

**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: 7H15017



NELAP/TCEQ # T104704516-16-7

Report Date: 08/24/17

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

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

Fax: (432) 571-7832

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
S-1	7H15017-01	Water	08/15/17 08:38	08-15-2017 15:36
S-2	7H15017-02	Water	08/15/17 09:24	08-15-2017 15:36
S-3	7H15017-03	Water	08/15/17 09:32	08-15-2017 15:36
S-3A	7H15017-04	Water	08/15/17 09:47	08-15-2017 15:36
S-3B	7H15017-05	Water	08/15/17 09:55	08-15-2017 15:36
S-4	7H15017-06	Water	08/15/17 10:09	08-15-2017 15:36
S-4A	7H15017-07	Water	08/15/17 10:18	08-15-2017 15:36
S-4B	7H15017-08	Water	08/15/17 10:27	08-15-2017 15:36
S-4C	7H15017-09	Water	08/15/17 10:44	08-15-2017 15:36
S-5	7H15017-10	Water	08/15/17 09:28	08-15-2017 15:36
S-5A	7H15017-11	Water	08/15/17 10:03	08-15-2017 15:36
S-5B	7H15017-12	Water	08/15/17 11:15	08-15-2017 15:36
S-6	7H15017-13	Water	08/15/17 10:16	08-15-2017 15:36
S-6A	7H15017-14	Water	08/15/17 10:35	08-15-2017 15:36
S-6B	7H15017-15	Water	08/15/17 10:54	08-15-2017 15:36
DUP-1	7H15017-16	Water	08/15/17 12:00	08-15-2017 15:36
DUP-2	7H15017-17	Water	08/15/17 12:00	08-15-2017 15:36

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

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

Fax: (432) 571-7832

S-1
7H15017-01 (Water)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
---------	--------	--------------------	-------	----------	-------	----------	----------	--------	-------

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		80.9 %	70-130		P7H1710	08/16/17	08/16/17	TX 1005	
Surrogate: o-Terphenyl		99.8 %	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	130	10.0	mg/L	1	P7H1609	08/16/17	08/16/17	EPA 310.1M	
Carbonate Alkalinity	ND	10.0	mg/L	1	P7H1609	08/16/17	08/16/17	EPA 310.1M	
Bicarbonate Alkalinity	130	10.0	mg/L	1	P7H1609	08/16/17	08/16/17	EPA 310.1M	
Hydroxide Alkalinity	ND	10.0	mg/L	1	P7H1609	08/16/17	08/16/17	EPA 310.1M	
Bromide	ND	0.0500	mg/L	1	P7H1604	08/16/17	08/17/17	EPA 300.0	
Chloride	102	25.0	mg/L	50	P7H1604	08/16/17	08/17/17	EPA 300.0	
Specific Conductance (EC)	3090	5.00	umhos/cm	1	P7H1707	08/17/17	08/17/17	EPA 120.1	
Dissolved Oxygen	6.00		mg/L	1	P7H1610	08/16/17	08/16/17	CHEMets	QAL1
pH	7.98		pH Units	1	P7H1611	08/16/17	08/16/17	EPA 150.1	
Temperature	23.90		pH Units	1	P7H1611	08/16/17	08/16/17	EPA 150.1	
Total Dissolved Solids	2900	20.0	mg/L	1	P7H1612	08/16/17	08/16/17	EPA 160.1	
Sulfate	1690	50.0	mg/L	50	P7H1604	08/16/17	08/17/17	EPA 300.0	

Total Metals by EPA / Standard Methods

Calcium	590	5.00	mg/L	1	P7H1607	08/16/17	08/22/17	EPA 6010B	QAL2
Magnesium	36.4	5.00	mg/L	1	P7H1607	08/16/17	08/22/17	EPA 6010B	QAL2
Potassium	6.02	5.00	mg/L	1	P7H1607	08/16/17	08/22/17	EPA 6010B	QAL2
Sodium	94.1	5.00	mg/L	1	P7H1607	08/16/17	08/22/17	EPA 6010B	QAL2
Hardness	1620	5.00	mg/L	1	P7H1607	08/16/17	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-2
7H15017-02 (Water)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
---------	--------	--------------------	-------	----------	-------	----------	----------	--------	-------

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		90.2 %	70-130		P7H1710	08/16/17	08/16/17	TX 1005	
Surrogate: o-Terphenyl		112 %	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	110	10.0	mg/L	1	P7H1609	08/16/17	08/16/17	EPA 310.1M	
Carbonate Alkalinity	ND	10.0	mg/L	1	P7H1609	08/16/17	08/16/17	EPA 310.1M	
Bicarbonate Alkalinity	110	10.0	mg/L	1	P7H1609	08/16/17	08/16/17	EPA 310.1M	
Hydroxide Alkalinity	ND	10.0	mg/L	1	P7H1609	08/16/17	08/16/17	EPA 310.1M	
Bromide	ND	0.0500	mg/L	1	P7H1604	08/16/17	08/17/17	EPA 300.0	
Chloride	90.9	12.5	mg/L	25	P7H1604	08/16/17	08/17/17	EPA 300.0	
Specific Conductance (EC)	2990	5.00	umhos/cm	1	P7H1707	08/17/17	08/17/17	EPA 120.1	
Dissolved Oxygen	6.00		mg/L	1	P7H1610	08/16/17	08/16/17	CHEMets	QAL1
pH	8.02		pH Units	1	P7H1611	08/16/17	08/16/17	EPA 150.1	
Temperature	23.90		pH Units	1	P7H1611	08/16/17	08/16/17	EPA 150.1	
Total Dissolved Solids	2910	20.0	mg/L	1	P7H1612	08/16/17	08/16/17	EPA 160.1	
Sulfate	1740	25.0	mg/L	25	P7H1604	08/16/17	08/17/17	EPA 300.0	

Total Metals by EPA / Standard Methods

Calcium	713	5.00	mg/L	1	P7H1607	08/16/17	08/22/17	EPA 6010B	QAL2
Magnesium	66.3	5.00	mg/L	1	P7H1607	08/16/17	08/22/17	EPA 6010B	QAL2
Potassium	4.99	1.00	mg/L	1	P7H1607	08/16/17	08/22/17	EPA 6010B	QAL2
Sodium	122	5.00	mg/L	1	P7H1607	08/16/17	08/22/17	EPA 6010B	QAL2
Hardness	2050	5.00	mg/L	1	P7H1607	08/16/17	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-3
7H15017-03 (Water)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
---------	--------	--------------------	-------	----------	-------	----------	----------	--------	-------

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		80.2 %	70-130		P7H1710	08/16/17	08/16/17	TX 1005	
Surrogate: o-Terphenyl		100 %	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	120	10.0	mg/L	1	P7H1609	08/16/17	08/16/17	EPA 310.1M	
Carbonate Alkalinity	ND	10.0	mg/L	1	P7H1609	08/16/17	08/16/17	EPA 310.1M	
Bicarbonate Alkalinity	120	10.0	mg/L	1	P7H1609	08/16/17	08/16/17	EPA 310.1M	
Hydroxide Alkalinity	ND	10.0	mg/L	1	P7H1609	08/16/17	08/16/17	EPA 310.1M	
Bromide	ND	0.0500	mg/L	1	P7H1604	08/16/17	08/17/17	EPA 300.0	
Chloride	103	25.0	mg/L	50	P7H1604	08/16/17	08/17/17	EPA 300.0	
Specific Conductance (EC)	3130	5.00	umhos/cm	1	P7H1707	08/17/17	08/17/17	EPA 120.1	
Dissolved Oxygen	6.00		mg/L	1	P7H1610	08/16/17	08/16/17	CHEMets	QAL1
pH	7.92		pH Units	1	P7H1611	08/16/17	08/16/17	EPA 150.1	
Temperature	23.60		pH Units	1	P7H1611	08/16/17	08/16/17	EPA 150.1	
Total Dissolved Solids	2850	20.0	mg/L	1	P7H1612	08/16/17	08/16/17	EPA 160.1	
Sulfate	1850	50.0	mg/L	50	P7H1604	08/16/17	08/17/17	EPA 300.0	

