GeoInsight®
Environmental Strategy & Engineering

September 21, 2018 GeoInsight Project 8908-000

United States Environmental Protection Agency
Office of Ecosystem Protection
EPA/OEP RGP Applications Coordinator
5 Post Office Square - Suite 100 (OEP06-01)
Boston, MA 02109-3912

RE: Notice of Intent – Remediation General Permit
Nouria Retail Fueling Station
356 Lowell Street
Wakefield, Massachusetts

To Whom It May Concern:

GeoInsight Inc. (GeoInsight) prepared the attached Notice of Intent (NOI) for the Remediation General Permit (RGP) at the request of Nouria Energy Corporation (Nouria). A copy of the NOI is provided in Attachment A.

The purpose of this submittal is to obtain a permit to temporarily discharge water generated during redevelopment activities at 356 Lowell Street in Wakefield, Massachusetts (herein referred to as the "Property"). Property redevelopment activities will include the removal and replacement of underground storage tanks (USTs) and dewatering during the UST replacement activities will be necessary. Refer to Figure 1 for the location of the Property and Figure 2 for Property features.

BACKGROUND

The Property is currently an active Shell-branded gasoline service station with an area of approximately 0.86 acres located on the northwest corner of the intersection between Lowell Street and Vernon Street. The Property is bounded by the Dolbeare Elementary School to the north. Residential and/or commercial properties are located top the east, west and south.

Three Massachusetts Department of Environmental Protection (MADEP) Release Tracking Numbers (RTNs) associated with historical releases of petroleum are located at the Property according to the online MADEP Data Portal (RTNs 3-3080, 3-28019, and 3-30180). The MADEP Data Portal indicates that response actions under the Massachusetts Contingency Plan (MCP 310 CMR 40.0000) have been completed for these RTNs but residual petroleum impacts

GeoInsight, Inc.
186 Granite Street, 3rd Floor, Suite A
Manchester, NH 03101-2643
Tel (603) 314-0820
Fax (603) 314-0821
www.geoinsight.com

GeoInsight, Inc.
One Monarch Drive, Suite 201
Littleton, MA 01460-1440
Tel (978) 679-1600
Fax (978) 679-1601
www.geoinsight.com

GeoInsight, Inc.
200 Court Street, 2nd Floor
Middletown, CT 06457-3341
Tel (860) 894-1022
Fax (860) 894-1023
www.geoinsight.com

to soil and groundwater remain in some areas at the Property. The approximate Universal Transverse Mercator (UTM) and latitude/longitude coordinates for the approximate center of the Property are as follows:

UTM Coordinates (Zone 19)	Latitude & Longitude Coordinates
4,709,348 meters North	42.51778° North
330,424 meters East	71.06417° West

Excavations at the Property are anticipated to be conducted to approximately 14 feet below ground surface (bgs) to facilitate the installation of three 12,000-gallon double-walled fiberglass USTs. The new USTs will be installed in the same approximate location as the existing USTs. Based upon studies conducted to date, depth to groundwater is anticipated to be approximately 5 to 6 feet bgs. Property features and the proposed redevelopment areas are shown on the MHF Design Consultant *Tank & Piping Plan* (Sheet 2 of 7) included in Attachment B.

Dewatering will be conducted from one or more sumps located inside the excavation area for the new USTs. Dewatering will be necessary to control groundwater seepage, precipitation, surface water runoff, and possible construction-generated water to enable installation of the new USTs to occur in a relatively dry environment. Below grade construction is anticipated to start in September 2018. Dewatering is anticipated to occur between approximately September and October 2018.

REMEDIATION GENERAL PERMIT NOTICE OF INTENT

On July 31, 2018, groundwater samples were obtained from a monitoring well designated MW-TP1, located adjacent to the USTs on the Property. Prior to sampling, groundwater was purged using a peristaltic pump, disposable polyethylene tubing, and modified low-flow sampling techniques. Field parameters (i.e., temperature, pH, dissolved oxygen, oxidation-reduction potential, and specific conductivity) were measured during purging, and the groundwater samples were collected when the field parameters stabilized.

The groundwater samples were submitted to Alpha Analytical Laboratory of Westborough, Massachusetts (Alpha) for analysis of RGP permit parameters. The groundwater samples were analyzed for volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), total metals, total petroleum hydrocarbons (TPH), polychlorinated biphenyls (PCBs), total suspended solids (TSS), chloride, cyanide, ammonia, hardness, and total residual chlorine (TRC). The analytical results for the groundwater sample identified that concentrations of iron above applicable RGP effluent limits.

On July 31 and August 9, 2018, samples were collected from the receiving water body, an unnamed stream/wetland that flows to the Mill River (segment MA93-31) and field analyzed for temperature and pH. Samples from the receiving water body were also collected for laboratory analysis of ammonia, hardness, and total metals.

During the dewatering process, groundwater will be pumped from the excavation into one or more sedimentation tanks and/or through bag filters to remove suspended solids. Supplemental chemical treatment may be needed to reduce iron concentrations to meet the USEPA effluent limits. Preliminary design of the system includes flocculent AP201 and a coagulant WC500, which are routinely used to reduce iron concentrations during dewatering activities. Estimates on the frequency, duration, and magnitude of flocculent AP201 and coagulant WC500 used in the treatment system under maximum system design flow (50 gallons per minute) are included in Appendix C. It can be noted, that the addition of such chemicals: 1) will not add pollutants in concentrations which exceed permit effluent limitations; 2) will not exceed applicable water quality standard; and 3) will not add pollutants that would justify the application of permit conditions that are different from or absent in this permit.

The schematics for a supplemental treatment system that includes a clarifier aeration tank, a flocculant feeding point, bag filters, and an optional resin vessel are in Attachment C. The Material Safety Data Sheets for flocculent AP201 and a coagulant WC500 that are routinely used to reduce iron concentrations during dewatering activities are also included in Attachment C. Final system design is being evaluated with the treatment system suppliers.

Dewatering under this RGP NOI will include piping and discharging to storm drains located on the southeast side of the Property. The storm drain system carries water from the Property approximately 600 feet to the east before discharging to an unnamed stream/wetland that flows to the Mill River. The water from the Property will travel through the storm drain systems located beneath Vernon Street and Lowell Street. The proposed discharge route is shown on Figures 3A and 3B. Supporting documentation for the NOI is included in Attachments D through J.

DILUTION FACTOR AND EFFLUENT LIMITATION CALCULATIONS

A Dilution Factor (DF) was calculated using the methods described in Appendix V of the RGP. In order to calculate a DF, the seven day-ten-year low flow (7Q10) of the receiving water was identified in accordance with the instructions in Appendix V of the RGP and verified with Catherine Vakalopoulos of the MADEP. Due to the low 7Q10 value for the value for the downstream receiving water, a DF of 1 was used in development of water-quality based effluent limitations (WQBELs). A copy of the correspondence with Ms. Vakalopoulos is included in Attachment H. A copy of the USEPA provided spreadsheet to calculate the DF and water quality-based effluent limitations (WQBELs) is included in Attachment I.

SUMMARY AND CONCLUSIONS

The purpose of this report is to summarize environmental conditions and groundwater data collected to date to support a Notice of Intent to discharge under the Remediation General Permit for the redevelopment project located at 356 Lowell Street in Wakefield, Massachusetts. The proposed construction dewatering effluent treatment system will be modified as needed to achieve the USEPA's effluent limits.

If you have any questions or comments regarding the contents of this letter or the enclosed materials, please contact either of us at (978) 679-1600.

Sincerely,
GEOINSIGHT, INC.

Timothy W. Maus, P.G.
Project Geologist

Kevin D. Trainer, C.P.G., P.G., L.S.P.
Senior Associate

Enclosures:

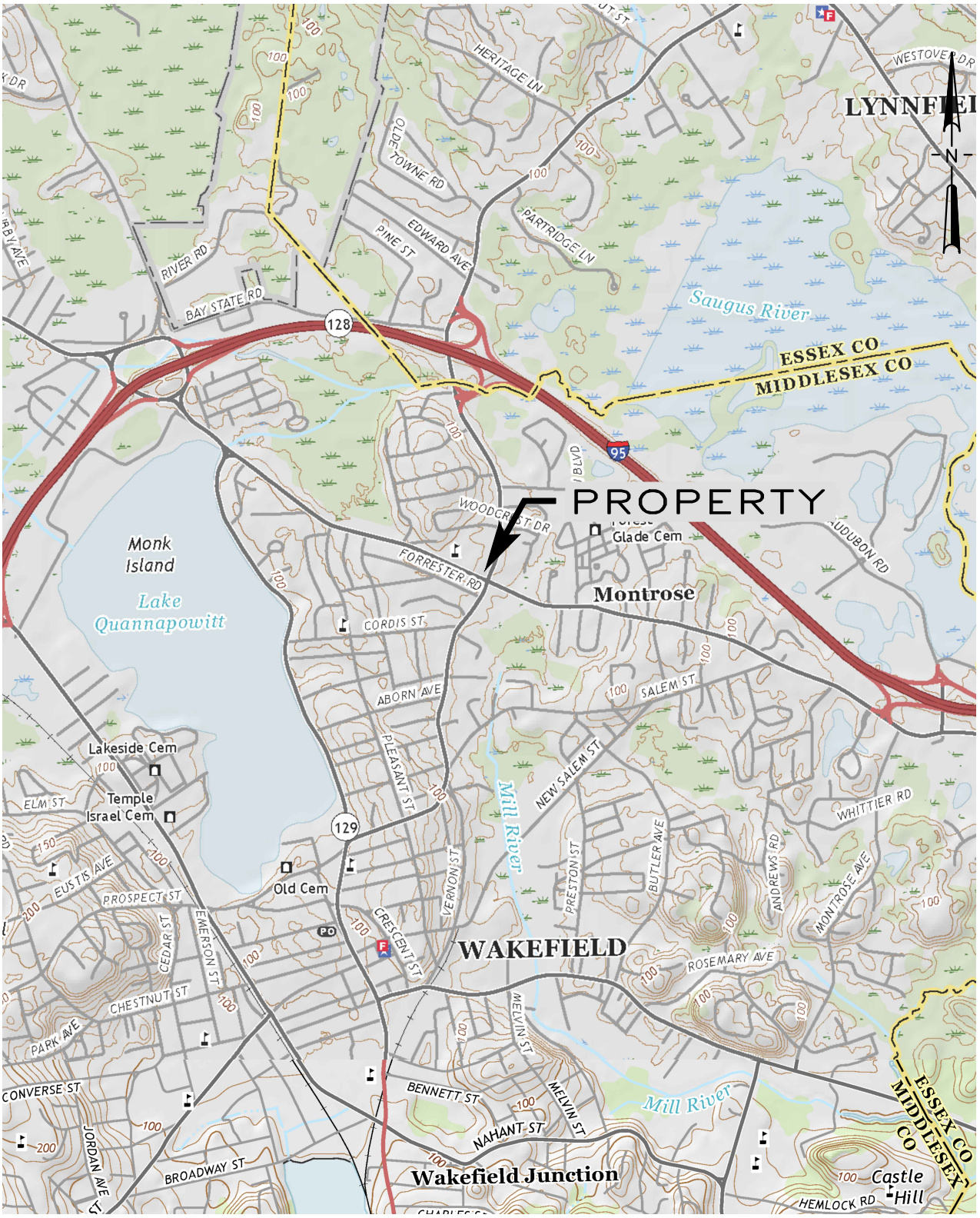
FIGURES

Figure 1 - Property Locus
Figure 2 - Property Plan
Figure 3A - Proposed Dewatering Discharge Route
Figure 3B - Proposed Dewatering Discharge Route

ATTACHMENTS

Attachment A - Notice of Intent for the Remediation General Permit
Attachment B - Tank and Piping Plan
Attachment C - Treatment System Schematics, MSDS, and Chemical Addition Estimates
Attachment D - Endangered Species Act Documentation
Attachment E - National Historic Preservation Act Documentation
Attachment F - Receiving Water Hydrologic Information
Attachment G - Laboratory Reports
Attachment H - MADEP Correspondence
Attachment I - USEPA Appendix V Dilution Factor and WQBEL Spreadsheet
Attachment J - BWSC Phase I Site Assessment Map

FIGURES



SOURCE:

USGS READING, MASSACHUSETTS
TOPOGRAPHIC QUADRANGLE 2015
CONTOUR INTERVAL: 10 FEET

0 2000 4000
APPROX. SCALE IN FEET

CLIENT: NOURIA ENERGY CORPORATION				
PROJECT: 356 LOWELL STREET WAKEFIELD, MASSACHUSETTS				
TITLE: PROPERTY LOCUS				
DESIGNED: JER	DRAWN: JER	CHECKED: TWM	APPROVED: RCR	
SCALE: 1" = 2000'	DATE: 08/14/18	FILE NO.: 8908-LOCUS	PROJECT NO.: 8908-000	FIGURE NO.: 1

GeoInsight
Practical in Nature

PLOT DATE: 8-14-18
FILE: \\geomao\MAO_Projects\8908 - Wakefield MA - Nouria\Figures\8908-LOCUS.dwg


ADDRESS: 356 LOWELL STREET WAKEFIELD, MA
TITLE: PROPERTY PLAN
FIGURE NO. 2
MW-TP1
STORM DRAIN
Lowell St
N
200 ft
Google Earth
© 2018 Google

Project Location:
356 Lowell Street,
Wakefield, MA

Proposed Dewatering Discharge Route
356 Lowell Street, Wakefield, Massachusetts
Figure 3A

Discharge Flow Path

VERNON STREET

VERNON STREET

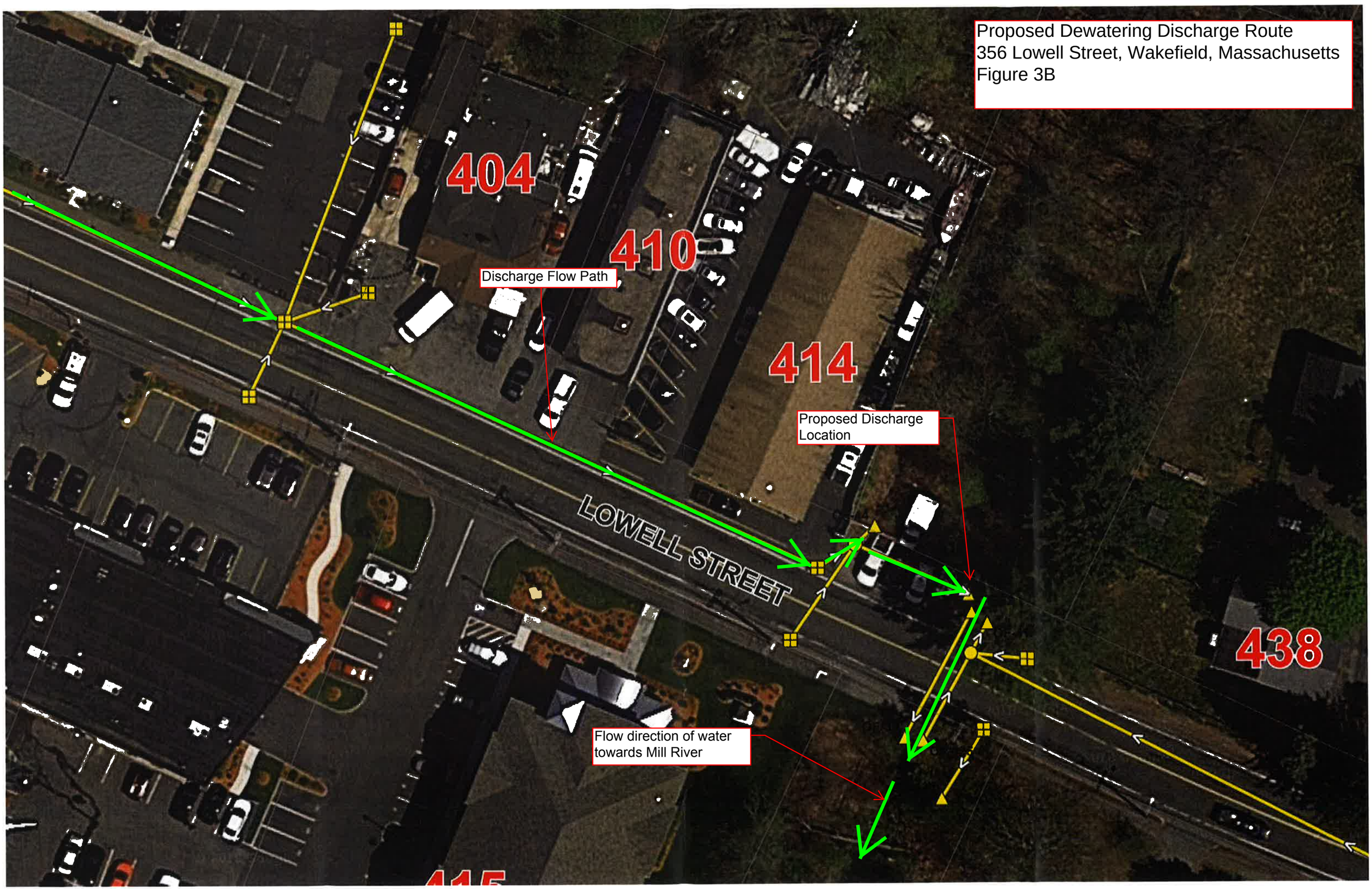
LOWELL STREET

404

410

283

Proposed Dewatering Discharge Route
356 Lowell Street, Wakefield, Massachusetts
Figure 3B



ATTACHMENTS

ATTACHMENT A

NOTICE OF INTENT FOR THE REMEDIATION GENERAL PERMIT

II. Suggested Format for the Remediation General Permit Notice of Intent (NOI)

A. General site information:

<table>
<tr><td rowspan="2">1. Name of site:
Nouria Wakefield Service Station</td><td colspan="3">Site address: 356
Street: Lowell Street</td></tr>
<tr><td>City: Wakefield</td><td>State: MA</td><td>Zip: 01880</td></tr>
<tr><td rowspan="4">2. Site owner
GTY MA/NH Leasing Inc.

