mg/L	1	P7H1516	08/15/17	08/15/17	EPA 160.1	
Sulfate	1300	25.0	mg/L	25	P7H1505	08/15/17	08/17/17	EPA 300.0	

Total Metals by EPA / Standard Methods

Calcium	456	5.00	mg/L	1	P7H1606	08/16/17	08/16/17	EPA 6010B	QAL2
Magnesium	32.0	5.00	mg/L	1	P7H1606	08/16/17	08/16/17	EPA 6010B	QAL2
Potassium	5.30	5.00	mg/L	1	P7H1606	08/16/17	08/16/17	EPA 6010B	QAL2
Sodium	64.3	5.00	mg/L	1	P7H1606	08/16/17	08/16/17	EPA 6010B	QAL2
Hardness	1270	5.00	mg/L	1	P7H1606	08/16/17	08/16/17	EPA 6010B	QAL2

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S-5A
7H14006-11 (Water)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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Permian Basin Environmental Lab, L.P.

Organics by GC

C6-C12	ND	2.50	mg/L	1	P7H1517	08/15/17	08/16/17	TX 1005	
>C12-C28	ND	2.50	mg/L	1	P7H1517	08/15/17	08/16/17	TX 1005	
>C28-C35	ND	2.50	mg/L	1	P7H1517	08/15/17	08/16/17	TX 1005	
Surrogate: 1-Chlorooctane		97.1 %	70-130		P7H1517	08/15/17	08/16/17	TX 1005	
Surrogate: o-Terphenyl		103 %	70-130		P7H1517	08/15/17	08/16/17	TX 1005	
Total Hydrocarbon nC6-nC35	ND	2.50	mg/L	1	[CALC]	08/15/17	08/16/17	[CALC]	

General Chemistry Parameters by EPA / Standard Methods

Total Alkalinity	85.0	10.0	mg/L	1	P7H1514	08/15/17	08/15/17	EPA 310.1M	
Carbonate Alkalinity	ND	10.0	mg/L	1	P7H1514	08/15/17	08/15/17	EPA 310.1M	
Bicarbonate Alkalinity	85.0	10.0	mg/L	1	P7H1514	08/15/17	08/15/17	EPA 310.1M	
Hydroxide Alkalinity	ND	10.0	mg/L	1	P7H1514	08/15/17	08/15/17	EPA 310.1M	
Bromide	ND	0.0500	mg/L	1	P7H1505	08/15/17	08/17/17	EPA 300.0	
Chloride	80.4	12.5	mg/L	25	P7H1505	08/15/17	08/17/17	EPA 300.0	
Specific Conductance (EC)	2880	5.00	umhos/cm	1	P7H1703	08/17/17	08/17/17	EPA 120.1	
Dissolved Oxygen	6.00		mg/L	1	P7H1513	08/15/17	08/15/17	CHEMets	QAL1
pH	7.84		pH Units	1	P7H1515	08/15/17	08/15/17	EPA 150.1	
Temperature	21.20		pH Units	1	P7H1515	08/15/17	08/15/17	EPA 150.1	
Total Dissolved Solids	2710	20.0	mg/L	1	P7H1516	08/15/17	08/15/17	EPA 160.1	
Sulfate	1560	25.0	mg/L	25	P7H1505	08/15/17	08/17/17	EPA 300.0	

Total Metals by EPA / Standard Methods

Calcium	513	5.00	mg/L	1	P7H1606	08/16/17	08/16/17	EPA 6010B	QAL2
Magnesium	32.0	5.00	mg/L	1	P7H1606	08/16/17	08/16/17	EPA 6010B	QAL2
Potassium	5.35	5.00	mg/L	1	P7H1606	08/16/17	08/16/17	EPA 6010B	QAL2
Sodium	66.7	5.00	mg/L	1	P7H1606	08/16/17	08/16/17	EPA 6010B	QAL2
Hardness	1410	5.00	mg/L	1	P7H1606	08/16/17	08/16/17	EPA 6010B	QAL2

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Project: Assault SWD
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S-5B

7H14006-12 (Water)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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Permian Basin Environmental Lab, L.P.

Organics by GC

C6-C12	ND	2.50	mg/L	1	P7H1517	08/15/17	08/16/17	TX 1005	
>C12-C28	ND	2.50	mg/L	1	P7H1517	08/15/17	08/16/17	TX 1005	
>C28-C35	ND	2.50	mg/L	1	P7H1517	08/15/17	08/16/17	TX 1005	
Surrogate: 1-Chlorooctane		110 %	70-130		P7H1517	08/15/17	08/16/17	TX 1005	
Surrogate: o-Terphenyl		116 %	70-130		P7H1517	08/15/17	08/16/17	TX 1005	
Total Hydrocarbon nC6-nC35	ND	2.50	mg/L	1	[CALC]	08/15/17	08/16/17	[CALC]	