Total Metals by EPA / Standard Methods

Calcium	678	5.00	mg/L	1	P7H1607	08/16/17	08/22/17	EPA 6010B	QAL2
Magnesium	55.2	5.00	mg/L	1	P7H1607	08/16/17	08/22/17	EPA 6010B	QAL2
Potassium	5.30	5.00	mg/L	1	P7H1607	08/16/17	08/22/17	EPA 6010B	QAL2
Sodium	99.2	5.00	mg/L	1	P7H1607	08/16/17	08/22/17	EPA 6010B	QAL2
Hardness	1920	5.00	mg/L	1	P7H1607	08/16/17	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-3A
7H15017-04 (Water)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
---------	--------	--------------------	-------	----------	-------	----------	----------	--------	-------

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		80.4 %	70-130		P7H1710	08/16/17	08/16/17	TX 1005	
Surrogate: o-Terphenyl		98.3 %	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	150	10.0	mg/L	1	P7H1609	08/16/17	08/16/17	EPA 310.1M	
Carbonate Alkalinity	ND	10.0	mg/L	1	P7H1609	08/16/17	08/16/17	EPA 310.1M	
Bicarbonate Alkalinity	150	10.0	mg/L	1	P7H1609	08/16/17	08/16/17	EPA 310.1M	
Hydroxide Alkalinity	ND	10.0	mg/L	1	P7H1609	08/16/17	08/16/17	EPA 310.1M	
Bromide	ND	0.0500	mg/L	1	P7H1604	08/16/17	08/17/17	EPA 300.0	
Chloride	97.9	25.0	mg/L	50	P7H1604	08/16/17	08/17/17	EPA 300.0	
Specific Conductance (EC)	3040	5.00	umhos/cm	1	P7H1707	08/17/17	08/17/17	EPA 120.1	
Dissolved Oxygen	6.00		mg/L	1	P7H1610	08/16/17	08/16/17	CHEMets	QAL1
pH	8.05		pH Units	1	P7H1611	08/16/17	08/16/17	EPA 150.1	
Temperature	23.50		pH Units	1	P7H1611	08/16/17	08/16/17	EPA 150.1	
Total Dissolved Solids	2800	20.0	mg/L	1	P7H1612	08/16/17	08/16/17	EPA 160.1	
Sulfate	1850	50.0	mg/L	50	P7H1604	08/16/17	08/17/17	EPA 300.0	

Total Metals by EPA / Standard Methods

Calcium	710	5.00	mg/L	1	P7H1607	08/16/17	08/22/17	EPA 6010B	QAL2
Magnesium	55.1	5.00	mg/L	1	P7H1607	08/16/17	08/22/17	EPA 6010B	QAL2
Potassium	5.73	5.00	mg/L	1	P7H1607	08/16/17	08/22/17	EPA 6010B	QAL2
Sodium	104	5.00	mg/L	1	P7H1607	08/16/17	08/22/17	EPA 6010B	QAL2
Hardness	2000	5.00	mg/L	1	P7H1607	08/16/17	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-3B

7H15017-05 (Water)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
---------	--------	--------------------	-------	----------	-------	----------	----------	--------	-------

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		80.7 %	70-130		P7H1710	08/16/17	08/16/17	TX 1005	
Surrogate: o-Terphenyl		98.7 %	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	112	10.0	mg/L	1	P7H1609	08/16/17	08/16/17	EPA 310.1M	
Carbonate Alkalinity	ND	10.0	mg/L	1	P7H1609	08/16/17	08/16/17	EPA 310.1M	
Bicarbonate Alkalinity	112	10.0	mg/L	1	P7H1609	08/16/17	08/16/17	EPA 310.1M	
Hydroxide Alkalinity	ND	10.0	mg/L	1	P7H1609	08/16/17	08/16/17	EPA 310.1M	
Bromide	ND	0.0500	mg/L	1	P7H1604	08/16/17	08/17/17	EPA 300.0	
Chloride	140	25.0	mg/L	50	P7H1604	08/16/17	08/17/17	EPA 300.0	
Specific Conductance (EC)	3020	5.00	umhos/cm	1	P7H1707	08/17/17	08/17/17	EPA 120.1	
Dissolved Oxygen	6.00		mg/L	1	P7H1610	08/16/17	08/16/17	CHEMets	QAL1
pH	8.05		pH Units	1	P7H1611	08/16/17	08/16/17	EPA 150.1	
Temperature	23.40		pH Units	1	P7H1611	08/16/17	08/16/17	EPA 150.1	
Total Dissolved Solids	2740	20.0	mg/L	1	P7H1612	08/16/17	08/16/17	EPA 160.1	
Sulfate	1820	50.0	mg/L	50	P7H1604	08/16/17	08/17/17	EPA 300.0	

Total Metals by EPA / Standard Methods

Calcium	707	5.00	mg/L	1	P7H1607	08/16/17	08/22/17	EPA 6010B	QAL2
Magnesium	54.5	5.00	mg/L	1	P7H1607	08/16/17	08/22/17	EPA 6010B	QAL2
Potassium	5.62	5.00	mg/L	1	P7H1607	08/16/17	08/22/17	EPA 6010B	QAL2
Sodium	104	5.00	mg/L	1	P7H1607	08/16/17	08/22/17	EPA 6010B	QAL2
Hardness	1990	5.00	mg/L	1	P7H1607	08/16/17	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-4
7H15017-06 (Water)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
---------	--------	--------------------	-------	----------	-------	----------	----------	--------	-------

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		87.4 %	70-130		P7H1710	08/16/17	08/16/17	TX 1005	
Surrogate: o-Terphenyl		109 %	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	112	10.0	mg/L	1	P7H1609	08/16/17	08/16/17	EPA 310.1M	
Carbonate Alkalinity	ND	10.0	mg/L	1	P7H1609	08/16/17	08/16/17	EPA 310.1M	
Bicarbonate Alkalinity	112	10.0	mg/L	1	P7H1609	08/16/17	08/16/17	EPA 310.1M	
Hydroxide Alkalinity	ND	10.0	mg/L	1	P7H1609	08/16/17	08/16/17	EPA 310.1M	
Bromide	ND	0.0500	mg/L	1	P7H1604	08/16/17	08/17/17	EPA 300.0	
Chloride	104	25.0	mg/L	50	P7H1604	08/16/17	08/17/17	EPA 300.0	
Specific Conductance (EC)	3040	5.00	umhos/cm	1	P7H1707	08/17/17	08/17/17	EPA 120.1	
Dissolved Oxygen	6.00		mg/L	1	P7H1610	08/16/17	08/16/17	CHEMets	QAL1
pH	7.96		pH Units	1	P7H1611	08/16/17	08/16/17	EPA 150.1	
Temperature	23.30		pH Units	1	P7H1611	08/16/17	08/16/17	EPA 150.1	
Total Dissolved Solids	2860	20.0	mg/L	1	P7H1612	08/16/17	08/16/17	EPA 160.1	
Sulfate	1900	50.0	mg/L	50	P7H1604	08/16/17	08/17/17	EPA 300.0	

