

**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: 7H16007



NELAP/TCEQ # T104704516-16-7

Report Date: 08/25/17

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	7H16007-01	Water	08/16/17 08:05	08-16-2017 15:25
S-2	7H16007-02	Water	08/16/17 09:20	08-16-2017 15:25
S-3	7H16007-03	Water	08/16/17 09:28	08-16-2017 15:25
S-3A	7H16007-04	Water	08/16/17 09:39	08-16-2017 15:25
S-3B	7H16007-05	Water	08/16/17 09:45	08-16-2017 15:25
S-4	7H16007-06	Water	08/16/17 09:57	08-16-2017 15:25
S-4A	7H16007-07	Water	08/16/17 10:05	08-16-2017 15:25
S-4B	7H16007-08	Water	08/16/17 10:14	08-16-2017 15:25
S-4C	7H16007-09	Water	08/16/17 10:28	08-16-2017 15:25
S-5	7H16007-10	Water	08/16/17 09:27	08-16-2017 15:25
S-5A	7H16007-11	Water	08/16/17 09:51	08-16-2017 15:25
S-5B	7H16007-12	Water	08/16/17 11:11	08-16-2017 15:25
S-6	7H16007-13	Water	08/16/17 10:02	08-16-2017 15:25
S-6A	7H16007-14	Water	08/16/17 10:40	08-16-2017 15:25
S-6C	7H16007-15	Water	08/16/17 10:21	08-16-2017 15:25
DUP-1	7H16007-16	Water	08/16/17 12:00	08-16-2017 15:25
DUP-2	7H16007-17	Water	08/16/17 12:00	08-16-2017 15:25

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

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S-1
7H16007-01 (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	P7H2307	08/21/17	08/21/17	TX 1005	
>C12-C28	ND	2.50	mg/L	1	P7H2307	08/21/17	08/21/17	TX 1005	
>C28-C35	ND	2.50	mg/L	1	P7H2307	08/21/17	08/21/17	TX 1005	
Surrogate: 1-Chlorooctane		93.8 %	70-130		P7H2307	08/21/17	08/21/17	TX 1005	
Surrogate: o-Terphenyl		112 %	70-130		P7H2307	08/21/17	08/21/17	TX 1005	
Total Hydrocarbon nC6-nC35	ND	2.50	mg/L	1	[CALC]	08/21/17	08/21/17	[CALC]	

General Chemistry Parameters by EPA / Standard Methods

Total Alkalinity	130	10.0	mg/L	1	P7H1716	08/17/17	08/22/17	EPA 310.1M	
Carbonate Alkalinity	ND	10.0	mg/L	1	P7H1716	08/17/17	08/22/17	EPA 310.1M	
Bicarbonate Alkalinity	130	10.0	mg/L	1	P7H1716	08/17/17	08/22/17	EPA 310.1M	
Hydroxide Alkalinity	ND	10.0	mg/L	1	P7H1716	08/17/17	08/22/17	EPA 310.1M	
Bromide	0.305	0.0500	mg/L	1	P7H1719	08/17/17	08/21/17	EPA 300.0	
Chloride	110	25.0	mg/L	50	P7H1719	08/17/17	08/21/17	EPA 300.0	
Specific Conductance (EC)	3390	5.00	umhos/cm	1	P7H1708	08/17/17	08/17/17	EPA 120.1	
Dissolved Oxygen	6.00		mg/L	1	P7H1715	08/17/17	08/22/17	CHEMets	QAL1
pH	7.92		pH Units	1	P7H1717	08/17/17	08/17/17	EPA 150.1	
Temperature	22.10		pH Units	1	P7H1717	08/17/17	08/17/17	EPA 150.1	
Total Dissolved Solids	2890	20.0	mg/L	1	P7H1718	08/17/17	08/17/17	EPA 160.1	
Sulfate	1800	50.0	mg/L	50	P7H1719	08/17/17	08/21/17	EPA 300.0	

Total Metals by EPA / Standard Methods

Calcium	643	5.00	mg/L	1	P7H1702	08/17/17	08/22/17	EPA 6010B	QAL2
Magnesium	61.3	5.00	mg/L	1	P7H1702	08/17/17	08/22/17	EPA 6010B	QAL2
Potassium	3.66	5.00	mg/L	1	P7H1702	08/17/17	08/22/17	EPA 6010B	QAL2, J
Sodium	102	5.00	mg/L	1	P7H1702	08/17/17	08/22/17	EPA 6010B	QAL2
Hardness	1860	5.00	mg/L	1	P7H1702	08/17/17	08/22/17	EPA 6010B	QAL2

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S-2
7H16007-02 (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	P7H2307	08/21/17	08/21/17	TX 1005	
>C12-C28	ND	2.50	mg/L	1	P7H2307	08/21/17	08/21/17	TX 1005	
>C28-C35	ND	2.50	mg/L	1	P7H2307	08/21/17	08/21/17	TX 1005	
Surrogate: 1-Chlorooctane		99.1 %	70-130		P7H2307	08/21/17	08/21/17	TX 1005	
Surrogate: o-Terphenyl		117 %	70-130		P7H2307	08/21/17	08/21/17	TX 1005	
Total Hydrocarbon nC6-nC35	ND	2.50	mg/L	1	[CALC]	08/21/17	08/21/17	[CALC]	

General Chemistry Parameters by EPA / Standard Methods

Total Alkalinity	122	10.0	mg/L	1	P7H1716	08/17/17	08/22/17	EPA 310.1M	
Carbonate Alkalinity	ND	10.0	mg/L	1	P7H1716	08/17/17	08/22/17	EPA 310.1M	
Bicarbonate Alkalinity	122	10.0	mg/L	1	P7H1716	08/17/17	08/22/17	EPA 310.1M	
Hydroxide Alkalinity	ND	10.0	mg/L	1	P7H1716	08/17/17	08/22/17	EPA 310.1M	
Bromide	0.299	0.0500	mg/L	1	P7H1719	08/17/17	08/21/17	EPA 300.0	
Chloride	100	25.0	mg/L	50	P7H1719	08/17/17	08/21/17	EPA 300.0	
Specific Conductance (EC)	3110	5.00	umhos/cm	1	P7H1708	08/17/17	08/17/17	EPA 120.1	
Dissolved Oxygen	6.00		mg/L	1	P7H1715	08/17/17	08/22/17	CHEMets	QAL1
pH	7.89		pH Units	1	P7H1717	08/17/17	08/17/17	EPA 150.1	
Temperature	21.90		pH Units	1	P7H1717	08/17/17	08/17/17	EPA 150.1	
Total Dissolved Solids	2880	20.0	mg/L	1	P7H1718	08/17/17	08/17/17	EPA 160.1	
Sulfate	1930	50.0	mg/L	50	P7H1719	08/17/17	08/21/17	EPA 300.0	

Total Metals by EPA / Standard Methods

Calcium	735	5.00	mg/L	1	P7H1702	08/17/17	08/22/17	EPA 6010B	QAL2
Magnesium	62.4	5.00	mg/L	1	P7H1702	08/17/17	08/22/17	EPA 6010B	QAL2
Potassium	4.97	5.00	mg/L	1	P7H1702	08/17/17	08/22/17	EPA 6010B	QAL2, J
Sodium	103	5.00	mg/L	1	P7H1702	08/17/17	08/22/17	EPA 6010B	QAL2
Hardness	2090	5.00	mg/L	1	P7H1702	08/17/17	08/22/17	EPA 6010B	QAL2

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S-3
7H16007-03 (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	P7H2307	08/21/17	08/21/17	TX 1005	
>C12-C28	ND	2.50	mg/L	1	P7H2307	08/21/17	08/21/17	TX 1005	
>C28-C35	ND	2.50	mg/L	1	P7H2307	08/21/17	08/21/17	TX 1005	
Surrogate: 1-Chlorooctane		97.4 %	70-130		P7H2307	08/21/17	08/21/17	TX 1005	
Surrogate: o-Terphenyl		117 %	70-130		P7H2307	08/21/17	08/21/17	TX 1005	
Total Hydrocarbon nC6-nC35	ND	2.50	mg/L	1	[CALC]	08/21/17	08/21/17	[CALC]	