General Chemistry Parameters by EPA / Standard Methods

Total Alkalinity	90.0	10.0	mg/L	1	P7H1514	08/15/17	08/15/17	EPA 310.1M	
Carbonate Alkalinity	ND	10.0	mg/L	1	P7H1514	08/15/17	08/15/17	EPA 310.1M	
Bicarbonate Alkalinity	90.0	10.0	mg/L	1	P7H1514	08/15/17	08/15/17	EPA 310.1M	
Hydroxide Alkalinity	ND	10.0	mg/L	1	P7H1514	08/15/17	08/15/17	EPA 310.1M	
Bromide	ND	0.0500	mg/L	1	P7H1505	08/15/17	08/17/17	EPA 300.0	
Chloride	75.2	12.5	mg/L	25	P7H1505	08/15/17	08/17/17	EPA 300.0	
Specific Conductance (EC)	2900	5.00	umhos/cm	1	P7H1703	08/17/17	08/17/17	EPA 120.1	
Dissolved Oxygen	6.00		mg/L	1	P7H1513	08/15/17	08/15/17	CHEMets	QAL1
pH	7.87		pH Units	1	P7H1515	08/15/17	08/15/17	EPA 150.1	
Temperature	21.10		pH Units	1	P7H1515	08/15/17	08/15/17	EPA 150.1	
Total Dissolved Solids	2720	20.0	mg/L	1	P7H1516	08/15/17	08/15/17	EPA 160.1	
Sulfate	1640	25.0	mg/L	25	P7H1505	08/15/17	08/17/17	EPA 300.0	

Total Metals by EPA / Standard Methods

Calcium	575	5.00	mg/L	1	P7H1606	08/16/17	08/16/17	EPA 6010B	QAL2
Magnesium	31.1	5.00	mg/L	1	P7H1606	08/16/17	08/16/17	EPA 6010B	QAL2
Potassium	5.85	5.00	mg/L	1	P7H1606	08/16/17	08/16/17	EPA 6010B	QAL2
Sodium	64.7	5.00	mg/L	1	P7H1606	08/16/17	08/16/17	EPA 6010B	QAL2
Hardness	1560	5.00	mg/L	1	P7H1606	08/16/17	08/16/17	EPA 6010B	QAL2

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S-6
7H14006-13 (Water)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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Permian Basin Environmental Lab, L.P.

Organics by GC

C6-C12	ND	2.50	mg/L	1	P7H1517	08/15/17	08/16/17	TX 1005	
>C12-C28	ND	2.50	mg/L	1	P7H1517	08/15/17	08/16/17	TX 1005	
>C28-C35	ND	2.50	mg/L	1	P7H1517	08/15/17	08/16/17	TX 1005	
Surrogate: 1-Chlorooctane		101 %	70-130		P7H1517	08/15/17	08/16/17	TX 1005	
Surrogate: o-Terphenyl		107 %	70-130		P7H1517	08/15/17	08/16/17	TX 1005	
Total Hydrocarbon nC6-nC35	ND	2.50	mg/L	1	[CALC]	08/15/17	08/16/17	[CALC]	

General Chemistry Parameters by EPA / Standard Methods

Total Alkalinity	80.0	10.0	mg/L	1	P7H1514	08/15/17	08/15/17	EPA 310.1M	
Carbonate Alkalinity	ND	10.0	mg/L	1	P7H1514	08/15/17	08/15/17	EPA 310.1M	
Bicarbonate Alkalinity	80.0	10.0	mg/L	1	P7H1514	08/15/17	08/15/17	EPA 310.1M	
Hydroxide Alkalinity	ND	10.0	mg/L	1	P7H1514	08/15/17	08/15/17	EPA 310.1M	
Bromide	ND	0.0500	mg/L	1	P7H1505	08/15/17	08/17/17	EPA 300.0	
Chloride	63.2	12.5	mg/L	25	P7H1505	08/15/17	08/17/17	EPA 300.0	
Specific Conductance (EC)	2800	5.00	umhos/cm	1	P7H1703	08/17/17	08/17/17	EPA 120.1	
Dissolved Oxygen	6.00		mg/L	1	P7H1513	08/15/17	08/15/17	CHEMets	QAL1
pH	7.88		pH Units	1	P7H1515	08/15/17	08/15/17	EPA 150.1	
Temperature	22.00		pH Units	1	P7H1515	08/15/17	08/15/17	EPA 150.1	
Total Dissolved Solids	2670	20.0	mg/L	1	P7H1516	08/15/17	08/15/17	EPA 160.1	
Sulfate	1600	25.0	mg/L	25	P7H1505	08/15/17	08/17/17	EPA 300.0	

Total Metals by EPA / Standard Methods

Calcium	565	5.00	mg/L	1	P7H1606	08/16/17	08/16/17	EPA 6010B	QAL2
Magnesium	26.1	5.00	mg/L	1	P7H1606	08/16/17	08/16/17	EPA 6010B	QAL2
Potassium	5.65	5.00	mg/L	1	P7H1606	08/16/17	08/16/17	EPA 6010B	QAL2
Sodium	53.1	5.00	mg/L	1	P7H1606	08/16/17	08/16/17	EPA 6010B	QAL2
Hardness	1520	5.00	mg/L	1	P7H1606	08/16/17	08/16/17	EPA 6010B	QAL2

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S-6A
7H14006-14 (Water)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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Permian Basin Environmental Lab, L.P.

