

**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: 7H10011



NELAP/TCEQ # T104704516-16-7

Report Date: 08/13/17

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	7H10011-01	Water	08/10/17 08:28	08-10-2017 15:50
S-2	7H10011-02	Water	08/10/17 09:45	08-10-2017 15:50
S-3	7H10011-03	Water	08/10/17 10:29	08-10-2017 15:50
S-3A	7H10011-04	Water	08/10/17 10:00	08-10-2017 15:50
S-3B	7H10011-05	Water	08/10/17 10:08	08-10-2017 15:50
S-4	7H10011-06	Water	08/10/17 09:40	08-10-2017 15:50
S-4A	7H10011-07	Water	08/10/17 09:48	08-10-2017 15:50
S-4B	7H10011-08	Water	08/10/17 10:00	08-10-2017 15:50
S-4C	7H10011-09	Water	08/10/17 10:13	08-10-2017 15:50
S-5	7H10011-10	Water	08/10/17 11:07	08-10-2017 15:50
S-5A	7H10011-11	Water	08/10/17 10:24	08-10-2017 15:50
S-5B	7H10011-12	Water	08/10/17 10:05	08-10-2017 15:50
S-6	7H10011-13	Water	08/10/17 09:48	08-10-2017 15:50
S-6A	7H10011-14	Water	08/10/17 10:11	08-10-2017 15:50
S-6C	7H10011-15	Water	08/10/17 10:35	08-10-2017 15:50
DUP-1	7H10011-16	Water	08/10/17 12:00	08-10-2017 15:50
DUP-2	7H10011-17	Water	08/10/17 12:00	08-10-2017 15:50

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
7H10011-01 (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	P7H1308	08/11/17	08/11/17	TX 1005	
>C12-C28	ND	2.50	mg/L	1	P7H1308	08/11/17	08/11/17	TX 1005	
>C28-C35	ND	2.50	mg/L	1	P7H1308	08/11/17	08/11/17	TX 1005	
Surrogate: 1-Chlorooctane		83.2 %	70-130		P7H1308	08/11/17	08/11/17	TX 1005	
Surrogate: o-Terphenyl		85.8 %	70-130		P7H1308	08/11/17	08/11/17	TX 1005	
Total Hydrocarbon nC6-nC35	ND	2.50	mg/L	1	[CALC]	08/11/17	08/11/17	[CALC]	

General Chemistry Parameters by EPA / Standard Methods

Total Alkalinity	90.0	10.0	mg/L	1	P7H1120	08/11/17	08/11/17	EPA 310.1M	
Carbonate Alkalinity	ND	10.0	mg/L	1	P7H1120	08/11/17	08/11/17	EPA 310.1M	
Bicarbonate Alkalinity	90.0	10.0	mg/L	1	P7H1120	08/11/17	08/11/17	EPA 310.1M	
Hydroxide Alkalinity	ND	10.0	mg/L	1	P7H1120	08/11/17	08/11/17	EPA 310.1M	
Bromide	0.185	0.0500	mg/L	1	P7H1109	08/11/17	08/11/17	EPA 300.0	
Chloride	46.7	0.500	mg/L	1	P7H1109	08/11/17	08/11/17	EPA 300.0	
Specific Conductance (EC)	2820	5.00	umhos/cm	1	P7H1217	08/11/17	08/11/17	EPA 120.1	
Dissolved Oxygen	6.00		mg/L	1	P7H1118	08/11/17	08/11/17	CHEMets	QAL1
pH	7.69		pH Units	1	P7H1119	08/11/17	08/11/17	EPA 150.1	
Temperature	23.40		pH Units	1	P7H1119	08/11/17	08/11/17	EPA 150.1	
Total Dissolved Solids	2690	20.0	mg/L	1	P7H1121	08/11/17	08/11/17	EPA 160.1	
Sulfate	1560	25.0	mg/L	25	P7H1109	08/11/17	08/11/17	EPA 300.0	

Total Metals by EPA / Standard Methods

Calcium	568	5.00	mg/L	1	P7H1103	08/11/17	08/12/17	EPA 6010B	QAL2
Magnesium	27.5	5.00	mg/L	1	P7H1103	08/11/17	08/12/17	EPA 6010B	QAL2
Potassium	5.20	5.00	mg/L	1	P7H1103	08/11/17	08/12/17	EPA 6010B	QAL2
Sodium	46.1	5.00	mg/L	1	P7H1103	08/11/17	08/12/17	EPA 6010B	QAL2
Hardness	1530	5.00	mg/L	1	P7H1103	08/11/17	08/12/17	EPA 6010B	QAL2

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

Project: Assault SWD
Project Number: [none]
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Fax: (432) 571-7832

S-2
7H10011-02 (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	P7H1308	08/11/17	08/11/17	TX 1005	
>C12-C28	ND	2.50	mg/L	1	P7H1308	08/11/17	08/11/17	TX 1005	
>C28-C35	ND	2.50	mg/L	1	P7H1308	08/11/17	08/11/17	TX 1005	
Surrogate: 1-Chlorooctane		81.9 %	70-130		P7H1308	08/11/17	08/11/17	TX 1005	
Surrogate: o-Terphenyl		85.3 %	70-130		P7H1308	08/11/17	08/11/17	TX 1005	
Total Hydrocarbon nC6-nC35	ND	2.50	mg/L	1	[CALC]	08/11/17	08/11/17	[CALC]	

General Chemistry Parameters by EPA / Standard Methods

Total Alkalinity	60.0	10.0	mg/L	1	P7H1120	08/11/17	08/11/17	EPA 310.1M	
Carbonate Alkalinity	ND	10.0	mg/L	1	P7H1120	08/11/17	08/11/17	EPA 310.1M	
Bicarbonate Alkalinity	60.0	10.0	mg/L	1	P7H1120	08/11/17	08/11/17	EPA 310.1M	
Hydroxide Alkalinity	ND	10.0	mg/L	1	P7H1120	08/11/17	08/11/17	EPA 310.1M	
Bromide	ND	0.0500	mg/L	1	P7H1109	08/11/17	08/11/17	EPA 300.0	
Chloride	15.8	0.500	mg/L	1	P7H1109	08/11/17	08/11/17	EPA 300.0	
Specific Conductance (EC)	2480	5.00	umhos/cm	1	P7H1217	08/11/17	08/11/17	EPA 120.1	
Dissolved Oxygen	6.00		mg/L	1	P7H1118	08/11/17	08/11/17	CHEMets	QAL1
pH	7.68		pH Units	1	P7H1119	08/11/17	08/11/17	EPA 150.1	
Temperature	23.00		pH Units	1	P7H1119	08/11/17	08/11/17	EPA 150.1	
Total Dissolved Solids	2470	20.0	mg/L	1	P7H1121	08/11/17	08/11/17	EPA 160.1	
Sulfate	1480	25.0	mg/L	25	P7H1109	08/11/17	08/11/17	EPA 300.0	

Total Metals by EPA / Standard Methods

Calcium	711	5.00	mg/L	1	P7H1103	08/11/17	08/12/17	EPA 6010B	QAL2
Magnesium	16.2	5.00	mg/L	1	P7H1103	08/11/17	08/12/17	EPA 6010B	QAL2
Potassium	6.81	5.00	mg/L	1	P7H1103	08/11/17	08/12/17	EPA 6010B	QAL2
Sodium	20.2	5.00	mg/L	1	P7H1103	08/11/17	08/12/17	EPA 6010B	QAL2
Hardness	1840	5.00	mg/L	1	P7H1103	08/11/17	08/12/17	EPA 6010B	QAL2

Cimarex
600 N. Marinfeld, Ste. 600
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Fax: (432) 571-7832