Owner is (check one): ☐ Federal ☐ State/Tribal ■ Private
☐ Other; if so, specify:</td><td colspan="3">Contact Person: Paul Belanger</td></tr>
<tr><td colspan="2">Telephone: 508-762-3708</td><td>Email: paul.belanger@nouriaenergy.com</td></tr>
<tr><td colspan="3">Mailing address:
Street: 326 Clark Street</td></tr>
<tr><td>City: Worcester</td><td>State: MA</td><td>Zip: 01606</td></tr>
<tr><td rowspan="4">3. Site operator, if different than owner
GeoInsight, Inc.</td><td colspan="3">Contact Person: Kevin D. Trainer, L.S.P.</td></tr>
<tr><td colspan="2">Telephone: 978-679-1600</td><td>Email: kdtrainer@geoinc.com</td></tr>
<tr><td colspan="3">Mailing address:
Street: One Monarch Drive, Suite 201</td></tr>
<tr><td>City: Littleton</td><td>State: MA</td><td>Zip: 01460</td></tr>
<tr><td>4. NPDES permit number assigned by EPA:

NPDES permit is (check all that apply: ■ RGP ☐ DGP ☐ CGP
☐ MSGP ☐ Individual NPDES permit ☐ Other; if so, specify:</td><td colspan="3">5. Other regulatory program(s) that apply to the site (check all that apply):
☐ MA Chapter 21e; list RTN(s):
☐ NH Groundwater Management Permit or Groundwater Release Detection Permit:
☐ CERCLA
☐ UIC Program
☐ POTW Pretreatment
☐ CWA Section 404</td></tr>
</table>

B. Receiving water information:

1. Name of receiving water(s):	Waterbody identification of receiving water(s):	Classification of receiving water(s):
Mill River	MA93-31	Class B

Receiving water is (check any that apply): ☐ Outstanding Resource Water ☐ Ocean Sanctuary ☐ territorial sea ☐ Wild and Scenic River

2. Has the operator attached a location map in accordance with the instructions in B, above? (check one): ■ Yes ☐ No

Are sensitive receptors present near the site? (check one): ■ Yes ☐ No

If yes, specify: Dolbeare Elementary School located adjacent to the north/northwest of the Property.

3. Indicate if the receiving water(s) is listed in the State's Integrated List of Waters (i.e., CWA Section 303(d)). Include which designated uses are impaired, and any pollutants indicated. Also, indicate if a final TMDL is available for any of the indicated pollutants. For more information, contact the appropriate State as noted in Part 4.6 of the RGP. Yes. Impairment: Fecal coliform, dissolved oxygen, TSS, turbidity. EPA TMDL for fecal coliform is 50120.

4. Indicate the seven day-ten-year low flow (7Q10) of the receiving water determined in accordance with the instructions in Appendix V for sites located in Massachusetts and Appendix VI for sites located in New Hampshire.	NA
5. Indicate the requested dilution factor for the calculation of water quality-based effluent limitations (WQBELs) determined in accordance with the instructions in Appendix V for sites in Massachusetts and Appendix VI for sites in New Hampshire.	1

6. Has the operator received confirmation from the appropriate State for the 7Q10and dilution factor indicated? (check one): ■ Yes ☐ No

If yes, indicate date confirmation received: August 8, 2018

7. Has the operator attached a summary of receiving water sampling results as required in Part 4.2 of the RGP in accordance with the instruction in Appendix VIII? (check one): ■ Yes ☐ No

C. Source water information:

1. Source water(s) is (check any that apply):

■ Contaminated groundwater Has the operator attached a summary of influent sampling results as required in Part 4.2 of the RGP in accordance with the instruction in Appendix VIII? (check one): ■ Yes ☐ No	☐ Contaminated surface water Has the operator attached a summary of influent sampling results as required in Part 4.2 of the RGP in accordance with the instruction in Appendix VIII? (check one): ☐ Yes ☐ No	☐ The receiving water ☐ A surface water other than the receiving water; if so, indicate waterbody:	☐ Potable water; if so, indicate municipality or origin: ☐ Other; if so, specify:

2. Source water contaminants: iron	
a. For source waters that are contaminated groundwater or contaminated surface water, indicate are any contaminants present that are not included in the RGP? (check one): ☐ Yes ■ No If yes, indicate the contaminant(s) and the maximum concentration present in accordance with the instructions in Appendix VIII.	b. For a source water that is a surface water other than the receiving water, potable water or other, indicate any contaminants present at the maximum concentration in accordance with the instructions in Appendix VIII? (check one): ☐ Yes ☐ No
3. Has the source water been previously chlorinated or otherwise contains residual chlorine? (check one): ☐ Yes ■ No	

D. Discharge information

1.The discharge(s) is a(n) (check any that apply): ☐ Existing discharge ■ New discharge ☐ New source	
Outfall(s): Treated water will be discharged to a catch basin located at 356 Lowell Street. Treated water will then travel via municipal storm water system before discharging at an outfall along Lowell Street at the wetlands/headwaters of the Mill River.	Outfall location(s): (Latitude, Longitude) 42.5169 N 71.0622 W
Discharges enter the receiving water(s) via (check any that apply): ■ Direct discharge to the receiving water ☐ Indirect discharge, if so, specify: ☐ A private storm sewer system ■ A municipal storm sewer system If the discharge enters the receiving water via a private or municipal storm sewer system: Has notification been provided to the owner of this system? (check one): ■ Yes ☐ No Has the operator has received permission from the owner to use such system for discharges? (check one): ☐ Yes ■ No, if so, explain, with an estimated timeframe for obtaining permission: Permission from the Town of Wakefield is pending review of the NOI. Has the operator attached a summary of any additional requirements the owner of this system has specified? (check one): ☐ Yes ■ No	
Provide the expected start and end dates of discharge(s) (month/year): September 2018 to January 2019 Indicate if the discharge is expected to occur over a duration of: ■ less than 12 months ☐ 12 months or more ☐ is an emergency discharge	
Has the operator attached a site plan in accordance with the instructions in D, above? (check one): ■ Yes ☐ No	

<table>
<tr><td>2. Activity Category: (check all that apply)</td><td colspan="2">3. Contamination Type Category: (check all that apply)</td></tr>
<tr><td rowspan="5">■ I – Petroleum-Related Site Remediation
☐ II – Non-Petroleum-Related Site Remediation
☐ III – Contaminated Site Dewatering
☐ IV – Dewatering of Pipelines and Tanks
☐ V – Aquifer Pump Testing
☐ VI – Well Development/Rehabilitation
☐ VII – Collection Structure Dewatering/Remediation
☐ VIII – Dredge-Related Dewatering</td><td colspan="2">a. If Activity Category I or II: (check all that apply)

☐ A. Inorganics
☐ B. Non-Halogenated Volatile Organic Compounds
☐ C. Halogenated Volatile Organic Compounds
☐ D. Non-Halogenated Semi-Volatile Organic Compounds
☐ E. Halogenated Semi-Volatile Organic Compounds
■ F. Fuels Parameters</td></tr>
<tr><td colspan="2">b. If Activity Category III, IV, V, VI, VII or VIII: (check either G or H)</td></tr>
<tr><td>■ G. Sites with Known Contamination</td><td>☐ H. Sites with Unknown Contamination</td></tr>
<tr><td>c. If Category III-G, IV-G, V-G, VI-G, VII-G or VIII-G: (check all that apply)

■ A. Inorganics
☐ B. Non-Halogenated Volatile Organic Compounds
☐ C. Halogenated Volatile Organic Compounds
■ D. Non-Halogenated Semi-Volatile Organic Compounds
☐ E. Halogenated Semi-Volatile Organic Compounds
☐ F. Fuels Parameters</td><td>d. If Category III-H, IV-H, V-H, VI-H, VII-H or VIII-H Contamination Type Categories A through F apply</td></tr>
</table>

4. Influent and Effluent Characteristics

Parameter	Known or believed absent	Known or believed present	# of samples	Test method (#)	Detection limit (µg/l)	Influent		Effluent Limitations	
						Daily maximum (µg/l)	Daily average (µg/l)	TBEL	WQBEL
A. Inorganics									
Ammonia		✓	1	4500NH3	75	713	713	Report mg/L	---
Chloride		✓	1	300	12,500	678,000	678,000	Report µg/l	---
Total Residual Chlorine	✓		1	4500CL-D	20	<20	0	0.2 mg/L	11µg/L
Total Suspended Solids		✓	1	2540D	5,000	12,000	12,000	30 mg/L	---
Antimony	✓		1	200.8	4	<4	0	206 µg/L	640 µg/L
Arsenic	✓		1	200.8	1	<1	0	104 µg/L	10 µg/L
Cadmium	✓		1	200.8	0.2	<0.2	0	10.2 µg/L	0.3174 µg/L
Chromium III	✓		1	107	10	<10	0	323 µg/L	102.8 µg/L
Chromium VI	✓		1	7196A	10	<10	0	323 µg/L	11.4 µg/L
Copper		✓	1	200.8	1	1.52	1.52	242 µg/L	11.2 µg/L
Iron		✓	1	200.7	50	113,000	113,000	5,000 µg/L	1,000 µg/L
Lead	✓		1	200.8	1	<1	0	160 µg/L	4.18 µg/L
Mercury	✓		1	245.1	0.2	<0.2	0	0.739 µg/L	0.91 µg/L
Nickel	✓		1	200.8	2	<2	0	1,450 µg/L	62.6 µg/L
Selenium	✓		1	200.8	5	<5	0	235.8 µg/L	5.0 µg/L
Silver	✓		1	200.8	0.4	<0.4	0	35.1 µg/L	5.5 µg/L
Zinc		✓	1	200.8	10	204.8	204.8	420 µg/L	143.8 µg/L
Cyanide	✓		1	4500CN-C	5	<5	0	178 mg/L	5.2 µg/L
B. Non-Halogenated VOCs									
Total BTEX	✓		1	624.1	4	<4	0	100 µg/L	---
Benzene	✓		1	624.1	1	<1	0	5.0 µg/L	---
1,4 Dioxane	✓		1	624.1SIM	50	<50	0	200 µg/L	---
Acetone	✓		1	624.1	10	<10	0	7.97 mg/L	---
Phenol	✓		1	420.1	30	<30	0	1,080 µg/L	300 µg/L

Parameter	Known or believed absent	Known or believed present	# of samples	Test method (#)	Detection limit (µg/l)	Influent		Effluent Limitations	
						Daily maximum (µg/l)	Daily average (µg/l)	TBEL	WQBEL
C. Halogenated VOCs									
Carbon Tetrachloride	✓		1	624.1	1	<1	0	4.4 µg/L	1.6 µg/L
1,2 Dichlorobenzene	✓		1	624.1	5	<5	0	600 µg/L	---
1,3 Dichlorobenzene	✓		1	624.1	5	<5	0	320 µg/L	---
1,4 Dichlorobenzene	✓		1	624.1	5	<5	0	5.0 µg/L	---
Total dichlorobenzene	✓		1	624.1	5	<5	0	763 µg/L in NH	---
1,1 Dichloroethane	✓		1	624.1	1	<1	0	70 µg/L	---
1,2 Dichloroethane	✓		1	624.1	1.5	<1.5	0	5.0 µg/L	---
1,1 Dichloroethylene	✓		1	624.1	1	<1	0	3.2 µg/L	---
Ethylene Dibromide	✓		1	624.1	0.01	<0.01	0	0.05 µg/L	---
Methylene Chloride	✓		1	624.1	1	<1	0	4.6 µg/L	---
1,1,1 Trichloroethane	✓		1	624.1	2	<2	0	200 µg/L	---
1,1,2 Trichloroethane	✓		1	624.1	1.5	<1.5	0	5.0 µg/L	---
Trichloroethylene	✓		1	624.1	1	<1	0	5.0 µg/L	---
Tetrachloroethylene	✓		1	624.1	1.5	<1.5	0	5.0 µg/L	3.3 µg/L
cis-1,2 Dichloroethylene	✓		1	624.1	1	<1	0	70 µg/L	---
Vinyl Chloride	✓		1	624.1	1	<1	0	2.0 µg/L	---
D. Non-Halogenated SVOCs									
Total Phthalates	✓		1	625.1	5.0	<5.0	0	190 µg/L	---
Diethylhexyl phthalate	✓		1	625.1	5.0	<5.0	0	101 µg/L	2.2 µg/L
Total Group I PAHs	✓		1	625.1	0.1	<0.1	0	1.0 µg/L	---
Benzo(a)anthracene	✓		1	625.1	0.1	<0.1	0	As Total PAHs	0.0038 µg/L
Benzo(a)pyrene	✓		1	625.1	0.1	<0.1	0		0.0038 µg/L
Benzo(b)fluoranthene	✓		1	625.1	0.1	<0.1	0		0.0038 µg/L
Benzo(k)fluoranthene	✓		1	625.1	0.1	<0.1	0		0.0038 µg/L
Chrysene	✓		1	625.1	0.1	<0.1	0		0.0038 µg/L
Dibenzo(a,h)anthracene	✓		1	625.1	0.1	<0.1	0		0.0038 µg/L
Indeno(1,2,3-cd)pyrene	✓		1	625.1	0.1	<0.1	0		0.0038 µg/L

Parameter	Known or believed absent	Known or believed present	# of samples	Test method (#)	Detection limit (µg/l)	Influent		Effluent Limitations	
						Daily maximum (µg/l)	Daily average (µg/l)	TBEL	WQBEL
Total Group II PAHs	✓		1	625.1	0.1	<0.1	0	100 µg/L	---
Naphthalene		✓	1	625.1	0.1	.48	0.48	20 µg/L	---
E. Halogenated SVOCs									
Total PCBs	✓		1	608.3	.250	<.250	0	0.000064 µg/L	---
Pentachlorophenol	✓		1	625.1	1	<1	0	1.0 µg/L	---
F. Fuels Parameters									
Total Petroleum Hydrocarbons	✓		1	1664A	4,400	<4,400	0	5.0 mg/L	---
Ethanol	✓		1	1671A	500	<500	0	Report mg/L	---
Methyl-tert-Butyl Ether	✓		1	624.1	10	<10	0	70 µg/L	20 µg/L
tert-Butyl Alcohol	✓		1	624.1	100	<100	0	120 µg/L in MA 40 µg/L in NH	---
tert-Amyl Methyl Ether	✓		1	624.1	20	<20	0	90 µg/L in MA 140 µg/L in NH	---
Other (i.e., pH, temperature, hardness, salinity, LC_{50}, additional pollutants present); if so, specify:									
pH		✓	1	Field	NA	6.74	6.74		
Hardenss		✓	1	200.7	660	120,000	120,000		
Total Chromium	✓		1	200.8	0.2	<0.2	0		

E. Treatment system information

1. Indicate the type(s) of treatment that will be applied to effluent prior to discharge: (check all that apply)

☐ Adsorption/Absorption ☐ Advanced Oxidation Processes ☐ Air Stripping ☐ Granulated Activated Carbon ("GAC")/Liquid Phase Carbon Adsorption
☐ Ion Exchange ■ Precipitation/Coagulation/Flocculation ■ Separation/Filtration ☐ Other; if so, specify:

2. Provide a written description of all treatment system(s) or processes that will be applied to the effluent prior to discharge.

The dewatering system consists of pumps to remove the water, a settling tank, and bag filters. Additional treatment will be conducted as necessary to meet the RGP discharge requirements. See attached Figures for schematic of treatment system.

Identify each major treatment component (check any that apply):
■ Fractionation tanks☐ Equalization tank ☐ Oil/water separator ☐ Mechanical filter ☐ Media filter
☐ Chemical feed tank ☐ Air stripping unit ■ Bag filter ☐ Other; if so, specify:

Indicate if either of the following will occur (check any that apply):
☐ Chlorination ☐ De-chlorination

3. Provide the **design flow capacity** in gallons per minute (gpm) of the most limiting component. Indicate the most limiting component: Bag Filter Is use of a flow meter feasible? (check one): ■ Yes ☐ No, if so, provide justification:	
Provide the proposed maximum effluent flow in gpm.	50
Provide the average effluent flow in gpm.	20
If Activity Category IV applies, indicate the estimated total volume of water that will be discharged:	NA

4. Has the operator attached a schematic of flow in accordance with the instructions in E, above? (check one): ■ Yes ☐ No

F. Chemical and additive information

1. Indicate the type(s) of chemical or additive that will be applied to effluent prior to discharge or that may otherwise be present in the discharge(s): (check all that apply)

☐ Algaecides/biocides ☐ Antifoams ☐ Coagulants ☐ Corrosion/scale inhibitors ☐ Disinfectants ■ Flocculants ☐ Neutralizing agents ☐ Oxidants ☐ Oxygen ☐ scavengers ☐ pH conditioners ☐ Bioremedial agents, including microbes ☐ Chlorine or chemicals containing chlorine ☐ Other; if so, specify:
NA

2. Provide the following information for each chemical/additive, using attachments, if necessary:

a. Product name, chemical formula, and manufacturer of the chemical/additive;
b. Purpose or use of the chemical/additive or remedial agent;
c. Material Safety Data Sheet (MSDS) and Chemical Abstracts Service (CAS) Registry number for each chemical/additive;
d. The frequency (hourly, daily, etc.), duration (hours, days), quantity (maximum and average), and method of application for the chemical/additive;
e. Any material compatibility risks for storage and/or use including the control measures used to minimize such risks; and
f. If available, the vendor's reported aquatic toxicity (NOAEL and/or LC50 in percent for aquatic organism(s)).