Total Metals by EPA / Standard Methods

Calcium	726	5.00	mg/L	1	P7H1607	08/16/17	08/22/17	EPA 6010B	QAL2
Magnesium	52.3	5.00	mg/L	1	P7H1607	08/16/17	08/22/17	EPA 6010B	QAL2
Potassium	5.57	5.00	mg/L	1	P7H1607	08/16/17	08/22/17	EPA 6010B	QAL2
Sodium	102	5.00	mg/L	1	P7H1607	08/16/17	08/22/17	EPA 6010B	QAL2
Hardness	2030	5.00	mg/L	1	P7H1607	08/16/17	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

7H15017-07 (Water)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
---------	--------	--------------------	-------	----------	-------	----------	----------	--------	-------

Permian Basin Environmental Lab, L.P.

Organics by GC

C6-C12	ND	2.50	mg/L	1	P7H1711	08/16/17	08/17/17	TX 1005	
>C12-C28	ND	2.50	mg/L	1	P7H1711	08/16/17	08/17/17	TX 1005	
>C28-C35	ND	2.50	mg/L	1	P7H1711	08/16/17	08/17/17	TX 1005	
Surrogate: 1-Chlorooctane		81.3 %	70-130		P7H1711	08/16/17	08/17/17	TX 1005	
Surrogate: o-Terphenyl		97.5 %	70-130		P7H1711	08/16/17	08/17/17	TX 1005	
Total Hydrocarbon nC6-nC35	ND	2.50	mg/L	1	[CALC]	08/16/17	08/17/17	[CALC]	

General Chemistry Parameters by EPA / Standard Methods

Total Alkalinity	100	10.0	mg/L	1	P7H1609	08/16/17	08/16/17	EPA 310.1M	
Carbonate Alkalinity	ND	10.0	mg/L	1	P7H1609	08/16/17	08/16/17	EPA 310.1M	
Bicarbonate Alkalinity	100	10.0	mg/L	1	P7H1609	08/16/17	08/16/17	EPA 310.1M	
Hydroxide Alkalinity	ND	10.0	mg/L	1	P7H1609	08/16/17	08/16/17	EPA 310.1M	
Bromide	ND	0.0500	mg/L	1	P7H1604	08/16/17	08/17/17	EPA 300.0	
Chloride	104	25.0	mg/L	50	P7H1604	08/16/17	08/17/17	EPA 300.0	
Specific Conductance (EC)	3080	5.00	umhos/cm	1	P7H1707	08/17/17	08/17/17	EPA 120.1	
Dissolved Oxygen	6.00		mg/L	1	P7H1610	08/16/17	08/16/17	CHEMets	QAL1
pH	7.97		pH Units	1	P7H1611	08/16/17	08/16/17	EPA 150.1	
Temperature	23.30		pH Units	1	P7H1611	08/16/17	08/16/17	EPA 150.1	
Total Dissolved Solids	2800	20.0	mg/L	1	P7H1612	08/16/17	08/16/17	EPA 160.1	
Sulfate	1910	50.0	mg/L	50	P7H1604	08/16/17	08/17/17	EPA 300.0	

Total Metals by EPA / Standard Methods

Calcium	721	5.00	mg/L	1	P7H1607	08/16/17	08/22/17	EPA 6010B	QAL2
Magnesium	49.5	5.00	mg/L	1	P7H1607	08/16/17	08/22/17	EPA 6010B	QAL2
Potassium	5.70	5.00	mg/L	1	P7H1607	08/16/17	08/22/17	EPA 6010B	QAL2
Sodium	95.5	5.00	mg/L	1	P7H1607	08/16/17	08/22/17	EPA 6010B	QAL2
Hardness	2000	5.00	mg/L	1	P7H1607	08/16/17	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

7H15017-08 (Water)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
---------	--------	--------------------	-------	----------	-------	----------	----------	--------	-------

Permian Basin Environmental Lab, L.P.

Organics by GC

C6-C12	ND	2.50	mg/L	1	P7H1711	08/16/17	08/17/17	TX 1005	
>C12-C28	ND	2.50	mg/L	1	P7H1711	08/16/17	08/17/17	TX 1005	
>C28-C35	ND	2.50	mg/L	1	P7H1711	08/16/17	08/17/17	TX 1005	
Surrogate: 1-Chlorooctane		87.4 %	70-130		P7H1711	08/16/17	08/17/17	TX 1005	
Surrogate: o-Terphenyl		105 %	70-130		P7H1711	08/16/17	08/17/17	TX 1005	
Total Hydrocarbon nC6-nC35	ND	2.50	mg/L	1	[CALC]	08/16/17	08/17/17	[CALC]	

General Chemistry Parameters by EPA / Standard Methods

Total Alkalinity	92.0	10.0	mg/L	1	P7H1609	08/16/17	08/16/17	EPA 310.1M	
Carbonate Alkalinity	ND	10.0	mg/L	1	P7H1609	08/16/17	08/16/17	EPA 310.1M	
Bicarbonate Alkalinity	92.0	10.0	mg/L	1	P7H1609	08/16/17	08/16/17	EPA 310.1M	
Hydroxide Alkalinity	ND	10.0	mg/L	1	P7H1609	08/16/17	08/16/17	EPA 310.1M	
Bromide	ND	0.0500	mg/L	1	P7H1604	08/16/17	08/17/17	EPA 300.0	
Chloride	94.2	25.0	mg/L	50	P7H1604	08/16/17	08/17/17	EPA 300.0	
Specific Conductance (EC)	3100	5.00	umhos/cm	1	P7H1707	08/17/17	08/17/17	EPA 120.1	
Dissolved Oxygen	6.00		mg/L	1	P7H1610	08/16/17	08/16/17	CHEMets	QAL1
pH	8.04		pH Units	1	P7H1611	08/16/17	08/16/17	EPA 150.1	
Temperature	23.20		pH Units	1	P7H1611	08/16/17	08/16/17	EPA 150.1	
Total Dissolved Solids	2760	20.0	mg/L	1	P7H1612	08/16/17	08/16/17	EPA 160.1	
Sulfate	1880	50.0	mg/L	50	P7H1604	08/16/17	08/17/17	EPA 300.0	

Total Metals by EPA / Standard Methods

Calcium	705	5.00	mg/L	1	P7H1607	08/16/17	08/22/17	EPA 6010B	QAL2
Magnesium	47.6	5.00	mg/L	1	P7H1607	08/16/17	08/22/17	EPA 6010B	QAL2
Potassium	5.25	5.00	mg/L	1	P7H1607	08/16/17	08/22/17	EPA 6010B	QAL2
Sodium	93.6	5.00	mg/L	1	P7H1607	08/16/17	08/22/17	EPA 6010B	QAL2
Hardness	1960	5.00	mg/L	1	P7H1607	08/16/17	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-4C

7H15017-09 (Water)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
---------	--------	--------------------	-------	----------	-------	----------	----------	--------	-------

Permian Basin Environmental Lab, L.P.