General Chemistry Parameters by EPA / Standard Methods

Total Alkalinity	115	10.0	mg/L	1	P7H1716	08/17/17	08/22/17	EPA 310.1M	
Carbonate Alkalinity	ND	10.0	mg/L	1	P7H1716	08/17/17	08/22/17	EPA 310.1M	
Bicarbonate Alkalinity	115	10.0	mg/L	1	P7H1716	08/17/17	08/22/17	EPA 310.1M	
Hydroxide Alkalinity	ND	10.0	mg/L	1	P7H1716	08/17/17	08/22/17	EPA 310.1M	
Bromide	0.339	0.0500	mg/L	1	P7H1719	08/17/17	08/21/17	EPA 300.0	
Chloride	118	25.0	mg/L	50	P7H1719	08/17/17	08/21/17	EPA 300.0	
Specific Conductance (EC)	3180	5.00	umhos/cm	1	P7H1708	08/17/17	08/17/17	EPA 120.1	
Dissolved Oxygen	6.00		mg/L	1	P7H1715	08/17/17	08/22/17	CHEMets	QAL1
pH	7.91		pH Units	1	P7H1717	08/17/17	08/17/17	EPA 150.1	
Temperature	21.80		pH Units	1	P7H1717	08/17/17	08/17/17	EPA 150.1	
Total Dissolved Solids	2830	20.0	mg/L	1	P7H1718	08/17/17	08/17/17	EPA 160.1	
Sulfate	1950	50.0	mg/L	50	P7H1719	08/17/17	08/21/17	EPA 300.0	

Total Metals by EPA / Standard Methods

Calcium	719	5.00	mg/L	1	P7H1702	08/17/17	08/22/17	EPA 6010B	QAL2
Magnesium	61.7	5.00	mg/L	1	P7H1702	08/17/17	08/22/17	EPA 6010B	QAL2
Potassium	4.77	5.00	mg/L	1	P7H1702	08/17/17	08/22/17	EPA 6010B	QAL2, J
Sodium	104	5.00	mg/L	1	P7H1702	08/17/17	08/22/17	EPA 6010B	QAL2
Hardness	2050	5.00	mg/L	1	P7H1702	08/17/17	08/22/17	EPA 6010B	QAL2

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S-3A

7H16007-04 (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	P7H2307	08/21/17	08/21/17	TX 1005	
>C12-C28	ND	2.50	mg/L	1	P7H2307	08/21/17	08/21/17	TX 1005	
>C28-C35	ND	2.50	mg/L	1	P7H2307	08/21/17	08/21/17	TX 1005	
Surrogate: 1-Chlorooctane		91.8 %	70-130		P7H2307	08/21/17	08/21/17	TX 1005	
Surrogate: o-Terphenyl		109 %	70-130		P7H2307	08/21/17	08/21/17	TX 1005	
Total Hydrocarbon nC6-nC35	ND	2.50	mg/L	1	[CALC]	08/21/17	08/21/17	[CALC]	

General Chemistry Parameters by EPA / Standard Methods

Total Alkalinity	117	10.0	mg/L	1	P7H1716	08/17/17	08/22/17	EPA 310.1M	
Carbonate Alkalinity	ND	10.0	mg/L	1	P7H1716	08/17/17	08/22/17	EPA 310.1M	
Bicarbonate Alkalinity	117	10.0	mg/L	1	P7H1716	08/17/17	08/22/17	EPA 310.1M	
Hydroxide Alkalinity	ND	10.0	mg/L	1	P7H1716	08/17/17	08/22/17	EPA 310.1M	
Bromide	0.335	0.0500	mg/L	1	P7H1719	08/17/17	08/21/17	EPA 300.0	
Chloride	99.5	25.0	mg/L	50	P7H1719	08/17/17	08/21/17	EPA 300.0	
Specific Conductance (EC)	3120	5.00	umhos/cm	1	P7H1708	08/17/17	08/17/17	EPA 120.1	
Dissolved Oxygen	6.00		mg/L	1	P7H1715	08/17/17	08/22/17	CHEMets	QAL1
pH	7.97		pH Units	1	P7H1717	08/17/17	08/17/17	EPA 150.1	
Temperature	21.70		pH Units	1	P7H1717	08/17/17	08/17/17	EPA 150.1	
Total Dissolved Solids	2780	20.0	mg/L	1	P7H1718	08/17/17	08/17/17	EPA 160.1	
Sulfate	1900	50.0	mg/L	50	P7H1719	08/17/17	08/21/17	EPA 300.0	

Total Metals by EPA / Standard Methods

Calcium	661	5.00	mg/L	1	P7H1702	08/17/17	08/22/17	EPA 6010B	QAL2
Magnesium	55.1	5.00	mg/L	1	P7H1702	08/17/17	08/22/17	EPA 6010B	QAL2
Potassium	3.59	5.00	mg/L	1	P7H1702	08/17/17	08/22/17	EPA 6010B	J, QAL2
Sodium	90.4	5.00	mg/L	1	P7H1702	08/17/17	08/22/17	EPA 6010B	QAL2
Hardness	1880	5.00	mg/L	1	P7H1702	08/17/17	08/22/17	EPA 6010B	QAL2

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Project: Assault SWD
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S-3B

7H16007-05 (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	P7H2307	08/21/17	08/21/17	TX 1005	
>C12-C28	ND	2.50	mg/L	1	P7H2307	08/21/17	08/21/17	TX 1005	
>C28-C35	ND	2.50	mg/L	1	P7H2307	08/21/17	08/21/17	TX 1005	
Surrogate: 1-Chlorooctane		96.4 %	70-130		P7H2307	08/21/17	08/21/17	TX 1005	
Surrogate: o-Terphenyl		115 %	70-130		P7H2307	08/21/17	08/21/17	TX 1005	
Total Hydrocarbon nC6-nC35	ND	2.50	mg/L	1	[CALC]	08/21/17	08/21/17	[CALC]	

General Chemistry Parameters by EPA / Standard Methods

Total Alkalinity	112	10.0	mg/L	1	P7H1716	08/17/17	08/22/17	EPA 310.1M	
Carbonate Alkalinity	ND	10.0	mg/L	1	P7H1716	08/17/17	08/22/17	EPA 310.1M	
Bicarbonate Alkalinity	112	10.0	mg/L	1	P7H1716	08/17/17	08/22/17	EPA 310.1M	
Hydroxide Alkalinity	ND	10.0	mg/L	1	P7H1716	08/17/17	08/22/17	EPA 310.1M	
Bromide	0.307	0.0500	mg/L	1	P7H1719	08/17/17	08/21/17	EPA 300.0	
Chloride	102	25.0	mg/L	50	P7H1719	08/17/17	08/21/17	EPA 300.0	
Specific Conductance (EC)	3190	5.00	umhos/cm	1	P7H1708	08/17/17	08/17/17	EPA 120.1	
Dissolved Oxygen	6.00		mg/L	1	P7H1715	08/17/17	08/22/17	CHEMets	QAL1
pH	7.98		pH Units	1	P7H1717	08/17/17	08/17/17	EPA 150.1	
Temperature	21.70		pH Units	1	P7H1717	08/17/17	08/17/17	EPA 150.1	
Total Dissolved Solids	2810	20.0	mg/L	1	P7H1718	08/17/17	08/17/17	EPA 160.1	
Sulfate	1910	50.0	mg/L	50	P7H1719	08/17/17	08/21/17	EPA 300.0	