3. Has the operator attached an explanation which demonstrates that the addition of such chemicals/additives may be authorized under this general permit in accordance with the instructions in F, above? (check one): ☐ Yes ☐ No; if no, has the operator attached data that demonstrates each of the 126 priority pollutants in CWA Section 307(a) and 40 CFR Part 423.15(j)(1) are non-detect in discharges with the addition of the proposed chemical/additive?
(check one): ☐ Yes ☐ No

G. Endangered Species Act eligibility determination

1. Indicate under which criterion the discharge(s) is eligible for coverage under this general permit:

■ **FWS Criterion A**: No endangered or threatened species or critical habitat are in proximity to the discharges or related activities or come in contact with the "action area".

☐ **FWS Criterion B**: Formal or informal consultation with the FWS under section 7 of the ESA resulted in either a no jeopardy opinion (formal consultation) or a written concurrence by FWS on a finding that the discharges and related activities are "not likely to adversely affect" listed species or critical habitat (informal consultation). Has the operator completed consultation with FWS? (check one): ☐ Yes ☐ No; if no, is consultation underway? (check one): ☐ Yes ☐ No

☐ **FWS Criterion C**: Using the best scientific and commercial data available, the effect of the discharges and related activities on listed species and critical habitat have been evaluated. Based on those evaluations, a determination is made by EPA, or by the operator and affirmed by EPA, that the discharges and related activities will have "no effect" on any federally threatened or endangered listed species or designated critical habitat under the jurisdiction of the FWS. This determination was made by: (check one) ☐ the operator ☐ EPA ☐ Other; if so, specify:

☐ **NMFS Criterion**: A determination made by EPA is affirmed by the operator that the discharges and related activities will have "no effect" or are "not likely to adversely affect" any federally threatened or endangered listed species or critical habitat under the jurisdiction of NMFS and will not result in any take of listed species. Has the operator previously completed consultation with NMFS? (check one): ☐ Yes ☐ No

2. Has the operator attached supporting documentation of ESA eligibility in accordance with the instructions in Appendix I, and G, above? (check one): ■ Yes ☐ No

Does the supporting documentation include any written concurrence or finding provided by the Services? (check one): ☐ Yes ■ No; if yes, attach.

H. National Historic Preservation Act eligibility determination

1. Indicate under which criterion the discharge(s) is eligible for coverage under this general permit:

■ **Criterion A**: No historic properties are present. The discharges and discharge-related activities (e.g., BMPs) do not have the potential to cause effects on historic properties.

☐ **Criterion B**: Historic properties are present. Discharges and discharge related activities do not have the potential to cause effects on historic properties.

☐ **Criterion C**: Historic properties are present. The discharges and discharge-related activities have the potential to have an effect or will have an adverse effect on historic properties.

2. Has the operator attached supporting documentation of NHPA eligibility in accordance with the instructions in H, above? (check one): ■ Yes ☐ No

Does the supporting documentation include any written agreement with the State Historic Preservation Officer (SHPO), Tribal Historic Preservation Officer (TPHO), or other tribal representative that outlines measures the operator will carry out to mitigate or prevent any adverse effects on historic properties? (check one): ☐ Yes ■ No

I. Supplemental information

Describe any supplemental information being provided with the NOI. Include attachments if required or otherwise necessary.

Has the operator attached data, including any laboratory case narrative and chain of custody used to support the application? (check one): ■ Yes ☐ No

Has the operator attached the certification requirement for the Best Management Practices Plan (BMPP)? (check one): ■ Yes ☐ No

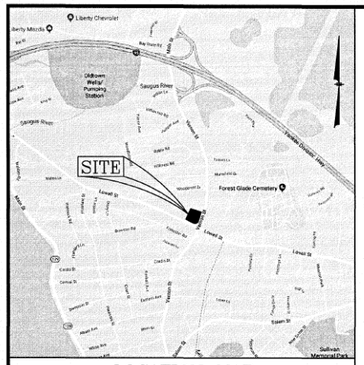
J. Certification requirement

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I have no personal knowledge that the information submitted is other than true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

BMPP certification statement: A BMPP meeting the requirements of this general permit will be implemented upon initiation of discharge.	
Notification provided to the appropriate State, including a copy of this NOI, if required.	Check one: Yes ■ No ☐
Notification provided to the municipality in which the discharge is located, including a copy of this NOI, if requested.	Check one: Yes ■ No ☐
Notification provided to the owner of a private or municipal storm sewer system, if such system is used for site discharges, including a copy of this NOI, if requested.	Check one: Yes ■ No ☐ NA ☐
Permission obtained from the owner of a private or municipal storm sewer system, if such system is used for site discharges. If yes, attach additional conditions. If no, attach explanation and timeframe for obtaining permission.	Check one: Yes ☐ No ■ NA ☐
Notification provided to the owner/operator of the area associated with activities covered by an additional discharge permit(s). Additional discharge permit is (check one): ☐ RGP ☐ DGP ☐ CGP ☐ MSGP ☐ Individual NPDES permit ☐ Other; if so, specify:	Check one: Yes ☐ No ☐ NA ■
Signature: 	Date: 08/27/2018
Print Name and Title: Kevin D. Trainer	

ATTACHMENT B

TANK AND PIPING PLAN

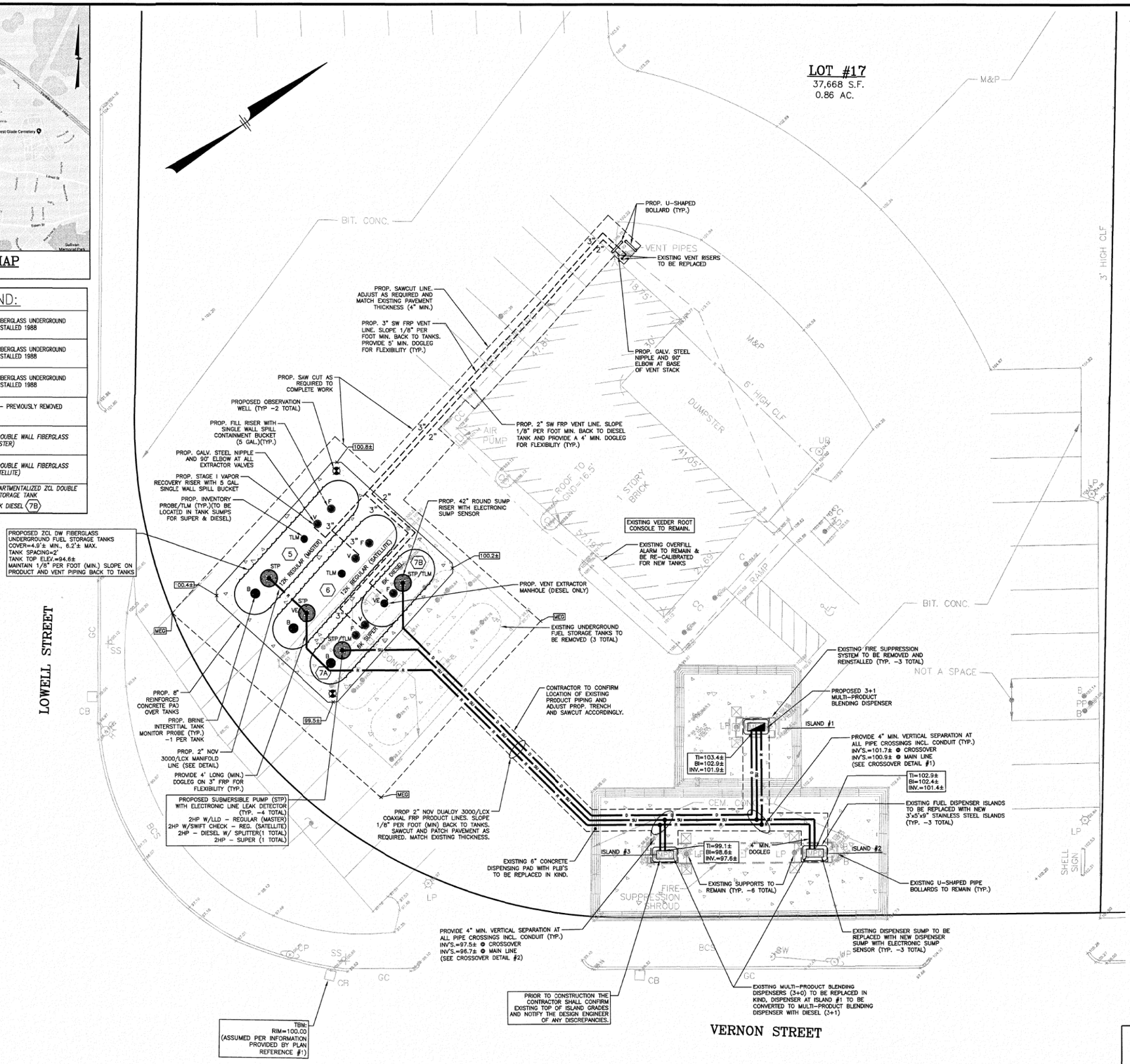


LOCATION MAP

NOT TO SCALE

TANK LEGEND:

1 12K REGULAR	EXISTING 12,000 GAL DOUBLE WALL FIBERGLASS UNDERGROUND STORAGE TANK TO BE REMOVED – INSTALLED 1988
2 12K REGULAR	EXISTING 12,000 GAL DOUBLE WALL FIBERGLASS UNDERGROUND STORAGE TANK TO BE REMOVED – INSTALLED 1988
3 12K SUPER	EXISTING 12,000 GAL DOUBLE WALL FIBERGLASS UNDERGROUND STORAGE TANK TO BE REMOVED – INSTALLED 1988
4 1K WASTE OIL	FORMER 1,000 GAL WASTE OIL TANK – PREVIOUSLY REMOVED
5 12K REGULAR	*NEW 12,000 GAL. 8'-6" DIA. ZCL DOUBLE WALL FIBERGLASS UNDERGROUND STORAGE TANK (MASTER)*
6 12K REGULAR	*NEW 12,000 GAL. 8'-6" DIA. ZCL DOUBLE WALL FIBERGLASS UNDERGROUND STORAGE TANK (SATELLITE)*
7A 7B 12K SUPER/DSL	*NEW 12,000 GAL. 8'-6" DIA. COMPARTMENTALIZED ZCL DOUBLE WALL FIBERGLASS UNDERGROUND STORAGE TANK* BASE=6K SUPER (7A) AND END=6K DIESEL (7B)



GRAPHIC SCALE

10 0 5 10 20 40

(IN FEET)

1 inch = 10 ft.

NOTES:

1. THIS IS AN EXISTING UST FACILITY (MASS DEP FACILITY #18474). THE INTENT OF THIS PLAN IS TO SHOW THE INSTALLATION OF TWO NEW UNDERGROUND FUEL STORAGE TANKS, PRODUCT PIPING, VENT PIPING, DISPENSER ISLANDS AND OVERHEAD CANOPY. ALL EXISTING TANKS AND PRODUCT AND VENT PIPING SHALL BE REMOVED BY THE CONTRACTOR.
2. EXISTING BOUNDARY, TOPOGRAPHIC, AND SITE LAYOUT INFORMATION AS SHOWN WAS TAKEN FROM PLAN REFERENCE #1.
3. NEW UNDERGROUND STORAGE TANKS SHALL BEAR A STENCIL, LABEL OR PLATE WHICH CONTAINS THE STANDARD OF DESIGN BY WHICH THE TANK WAS MANUFACTURED, THE YEAR IN WHICH THE TANK WAS MANUFACTURED, THE DIMENSIONS AND CAPACITY OF THE TANK AND THE NAME OF THE MANUFACTURER. A CERTIFICATE WHICH SHOWS ALL OF THE INFORMATION REQUIRED ABOVE AND WHICH SHOWS THE DATE OF INSTALLATION AND THE REGULATED SUBSTANCES AND PERCENTAGES BY VOLUME OF ANY ADDITIVES WHICH MAY BE STORED PERMANENTLY AND COMPATIBLY WITHIN, SHALL BE CONSPICUOUSLY DISPLAYED AND PERMANENTLY AFFIXED AT THE FACILITY PREMISES.
4. CONTRACTOR INSTALLING UST SYSTEM SHALL BE CERTIFIED PER MASSACHUSETTS 310 CMR 80.00.
5. THE NEW UNDERGROUND FUEL STORAGE SYSTEM WILL BE TESTED BY THE CONTRACTOR PRIOR TO BACKFILLING AS FOLLOWS:
   - A. PRODUCT PIPING
     PRIMARY LINE –SEE SHEET 7
     INTERSTITIAL SPACE –SEE SHEET 7
   - B. TANKS
     THE TANKS SHALL BE PRECISION TIGHTNESS TESTED AT 5 PSIG FOR 60 MINUTES BY A QUALIFIED TECHNICIAN IN ACCORDANCE WITH THE STATE OF MASSACHUSETTS DEP REGULATIONS.
   - C. VENT PIPING –SEE SHEET 7
   - D. DISPENSER SUMPS –SEE SHEET 7
   - E. TANK SUMPS –SEE SHEET 7
   - F. SPILL CONTAINMENT MANHOLES –SEE SHEET 7
6. THE CONTRACTOR SHALL CALL DIGSAFE (811) AT LEAST 72 HOURS PRIOR TO ANY EXCAVATION.
7. CONTRACTOR SHALL PROVIDE AT LEAST 5 DAYS ADVANCE NOTICE TO THE LOCAL FIRE DEPARTMENT AND THE ENGINEER TO INSPECT THE UST SYSTEM PRIOR TO FINAL BACKFILL.
8. UNDERGROUND TANKS TO BE FILLED BY GRAVITY.
9. CONTRACTOR TO PROVIDE FLEXIBILITY ON ALL VENT AND VAPOR RECOVERY LINES BY PROVIDING AT LEAST FOUR FEET OF STRAIGHT RUN FOR 2" PIPE AND FIVE FEET OF STRAIGHT RUN FOR 3" PIPE, BETWEEN CHANGES IN DIRECTION GREATER THAN 30 DEGREES.
10. CONTRACTOR TO VERIFY WITH OWNER THE PRODUCT PIPING LAYOUT AS SHOWN ON THIS PLAN PRIOR TO CONSTRUCTION, SPECIFICALLY, THE ORDER OF THE PIPING AT THE DIESEL DISPENSER.
11. ALL CONSTRUCTION AND EQUIPMENT MUST CONFORM TO THE APPLICABLE REGULATIONS AND CODES OF THE MUNICIPALITY, THE COMMONWEALTH OF MASSACHUSETTS BOARD OF FIRE PREVENTION REGULATION 310 CMR 80.00, AND THE NFPA. THIS WORK INCLUDES THE INSTALLATION OF A STAGE I CARB EVR SYSTEM OR A STAGE I COMPONENT EVR SYSTEM IN ACCORDANCE WITH 310 CMR 7.24(3).
12. THE EXISTING POSITIVE LIMITING BARRIERS (PLB'S) AT THE FUEL DISPENSING AREA THAT ARE DISTURBED ARE TO BE REPLACED IN KIND.
13. THE CLOSURE AND REMOVAL OF THE THREE (3) EXISTING UNDERGROUND STORAGE TANKS SCHEDULED FOR REMOVAL SHALL BE PERFORMED IN ACCORDANCE WITH MASSACHUSETTS DEP REGULATIONS.