Organics by GC

C6-C12	ND	2.50	mg/L	1	P7H1711	08/16/17	08/17/17	TX 1005	
>C12-C28	ND	2.50	mg/L	1	P7H1711	08/16/17	08/17/17	TX 1005	
>C28-C35	ND	2.50	mg/L	1	P7H1711	08/16/17	08/17/17	TX 1005	
Surrogate: 1-Chlorooctane		88.5 %	70-130		P7H1711	08/16/17	08/17/17	TX 1005	
Surrogate: o-Terphenyl		106 %	70-130		P7H1711	08/16/17	08/17/17	TX 1005	
Total Hydrocarbon nC6-nC35	ND	2.50	mg/L	1	[CALC]	08/16/17	08/17/17	[CALC]	

General Chemistry Parameters by EPA / Standard Methods

Total Alkalinity	92.0	10.0	mg/L	1	P7H1609	08/16/17	08/16/17	EPA 310.1M	
Carbonate Alkalinity	ND	10.0	mg/L	1	P7H1609	08/16/17	08/16/17	EPA 310.1M	
Bicarbonate Alkalinity	92.0	10.0	mg/L	1	P7H1609	08/16/17	08/16/17	EPA 310.1M	
Hydroxide Alkalinity	ND	10.0	mg/L	1	P7H1609	08/16/17	08/16/17	EPA 310.1M	
Bromide	ND	0.0500	mg/L	1	P7H1604	08/16/17	08/17/17	EPA 300.0	
Chloride	90.2	12.5	mg/L	25	P7H1604	08/16/17	08/17/17	EPA 300.0	
Specific Conductance (EC)	2980	5.00	umhos/cm	1	P7H1707	08/17/17	08/17/17	EPA 120.1	
Dissolved Oxygen	6.00		mg/L	1	P7H1610	08/16/17	08/16/17	CHEMets	QAL1
pH	7.98		pH Units	1	P7H1611	08/16/17	08/16/17	EPA 150.1	
Temperature	23.20		pH Units	1	P7H1611	08/16/17	08/16/17	EPA 150.1	
Total Dissolved Solids	2730	20.0	mg/L	1	P7H1612	08/16/17	08/16/17	EPA 160.1	
Sulfate	1740	25.0	mg/L	25	P7H1604	08/16/17	08/17/17	EPA 300.0	

Total Metals by EPA / Standard Methods

Calcium	794	5.00	mg/L	1	P7H1607	08/16/17	08/22/17	EPA 6010B	QAL2
Magnesium	52.9	5.00	mg/L	1	P7H1607	08/16/17	08/22/17	EPA 6010B	QAL2
Potassium	6.24	5.00	mg/L	1	P7H1607	08/16/17	08/22/17	EPA 6010B	QAL2
Sodium	102	5.00	mg/L	1	P7H1607	08/16/17	08/22/17	EPA 6010B	QAL2
Hardness	2200	5.00	mg/L	1	P7H1607	08/16/17	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-5
7H15017-10 (Water)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
---------	--------	--------------------	-------	----------	-------	----------	----------	--------	-------

Permian Basin Environmental Lab, L.P.

Organics by GC

C6-C12	ND	2.50	mg/L	1	P7H1711	08/16/17	08/17/17	TX 1005	
>C12-C28	ND	2.50	mg/L	1	P7H1711	08/16/17	08/17/17	TX 1005	
>C28-C35	ND	2.50	mg/L	1	P7H1711	08/16/17	08/17/17	TX 1005	
Surrogate: 1-Chlorooctane		88.2 %	70-130		P7H1711	08/16/17	08/17/17	TX 1005	
Surrogate: o-Terphenyl		105 %	70-130		P7H1711	08/16/17	08/17/17	TX 1005	
Total Hydrocarbon nC6-nC35	ND	2.50	mg/L	1	[CALC]	08/16/17	08/17/17	[CALC]	

General Chemistry Parameters by EPA / Standard Methods

Total Alkalinity	100	10.0	mg/L	1	P7H1609	08/16/17	08/16/17	EPA 310.1M	
Carbonate Alkalinity	ND	10.0	mg/L	1	P7H1609	08/16/17	08/16/17	EPA 310.1M	
Bicarbonate Alkalinity	100	10.0	mg/L	1	P7H1609	08/16/17	08/16/17	EPA 310.1M	
Hydroxide Alkalinity	ND	10.0	mg/L	1	P7H1609	08/16/17	08/16/17	EPA 310.1M	
Bromide	ND	0.0500	mg/L	1	P7H1604	08/16/17	08/17/17	EPA 300.0	
Chloride	131	25.0	mg/L	50	P7H1604	08/16/17	08/17/17	EPA 300.0	
Specific Conductance (EC)	3020	5.00	umhos/cm	1	P7H1707	08/17/17	08/17/17	EPA 120.1	
Dissolved Oxygen	6.00		mg/L	1	P7H1610	08/16/17	08/16/17	CHEMets	QAL1
pH	7.81		pH Units	1	P7H1611	08/16/17	08/16/17	EPA 150.1	
Temperature	23.40		pH Units	1	P7H1611	08/16/17	08/16/17	EPA 150.1	
Total Dissolved Solids	2870	20.0	mg/L	1	P7H1612	08/16/17	08/16/17	EPA 160.1	
Sulfate	1840	50.0	mg/L	50	P7H1604	08/16/17	08/17/17	EPA 300.0	

Total Metals by EPA / Standard Methods

Calcium	847	5.00	mg/L	1	P7H1607	08/16/17	08/22/17	EPA 6010B	QAL2
Magnesium	57.8	5.00	mg/L	1	P7H1607	08/16/17	08/22/17	EPA 6010B	QAL2
Potassium	6.69	5.00	mg/L	1	P7H1607	08/16/17	08/22/17	EPA 6010B	QAL2
Sodium	111	5.00	mg/L	1	P7H1607	08/16/17	08/22/17	EPA 6010B	QAL2
Hardness	2350	5.00	mg/L	1	P7H1607	08/16/17	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-5A
7H15017-11 (Water)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
---------	--------	--------------------	-------	----------	-------	----------	----------	--------	-------

Permian Basin Environmental Lab, L.P.

Organics by GC

C6-C12	ND	2.50	mg/L	1	P7H1711	08/16/17	08/17/17	TX 1005	
>C12-C28	ND	2.50	mg/L	1	P7H1711	08/16/17	08/17/17	TX 1005	
>C28-C35	ND	2.50	mg/L	1	P7H1711	08/16/17	08/17/17	TX 1005	
Surrogate: 1-Chlorooctane		93.9 %	70-130		P7H1711	08/16/17	08/17/17	TX 1005	
Surrogate: o-Terphenyl		111 %	70-130		P7H1711	08/16/17	08/17/17	TX 1005	
Total Hydrocarbon nC6-nC35	ND	2.50	mg/L	1	[CALC]	08/16/17	08/17/17	[CALC]	