Organics by GC

C6-C12	ND	2.50	mg/L	1	P7H1710	08/16/17	08/16/17	TX 1005	
>C12-C28	ND	2.50	mg/L	1	P7H1710	08/16/17	08/16/17	TX 1005	
>C28-C35	ND	2.50	mg/L	1	P7H1710	08/16/17	08/16/17	TX 1005	
Surrogate: 1-Chlorooctane		71.2 %	70-130		P7H1710	08/16/17	08/16/17	TX 1005	
Surrogate: o-Terphenyl		84.3 %	70-130		P7H1710	08/16/17	08/16/17	TX 1005	
Total Hydrocarbon nC6-nC35	ND	2.50	mg/L	1	[CALC]	08/16/17	08/16/17	[CALC]	

General Chemistry Parameters by EPA / Standard Methods

Total Alkalinity	75.0	10.0	mg/L	1	P7H1514	08/15/17	08/15/17	EPA 310.1M	
Carbonate Alkalinity	ND	10.0	mg/L	1	P7H1514	08/15/17	08/15/17	EPA 310.1M	
Bicarbonate Alkalinity	75.0	10.0	mg/L	1	P7H1514	08/15/17	08/15/17	EPA 310.1M	
Hydroxide Alkalinity	ND	10.0	mg/L	1	P7H1514	08/15/17	08/15/17	EPA 310.1M	
Bromide	0.226	0.0500	mg/L	1	P7H1505	08/15/17	08/17/17	EPA 300.0	
Chloride	59.0	12.5	mg/L	25	P7H1505	08/15/17	08/17/17	EPA 300.0	
Specific Conductance (EC)	2870	5.00	umhos/cm	1	P7H1703	08/17/17	08/17/17	EPA 120.1	
Dissolved Oxygen	6.00		mg/L	1	P7H1513	08/15/17	08/15/17	CHEMets	QAL1
pH	7.72		pH Units	1	P7H1515	08/15/17	08/15/17	EPA 150.1	
Temperature	21.80		pH Units	1	P7H1515	08/15/17	08/15/17	EPA 150.1	
Total Dissolved Solids	2710	20.0	mg/L	1	P7H1516	08/15/17	08/15/17	EPA 160.1	
Sulfate	1590	25.0	mg/L	25	P7H1505	08/15/17	08/17/17	EPA 300.0	

Total Metals by EPA / Standard Methods

Calcium	599	5.00	mg/L	1	P7H1606	08/16/17	08/16/17	EPA 6010B	QAL2
Magnesium	22.8	5.00	mg/L	1	P7H1606	08/16/17	08/16/17	EPA 6010B	QAL2
Potassium	5.97	5.00	mg/L	1	P7H1606	08/16/17	08/16/17	EPA 6010B	QAL2
Sodium	47.8	5.00	mg/L	1	P7H1606	08/16/17	08/16/17	EPA 6010B	QAL2
Hardness	1590	5.00	mg/L	1	P7H1606	08/16/17	08/16/17	EPA 6010B	QAL2

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Project: Assault SWD
Project Number: [none]
Project Manager: Christine Alderman

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S-6C
7H14006-15 (Water)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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Permian Basin Environmental Lab, L.P.

Organics by GC

C6-C12	ND	2.50	mg/L	1	P7H1710	08/16/17	08/16/17	TX 1005	
>C12-C28	ND	2.50	mg/L	1	P7H1710	08/16/17	08/16/17	TX 1005	
>C28-C35	ND	2.50	mg/L	1	P7H1710	08/16/17	08/16/17	TX 1005	
Surrogate: 1-Chlorooctane		75.2 %	70-130		P7H1710	08/16/17	08/16/17	TX 1005	
Surrogate: o-Terphenyl		91.5 %	70-130		P7H1710	08/16/17	08/16/17	TX 1005	
Total Hydrocarbon nC6-nC35	ND	2.50	mg/L	1	[CALC]	08/16/17	08/16/17	[CALC]	

General Chemistry Parameters by EPA / Standard Methods

Total Alkalinity	75.0	10.0	mg/L	1	P7H1514	08/15/17	08/15/17	EPA 310.1M	
Carbonate Alkalinity	ND	10.0	mg/L	1	P7H1514	08/15/17	08/15/17	EPA 310.1M	
Bicarbonate Alkalinity	75.0	10.0	mg/L	1	P7H1514	08/15/17	08/15/17	EPA 310.1M	
Hydroxide Alkalinity	ND	10.0	mg/L	1	P7H1514	08/15/17	08/15/17	EPA 310.1M	
Bromide	0.237	0.0500	mg/L	1	P7H1505	08/15/17	08/17/17	EPA 300.0	
Chloride	82.3	12.5	mg/L	25	P7H1505	08/15/17	08/17/17	EPA 300.0	
Specific Conductance (EC)	2980	5.00	umhos/cm	1	P7H1703	08/17/17	08/17/17	EPA 120.1	
Dissolved Oxygen	6.00		mg/L	1	P7H1513	08/15/17	08/15/17	CHEMets	QAL1
pH	7.79		pH Units	1	P7H1515	08/15/17	08/15/17	EPA 150.1	
Temperature	21.80		pH Units	1	P7H1515	08/15/17	08/15/17	EPA 150.1	
Total Dissolved Solids	2710	20.0	mg/L	1	P7H1516	08/15/17	08/15/17	EPA 160.1	
Sulfate	1620	25.0	mg/L	25	P7H1505	08/15/17	08/17/17	EPA 300.0	