S-3
7H10011-03 (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	P7H1308	08/11/17	08/11/17	TX 1005	
>C12-C28	ND	2.50	mg/L	1	P7H1308	08/11/17	08/11/17	TX 1005	
>C28-C35	ND	2.50	mg/L	1	P7H1308	08/11/17	08/11/17	TX 1005	
Surrogate: 1-Chlorooctane		78.2 %	70-130		P7H1308	08/11/17	08/11/17	TX 1005	
Surrogate: o-Terphenyl		77.8 %	70-130		P7H1308	08/11/17	08/11/17	TX 1005	
Total Hydrocarbon nC6-nC35	ND	2.50	mg/L	1	[CALC]	08/11/17	08/11/17	[CALC]	

General Chemistry Parameters by EPA / Standard Methods

Total Alkalinity	60.0	10.0	mg/L	1	P7H1120	08/11/17	08/11/17	EPA 310.1M	
Carbonate Alkalinity	ND	10.0	mg/L	1	P7H1120	08/11/17	08/11/17	EPA 310.1M	
Bicarbonate Alkalinity	60.0	10.0	mg/L	1	P7H1120	08/11/17	08/11/17	EPA 310.1M	
Hydroxide Alkalinity	ND	10.0	mg/L	1	P7H1120	08/11/17	08/11/17	EPA 310.1M	
Bromide	ND	0.0500	mg/L	1	P7H1109	08/11/17	08/11/17	EPA 300.0	
Chloride	16.7	0.500	mg/L	1	P7H1109	08/11/17	08/11/17	EPA 300.0	
Specific Conductance (EC)	2460	5.00	umhos/cm	1	P7H1217	08/11/17	08/11/17	EPA 120.1	
Dissolved Oxygen	6.00		mg/L	1	P7H1118	08/11/17	08/11/17	CHEMets	QAL1
pH	7.60		pH Units	1	P7H1119	08/11/17	08/11/17	EPA 150.1	
Temperature	22.70		pH Units	1	P7H1119	08/11/17	08/11/17	EPA 150.1	
Total Dissolved Solids	2490	20.0	mg/L	1	P7H1121	08/11/17	08/11/17	EPA 160.1	
Sulfate	1460	25.0	mg/L	25	P7H1109	08/11/17	08/11/17	EPA 300.0	

Total Metals by EPA / Standard Methods

Calcium	745	5.00	mg/L	1	P7H1103	08/11/17	08/12/17	EPA 6010B	QAL2
Magnesium	15.8	5.00	mg/L	1	P7H1103	08/11/17	08/12/17	EPA 6010B	QAL2
Potassium	6.33	5.00	mg/L	1	P7H1103	08/11/17	08/12/17	EPA 6010B	QAL2
Sodium	21.9	5.00	mg/L	1	P7H1103	08/11/17	08/12/17	EPA 6010B	QAL2
Hardness	1920	5.00	mg/L	1	P7H1103	08/11/17	08/12/17	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
7H10011-04 (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	P7H1308	08/11/17	08/11/17	TX 1005	
>C12-C28	ND	2.50	mg/L	1	P7H1308	08/11/17	08/11/17	TX 1005	
>C28-C35	ND	2.50	mg/L	1	P7H1308	08/11/17	08/11/17	TX 1005	
Surrogate: 1-Chlorooctane		90.0 %	70-130		P7H1308	08/11/17	08/11/17	TX 1005	
Surrogate: o-Terphenyl		93.5 %	70-130		P7H1308	08/11/17	08/11/17	TX 1005	
Total Hydrocarbon nC6-nC35	ND	2.50	mg/L	1	[CALC]	08/11/17	08/11/17	[CALC]	

General Chemistry Parameters by EPA / Standard Methods

Total Alkalinity	65.0	10.0	mg/L	1	P7H1120	08/11/17	08/11/17	EPA 310.1M	
Carbonate Alkalinity	ND	10.0	mg/L	1	P7H1120	08/11/17	08/11/17	EPA 310.1M	
Bicarbonate Alkalinity	65.0	10.0	mg/L	1	P7H1120	08/11/17	08/11/17	EPA 310.1M	
Hydroxide Alkalinity	ND	10.0	mg/L	1	P7H1120	08/11/17	08/11/17	EPA 310.1M	
Bromide	ND	0.0500	mg/L	1	P7H1109	08/11/17	08/11/17	EPA 300.0	
Chloride	15.0	0.500	mg/L	1	P7H1109	08/11/17	08/11/17	EPA 300.0	
Specific Conductance (EC)	2440	5.00	umhos/cm	1	P7H1217	08/11/17	08/11/17	EPA 120.1	
Dissolved Oxygen	6.00		mg/L	1	P7H1118	08/11/17	08/11/17	CHEMets	QAL1
pH	7.60		pH Units	1	P7H1119	08/11/17	08/11/17	EPA 150.1	
Temperature	22.50		pH Units	1	P7H1119	08/11/17	08/11/17	EPA 150.1	
Total Dissolved Solids	2440	20.0	mg/L	1	P7H1121	08/11/17	08/11/17	EPA 160.1	
Sulfate	1470	25.0	mg/L	25	P7H1109	08/11/17	08/11/17	EPA 300.0	

Total Metals by EPA / Standard Methods

Calcium	620	5.00	mg/L	1	P7H1103	08/11/17	08/12/17	EPA 6010B	QAL2
Magnesium	13.4	5.00	mg/L	1	P7H1103	08/11/17	08/12/17	EPA 6010B	QAL2
Potassium	5.85	5.00	mg/L	1	P7H1103	08/11/17	08/12/17	EPA 6010B	QAL2
Sodium	17.4	5.00	mg/L	1	P7H1103	08/11/17	08/12/17	EPA 6010B	QAL2
Hardness	1600	5.00	mg/L	1	P7H1103	08/11/17	08/12/17	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

7H10011-05 (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	P7H1308	08/11/17	08/11/17	TX 1005	
>C12-C28	ND	2.50	mg/L	1	P7H1308	08/11/17	08/11/17	TX 1005	
>C28-C35	ND	2.50	mg/L	1	P7H1308	08/11/17	08/11/17	TX 1005	
Surrogate: 1-Chlorooctane		86.9 %	70-130		P7H1308	08/11/17	08/11/17	TX 1005	
Surrogate: o-Terphenyl		89.5 %	70-130		P7H1308	08/11/17	08/11/17	TX 1005	
Total Hydrocarbon nC6-nC35	ND	2.50	mg/L	1	[CALC]	08/11/17	08/11/17	[CALC]	

General Chemistry Parameters by EPA / Standard Methods

Total Alkalinity	60.0	10.0	mg/L	1	P7H1120	08/11/17	08/11/17	EPA 310.1M	
Carbonate Alkalinity	ND	10.0	mg/L	1	P7H1120	08/11/17	08/11/17	EPA 310.1M	
Bicarbonate Alkalinity	60.0	10.0	mg/L	1	P7H1120	08/11/17	08/11/17	EPA 310.1M	
Hydroxide Alkalinity	ND	10.0	mg/L	1	P7H1120	08/11/17	08/11/17	EPA 310.1M	
Bromide	ND	0.0500	mg/L	1	P7H1109	08/11/17	08/11/17	EPA 300.0	
Chloride	15.2	0.500	mg/L	1	P7H1109	08/11/17	08/11/17	EPA 300.0	
Specific Conductance (EC)	2430	5.00	umhos/cm	1	P7H1217	08/11/17	08/11/17	EPA 120.1	
Dissolved Oxygen	6.00		mg/L	1	P7H1118	08/11/17	08/11/17	CHEMets	QAL1
pH	7.64		pH Units	1	P7H1119	08/11/17	08/11/17	EPA 150.1	
Temperature	22.50		pH Units	1	P7H1119	08/11/17	08/11/17	EPA 150.1	
Total Dissolved Solids	2470	20.0	mg/L	1	P7H1121	08/11/17	08/11/17	EPA 160.1	
Sulfate	1450	25.0	mg/L	25	P7H1109	08/11/17	08/11/17	EPA 300.0	

