1005 BOSTON POST ROAD
MADISON, CT 06443

ENVIRONMENTAL
CONSULTING LABORATORIES, INC.

Phone 203-245-0568
Fax 203-318-0830
Connecticut Certification PH-0535
www.eclinconline.com

December 17, 2018

Town of Old Lyme WPCA
Attn: Richard Prendergast
Town Hall
82 Lyme Street
Old Lyme, Ct 06371

RE: Monitoring Well Test Results

Dear Mr Prendergast,

Enclosed is the report of test results for samples collected on November 20, 2018.

As discussed we will collect the next round in January 2019. I will schedule early in the month if there is no snowfall.

Please contact me should you have any questions.

Sincerely,

David C. Barris
Laboratory Director

Enclosure

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REPORT OF TESTS

REPORT PREPARED FOR:

Town of Old Lyme WPCA
83 Lyme Street
Old Lyme, CT 06371

REPORT PREPARED BY:

David C. Barris
Laboratory Director

ENVIRONMENTAL CONSULTING LABORATORIES, INC.
1005 Boston Post Road
Madison, CT 06443

REPORT DATE: December 17, 2018

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INTRODUCTION

ENVIRONMENTAL CONSULTING LABORATORIES, INC., is a State of Connecticut certified public health laboratory. Dedicated to servicing our clients, we offer comprehensive, cost-effective environmental consulting and testing services. Analytical capabilities include testing of industrial effluents, groundwater, hazardous wastes, sewage, sludge, sediment, soils. All sampling and analytical procedures are in accordance with Federal and State regulations.

Environmental Consulting Laboratories, Inc., maintains strict quality control and assurance procedures to ensure data that can be used with confidence. Strict adherence to EPA approved methods, blanks, standards, spikes, and duplicate sample analyses are routine lab practice. In addition, Environmental Consulting Laboratories, Inc., participates in EPA and Connecticut proficiency performance evaluations.

SAMPLE & SITE IDENTIFICATION

Ground water samples were collected by Environmental Consulting Laboratories, Inc., on November 20, 2018. Monitoring wells are identified as HN-1-98, HN-2-98, HN-3-98, HN-4N, HN-5N, HN-6, HN-7, HN-8, HN-9, HN-10 and HN-11. See Site Map in Appendix B

SAMPLING METHODOLOGY

Groundwater samples were taken in accordance with Town of Old Lyme Groundwater Monitoring Standard Operating Procedures. See document in Appendix D.

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Report of Analysis

Name: Old Lyme Town Hall
c/o WPCA
82 Lyme Street
Old Lyme, CT 06371
Attn: Richard Prendergast

Sample Date: 11/20/2018
Receipt Date: 11/20/2018
Report Date: 12/17/2018
Sample Site: HN-1-98

Sample ID#: 121433
Sample Type: Groundwater
Sample Source: Sewer Avoidance Monitoring - Wells
Sampler: ECL - MB

Parameter	Sample Result	Units	Method	MDL	Analysis Date	Analyst
Biological						
Coliform, E. Coli	<10	MPN/100mL	Colilert-18	10	11/20/2018	JB
Coliform, Total	<10	MPN/100mL	Colilert-18	10	11/20/2018	JB
Enterococcus Bacteria	<10	MPN/100mL	Enterolert	10	11/20/2018	JB
Fecal Coliform Bacteria	<10	MPN/100mL	Colilert-18	10	11/20/2018	JB
Fecal Strep Bacteria	<10	col/100ml	SM9230	10	11/20/2018	JB
Chemical						
Ammonia as N	ND	mg/L	ASTM D6919-03	0.05	12/4/2018	KC
Chloride	30.6	mg/L	EPA300.0	0.5	11/20/2018	JB
Nitrate as N	9.31	mg/L	EPA300.0	0.1	11/20/2018	JB
Nitrite as N	ND	mg/L	EPA300.0	0.01	11/20/2018	JB
Phosphorous -Total as P	ND	mg/L	EPA 200.7	0.04	11/29/2018	JM
TKN as N	<0.50	mg/L	4500NorgC	0.5	12/12/2018	KC
Total Nitrogen as N	9.31	mg/L	CALC	1	12/14/2018	KC
Physical						
Conductivity	197	umhos/cm	SM2510B	1	11/20/2018	DB
Turbidity	8.2	NTU	180.1	0.05	11/20/2018	DB

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ND = Not Detected

Comments <= less than our Method Detection Limit.

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Report of Analysis

Name: Old Lyme Town Hall
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82 Lyme Street
Old Lyme, CT 06371
Attn: Richard Prendergast

Sample Date: 11/20/2018
Receipt Date: 11/20/2018
Report Date: 12/17/2018
Sample Site: HN-2-98

Sample ID#: 121434
Sample Type: Groundwater
Sample Source: Sewer Avoidance Monitoring - Wells
Sampler: ECL - MB

Parameter	Sample Result	Units	Method	MDL	Analysis Date	Analyst
Biological						
Coliform, E. Coli	<10	MPN/100mL	Colilert-18	10	11/20/2018	JB
Coliform, Total	75	MPN/100mL	Colilert-18	10	11/20/2018	JB
Enterococcus Bacteria	<10	MPN/100mL	Enterolert	10	11/20/2018	JB
Fecal Coliform Bacteria	<10	MPN/100mL	Colilert-18	10	11/20/2018	JB
Fecal Strep Bacteria	<10	col/100ml	SM9230	10	11/20/2018	JB
Chemical						
Ammonia as N	<0.05	mg/L	ASTM D6919-03	0.05	12/3/2018	KC
Chloride	27.6	mg/L	EPA300.0	0.5	11/20/2018	JB
Nitrate as N	4.80	mg/L	EPA300.0	0.1	11/20/2018	JB
Nitrite as N	ND	mg/L	EPA300.0	0.01	11/20/2018	JB
Phosphorous -Total as P	ND	mg/L	EPA 200.7	0.04	11/29/2018	JM
TKN as N	<0.50	mg/L	4500NorgC	0.5	12/12/2018	KC
Total Nitrogen as N	4.80	mg/L	CALC	1	12/14/2018	KC
Physical						
Conductivity	173	umhos/cm	SM2510B	1	11/20/2018	DB
Turbidity	1.8	NTU	180.1	0.05	11/20/2018	DB