Total Metals by EPA / Standard Methods

Calcium	723	5.00	mg/L	1	P7H1702	08/17/17	08/22/17	EPA 6010B	QAL2
Magnesium	60.5	5.00	mg/L	1	P7H1702	08/17/17	08/22/17	EPA 6010B	QAL2
Potassium	6.05	5.00	mg/L	1	P7H1702	08/17/17	08/22/17	EPA 6010B	QAL2
Sodium	98.5	5.00	mg/L	1	P7H1702	08/17/17	08/22/17	EPA 6010B	QAL2
Hardness	2050	5.00	mg/L	1	P7H1702	08/17/17	08/22/17	EPA 6010B	QAL2

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Project: Assault SWD
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S-4

7H16007-06 (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	P7H2307	08/21/17	08/21/17	TX 1005	
>C12-C28	ND	2.50	mg/L	1	P7H2307	08/21/17	08/21/17	TX 1005	
>C28-C35	ND	2.50	mg/L	1	P7H2307	08/21/17	08/21/17	TX 1005	
Surrogate: 1-Chlorooctane		98.8 %	70-130		P7H2307	08/21/17	08/21/17	TX 1005	
Surrogate: o-Terphenyl		119 %	70-130		P7H2307	08/21/17	08/21/17	TX 1005	
Total Hydrocarbon nC6-nC35	ND	2.50	mg/L	1	[CALC]	08/21/17	08/21/17	[CALC]	

General Chemistry Parameters by EPA / Standard Methods

Total Alkalinity	122	10.0	mg/L	1	P7H1716	08/17/17	08/22/17	EPA 310.1M	
Carbonate Alkalinity	ND	10.0	mg/L	1	P7H1716	08/17/17	08/22/17	EPA 310.1M	
Bicarbonate Alkalinity	122	10.0	mg/L	1	P7H1716	08/17/17	08/22/17	EPA 310.1M	
Hydroxide Alkalinity	ND	10.0	mg/L	1	P7H1716	08/17/17	08/22/17	EPA 310.1M	
Bromide	ND	0.0500	mg/L	1	P7H1719	08/17/17	08/21/17	EPA 300.0	
Chloride	106	12.5	mg/L	25	P7H1719	08/17/17	08/21/17	EPA 300.0	
Specific Conductance (EC)	2970	5.00	umhos/cm	1	P7H1708	08/17/17	08/17/17	EPA 120.1	
Dissolved Oxygen	6.00		mg/L	1	P7H1715	08/17/17	08/22/17	CHEMets	QAL1
pH	7.87		pH Units	1	P7H1717	08/17/17	08/17/17	EPA 150.1	
Temperature	21.70		pH Units	1	P7H1717	08/17/17	08/17/17	EPA 150.1	
Total Dissolved Solids	2920	20.0	mg/L	1	P7H1718	08/17/17	08/17/17	EPA 160.1	
Sulfate	1800	25.0	mg/L	25	P7H1719	08/17/17	08/21/17	EPA 300.0	

Total Metals by EPA / Standard Methods

Calcium	546	5.00	mg/L	1	P7H1702	08/17/17	08/22/17	EPA 6010B	QAL2
Magnesium	45.6	5.00	mg/L	1	P7H1702	08/17/17	08/22/17	EPA 6010B	QAL2
Potassium	5.13	5.00	mg/L	1	P7H1702	08/17/17	08/22/17	EPA 6010B	QAL2
Sodium	90.2	5.00	mg/L	1	P7H1702	08/17/17	08/22/17	EPA 6010B	QAL2
Hardness	1550	5.00	mg/L	1	P7H1702	08/17/17	08/22/17	EPA 6010B	QAL2

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

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

Fax: (432) 571-7832

S-4A

7H16007-07 (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	P7H2307	08/21/17	08/21/17	TX 1005	
>C12-C28	ND	2.50	mg/L	1	P7H2307	08/21/17	08/21/17	TX 1005	
>C28-C35	ND	2.50	mg/L	1	P7H2307	08/21/17	08/21/17	TX 1005	
Surrogate: 1-Chlorooctane		90.9 %	70-130		P7H2307	08/21/17	08/21/17	TX 1005	
Surrogate: o-Terphenyl		110 %	70-130		P7H2307	08/21/17	08/21/17	TX 1005	
Total Hydrocarbon nC6-nC35	ND	2.50	mg/L	1	[CALC]	08/21/17	08/21/17	[CALC]	

General Chemistry Parameters by EPA / Standard Methods

Total Alkalinity	120	10.0	mg/L	1	P7H1716	08/17/17	08/22/17	EPA 310.1M	
Carbonate Alkalinity	ND	10.0	mg/L	1	P7H1716	08/17/17	08/22/17	EPA 310.1M	
Bicarbonate Alkalinity	120	10.0	mg/L	1	P7H1716	08/17/17	08/22/17	EPA 310.1M	
Hydroxide Alkalinity	ND	10.0	mg/L	1	P7H1716	08/17/17	08/22/17	EPA 310.1M	
Bromide	0.376	0.0500	mg/L	1	P7H1719	08/17/17	08/21/17	EPA 300.0	
Chloride	104	12.5	mg/L	25	P7H1719	08/17/17	08/21/17	EPA 300.0	
Specific Conductance (EC)	2930	5.00	umhos/cm	1	P7H1708	08/17/17	08/17/17	EPA 120.1	
Dissolved Oxygen	6.00		mg/L	1	P7H1715	08/17/17	08/22/17	CHEMets	QAL1
pH	7.91		pH Units	1	P7H1717	08/17/17	08/17/17	EPA 150.1	
Temperature	21.70		pH Units	1	P7H1717	08/17/17	08/17/17	EPA 150.1	
Total Dissolved Solids	2680	20.0	mg/L	1	P7H1718	08/17/17	08/17/17	EPA 160.1	
Sulfate	1750	25.0	mg/L	25	P7H1719	08/17/17	08/21/17	EPA 300.0	

Total Metals by EPA / Standard Methods

Calcium	541	5.00	mg/L	1	P7H1702	08/17/17	08/22/17	EPA 6010B	QAL2
Magnesium	45.5	5.00	mg/L	1	P7H1702	08/17/17	08/22/17	EPA 6010B	QAL2
Potassium	5.86	5.00	mg/L	1	P7H1702	08/17/17	08/22/17	EPA 6010B	QAL2
Sodium	86.5	5.00	mg/L	1	P7H1702	08/17/17	08/22/17	EPA 6010B	QAL2
Hardness	1540	5.00	mg/L	1	P7H1702	08/17/17	08/22/17	EPA 6010B	QAL2

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

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

Fax: (432) 571-7832

S-4B

7H16007-08 (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	P7H2307	08/21/17	08/21/17	TX 1005	
>C12-C28	ND	2.50	mg/L	1	P7H2307	08/21/17	08/21/17	TX 1005	
>C28-C35	ND	2.50	mg/L	1	P7H2307	08/21/17	08/21/17	TX 1005	
Surrogate: 1-Chlorooctane		99.9 %	70-130		P7H2307	08/21/17	08/21/17	TX 1005	
Surrogate: o-Terphenyl		121 %	70-130		P7H2307	08/21/17	08/21/17	TX 1005	
Total Hydrocarbon nC6-nC35	ND	2.50	mg/L	1	[CALC]	08/21/17	08/21/17	[CALC]	