General Chemistry Parameters by EPA / Standard Methods

Total Alkalinity	85.0	10.0	mg/L	1	P7H1609	08/16/17	08/16/17	EPA 310.1M	
Carbonate Alkalinity	ND	10.0	mg/L	1	P7H1609	08/16/17	08/16/17	EPA 310.1M	
Bicarbonate Alkalinity	85.0	10.0	mg/L	1	P7H1609	08/16/17	08/16/17	EPA 310.1M	
Hydroxide Alkalinity	ND	10.0	mg/L	1	P7H1609	08/16/17	08/16/17	EPA 310.1M	
Bromide	ND	0.0500	mg/L	1	P7H1604	08/16/17	08/17/17	EPA 300.0	
Chloride	80.0	12.5	mg/L	25	P7H1604	08/16/17	08/17/17	EPA 300.0	
Specific Conductance (EC)	2750	5.00	umhos/cm	1	P7H1707	08/17/17	08/17/17	EPA 120.1	
Dissolved Oxygen	6.00		mg/L	1	P7H1610	08/16/17	08/16/17	CHEMets	QAL1
pH	7.85		pH Units	1	P7H1611	08/16/17	08/16/17	EPA 150.1	
Temperature	23.30		pH Units	1	P7H1611	08/16/17	08/16/17	EPA 150.1	
Total Dissolved Solids	2480	20.0	mg/L	1	P7H1612	08/16/17	08/16/17	EPA 160.1	
Sulfate	1470	25.0	mg/L	25	P7H1604	08/16/17	08/17/17	EPA 300.0	

Total Metals by EPA / Standard Methods

Calcium	689	5.00	mg/L	1	P7H1607	08/16/17	08/22/17	EPA 6010B	QAL2
Magnesium	48.2	5.00	mg/L	1	P7H1607	08/16/17	08/22/17	EPA 6010B	QAL2
Potassium	6.06	5.00	mg/L	1	P7H1607	08/16/17	08/22/17	EPA 6010B	QAL2
Sodium	95.4	5.00	mg/L	1	P7H1607	08/16/17	08/22/17	EPA 6010B	QAL2
Hardness	1920	5.00	mg/L	1	P7H1607	08/16/17	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-5B

7H15017-12 (Water)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
---------	--------	--------------------	-------	----------	-------	----------	----------	--------	-------

Permian Basin Environmental Lab, L.P.

Organics by GC

C6-C12	ND	2.50	mg/L	1	P7H1711	08/16/17	08/17/17	TX 1005	
>C12-C28	ND	2.50	mg/L	1	P7H1711	08/16/17	08/17/17	TX 1005	
>C28-C35	ND	2.50	mg/L	1	P7H1711	08/16/17	08/17/17	TX 1005	
Surrogate: 1-Chlorooctane		89.8 %	70-130		P7H1711	08/16/17	08/17/17	TX 1005	
Surrogate: o-Terphenyl		106 %	70-130		P7H1711	08/16/17	08/17/17	TX 1005	
Total Hydrocarbon nC6-nC35	ND	2.50	mg/L	1	[CALC]	08/16/17	08/17/17	[CALC]	

General Chemistry Parameters by EPA / Standard Methods

Total Alkalinity	77.0	10.0	mg/L	1	P7H1609	08/16/17	08/16/17	EPA 310.1M	
Carbonate Alkalinity	ND	10.0	mg/L	1	P7H1609	08/16/17	08/16/17	EPA 310.1M	
Bicarbonate Alkalinity	77.0	10.0	mg/L	1	P7H1609	08/16/17	08/16/17	EPA 310.1M	
Hydroxide Alkalinity	ND	10.0	mg/L	1	P7H1609	08/16/17	08/16/17	EPA 310.1M	
Bromide	ND	0.0500	mg/L	1	P7H1604	08/16/17	08/17/17	EPA 300.0	
Chloride	99.3	12.5	mg/L	25	P7H1604	08/16/17	08/17/17	EPA 300.0	
Specific Conductance (EC)	2730	5.00	umhos/cm	1	P7H1707	08/17/17	08/17/17	EPA 120.1	
Dissolved Oxygen	6.00		mg/L	1	P7H1610	08/16/17	08/16/17	CHEMets	QAL1
pH	7.76		pH Units	1	P7H1611	08/16/17	08/16/17	EPA 150.1	
Temperature	23.40		pH Units	1	P7H1611	08/16/17	08/16/17	EPA 150.1	
Total Dissolved Solids	2510	20.0	mg/L	1	P7H1612	08/16/17	08/16/17	EPA 160.1	
Sulfate	1620	25.0	mg/L	25	P7H1604	08/16/17	08/17/17	EPA 300.0	

Total Metals by EPA / Standard Methods

Calcium	735	5.00	mg/L	1	P7H1607	08/16/17	08/22/17	EPA 6010B	QAL2
Magnesium	48.7	5.00	mg/L	1	P7H1607	08/16/17	08/22/17	EPA 6010B	QAL2
Potassium	6.64	5.00	mg/L	1	P7H1607	08/16/17	08/22/17	EPA 6010B	QAL2
Sodium	99.8	5.00	mg/L	1	P7H1607	08/16/17	08/22/17	EPA 6010B	QAL2
Hardness	2040	5.00	mg/L	1	P7H1607	08/16/17	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-6
7H15017-13 (Water)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
---------	--------	--------------------	-------	----------	-------	----------	----------	--------	-------

Permian Basin Environmental Lab, L.P.

Organics by GC

C6-C12	ND	2.50	mg/L	1	P7H1711	08/16/17	08/17/17	TX 1005	
>C12-C28	ND	2.50	mg/L	1	P7H1711	08/16/17	08/17/17	TX 1005	
>C28-C35	ND	2.50	mg/L	1	P7H1711	08/16/17	08/17/17	TX 1005	
Surrogate: 1-Chlorooctane		91.3 %	70-130		P7H1711	08/16/17	08/17/17	TX 1005	
Surrogate: o-Terphenyl		110 %	70-130		P7H1711	08/16/17	08/17/17	TX 1005	
Total Hydrocarbon nC6-nC35	ND	2.50	mg/L	1	[CALC]	08/16/17	08/17/17	[CALC]	

General Chemistry Parameters by EPA / Standard Methods

Total Alkalinity	75.0	10.0	mg/L	1	P7H1609	08/16/17	08/16/17	EPA 310.1M	
Carbonate Alkalinity	ND	10.0	mg/L	1	P7H1609	08/16/17	08/16/17	EPA 310.1M	
Bicarbonate Alkalinity	75.0	10.0	mg/L	1	P7H1609	08/16/17	08/16/17	EPA 310.1M	
Hydroxide Alkalinity	ND	10.0	mg/L	1	P7H1609	08/16/17	08/16/17	EPA 310.1M	
Bromide	ND	0.0500	mg/L	1	P7H1604	08/16/17	08/17/17	EPA 300.0	
Chloride	106	12.5	mg/L	25	P7H1604	08/16/17	08/17/17	EPA 300.0	
Specific Conductance (EC)	2870	5.00	umhos/cm	1	P7H1707	08/17/17	08/17/17	EPA 120.1	
Dissolved Oxygen	6.00		mg/L	1	P7H1610	08/16/17	08/16/17	CHEMets	QAL1
pH	7.80		pH Units	1	P7H1611	08/16/17	08/16/17	EPA 150.1	
Temperature	23.40		pH Units	1	P7H1611	08/16/17	08/16/17	EPA 150.1	
Total Dissolved Solids	2630	20.0	mg/L	1	P7H1612	08/16/17	08/16/17	EPA 160.1	
Sulfate	1800	25.0	mg/L	25	P7H1604	08/16/17	08/17/17	EPA 300.0	

Total Metals by EPA / Standard Methods

Calcium	748	5.00	mg/L	1	P7H1607	08/16/17	08/22/17	EPA 6010B	QAL2
Magnesium	44.9	5.00	mg/L	1	P7H1607	08/16/17	08/22/17	EPA 6010B	QAL2
Potassium	6.34	5.00	mg/L	1	P7H1607	08/16/17	08/22/17	EPA 6010B	QAL2
Sodium	93.9	5.00	mg/L	1	P7H1607	08/16/17	08/22/17	EPA 6010B	QAL2
Hardness	2050	5.00	mg/L	1	P7H1607	08/16/17	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-6A
7H15017-14 (Water)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
---------	--------	--------------------	-------	----------	-------	----------	----------	--------	-------

Permian Basin Environmental Lab, L.P.