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82 Lyme Street
Old Lyme, CT 06371
Attn: Richard Prendergast

Sample Date: 11/20/2018
Receipt Date: 11/20/2018
Report Date: 12/17/2018
Sample Site: HN-3-98

Sample ID#: 121435
Sample Type: Groundwater
Sample Source: Sewer Avoidance Monitoring - Wells
Sampler: ECL - MB

Parameter	Sample Result	Units	Method	MDL	Analysis Date	Analyst
Biological						
Coliform, E. Coli	<10	MPN/100mL	Colilert-18	10	11/20/2018	JB
Coliform, Total	279	MPN/100mL	Colilert-18	10	11/20/2018	JB
Enterococcus Bacteria	10	MPN/100mL	Enterolert	10	11/20/2018	JB
Fecal Coliform Bacteria	85	MPN/100mL	Colilert-18	10	11/20/2018	JB
Fecal Strep Bacteria	<10	col/100ml	SM9230	10	11/20/2018	JB
Chemical						
Ammonia as N	ND	mg/L	ASTM D6919-03	0.05	12/3/2018	KC
Chloride	18.2	mg/L	EPA300.0	0.5	11/20/2018	JB
Nitrate as N	5.66	mg/L	EPA300.0	0.1	11/20/2018	JB
Nitrite as N	ND	mg/L	EPA300.0	0.01	11/20/2018	JB
Phosphorous -Total as P	0.08	mg/L	EPA 200.7	0.04	11/29/2018	JM
TKN as N	1.52	mg/L	4500NorgC	0.5	12/12/2018	KC
Total Nitrogen as N	7.18	mg/L	CALC	1	12/14/2018	KC
Physical						
Conductivity	167	umhos/cm	SM2510B	1	11/20/2018	DB
Turbidity	50	NTU	180.1	0.05	11/20/2018	DB

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Old Lyme, CT 06371
Attn: Richard Prendergast

Sample Date: 11/20/2018
Receipt Date: 11/20/2018
Report Date: 12/17/2018
Sample Site: HN-4N

Sample ID#: 121436
Sample Type: Groundwater
Sample Source: Sewer Avoidance Monitoring - Wells
Sampler: ECL - MB

Parameter	Sample Result	Units	Method	MDL	Analysis Date	Analyst
Biological						
Coliform, E. Coli	<10	MPN/100mL	Colilert-18	10	11/20/2018	JB
Coliform, Total	759	MPN/100mL	Colilert-18	10	11/20/2018	JB
Enterococcus Bacteria	<10	MPN/100mL	Enterolert	10	11/20/2018	JB
Fecal Coliform Bacteria	<10	MPN/100mL	Colilert-18	10	11/20/2018	JB
Fecal Strep Bacteria	<10	col/100ml	SM9230	10	11/20/2018	JB
Chemical						
Ammonia as N	ND	mg/L	ASTM D6919-03	0.05	12/3/2018	KC
Chloride	70.5	mg/L	EPA300.0	0.5	11/20/2018	JB
Nitrate as N	2.99	mg/L	EPA300.0	0.1	11/20/2018	JB
Nitrite as N	ND	mg/L	EPA300.0	0.01	11/20/2018	JB
Phosphorous -Total as P	0.27	mg/L	EPA 200.7	0.04	11/29/2018	JM
TKN as N	<0.50	mg/L	4500NorgC	0.5	12/12/2018	KC
Total Nitrogen as N	2.99	mg/L	CALC	1	12/14/2018	KC
Physical						
Conductivity	291	umhos/cm	SM2510B	1	11/20/2018	DB
Turbidity	75	NTU	180.1	0.05	11/20/2018	DB

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Attn: Richard Prendergast

Sample Date: 11/20/2018
Receipt Date: 11/20/2018
Report Date: 12/17/2018
Sample Site: HN-5N

Sample ID#: 121437
Sample Type: Groundwater
Sample Source: Sewer Avoidance Monitoring - Wells
Sampler: ECL - MB

Parameter	Sample Result	Units	Method	MDL	Analysis Date	Analyst
Biological						
Coliform, E. Coli	<10	MPN/100mL	Colilert-18	10	11/20/2018	JB
Coliform, Total	1178	MPN/100mL	Colilert-18	10	11/20/2018	JB
Enterococcus Bacteria	30	MPN/100mL	Enterolert	10	11/20/2018	JB
Fecal Coliform Bacteria	20	MPN/100mL	Colilert-18	10	11/20/2018	JB
Fecal Strep Bacteria	<10	col/100ml	SM9230	10	11/20/2018	JB
Chemical						
Ammonia as N	4.51	mg/L	ASTM D6919-03	0.05	12/3/2018	KC
Chloride	50.4	mg/L	EPA300.0	0.5	11/20/2018	JB
Nitrate as N	3.11	mg/L	EPA300.0	0.1	11/20/2018	JB
Nitrite as N	0.01	mg/L	EPA300.0	0.01	11/20/2018	JB
Phosphorous -Total as P	0.43	mg/L	EPA 200.7	0.04	11/29/2018	JM
TKN as N	7.73	mg/L	4500NorgC	0.5	12/12/2018	KC
Total Nitrogen as N	10.9	mg/L	CALC	1	12/14/2018	KC
Physical						
Conductivity	344	umhos/cm	SM2510B	1	11/20/2018	DB
Turbidity	700	NTU	180.1	0.05	11/20/2018	DB

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Attn: Richard Prendergast

Sample Date: 11/20/2018
Receipt Date: 11/20/2018
Report Date: 12/17/2018
Sample Site: HN-6

Sample ID#: 121438
Sample Type: Groundwater
Sample Source: Sewer Avoidance Monitoring - Wells
Sampler: ECL - MB