Total Metals by EPA / Standard Methods

Calcium	664	5.00	mg/L	1	P7H1103	08/11/17	08/12/17	EPA 6010B	QAL2
Magnesium	12.9	5.00	mg/L	1	P7H1103	08/11/17	08/12/17	EPA 6010B	QAL2
Potassium	5.85	5.00	mg/L	1	P7H1103	08/11/17	08/12/17	EPA 6010B	QAL2
Sodium	17.8	5.00	mg/L	1	P7H1103	08/11/17	08/12/17	EPA 6010B	QAL2
Hardness	1710	5.00	mg/L	1	P7H1103	08/11/17	08/12/17	EPA 6010B	QAL2

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

Project: Assault SWD
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Project Manager: Christine Alderman

Fax: (432) 571-7832

S-4
7H10011-06 (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	P7H1308	08/11/17	08/11/17	TX 1005	
>C12-C28	ND	2.50	mg/L	1	P7H1308	08/11/17	08/11/17	TX 1005	
>C28-C35	ND	2.50	mg/L	1	P7H1308	08/11/17	08/11/17	TX 1005	
Surrogate: 1-Chlorooctane		92.2 %	70-130		P7H1308	08/11/17	08/11/17	TX 1005	
Surrogate: o-Terphenyl		101 %	70-130		P7H1308	08/11/17	08/11/17	TX 1005	
Total Hydrocarbon nC6-nC35	ND	2.50	mg/L	1	[CALC]	08/11/17	08/11/17	[CALC]	

General Chemistry Parameters by EPA / Standard Methods

Total Alkalinity	60.0	10.0	mg/L	1	P7H1120	08/11/17	08/11/17	EPA 310.1M	
Carbonate Alkalinity	ND	10.0	mg/L	1	P7H1120	08/11/17	08/11/17	EPA 310.1M	
Bicarbonate Alkalinity	60.0	10.0	mg/L	1	P7H1120	08/11/17	08/11/17	EPA 310.1M	
Hydroxide Alkalinity	ND	10.0	mg/L	1	P7H1120	08/11/17	08/11/17	EPA 310.1M	
Bromide	ND	0.0500	mg/L	1	P7H1109	08/11/17	08/11/17	EPA 300.0	
Chloride	14.4	0.500	mg/L	1	P7H1109	08/11/17	08/11/17	EPA 300.0	
Specific Conductance (EC)	2520	5.00	umhos/cm	1	P7H1217	08/11/17	08/11/17	EPA 120.1	
Dissolved Oxygen	6.00		mg/L	1	P7H1118	08/11/17	08/11/17	CHEMets	QAL1
pH	7.63		pH Units	1	P7H1119	08/11/17	08/11/17	EPA 150.1	
Temperature	22.40		pH Units	1	P7H1119	08/11/17	08/11/17	EPA 150.1	
Total Dissolved Solids	2390	20.0	mg/L	1	P7H1121	08/11/17	08/11/17	EPA 160.1	
Sulfate	1450	25.0	mg/L	25	P7H1109	08/11/17	08/11/17	EPA 300.0	

Total Metals by EPA / Standard Methods

Calcium	690	5.00	mg/L	1	P7H1103	08/11/17	08/12/17	EPA 6010B	QAL2
Magnesium	12.9	5.00	mg/L	1	P7H1103	08/11/17	08/12/17	EPA 6010B	QAL2
Potassium	6.12	5.00	mg/L	1	P7H1103	08/11/17	08/12/17	EPA 6010B	QAL2
Sodium	17.8	5.00	mg/L	1	P7H1103	08/11/17	08/12/17	EPA 6010B	QAL2
Hardness	1780	5.00	mg/L	1	P7H1103	08/11/17	08/12/17	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
7H10011-07 (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	P7H1308	08/11/17	08/11/17	TX 1005	
>C12-C28	ND	2.50	mg/L	1	P7H1308	08/11/17	08/11/17	TX 1005	
>C28-C35	ND	2.50	mg/L	1	P7H1308	08/11/17	08/11/17	TX 1005	
Surrogate: 1-Chlorooctane		92.4 %	70-130		P7H1308	08/11/17	08/11/17	TX 1005	
Surrogate: o-Terphenyl		97.4 %	70-130		P7H1308	08/11/17	08/11/17	TX 1005	
Total Hydrocarbon nC6-nC35	ND	2.50	mg/L	1	[CALC]	08/11/17	08/11/17	[CALC]	

General Chemistry Parameters by EPA / Standard Methods

Total Alkalinity	60.0	10.0	mg/L	1	P7H1120	08/11/17	08/11/17	EPA 310.1M	
Carbonate Alkalinity	ND	10.0	mg/L	1	P7H1120	08/11/17	08/11/17	EPA 310.1M	
Bicarbonate Alkalinity	60.0	10.0	mg/L	1	P7H1120	08/11/17	08/11/17	EPA 310.1M	
Hydroxide Alkalinity	ND	10.0	mg/L	1	P7H1120	08/11/17	08/11/17	EPA 310.1M	
Bromide	ND	0.0500	mg/L	1	P7H1109	08/11/17	08/11/17	EPA 300.0	
Chloride	14.0	0.500	mg/L	1	P7H1109	08/11/17	08/11/17	EPA 300.0	
Specific Conductance (EC)	2500	5.00	umhos/cm	1	P7H1217	08/11/17	08/11/17	EPA 120.1	
Dissolved Oxygen	6.00		mg/L	1	P7H1118	08/11/17	08/11/17	CHEMets	QAL1
pH	7.63		pH Units	1	P7H1119	08/11/17	08/11/17	EPA 150.1	
Temperature	22.50		pH Units	1	P7H1119	08/11/17	08/11/17	EPA 150.1	
Total Dissolved Solids	2440	20.0	mg/L	1	P7H1121	08/11/17	08/11/17	EPA 160.1	
Sulfate	1460	25.0	mg/L	25	P7H1109	08/11/17	08/11/17	EPA 300.0	

Total Metals by EPA / Standard Methods

Calcium	667	5.00	mg/L	1	P7H1103	08/11/17	08/12/17	EPA 6010B	QAL2
Magnesium	12.7	5.00	mg/L	1	P7H1103	08/11/17	08/12/17	EPA 6010B	QAL2
Potassium	6.69	5.00	mg/L	1	P7H1103	08/11/17	08/12/17	EPA 6010B	QAL2
Sodium	16.9	5.00	mg/L	1	P7H1103	08/11/17	08/12/17	EPA 6010B	QAL2
Hardness	1720	5.00	mg/L	1	P7H1103	08/11/17	08/12/17	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

7H10011-08 (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	P7H1308	08/11/17	08/11/17	TX 1005	
>C12-C28	ND	2.50	mg/L	1	P7H1308	08/11/17	08/11/17	TX 1005	
>C28-C35	ND	2.50	mg/L	1	P7H1308	08/11/17	08/11/17	TX 1005	
Surrogate: 1-Chlorooctane		90.9 %	70-130		P7H1308	08/11/17	08/11/17	TX 1005	
Surrogate: o-Terphenyl		97.7 %	70-130		P7H1308	08/11/17	08/11/17	TX 1005	
Total Hydrocarbon nC6-nC35	ND	2.50	mg/L	1	[CALC]	08/11/17	08/11/17	[CALC]	