Organics by GC

C6-C12	ND	2.50	mg/L	1	P7H1711	08/16/17	08/17/17	TX 1005	
>C12-C28	ND	2.50	mg/L	1	P7H1711	08/16/17	08/17/17	TX 1005	
>C28-C35	ND	2.50	mg/L	1	P7H1711	08/16/17	08/17/17	TX 1005	
Surrogate: 1-Chlorooctane		91.1 %	70-130		P7H1711	08/16/17	08/17/17	TX 1005	
Surrogate: o-Terphenyl		109 %	70-130		P7H1711	08/16/17	08/17/17	TX 1005	
Total Hydrocarbon nC6-nC35	ND	2.50	mg/L	1	[CALC]	08/16/17	08/17/17	[CALC]	

General Chemistry Parameters by EPA / Standard Methods

Total Alkalinity	65.0	10.0	mg/L	1	P7H1609	08/16/17	08/16/17	EPA 310.1M	
Carbonate Alkalinity	ND	10.0	mg/L	1	P7H1609	08/16/17	08/16/17	EPA 310.1M	
Bicarbonate Alkalinity	65.0	10.0	mg/L	1	P7H1609	08/16/17	08/16/17	EPA 310.1M	
Hydroxide Alkalinity	ND	10.0	mg/L	1	P7H1609	08/16/17	08/16/17	EPA 310.1M	
Bromide	ND	0.0500	mg/L	1	P7H1604	08/16/17	08/17/17	EPA 300.0	
Chloride	85.0	12.5	mg/L	25	P7H1604	08/16/17	08/17/17	EPA 300.0	
Specific Conductance (EC)	2780	5.00	umhos/cm	1	P7H1707	08/17/17	08/17/17	EPA 120.1	
Dissolved Oxygen	6.00		mg/L	1	P7H1610	08/16/17	08/16/17	CHEMets	QAL1
pH	7.87		pH Units	1	P7H1611	08/16/17	08/16/17	EPA 150.1	
Temperature	24.10		pH Units	1	P7H1611	08/16/17	08/16/17	EPA 150.1	
Total Dissolved Solids	2630	20.0	mg/L	1	P7H1612	08/16/17	08/16/17	EPA 160.1	
Sulfate	1810	25.0	mg/L	25	P7H1604	08/16/17	08/17/17	EPA 300.0	

Total Metals by EPA / Standard Methods

Calcium	867	5.00	mg/L	1	P7H1607	08/16/17	08/22/17	EPA 6010B	QAL2
Magnesium	39.2	5.00	mg/L	1	P7H1607	08/16/17	08/22/17	EPA 6010B	QAL2
Potassium	6.86	5.00	mg/L	1	P7H1607	08/16/17	08/22/17	EPA 6010B	QAL2
Sodium	73.2	5.00	mg/L	1	P7H1607	08/16/17	08/22/17	EPA 6010B	QAL2
Hardness	2330	5.00	mg/L	1	P7H1607	08/16/17	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-6B
7H15017-15 (Water)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
---------	--------	--------------------	-------	----------	-------	----------	----------	--------	-------

Permian Basin Environmental Lab, L.P.

Organics by GC

C6-C12	ND	2.50	mg/L	1	P7H1711	08/16/17	08/17/17	TX 1005	
>C12-C28	ND	2.50	mg/L	1	P7H1711	08/16/17	08/17/17	TX 1005	
>C28-C35	ND	2.50	mg/L	1	P7H1711	08/16/17	08/17/17	TX 1005	
Surrogate: 1-Chlorooctane		90.8 %	70-130		P7H1711	08/16/17	08/17/17	TX 1005	
Surrogate: o-Terphenyl		109 %	70-130		P7H1711	08/16/17	08/17/17	TX 1005	
Total Hydrocarbon nC6-nC35	ND	2.50	mg/L	1	[CALC]	08/16/17	08/17/17	[CALC]	

General Chemistry Parameters by EPA / Standard Methods

Total Alkalinity	70.0	10.0	mg/L	1	P7H1609	08/16/17	08/16/17	EPA 310.1M	
Carbonate Alkalinity	ND	10.0	mg/L	1	P7H1609	08/16/17	08/16/17	EPA 310.1M	
Bicarbonate Alkalinity	70.0	10.0	mg/L	1	P7H1609	08/16/17	08/16/17	EPA 310.1M	
Hydroxide Alkalinity	ND	10.0	mg/L	1	P7H1609	08/16/17	08/16/17	EPA 310.1M	
Bromide	ND	0.0500	mg/L	1	P7H1604	08/16/17	08/17/17	EPA 300.0	
Chloride	69.1	12.5	mg/L	25	P7H1604	08/16/17	08/17/17	EPA 300.0	
Specific Conductance (EC)	2760	5.00	umhos/cm	1	P7H1707	08/17/17	08/17/17	EPA 120.1	
Dissolved Oxygen	6.00		mg/L	1	P7H1610	08/16/17	08/16/17	CHEMets	QAL1
pH	7.75		pH Units	1	P7H1611	08/16/17	08/16/17	EPA 150.1	
Temperature	24.00		pH Units	1	P7H1611	08/16/17	08/16/17	EPA 150.1	
Total Dissolved Solids	2610	20.0	mg/L	1	P7H1612	08/16/17	08/16/17	EPA 160.1	
Sulfate	1750	25.0	mg/L	25	P7H1604	08/16/17	08/17/17	EPA 300.0	

Total Metals by EPA / Standard Methods

Calcium	801	5.00	mg/L	1	P7H1607	08/16/17	08/22/17	EPA 6010B	QAL2
Magnesium	32.0	5.00	mg/L	1	P7H1607	08/16/17	08/22/17	EPA 6010B	QAL2
Potassium	6.30	5.00	mg/L	1	P7H1607	08/16/17	08/22/17	EPA 6010B	QAL2
Sodium	64.1	5.00	mg/L	1	P7H1607	08/16/17	08/22/17	EPA 6010B	QAL2
Hardness	2130	5.00	mg/L	1	P7H1607	08/16/17	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

DUP-1
7H15017-16 (Water)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
---------	--------	--------------------	-------	----------	-------	----------	----------	--------	-------

Permian Basin Environmental Lab, L.P.