Parameter	Sample Result	Units	Method	MDL	Analysis Date	Analyst
Biological						
Coliform, E. Coli	<10	MPN/100mL	Colilert-18	10	11/20/2018	JB
Coliform, Total	30	MPN/100mL	Colilert-18	10	11/20/2018	JB
Enterococcus Bacteria	20	MPN/100mL	Enterolert	10	11/20/2018	JB
Fecal Coliform Bacteria	<10	MPN/100mL	Colilert-18	10	11/20/2018	JB
Fecal Strep Bacteria	80	col/100ml	SM9230	10	11/20/2018	JB
Chemical						
Ammonia as N	ND	mg/L	ASTM D6919-03	0.05	12/3/2018	KC
Chloride	37.7	mg/L	EPA300.0	0.5	11/20/2018	JB
Nitrate as N	2.44	mg/L	EPA300.0	0.1	11/20/2018	JB
Nitrite as N	ND	mg/L	EPA300.0	0.01	11/20/2018	JB
Phosphorous -Total as P	ND	mg/L	EPA 200.7	0.04	11/29/2018	JM
TKN as N	0.58	mg/L	4500NorgC	0.5	12/12/2018	KC
Total Nitrogen as N	3.02	mg/L	CALC	1	12/14/2018	KC
Physical						
Conductivity	219	umhos/cm	SM2510B	1	11/20/2018	DB
Turbidity	40	NTU	180.1	0.05	11/20/2018	DB

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Old Lyme, CT 06371
Attn: Richard Prendergast

Sample Date: 11/20/2018
Receipt Date: 11/20/2018
Report Date: 12/17/2018
Sample Site: HN-7

Sample ID#: 121439
Sample Type: Groundwater
Sample Source: Sewer Avoidance Monitoring - Wells
Sampler: ECL - MB

Parameter	Sample Result	Units	Method	MDL	Analysis Date	Analyst
Biological						
Coliform, E. Coli	10	MPN/100mL	Colilert-18	10	11/20/2018	JB
Coliform, Total	1124	MPN/100mL	Colilert-18	10	11/20/2018	JB
Enterococcus Bacteria	<10	MPN/100mL	Enterolert	10	11/20/2018	JB
Fecal Coliform Bacteria	74	MPN/100mL	Colilert-18	10	11/20/2018	JB
Fecal Strep Bacteria	<10	col/100ml	SM9230	10	11/20/2018	JB
Chemical						
Ammonia as N	ND	mg/L	ASTM D6919-03	0.05	12/3/2018	KC
Chloride	233	mg/L	EPA300.0	0.5	11/20/2018	JB
Nitrate as N	0.83	mg/L	EPA300.0	0.1	11/20/2018	JB
Nitrite as N	ND	mg/L	EPA300.0	0.01	11/20/2018	JB
Phosphorous -Total as P	1.06	mg/L	EPA 200.7	0.04	11/29/2018	JM
TKN as N	2.31	mg/L	4500NorgC	0.5	12/12/2018	KC
Total Nitrogen as N	3.14	mg/L	CALC	1	12/14/2018	KC
Physical						
Conductivity	864	umhos/cm	SM2510B	1	11/20/2018	DB
Turbidity	1800	NTU	180.1	0.05	11/20/2018	DB

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Old Lyme, CT 06371
Attn: Richard Prendergast

Sample Date: 11/20/2018
Receipt Date: 11/20/2018
Report Date: 12/17/2018
Sample Site: HN-8

Sample ID#: 121440
Sample Type: Groundwater
Sample Source: Sewer Avoidance Monitoring - Wells
Sampler: ECL - MB

Parameter	Sample Result	Units	Method	MDL	Analysis Date	Analyst
Biological						
Coliform, E. Coli	<10	MPN/100mL	Colilert-18	10	11/20/2018	JB
Coliform, Total	2064	MPN/100mL	Colilert-18	10	11/20/2018	JB
Enterococcus Bacteria	31	MPN/100mL	Enterolert	10	11/20/2018	JB
Fecal Coliform Bacteria	10	MPN/100mL	Colilert-18	10	11/20/2018	JB
Fecal Strep Bacteria	<10	col/100ml	SM9230	10	11/20/2018	JB
Chemical						
Ammonia as N	ND	mg/L	ASTM D6919-03	0.05	12/3/2018	KC
Chloride	60.3	mg/L	EPA300.0	0.5	11/20/2018	JB
Nitrate as N	2.64	mg/L	EPA300.0	0.1	11/20/2018	JB
Nitrite as N	ND	mg/L	EPA300.0	0.01	11/20/2018	JB
Phosphorous -Total as P	0.49	mg/L	EPA 200.7	0.04	11/29/2018	JM
TKN as N	2.26	mg/L	4500NorgC	0.5	12/12/2018	KC
Total Nitrogen as N	4.90	mg/L	CALC	1	12/14/2018	KC
Physical						
Conductivity	252	umhos/cm	SM2510B	1	11/20/2018	DB
Turbidity	700	NTU	180.1	0.05	11/20/2018	DB

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Old Lyme, CT 06371
Attn: Richard Prendergast

Sample Date: 11/20/2018
Receipt Date: 11/20/2018
Report Date: 12/17/2018
Sample Site: HN-9

Sample ID#: 121441
Sample Type: Groundwater
Sample Source: Sewer Avoidance Monitoring - Wells
Sampler: ECL - MB

Parameter	Sample Result	Units	Method	MDL	Analysis Date	Analyst
Biological						
Coliform, E. Coli	<10	MPN/100mL	Colilert-18	10	11/20/2018	JB
Coliform, Total	85	MPN/100mL	Colilert-18	10	11/20/2018	JB
Enterococcus Bacteria	<10	MPN/100mL	Enterolert	10	11/20/2018	JB
Fecal Coliform Bacteria	<10	MPN/100mL	Colilert-18	10	11/20/2018	JB
Fecal Strep Bacteria	<10	col/100ml	SM9230	10	11/20/2018	JB
Chemical						
Ammonia as N	0.44	mg/L	ASTM D6919-03	0.05	12/3/2018	KC
Chloride	4541	mg/L	EPA300.0	0.5	11/20/2018	JB
Nitrate as N	<0.10	mg/L	EPA300.0	0.1	11/20/2018	JB
Nitrite as N	ND	mg/L	EPA300.0	0.01	11/20/2018	JB
Phosphorous -Total as P	0.32	mg/L	EPA 200.7	0.04	11/29/2018	JM
TKN as N	2.15	mg/L	4500NorgC	0.5	12/12/2018	KC
Total Nitrogen as N	2.15	mg/L	CALC	1	12/14/2018	KC
Physical						
Conductivity	7550	umhos/cm	SM2510B	1	11/20/2018	DB
Turbidity	170	NTU	180.1	0.05	11/20/2018	DB