General Chemistry Parameters by EPA / Standard Methods

Total Alkalinity	50.0	10.0	mg/L	1	P7H1120	08/11/17	08/11/17	EPA 310.1M	
Carbonate Alkalinity	ND	10.0	mg/L	1	P7H1120	08/11/17	08/11/17	EPA 310.1M	
Bicarbonate Alkalinity	50.0	10.0	mg/L	1	P7H1120	08/11/17	08/11/17	EPA 310.1M	
Hydroxide Alkalinity	ND	10.0	mg/L	1	P7H1120	08/11/17	08/11/17	EPA 310.1M	
Bromide	ND	0.0500	mg/L	1	P7H1109	08/11/17	08/11/17	EPA 300.0	
Chloride	15.0	0.500	mg/L	1	P7H1109	08/11/17	08/11/17	EPA 300.0	
Specific Conductance (EC)	2520	5.00	umhos/cm	1	P7H1217	08/11/17	08/11/17	EPA 120.1	
Dissolved Oxygen	6.00		mg/L	1	P7H1118	08/11/17	08/11/17	CHEMets	QAL1
pH	7.74		pH Units	1	P7H1119	08/11/17	08/11/17	EPA 150.1	
Temperature	22.50		pH Units	1	P7H1119	08/11/17	08/11/17	EPA 150.1	
Total Dissolved Solids	2450	20.0	mg/L	1	P7H1121	08/11/17	08/11/17	EPA 160.1	
Sulfate	1470	25.0	mg/L	25	P7H1109	08/11/17	08/11/17	EPA 300.0	

Total Metals by EPA / Standard Methods

Calcium	815	5.00	mg/L	1	P7H1103	08/11/17	08/12/17	EPA 6010B	QAL2
Magnesium	15.4	5.00	mg/L	1	P7H1103	08/11/17	08/12/17	EPA 6010B	QAL2
Potassium	7.54	5.00	mg/L	1	P7H1103	08/11/17	08/12/17	EPA 6010B	QAL2
Sodium	21.2	5.00	mg/L	1	P7H1103	08/11/17	08/12/17	EPA 6010B	QAL2
Hardness	2100	5.00	mg/L	1	P7H1103	08/11/17	08/12/17	EPA 6010B	QAL2

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

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

Fax: (432) 571-7832

S-4C
7H10011-09 (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	P7H1308	08/11/17	08/11/17	TX 1005	
>C12-C28	ND	2.50	mg/L	1	P7H1308	08/11/17	08/11/17	TX 1005	
>C28-C35	ND	2.50	mg/L	1	P7H1308	08/11/17	08/11/17	TX 1005	
Surrogate: 1-Chlorooctane		91.7 %	70-130		P7H1308	08/11/17	08/11/17	TX 1005	
Surrogate: o-Terphenyl		98.7 %	70-130		P7H1308	08/11/17	08/11/17	TX 1005	
Total Hydrocarbon nC6-nC35	ND	2.50	mg/L	1	[CALC]	08/11/17	08/11/17	[CALC]	

General Chemistry Parameters by EPA / Standard Methods

Total Alkalinity	55.0	10.0	mg/L	1	P7H1120	08/11/17	08/11/17	EPA 310.1M	
Carbonate Alkalinity	ND	10.0	mg/L	1	P7H1120	08/11/17	08/11/17	EPA 310.1M	
Bicarbonate Alkalinity	55.0	10.0	mg/L	1	P7H1120	08/11/17	08/11/17	EPA 310.1M	
Hydroxide Alkalinity	ND	10.0	mg/L	1	P7H1120	08/11/17	08/11/17	EPA 310.1M	
Bromide	ND	0.0500	mg/L	1	P7H1109	08/11/17	08/11/17	EPA 300.0	
Chloride	15.2	0.500	mg/L	1	P7H1109	08/11/17	08/11/17	EPA 300.0	
Specific Conductance (EC)	2490	5.00	umhos/cm	1	P7H1217	08/11/17	08/11/17	EPA 120.1	
Dissolved Oxygen	6.00		mg/L	1	P7H1118	08/11/17	08/11/17	CHEMets	QAL1
pH	7.76		pH Units	1	P7H1119	08/11/17	08/11/17	EPA 150.1	
Temperature	22.40		pH Units	1	P7H1119	08/11/17	08/11/17	EPA 150.1	
Total Dissolved Solids	2450	20.0	mg/L	1	P7H1121	08/11/17	08/11/17	EPA 160.1	
Sulfate	1480	25.0	mg/L	25	P7H1109	08/11/17	08/11/17	EPA 300.0	

Total Metals by EPA / Standard Methods

Calcium	619	5.00	mg/L	1	P7H1103	08/11/17	08/12/17	EPA 6010B	QAL2
Magnesium	11.4	5.00	mg/L	1	P7H1103	08/11/17	08/12/17	EPA 6010B	QAL2
Potassium	5.98	5.00	mg/L	1	P7H1103	08/11/17	08/12/17	EPA 6010B	QAL2
Sodium	15.9	5.00	mg/L	1	P7H1103	08/11/17	08/12/17	EPA 6010B	QAL2
Hardness	1590	5.00	mg/L	1	P7H1103	08/11/17	08/12/17	EPA 6010B	QAL2

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

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

Fax: (432) 571-7832

S-5
7H10011-10 (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	P7H1308	08/11/17	08/11/17	TX 1005	
>C12-C28	ND	2.50	mg/L	1	P7H1308	08/11/17	08/11/17	TX 1005	
>C28-C35	ND	2.50	mg/L	1	P7H1308	08/11/17	08/11/17	TX 1005	
Surrogate: 1-Chlorooctane		97.1 %	70-130		P7H1308	08/11/17	08/11/17	TX 1005	
Surrogate: o-Terphenyl		105 %	70-130		P7H1308	08/11/17	08/11/17	TX 1005	
Total Hydrocarbon nC6-nC35	ND	2.50	mg/L	1	[CALC]	08/11/17	08/11/17	[CALC]	

General Chemistry Parameters by EPA / Standard Methods

Total Alkalinity	55.0	10.0	mg/L	1	P7H1120	08/11/17	08/11/17	EPA 310.1M	
Carbonate Alkalinity	ND	10.0	mg/L	1	P7H1120	08/11/17	08/11/17	EPA 310.1M	
Bicarbonate Alkalinity	55.0	10.0	mg/L	1	P7H1120	08/11/17	08/11/17	EPA 310.1M	
Hydroxide Alkalinity	ND	10.0	mg/L	1	P7H1120	08/11/17	08/11/17	EPA 310.1M	
Bromide	ND	0.0500	mg/L	1	P7H1109	08/11/17	08/11/17	EPA 300.0	
Chloride	20.6	0.500	mg/L	1	P7H1109	08/11/17	08/11/17	EPA 300.0	
Specific Conductance (EC)	2550	5.00	umhos/cm	1	P7H1217	08/11/17	08/11/17	EPA 120.1	
Dissolved Oxygen	6.00		mg/L	1	P7H1118	08/11/17	08/11/17	CHEMets	QAL1
pH	7.68		pH Units	1	P7H1119	08/11/17	08/11/17	EPA 150.1	
Temperature	22.40		pH Units	1	P7H1119	08/11/17	08/11/17	EPA 150.1	
Total Dissolved Solids	2490	20.0	mg/L	1	P7H1121	08/11/17	08/11/17	EPA 160.1	
Sulfate	1470	25.0	mg/L	25	P7H1109	08/11/17	08/11/17	EPA 300.0	

Total Metals by EPA / Standard Methods

Calcium	815	5.00	mg/L	1	P7H1103	08/11/17	08/12/17	EPA 6010B	QAL2
Magnesium	16.9	5.00	mg/L	1	P7H1103	08/11/17	08/12/17	EPA 6010B	QAL2
Potassium	7.61	5.00	mg/L	1	P7H1103	08/11/17	08/12/17	EPA 6010B	QAL2
Sodium	26.2	5.00	mg/L	1	P7H1103	08/11/17	08/12/17	EPA 6010B	QAL2
Hardness	2100	5.00	mg/L	1	P7H1103	08/11/17	08/12/17	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
7H10011-11 (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	P7H1308	08/11/17	08/11/17	TX 1005	
>C12-C28	ND	2.50	mg/L	1	P7H1308	08/11/17	08/11/17	TX 1005	
>C28-C35	ND	2.50	mg/L	1	P7H1308	08/11/17	08/11/17	TX 1005	
Surrogate: 1-Chlorooctane		86.2 %	70-130		P7H1308	08/11/17	08/11/17	TX 1005	
Surrogate: o-Terphenyl		88.9 %	70-130		P7H1308	08/11/17	08/11/17	TX 1005	
Total Hydrocarbon nC6-nC35	ND	2.50	mg/L	1	[CALC]	08/11/17	08/11/17	[CALC]	