PLAN REFERENCES:

1. "ALTA/ACSM LAND TITLE SURVEY" PREPARED BY COMMERCIAL DUE DILIGENCE SERVICES, 1700 SOUTH BROADWAY, BLDG E, MOORE, OKLAHOMA 73160, PREPARED FOR SHELL (CLIENT REFERENCE NO. 137869), 356 LOWELL STREET, WAKEFIELD, MA, DATED 6/12/09 (REV. DATE OF 3/7/11, SCALE: 1"=20'

NO.	DESCRIPTION	BY	DATE

REVISIONS

TANK & PIPING PLAN

ASSESSORS MAP 14C BLOCK 75 LOT 17
356 LOWELL STREET
WAKEFIELD, MA
PREPARED FOR:
NOURIA ENERGY CORPORATION
326 CLARK STREET
WORCESTER, MA 01606

MHF Design Consultants, Inc.
44 Stiles Road, Suite One
Salem, New Hampshire 03079
(603) 893-0720
ENGINEERS • PLANNERS • SURVEYORS
www.mhfdesign.com

FRANK C. MONTEIRO CIVIL NO. 36341 REGISTERED PROFESSIONAL ENGINEER
COMMONWEALTH OF MASSACHUSETTS
7/12/18

MassDEP Facility ID #04038

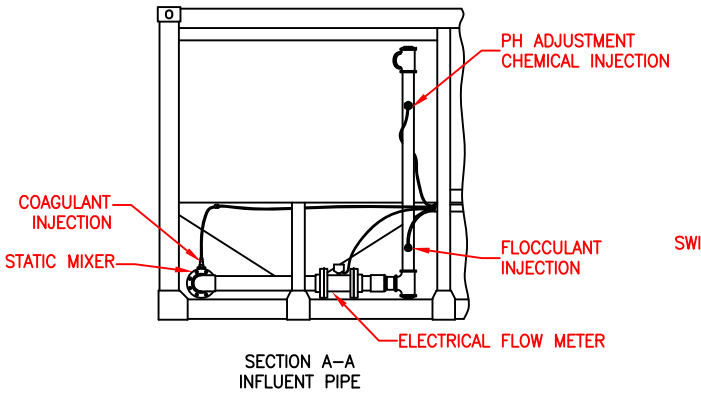
SCALE: 1"= 10'	DATE: JULY 12, 2018		DRAWING NO. 4421TP.DWG
DRAWN BY:	CHECKED BY:	PROJECT NO.	SHEET NO.
DSA	HS	442118	2 OF 7

DigSafe 811 MA.ME.NH.RI.VT

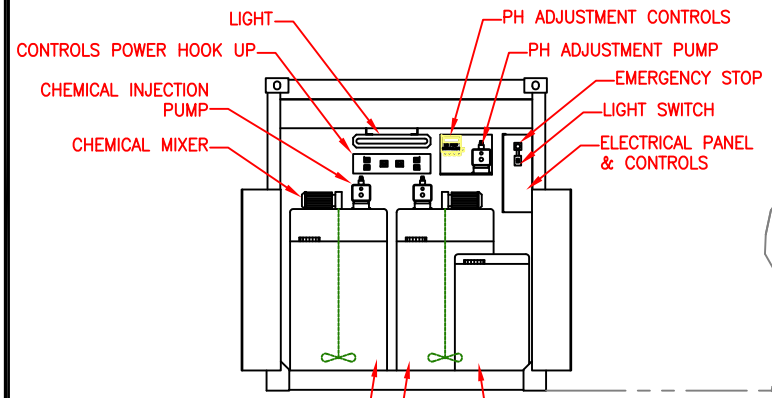
F:\Projects\CAD\442118\UST PLANS\4421TP.dwg TP 7/12/18 4:05pm cps

ATTACHMENT C

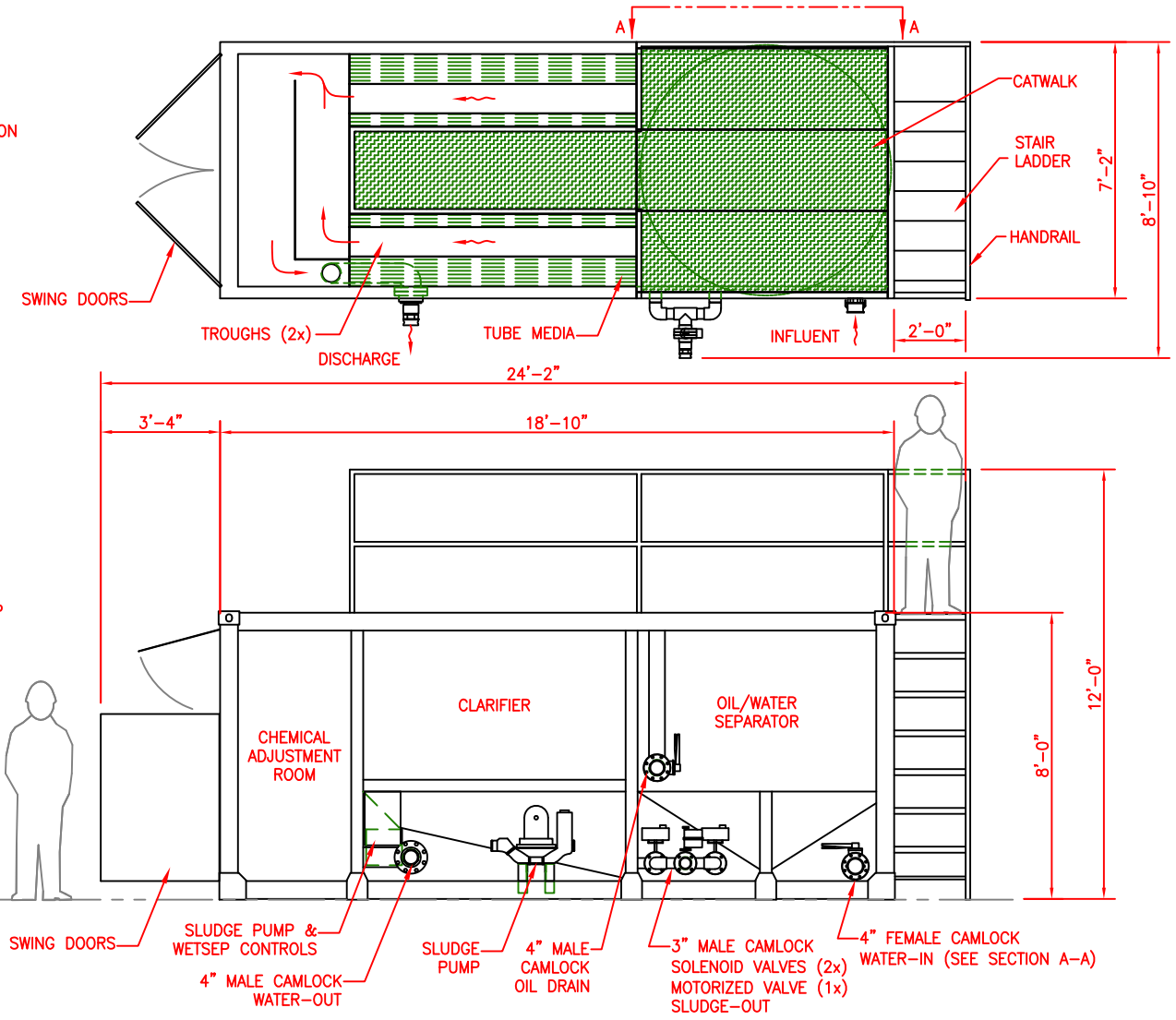
TREATMENT SYSTEM SCHEMATICS, MSDS, AND CHEMICAL ADDITION ESTIMATES



SECTION A–A
INFLUENT PIPE



CHEMICAL ADJUSTMENT ROOM



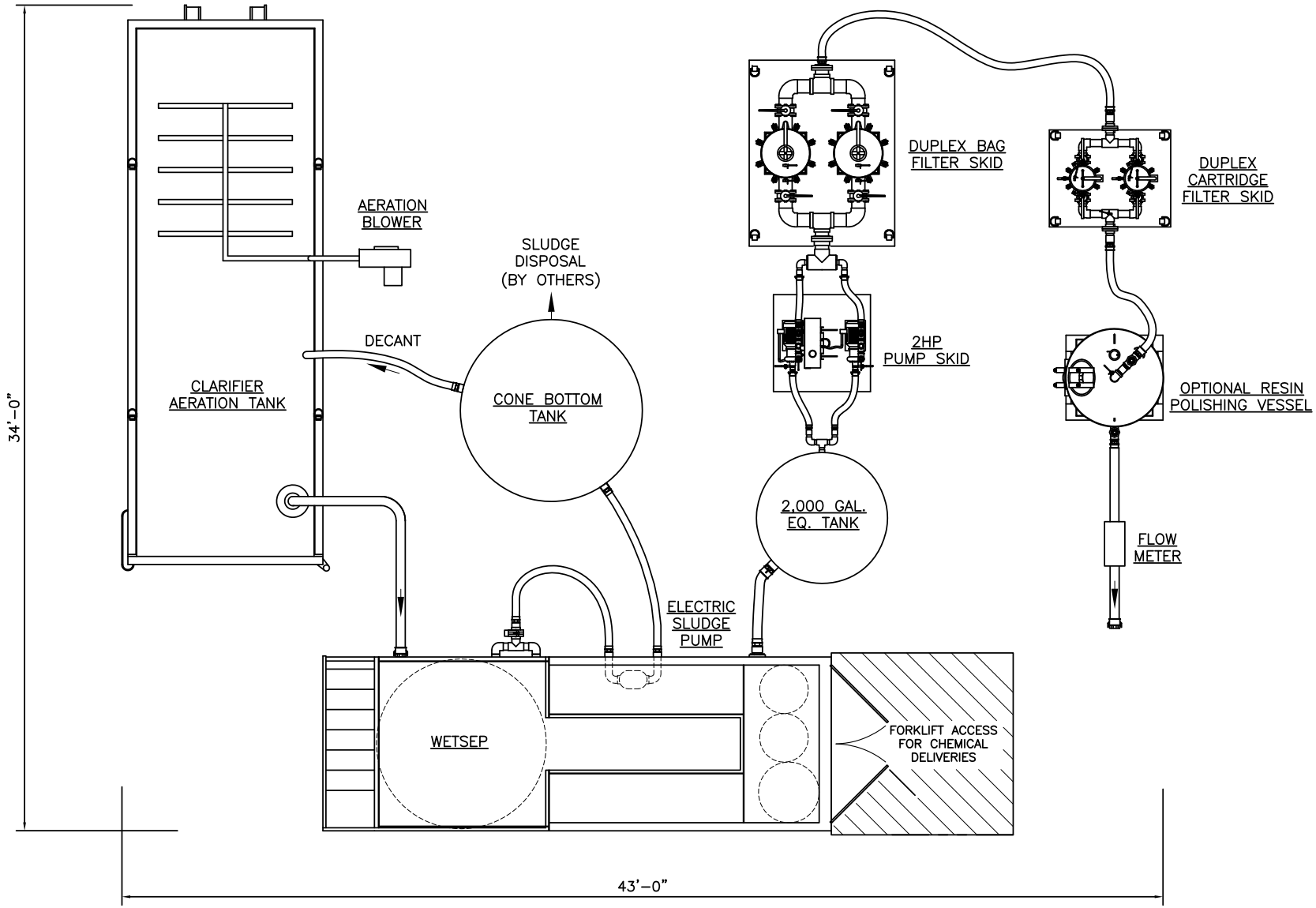
NO.	REVISIONS	DATE
A	TYPICAL	04/15/09

TYPICAL WETSEP
STANDARD LAYOUT

SCALE: NTS	APPROVED BY: PL	DRAWN BY: AAV	
DATE: 12/03/09			

GROUND/WATER TREATMENT & TECHNOLOGY
39 River St.
Millbury, MA 01527

DWG SIZE: A	SHEET: 1 OF 1	DRAWING NUMBER: ST–0079–LYT	A



NOTES:
1) MAXIMUM FLOWRATE = 100 GPM
2) SYSTEM FOOTPRINT APPROX. 34' X 43'
3) NOT ALL VALVES, INSTRUMENTATION AND PIPING, ETC. SHOWN FOR CLARITY.
4) POWER REQUIREMENTS (BY OTHERS) – 460V, 3 PHASE, 100 AMPS.

REV.	DATE	BY	REMARKS
–	08/22/18	MSM	INITIAL ISSUE.

CUSTOMER: GEOLNSIGHT

SITE: LOWELL STREET WAKEFIELD, MA

TITLE: SITE LAYOUT TEMPORARY TREATMENT SYSTEM

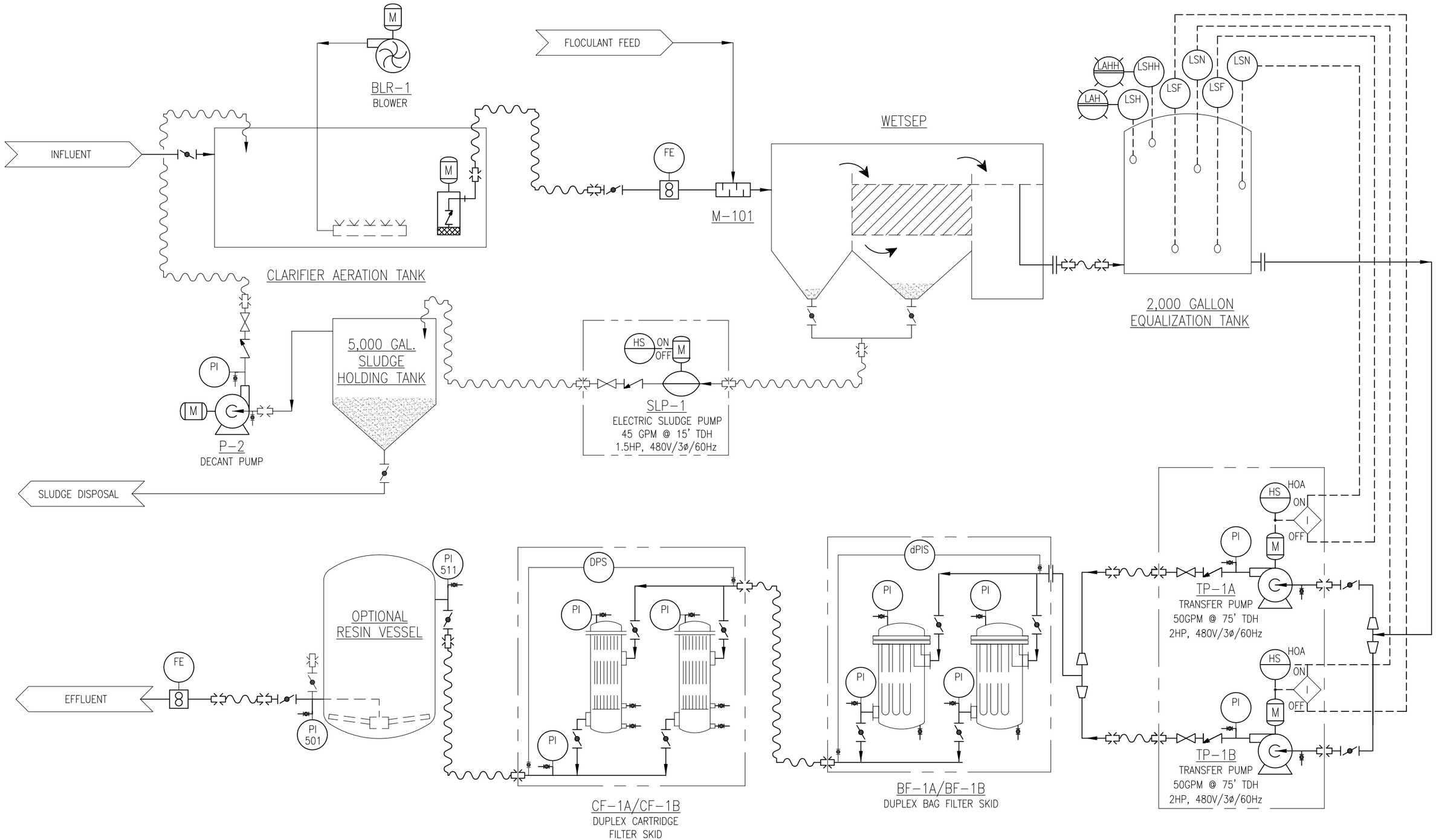
SCALE: NTS

DRAWN BY: MSM DATE: 08/22/18

APPROVED BY: DATE:

DWG SIZE: A SHEET: 1 OF 1 DRAWING NO.: QTE-168326-LYT01 –

GWTT Ground/Water Treatment & Technology, LLC
627 MOUNT HOPE ROAD
WHARTON, NJ 07885
PHONE: 973-983-0901
FAX: 973-983-0903
www.gwttllc.com



T:\Cad Files\PROJECTS\Div.16 - New England\16-1692 Fall River\Working CAD\JOB-161692-PID01(-).dwg - 8/22/18 - 3:04 PM

REV.	DATE	BY	REMARKS	REV.	DATE	BY	REMARKS
-	08/22/18	MSM	INITIAL ISSUE.				

CUSTOMER: GEOLNSIGHT

SITE: LOWELL STREET
WAKEFIELD, MA

TITLE: PIPING & INSTRUMENT DIAGRAM
TEMPORARY TREATMENT SYSTEM

SCALE: NTS
DRAWN
BY: MSM | DATE: 08/22/18
APPROVED
BY: | DATE:

GWTT Ground/Water Treatment & Technology, LLC
627 MOUNT HOPE ROAD WHARTON, NJ 07885
PHONE: 973-983-0901 · FAX: 973-983-0903
www.gwttllc.com

DWG SIZE: B | SHEET: 1 OF 1 | DRAWING NO.: QTE-168326-PID01 | -

ADEGA CHEMICAL COMPANY

MATERIAL SAFETY DATA SHEET
Material Name: AP-210

SECTION 1 – GENERAL INFORMATION

Manufacturer/Supplier's Name: ADEGA CHEMICAL
27917 Paseo El Concho
San Juan Capistrano, CA 92675

PRODUCT AND TECHNICAL INFORMATION NUMBER: (949) 275-7208

SECTION 2 – COMPOSITION / INFORMATION ON INGREDIENTS

IDENTIFICATION OF THE PREPARATION: Anionic Water-Soluble Polymer

SECTION 3 – HAZARDS IDENTIFICATION

Aqueous solutions or powders that become wet render surfaces extremely slippery

SECTION 4 – FIRST AID MEASURES

INHALATION: Move to fresh air.

SKIN CONTACT: Wash with water and soap as a precaution. In case of persistent skin irritation, consult physician.

EYE CONTACT: Rinse thoroughly with plenty of water, also under the eyelids. In case of persistent eye irritation, consult a physician.

INGESTION: The product is not considered toxic based on studies on laboratory animals.

SECTION 5 – FIRE-FIGHTING MEASURES

SUITABLE EXTINGUISHING MEDIA: Water, water spray, foam, carbon dioxide (C02), dry powder.

SPECIAL FIRE-FIGHTING PRECAUTIONS: Aqueous solutions or powders that become wet render surfaces extremely slippery.

PROTECTIVE EQUIPMENT FOR FIREFIGHTERS: No special protective equipment required.

SECTION 6 – ACCIDENTAL RELEASE MEASURES

PERSONAL PRECAUTIONS: No special precautions required.