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Attn: Richard Prendergast

Sample Date: 11/20/2018
Receipt Date: 11/20/2018
Report Date: 12/17/2018
Sample Site: HN-10

Sample ID#: 121442
Sample Type: Groundwater
Sample Source: Sewer Avoidance Monitoring - Wells
Sampler: ECL - MB

Parameter	Sample Result	Units	Method	MDL	Analysis Date	Analyst
Biological						
Coliform, E. Coli	10	MPN/100mL	Colilert-18	10	11/20/2018	JB
Coliform, Total	355	MPN/100mL	Colilert-18	10	11/20/2018	JB
Enterococcus Bacteria	<10	MPN/100mL	Enterolert	10	11/20/2018	JB
Fecal Coliform Bacteria	<10	MPN/100mL	Colilert-18	10	11/20/2018	JB
Fecal Strep Bacteria	<10	col/100ml	SM9230	10	11/20/2018	JB
Chemical						
Ammonia as N	0.26	mg/L	ASTM D6919-03	0.05	12/3/2018	KC
Chloride	1263	mg/L	EPA300.0	0.5	11/20/2018	JB
Nitrate as N	0.26	mg/L	EPA300.0	0.1	11/20/2018	JB
Nitrite as N	ND	mg/L	EPA300.0	0.01	11/20/2018	JB
Phosphorous -Total as P	ND	mg/L	EPA 200.7	0.04	11/29/2018	JM
TKN as N	1.11	mg/L	4500NorgC	0.5	12/12/2018	KC
Total Nitrogen as N	1.37	mg/L	CALC	1	12/14/2018	KC
Physical						
Conductivity	2760	umhos/cm	SM2510B	1	11/20/2018	DB
Turbidity	32	NTU	180.1	0.05	11/20/2018	DB

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82 Lyme Street
Old Lyme, CT 06371
Attn: Richard Prendergast

Sample Date: 11/20/2018
Receipt Date: 11/20/2018
Report Date: 12/17/2018
Sample Site: HN-11

Sample ID#: 121443
Sample Type: Groundwater
Sample Source: Sewer Avoidance Monitoring - Wells
Sampler: ECL - MB

Parameter	Sample Result	Units	Method	MDL	Analysis Date	Analyst
Biological						
Coliform, E. Coli	<10	MPN/100mL	Colilert-18	10	11/20/2018	JB
Coliform, Total	>24196	MPN/100mL	Colilert-18	10	11/20/2018	JB
Enterococcus Bacteria	<10	MPN/100mL	Enterolert	10	11/20/2018	JB
Fecal Coliform Bacteria	<10	MPN/100mL	Colilert-18	10	11/20/2018	JB
Fecal Strep Bacteria	<10	col/100ml	SM9230	10	11/20/2018	JB
Chemical						
Ammonia as N	ND	mg/L	ASTM D6919-03	0.05	12/3/2018	KC
Chloride	8022	mg/L	EPA300.0	0.5	11/20/2018	JB
Nitrate as N	0.92	mg/L	EPA300.0	0.1	11/20/2018	JB
Nitrite as N	ND	mg/L	EPA300.0	0.01	11/20/2018	JB
Phosphorous -Total as P	0.23	mg/L	EPA 200.7	0.04	11/29/2018	JM
TKN as N	1.26	mg/L	4500NorgC	0.5	12/12/2018	KC
Total Nitrogen as N	2.18	mg/L	CALC	1	12/14/2018	KC
Physical						
Conductivity	12620	umhos/cm	SM2510B	1	11/20/2018	DB
Turbidity	46	NTU	180.1	0.05	11/20/2018	DB

DAVID BARRIS - LABORATORY DIRECTOR

ND = Not Detected

Comments > 24196 = Greater than test dilution setup range.
< = less than our Method Detection Limit.

APPENDIX A

ENVIRONMENTAL
CONSULTING LABORATORIES, INC.

1005 Boston Post Road
Madison, CT 06443

(203) 245-0568 Phone
(203) 318-0830 Fax

Client: **Old Lyme Town Hall**
Contact: **C/O WPCA Richard Prendergast**
Address: **52 Lyme St. Old Lyme, CT 06371**
Phone: **203-641-1237** Email: **chairWPCA@oldlyme-ct.gov**

Project: **Sewer Avoidance Program Monitoring Wells**

System Type:

Samplers Name: (Print) M Barris

Client I.D.	Sampling Location	Date	Time	Sample Type: Water	Sample Type: Grab	Number of Containers	Required Analysis: Total Coliform + Ecoli	Fecal Coliform	Enterococci, Fecal Strep	Phosphorus- Total	Nitrate/Nitrite, TKN, TN	Ammonia, Chloride	Conductivity, pH	Turbidity	ECL Sample I.D.#
	HN-1-98	11-20	11:08Am	X	X	5	X	X	X	X	X	X	X	X	121433
	HN-2-98		9:38Am	X	X	5	X	X	X	X	X	X	X	X	121434
	HN-3-98		9:55Am	X	X	5	X	X	X	X	X	X	X	X	121435
	HN-4N		10:52Am	X	X	5	X	X	X	X	X	X	X	X	121436
	HN-5N		10:13Am	X	X	5	X	X	X	X	X	X	X	X	121437
	HN-6		11:26Am	X	X	5	X	X	X	X	X	X	X	X	121438
	HN-7		11:40Am	X	X	5	X	X	X	X	X	X	X	X	121439
	HN-8		10:36Am	X	X	5	X	X	X	X	X	X	X	X	121440
	HN-9		9:19Am	X	X	5	X	X	X	X	X	X	X	X	121441
	HN-10		8:50Am	X	X	5	X	X	X	X	X	X	X	X	121442
	HN-11		8:20Am	X	X	5	X	X	X	X	X	X	X	X	121443