General Chemistry Parameters by EPA / Standard Methods

Total Alkalinity	60.0	10.0	mg/L	1	P7H1120	08/11/17	08/11/17	EPA 310.1M	
Carbonate Alkalinity	ND	10.0	mg/L	1	P7H1120	08/11/17	08/11/17	EPA 310.1M	
Bicarbonate Alkalinity	60.0	10.0	mg/L	1	P7H1120	08/11/17	08/11/17	EPA 310.1M	
Hydroxide Alkalinity	ND	10.0	mg/L	1	P7H1120	08/11/17	08/11/17	EPA 310.1M	
Bromide	0.106	0.0500	mg/L	1	P7H1109	08/11/17	08/11/17	EPA 300.0	
Chloride	23.4	0.500	mg/L	1	P7H1109	08/11/17	08/11/17	EPA 300.0	
Specific Conductance (EC)	2560	5.00	umhos/cm	1	P7H1217	08/11/17	08/11/17	EPA 120.1	
Dissolved Oxygen	6.00		mg/L	1	P7H1118	08/11/17	08/11/17	CHEMets	QAL1
pH	7.76		pH Units	1	P7H1119	08/11/17	08/11/17	EPA 150.1	
Temperature	22.40		pH Units	1	P7H1119	08/11/17	08/11/17	EPA 150.1	
Total Dissolved Solids	2540	20.0	mg/L	1	P7H1121	08/11/17	08/11/17	EPA 160.1	
Sulfate	1480	25.0	mg/L	25	P7H1109	08/11/17	08/11/17	EPA 300.0	

Total Metals by EPA / Standard Methods

Calcium	712	5.00	mg/L	1	P7H1103	08/11/17	08/12/17	EPA 6010B	QAL2
Magnesium	18.4	5.00	mg/L	1	P7H1103	08/11/17	08/12/17	EPA 6010B	QAL2
Potassium	6.85	5.00	mg/L	1	P7H1103	08/11/17	08/12/17	EPA 6010B	QAL2
Sodium	26.5	5.00	mg/L	1	P7H1103	08/11/17	08/12/17	EPA 6010B	QAL2
Hardness	1850	5.00	mg/L	1	P7H1103	08/11/17	08/12/17	EPA 6010B	QAL2

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

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

Fax: (432) 571-7832

S-5B
7H10011-12 (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	P7H1308	08/11/17	08/11/17	TX 1005	
>C12-C28	ND	2.50	mg/L	1	P7H1308	08/11/17	08/11/17	TX 1005	
>C28-C35	ND	2.50	mg/L	1	P7H1308	08/11/17	08/11/17	TX 1005	
Surrogate: 1-Chlorooctane		87.4 %	70-130		P7H1308	08/11/17	08/11/17	TX 1005	
Surrogate: o-Terphenyl		90.9 %	70-130		P7H1308	08/11/17	08/11/17	TX 1005	
Total Hydrocarbon nC6-nC35	ND	2.50	mg/L	1	[CALC]	08/11/17	08/11/17	[CALC]	

General Chemistry Parameters by EPA / Standard Methods

Total Alkalinity	67.0	10.0	mg/L	1	P7H1120	08/11/17	08/11/17	EPA 310.1M	
Carbonate Alkalinity	ND	10.0	mg/L	1	P7H1120	08/11/17	08/11/17	EPA 310.1M	
Bicarbonate Alkalinity	67.0	10.0	mg/L	1	P7H1120	08/11/17	08/11/17	EPA 310.1M	
Hydroxide Alkalinity	ND	10.0	mg/L	1	P7H1120	08/11/17	08/11/17	EPA 310.1M	
Bromide	0.190	0.0500	mg/L	1	P7H1109	08/11/17	08/11/17	EPA 300.0	
Chloride	23.2	0.500	mg/L	1	P7H1109	08/11/17	08/11/17	EPA 300.0	
Specific Conductance (EC)	2620	5.00	umhos/cm	1	P7H1217	08/11/17	08/11/17	EPA 120.1	
Dissolved Oxygen	6.00		mg/L	1	P7H1118	08/11/17	08/11/17	CHEMets	QAL1
pH	7.77		pH Units	1	P7H1119	08/11/17	08/11/17	EPA 150.1	
Temperature	22.40		pH Units	1	P7H1119	08/11/17	08/11/17	EPA 150.1	
Total Dissolved Solids	2500	20.0	mg/L	1	P7H1121	08/11/17	08/11/17	EPA 160.1	
Sulfate	1490	25.0	mg/L	25	P7H1109	08/11/17	08/11/17	EPA 300.0	

Total Metals by EPA / Standard Methods

Calcium	732	5.00	mg/L	1	P7H1103	08/11/17	08/12/17	EPA 6010B	QAL2
Magnesium	26.2	5.00	mg/L	1	P7H1103	08/11/17	08/12/17	EPA 6010B	QAL2
Potassium	6.81	5.00	mg/L	1	P7H1103	08/11/17	08/12/17	EPA 6010B	QAL2
Sodium	40.7	5.00	mg/L	1	P7H1103	08/11/17	08/12/17	EPA 6010B	QAL2
Hardness	1940	5.00	mg/L	1	P7H1103	08/11/17	08/12/17	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
7H10011-13 (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	P7H1308	08/11/17	08/11/17	TX 1005	
>C12-C28	ND	2.50	mg/L	1	P7H1308	08/11/17	08/11/17	TX 1005	
>C28-C35	ND	2.50	mg/L	1	P7H1308	08/11/17	08/11/17	TX 1005	
Surrogate: 1-Chlorooctane		87.8 %	70-130		P7H1308	08/11/17	08/11/17	TX 1005	
Surrogate: o-Terphenyl		91.2 %	70-130		P7H1308	08/11/17	08/11/17	TX 1005	
Total Hydrocarbon nC6-nC35	ND	2.50	mg/L	1	[CALC]	08/11/17	08/11/17	[CALC]	

General Chemistry Parameters by EPA / Standard Methods

Total Alkalinity	77.0	10.0	mg/L	1	P7H1120	08/11/17	08/11/17	EPA 310.1M	
Carbonate Alkalinity	ND	10.0	mg/L	1	P7H1120	08/11/17	08/11/17	EPA 310.1M	
Bicarbonate Alkalinity	77.0	10.0	mg/L	1	P7H1120	08/11/17	08/11/17	EPA 310.1M	
Hydroxide Alkalinity	ND	10.0	mg/L	1	P7H1120	08/11/17	08/11/17	EPA 310.1M	
Bromide	0.103	0.0500	mg/L	1	P7H1109	08/11/17	08/11/17	EPA 300.0	
Chloride	37.4	12.5	mg/L	25	P7H1109	08/11/17	08/11/17	EPA 300.0	
Specific Conductance (EC)	2710	5.00	umhos/cm	1	P7H1217	08/11/17	08/11/17	EPA 120.1	
Dissolved Oxygen	6.00		mg/L	1	P7H1118	08/11/17	08/11/17	CHEMets	QAL1
pH	7.82		pH Units	1	P7H1119	08/11/17	08/11/17	EPA 150.1	
Temperature	22.40		pH Units	1	P7H1119	08/11/17	08/11/17	EPA 150.1	
Total Dissolved Solids	2540	20.0	mg/L	1	P7H1121	08/11/17	08/11/17	EPA 160.1	
Sulfate	1500	25.0	mg/L	25	P7H1109	08/11/17	08/11/17	EPA 300.0	