ENVIRONMENTAL PRECAUTIONS: Do not contaminate water

METHODS FOR CLEANING UP: Do not flush with water. Clean Up promptly by sweeping or vacuum. Keep in suitable and closed containers for disposal. After cleaning, flush away traces with water.

SECTION 7 – HANDLING AND STORAGE

HANDLING: Avoid contact with skin and eyes. Avoid dust formation. Do not breathe dust. Wash hands before breaks and at the end of workday.

STORAGE: Keep in a dry, cool place (0-35°C).

SECTION 8 – EXPOSURE CONTROLS / PERSONAL PROTECTION

ENGINEERING CONTROLS: Use local exhaust if dusting occurs. Natural ventilation is adequate in absence of dusts.

PERSONAL PROTECTION EQUIPMENT

RESPIRATORY PROTECTION: Dust safety masks are recommended where concentration of total dust is more than 10 mg/m’

HAND PROTECTION: Rubber gloves

EYE PROTECTION: Safety glasses with side-shields. Do not wear contact lenses

SKIN PROTECTION: Chemical resistant apron or protective suit if splashing or contact with solution is likely.

HYGIENE MEASURES: Wash hands before breaks and at the end of the workday. Handle in accordance with good industrial hygiene and safety practice.

SECTION 9 – PHYSICAL AND CHEMICAL PROPERTIES

FORM:	Granular solid
COLOR:	White
ODOR:	None
PH:	4-9@5g/l
MELTING POINT (C):	Not Applicable
FLASH POINT(C):	Not Applicable
AUTOIGNITION TEMPERATURE (C):	Not Applicable
VAPOUR PRESSURE (MM HG):	Not Applicable
BULK DENSITY:	See Technical Bulletin
WATER SOLUBILITY:	See Technical Bulletin
VISCOSITY (MPA S):	See Technical Bulletin

SECTION 10 – STABILITY AND REACTIVITY

STABILITY: Product is stable. No hazardous polymerization will occur

CONDITIONS TO AVOID: Oxidizing agents may cause exothermic reactions.

HAZARDOUS DECOMPOSITION PRODUCTS: Thermal decomposition may produce nitrogen oxides (NOx), carbon oxides C(Ox)

SECTION 11 – TOXICOLOGICAL INFORMATION

ACUTE TOXICITY

ORAL:	LD50/Oral/Rat>5000mg/kg
DERMAL:	The results of testing on rabbits showed this material to be non-toxic even at high dose levels.
INHALATION:	The product is not expected to be toxic by inhalation.

IRRITATION

SKIN:	The results of testing on rabbits showed this material to be non-irritating to the skin.
EYES:	Testing conducted according to the Draize technique showed the material produces no corneal or iridial effects and only slight transitory conjuctival effects similar to those which all granular materials have on conjuctivae.

SENSITIZATION: The results of testing on guinea pigs showed this material to be non-sensitizing.

CHRONIC TOXICITY: A two-year feeding study on rats did not reveal adverse health effects. A two-year feeding study on dogs did not reveal adverse health effects.

SECTION 12 – EXOLOGICAL INFORMATION

FISH: LC50/Danio rerio/96 hr>100 mg/L (OECD 203) (Based on results obtained from tests of analogous products.)

ALGAE: LC50/Scenedesmus Subspicatus/72hr>100 mg/L (OECD 201) (Based on results obtained from tests of analogous products.)

DAPHNIA: EC50/Daphnia magna/48 hr>100 mg/L (OECD 202) (Based on results obtained from tests of analogous products.)

BIOACCUMULATION: Does not bioaccumulate.

PERSISTENCE / DEGRADABILITY: Not readily biodegradable.

SECTION 13 – DISPOSAL CONSIDERATIONS

WASTE FROM RESIDUES / UNUSED PRODUCTS: In accordance with Federal, State, and Local Regulations.

CONTAMINATED PACKAGING: Rinse empty containers with water and use the rinse water to prepare the working solution. Can be landfilled or incinerated, when in compliance with local regulations.

SECTION 14 – TRANSPORT INFORMATION

NOT REGULATED BY D.O.T.

SECTION 15 – REGULATORY INFORMATION

ALL COMPONENTS OF THIS PRODUCT ARE ON THE TSCA AND DSL INVENTORIES

RCRA STATUS: Not a hazardous waste.

HAZARDOUS WASTE NUMBER: Not Applicable

REPORTABLE QUANTITY (40 CFR 302): Not Applicable

THRESHOLD PLANNING QUANTITY (40 CFR 355): Not Applicable

CALIFORNIA PROPOSITION 65 INFORMATION:

The following statement is made in order to comply with the ca safe drinking water and toxic enforcement act of 1986: this product contains a chemical known to the state of california to cause cancer: residual acrylamide

HMIS & NFPA RATINGS

	HMIS	NFPA
HEALTH	**-**	**-**
FLAMMABILITY:	**-**	**1**
REACTIVITY:	**0**	**0**

SECTION 16 – OTHER INFORMATION

PERSON TO CONTACT: Regulatory Affairs Manager

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of it's publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release, and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process unless specified in the text.

SECTION 1 – GENERAL INFORMATION

MANUFACTURER/SUPPLIER'S NAME: ADEGA CHEMICAL
27917 Paseo El Concho
San Juan Capistrano, Ca. 9267 NJ 07885

PRODUCT AND TECHNICAL INFORMATION NUMBER: (949) 275-7208

PROPER SHIPPING NAME (49CFR 172.101): NONE
D.O.T. HAZARD NAME (49CFR 172.101): NONE
D.O.T. ID NUMBER (49CFR 172.101): NONE
D.O.T. HAZARD CLASS (49CFR 172.101): NONE
RCRA HAZARD CLASS (40CFR 261) (IF DISCARDED): NONE
E.P.A PRIORITY POLLUTANTS (40 CFR 122.53): NONE
HEALTH (NFPA): 2 FLAMMABILITY (NFPA): 0 REACTIVITY (NFPA): 0

GENERIC DESCRIPTION: PROPRIETARY BLEND

SECTION 2 – HAZARDOUS INGREDIENTS AS DEFINED IN 29 CFR 1910 1200

CAS NO.	INGREDIENT	EXPOSURE LIMITS
PROPRIETARY	CONTAINS WATER SOLUBLE ALUMINUM COMPOUNDS	OSHA PEL AND ACG1H TLV FOR ALUMINUM, SOLUBLE SALTS: TWA 2 MG/M3 AS ALUMINUM

SECTION 3 – EFFECTS OF OVEREXPOSURE

EYES: DIRECT CONTACT IRRITATES SLIGHTLY TO MODERATELY WITH REDNESS AND SWELLING

SKIN: A SINGLE RELATIVELY SHORT EXPOSURE CAUSES NO KNOWN ADVERSE EFFECT. REPEATED EXPOSURES MAY IRRITATE.

INHALATION: INHALING DUST OR MIST CREATED DURING USE MAY INJURE THE RESPIRATORY SYSTEM AND CAUSE AN ADVERSE LUNG REACTION

ORAL: SMALL AMOUNTS TRANSFERRED TO THE MOUTH BY FINGERS DURING USE ETC., SHOULD NOT INJURE. SWALLOWING LARGE AMOUNTS MAY CAUSE INJURY.

COMMENTS: THIS PRODUCT, AS WITH ANY CHEMICAL, MAY ENHANCE ALLERGIC CONDITIONS ON CERTAIN PEOPLE

SECTION 4 – EMERGENCY AND FIRST AID PROCEDURES

EYES: IMMEDIATELY FLUSH WITH WATER FOR 15 MIN. GET IMMEDIATE MEDICAL ATTENTION

SKIN: WIPE OFF AND FLUSH WITH WATER, THEN WASH WITH SOAP AND WATER.

INHALATION: GET MEDICAL ATTENTION IF THERE IS ANY DISCOMFORT.

ORAL: GET MEDICAL ATTENTION IF LARGE AMOUNT SWALLOWED OR THERE IS ANY DISCOMFORT.

SECTION 5 – FIRE AND EXPLOSION DATA

FLASH POINT (METHOD USED): NONE; NOT FLAMMABLE

EXTINGUISHING MEDIA: COOL CONTAINERS WITH WATER FOG

SPECIAL FIRE FIGHTING PROCEDURES: SELF-CONTAINED BREATHING APPARATUS AND PROTECTIVE CLOTHING SHOULD BE WORN IN FIGHTING FIRES INVOLVING CHEMICALS.

UNUSUAL FIRE AND EXPLOSION HAZARDS: HAZARDOUS CHLORINE COMPOUNDS MAY FORM WHEN EXPOSED TO FIRE OR HIGH HEAT.

SECTION 6 – PHYSICAL DATA

BOILING POINT (AT 760 MM HG): APPROX 212F/100C
SPECIFIC GRAVITY (AT 77 DEG. F / 25 DEG. C) 1.34
MELTING POINT: APPROX. 32F / OC
VAPOR PRESSURE (AT 77 DEB F / 25 DEG C): 24 MM (WATER)
VAPOR DENSITY (AIR = 1 AT 77 DEG F / 25 DEG C): THAT OF MOIST AIR
PERCENT VOLATILE BY WEIGHT (%): 50 (WATER)
EVAPORATION RATE (ETHER = 1): AS WATER
SOLUBILITY IN WATER (%): APPROX. 100
ODOR, APPEARANCE, COLOR: NO ODOR, LIQUID, CLEAR AND COLORLESS

NOTE: THE ABOVE INFORMATION IS NOT INTENDED FOR USE IN PREPARING PRODUCT SPECIFICATIONS, CONTACT MANUFACTURER BEFORE WRITING SPECIFICATIONS.

SECTION 7 – REACTIVITY DATA

STABILITY: STABLE

INCOMPATIBILITY (MATERIAL TO AVOID): OXIDIZING MATERIAL CAN CAUSE A REACTION. CAUSTICS WILL PRECIPITATE ALUMINUM HYDROXIDE.

CONDITIONS TO AVOID: EXPOSURE TO ABOVE AND CONTINUOUS HIGH TEMPERATURES.

HAZARDOUS DECOMPOSITION PRODUCTS: CHLORINE COMPOUNDS. METAL OXIDES

HAZARDOUS POLYMERIZATION: WILL NOT OCCUR

SECTION 8 – SPILL, LEAK, MAINTENANCE / REPAIR AND DISPOSAL PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED: USE ABSORBENT MATERIAL TO COLLECT AND CONTAIN. WASH WITH CLEAR WATER ONLY

PERSONAL PROTECTIVE EQUIPMENT:
EYES: SAFETY GLASSES, AS A MINIMUM, GOGGLES IF SPLASHING SHOULD OCCUR.

SKIN: WASHING AT MEALTIME AND END OF SHIFT IS ADEQUATE.

INHALATION: NO RESPIRATORY PROTECTION SHOULD BE NEEDED.

WASTE DISPOSAL METHOD: MANUFACTURER SUGGESTS THAT CALL LOCAL, STATE AND FEDERAL REGULATIONS CONCERNING HEALTH AND POLLUTION BE REVIEWED TO DETERMINE APPORVED DISPOSAL PROCEDURES. CONTACT MANUFACTURER IF THERE ARE ANY DISPOSAL QUESTIONS.

D.O.T. (49CFR 171.8)/E.P.A. (40CFR 117) SPILL REPORTING INFORMATION:
HAZARDOUS SUBSTANCE: NONE **REPORTABLE QUANTITY:** NOT APPLICABLE
CONCENTRATION OF HAZARDOUS SUBSTANCE: NOT APPLICABLE
REPORTABLE QUANTITY OF PRODUCT: NOT APPLICABLE

COMMENTS: PRODUCT CONTAINS NO INGREDIENT SUBJECT TO D.O.T. OR E.P.A. CERCLA / SARA ENVIRONMENTAL RELEASE REPORTING REGULATIONS. SEE SEC. 11 FOR ADDITIONAL SARA COMPLIANCE INFORMATION.

SECTION 9 – ROUTINE HANDLING PRECAUTIONS

PERSONAL PROTECTIVE EQUIPMENT:
EYES: SAFETY GLASSES, AS A MINIMUM, GOGGLES IF SPLASHING SHOULD OCCUR.

SKIN: WASHING AT MEALTIME AND END OF SHIFT IS ADEQUATE.

INHALATION: NO RESPIRATORY PROTECTION SHOULD BE NEEDED UNLESS MISTS ARE CREATED.

VENTILATION: LOCAL EXHAUST: NONE SHOULD BE NEEDED.
MECHANICAL (GENERAL): RECOMMENDED

SUITABLE RESPIRATOR: DUST / MIST TYPE

THESE PRECAUTIONS ARE FOR ROOM TEMPERATURE HANDLING. USE AT ELEVATED TEMPERATURES, OR AEROSOL / SPRAY APPLICATIONS MAY REQUIRE ADDED PRECAUTIONS.

*GOOD PRACTICE REQUIRES THAT GROSS AMOUNT OF ANY CHEMICAL BE REMOVED FROM THE SKIN AS SOON AS PRACTICAL, ESPECIALLY BEFORE EASTING OR SMOKING

COMMENTS: AVOID EYE CONTACT

SECTION 10 – SPECIAL PRECAUTIONS

USE REASONABLE CARE AND CAUTION IN HANDLING AND STORAGE. STORE BETWEEN 32 F. / 0C. AND 120 F / 49 C.

SECTION 11 – COMMENTS

ADDITIONAL SARA REGULATORY COMPLIANCE INFORMATION SEC. 312 HAZARD CLASS: IMMEDIATE AND DELAYED.

SEC. 313 NOTIFICATION: NOT APPLICABLE; EITHER NONE PRESENT OR NONE PRESENT IN REGULATED QUANTITIES.

THESE DATA ARE OFFERED IN GOOD FAITH AS TYPICAL VALUES AND NOT AS A PRODUCT SPCIFICATION. NO WARRANTY, EITHER EXPRESSED OR IMPLIED, IS HEREBY MADE. THE RECOMMENDED INDUSTRIAL HYGIENE AND SAFE HANDLING PROCEDURES ARE BELIEVED TO BE GENERALLY APPLICABLE. HOWEVER, EACH USER SHOULD REVIEW THESE RECOMMENDATIONS IN THE SPECIFIC CONTEXT OF THE INTEDED USE AND DETERMINE WHETHER THEY ARE APPROPRIATE

Ground/Water Treatment and Technology, Inc.

PO Box 1174 •Denville, New Jersey 07834

Phone (973) 983-0901 • Fax (973) 983-0903

Job Number: OP 8326 Date: 09/21/18

Lowell St Wakefield - Bid (Prelim)

GIVEN:

Name of Coagulant: wc500 Active **Chemical**

concentration of **active chemical** in coag product (by weight) : 50 %

specific gravity (S.G.) of Coag product : 1.34 [unitless]

Water: $8.34 \frac{\#}{gal}$

$$8.34 \frac{\#}{gal} * S.G._{Coagulant} = \frac{\#}{gal_{Coagulant}} =$$

11.18 $\frac{\#}{gal_{Coagulant}}$

Based on concentration of **active chemical** in Coagulant solution: 5.59 $\frac{\#_{Active\ Chemical}}{gal_{Coagulant}}$

Amount of Coagulant required as determined by Bench Testing (# drops): 2 drops

(using a 1mL syringe, 1 drop = 0.03mL, 3 drops = 0.1mL)

Volume of Wastewater sample used to perfom Bench Testing (in mL): 1000 mL

Concentration of Coagulant as determined by Bench Testing: 80 ppm

(for reference, 1mg/L = 1ppm)

System Flow (in GPM): 50 $\frac{gallons}{minute}$ System Run Time per day (in hr/day): 24 $\frac{hours}{day}$

Process Water per day through system: 600480 $\frac{\#Water}{day}$

Pounds of Coagulant required per day: 48.25 $\frac{\#_{Coaglant}}{day}$

(given aforementioned quantity of Process Water)

Required Average Capacity for Coagulant Pump: 0.18 $\frac{gal_{Coagulant}}{hour}$

(given aforemention System Run Time)

Ground/Water Treatment and Technology, Inc.
PO Box 1174 •Denville, New Jersey 07834
Phone (973) 983-0901 • Fax (973) 983-0903

Maximum Rated Output of LMI Pump: 0.5 $\frac{gal}{hour}$

Required Average Capacity for Coagulant Pump: 0.18 $\frac{gal_{Coagulant}}{hour}$

Speed Setting * Power Setting on LMI Pump must multiply to: 36 %

$$\left(\frac{\text{Speed Setting(as \%)}}{100} * \frac{\text{Power Setting(as \%)}}{100}\right) * 100 = \%\ \text{of Rated Capacity of LMI Pump}$$

Estimate duration: 1 Week

Ground/Water Treatment and Technology, LLC.