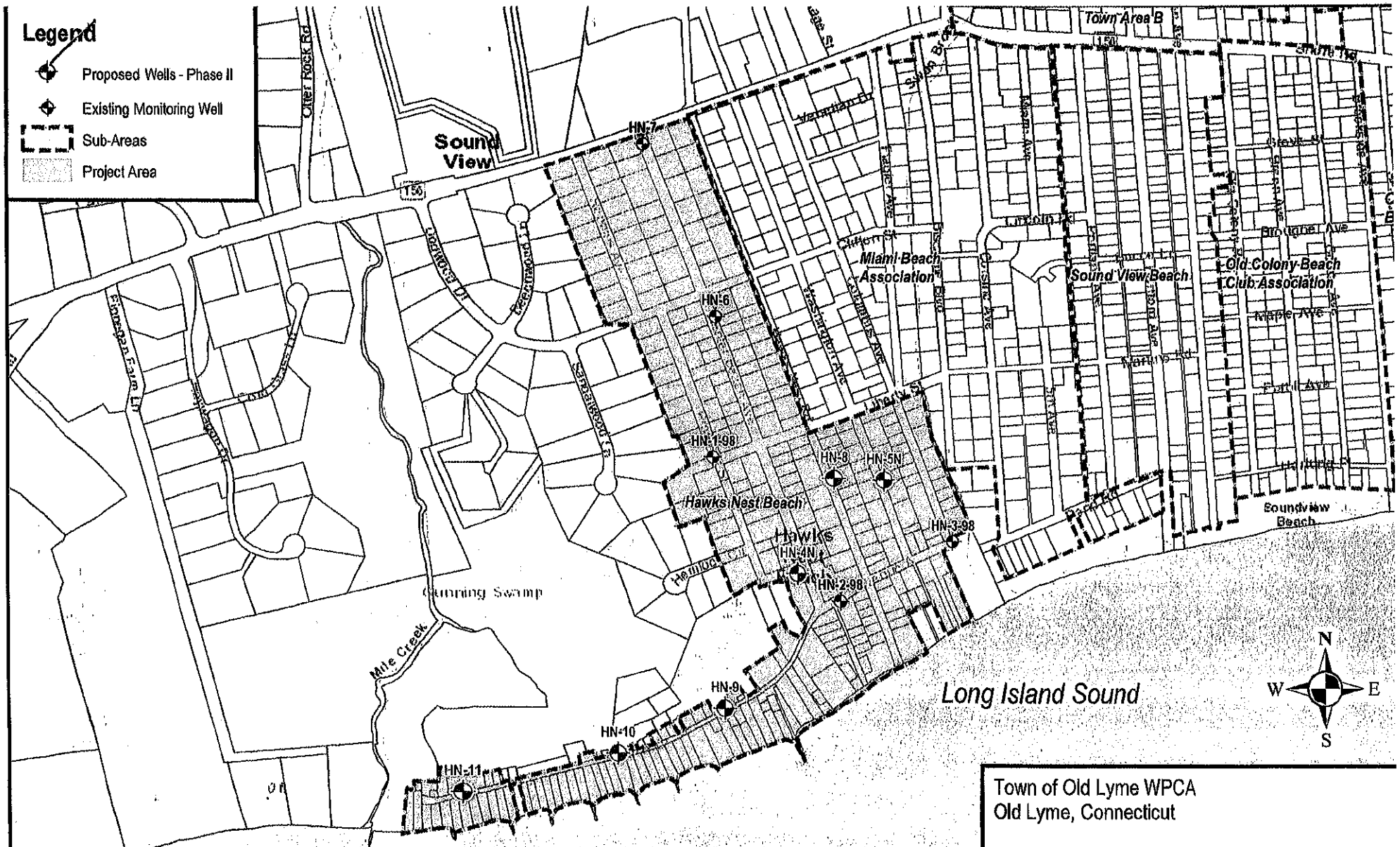
Relinquished by: [signature] Date: 11-20-18 Time: 1:30pm Received by: Andrew Barris

Relinquished by: Date: Time: Received by:

Were Samples received within holding time? (Y) N
Were Samples chilled upon reciept? (Y) N 3.8° C
Were Samples in appropriate containers? (Y) N
If No Explain

Are containers broken/leaking? Y (N)
Did Samples need to be split upon receipt? Y (N)
Were Samples preserved properly? (Y) N
~~If No type needed~~

APPENDIX B



Service Layer Credits: Sources: Esri, HERE, DeLorme, Intermap, Increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap

Notes:
1. Groundwater monitoring well locations are approximated based on Monitoring Well Location Plan, Prepared for Old Lyme WPCA, by J. Robert Pfanner & Associates, P.C., dated May 23, 2017.
2. Proposed locations for the new wells are subject to change based on a review of Site conditions and input from stakeholders.

Town of Old Lyme WPCA
Old Lyme, Connecticut

Proposed Areas for Additional Groundwater Monitoring

Figure 1

WOODARD &CURRAN

SCALE: 1 in = 600 ft	DRAWN BY: ACB
DATE: May 2018	JOB NO.: 226617
DOC: Figure1_Proposed_update05-25-18.mxd	

APPENDIX C

GROUND WATER SAMPLE LOG

1. Sample Location: OL
2. Well Number: I-IN-1-98
3. Sampled By: MB
4. Date: 11-20
5. Time: 11:08 Am
6. Weather:

(Cloudy)	(Cold)	Snow
Sunny	Warm	(Rain)
Hot	Windy	

7. Sample Method: **Bailer (Disposable)**
8. Depth to bottom of well from measuring point: 20.10 Feet
9. Depth to Water: 10.10 Feet
10. #8 - #9= LWC: 10 Feet (**Length of water column**)
11. Diameter of inner casings: (2") 4" 6"
12. Volume of water in well:

    (2") Diameter well = 0.163 x LWC = 1.63 Gallons

    4" Diameter Well = 0.633 x LWC = _____ Gallons

    6" Diameter Well = 1.467 x LWC = _____ Gallons

13. Purge Volume: 3 x #12 = 4.89 Gallons to purge

Town of Old Lyme

FIELD WATER QUALITY MEASURMENTS FORM

Location (Site/Facility Name) - Old Lyme

Well Number HIV-1-98 Date 11-20-18

Clock Time 24 HR		Depth To Water			pH		Temperature			Comments
11:08AM		10.10			4.98		13.3°	C		—

GROUND WATER SAMPLE LOG

1. Sample Location: OL
2. Well Number: HN-2-98
3. Sampled By: MB
4. Date: 11-20
5. Time: 9:38 Am
6. Weather:

~~Cloudy~~	~~Cold~~	Snow
Sunny	Warm	Rain
Hot	Windy	

7. Sample Method: **Bailer (Disposable)**
8. Depth to bottom of well from measuring point: 15.60 Feet
9. Depth to Water: 6.90 Feet
10. #8 - #9= LWC: 8.7 Feet (**Length of water column**)
11. Diameter of inner casings: (2") 4" 6"
12. Volume ~~of~~ water in well:
    2" Diameter well = 0.163 x LWC = 1.42 Gallons
    4" Diameter Well = 0.633 x LWC = _____ Gallons
    6" Diameter Well = 1.467 x LWC = _____ Gallons
13. Purge Volume: 3 x #12 = 4.25 Gallons to purge

Town of Old Lyme

FIELD WATER QUALITY MEASURMENTS FORM

Location (Site/Facility Name) - Old Lyme

Well Number HV-2-98 Date 11-20-18

Clock Time 24 HR		Depth To Water			pH		Temperature			Comments
9:38 AM		6.90			5.79		12.5 °C			—

GROUND WATER SAMPLE LOG

1. Sample Location: OL
2. Well Number: HN-3-98
3. Sampled By: MB
4. Date: 11-20
5. Time: 9:55 Am
6. Weather: ~~Cloudy~~ ~~Cold~~ Snow
   Sunny Warm ~~Rain~~
   Hot Windy
7. Sample Method: **Bailer (Disposable)**
8. Depth to bottom of well from measuring point: 13.0 Feet
9. Depth to Water: 5.10 Feet
10. #8 - #9= LWC: 7.9 Feet (**Length of water column**)
11. Diameter of inner casings: (2") 4" 6"
12. Volume of water in well:
    (2") Diameter well = 0.163 x LWC = 1.29 Gallons
    4" Diameter Well = 0.633 x LWC = _____ Gallons
    6" Diameter Well = 1.467 x LWC = _____ Gallons
13. Purge Volume: 3 x #12 = 3.86 Gallons to purge

Town of Old Lyme

FIELD WATER QUALITY MEASURMENTS FORM

Location (Site/Facility Name) - Old Lyme

Well Number HW-3-98 Date 11-20-18

Clock Time 24 HR		Depth To Water			pH		Temperature			Comments
9:55		5.10			5.85		14.2°C			—

GROUND WATER SAMPLE LOG

1. Sample Location: OL
2. Well Number: HN-4N
3. Sampled By: MB
4. Date: 11-20
5. Time: 10:52AM
6. Weather: (Cloudy) (Cold) Snow
   Sunny Warm (Rain)
   Hot Windy
7. Sample Method: **Bailer (Disposable)**
8. Depth to bottom of well from measuring point: 16.30 Feet
9. Depth to Water: 8.90 Feet
10. #8 - #9= LWC: 7.40 Feet (**Length of water column**)
11. Diameter of inner casings: (2") 4" 6"
12. Volume of water in well:
    (2") Diameter well = 0.163 x LWC = 1.21 Gallons

    4" Diameter Well = 0.633 x LWC = _____ Gallons

    6" Diameter Well = 1.467 x LWC = _____ Gallons
13. Purge Volume: 3 x #12 = 3.63 Gallons to purge

Town of Old Lyme

FIELD WATER QUALITY MEASURMENTS FORM

Location (Site/Facility Name) - Old Lyme

Well Number HN-4N Date 11-20-18

Clock Time 24 HR		Depth To Water			pH		Temperature			Comments
1052	AM	8.90			4.96		14°C			—

GROUND WATER SAMPLE LOG

1. Sample Location: OL
2. Well Number: HIV-5N
3. Sampled By: MB
4. Date: 11-20
5. Time: 10:13 AM
6. Weather:

Cloudy	Cold	Snow
Sunny	Warm	Rain
Hot	Windy	

7. Sample Method: **Bailer (Disposable)**
8. Depth to bottom of well from measuring point: 12.90 Feet
9. Depth to Water: 4.30 Feet
10. #8 - #9= LWC: 8.6 Feet (**Length of water column**)
11. Diameter of inner casings: 2" 4" 6"
12. Volume of water in well:

2" Diameter well = 0.163 x LWC = 1.40 Gallons

4" Diameter Well = 0.633 x LWC = _____ Gallons

6" Diameter Well = 1.467 x LWC = _____ Gallons

13. Purge Volume: 3 x #12 = 4.2 Gallons to purge

Town of Old Lyme

FIELD WATER QUALITY MEASURMENTS FORM

Location (Site/Facility Name) - Old Lyme

Well Number HN-5N Date 11-2e-18

Clock Time 24 HR		Depth To Water			pH		Temperature			Comments
10:13AM		4.30			6.10		7.2°C			—

GROUND WATER SAMPLE LOG

1. Sample Location: OL
2. Well Number: HN-6
3. Sampled By: MB
4. Date: 11-20
5. Time: 11:26Am
6. Weather: ~~Cloudy~~ (Cold) Snow
   Sunny Warm ~~Rain~~
   Hot Windy
7. Sample Method: **Bailer (Disposable)**
8. Depth to bottom of well from measuring point: 13.0 Feet
9. Depth to Water: 8.50 Feet
10. #8 - #9= LWC: 4.5 Feet (**Length of water column**)
11. Diameter of inner casings: (2") 4" 6"
12. Volume of water in well:
    (2") Diameter well = 0.163 x LWC = .73 Gallons
    4" Diameter Well = 0.633 x LWC = _____ Gallons
    6" Diameter Well = 1.467 x LWC = _____ Gallons
13. Purge Volume: 3 x #12 = 2.2 Gallons to purge