Organics by GC

C6-C12	ND	2.50	mg/L	1	P7H1711	08/16/17	08/17/17	TX 1005	
>C12-C28	ND	2.50	mg/L	1	P7H1711	08/16/17	08/17/17	TX 1005	
>C28-C35	ND	2.50	mg/L	1	P7H1711	08/16/17	08/17/17	TX 1005	
Surrogate: 1-Chlorooctane		89.8 %	70-130		P7H1711	08/16/17	08/17/17	TX 1005	
Surrogate: o-Terphenyl		106 %	70-130		P7H1711	08/16/17	08/17/17	TX 1005	
Total Hydrocarbon nC6-nC35	ND	2.50	mg/L	1	[CALC]	08/16/17	08/17/17	[CALC]	

General Chemistry Parameters by EPA / Standard Methods

Total Alkalinity	95.0	10.0	mg/L	1	P7H1609	08/16/17	08/16/17	EPA 310.1M	
Carbonate Alkalinity	ND	10.0	mg/L	1	P7H1609	08/16/17	08/16/17	EPA 310.1M	
Bicarbonate Alkalinity	95.0	10.0	mg/L	1	P7H1609	08/16/17	08/16/17	EPA 310.1M	
Hydroxide Alkalinity	ND	10.0	mg/L	1	P7H1609	08/16/17	08/16/17	EPA 310.1M	
Bromide	ND	0.0500	mg/L	1	P7H1604	08/16/17	08/17/17	EPA 300.0	
Chloride	93.8	12.5	mg/L	25	P7H1604	08/16/17	08/17/17	EPA 300.0	
Specific Conductance (EC)	2880	5.00	umhos/cm	1	P7H1707	08/17/17	08/17/17	EPA 120.1	
Dissolved Oxygen	6.00		mg/L	1	P7H1610	08/16/17	08/16/17	CHEMets	QAL1
pH	7.95		pH Units	1	P7H1611	08/16/17	08/16/17	EPA 150.1	
Temperature	23.90		pH Units	1	P7H1611	08/16/17	08/16/17	EPA 150.1	
Total Dissolved Solids	2770	20.0	mg/L	1	P7H1612	08/16/17	08/16/17	EPA 160.1	
Sulfate	1810	25.0	mg/L	25	P7H1604	08/16/17	08/17/17	EPA 300.0	

Total Metals by EPA / Standard Methods

Calcium	768	5.00	mg/L	1	P7H1607	08/16/17	08/22/17	EPA 6010B	QAL2
Magnesium	50.2	5.00	mg/L	1	P7H1607	08/16/17	08/22/17	EPA 6010B	QAL2
Potassium	5.61	5.00	mg/L	1	P7H1607	08/16/17	08/22/17	EPA 6010B	QAL2
Sodium	97.2	5.00	mg/L	1	P7H1607	08/16/17	08/22/17	EPA 6010B	QAL2
Hardness	2120	5.00	mg/L	1	P7H1607	08/16/17	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

DUP-2
7H15017-17 (Water)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
---------	--------	--------------------	-------	----------	-------	----------	----------	--------	-------

Permian Basin Environmental Lab, L.P.

Organics by GC

C6-C12	ND	2.50	mg/L	1	P7H1711	08/16/17	08/17/17	TX 1005	
>C12-C28	ND	2.50	mg/L	1	P7H1711	08/16/17	08/17/17	TX 1005	
>C28-C35	ND	2.50	mg/L	1	P7H1711	08/16/17	08/17/17	TX 1005	
Surrogate: 1-Chlorooctane		87.8 %	70-130		P7H1711	08/16/17	08/17/17	TX 1005	
Surrogate: o-Terphenyl		105 %	70-130		P7H1711	08/16/17	08/17/17	TX 1005	
Total Hydrocarbon nC6-nC35	ND	2.50	mg/L	1	[CALC]	08/16/17	08/17/17	[CALC]	

General Chemistry Parameters by EPA / Standard Methods

Total Alkalinity	72.0	10.0	mg/L	1	P7H1609	08/16/17	08/16/17	EPA 310.1M	
Carbonate Alkalinity	ND	10.0	mg/L	1	P7H1609	08/16/17	08/16/17	EPA 310.1M	
Bicarbonate Alkalinity	72.0	10.0	mg/L	1	P7H1609	08/16/17	08/16/17	EPA 310.1M	
Hydroxide Alkalinity	ND	10.0	mg/L	1	P7H1609	08/16/17	08/16/17	EPA 310.1M	
Bromide	0.188	0.0500	mg/L	1	P7H1604	08/16/17	08/17/17	EPA 300.0	
Chloride	94.1	12.5	mg/L	25	P7H1604	08/16/17	08/17/17	EPA 300.0	
Specific Conductance (EC)	2750	5.00	umhos/cm	1	P7H1707	08/17/17	08/17/17	EPA 120.1	
Dissolved Oxygen	6.00		mg/L	1	P7H1610	08/16/17	08/16/17	CHEMets	QAL1
pH	7.78		pH Units	1	P7H1611	08/16/17	08/16/17	EPA 150.1	
Temperature	23.90		pH Units	1	P7H1611	08/16/17	08/16/17	EPA 150.1	
Total Dissolved Solids	2720	20.0	mg/L	1	P7H1612	08/16/17	08/16/17	EPA 160.1	
Sulfate	1740	25.0	mg/L	25	P7H1604	08/16/17	08/17/17	EPA 300.0	

Total Metals by EPA / Standard Methods

Calcium	814	5.00	mg/L	1	P7H1607	08/16/17	08/22/17	EPA 6010B	QAL2
Magnesium	49.7	5.00	mg/L	1	P7H1607	08/16/17	08/22/17	EPA 6010B	QAL2
Potassium	6.87	5.00	mg/L	1	P7H1607	08/16/17	08/22/17	EPA 6010B	QAL2
Sodium	103	5.00	mg/L	1	P7H1607	08/16/17	08/22/17	EPA 6010B	QAL2
Hardness	2240	5.00	mg/L	1	P7H1607	08/16/17	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

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 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

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

Batch P7H1711 - TX 1005

Blank (P7H1711-BLK1)

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

C6-C12	ND	2.50	mg/L							
>C12-C28	ND	2.50	"							
>C28-C35	ND	2.50	"							
Surrogate: 1-Chlorooctane	9.91		"	9.38		106	70-130			
Surrogate: o-Terphenyl	5.79		"	4.69		124	70-130			

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

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

Fax: (432) 571-7832

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 P7H1711 - TX 1005

LCS (P7H1711-BS1)

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

C6-C12	98.3	2.50	mg/L	93.8		105	75-125			
>C12-C28	98.8	2.50	"	93.8		105	75-125			
Surrogate: 1-Chlorooctane	11.4		"	9.38		121	70-130			
Surrogate: o-Terphenyl	5.38		"	4.69		115	70-130			

LCS Dup (P7H1711-BSD1)

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

C6-C12	88.6	2.50	mg/L	93.8		94.5	75-125	10.4	20	
>C12-C28	90.3	2.50	"	93.8		96.4	75-125	8.99	20	
Surrogate: 1-Chlorooctane	11.3		"	9.38		121	70-130			
Surrogate: o-Terphenyl	4.96		"	4.69		106	70-130			

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
---------	--------	--------------------	-------	----------------	------------------	------	----------------	-----	--------------	-------

Batch P7H1604 - * DEFAULT PREP *****

Blank (P7H1604-BLK1)

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

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

LCS (P7H1604-BS1)

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

Sulfate	43.7	1.00	mg/L	40.0	109	85-115
Chloride	42.6	0.500	"	40.0	107	85-115
Bromide	5.93	0.0500	"	5.00	119	80-120

LCS Dup (P7H1604-BSD1)

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

Sulfate	43.6	1.00	mg/L	40.0	109	85-115	0.0618	20
Bromide	5.95	0.0500	"	5.00	119	80-120	0.219	20
Chloride	42.5	0.500	"	40.0	106	85-115	0.294	20

Duplicate (P7H1604-DUP1)

Source: 7H15017-01

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

Chloride	101	25.0	mg/L	102	1.72	20
Bromide	ND	0.0500	"	ND		20
Sulfate	1690	50.0	"	1690	0.331	20