PO Box 1174 •Denville, New Jersey 07834

Phone (973) 983-0901 • Fax (973) 983-0903

Job Number: OP 8326 Date: 9/21/2018

Lowell St Wakefield - Bid (Prelim)

GIVEN:

Name of Flocculent: AP210 Active Product:

Solution Concentration:

Volume of dry polymer added (in cc): 1 cc (1 cc = 1 mL = 1 gram)

Volume of distilled water used (in mL): 250 mL

Dilute Floc Solution Concentration: 0.40 weight % 4000 ppm

Dosage Rate:

Volume of Dilute Floc Solution added to Wastewater sample (in mL): 2 mL

Volume of water the Dilute Floc Solution was added to (in mL): 1000 mL

Dosage Rate: 8.00 ppm

System Flow (in GPM): 50 $\frac{gallons}{minute}$ System Run Time per day (in hr/day): 24 $\frac{hours}{day}$

Process Water per day through system: 600480 $\frac{\#\ Water}{day}$

Pounds of 100% Active Flocculent required per day: 4.80 $\frac{\#\ Flocculent}{day}$

(given aforementioned quantity of Process Water)

Pounds of Made-Down Solution required per day: 1200.96 $\frac{\#\ Solution}{day}$ at a Solution Concentration 0.40 %

(given aforementioned quantity of Process Water)

Required Average Capacity for Flocculent Pump: 6.00 $\frac{gal\ Flocculent}{hour}$

(given aforemention System Run Time)

Ground/Water Treatment and Technology, Inc.
PO Box 1174 •Denville, New Jersey 07834
Phone (973) 983-0901 • Fax (973) 983-0903

Maximum Rated Output of LMI Pump: 10 $\frac{gal}{hour}$

Required Average Capacity for Flocculent Pump: 6.00 $\frac{gal\ \text{Flocculent}}{hour}$

Speed Setting * Power Setting on LMI Pump must multiply to: 60 %

$$\left(\frac{\text{Speed Setting(as \%)}}{100} * \frac{\text{Power Setting(as \%)}}{100}\right) * 100 = \%\ \text{of Rated Capacity of LMI Pump}$$

Estimate duration: 1 Week

ATTACHMENT D

ENDANGERED SPECIES ACT DOCUMENTATION

United States Department of the Interior

FISH AND WILDLIFE SERVICE
New England Ecological Services Field Office
70 Commercial Street, Suite 300
Concord, NH 03301-5094
Phone: (603) 223-2541 Fax: (603) 223-0104
http://www.fws.gov/newengland

In Reply Refer To:
Consultation Code: 05E1NE00-2018-SLI-2651
Event Code: 05E1NE00-2018-E-06195
Project Name: Nouria Wakefield RGP NOI

August 08, 2018

Subject: List of threatened and endangered species that may occur in your proposed project location, and/or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the ECOS-IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 *et seq.*), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2)(c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:

http://www.fws.gov/endangered/esa-library/pdf/TOC-GLOS.PDF

Please be aware that bald and golden eagles are protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668 *et seq.*), and projects affecting these species may require development of an eagle conservation plan (http://www.fws.gov/windenergy/eagle_guidance.html). Additionally, wind energy projects should follow the wind energy guidelines (http://www.fws.gov/windenergy/) for minimizing impacts to migratory birds and bats.

Guidance for minimizing impacts to migratory birds for projects including communications towers (e.g., cellular, digital television, radio, and emergency broadcast) can be found at: http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/towers.htm; http://www.towerkill.com; and http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/comtow.html.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Tracking Number in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment(s):

- Official Species List

Official Species List

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

New England Ecological Services Field Office
70 Commercial Street, Suite 300
Concord, NH 03301-5094
(603) 223-2541

Project Summary

Consultation Code: 05E1NE00-2018-SLI-2651

Event Code: 05E1NE00-2018-E-06195

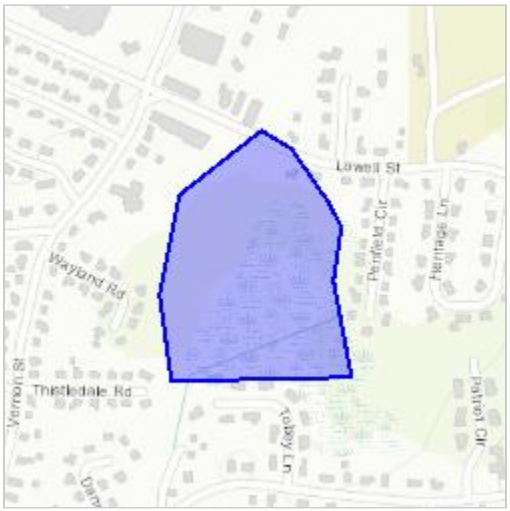
Project Name: Nouria Wakefield RGP NOI

Project Type: DEVELOPMENT

Project Description: Dewatering associated with replacement of USTs.

Project Location:

Approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/place/42.515642455962606N71.06250408263665W



Counties: Middlesex, MA

Endangered Species Act Species

There is a total of 1 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries[1], as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

---

1. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

Mammals

NAME	STATUS
Northern Long-eared Bat *Myotis septentrionalis* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9045	Threatened

Critical habitats

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

ATTACHMENT E

NATIONAL HISTORIC PRESERVATION ACT DOCUMENTATION

Massachusetts Cultural Resource Information System

MACRIS

MACRIS Search Results

Search Criteria: Town(s): Wakefield; Resource Type(s): Area, Building, Burial Ground, Object, Structure;

Inv. No.	Property Name	Street	Town	Year
WAK.A	Church - Lafayette Streets Historic District		Wakefield	
WAK.B	Common Historic District		Wakefield	
WAK.C	Wakefield Park Historic District		Wakefield	
WAK.D	Yale Avenue Historic District		Wakefield	
WAK.E	Wakefield Multiple Resource Area		Wakefield	
WAK.F	First Period Buildings of Eastern Massachusetts		Wakefield	
WAK.G	Wakefield Rattan Company		Wakefield	
WAK.H	Metropolitan Park System of Greater Boston		Wakefield	
WAK.I	Breakheart Reservation Parkways		Wakefield	
WAK.J	Breakheart Reservation		Wakefield	
WAK.K	Camp Curtis Guild		Wakefield	
WAK.62	Aborn Street, 18A-20	18A-20 Aborn St	Wakefield	r 1885
WAK.253	Adams Street, 6	6 Adams St	Wakefield	c 1907
WAK.373	U. S. Post Office - Wakefield Branch	Albion St	Wakefield	r 1910
WAK.250		13-15 Albion St	Wakefield	c 1906
WAK.227	Quannapowitt House	18 Albion St	Wakefield	c 1800
WAK.224	Item Building	26 Albion St	Wakefield	c 1912
WAK.249	Wiley, John House	45 Albion St	Wakefield	r 1815
WAK.248	Williams, Francis House	63 Albion St	Wakefield	r 1847
WAK.223	Hartshorne, Charles F. House	68 Albion St	Wakefield	r 1872
WAK.222	Harvard Knitting Mills	178 Albion St	Wakefield	c 1897
WAK.238	Gould, Abraham House	335 Albion St	Wakefield	c 1760
WAK.237	Paine, Stephen House	371 Albion St	Wakefield	c 1840
WAK.228	Tilton, D. Horace House	379 Albion St	Wakefield	r 1730
WAK.221	Albion Street, 380	380 Albion St	Wakefield	c 1910
WAK.297		10-10A Avon St	Wakefield	r 1884
WAK.293	Avon Street, 23	23 Avon St	Wakefield	c 1855

Inv. No.	Property Name	Street	Town	Year
WAK.296	Avon Street, 25	25 Avon St	Wakefield	c 1880
WAK.294		29 Avon St	Wakefield	r 1852
WAK.295	Greenough, William S. House	30 Avon St	Wakefield	c 1855
WAK.905	Boston and Maine Railroad Bridge	B and M Railroad	Wakefield	1893
WAK.206	Sherry Wine Bitters Production Facility	48 Bartley St	Wakefield	c 1835
WAK.343	Beacon Street Tomb	Beacon St	Wakefield	r 1859
WAK.145	Boit, E. E. Home for Aged Women	5 Bennett St	Wakefield	r 1878
WAK.146	Gaffey, John B. and Frank T. House	60 Bennett St	Wakefield	r 1871
WAK.213	Wakefield Waterworks Filter House	72 Broadway	Wakefield	c 1928
WAK.210	Wakefield Waterworks Pumping Station	108 Broadway	Wakefield	c 1883
WAK.205		135 Broadway	Wakefield	r 1847
WAK.204	Kimball, Cyrus House	144 Broadway	Wakefield	c 1850
WAK.203	Kenniston, J. W. House	152 Broadway	Wakefield	c 1856
WAK.93		2 Bryant St	Wakefield	c 1910
WAK.11	Emmanuel Parish Episcopal Church	5 Bryant St	Wakefield	c 1881
WAK.94	Emanual Episcopal Church Rectory	5 Bryant St	Wakefield	c 1903
WAK.115	Butler, Aaron House	81 Butler St	Wakefield	c 1903
WAK.277	Downes, John W. House	6 Cedar Ct	Wakefield	c 1907
WAK.276	Davis, Augustus A. House	8 Cedar Ct	Wakefield	r 1895
WAK.278	Frye, Walter H. House	1 Cedar Pl	Wakefield	r 1896
WAK.280		39 Cedar St	Wakefield	r 1895
WAK.279		65 Cedar St	Wakefield	c 1850
WAK.289	Perkins, A. C. House	7 Chestnut St	Wakefield	r 1857
WAK.288	Perkins, A. C. House	11 Chestnut St	Wakefield	r 1852
WAK.286	Chestnut Street, 15	15 Chestnut St	Wakefield	c 1885
WAK.287	Chestnut Street, 21	21 Chestnut St	Wakefield	c 1850
WAK.285	Mooney, Amos W. House	39 Chestnut St	Wakefield	c 1855
WAK.274		72 Chestnut St	Wakefield	c 1890
WAK.272	Killorin, George W. House	94 Chestnut St	Wakefield	c 1890
WAK.270	Chestnut Street, 95	95 Chestnut St	Wakefield	1849
WAK.269	Thayer, Harry I. House	120 Chestnut St	Wakefield	r 1917
WAK.268		122 Chestnut St	Wakefield	c 1885
WAK.252	Boit, Elizabeth House	127 Chestnut St	Wakefield	c 1911
WAK.267	Perkins, Oliver House	128 Chestnut St	Wakefield	c 1886
WAK.801	Old Burial Ground	Church St	Wakefield	c 1688
WAK.369	First Parish Congregational Church	1 Church St	Wakefield	r 1891
WAK.368	Adams House	10 Church St	Wakefield	c 1835
WAK.367		12 Church St	Wakefield	r 1895

Inv. No.	Property Name	Street	Town	Year
WAK.366	Hart, Henry J. House	16 Church St	Wakefield	c 1850
WAK.365	Upton, Edward A. House	18 Church St	Wakefield	c 1880
WAK.364	Atwell, S. B. House	24 Church St	Wakefield	c 1857
WAK.363	Deadman, William House	34 Church St	Wakefield	c 1812
WAK.362	Hartshorne House	36 Church St	Wakefield	c 1880
WAK.361	Hay, Francis House	38 Church St	Wakefield	c 1803
WAK.360	Wiley, Ebenezer House	40 Church St	Wakefield	c 1804
WAK.359	Hartshorne, Col. James House	41 Church St	Wakefield	c 1681
WAK.358	Stacy, Samuel House	42 Church St	Wakefield	c 1800
WAK.357	Cowdrey, Nathaniel House	44 Church St	Wakefield	c 1790
WAK.356	Emerson, William House	46 Church St	Wakefield	c 1814
WAK.400		1-3 Clarina St	Wakefield	c 1920
WAK.266	Wilkins, Edward House	8 Clarina St	Wakefield	c 1900
WAK.353	First Baptist Church	Common St	Wakefield	c 1872
WAK.355		1 Common St	Wakefield	r 1816
WAK.354		3 Common St	Wakefield	c 1855
WAK.383		5 Common St	Wakefield	
WAK.242	Warren, H. M. Public School	30 Converse St	Wakefield	r 1896
WAK.241	Converse Street, 39	39 Converse St	Wakefield	c 1880
WAK.240		70 Converse St	Wakefield	c 1860
WAK.917	Cooper Street Bridge over B & M Railroad	Cooper St	Wakefield	1903
WAK.185	Gould, Capt. Thomas Homestead	11-13 Cooper St	Wakefield	c 1763
WAK.55	Hurd, Francis P. Public School	Cordis St	Wakefield	c 1889
WAK.51	Nicols House	6 Cordis St	Wakefield	r 1841
WAK.52		12 Cordis St	Wakefield	r 1847
WAK.53	Clark, Sylvanus House	16 Cordis St	Wakefield	1851
WAK.54	Cordis Street, 28	28 Cordis St	Wakefield	r 1840
WAK.56		47 Cordis St	Wakefield	r 1848
WAK.57	Brown, John House	49 Cordis St	Wakefield	c 1760
WAK.156		2 Cottage St	Wakefield	r 1867
WAK.58		48 Court St	Wakefield	r 1850
WAK.106		5 Crescent Hill St	Wakefield	c 1899
WAK.98	Eaton, Lilley House	10 Crescent St	Wakefield	c 1785
WAK.100	Hart, Dr. John House	17 Crescent St	Wakefield	c 1784
WAK.99	Crocker House	19 Crescent St	Wakefield	c 1840
WAK.102	Lincoln Elementary School	26 Crescent St	Wakefield	c 1892
WAK.101		30 Crescent St	Wakefield	r 1870
WAK.103	Wakefield Fire Station	37 Crescent St	Wakefield	c 1900

Inv. No.	Property Name	Street	Town	Year
WAK.104	Crescent Street, 40	40 Crescent St	Wakefield	c 1839
WAK.105	Chapman, A. W. House	51A-51B Crescent St	Wakefield	c 1840
WAK.264		2 Dell Ave	Wakefield	c 1905
WAK.107	Cutter, Nathaniel Everett House	6 Eaton St	Wakefield	r 1865
WAK.108	Eaton, Zenas House	15 Eaton St	Wakefield	c 1840
WAK.109	Kingman, Samuel House	21 Eaton St	Wakefield	r 1848
WAK.110	Upham, E. S. House	23 Eaton St	Wakefield	c 1814
WAK.921	Breakheart Reservation Parkways - Elm Road	Elm Rd	Wakefield	c 1938
WAK.923	Breakheart Reservation Parkways - Elm Road Culvert	Elm Rd	Wakefield	c 1960
WAK.332		4-6 Elm Sq	Wakefield	c 1900
WAK.337	Goodwin, Capt. - Eustis, James House	1 Elm St	Wakefield	c 1770
WAK.336	Hay, Dr. John House	53 Elm St	Wakefield	c 1780
WAK.331	Winn, Maj. Suell House	72-74 Elm St	Wakefield	c 1813
WAK.330	Nichols, Richard House	80 Elm St	Wakefield	c 1700
WAK.112	Connell, Joseph House	12 Emerald St	Wakefield	r 1870
WAK.284		17 Emerson St	Wakefield	c 1860
WAK.283		29 Emerson St	Wakefield	c 1890
WAK.282		40 Emerson St	Wakefield	c 1890
WAK.281		48 Emerson St	Wakefield	c 1915
WAK.334		Eustis Ave	Wakefield	c 1915
WAK.333		22 Eustis Ave	Wakefield	c 1900
WAK.335		53 Eustis Ave	Wakefield	c 1905
WAK.275		14 Fairmount St	Wakefield	c 1875
WAK.273	White, Samuel House	35 Fairmount St	Wakefield	c 1890
WAK.132	Woodville School	Farm St	Wakefield	c 1920
WAK.131		75 Farm St	Wakefield	r 1916
WAK.50		11 Fitch Ct	Wakefield	r 1853
WAK.195		Forest St	Wakefield	1940
WAK.924	Breakheart Reservation Culvert System	Forest St	Wakefield	r 1920
WAK.226	South Reading Academy	7 Foster St	Wakefield	c 1828
WAK.225	Volunteer Hose No. 2 Company Firehouse	9 Foster St	Wakefield	c 1900
WAK.211	Massachusetts Oilless Bearing Company Machine Shop	29 Foundry St	Wakefield	c 1910
WAK.212	Smith and Anthony Foundry Power House	88 Foundry St	Wakefield	c 1870
WAK.177	Francis Avenue, 26	26 Francis Ave	Wakefield	r 1914
WAK.154		9 Franklin St	Wakefield	r 1864
WAK.155		34 Franklin St	Wakefield	c 1880

Inv. No.	Property Name	Street	Town	Year
WAK.245	Saint Joseph's School	Gould St	Wakefield	1924
WAK.244		24 Gould St	Wakefield	c 1874
WAK.159		21 Green St	Wakefield	r 1911
WAK.171	Hitchinson, Robert House	5 Greenwood Ave	Wakefield	r 1932
WAK.172		33 Greenwood Ave	Wakefield	r 1894
WAK.173	Evans, George T. House	34 Greenwood Ave	Wakefield	c 1928
WAK.174	Varndon, Ross House	56 Greenwood Ave	Wakefield	r 1909
WAK.175	Hodgedon, Charles House	68 Greenwood Ave	Wakefield	r 1919
WAK.176	Marble, Matthew A. House	101 Greenwood Ave	Wakefield	r 1902
WAK.194	Walton, Thomas House	7-9 Greenwood St	Wakefield	c 1700
WAK.193	Locke, Joseph J. House	13 Greenwood St	Wakefield	c 1840
WAK.192		83 Greenwood St	Wakefield	c 1877
WAK.188	Greenwood Street, 118	118 Greenwood St	Wakefield	c 1875
WAK.189	Green - Brown - White House	133 Greenwood St	Wakefield	c 1795
WAK.187	Morse, Henry R. House	146 Greenwood St	Wakefield	c 1857
WAK.184		3 Grove St	Wakefield	c 1840
WAK.183		7 Grove St	Wakefield	c 1840
WAK.30	Hancock Road, 20	20 Hancock Rd	Wakefield	r 1867
WAK.406	Camp Curtis Guild Barn #TS02	25 Haverhill St	Wakefield	r 1945
WAK.407	Camp Curtis Guild Motor Vehicle Garage #L0001	25 Haverhill St	Wakefield	1937
WAK.408	Camp Curtis Guild Administration Building	25 Haverhill St	Wakefield	c 1993
WAK.409	Camp Curtis Guild Organizational Maintenance Shop	25 Haverhill St	Wakefield	1978
WAK.410	Camp Curtis Guild Flammable Material Storage	25 Haverhill St	Wakefield	1978
WAK.411	Camp Curtis Guild Building #TS077	25 Haverhill St	Wakefield	c 1965
WAK.926	Camp Curtis Guild Lube Storage Building #L0004	25 Haverhill St	Wakefield	1950
WAK.927	Reading - Lynnfield - Wakefield Boundary Marker	25 Haverhill St	Wakefield	
WAK.922	Breakheart Reservation Parkways - Hemlock Road	Hemlock Rd	Wakefield	c 1938
WAK.925	Breakheart Reservation Hemlock Road Entry Gates	Hemlock Rd	Wakefield	c 1956
WAK.179	Hogg, Wilton P. House	2 High St	Wakefield	c 1926
WAK.180	Jordan, Leon E. House	16 High St	Wakefield	r 1918
WAK.169	McKee, William U. House	4 Hillis St	Wakefield	r 1897
WAK.170	Chadwick, Gilbert House	6 Hillis St	Wakefield	c 1928
WAK.307	Hopkins Street, 42	42 Hopkins St	Wakefield	r 1855
WAK.230	Jordan, Dr. Charles House	9 Jordan Ave	Wakefield	c 1885
WAK.232		41 Jordan Ave	Wakefield	c 1860