Total Metals by EPA / Standard Methods

Calcium	593	5.00	mg/L	1	P7H1606	08/16/17	08/16/17	EPA 6010B	QAL2
Magnesium	29.2	5.00	mg/L	1	P7H1606	08/16/17	08/16/17	EPA 6010B	QAL2
Potassium	6.21	5.00	mg/L	1	P7H1606	08/16/17	08/16/17	EPA 6010B	QAL2
Sodium	59.9	5.00	mg/L	1	P7H1606	08/16/17	08/16/17	EPA 6010B	QAL2
Hardness	1600	5.00	mg/L	1	P7H1606	08/16/17	08/16/17	EPA 6010B	QAL2

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Project Manager: Christine Alderman

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DUP-1
7H14006-16 (Water)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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Permian Basin Environmental Lab, L.P.

Organics by GC

C6-C12	ND	2.50	mg/L	1	P7H1710	08/16/17	08/16/17	TX 1005	
>C12-C28	ND	2.50	mg/L	1	P7H1710	08/16/17	08/16/17	TX 1005	
>C28-C35	ND	2.50	mg/L	1	P7H1710	08/16/17	08/16/17	TX 1005	
Surrogate: 1-Chlorooctane		75.5 %	70-130		P7H1710	08/16/17	08/16/17	TX 1005	
Surrogate: o-Terphenyl		93.4 %	70-130		P7H1710	08/16/17	08/16/17	TX 1005	
Total Hydrocarbon nC6-nC35	ND	2.50	mg/L	1	[CALC]	08/16/17	08/16/17	[CALC]	

General Chemistry Parameters by EPA / Standard Methods

Total Alkalinity	90.0	10.0	mg/L	1	P7H1514	08/15/17	08/15/17	EPA 310.1M	
Carbonate Alkalinity	ND	10.0	mg/L	1	P7H1514	08/15/17	08/15/17	EPA 310.1M	
Bicarbonate Alkalinity	90.0	10.0	mg/L	1	P7H1514	08/15/17	08/15/17	EPA 310.1M	
Hydroxide Alkalinity	ND	10.0	mg/L	1	P7H1514	08/15/17	08/15/17	EPA 310.1M	
Bromide	0.216	0.0500	mg/L	1	P7H1505	08/15/17	08/17/17	EPA 300.0	
Chloride	68.1	12.5	mg/L	25	P7H1505	08/15/17	08/17/17	EPA 300.0	
Specific Conductance (EC)	2680	5.00	umhos/cm	1	P7H1703	08/17/17	08/17/17	EPA 120.1	
Dissolved Oxygen	6.00		mg/L	1	P7H1513	08/15/17	08/15/17	CHEMets	QAL1
pH	7.94		pH Units	1	P7H1515	08/15/17	08/15/17	EPA 150.1	
Temperature	21.70		pH Units	1	P7H1515	08/15/17	08/15/17	EPA 150.1	
Total Dissolved Solids	2470	20.0	mg/L	1	P7H1516	08/15/17	08/15/17	EPA 160.1	
Sulfate	1410	25.0	mg/L	25	P7H1505	08/15/17	08/17/17	EPA 300.0	

Total Metals by EPA / Standard Methods

Calcium	489	5.00	mg/L	1	P7H1606	08/16/17	08/16/17	EPA 6010B	QAL2
Magnesium	32.3	5.00	mg/L	1	P7H1606	08/16/17	08/16/17	EPA 6010B	QAL2
Potassium	5.20	5.00	mg/L	1	P7H1606	08/16/17	08/16/17	EPA 6010B	QAL2
Sodium	61.2	5.00	mg/L	1	P7H1606	08/16/17	08/16/17	EPA 6010B	QAL2
Hardness	1350	5.00	mg/L	1	P7H1606	08/16/17	08/16/17	EPA 6010B	QAL2

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DUP-2
7H14006-17 (Water)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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Permian Basin Environmental Lab, L.P.