Total Metals by EPA / Standard Methods

Calcium	724	5.00	mg/L	1	P7H1103	08/11/17	08/12/17	EPA 6010B	QAL2
Magnesium	32.6	5.00	mg/L	1	P7H1103	08/11/17	08/12/17	EPA 6010B	QAL2
Potassium	7.05	5.00	mg/L	1	P7H1103	08/11/17	08/12/17	EPA 6010B	QAL2
Sodium	51.7	5.00	mg/L	1	P7H1103	08/11/17	08/12/17	EPA 6010B	QAL2
Hardness	1940	5.00	mg/L	1	P7H1103	08/11/17	08/12/17	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
7H10011-14 (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	P7H1308	08/11/17	08/11/17	TX 1005	
>C12-C28	ND	2.50	mg/L	1	P7H1308	08/11/17	08/11/17	TX 1005	
>C28-C35	ND	2.50	mg/L	1	P7H1308	08/11/17	08/11/17	TX 1005	
Surrogate: 1-Chlorooctane		90.5 %	70-130		P7H1308	08/11/17	08/11/17	TX 1005	
Surrogate: o-Terphenyl		96.0 %	70-130		P7H1308	08/11/17	08/11/17	TX 1005	
Total Hydrocarbon nC6-nC35	ND	2.50	mg/L	1	[CALC]	08/11/17	08/11/17	[CALC]	

General Chemistry Parameters by EPA / Standard Methods

Total Alkalinity	102	10.0	mg/L	1	P7H1120	08/11/17	08/11/17	EPA 310.1M	
Carbonate Alkalinity	ND	10.0	mg/L	1	P7H1120	08/11/17	08/11/17	EPA 310.1M	
Bicarbonate Alkalinity	102	10.0	mg/L	1	P7H1120	08/11/17	08/11/17	EPA 310.1M	
Hydroxide Alkalinity	ND	10.0	mg/L	1	P7H1120	08/11/17	08/11/17	EPA 310.1M	
Bromide	ND	0.0500	mg/L	1	P7H1109	08/11/17	08/11/17	EPA 300.0	
Chloride	53.1	12.5	mg/L	25	P7H1109	08/11/17	08/11/17	EPA 300.0	
Specific Conductance (EC)	2730	5.00	umhos/cm	1	P7H1217	08/11/17	08/11/17	EPA 120.1	
Dissolved Oxygen	6.00		mg/L	1	P7H1118	08/11/17	08/11/17	CHEMets	QAL1
pH	7.89		pH Units	1	P7H1119	08/11/17	08/11/17	EPA 150.1	
Temperature	22.60		pH Units	1	P7H1119	08/11/17	08/11/17	EPA 150.1	
Total Dissolved Solids	2540	20.0	mg/L	1	P7H1121	08/11/17	08/11/17	EPA 160.1	
Sulfate	1450	25.0	mg/L	25	P7H1109	08/11/17	08/11/17	EPA 300.0	

Total Metals by EPA / Standard Methods

Calcium	669	5.00	mg/L	1	P7H1103	08/11/17	08/12/17	EPA 6010B	QAL2
Magnesium	39.9	5.00	mg/L	1	P7H1103	08/11/17	08/12/17	EPA 6010B	QAL2
Potassium	7.11	5.00	mg/L	1	P7H1103	08/11/17	08/12/17	EPA 6010B	QAL2
Sodium	70.3	5.00	mg/L	1	P7H1103	08/11/17	08/12/17	EPA 6010B	QAL2
Hardness	1840	5.00	mg/L	1	P7H1103	08/11/17	08/12/17	EPA 6010B	QAL2

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

Fax: (432) 571-7832

S-6C
7H10011-15 (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	P7H1308	08/11/17	08/11/17	TX 1005	
>C12-C28	ND	2.50	mg/L	1	P7H1308	08/11/17	08/11/17	TX 1005	
>C28-C35	ND	2.50	mg/L	1	P7H1308	08/11/17	08/11/17	TX 1005	
Surrogate: 1-Chlorooctane		82.4 %	70-130		P7H1308	08/11/17	08/11/17	TX 1005	
Surrogate: o-Terphenyl		88.3 %	70-130		P7H1308	08/11/17	08/11/17	TX 1005	
Total Hydrocarbon nC6-nC35	ND	2.50	mg/L	1	[CALC]	08/11/17	08/11/17	[CALC]	

General Chemistry Parameters by EPA / Standard Methods

Total Alkalinity	70.0	10.0	mg/L	1	P7H1120	08/11/17	08/11/17	EPA 310.1M	
Carbonate Alkalinity	ND	10.0	mg/L	1	P7H1120	08/11/17	08/11/17	EPA 310.1M	
Bicarbonate Alkalinity	70.0	10.0	mg/L	1	P7H1120	08/11/17	08/11/17	EPA 310.1M	
Hydroxide Alkalinity	ND	10.0	mg/L	1	P7H1120	08/11/17	08/11/17	EPA 310.1M	
Bromide	0.155	0.0500	mg/L	1	P7H1109	08/11/17	08/11/17	EPA 300.0	
Chloride	33.1	12.5	mg/L	25	P7H1109	08/11/17	08/11/17	EPA 300.0	
Specific Conductance (EC)	2350	5.00	umhos/cm	1	P7H1217	08/11/17	08/11/17	EPA 120.1	
Dissolved Oxygen	6.00		mg/L	1	P7H1118	08/11/17	08/11/17	CHEMets	QAL1
pH	7.80		pH Units	1	P7H1119	08/11/17	08/11/17	EPA 150.1	
Temperature	23.50		pH Units	1	P7H1119	08/11/17	08/11/17	EPA 150.1	
Total Dissolved Solids	2250	20.0	mg/L	1	P7H1121	08/11/17	08/11/17	EPA 160.1	
Sulfate	1270	25.0	mg/L	25	P7H1109	08/11/17	08/11/17	EPA 300.0	

Total Metals by EPA / Standard Methods

Calcium	544	5.00	mg/L	1	P7H1103	08/11/17	08/12/17	EPA 6010B	QAL2
Magnesium	21.8	5.00	mg/L	1	P7H1103	08/11/17	08/12/17	EPA 6010B	QAL2
Potassium	5.87	5.00	mg/L	1	P7H1103	08/11/17	08/12/17	EPA 6010B	QAL2
Sodium	39.4	5.00	mg/L	1	P7H1103	08/11/17	08/12/17	EPA 6010B	QAL2
Hardness	1450	5.00	mg/L	1	P7H1103	08/11/17	08/12/17	EPA 6010B	QAL2

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Project Number: [none]
Project Manager: Christine Alderman

Fax: (432) 571-7832

DUP-1
7H10011-16 (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	P7H1308	08/11/17	08/11/17	TX 1005	
>C12-C28	ND	2.50	mg/L	1	P7H1308	08/11/17	08/11/17	TX 1005	
>C28-C35	ND	2.50	mg/L	1	P7H1308	08/11/17	08/11/17	TX 1005	
Surrogate: 1-Chlorooctane		80.3 %	70-130		P7H1308	08/11/17	08/11/17	TX 1005	
Surrogate: o-Terphenyl		85.3 %	70-130		P7H1308	08/11/17	08/11/17	TX 1005	
Total Hydrocarbon nC6-nC35	ND	2.50	mg/L	1	[CALC]	08/11/17	08/11/17	[CALC]	