Inv. No.	Property Name	Street	Town	Year
WAK.233		48 Jordan Ave	Wakefield	c 1880
WAK.404		48 Jordan Ave	Wakefield	c 1880
WAK.234		56 Jordan Ave	Wakefield	c 1860
WAK.243		4 Karl Rd	Wakefield	c 1925
WAK.181		65 Kendrick St	Wakefield	r 1931
WAK.352	Wakefield High School - Wakefield Town Hall	1 Lafayette St	Wakefield	c 1871
WAK.351		19 Lafayette St	Wakefield	c 1855
WAK.350	Russell, Samuel House	21 Lafayette St	Wakefield	c 1830
WAK.349	Lambert, John House	23 Lafayette St	Wakefield	c 1834
WAK.348		28 Lafayette St	Wakefield	c 1832
WAK.384		29 Lafayette St	Wakefield	c 1834
WAK.385		32 Lafayette St	Wakefield	1930
WAK.386		33 Lafayette St	Wakefield	1940
WAK.347		34 Lafayette St	Wakefield	c 1835
WAK.387		36 Lafayette St	Wakefield	r 1850
WAK.207		44-44D Lake St	Wakefield	c 1890
WAK.208	O'Connell, Michael House	47 Lake St	Wakefield	c 1856
WAK.1		4 Lakeview Ave	Wakefield	c 1913
WAK.2		26 Lakeview Ave	Wakefield	c 1923
WAK.67	Lawrence Street, 15	15 Lawrence St	Wakefield	r 1872
WAK.68	Evans, Arthur House	16 Lawrence St	Wakefield	1924
WAK.69	Lawrence Street, 20	20 Lawrence St	Wakefield	c 1880
WAK.70	Lawrence Street, 23	23 Lawrence St	Wakefield	c 1890
WAK.71	Gould, Joseph House	34 Lawrence St	Wakefield	1765
WAK.72		44 Lawrence St	Wakefield	r 1902
WAK.197	Lynnwood	5 Linden Ave	Wakefield	c 1858
WAK.919	Wakefield Spanish-American War Memorial	Lowell Rd	Wakefield	
WAK.20		222 Lowell St	Wakefield	r 1902
WAK.21		234 Lowell St	Wakefield	r 1870
WAK.23	Sweetser, Daniel House	458 Lowell St	Wakefield	c 1780
WAK.22	Burditt House - Larsen Poultry Farm	467 Lowell St	Wakefield	c 1797
WAK.24		486 Lowell St	Wakefield	c 1910
WAK.25		502 Lowell St	Wakefield	r 1853
WAK.26	Marshall, Alonzo L. House	503 Lowell St	Wakefield	r 1855
WAK.27	Brown, John House	524 Lowell St	Wakefield	c 1760
WAK.28		550 Lowell St	Wakefield	r 1869
WAK.29	Lowell Street, 556	556 Lowell St	Wakefield	c 1894
WAK.298	Beebe, Lucius Memorial Library	Main St	Wakefield	1922

Inv. No.	Property Name	Street	Town	Year
WAK.900	Wakefield Civil War Monument	Main St	Wakefield	1902
WAK.901	Wakefield World War I Memorial	Main St	Wakefield	1920
WAK.902	Rockery, The	Main St	Wakefield	1884
WAK.904	Historic Lynn Village Monument	Main St	Wakefield	1888
WAK.906	Crystal Lake	Main St	Wakefield	
WAK.907	Wakefield Savings Bank Clock	Main St	Wakefield	c 1902
WAK.908	Wakefield Bandstand	Main St	Wakefield	1885
WAK.909	Lake Quannapowitt	Main St	Wakefield	
WAK.910	Wakefield Common	Main St	Wakefield	c 1644
WAK.912	Wakefield Spanish American War Monument	Main St	Wakefield	1926
WAK.913	Wakefield World War II Memorial	Main St	Wakefield	1945
WAK.914	Wakefield Korean and Vietnam Memorial	Main St	Wakefield	
WAK.371	Woodward Homestead	17 Main St	Wakefield	c 1765
WAK.3		40 Main St	Wakefield	r 1907
WAK.4	Bayrd's Indian Trading Post	52 Main St	Wakefield	1955
WAK.5	Simpson, Dr. Thomas House	114 Main St	Wakefield	c 1750
WAK.9	Beebe Homestead	142 Main St	Wakefield	r 1808
WAK.6	Young, William F. House	190 Main St	Wakefield	r 1848
WAK.7	White, William House	194 Main St	Wakefield	r 1848
WAK.8	Eaton, Hiram House	196 Main St	Wakefield	r 1848
WAK.10	Wright, A. J. House	202 Main St	Wakefield	c 1888
WAK.12	Eaton - Emerson - Wiley House	252 Main St	Wakefield	c 1818
WAK.374		254 Main St	Wakefield	1860
WAK.375		258 Main St	Wakefield	c 1850
WAK.377		266 Main St	Wakefield	r 1850
WAK.378		270 Main St	Wakefield	c 1860
WAK.379		272 Main St	Wakefield	r 1850
WAK.380		282 Main St	Wakefield	1920
WAK.381		284 Main St	Wakefield	c 1930
WAK.13	Crystal Apartments	294-298 Main St	Wakefield	1924
WAK.15	Wiley, Benjamin Shoe Manufacturing Factory	306 Main St	Wakefield	c 1800
WAK.382		310 Main St	Wakefield	1940
WAK.16	Wiley, Benjamin Brown House	316 Main St	Wakefield	1822
WAK.305		317 Main St	Wakefield	c 1908
WAK.299	U. S. Post Office - Wakefield Branch	321 Main St	Wakefield	1936
WAK.14	First Universalist Church	326 Main St	Wakefield	c 1836
WAK.292	Flanley's Block	349-353 Main St	Wakefield	c 1895
WAK.17		356 Main St	Wakefield	c 1855

Inv. No.	Property Name	Street	Town	Year
WAK.251	Kingman Block	369 Main St	Wakefield	c 1860
WAK.290	Wakefield Trust Company	371 Main St	Wakefield	1924
WAK.18	Butler Block - Boothby's Block	380 Main St	Wakefield	1875
WAK.220	Richardson, Solon O. Building	405 Main St	Wakefield	1901
WAK.19	Wakefield Block - Taylor Block	414-416 Main St	Wakefield	c 1870
WAK.134	Hodgdon, Charles W. Building	450-458 Main St	Wakefield	r 1921
WAK.214	Massachusetts State Armory	465 Main St	Wakefield	1913
WAK.135	Richardson, Dr. Solon O. House	694 Main St	Wakefield	r 1839
WAK.202	Shea, William House	695 Main St	Wakefield	c 1860
WAK.201		701 Main St	Wakefield	c 1857
WAK.200	Heath, Elroy House	705 Main St	Wakefield	r 1858
WAK.199		711 Main St	Wakefield	r 1857
WAK.198	Green, Dea. Daniel House	757 Main St	Wakefield	r 1767
WAK.136	Evans, Jonathan House	758 Main St	Wakefield	r 1811
WAK.137	Kendrick, Rufus House	824 Main St	Wakefield	c 1867
WAK.138		984 Main St	Wakefield	r 1867
WAK.141	Green House	1068-1070 Main St	Wakefield	c 1760
WAK.140		1102-1104 Main St	Wakefield	r 1884
WAK.231	Winship, Charles House	13 Mansion Rd	Wakefield	r 1903
WAK.338		3 Margin St	Wakefield	c 1849
WAK.918	Meriam Street Bridge over B and M Railroad	Meriam St	Wakefield	1939
WAK.196	Gould, Samuel House	48 Meriam St	Wakefield	c 1735
WAK.116	Edmands, Rodney and Jesse C. House	106 Montrose Ave	Wakefield	r 1895
WAK.255	Morrison Avenue, 1	1 Morrison Ave	Wakefield	c 1890
WAK.257	Morrison Road, 20	20 Morrison Rd	Wakefield	c 1890
WAK.256	Morrison Road, 32	32 Morrison Rd	Wakefield	r 1907
WAK.186	Kimball, Sam House	8 Myrtle Ave	Wakefield	c 1850
WAK.147	Sweetser, Michael House	15 Nahant St	Wakefield	c 1755
WAK.148		75 Nahant St	Wakefield	r 1775
WAK.149	Franklin School	100 Nahant St	Wakefield	1902
WAK.150	Cooper, Jacob T. House	101 Nahant St	Wakefield	r 1866
WAK.113		102 New Salem St	Wakefield	r 1895
WAK.236		2-2A Newell Rd	Wakefield	r 1917
WAK.235		10-12 Newell Rd	Wakefield	c 1910
WAK.123	Newhall, James William and William House	6 Newhall Ct	Wakefield	r 1878
WAK.124		7 Newhall Ct	Wakefield	r 1915
WAK.324	Nichols Street, 2	2 Nichols St	Wakefield	r 1895
WAK.342	Lakeside Cemetery Chapel	North Ave	Wakefield	1932

Inv. No.	Property Name	Street	Town	Year
WAK.800	Temple Israel Cemetery	North Ave	Wakefield	1859
WAK.915	Veterans Field Park	North Ave	Wakefield	1932
WAK.920	Wakefield Firefighters Memorial	North Ave	Wakefield	
WAK.341		231-233 North Ave	Wakefield	c 1900
WAK.344		504 North Ave	Wakefield	c 1885
WAK.345	North Avenue, 509	509 North Ave	Wakefield	c 1848
WAK.346		610 North Ave	Wakefield	c 1850
WAK.161	Savage, Henry H. House	10 Oak Ave	Wakefield	r 1882
WAK.139	Greenwood Union Church	Oak St	Wakefield	c 1884
WAK.162		14 Oak St	Wakefield	r 1900
WAK.163		24 Oak St	Wakefield	r 1882
WAK.164	Oak Street, 52	52 Oak St	Wakefield	r 1895
WAK.165	Oliver House	58 Oak St	Wakefield	c 1790
WAK.166	Oliver, Dea. Ezekiel House	68 Oak St	Wakefield	r 1820
WAK.167	Levi, Thomas House	220 Oak St	Wakefield	r 1881
WAK.168		230R Oak St	Wakefield	c 1750
WAK.151	Smith, John House	3 Old Nahant Rd	Wakefield	c 1792
WAK.152		42 Old Nahant Rd	Wakefield	r 1848
WAK.111		16 Otis St	Wakefield	c 1888
WAK.916	Park Avenue - Clarina Street Traffic Circle	Park Ave	Wakefield	c 1899
WAK.391		2 Park Ave	Wakefield	c 1899
WAK.392		4 Park Ave	Wakefield	c 1900
WAK.393		5 Park Ave	Wakefield	
WAK.394		6 Park Ave	Wakefield	c 1909
WAK.395		7 Park Ave	Wakefield	c 1908
WAK.396		8 Park Ave	Wakefield	c 1900
WAK.265		18 Park Ave	Wakefield	c 1908
WAK.397		19 Park Ave	Wakefield	c 1920
WAK.398		20 Park Ave	Wakefield	c 1901
WAK.399		21 Park Ave	Wakefield	c 1920
WAK.263		24 Park Ave	Wakefield	c 1890
WAK.262		25 Park Ave	Wakefield	c 1889
WAK.261		30 Park Ave	Wakefield	c 1910
WAK.260	MacKay, John House	34 Park Ave	Wakefield	c 1890
WAK.259		35 Park Ave	Wakefield	c 1890
WAK.258		36 Park Ave	Wakefield	c 1900
WAK.308	Cook, Marjorie House	99 Park Ave	Wakefield	r 1832
WAK.95	Park Street, 8	8 Park St	Wakefield	r 1853

Inv. No.	Property Name	Street	Town	Year
WAK.96	Pinkham, Henry House	16 Park St	Wakefield	r 1886
WAK.97	Park Street, 18	18 Park St	Wakefield	c 1922
WAK.318	Parker Road, 22	22 Parker Rd	Wakefield	c 1890
WAK.317	Ricker, Edward J. House	23 Parker Rd	Wakefield	c 1900
WAK.316		35 Parker Rd	Wakefield	c 1917
WAK.178	Chamberline, A. B. House	17 Pine St	Wakefield	r 1898
WAK.182		7 Pitman Ave	Wakefield	c 1740
WAK.39	Anderson, Otto House	6 Pleasant St	Wakefield	r 1881
WAK.38	Waterman, Otis W. House	15 Pleasant St	Wakefield	r 1869
WAK.37	Batchelor, John House	28 Pleasant St	Wakefield	r 1762
WAK.36	Boardman House	54 Pleasant St	Wakefield	r 1881
WAK.35	Boswell, James O. House	55 Pleasant St	Wakefield	r 1863
WAK.34	Boardman, M. House	56 Pleasant St	Wakefield	r 1881
WAK.33	Bradford, Francis and Sarah House	58 Pleasant St	Wakefield	1930
WAK.32	Floyd, Stephen House	129 Pleasant St	Wakefield	r 1864
WAK.31		142 Pleasant St	Wakefield	c 1925
WAK.329	Kendall, Dea. Thomas Homestead	1 Prospect St	Wakefield	c 1750
WAK.328	Stimpson, William House #2	16 Prospect St	Wakefield	c 1847
WAK.327	Stimpson, William House	22 Prospect St	Wakefield	c 1795
WAK.326	Atwell, William House #2	24 Prospect St	Wakefield	c 1835
WAK.325	West Ward School	39 Prospect St	Wakefield	c 1847
WAK.323	Cowdrey, Jonas House	61 Prospect St	Wakefield	c 1833
WAK.322	Cowdrey, Nathaniel House	71 Prospect St	Wakefield	c 1764
WAK.321		75 Prospect St	Wakefield	c 1855
WAK.320	Boit, Elizabeth House	88 Prospect St	Wakefield	c 1913
WAK.319	Boit, Elizabeth House	90 Prospect St	Wakefield	1913
WAK.315	Cowdry, Aaron House	98 Prospect St	Wakefield	1833
WAK.314		106 Prospect St	Wakefield	r 1800
WAK.313		107 Prospect St	Wakefield	c 1840
WAK.309		180 Prospect St	Wakefield	c 1915
WAK.306		211 Prospect St	Wakefield	r 1917
WAK.254	Reed, George W. House	49 Renwick Rd	Wakefield	c 1909
WAK.142		8 Richardson Ave	Wakefield	r 1881
WAK.143		24 Richardson Ave	Wakefield	r 1882
WAK.219	Richardson Avenue, 35-37	35-37 Richardson Ave	Wakefield	r 1913
WAK.218	Richardson Avenue, 38-49	38-49 Richardson Ave	Wakefield	c 1912
WAK.144	Pennell, Sumner House	47 Richardson Ave	Wakefield	r 1862
WAK.903	Route 128 Bridge over North Avenue	Rt 128	Wakefield	1950