Town of Old Lyme

FIELD WATER QUALITY MEASURMENTS FORM

Location (Site/Facility Name) - Old Lyme

Well Number HV-6 Date 11-20-18

Clock Time 24 HR		Depth To Water			pH		Temperature			Comments
11:20am		8.50			5.46		12.5°	C		—

GROUND WATER SAMPLE LOG

1. Sample Location: OL
2. Well Number: HN-7
3. Sampled By: MB
4. Date: 11-20
5. Time: 11:40 Am
6. Weather:

~~Cloudy~~	~~Cold~~	Snow
Sunny	Warm	~~Rain~~
Hot	Windy	

7. Sample Method: **Bailer (Disposable)**
8. Depth to bottom of well from measuring point: 16.80 Feet
9. Depth to Water: 7.60 Feet
10. #8 - #9= LWC: 9.2 Feet (**Length of water column**)
11. Diameter of inner casings: 2" 4" 6"
12. Volume of water in well:
    - 2" Diameter well = 0.163 x LWC = 1.5 Gallons
    - 4" Diameter Well = 0.633 x LWC = _____ Gallons
    - 6" Diameter Well = 1.467 x LWC = _____ Gallons
13. Purge Volume: 3 x #12 = 4.5 Gallons to purge

Town of Old Lyme

FIELD WATER QUALITY MEASURMENTS FORM

Location (Site/Facility Name) - Old Lyme

Well Number HN-7 Date 11-20-18

Clock Time 24 HR		Depth To Water			pH		Temperature			Comments
11:40am		7.60			5.54		13°	C		—

GROUND WATER SAMPLE LOG

1. Sample Location: OL
2. Well Number: HW-8
3. Sampled By: MB
4. Date: 11-20
5. Time: 10:36am
6. Weather: (Cloudy) ~~Cold~~ ~~Snow~~
   Sunny Warm ~~Rain~~
   Hot Windy
7. Sample Method: **Bailer (Disposable)**
8. Depth to bottom of well from measuring point: 11.90 Feet
9. Depth to Water: 5.20 Feet
10. #8 - #9= LWC: 6.7 Feet (**Length of water column**)
11. Diameter of inner casings: (2") 4" 6"
12. Volume of water in well:
    (2") Diameter well = 0.163 x LWC = 1.1 Gallons

    4" Diameter Well = 0.633 x LWC = _____ Gallons

    6" Diameter Well = 1.467 x LWC = _____ Gallons
13. Purge Volume: 3 x #12 = 3.3 Gallons to purge

Town of Old Lyme

FIELD WATER QUALITY MEASURMENTS FORM

Location (Site/Facility Name) - Old Lyme

Well Number HN-8 Date 11-20-18

Clock Time 24 HR		Depth To Water			pH		Temperature			Comments
10:36AM		5.20			5.42		12° C			—

GROUND WATER SAMPLE LOG

1. Sample Location: OL
2. Well Number: HN-9
3. Sampled By: MB
4. Date: 11-20
5. Time: 9:19 AM
6. Weather: (Cloudy) Sunny Hot (Cold) Warm Windy (Snow) (Rain)
7. Sample Method: **Bailer (Disposable)**
8. Depth to bottom of well from measuring point: 11.40 Feet
9. Depth to Water: 2.90 Feet
10. #8 - #9= LWC: 8.5 Feet (**Length of water column**)
11. Diameter of inner casings: (2") 4" 6"
12. Volume of water in well:
    (2") Diameter well = 0.163 x LWC = 1.4 Gallons
    4" Diameter Well = 0.633 x LWC = _____ Gallons
    6" Diameter Well = 1.467 x LWC = _____ Gallons
13. Purge Volume: 3 x #12 = 4.2 Gallons to purge

Town of Old Lyme

FIELD WATER QUALITY MEASURMENTS FORM

Location (Site/Facility Name) - Old Lyme

Well Number HN-9 Date 11-20-18

Clock Time 24 HR		Depth To Water			pH		Temperature			Comments
9:19 AM		2.90			6.75		12.4 °C			—

GROUND WATER SAMPLE LOG

1. Sample Location: OL
2. Well Number: HN-10
3. Sampled By: MB
4. Date: 11-20
5. Time: 8:50Am
6. Weather: ~~Cloudy~~ ~~Cold~~ Snow
   Sunny Warm ~~Rain~~
   Hot Windy
7. Sample Method: **Bailer (Disposable)**
8. Depth to bottom of well from measuring point: 11.50 Feet
9. Depth to Water: 3.10 Feet
10. #8 - #9= LWC: 8.40 Feet (**Length of water column**)
11. Diameter of inner casings: 2" 4" 6"
12. Volume of water in well:
    2" Diameter well = 0.163 x LWC = 1.37 Gallons
    4" Diameter Well = 0.633 x LWC = _____ Gallons
    6" Diameter Well = 1.467 x LWC = _____ Gallons
13. Purge Volume: 3 x #12 = 4.10 Gallons to purge

Town of Old Lyme

FIELD WATER QUALITY MEASURMENTS FORM

Location (Site/Facility Name) - Old Lyme

Well Number HN-10 Date 11-20-18

Clock Time 24 HR		Depth To Water			pH		Temperature			Comments
8:50AM		3.10			6.27		9.9 °C			—

GROUND WATER SAMPLE LOG

1. Sample Location: OL
2. Well Number: HN-11
3. Sampled By: MB
4. Date: 11-20
5. Time: 8:20Am
6. Weather: ~~Cloudy~~ Cold Snow
   Sunny Warm ~~Rain~~
   Hot Windy
7. Sample Method: **Bailer (Disposable)**
8. Depth to bottom of well from measuring point: 11.40 Feet
9. Depth to Water: 4.0 Feet
10. #8 - #9= LWC: 7.40 Feet (**Length of water column**)
11. Diameter of inner casings: (2") 4" 6"
12. Volume of water in well:
    (2") Diameter well = 0.163 x LWC = 1.2 Gallons