General Chemistry Parameters by EPA / Standard Methods

Total Alkalinity	115	10.0	mg/L	1	P7H1716	08/17/17	08/22/17	EPA 310.1M	
Carbonate Alkalinity	ND	10.0	mg/L	1	P7H1716	08/17/17	08/22/17	EPA 310.1M	
Bicarbonate Alkalinity	115	10.0	mg/L	1	P7H1716	08/17/17	08/22/17	EPA 310.1M	
Hydroxide Alkalinity	ND	10.0	mg/L	1	P7H1716	08/17/17	08/22/17	EPA 310.1M	
Bromide	ND	0.0500	mg/L	1	P7H1719	08/17/17	08/21/17	EPA 300.0	
Chloride	115	25.0	mg/L	50	P7H1719	08/17/17	08/21/17	EPA 300.0	
Specific Conductance (EC)	3030	5.00	umhos/cm	1	P7H1708	08/17/17	08/17/17	EPA 120.1	
Dissolved Oxygen	6.00		mg/L	1	P7H1715	08/17/17	08/22/17	CHEMets	QAL1
pH	7.95		pH Units	1	P7H1717	08/17/17	08/17/17	EPA 150.1	
Temperature	21.70		pH Units	1	P7H1717	08/17/17	08/17/17	EPA 150.1	
Total Dissolved Solids	5910	20.0	mg/L	1	P7H1718	08/17/17	08/17/17	EPA 160.1	
Sulfate	1900	50.0	mg/L	50	P7H1719	08/17/17	08/21/17	EPA 300.0	

Total Metals by EPA / Standard Methods

Calcium	638	5.00	mg/L	1	P7H1702	08/17/17	08/22/17	EPA 6010B	QAL2
Magnesium	54.0	5.00	mg/L	1	P7H1702	08/17/17	08/22/17	EPA 6010B	QAL2
Potassium	4.77	5.00	mg/L	1	P7H1702	08/17/17	08/22/17	EPA 6010B	J, QAL2
Sodium	89.9	5.00	mg/L	1	P7H1702	08/17/17	08/22/17	EPA 6010B	QAL2
Hardness	1820	5.00	mg/L	1	P7H1702	08/17/17	08/22/17	EPA 6010B	QAL2

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S-4C

7H16007-09 (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	P7H2307	08/21/17	08/21/17	TX 1005	
>C12-C28	ND	2.50	mg/L	1	P7H2307	08/21/17	08/21/17	TX 1005	
>C28-C35	ND	2.50	mg/L	1	P7H2307	08/21/17	08/21/17	TX 1005	
Surrogate: 1-Chlorooctane		98.3 %	70-130		P7H2307	08/21/17	08/21/17	TX 1005	
Surrogate: o-Terphenyl		118 %	70-130		P7H2307	08/21/17	08/21/17	TX 1005	
Total Hydrocarbon nC6-nC35	ND	2.50	mg/L	1	[CALC]	08/21/17	08/21/17	[CALC]	

General Chemistry Parameters by EPA / Standard Methods

Total Alkalinity	112	10.0	mg/L	1	P7H1716	08/17/17	08/22/17	EPA 310.1M	
Carbonate Alkalinity	ND	10.0	mg/L	1	P7H1716	08/17/17	08/22/17	EPA 310.1M	
Bicarbonate Alkalinity	112	10.0	mg/L	1	P7H1716	08/17/17	08/22/17	EPA 310.1M	
Hydroxide Alkalinity	ND	10.0	mg/L	1	P7H1716	08/17/17	08/22/17	EPA 310.1M	
Bromide	ND	0.0500	mg/L	1	P7H1719	08/17/17	08/21/17	EPA 300.0	
Chloride	117	25.0	mg/L	50	P7H1719	08/17/17	08/21/17	EPA 300.0	
Specific Conductance (EC)	3040	5.00	umhos/cm	1	P7H1708	08/17/17	08/17/17	EPA 120.1	
Dissolved Oxygen	6.00		mg/L	1	P7H1715	08/17/17	08/22/17	CHEMets	QAL1
pH	7.95		pH Units	1	P7H1717	08/17/17	08/17/17	EPA 150.1	
Temperature	21.70		pH Units	1	P7H1717	08/17/17	08/17/17	EPA 150.1	
Total Dissolved Solids	2700	20.0	mg/L	1	P7H1718	08/17/17	08/17/17	EPA 160.1	
Sulfate	1900	50.0	mg/L	50	P7H1719	08/17/17	08/21/17	EPA 300.0	

Total Metals by EPA / Standard Methods

Calcium	589	5.00	mg/L	1	P7H1705	08/17/17	08/17/17	EPA 6010B	QAL2
Magnesium	47.4	5.00	mg/L	1	P7H1705	08/17/17	08/17/17	EPA 6010B	QAL2
Potassium	5.88	5.00	mg/L	1	P7H1705	08/17/17	08/17/17	EPA 6010B	QAL2
Sodium	92.1	5.00	mg/L	1	P7H1705	08/17/17	08/17/17	EPA 6010B	QAL2
Hardness	1670	5.00	mg/L	1	P7H1705	08/17/17	08/17/17	EPA 6010B	QAL2

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S-5
7H16007-10 (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	P7H2307	08/21/17	08/21/17	TX 1005	
>C12-C28	ND	2.50	mg/L	1	P7H2307	08/21/17	08/21/17	TX 1005	
>C28-C35	ND	2.50	mg/L	1	P7H2307	08/21/17	08/21/17	TX 1005	
Surrogate: 1-Chlorooctane		84.6 %	70-130		P7H2307	08/21/17	08/21/17	TX 1005	
Surrogate: o-Terphenyl		103 %	70-130		P7H2307	08/21/17	08/21/17	TX 1005	
Total Hydrocarbon nC6-nC35	ND	2.50	mg/L	1	[CALC]	08/21/17	08/21/17	[CALC]	

General Chemistry Parameters by EPA / Standard Methods

Total Alkalinity	112	10.0	mg/L	1	P7H1716	08/17/17	08/22/17	EPA 310.1M	
Carbonate Alkalinity	ND	10.0	mg/L	1	P7H1716	08/17/17	08/22/17	EPA 310.1M	
Bicarbonate Alkalinity	112	10.0	mg/L	1	P7H1716	08/17/17	08/22/17	EPA 310.1M	
Hydroxide Alkalinity	ND	10.0	mg/L	1	P7H1716	08/17/17	08/22/17	EPA 310.1M	
Bromide	ND	0.0500	mg/L	1	P7H1719	08/17/17	08/21/17	EPA 300.0	
Chloride	143	25.0	mg/L	50	P7H1719	08/17/17	08/21/17	EPA 300.0	
Specific Conductance (EC)	3280	5.00	umhos/cm	1	P7H1708	08/17/17	08/17/17	EPA 120.1	
Dissolved Oxygen	6.00		mg/L	1	P7H1715	08/17/17	08/22/17	CHEMets	QAL1
pH	7.82		pH Units	1	P7H1717	08/17/17	08/17/17	EPA 150.1	
Temperature	21.80		pH Units	1	P7H1717	08/17/17	08/17/17	EPA 150.1	
Total Dissolved Solids	2920	20.0	mg/L	1	P7H1718	08/17/17	08/17/17	EPA 160.1	
Sulfate	1930	50.0	mg/L	50	P7H1719	08/17/17	08/21/17	EPA 300.0	

Total Metals by EPA / Standard Methods

Calcium	684	5.00	mg/L	1	P7H1705	08/17/17	08/17/17	EPA 6010B	QAL2
Magnesium	53.3	5.00	mg/L	1	P7H1705	08/17/17	08/17/17	EPA 6010B	QAL2
Potassium	6.66	5.00	mg/L	1	P7H1705	08/17/17	08/17/17	EPA 6010B	QAL2
Sodium	106	5.00	mg/L	1	P7H1705	08/17/17	08/17/17	EPA 6010B	QAL2
Hardness	1930	5.00	mg/L	1	P7H1705	08/17/17	08/17/17	EPA 6010B	QAL2