General Chemistry Parameters by EPA / Standard Methods

Total Alkalinity	55.0	10.0	mg/L	1	P7H1120	08/11/17	08/11/17	EPA 310.1M	
Carbonate Alkalinity	ND	10.0	mg/L	1	P7H1120	08/11/17	08/11/17	EPA 310.1M	
Bicarbonate Alkalinity	55.0	10.0	mg/L	1	P7H1120	08/11/17	08/11/17	EPA 310.1M	
Hydroxide Alkalinity	ND	10.0	mg/L	1	P7H1120	08/11/17	08/11/17	EPA 310.1M	
Bromide	ND	0.0500	mg/L	1	P7H1109	08/11/17	08/11/17	EPA 300.0	
Chloride	14.8	0.500	mg/L	1	P7H1109	08/11/17	08/11/17	EPA 300.0	
Specific Conductance (EC)	2440	5.00	umhos/cm	1	P7H1217	08/11/17	08/11/17	EPA 120.1	
Dissolved Oxygen	6.00		mg/L	1	P7H1118	08/11/17	08/11/17	CHEMets	QAL1
pH	7.76		pH Units	1	P7H1119	08/11/17	08/11/17	EPA 150.1	
Temperature	23.20		pH Units	1	P7H1119	08/11/17	08/11/17	EPA 150.1	
Total Dissolved Solids	2460	20.0	mg/L	1	P7H1121	08/11/17	08/11/17	EPA 160.1	
Sulfate	1470	25.0	mg/L	25	P7H1109	08/11/17	08/11/17	EPA 300.0	

Total Metals by EPA / Standard Methods

Calcium	680	5.00	mg/L	1	P7H1103	08/11/17	08/12/17	EPA 6010B	QAL2
Magnesium	12.6	5.00	mg/L	1	P7H1103	08/11/17	08/12/17	EPA 6010B	QAL2
Potassium	6.57	5.00	mg/L	1	P7H1103	08/11/17	08/12/17	EPA 6010B	QAL2
Sodium	17.8	5.00	mg/L	1	P7H1103	08/11/17	08/12/17	EPA 6010B	QAL2
Hardness	1750	5.00	mg/L	1	P7H1103	08/11/17	08/12/17	EPA 6010B	QAL2

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Project Number: [none]
Project Manager: Christine Alderman

Fax: (432) 571-7832

DUP-2
7H10011-17 (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	P7H1308	08/11/17	08/11/17	TX 1005	
>C12-C28	ND	2.50	mg/L	1	P7H1308	08/11/17	08/11/17	TX 1005	
>C28-C35	ND	2.50	mg/L	1	P7H1308	08/11/17	08/11/17	TX 1005	
Surrogate: 1-Chlorooctane		86.2 %	70-130		P7H1308	08/11/17	08/11/17	TX 1005	
Surrogate: o-Terphenyl		94.4 %	70-130		P7H1308	08/11/17	08/11/17	TX 1005	
Total Hydrocarbon nC6-nC35	ND	2.50	mg/L	1	[CALC]	08/11/17	08/11/17	[CALC]	

General Chemistry Parameters by EPA / Standard Methods

Total Alkalinity	100	10.0	mg/L	1	P7H1120	08/11/17	08/11/17	EPA 310.1M	
Carbonate Alkalinity	ND	10.0	mg/L	1	P7H1120	08/11/17	08/11/17	EPA 310.1M	
Bicarbonate Alkalinity	100	10.0	mg/L	1	P7H1120	08/11/17	08/11/17	EPA 310.1M	
Hydroxide Alkalinity	ND	10.0	mg/L	1	P7H1120	08/11/17	08/11/17	EPA 310.1M	
Bromide	0.256	0.0500	mg/L	1	P7H1109	08/11/17	08/11/17	EPA 300.0	
Chloride	53.1	12.5	mg/L	25	P7H1109	08/11/17	08/11/17	EPA 300.0	
Specific Conductance (EC)	2690	5.00	umhos/cm	1	P7H1217	08/11/17	08/11/17	EPA 120.1	
Dissolved Oxygen	6.00		mg/L	1	P7H1118	08/11/17	08/11/17	CHEMets	QAL1
pH	7.86		pH Units	1	P7H1119	08/11/17	08/11/17	EPA 150.1	
Temperature	23.00		pH Units	1	P7H1119	08/11/17	08/11/17	EPA 150.1	
Total Dissolved Solids	2570	20.0	mg/L	1	P7H1121	08/11/17	08/11/17	EPA 160.1	
Sulfate	1470	25.0	mg/L	25	P7H1109	08/11/17	08/11/17	EPA 300.0	

Total Metals by EPA / Standard Methods

Calcium	717	5.00	mg/L	1	P7H1103	08/11/17	08/12/17	EPA 6010B	QAL2
Magnesium	39.9	5.00	mg/L	1	P7H1103	08/11/17	08/12/17	EPA 6010B	QAL2
Potassium	6.88	5.00	mg/L	1	P7H1103	08/11/17	08/12/17	EPA 6010B	QAL2
Sodium	69.9	5.00	mg/L	1	P7H1103	08/11/17	08/12/17	EPA 6010B	QAL2
Hardness	1950	5.00	mg/L	1	P7H1103	08/11/17	08/12/17	EPA 6010B	QAL2

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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 P7H1308 - TX 1005										
Blank (P7H1308-BLK1)				Prepared & Analyzed: 08/11/17						
C6-C12	ND	2.50	mg/L							
>C12-C28	ND	2.50	"							
>C28-C35	ND	2.50	"							
Surrogate: 1-Chlorooctane	9.48		"	9.38		101	70-130			
Surrogate: o-Terphenyl	4.89		"	4.69		104	70-130			
LCS (P7H1308-BS1)				Prepared & Analyzed: 08/11/17						
C6-C12	79.7	2.50	mg/L	93.8		85.0	75-125			
>C12-C28	76.0	2.50	"	93.8		81.1	75-125			
Surrogate: 1-Chlorooctane	10.0		"	9.38		107	70-130			
Surrogate: o-Terphenyl	4.84		"	4.69		103	70-130			
LCS Dup (P7H1308-BSD1)				Prepared & Analyzed: 08/11/17						
C6-C12	80.5	2.50	mg/L	93.8		85.9	75-125	0.956	20	
>C12-C28	75.8	2.50	"	93.8		80.8	75-125	0.297	20	
Surrogate: 1-Chlorooctane	10.1		"	9.38		108	70-130			
Surrogate: o-Terphenyl	4.89		"	4.69		104	70-130			
Duplicate (P7H1308-DUP1)		Source: 7H10011-05		Prepared & Analyzed: 08/11/17						
C6-C12	0.957	2.50	mg/L		1.75			58.5	20	R3
>C12-C28	ND	2.50	"		ND				20	
Surrogate: 1-Chlorooctane	8.15		"	9.38		86.9	70-130			
Surrogate: o-Terphenyl	4.22		"	4.69		90.0	70-130			

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Midland TX, 79701

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 P7H1109 - * DEFAULT PREP *****

LCS (P7H1109-BS1)

Prepared & Analyzed: 08/11/17

Sulfate	43.1	1.00	mg/L	40.0		108	85-115			
Bromide	5.62	0.0500	"	5.00		112	80-120			
Chloride	42.4	0.500	"	40.0		106	85-115			

LCS Dup (P7H1109-BSD1)

Prepared & Analyzed: 08/11/17

Chloride	42.5	0.500	mg/L	40.0		106	85-115	0.236	20	
Sulfate	43.2	1.00	"	40.0		108	85-115	0.155	20	
Bromide	5.60	0.0500	"	5.00		112	80-120	0.392	20	

Duplicate (P7H1109-DUP1)

Source: 7H10011-01

Prepared & Analyzed: 08/11/17

Sulfate	1560	25.0	mg/L		1560			0.378	20	
Bromide	ND	0.0500	"		0.185				20	
Chloride	46.7	0.500	"		46.7			0.0685	20	

Duplicate (P7H1109-DUP2)

Source: 7H10011-11

Prepared & Analyzed: 08/11/17

Sulfate	1480	25.0	mg/L		1480			0.213	20	
Bromide	0.514	0.0500	"		0.106			132	20	R2
Chloride	23.9	0.500	"		23.4			2.34	20	