Organics by GC

C6-C12	ND	2.50	mg/L	1	P7H1710	08/16/17	08/16/17	TX 1005	
>C12-C28	ND	2.50	mg/L	1	P7H1710	08/16/17	08/16/17	TX 1005	
>C28-C35	ND	2.50	mg/L	1	P7H1710	08/16/17	08/16/17	TX 1005	
Surrogate: 1-Chlorooctane		85.0 %	70-130		P7H1710	08/16/17	08/16/17	TX 1005	
Surrogate: o-Terphenyl		106 %	70-130		P7H1710	08/16/17	08/16/17	TX 1005	
Total Hydrocarbon nC6-nC35	ND	2.50	mg/L	1	[CALC]	08/16/17	08/16/17	[CALC]	

General Chemistry Parameters by EPA / Standard Methods

Total Alkalinity	80.0	10.0	mg/L	1	P7H1514	08/15/17	08/15/17	EPA 310.1M	
Carbonate Alkalinity	ND	10.0	mg/L	1	P7H1514	08/15/17	08/15/17	EPA 310.1M	
Bicarbonate Alkalinity	80.0	10.0	mg/L	1	P7H1514	08/15/17	08/15/17	EPA 310.1M	
Hydroxide Alkalinity	ND	10.0	mg/L	1	P7H1514	08/15/17	08/15/17	EPA 310.1M	
Bromide	0.224	0.0500	mg/L	1	P7H1505	08/15/17	08/17/17	EPA 300.0	
Chloride	63.3	12.5	mg/L	25	P7H1505	08/15/17	08/17/17	EPA 300.0	
Specific Conductance (EC)	2870	5.00	umhos/cm	1	P7H1703	08/17/17	08/17/17	EPA 120.1	
Dissolved Oxygen	6.00		mg/L	1	P7H1513	08/15/17	08/15/17	CHEMets	QAL1
pH	7.87		pH Units	1	P7H1515	08/15/17	08/15/17	EPA 150.1	
Temperature	21.70		pH Units	1	P7H1515	08/15/17	08/15/17	EPA 150.1	
Total Dissolved Solids	2650	20.0	mg/L	1	P7H1516	08/15/17	08/15/17	EPA 160.1	
Sulfate	1600	25.0	mg/L	25	P7H1505	08/15/17	08/17/17	EPA 300.0	

Total Metals by EPA / Standard Methods

Calcium	601	5.00	mg/L	1	P7H1606	08/16/17	08/16/17	EPA 6010B	QAL2
Magnesium	27.6	5.00	mg/L	1	P7H1606	08/16/17	08/16/17	EPA 6010B	QAL2
Potassium	6.10	5.00	mg/L	1	P7H1606	08/16/17	08/16/17	EPA 6010B	QAL2
Sodium	56.0	5.00	mg/L	1	P7H1606	08/16/17	08/16/17	EPA 6010B	QAL2
Hardness	1620	5.00	mg/L	1	P7H1606	08/16/17	08/16/17	EPA 6010B	QAL2

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Project: Assault SWD
Project Number: [none]
Project Manager: Christine Alderman

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Organics by GC - Quality Control
Permian Basin Environmental Lab, L.P.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch P7H1517 - TX 1005

Blank (P7H1517-BLK1)

Prepared: 08/15/17 Analyzed: 08/16/17

C6-C12	ND	2.50	mg/L							
>C12-C28	ND	2.50	"							
>C28-C35	ND	2.50	"							
Surrogate: 1-Chlorooctane	11.1		"	9.38		118	70-130			
Surrogate: o-Terphenyl	5.79		"	4.69		124	70-130			

LCS (P7H1517-BS1)

Prepared: 08/15/17 Analyzed: 08/16/17

C6-C12	72.8	2.50	mg/L	93.8		77.7	75-125			
>C12-C28	71.0	2.50	"	93.8		75.8	75-125			
Surrogate: 1-Chlorooctane	11.0		"	9.38		118	70-130			
Surrogate: o-Terphenyl	5.50		"	4.69		117	70-130			

LCS Dup (P7H1517-BSD1)

Prepared: 08/15/17 Analyzed: 08/16/17

C6-C12	72.0	2.50	mg/L	93.8		76.8	75-125	1.07	20	
>C12-C28	70.7	2.50	"	93.8		75.4	75-125	0.466	20	
Surrogate: 1-Chlorooctane	11.0		"	9.38		118	70-130			
Surrogate: o-Terphenyl	5.49		"	4.69		117	70-130			

Batch P7H1710 - TX 1005

Blank (P7H1710-BLK1)

Prepared & Analyzed: 08/16/17

C6-C12	ND	2.50	mg/L							
>C12-C28	ND	2.50	"							
>C28-C35	ND	2.50	"							
Surrogate: 1-Chlorooctane	11.6		"	9.38		124	70-130			
Surrogate: o-Terphenyl	6.74		"	4.69		144	70-130			S-GC

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Project: Assault SWD
Project Number: [none]
Project Manager: Christine Alderman

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Organics by GC - Quality Control
Permian Basin Environmental Lab, L.P.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch P7H1710 - TX 1005

LCS (P7H1710-BS1)

Prepared & Analyzed: 08/16/17

C6-C12	85.0	2.50	mg/L	93.8		90.7	75-125			
>C12-C28	73.7	2.50	"	93.8		78.6	75-125			
Surrogate: 1-Chlorooctane	10.9		"	9.38		116	70-130			
Surrogate: o-Terphenyl	5.71		"	4.69		122	70-130			