    4" Diameter Well = 0.633 x LWC = _____ Gallons

    6" Diameter Well = 1.467 x LWC = _____ Gallons
13. Purge Volume: 3 x #12 = 3.62 Gallons to purge

Town of Old Lyme

FIELD WATER QUALITY MEASURMENTS FORM

Location (Site/Facility Name) - Old Lyme

Well Number HN-11 Date 11-20-18

Clock Time 24 HR		Depth To Water			pH		Temperature			Comments
8:20AM		4.0			6.37		12.8°	C		—

APPENDIX D

Town of Old Lyme Ground Water Monitoring

SAMPLING SOP Rev 4 - Environmental Consulting Lab

Groundwater Monitoring Wells

Bailer Purge Technique

Overview:

Stagnant water must be removed from the monitoring well in order to obtain an accurate sample of groundwater for laboratory analysis.

This SOP will address the bailing and sampling procedures to be taken.

Safety:

Prior to sampling, field personnel should conduct a preliminary assessment of the area to determine any safety hazards.

Placement of traffic cones, safety vests and truck hazard lights should be used.

Minimize monitoring well water contact with potential personal protective equipment i.e. safety glasses & nitrile gloves.

Procedure:

Prior to purging the well, observe for any physical problems with monitoring well, ie: lock present, well cap broken or missing, condition of casing, etc.

Measure groundwater to the nearest hundredth of inch record on field sheet with time of measurement. Calculate the volume of standing water to purge a minimum of three volumes using prior readings of depth to bottom, to avoid agitating fines that may have accumulated on the bottom of the well.

A separate new bailer will be used for each well to minimize the potential for cross contamination of sampling equipment.

Lower bailer into monitoring well in a manner as to create minimum water disturbance. Repeat this process until three well volumes have been purged.

Following purging of three well volumes, measure pH and Temperature of the groundwater and record on field worksheet.

Sample Collection:

1. Do not rinse or empty bottles. Several bottles contain a preservative that must remain in the bottle.

2. If there is an overflow while filling a sample bottle that contains preservatives, restart the procedure using a new sample bottle.

3. If one bottle is to be used for several different tests, be sure there are no conflicts with preservation requirements.

Field Logs:

Use the Ground Water Sample Log (attached) to record all field information. Include Well ID, Date and Time, Weather, readings, observations and calculations for purge volume

Complete the Chain of Custody form (attached). Include sample ID/location, date and time.

The following pages contain specific sampling instructions and procedures that are dependent on analyte type.

GROUP:
Inorganics

SUBGROUP:

Chloride,Nitrate,Nitrite

BOTTLE: 500-mL

Preservative: Chill to 4 degrees C.

Holding Time: 48 Hrs

Test Method: EPA 300.1 Ion Chromatograpy

PROCEDURE

1. Using waterproof ink, fill out and attach label. At a minimum, include the Well ID number, sampling point and date.
2. Remove the sampling container cap. Be careful not to touch the inside of the sampling container or cap with your fingers. When possible, hold the sampling container in one hand and the cap in the other or set the cap on a clean surface. Quickly position the sampling container under the water flow.
3. Fill to the shoulder of the container. Do not over fill.
4. Quickly remove the sampling container from the water flow.
5. Replace cap and tighten.
6. Completely fill out the chain of custody form.
7. Sample must be placed in coolers for laboratory submittal.

GROUP:
Bacteria

Total/ Fecal
Coliforms,
Enterococci, Fecal
Strep

BOTTLE: (4) 120 mL sterile plastic bottle

Preservative: Chill to 4 degrees C.

Holding Time: 8 Hrs.

Test Methods: Colilert-18, Enterolert, SM9230

PROCEDURE

1. Using waterproof ink, fill out and attach label. At a minimum, include the Well ID number, sampling point and date.
2. Remove the sampling container cap. Be careful not to touch the inside of the sampling container or cap with your fingers. When possible, hold the sampling container in one hand and the cap in the other or set the cap on a clean surface. Quickly position the sampling container under the water flow.
3. Fill to at least the 100 mL mark. Leave some air space.
4. Quickly remove the sampling container from the waterflow.
5. Replace cap and tighten.
6. Completely fill out the chain of custody form.
7. Sample must be placed in coolers for laboratory submittal.

GROUP:
Inorganic

SUBGROUP:

Phosphorus-Total

BOTTLE: One 125 ml

Preservative: PH<2 1:1 Nitric Acid

Test Method: EPA 200.7 ICP

PROCEDURE:

1. Using waterproof ink, fill out and attach label. At a minimum, include the Well ID number, sampling point and date.
2. Remove the sampling container cap. Be careful not to touch the inside of the sampling container or cap with your fingers. When possible, hold the sampling container in one hand and the cap in the other or set the cap on a clean surface. Quickly position the sampling container under the water flow.
3. Fill to the shoulder of the container. Do not over fill.
4. Quickly remove the sampling container from the water flow.
5. Bottle contains Nitric Acid Preservative.
6. Replace cap and tighten.
7. Completely fill out the chain of custody form.
8. Sample must be placed in coolers for laboratory submittal.

GROUP:
Inorganic

SUBGROUP:
Ammonia, TKN

BOTTLE: 125-mL

Preservative: PH <2 with 1:1 Sulfuric Acid

Holding time: 28 Days

Test Method: ASTM D6919-03, SM 4500-Norg C

PROCEDURE

1. Using waterproof ink, fill out and attach label. At a minimum, include the Well ID number, sampling point and date.
2. Remove the sampling container cap. Be careful not to touch the inside of the sampling container or cap with your fingers. When possible, hold the sampling container in one hand and the cap in the other or set the cap on a clean surface. Quickly position the sampling container under the water flow.
3. Fill to the shoulder of the container. Do not over fill.
4. Quickly remove the sampling container from the water flow.
5. Bottle contains Sulfuric Acid Preservative.
6. Replace cap and tighten.
7. Completely fill out the chain of custody form.
8. Sample must be placed in coolers for laboratory submittal