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S-5A
7H16007-11 (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	P7H2307	08/21/17	08/21/17	TX 1005	
>C12-C28	ND	2.50	mg/L	1	P7H2307	08/21/17	08/21/17	TX 1005	
>C28-C35	ND	2.50	mg/L	1	P7H2307	08/21/17	08/21/17	TX 1005	
Surrogate: 1-Chlorooctane		115 %	70-130		P7H2307	08/21/17	08/21/17	TX 1005	
Surrogate: o-Terphenyl		137 %	70-130		P7H2307	08/21/17	08/21/17	TX 1005	S-GC
Total Hydrocarbon nC6-nC35	ND	2.50	mg/L	1	[CALC]	08/21/17	08/21/17	[CALC]	

General Chemistry Parameters by EPA / Standard Methods

Total Alkalinity	92.0	10.0	mg/L	1	P7H1716	08/17/17	08/22/17	EPA 310.1M	
Carbonate Alkalinity	ND	10.0	mg/L	1	P7H1716	08/17/17	08/22/17	EPA 310.1M	
Bicarbonate Alkalinity	92.0	10.0	mg/L	1	P7H1716	08/17/17	08/22/17	EPA 310.1M	
Hydroxide Alkalinity	ND	10.0	mg/L	1	P7H1716	08/17/17	08/22/17	EPA 310.1M	
Bromide	ND	0.0500	mg/L	1	P7H1719	08/17/17	08/21/17	EPA 300.0	
Chloride	90.8	12.5	mg/L	25	P7H1719	08/17/17	08/21/17	EPA 300.0	
Specific Conductance (EC)	2900	5.00	umhos/cm	1	P7H1708	08/17/17	08/17/17	EPA 120.1	
Dissolved Oxygen	6.00		mg/L	1	P7H1715	08/17/17	08/22/17	CHEMets	QAL1
pH	7.84		pH Units	1	P7H1717	08/17/17	08/17/17	EPA 150.1	
Temperature	21.80		pH Units	1	P7H1717	08/17/17	08/17/17	EPA 150.1	
Total Dissolved Solids	2400	20.0	mg/L	1	P7H1718	08/17/17	08/17/17	EPA 160.1	
Sulfate	1560	25.0	mg/L	25	P7H1719	08/17/17	08/21/17	EPA 300.0	

Total Metals by EPA / Standard Methods

Calcium	719	5.00	mg/L	1	P7H1705	08/17/17	08/17/17	EPA 6010B	QAL2
Magnesium	52.1	5.00	mg/L	1	P7H1705	08/17/17	08/17/17	EPA 6010B	QAL2
Potassium	7.53	5.00	mg/L	1	P7H1705	08/17/17	08/17/17	EPA 6010B	QAL2
Sodium	100	5.00	mg/L	1	P7H1705	08/17/17	08/17/17	EPA 6010B	QAL2
Hardness	2010	5.00	mg/L	1	P7H1705	08/17/17	08/17/17	EPA 6010B	QAL2

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Project: Assault SWD
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S-5B

7H16007-12 (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	P7H2307	08/21/17	08/21/17	TX 1005	
>C12-C28	ND	2.50	mg/L	1	P7H2307	08/21/17	08/21/17	TX 1005	
>C28-C35	ND	2.50	mg/L	1	P7H2307	08/21/17	08/21/17	TX 1005	
Surrogate: 1-Chlorooctane		99.1 %	70-130		P7H2307	08/21/17	08/21/17	TX 1005	
Surrogate: o-Terphenyl		119 %	70-130		P7H2307	08/21/17	08/21/17	TX 1005	
Total Hydrocarbon nC6-nC35	ND	2.50	mg/L	1	[CALC]	08/21/17	08/21/17	[CALC]	

General Chemistry Parameters by EPA / Standard Methods

Total Alkalinity	87.0	10.0	mg/L	1	P7H1716	08/17/17	08/22/17	EPA 310.1M	
Carbonate Alkalinity	ND	10.0	mg/L	1	P7H1716	08/17/17	08/22/17	EPA 310.1M	
Bicarbonate Alkalinity	87.0	10.0	mg/L	1	P7H1716	08/17/17	08/22/17	EPA 310.1M	
Hydroxide Alkalinity	ND	10.0	mg/L	1	P7H1716	08/17/17	08/22/17	EPA 310.1M	
Bromide	ND	0.0500	mg/L	1	P7H1719	08/17/17	08/21/17	EPA 300.0	
Chloride	108	12.5	mg/L	25	P7H1719	08/17/17	08/21/17	EPA 300.0	
Specific Conductance (EC)	2830	5.00	umhos/cm	1	P7H1708	08/17/17	08/17/17	EPA 120.1	
Dissolved Oxygen	6.00		mg/L	1	P7H1715	08/17/17	08/22/17	CHEMets	QAL1
pH	7.83		pH Units	1	P7H1717	08/17/17	08/17/17	EPA 150.1	
Temperature	22.40		pH Units	1	P7H1717	08/17/17	08/17/17	EPA 150.1	
Total Dissolved Solids	2550	20.0	mg/L	1	P7H1718	08/17/17	08/17/17	EPA 160.1	
Sulfate	1610	25.0	mg/L	25	P7H1719	08/17/17	08/21/17	EPA 300.0	

Total Metals by EPA / Standard Methods

Calcium	67.9	5.00	mg/L	1	P7H1705	08/17/17	08/17/17	EPA 6010B	QAL2
Magnesium	50.4	5.00	mg/L	1	P7H1705	08/17/17	08/17/17	EPA 6010B	QAL2
Potassium	7.32	5.00	mg/L	1	P7H1705	08/17/17	08/17/17	EPA 6010B	QAL2
Sodium	100	5.00	mg/L	1	P7H1705	08/17/17	08/17/17	EPA 6010B	QAL2
Hardness	1900	5.00	mg/L	1	P7H1705	08/17/17	08/17/17	EPA 6010B	QAL2

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Project: Assault SWD
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S-6
7H16007-13 (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	P7H2307	08/21/17	08/21/17	TX 1005	
>C12-C28	ND	2.50	mg/L	1	P7H2307	08/21/17	08/21/17	TX 1005	
>C28-C35	ND	2.50	mg/L	1	P7H2307	08/21/17	08/21/17	TX 1005	
Surrogate: 1-Chlorooctane		110 %	70-130		P7H2307	08/21/17	08/21/17	TX 1005	
Surrogate: o-Terphenyl		133 %	70-130		P7H2307	08/21/17	08/21/17	TX 1005	S-GC
Total Hydrocarbon nC6-nC35	ND	2.50	mg/L	1	[CALC]	08/21/17	08/21/17	[CALC]	

General Chemistry Parameters by EPA / Standard Methods

Total Alkalinity	90.0	10.0	mg/L	1	P7H1716	08/17/17	08/22/17	EPA 310.1M	
Carbonate Alkalinity	ND	10.0	mg/L	1	P7H1716	08/17/17	08/22/17	EPA 310.1M	
Bicarbonate Alkalinity	90.0	10.0	mg/L	1	P7H1716	08/17/17	08/22/17	EPA 310.1M	
Hydroxide Alkalinity	ND	10.0	mg/L	1	P7H1716	08/17/17	08/22/17	EPA 310.1M	
Bromide	ND	0.0500	mg/L	1	P7H1719	08/17/17	08/21/17	EPA 300.0	
Chloride	96.5	12.5	mg/L	25	P7H1719	08/17/17	08/21/17	EPA 300.0	
Specific Conductance (EC)	2850	5.00	umhos/cm	1	P7H1708	08/17/17	08/17/17	EPA 120.1	
Dissolved Oxygen	6.00		mg/L	1	P7H1715	08/17/17	08/22/17	CHEMets	QAL1
pH	7.75		pH Units	1	P7H1717	08/17/17	08/17/17	EPA 150.1	
Temperature	22.10		pH Units	1	P7H1717	08/17/17	08/17/17	EPA 150.1	
Total Dissolved Solids	2330	20.0	mg/L	1	P7H1718	08/17/17	08/17/17	EPA 160.1	
Sulfate	1610	25.0	mg/L	25	P7H1719	08/17/17	08/21/17	EPA 300.0	