LCS Dup (P7H1710-BS1)

Prepared & Analyzed: 08/16/17

C6-C12	75.0	2.50	mg/L	93.8		80.0	75-125	12.6	20	
>C12-C28	75.9	2.50	"	93.8		80.9	75-125	2.97	20	
Surrogate: 1-Chlorooctane	12.1		"	9.38		129	70-130			
Surrogate: o-Terphenyl	6.45		"	4.69		138	70-130			S-GC

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Project: Assault SWD
Project Number: [none]
Project Manager: Christine Alderman

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General Chemistry Parameters by EPA / Standard Methods - Quality Control
Permian Basin Environmental Lab, L.P.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch P7H1505 - * DEFAULT PREP *****

Blank (P7H1505-BLK1)

Prepared: 08/15/17 Analyzed: 08/17/17

Bromide	ND	0.0500	mg/L							
Sulfate	ND	1.00	"							
Chloride	ND	0.500	"							

LCS (P7H1505-BS1)

Prepared: 08/15/17 Analyzed: 08/17/17

Sulfate	39.5	1.00	mg/L	40.0		98.7	85-115			
Bromide	6.01	0.0500	"	5.00		120	80-120			
Chloride	43.5	0.500	"	40.0		109	85-115			

LCS Dup (P7H1505-BSD1)

Prepared: 08/15/17 Analyzed: 08/17/17

Sulfate	39.6	1.00	mg/L	40.0		99.0	85-115	0.346	20	
Bromide	6.03	0.0500	"	5.00		121	80-120	0.432	20	
Chloride	43.6	0.500	"	40.0		109	85-115	0.413	20	

Duplicate (P7H1505-DUP1)

Source: 7H14006-01

Prepared: 08/15/17 Analyzed: 08/17/17

Bromide	ND	0.0500	mg/L		0.199				20	
Chloride	96.7	12.5	"		92.8			4.17	20	
Sulfate	1610	25.0	"		1620			0.520	20	

Duplicate (P7H1505-DUP2)

Source: 7H14006-11

Prepared: 08/15/17 Analyzed: 08/17/17

Bromide	ND	0.0500	mg/L		ND				20	
Chloride	79.5	12.5	"		80.4			1.13	20	
Sulfate	1560	25.0	"		1560			0.559	20	

Matrix Spike (P7H1505-MS1)

Source: 7H14006-01

Prepared: 08/15/17 Analyzed: 08/17/17

Chloride	424	12.5	mg/L	200	92.8	165	80-120			
Sulfate	1950	25.0	"	200	1620	169	80-120			
Bromide	42.2	1.25	"	25.0	ND	169	75-125			

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Project: Assault SWD
Project Number: [none]
Project Manager: Christine Alderman

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General Chemistry Parameters by EPA / Standard Methods - Quality Control
Permian Basin Environmental Lab, L.P.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch P7H1513 - * DEFAULT PREP *****

Duplicate (P7H1513-DUP1)	Source: 7H14006-01		Prepared & Analyzed: 08/15/17							
Dissolved Oxygen	6.00		mg/L		6.00			0.00	200	QAL1

Batch P7H1514 - * DEFAULT PREP *****

Blank (P7H1514-BLK1)	Prepared & Analyzed: 08/15/17									
Total Alkalinity	ND	10.0	mg/L							
Carbonate Alkalinity	ND	10.0	"							
Bicarbonate Alkalinity	ND	10.0	"							
Hydroxide Alkalinity	ND	10.0	"							

Blank (P7H1514-BLK2)	Prepared & Analyzed: 08/15/17									
Total Alkalinity	ND	10.0	mg/L							
Carbonate Alkalinity	ND	10.0	"							
Bicarbonate Alkalinity	ND	10.0	"							
Hydroxide Alkalinity	ND	10.0	"							

Duplicate (P7H1514-DUP1)	Source: 7H14006-01		Prepared & Analyzed: 08/15/17							
Total Alkalinity	130	10.0	mg/L		132			1.53	20	
Carbonate Alkalinity	ND	10.0	"		ND				20	
Bicarbonate Alkalinity	130	10.0	"		132			1.53	20	
Hydroxide Alkalinity	ND	10.0	"		ND				20	

Duplicate (P7H1514-DUP2)	Source: 7H15005-04		Prepared & Analyzed: 08/15/17							
Total Alkalinity	97.0	10.0	mg/L		95.0			2.08	20	
Carbonate Alkalinity	ND	10.0	"		ND				20	
Bicarbonate Alkalinity	97.0	10.0	"		95.0			2.08	20	
Hydroxide Alkalinity	ND	10.0	"		ND				20	

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Midland TX, 79701

Project: Assault SWD
Project Number: [none]
Project Manager: Christine Alderman

Fax: (432) 571-7832

General Chemistry Parameters by EPA / Standard Methods - Quality Control
Permian Basin Environmental Lab, L.P.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch P7H1515 - * DEFAULT PREP *****