Matrix Spike (P7H1109-MS1)

Source: 7H10011-01

Prepared & Analyzed: 08/11/17

Bromide	26.8	1.25	mg/L	25.0	ND	107	75-125			
Chloride	253	12.5	"	200	46.7	103	80-120			
Sulfate	1760	25.0	"	200	1560	98.4	80-120			

Batch P7H1118 - * DEFAULT PREP *****

Duplicate (P7H1118-DUP1)

Source: 7H10011-01

Prepared & Analyzed: 08/11/17

Dissolved Oxygen	6.00		mg/L		6.00			0.00	200	QAL1
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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 P7H1119 - * DEFAULT PREP *****

Duplicate (P7H1119-DUP1)

Source: 7H10011-01

Prepared & Analyzed: 08/11/17

pH	7.63		pH Units		7.69			0.783	20	
Temperature	23.60		"		23.40			0.851	200	

Duplicate (P7H1119-DUP2)

Source: 7H10012-04

Prepared & Analyzed: 08/11/17

pH	7.93		pH Units		7.89			0.506	20	
Temperature	23.00		"		22.80			0.873	200	

Batch P7H1120 - * DEFAULT PREP *****

Blank (P7H1120-BLK1)

Prepared & Analyzed: 08/11/17

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

Blank (P7H1120-BLK2)

Prepared & Analyzed: 08/11/17

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

Duplicate (P7H1120-DUP1)

Source: 7H10011-01

Prepared & Analyzed: 08/11/17

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	

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

Fax: (432) 571-7832

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

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch P7H1120 - * DEFAULT PREP *****

Duplicate (P7H1120-DUP2)	Source: 7H10012-04			Prepared & Analyzed: 08/11/17						
Total Alkalinity	80.0	10.0	mg/L		82.0			2.47	20	
Carbonate Alkalinity	ND	10.0	"		ND				20	
Bicarbonate Alkalinity	80.0	10.0	"		82.0			2.47	20	
Hydroxide Alkalinity	ND	10.0	"		ND				20	

Batch P7H1121 - * DEFAULT PREP *****

Blank (P7H1121-BLK1)	Prepared & Analyzed: 08/11/17									
Total Dissolved Solids	ND	20.0	mg/L							

Blank (P7H1121-BLK2)	Prepared & Analyzed: 08/11/17									
Total Dissolved Solids	ND	20.0	mg/L							

Duplicate (P7H1121-DUP1)	Source: 7H10011-01			Prepared & Analyzed: 08/11/17						
Total Dissolved Solids	2800	20.0	mg/L		2690			4.01	20	

Duplicate (P7H1121-DUP2)	Source: 7H10012-04			Prepared & Analyzed: 08/11/17						
Total Dissolved Solids	2220	20.0	mg/L		2180			1.82	20	

Batch P7H1217 - * DEFAULT PREP *****

Duplicate (P7H1217-DUP1)	Source: 7H10011-01			Prepared & Analyzed: 08/11/17						
Specific Conductance (EC)	2880	5.00	umhos/cm		2820			2.11	20	

Duplicate (P7H1217-DUP2)	Source: 7H11010-01			Prepared & Analyzed: 08/12/17						
Specific Conductance (EC)	2720	5.00	umhos/cm		2650			2.61	20	

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Project Number: [none]
Project Manager: Christine Alderman

Fax: (432) 571-7832

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

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch P7H1217 - * DEFAULT PREP *****

Duplicate (P7H1217-DUP3)

Source: 7H12001-11

Prepared & Analyzed: 08/12/17

Specific Conductance (EC)	2700	5.00	umhos/cm		2750			1.83	20	
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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 P7H1103 - * DEFAULT PREP *****

Blank (P7H1103-BLK1)

Prepared: 08/11/17 Analyzed: 08/12/17

Calcium	8.10	5.00	mg/L							QAL2
Magnesium	0.158	5.00	"							J, QAL2
Potassium	0.112	5.00	"							J, QAL2
Sodium	0.339	5.00	"							J, QAL2
Hardness	20.9	30.0	"							J, QAL2

LCS (P7H1103-BS1)

Prepared: 08/11/17 Analyzed: 08/12/17

Calcium	55.6	5.00	mg/L	50.0		111	80-120			QAL2
Magnesium	54.1	5.00	"	50.0		108	80-120			QAL2
Potassium	54.9	5.00	"	50.0		110	80-120			QAL2
Sodium	57.7	5.00	"	50.0		115	80-120			QAL2

Duplicate (P7H1103-DUP1)

Source: 7H10011-01

Prepared: 08/11/17 Analyzed: 08/12/17

Calcium	780	5.00	mg/L		568			31.5	20	R2, QAL2
Magnesium	35.1	5.00	"		27.5			24.4	20	R2, QAL2
Potassium	6.78	5.00	"		5.20			26.4	20	R2, QAL2
Sodium	59.3	5.00	"		46.1			25.2	20	R2, QAL2
Hardness	2090	5.00	"		1530			31.0	20	R2, QAL2

Matrix Spike (P7H1103-MS1)

Source: 7H10011-01

Prepared: 08/11/17 Analyzed: 08/12/17

Calcium	702	5.00	mg/L	50.0	568	267	75-125			QAL2, QM-07
Magnesium	92.4	5.00	"	50.0	27.5	130	75-125			QAL2, QM-07
Potassium	72.6	5.00	"	50.0	5.20	135	75-125			QM-07, QAL2
Sodium	117	5.00	"	50.0	46.1	142	75-125			QM-07, 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

R3 The RPD exceeded the acceptance limit due to sample matrix effects.

R2 The RPD exceeded the acceptance limit.

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:

8/13/2017

Brent Barron, Laboratory Director/Technical Director

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

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

Fax: (432) 571-7832

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.



CHAIN OF CUSTODY RECORD

7H0011

000134

Facility Name		Analytical Laboratory Name		Today's Date															
Cimarex Energy		PBE Labs		8/16/17															
Address		Address		Page															
600 N. Maricopa Blvd Ste 600		City		Of															
City		State		Zip															
Mesa		AZ		85701															
Sample Group Identifier		Contact Name and Report to:		Analysis/Analytes															
		Christine Alderman																	
Site/Project Name or Identifier		Phone																	
Assault SUD		432-857-7064																	
Special Instructions		Carrier Waybill Number																	
24 hr TAT																			
Station Name or Sample ID	Sample Date	Time 24 hrs	Matrix	Sample Btm	Size	Containers Type No.	Filtered Y N	Preservative	Comments	Oil/Graze E1664A	TPH	Std. H ₂ O analysis	Anion/Cation						
S-1	8/16/17	0828	W			3													
S-2	8/16/17	0945																	
S-3		1024																	
S-3A		1000																	
S-3B		1008																	
S-4		0944																	
S-4A		0948																	
S-4B		1000																	
S-4C		1013																	
S-5		1107																	
S-5A		1024																	
S-5B		1005																	
S-6		0948																	

Notes:

Potential Hazardous Characteristics

☐ Non-Haz ☐ RCRA D001, 283, or 4 ☐ RCRA Listed ☐ Radioactive ☐ Unknown

Sample Disposal

☐ Disposal by Lab ☐ Return to Client ☐ Hold pending further instructions

1. Relinquished by	Date	Time	2. Received by	Date	Time
Sheldon Allen	8/16/17	1200	Christine Alderman	8/16/17	1200

3. Relinquished by	Date	Time	4. Received by	Date	Time

5. Relinquished by	Date	Time	6. Received by	Date	Time
Christine Alderman	8-10-17	1550		8-10-17	1550

Comments

Send invoice to ESH Department

Original - Send to lab with sample

Yellow - Return to ESH

Pink - Remain in book

CHAIN OF CUSTODY RECORD

[illegible]