Total Metals by EPA / Standard Methods

Calcium	681	5.00	mg/L	1	P7H1705	08/17/17	08/17/17	EPA 6010B	QAL2
Magnesium	48.9	5.00	mg/L	1	P7H1705	08/17/17	08/17/17	EPA 6010B	QAL2
Potassium	7.35	5.00	mg/L	1	P7H1705	08/17/17	08/17/17	EPA 6010B	QAL2
Sodium	99.1	5.00	mg/L	1	P7H1705	08/17/17	08/17/17	EPA 6010B	QAL2
Hardness	1900	5.00	mg/L	1	P7H1705	08/17/17	08/17/17	EPA 6010B	QAL2

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S-6A
7H16007-14 (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	P7H2307	08/21/17	08/21/17	TX 1005	
>C12-C28	ND	2.50	mg/L	1	P7H2307	08/21/17	08/21/17	TX 1005	
>C28-C35	ND	2.50	mg/L	1	P7H2307	08/21/17	08/21/17	TX 1005	
Surrogate: 1-Chlorooctane		115 %	70-130		P7H2307	08/21/17	08/21/17	TX 1005	
Surrogate: o-Terphenyl		142 %	70-130		P7H2307	08/21/17	08/21/17	TX 1005	S-GC
Total Hydrocarbon nC6-nC35	ND	2.50	mg/L	1	[CALC]	08/21/17	08/21/17	[CALC]	

General Chemistry Parameters by EPA / Standard Methods

Total Alkalinity	80.0	10.0	mg/L	1	P7H1716	08/17/17	08/22/17	EPA 310.1M	
Carbonate Alkalinity	ND	10.0	mg/L	1	P7H1716	08/17/17	08/22/17	EPA 310.1M	
Bicarbonate Alkalinity	80.0	10.0	mg/L	1	P7H1716	08/17/17	08/22/17	EPA 310.1M	
Hydroxide Alkalinity	ND	10.0	mg/L	1	P7H1716	08/17/17	08/22/17	EPA 310.1M	
Bromide	ND	0.0500	mg/L	1	P7H1719	08/17/17	08/21/17	EPA 300.0	
Chloride	92.4	25.0	mg/L	50	P7H1719	08/17/17	08/21/17	EPA 300.0	
Specific Conductance (EC)	3020	5.00	umhos/cm	1	P7H1708	08/17/17	08/17/17	EPA 120.1	
Dissolved Oxygen	6.00		mg/L	1	P7H1715	08/17/17	08/22/17	CHEMets	QAL1
pH	7.82		pH Units	1	P7H1717	08/17/17	08/17/17	EPA 150.1	
Temperature	22.10		pH Units	1	P7H1717	08/17/17	08/17/17	EPA 150.1	
Total Dissolved Solids	2640	20.0	mg/L	1	P7H1718	08/17/17	08/17/17	EPA 160.1	
Sulfate	1940	50.0	mg/L	50	P7H1719	08/17/17	08/21/17	EPA 300.0	

Total Metals by EPA / Standard Methods

Calcium	838	5.00	mg/L	1	P7H1705	08/17/17	08/17/17	EPA 6010B	QAL2
Magnesium	41.6	5.00	mg/L	1	P7H1705	08/17/17	08/17/17	EPA 6010B	QAL2
Potassium	8.37	5.00	mg/L	1	P7H1705	08/17/17	08/17/17	EPA 6010B	QAL2
Sodium	90.0	5.00	mg/L	1	P7H1705	08/17/17	08/17/17	EPA 6010B	QAL2
Hardness	2260	5.00	mg/L	1	P7H1705	08/17/17	08/17/17	EPA 6010B	QAL2

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

Fax: (432) 571-7832

S-6C
7H16007-15 (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	P7H2307	08/21/17	08/21/17	TX 1005	
>C12-C28	ND	2.50	mg/L	1	P7H2307	08/21/17	08/21/17	TX 1005	
>C28-C35	ND	2.50	mg/L	1	P7H2307	08/21/17	08/21/17	TX 1005	
Surrogate: 1-Chlorooctane		91.1 %	70-130		P7H2307	08/21/17	08/21/17	TX 1005	
Surrogate: o-Terphenyl		107 %	70-130		P7H2307	08/21/17	08/21/17	TX 1005	
Total Hydrocarbon nC6-nC35	ND	2.50	mg/L	1	[CALC]	08/21/17	08/21/17	[CALC]	

General Chemistry Parameters by EPA / Standard Methods

Total Alkalinity	80.0	10.0	mg/L	1	P7H1716	08/17/17	08/22/17	EPA 310.1M	
Carbonate Alkalinity	ND	10.0	mg/L	1	P7H1716	08/17/17	08/22/17	EPA 310.1M	
Bicarbonate Alkalinity	80.0	10.0	mg/L	1	P7H1716	08/17/17	08/22/17	EPA 310.1M	
Hydroxide Alkalinity	ND	10.0	mg/L	1	P7H1716	08/17/17	08/22/17	EPA 310.1M	
Bromide	ND	0.0500	mg/L	1	P7H1719	08/17/17	08/21/17	EPA 300.0	
Chloride	76.4	25.0	mg/L	50	P7H1719	08/17/17	08/21/17	EPA 300.0	
Specific Conductance (EC)	3040	5.00	umhos/cm	1	P7H1708	08/17/17	08/17/17	EPA 120.1	
Dissolved Oxygen	6.00		mg/L	1	P7H1715	08/17/17	08/22/17	CHEMets	QAL1
pH	7.67		pH Units	1	P7H1717	08/17/17	08/17/17	EPA 150.1	
Temperature	22.10		pH Units	1	P7H1717	08/17/17	08/17/17	EPA 150.1	
Total Dissolved Solids	2570	20.0	mg/L	1	P7H1718	08/17/17	08/17/17	EPA 160.1	
Sulfate	1830	50.0	mg/L	50	P7H1719	08/17/17	08/21/17	EPA 300.0	

Total Metals by EPA / Standard Methods

Calcium	793	5.00	mg/L	1	P7H1705	08/17/17	08/17/17	EPA 6010B	QAL2
Magnesium	35.6	5.00	mg/L	1	P7H1705	08/17/17	08/17/17	EPA 6010B	QAL2
Potassium	7.26	5.00	mg/L	1	P7H1705	08/17/17	08/17/17	EPA 6010B	QAL2
Sodium	64.2	5.00	mg/L	1	P7H1705	08/17/17	08/17/17	EPA 6010B	QAL2
Hardness	2130	5.00	mg/L	1	P7H1705	08/17/17	08/17/17	EPA 6010B	QAL2

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DUP-1
7H16007-16 (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	P7H2307	08/21/17	08/21/17	TX 1005	
>C12-C28	ND	2.50	mg/L	1	P7H2307	08/21/17	08/21/17	TX 1005	
>C28-C35	ND	2.50	mg/L	1	P7H2307	08/21/17	08/21/17	TX 1005	
Surrogate: 1-Chlorooctane		95.6 %	70-130		P7H2307	08/21/17	08/21/17	TX 1005	
Surrogate: o-Terphenyl		115 %	70-130		P7H2307	08/21/17	08/21/17	TX 1005	
Total Hydrocarbon nC6-nC35	ND	2.50	mg/L	1	[CALC]	08/21/17	08/21/17	[CALC]	