Duplicate (P7H1515-DUP1)	Source: 7H14006-01			Prepared & Analyzed: 08/15/17						
pH	7.90		pH Units		7.90			0.00	20	
Temperature	22.10		"		22.00			0.454	200	

Duplicate (P7H1515-DUP2)	Source: 7H15005-04			Prepared & Analyzed: 08/15/17						
pH	8.05		pH Units		8.10			0.619	20	
Temperature	21.20		"		21.20			0.00	200	

Batch P7H1516 - * DEFAULT PREP *****

Blank (P7H1516-BLK1)	Prepared & Analyzed: 08/15/17									
Total Dissolved Solids	ND	20.0	mg/L							

Blank (P7H1516-BLK2)	Prepared & Analyzed: 08/15/17									
Total Dissolved Solids	ND	20.0	mg/L							

Duplicate (P7H1516-DUP1)	Source: 7H14006-01			Prepared & Analyzed: 08/15/17						
Total Dissolved Solids	2930	20.0	mg/L		2750			6.34	20	

Duplicate (P7H1516-DUP2)	Source: 7H15005-04			Prepared & Analyzed: 08/15/17						
Total Dissolved Solids	6200	20.0	mg/L		6140			0.972	20	

Batch P7H1703 - * DEFAULT PREP *****

Duplicate (P7H1703-DUP1)	Source: 7H14006-01			Prepared & Analyzed: 08/17/17						
Specific Conductance (EC)	3100	5.00	umhos/cm		3010			2.95	20	

Cimarex
600 N. Marinfeld, Ste. 600
Midland TX, 79701

Project: Assault SWD
Project Number: [none]
Project Manager: Christine Alderman

Fax: (432) 571-7832

General Chemistry Parameters by EPA / Standard Methods - Quality Control
Permian Basin Environmental Lab, L.P.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch P7H1703 - * DEFAULT PREP *****

Duplicate (P7H1703-DUP2)

Source: 7H15005-01

Prepared & Analyzed: 08/17/17

Specific Conductance (EC)	8070	5.00	umhos/cm		8030			0.497	20	
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Cimarex
600 N. Marinfeld, Ste. 600
Midland TX, 79701

Project: Assault SWD
Project Number: [none]
Project Manager: Christine Alderman

Fax: (432) 571-7832

Total Metals by EPA / Standard Methods - Quality Control
Permian Basin Environmental Lab, L.P.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch P7H1412 - * DEFAULT PREP *****

Blank (P7H1412-BLK1)

Prepared: 08/14/17 Analyzed: 08/16/17

Calcium	0.311	5.00	mg/L							J, QAL2
Magnesium	ND	5.00	"							QAL2
Potassium	ND	5.00	"							QAL2
Sodium	0.262	5.00	"							QAL2, J
Hardness	ND	5.00	"							QAL2

LCS (P7H1412-BS1)

Prepared: 08/14/17 Analyzed: 08/16/17

Calcium	52.7	5.00	mg/L	50.0		105	80-120			QAL2
Magnesium	51.4	5.00	"	50.0		103	80-120			QAL2
Potassium	55.2	5.00	"	50.0		110	80-120			QAL2
Sodium	57.5	5.00	"	50.0		115	80-120			QAL2

Duplicate (P7H1412-DUP1)

Source: 7H13001-13

Prepared: 08/14/17 Analyzed: 08/16/17

Calcium	695	5.00	mg/L		599			14.9	20	QAL2
Magnesium	24.8	5.00	"		22.4			10.2	20	QAL2
Potassium	6.75	5.00	"		5.98			12.2	20	QAL2
Sodium	49.1	5.00	"		43.9			11.2	20	QAL2
Hardness	1840	5.00	"		1590			14.6	20	QAL2

Matrix Spike (P7H1412-MS1)

Source: 7H13001-13

Prepared: 08/14/17 Analyzed: 08/16/17

Calcium	678	5.00	mg/L	50.0	599	159	75-125			QAL2, QM-07
Magnesium	80.3	5.00	"	50.0	22.4	116	75-125			QAL2
Potassium	70.8	5.00	"	50.0	5.98	130	75-125			QAL2, QM-07
Sodium	107	5.00	"	50.0	43.9	126	75-125			QAL2, QM-07

Batch P7H1606 - * DEFAULT PREP *****

Blank (P7H1606-BLK1)

Prepared & Analyzed: 08/16/17

Calcium	0.447	5.00	mg/L							QAL2, J
Magnesium	ND	5.00	"							QAL2
Potassium	0.0743	5.00	"							QAL2, J
Sodium	0.355	5.00	"							QAL2, J
Hardness	ND	5.00	"							QAL2

Cimarex
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Midland TX, 79701

Project: Assault SWD
Project Number: [none]
Project Manager: Christine Alderman

Fax: (432) 571-7832

Total Metals by EPA / Standard Methods - Quality Control
Permian Basin Environmental Lab, L.P.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch P7H1606 - * DEFAULT PREP *****