Duplicate (P7H1604-DUP2)

Source: 7H15017-11

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

Chloride	80.3	12.5	mg/L	80.0	0.437	20
Bromide	ND	0.0500	"	ND		20
Sulfate	1470	25.0	"	1470	0.00	20

Matrix Spike (P7H1604-MS1)

Source: 7H15017-01

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

Bromide	69.0	2.50	mg/L	62.5	ND	110	75-125
Sulfate	2230	50.0	"	500	1690	108	80-120
Chloride	699	25.0	"	500	102	119	80-120

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
---------	--------	--------------------	-------	----------------	------------------	------	----------------	-----	--------------	-------

Batch P7H1609 - * DEFAULT PREP *****

Blank (P7H1609-BLK1)

Prepared & Analyzed: 08/16/17

Total Alkalinity	ND	10.0	mg/L
Carbonate Alkalinity	ND	10.0	"
Bicarbonate Alkalinity	ND	10.0	"
Hydroxide Alkalinity	ND	10.0	"

Blank (P7H1609-BLK2)

Prepared & Analyzed: 08/16/17

Total Alkalinity	ND	10.0	mg/L
Carbonate Alkalinity	ND	10.0	"
Bicarbonate Alkalinity	ND	10.0	"
Hydroxide Alkalinity	ND	10.0	"

Duplicate (P7H1609-DUP1)

Source: 7H15017-01

Prepared & Analyzed: 08/16/17

Total Alkalinity	135	10.0	mg/L	130	3.77	20
Carbonate Alkalinity	ND	10.0	"	ND		20
Bicarbonate Alkalinity	135	10.0	"	130	3.77	20
Hydroxide Alkalinity	ND	10.0	"	ND		20

Duplicate (P7H1609-DUP2)

Source: 7H16001-04

Prepared & Analyzed: 08/16/17

Total Alkalinity	90.0	10.0	mg/L	90.0	0.00	20
Carbonate Alkalinity	ND	10.0	"	ND		20
Bicarbonate Alkalinity	90.0	10.0	"	90.0	0.00	20
Hydroxide Alkalinity	ND	10.0	"	ND		20

Batch P7H1610 - * DEFAULT PREP *****

Duplicate (P7H1610-DUP1)

Source: 7H15017-01

Prepared & Analyzed: 08/16/17

Dissolved Oxygen	6.00		mg/L	6.00	0.00	200	QAL1
------------------	------	--	------	------	------	-----	------

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
---------	--------	--------------------	-------	----------------	------------------	------	----------------	-----	--------------	-------

Batch P7H1611 - * DEFAULT PREP *****

Duplicate (P7H1611-DUP1)	Source: 7H15017-01		Prepared & Analyzed: 08/16/17							
pH	7.97		pH Units		7.98			0.125	20	
Temperature	23.90		"		23.90			0.00	200	

Duplicate (P7H1611-DUP2)	Source: 7H16001-04		Prepared & Analyzed: 08/16/17							
pH	7.82		pH Units		7.82			0.00	20	
Temperature	23.70		"		23.50			0.847	200	

Batch P7H1612 - * DEFAULT PREP *****

Blank (P7H1612-BLK1)	Prepared & Analyzed: 08/16/17									
Total Dissolved Solids	50.0	20.0	mg/L							

Blank (P7H1612-BLK2)	Prepared & Analyzed: 08/16/17									
Total Dissolved Solids	ND	20.0	mg/L							

Duplicate (P7H1612-DUP1)	Source: 7H15017-01		Prepared & Analyzed: 08/16/17							
Total Dissolved Solids	2930	20.0	mg/L		2900			1.03	20	

Duplicate (P7H1612-DUP2)	Source: 7H16001-04		Prepared & Analyzed: 08/16/17							
Total Dissolved Solids	2780	20.0	mg/L		2780			0.00	20	

Batch P7H1707 - * DEFAULT PREP *****

Duplicate (P7H1707-DUP1)	Source: 7H15017-01		Prepared & Analyzed: 08/17/17							
Specific Conductance (EC)	3100	5.00	umhos/cm		3090			0.323	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
---------	--------	--------------------	-------	----------------	------------------	------	----------------	-----	--------------	-------

Batch P7H1707 - * DEFAULT PREP *****

Duplicate (P7H1707-DUP2)

Source: 7H15017-07

Prepared & Analyzed: 08/17/17

Specific Conductance (EC)	3110	5.00	umhos/cm		3080			0.969	20	
---------------------------	------	------	----------	--	------	--	--	-------	----	--

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
---------	--------	--------------------	-------	----------------	------------------	------	----------------	-----	--------------	-------

Batch P7H1607 - * DEFAULT PREP *****

Blank (P7H1607-BLK1)

Prepared: 08/16/17 Analyzed: 08/22/17

Calcium	ND	5.00	mg/L							QAL2
Magnesium	0.0374	5.00	"							J, QAL2
Potassium	ND	5.00	"							QAL2
Sodium	ND	5.00	"							QAL2
Hardness	ND	5.00	"							QAL2

LCS (P7H1607-BS1)

Prepared: 08/16/17 Analyzed: 08/22/17

Calcium	49.7	5.00	mg/L	50.0		99.4	80-120			QAL2
Magnesium	49.3	5.00	"	50.0		98.7	80-120			QAL2
Potassium	48.7	5.00	"	50.0		97.4	80-120			QAL2
Sodium	52.9	5.00	"	50.0		106	80-120			QAL2

LCS Dup (P7H1607-BSD1)

Prepared: 08/16/17 Analyzed: 08/22/17

Calcium	52.5	5.00	mg/L	50.0		105	80-120	5.53	20	QAL2
Magnesium	52.3	5.00	"	50.0		105	80-120	5.87	20	QAL2
Potassium	51.7	5.00	"	50.0		103	80-120	5.90	20	QAL2
Sodium	55.9	5.00	"	50.0		112	80-120	5.55	20	QAL2

Duplicate (P7H1607-DUP1)

Source: 7H15005-08

Prepared: 08/16/17 Analyzed: 08/22/17

Calcium	637	5.00	mg/L		577			9.75	20	QAL2
Magnesium	51.1	5.00	"		45.8			10.9	20	QAL2
Potassium	5.95	5.00	"		5.38			10.1	20	QAL2
Sodium	105	5.00	"		95.2			10.2	20	QAL2
Hardness	1800	5.00	"		1630			9.89	20	QAL2

Matrix Spike (P7H1607-MS1)

Source: 7H15005-08

Prepared: 08/16/17 Analyzed: 08/22/17

Calcium	1040	5.00	mg/L	5.00	577	NR	75-125			QAL2
Magnesium	588	5.00	"	5.00	45.8	NR	75-125			QAL2
Potassium	688	5.00	"	5.00	5.38	NR	75-125			QAL2
Sodium	868	5.00	"	5.00	95.2	NR	75-125			QAL2

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

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

Fax: (432) 571-7832

Notes and Definitions

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

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:



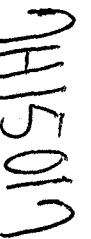
Date:

8/24/2017

Brent Barron, Laboratory Director/Technical Director

This material is intended only for the use of the individual (s) or entity to whom it is addressed, and may contain information that is privileged and confidential.

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



000144

Page 28 of 29

CHAIN OF CUSTODY RECORD

[illegible]

Original – Send to lab with sample

Yellow – Return to ESH

Pink - Remain in book