General Chemistry Parameters by EPA / Standard Methods

Total Alkalinity	107	10.0	mg/L	1	P7H1716	08/17/17	08/22/17	EPA 310.1M	
Carbonate Alkalinity	ND	10.0	mg/L	1	P7H1716	08/17/17	08/22/17	EPA 310.1M	
Bicarbonate Alkalinity	107	10.0	mg/L	1	P7H1716	08/17/17	08/22/17	EPA 310.1M	
Hydroxide Alkalinity	ND	10.0	mg/L	1	P7H1716	08/17/17	08/22/17	EPA 310.1M	
Bromide	ND	0.0500	mg/L	1	P7H1719	08/17/17	08/21/17	EPA 300.0	
Chloride	115	25.0	mg/L	50	P7H1719	08/17/17	08/21/17	EPA 300.0	
Specific Conductance (EC)	3280	5.00	umhos/cm	1	P7H1708	08/17/17	08/17/17	EPA 120.1	
Dissolved Oxygen	6.00		mg/L	1	P7H1715	08/17/17	08/22/17	CHEMets	QAL1
pH	7.90		pH Units	1	P7H1717	08/17/17	08/17/17	EPA 150.1	
Temperature	22.00		pH Units	1	P7H1717	08/17/17	08/17/17	EPA 150.1	
Total Dissolved Solids	2870	20.0	mg/L	1	P7H1718	08/17/17	08/17/17	EPA 160.1	
Sulfate	1910	50.0	mg/L	50	P7H1719	08/17/17	08/21/17	EPA 300.0	

Total Metals by EPA / Standard Methods

Calcium	751	5.00	mg/L	1	P7H1705	08/17/17	08/17/17	EPA 6010B	QAL2
Magnesium	62.7	5.00	mg/L	1	P7H1705	08/17/17	08/17/17	EPA 6010B	QAL2
Potassium	7.53	5.00	mg/L	1	P7H1705	08/17/17	08/17/17	EPA 6010B	QAL2
Sodium	120	5.00	mg/L	1	P7H1705	08/17/17	08/17/17	EPA 6010B	QAL2
Hardness	2130	5.00	mg/L	1	P7H1705	08/17/17	08/17/17	EPA 6010B	QAL2

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DUP-2
7H16007-17 (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	P7H2307	08/21/17	08/21/17	TX 1005	
>C12-C28	ND	2.50	mg/L	1	P7H2307	08/21/17	08/21/17	TX 1005	
>C28-C35	ND	2.50	mg/L	1	P7H2307	08/21/17	08/21/17	TX 1005	
Surrogate: 1-Chlorooctane		91.8 %	70-130		P7H2307	08/21/17	08/21/17	TX 1005	
Surrogate: o-Terphenyl		112 %	70-130		P7H2307	08/21/17	08/21/17	TX 1005	
Total Hydrocarbon nC6-nC35	ND	2.50	mg/L	1	[CALC]	08/21/17	08/21/17	[CALC]	

General Chemistry Parameters by EPA / Standard Methods

Total Alkalinity	95.0	10.0	mg/L	1	P7H1716	08/17/17	08/22/17	EPA 310.1M	
Carbonate Alkalinity	ND	10.0	mg/L	1	P7H1716	08/17/17	08/22/17	EPA 310.1M	
Bicarbonate Alkalinity	95.0	10.0	mg/L	1	P7H1716	08/17/17	08/22/17	EPA 310.1M	
Hydroxide Alkalinity	ND	10.0	mg/L	1	P7H1716	08/17/17	08/22/17	EPA 310.1M	
Bromide	ND	0.0500	mg/L	1	P7H1719	08/17/17	08/21/17	EPA 300.0	
Chloride	102	12.5	mg/L	25	P7H1719	08/17/17	08/21/17	EPA 300.0	
Specific Conductance (EC)	2850	5.00	umhos/cm	1	P7H1708	08/17/17	08/17/17	EPA 120.1	
Dissolved Oxygen	6.00		mg/L	1	P7H1715	08/17/17	08/22/17	CHEMets	QAL1
pH	7.74		pH Units	1	P7H1717	08/17/17	08/17/17	EPA 150.1	
Temperature	21.90		pH Units	1	P7H1717	08/17/17	08/17/17	EPA 150.1	
Total Dissolved Solids	2540	20.0	mg/L	1	P7H1718	08/17/17	08/17/17	EPA 160.1	
Sulfate	1620	25.0	mg/L	25	P7H1719	08/17/17	08/21/17	EPA 300.0	

Total Metals by EPA / Standard Methods

Calcium	635	5.00	mg/L	1	P7H1705	08/17/17	08/17/17	EPA 6010B	QAL2
Magnesium	45.4	5.00	mg/L	1	P7H1705	08/17/17	08/17/17	EPA 6010B	QAL2
Potassium	6.83	5.00	mg/L	1	P7H1705	08/17/17	08/17/17	EPA 6010B	QAL2
Sodium	92.1	5.00	mg/L	1	P7H1705	08/17/17	08/17/17	EPA 6010B	QAL2
Hardness	1770	5.00	mg/L	1	P7H1705	08/17/17	08/17/17	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
Batch P7H2307 - TX 1005										
Blank (P7H2307-BLK1)				Prepared & Analyzed: 08/21/17						
C6-C12	ND	2.50	mg/L							
>C12-C28	ND	2.50	"							
>C28-C35	ND	2.50	"							
Surrogate: 1-Chlorooctane	11.9		"	9.38		127	70-130			
Surrogate: o-Terphenyl	7.00		"	4.69		149	70-130			S-GC
LCS (P7H2307-BS1)				Prepared & Analyzed: 08/21/17						
C6-C12	98.1	2.50	mg/L	93.8		105	75-125			
>C12-C28	101	2.50	"	93.8		108	75-125			
Surrogate: 1-Chlorooctane	11.4		"	9.38		121	70-130			
Surrogate: o-Terphenyl	6.50		"	4.69		139	70-130			S-GC
LCS Dup (P7H2307-BSD1)				Prepared & Analyzed: 08/21/17						
C6-C12	100	2.50	mg/L	93.8		107	75-125	2.19	20	
>C12-C28	104	2.50	"	93.8		111	75-125	2.80	20	
Surrogate: 1-Chlorooctane	11.6		"	9.38		124	70-130			
Surrogate: o-Terphenyl	5.84		"	4.69		125	70-130			
Duplicate (P7H2307-DUP1)		Source: 7H16008-03		Prepared: 08/21/17 Analyzed: 08/22/17						
C6-C12	0.968	2.50	mg/L		ND				20	
>C12-C28	0.954	2.50	"		ND				20	
Surrogate: 1-Chlorooctane	9.57		"	9.38		102	70-130			
Surrogate: o-Terphenyl	5.84		"	4.69		125	70-130			

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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 P7H1708 - * DEFAULT PREP *****

Duplicate (P7H1708-DUP1)		Source: 7H16007-01		Prepared & Analyzed: 08/17/17		
Specific Conductance (EC)	3360	5.00	umhos/cm	3390	0.889	20
Duplicate (P7H1708-DUP2)		Source: 7H16008-11		Prepared & Analyzed: 08/17/17		
Specific Conductance (EC)	3450	5.00	umhos/cm	3480	0.866	20

Batch P7H1715 - * DEFAULT PREP *****

Duplicate (P7H1715-DUP1)		Source: 7H16007-01		Prepared: 08/17/17 Analyzed: 08/22/17			
Dissolved Oxygen	6.00	mg/L	6.00	0.00	200	QAL1	

Batch P7H1716 - * DEFAULT PREP *****

Blank (P7H1716-BLK1)	Prepared: 08/17/17 Analyzed: 08/22/17									
Total Alkalinity	ND	10.0	mg/L							
Carbonate Alkalinity	ND	10.0	"							
Bicarbonate Alkalinity	ND	10.0	"							
Hydroxide Alkalinity	ND	10.0	"							

Blank (P7H1716-BLK2)	Prepared: 08/17/17 Analyzed: 08/22/17									
Total Alkalinity	ND	10.0	mg/L							
Carbonate Alkalinity	ND	10.0	"							
Bicarbonate Alkalinity	ND	10.0	"							
Hydroxide Alkalinity	ND	10.0	"							