LCS (P7H1606-BS1)

Prepared & Analyzed: 08/16/17

Calcium	54.2	5.00	mg/L	50.0		108	80-120			QAL2
Magnesium	53.3	5.00	"	50.0		107	80-120			QAL2
Potassium	57.0	5.00	"	50.0		114	80-120			QAL2
Sodium	58.6	5.00	"	50.0		117	80-120			QAL2

Duplicate (P7H1606-DUP1)

Source: 7H14006-05

Prepared & Analyzed: 08/16/17

Calcium	642	5.00	mg/L		613			4.60	20	QAL2
Magnesium	41.1	5.00	"		40.3			2.04	20	QAL2
Potassium	5.99	5.00	"		5.99			0.00925	20	QAL2
Sodium	77.3	5.00	"		75.5			2.27	20	QAL2
Hardness	1770	5.00	"		1700			4.35	20	QAL2

Matrix Spike (P7H1606-MS1)

Source: 7H14006-05

Prepared & Analyzed: 08/16/17

Calcium	575	5.00	mg/L	50.0	613	NR	75-125			QAL2, QM-07
Magnesium	80.1	5.00	"	50.0	40.3	79.6	75-125			QAL2
Potassium	56.7	5.00	"	50.0	5.99	101	75-125			QAL2
Sodium	113	5.00	"	50.0	75.5	75.5	75-125			QAL2

Cimarex
600 N. Marinfeld, Ste. 600
Midland TX, 79701

Project: Assault SWD
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Notes and Definitions

S-GC Surrogate recovery outside of control limits. The data was accepted based on valid recovery of the remaining surrogate.

QM-07 The spike recovery was outside acceptance limits for the MS and/or MSD. The batch was accepted based on acceptable LCS recovery.

QAL2 Certification in process for this analyte.

QAL1 The Laboratory is not NELAC Certified for this analyte or analysis.

J Detected but below the Reporting Limit; therefore, result is an estimated concentration (CLP J-Flag).

DET Analyte DETECTED

ND Analyte NOT DETECTED at or above the reporting limit

NR Not Reported

dry Sample results reported on a dry weight basis

RPD Relative Percent Difference

LCS Laboratory Control Spike

MS Matrix Spike

Dup Duplicate

Report Approved By:



Date:

8/22/2017

Brent Barron, Laboratory Director/Technical Director

Cimarex
600 N. Marinfeld, Ste. 600
Midland TX, 79701

Project: Assault SWD
Project Number: [none]
Project Manager: Christine Alderman

Fax: (432) 571-7832

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If you have received this material in error, please notify us immediately at 432-686-7235.



CHAIN OF CUSTODY RECORD

7H14006

000142

Facility Name <i>Cimarex Energy</i>		Analytical Laboratory Name <i>DBE Labs</i>		Today's Date <i>8/14/17</i>													
Address <i>600N Marionfield St 800</i>		City <i>Midland TX</i>		Page <i>1</i>													
State <i>TX</i>		Zip <i>79721</i>		Of <i>2</i>													
Sample Group Identifier <i>Sample 11317</i>		Contact Name and Report to: <i>Christine Alvarado</i>		Analysis/Analyses													
Site/Project Name or Identifier <i>Sample 11317</i>		Phone <i>432-853-7059</i>		Fax <i>432-853-7059</i>													
Special Instructions <i>24 hr TAT</i>		Carrier Waybill Number															
Station Name or Sample ID	Sample Date	Time	Matrix	Sample Top Btm	Size	Containers Type No.	Filtered Y N	Preservative	Comments								
S-1	8/14/17	07:45	W			3			cool								
S-2		09:36															
S-3		09:53															
S-3A		09:57															
S-4		10:11															
S-4A		10:20															
S-4B		10:39															
S-4C		10:50															
S-5		09:32															
S-5A		09:57															
S-5B		11:12															
S-6		10:11															
Notes:																	
Potential Hazardous Characteristics																	
☐ Non-Haz ☐ RCRA D001, 283, or 4 ☐ RCRA Listed ☐ Radioactive ☐ Unknown																	
Sample Disposal																	
☐ Disposal by Lab ☐ Return to Client ☐ Hold pending further instructions																	
1. Relinquished by <i>Christine Alvarado</i>		Date <i>8/14/17</i>		Time <i>1149</i>		2. Received by <i>Christine Alvarado</i>		Date <i>8/14/17</i>		Time <i>1515</i>		3. Relinquished by <i>Christine Alvarado</i>		Date <i>8/14/17</i>		Time <i>1515</i>	
5. Relinquished by		Date		Time		6. Received by		Date		Time		7. Relinquished by		Date		Time	
Comments		Send invoice to ESH Department															

Original - Send to lab with sample

Yellow - Return to ESH

Pink - Remain in book

2.5 NCT 1

CHAIN OF CUSTODY RECORD

[illegible]

Original – Send to lab with sample

Yellow – Return to ESH

2,5 NCF 21
Pink - Remain in book

Pink – Remain in book

Version 1: 4/21/2015