Duplicate (P7H1716-DUP1)		Source: 7H16007-01			Prepared: 08/17/17		Analyzed: 08/22/17	
Total Alkalinity	127	10.0	mg/L		130		2.33	20
Carbonate Alkalinity	ND	10.0	"		ND			20
Bicarbonate Alkalinity	127	10.0	"		130		2.33	20
Hydroxide Alkalinity	ND	10.0	"		ND			20

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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 P7H1716 - * DEFAULT PREP *****

Duplicate (P7H1716-DUP2)		Source: 7H16008-04			Prepared: 08/17/17		Analyzed: 08/22/17			
Total Alkalinity	107	10.0	mg/L		105			1.89	20	
Carbonate Alkalinity	ND	10.0	"		ND				20	
Bicarbonate Alkalinity	107	10.0	"		105			1.89	20	
Hydroxide Alkalinity	ND	10.0	"		ND				20	

Batch P7H1717 - * DEFAULT PREP *****

Duplicate (P7H1717-DUP1)		Source: 7H16007-01			Prepared & Analyzed: 08/17/17					
pH	7.90		pH Units		7.92			0.253	20	
Temperature	22.10		"		22.10			0.00	200	
Duplicate (P7H1717-DUP2)		Source: 7H16008-04			Prepared & Analyzed: 08/17/17					
pH	7.91		pH Units		7.91			0.00	20	
Temperature	22.60		"		22.50			0.443	200	

Batch P7H1718 - * DEFAULT PREP *****

Blank (P7H1718-BLK1)					Prepared & Analyzed: 08/17/17					
Total Dissolved Solids	ND	20.0	mg/L							
Blank (P7H1718-BLK2)					Prepared & Analyzed: 08/17/17					
Total Dissolved Solids	ND	20.0	mg/L							
Duplicate (P7H1718-DUP1)		Source: 7H16007-01			Prepared & Analyzed: 08/17/17					
Total Dissolved Solids	2910	20.0	mg/L		2890			0.690	20	

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Project: Assault SWD
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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 P7H1718 - * DEFAULT PREP *****

Duplicate (P7H1718-DUP2)

Source: 7H16008-04

Prepared & Analyzed: 08/17/17

Total Dissolved Solids	2990	20.0	mg/L		3020			0.998	20	
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Batch P7H1719 - * DEFAULT PREP *****

Blank (P7H1719-BLK1)

Prepared: 08/17/17 Analyzed: 08/21/17

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

LCS (P7H1719-BS1)

Prepared: 08/17/17 Analyzed: 08/21/17

Chloride	42.5	0.500	mg/L	40.0		106	85-115			
Sulfate	43.6	1.00	"	40.0		109	85-115			
Bromide	6.29	0.0500	"	5.00		126	80-120			

LCS Dup (P7H1719-BSD1)

Prepared: 08/17/17 Analyzed: 08/21/17

Bromide	6.30	0.0500	mg/L	5.00		126	80-120	0.127	20	
Chloride	42.7	0.500	"	40.0		107	85-115	0.425	20	
Sulfate	43.7	1.00	"	40.0		109	85-115	0.254	20	

Duplicate (P7H1719-DUP1)

Source: 7H16007-01

Prepared: 08/17/17 Analyzed: 08/21/17

Chloride	102	25.0	mg/L		110			7.22	20	
Bromide	0.305	0.0500	"		0.305			0.00	20	
Sulfate	1770	50.0	"		1800			1.72	20	

Duplicate (P7H1719-DUP2)

Source: 7H16007-11

Prepared: 08/17/17 Analyzed: 08/21/17

Sulfate	1550	25.0	mg/L		1560			0.514	20	
Bromide	ND	0.0500	"		ND				20	
Chloride	88.8	12.5	"		90.8			2.28	20	

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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 P7H1719 - * DEFAULT PREP *****

Matrix Spike (P7H1719-MS1)

Source: 7H16007-01

Prepared: 08/17/17 Analyzed: 08/21/17

Sulfate	2270	50.0	mg/L	500	1800	93.5	80-120			
Chloride	626	25.0	"	500	110	103	80-120			
Bromide	76.8	2.50	"	62.5	ND	123	75-125			

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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 P7H1702 - * DEFAULT PREP *****

Blank (P7H1702-BLK1)

Prepared: 08/17/17 Analyzed: 08/22/17

Calcium	0.0289	5.00	mg/L							QAL2, J
Magnesium	0.0538	5.00	"							QAL2, J
Potassium	0.0128	5.00	"							QAL2, J
Sodium	ND	5.00	"							QAL2
Hardness	ND	5.00	"							QAL2

LCS (P7H1702-BS1)

Prepared: 08/17/17 Analyzed: 08/22/17

Calcium	51.4	5.00	mg/L	50.0		103	80-120			QAL2
Magnesium	51.1	5.00	"	50.0		102	80-120			QAL2
Potassium	52.3	5.00	"	50.0		105	80-120			QAL2
Sodium	55.6	5.00	"	50.0		111	80-120			QAL2

Matrix Spike (P7H1702-MS1)

Source: 7H16001-02

Prepared: 08/17/17 Analyzed: 08/22/17

Calcium	832	5.00	mg/L	50.0	808	47.9	75-125			QAL2, QM-07
Magnesium	152	5.00	"	50.0	46.2	212	75-125			QAL2, QM-07
Potassium	119	5.00	"	50.0	7.66	223	75-125			QAL2, QM-07
Sodium	203	5.00	"	50.0	90.8	224	75-125			QAL2, QM-07

Batch P7H1705 - * DEFAULT PREP *****

Blank (P7H1705-BLK1)

Prepared & Analyzed: 08/17/17

Calcium	ND	5.00	mg/L							QAL2
Magnesium	ND	5.00	"							QAL2
Potassium	0.166	5.00	"							QAL2, J
Sodium	ND	5.00	"							QAL2
Hardness	ND	5.00	"							QAL2

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 P7H1705 - * DEFAULT PREP *****

LCS (P7H1705-BS1)

Prepared & Analyzed: 08/17/17

Calcium	52.6	5.00	mg/L	50.0		105	80-120			QAL2
Magnesium	52.7	5.00	"	50.0		105	80-120			QAL2
Potassium	54.4	5.00	"	50.0		109	80-120			QAL2
Sodium	56.2	5.00	"	50.0		112	80-120			QAL2

LCS Dup (P7H1705-BSD1)

Prepared & Analyzed: 08/17/17

Calcium	53.1	5.00	mg/L	50.0		106	80-120	1.00	20	QAL2
Magnesium	52.9	5.00	"	50.0		106	80-120	0.374	20	QAL2
Potassium	54.4	5.00	"	50.0		109	80-120	0.150	20	QAL2
Sodium	56.0	5.00	"	50.0		112	80-120	0.209	20	QAL2

Duplicate (P7H1705-DUP1)

Source: 7H16007-09

Prepared & Analyzed: 08/17/17

Calcium	707	5.00	mg/L		589			18.3	20	QAL2
Magnesium	58.0	5.00	"		47.4			19.9	20	QAL2
Potassium	6.98	5.00	"		5.88			17.1	20	QAL2
Sodium	111	5.00	"		92.1			18.4	20	QAL2
Hardness	2010	5.00	"		1670			18.5	20	QAL2

Matrix Spike (P7H1705-MS1)

Source: 7H16007-09

Prepared & Analyzed: 08/17/17

Calcium	696	5.00	mg/L	50.0	589	215	75-125			QAL2, QM-07
Magnesium	113	5.00	"	50.0	47.4	131	75-125			QAL2, QM-07
Potassium	72.5	5.00	"	50.0	5.88	133	75-125			QAL2, QM-07
Sodium	159	5.00	"	50.0	92.1	135	75-125			QAL2, QM-07

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Midland TX, 79701

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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:

8/25/2017

Brent Barron, Laboratory Director/Technical Director

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

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

CHAIN OF CUSTODY RECORD

[illegible]



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