Inv. No.	Property Name	Street	Town	Year
WAK.376		1 Salem St	Wakefield	c 1920
WAK.73	Salem Street, 7	7 Salem St	Wakefield	r 1856
WAK.74	Swett, Daniel House	12 Salem St	Wakefield	r 1852
WAK.75	Salem Street, 19-21	19-21 Salem St	Wakefield	r 1780
WAK.76	Emerson - Poole, Franklin House	23 Salem St	Wakefield	c 1795
WAK.77	Gould, Mary and Nancy House	26 Salem St	Wakefield	c 1800
WAK.79	Swain, Samuel O. House	33 Salem St	Wakefield	r 1820
WAK.78	Boardman, Elias House	34 Salem St	Wakefield	c 1820
WAK.80	Salem Street, 38	38 Salem St	Wakefield	r 1822
WAK.81	Turnbull, Alexander House	52 Salem St	Wakefield	c 1865
WAK.82		55 Salem St	Wakefield	c 1795
WAK.83	Salem Street, 113	113 Salem St	Wakefield	r 1848
WAK.84		162 Salem St	Wakefield	r 1840
WAK.85		168 Salem St	Wakefield	r 1821
WAK.86	Burditt, Michael House	269 Salem St	Wakefield	r 1806
WAK.87		281 Salem St	Wakefield	r 1879
WAK.88	Montrose Chapel	292-294 Salem St	Wakefield	c 1885
WAK.90	Swain, Capt. John House	339 Salem St	Wakefield	c 1752
WAK.91	Pond, C. House	354 Salem St	Wakefield	r 1845
WAK.92		361 Salem St	Wakefield	r 1770
WAK.312	Sheffield Road, 13	13 Sheffield Rd	Wakefield	c 1918
WAK.311	Sheffield Road, 30	30 Sheffield Rd	Wakefield	c 1917
WAK.160		15 Sherman Rd	Wakefield	c 1922
WAK.158		4 Sidney St	Wakefield	r 1925
WAK.405	Morrill - Atwood Ice House	5 Spaulding St	Wakefield	c 1889
WAK.372		7 Spaulding St	Wakefield	c 1800
WAK.370		8 Spaulding St	Wakefield	c 1910
WAK.191	Green, Reuben House	43 Spring St	Wakefield	r 1789
WAK.190	Spring Street, 54	54 Spring St	Wakefield	c 1889
WAK.114		5 Spruce St	Wakefield	c 1917
WAK.153	Harper House	8 Stark Ave	Wakefield	c 1893
WAK.310		14 Strathmore Rd	Wakefield	c 1930
WAK.157		30 Summer St	Wakefield	r 1878
WAK.59		17 Sweetser St	Wakefield	r 1853
WAK.60	Burditt, H. House	22A Sweetser St	Wakefield	r 1861
WAK.61	Whitney, George N. House	39 Sweetser St	Wakefield	r 1871
WAK.247	Wakefield Upper Depot	27-29 Tuttle St	Wakefield	c 1889
WAK.246	Boston and Maine Railroad Freight Building	49 Tuttle St	Wakefield	c 1889

Inv. No.	Property Name	Street	Town	Year
WAK.129	Wakefield - Stoneham Street Railway Co. Car Barn	14 Valley St	Wakefield	c 1890
WAK.130		22 Valley St	Wakefield	r 1867
WAK.49		121 Vernon St	Wakefield	r 1900
WAK.48		125 Vernon St	Wakefield	r 1842
WAK.47	Turnbull, Alexander House	131 Vernon St	Wakefield	r 1848
WAK.46	Vernon Street, 193	193 Vernon St	Wakefield	r 1835
WAK.45		196 Vernon St	Wakefield	c 1831
WAK.44	Skinner, G. F. House	220 Vernon St	Wakefield	r 1872
WAK.43	Robbins, Dexter House	232 Vernon St	Wakefield	r 1865
WAK.42	Elk Spring Bottling Plant	323 Vernon St	Wakefield	r 1928
WAK.40	Green, Capt. William House	391 Vernon St	Wakefield	c 1680
WAK.117		30 Walton St	Wakefield	c 1905
WAK.127	Italian Baptist Chapel	Water St	Wakefield	c 1915
WAK.216	Murkland, Robert L. House	16 Water St	Wakefield	r 1848
WAK.125	Evans, L. B. Shoe Manufacturing Factory	27 Water St	Wakefield	1894
WAK.126	Wakefield Center Depot	57 Water St	Wakefield	r 1887
WAK.118	Wakefield Rattan Company - Building #10	134 Water St	Wakefield	c 1890
WAK.401	Wakefield Rattan Company - Building #11	134 Water St	Wakefield	c 1890
WAK.402	Wakefield Rattan Company - Building #12	134 Water St	Wakefield	c 1890
WAK.403	Wakefield Rattan Company - Building #13	134 Water St	Wakefield	r 1890
WAK.119		278 Water St	Wakefield	r 1915
WAK.120		288 Water St	Wakefield	r 1860
WAK.121	Wiley, Nathaniel House	427 Water St	Wakefield	c 1774
WAK.122		502 Water St	Wakefield	r 1852
WAK.64	Wave Avenue, 11	11 Wave Ave	Wakefield	r 1881
WAK.65	Wave Avenue, 15	15 Wave Ave	Wakefield	r 1879
WAK.66	Emerson, F. H. House	37 Wave Ave	Wakefield	r 1902
WAK.229	Buck, J. House	4 West Park Dr	Wakefield	r 1810
WAK.239		6 West St	Wakefield	c 1860
WAK.217	West Water Street, 12	12 West Water St	Wakefield	c 1860
WAK.215	Sweetser, Paul House	20 West Water St	Wakefield	c 1785
WAK.63	White Avenue, 9	9 White Ave	Wakefield	c 1904
WAK.271	Coon, John Lewis House	6 Whittemore Terr	Wakefield	c 1910
WAK.133	Wiley Street, 28	28 Wiley St	Wakefield	r 1810
WAK.911	Winn Street Railroad Bridge	Winn St	Wakefield	c 1844
WAK.340		9 Winn St	Wakefield	c 1885
WAK.41	Woodcrest Drive, 1	1 Woodcrest Dr	Wakefield	c 1789

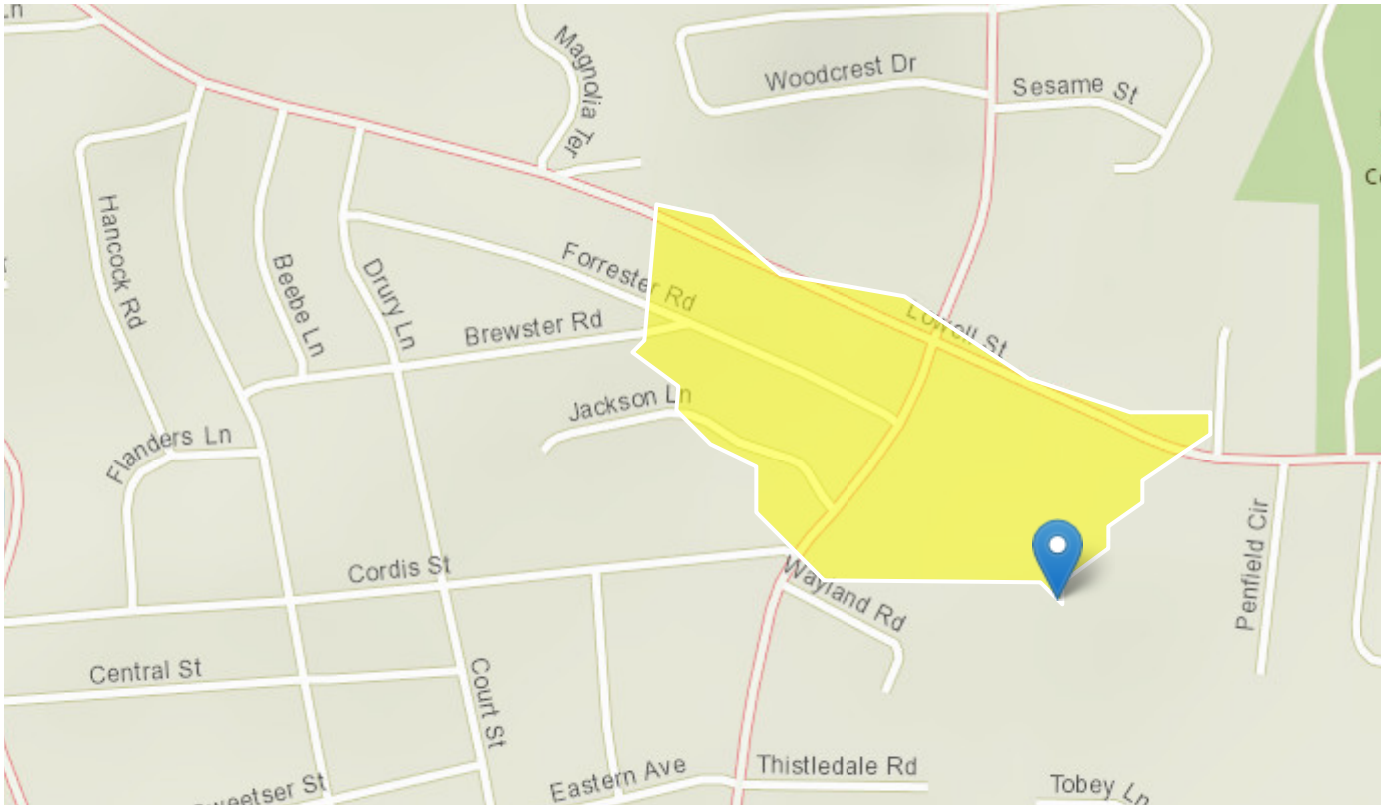
Inv. No.	Property Name	Street	Town	Year
WAK.388		16 Yale Ave	Wakefield	c 1874
WAK.304		18 Yale Ave	Wakefield	c 1863
WAK.389		20 Yale Ave	Wakefield	c 1877
WAK.303		21 Yale Ave	Wakefield	c 1870
WAK.390		22 Yale Ave	Wakefield	c 1896
WAK.302		23 Yale Ave	Wakefield	c 1863
WAK.301		24 Yale Ave	Wakefield	c 1863
WAK.300		25 Yale Ave	Wakefield	c 1865

ATTACHMENT F

RECEIVING WATER HYDROLOGIC INFORMATION

StreamStats Report

Region ID: MA
Workspace ID: MA20180806193806641000
Clicked Point (Latitude, Longitude): 42.51556, -71.06283
Time: 2018-08-06 15:38:09 -0400



Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
DRNAREA	Area that drains to a point on a stream	0.0348	square miles
ELEV	Mean Basin Elevation	76.8	feet
LC06STOR	Percentage of water bodies and wetlands determined from the NLCD 2006	6.98	percent
BSLDEM250	Mean basin slope computed from 1:250K DEM	1.138	percent
DRFTPERSTR	Area of stratified drift per unit of stream length	-100000	square mile per mile

Parameter Code	Parameter Description	Value	Unit
MAREGION	Region of Massachusetts 0 for Eastern 1 for Western	0	dimensionless
BSLDEM10M	Mean basin slope computed from 10 m DEM	2.927	percent
PCTSNDGRV	Percentage of land surface underlain by sand and gravel deposits	42.68	percent
FOREST	Percentage of area covered by forest	0	percent

Peak-Flow Statistics Parameters [Peak Statewide 2016 5156]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	0.0348	square miles	0.16	512
ELEV	Mean Basin Elevation	76.8	feet	80.6	1948
LC06STOR	Percent Storage from NLCD2006	6.98	percent	0	32.3

Peak-Flow Statistics Disclaimers [Peak Statewide 2016 5156]

One or more of the parameters is outside the suggested range. Estimates were extrapolated with unknown errors

Peak-Flow Statistics Flow Report [Peak Statewide 2016 5156]

Statistic	Value	Unit
2 Year Peak Flood	2.5	ft^3/s
5 Year Peak Flood	4.33	ft^3/s
10 Year Peak Flood	5.83	ft^3/s
25 Year Peak Flood	8.05	ft^3/s
50 Year Peak Flood	9.91	ft^3/s
100 Year Peak Flood	11.9	ft^3/s
200 Year Peak Flood	14.1	ft^3/s
500 Year Peak Flood	17.3	ft^3/s

Peak-Flow Statistics Citations

Zarriello, P.J.,2017, Magnitude of flood flows at selected annual exceedance probabilities for streams in Massachusetts: U.S. Geological Survey Scientific Investigations Report 2016–5156, 99 p. (https://dx.doi.org/10.3133/sir20165156)

Low-Flow Statistics Parameters [Statewide Low Flow WRIR00 4135]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	0.0348	square miles	1.61	149
BSLDEM250	Mean Basin Slope from 250K DEM	1.138	percent	0.32	24.6
DRFTPERSTR	Stratified Drift per Stream Length	-100000	square mile per mile	0	1.29
MAREGION	Massachusetts Region	0	dimensionless	0	1

Low-Flow Statistics Flow Report [Statewide Low Flow WRIR00 4135]

Statistic	Value	Unit

Low-Flow Statistics Citations

Flow-Duration Statistics Parameters [Statewide Low Flow WRIR00 4135]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	0.0348	square miles	1.61	149
DRFTPERSTR	Stratified Drift per Stream Length	-100000	square mile per mile	0	1.29
MAREGION	Massachusetts Region	0	dimensionless	0	1
BSLDEM250	Mean Basin Slope from 250K DEM	1.138	percent	0.32	24.6

Flow-Duration Statistics Flow Report [Statewide Low Flow WRIR00 4135]

Statistic	Value	Unit

Flow-Duration Statistics Citations

August Flow-Duration Statistics Parameters [Statewide Low Flow WRIR00 4135]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	0.0348	square miles	1.61	149
BSLDEM250	Mean Basin Slope from 250K DEM	1.138	percent	0.32	24.6
DRFTPERSTR	Stratified Drift per Stream Length	-100000	square mile per mile	0	1.29
MAREGION	Massachusetts Region	0	dimensionless	0	1

August Flow-Duration Statistics Flow Report [Statewide Low Flow WRIR00 4135]

Statistic	Value	Unit

August Flow-Duration Statistics Citations

Bankfull Statistics Parameters [Bankfull Statewide SIR2013 5155]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	0.0348	square miles	0.6	329
BSLDEM10M	Mean Basin Slope from 10m DEM	2.927	percent	2.2	23.9

Bankfull Statistics Disclaimers [Bankfull Statewide SIR2013 5155]

One or more of the parameters is outside the suggested range. Estimates were extrapolated with unknown errors

Bankfull Statistics Flow Report [Bankfull Statewide SIR2013 5155]

Statistic	Value	Unit
Bankfull Width	3.43	ft

Statistic	Value	Unit
Bankfull Depth	0.32	ft
Bankfull Area	1.08	ft^2
Bankfull Streamflow	1.49	ft^3/s

Bankfull Statistics Citations

Bent, G.C., and Waite, A.M.,2013, Equations for estimating bankfull channel geometry and discharge for streams in Massachusetts: U.S. Geological Survey Scientific Investigations Report 2013–5155, 62 p., (http://pubs.usgs.gov/sir/2013/5155/)

Probability Statistics Parameters [Perennial Flow Probability]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	0.0348	square miles	0.01	1.99
PCTSNDGRV	Percent Underlain By Sand And Gravel	42.68	percent	0	100
FOREST	Percent Forest	0	percent	0	100
MAREGION	Massachusetts Region	0	dimensionless	0	1

Probability Statistics Flow Report [Perennial Flow Probability]

PIl: Prediction Interval-Lower, PIu: Prediction Interval-Upper, SEp: Standard Error of Prediction, SE: Standard Error (other -- see report)

Statistic	Value	Unit	PC
Probability Stream Flowing Perennially	0.491	dim	71

Probability Statistics Citations

Bent, G.C., and Steeves, P.A.,2006, A revised logistic regression equation and an automated procedure for mapping the probability of a stream flowing perennially in Massachusetts: U.S. Geological Survey Scientific Investigations Report 2006–5031, 107 p. (http://pubs.usgs.gov/sir/2006/5031/pdfs/SIR_2006-5031rev.pdf)

release by the U.S. Geological Survey (USGS), no warranty expressed or implied is made regarding the display or utility of the data for other purposes, nor on all computer systems, nor shall the act of distribution constitute any such warranty.

USGS Software Disclaimer: This software has been approved for release by the U.S. Geological Survey (USGS). Although the software has been subjected to rigorous review, the USGS reserves the right to update the software as needed pursuant to further analysis and review. No warranty, expressed or implied, is made by the USGS or the U.S. Government as to the functionality of the software and related material nor shall the fact of release constitute any such warranty. Furthermore, the software is released on condition that neither the USGS nor the U.S. Government shall be held liable for any damages resulting from its authorized or unauthorized use.

USGS Product Names Disclaimer: Any use of trade, firm, or product names is for descriptive purposes only and does not imply endorsement by the U.S. Government.

Application Version: 4.2.1

ATTACHMENT G

LABORATORY REPORTS

ANALYTICAL REPORT

Lab Number:	L1829511
Client:	GeoInsight One Monarch Drive Littleton, MA 01460
ATTN:	Robert Reynolds
Phone:	(978) 679-1600
Project Name:	WAKEFIELD
Project Number:	8908
Report Date:	08/13/18

Certifications & Approvals: MA (M-MA086), NH NELAP (2064), CT (PH-0574), IL (200077), ME (MA00086), MD (348), NJ (MA935), NY (11148), NC (25700/666), PA (68-03671), RI (LAO00065), TX (T104704476), VT (VT-0935), VA (460195), USDA (Permit #P330-17-00196).

Eight Walkup Drive, Westborough, MA 01581-1019
508-898-9220 (Fax) 508-898-9193 800-624-9220 - www.alphalab.com

Project Name: WAKEFIELD
Project Number: 8908

Lab Number: L1829511
Report Date: 08/13/18

Alpha Sample ID	Client ID	Matrix	Sample Location	Collection Date/Time	Receive Date
L1829511-01	MW-TP1	WATER	356 LOWELL ST., WAKEFIELD, MA	07/31/18 09:30	07/31/18
L1829511-02	SW-1	WATER	356 LOWELL ST., WAKEFIELD, MA	07/31/18 11:45	07/31/18

Project Name: WAKEFIELD
Project Number: 8908

Lab Number: L1829511
Report Date: 08/13/18

Case Narrative

The samples were received in accordance with the Chain of Custody and no significant deviations were encountered during the preparation or analysis unless otherwise noted. Sample Receipt, Container Information, and the Chain of Custody are located at the back of the report.

Results contained within this report relate only to the samples submitted under this Alpha Lab Number and meet NELAP requirements for all NELAP accredited parameters unless otherwise noted in the following narrative. The data presented in this report is organized by parameter (i.e. VOC, SVOC, etc.). Sample specific Quality Control data (i.e. Surrogate Spike Recovery) is reported at the end of the target analyte list for each individual sample, followed by the Laboratory Batch Quality Control at the end of each parameter. Tentatively Identified Compounds (TICs), if requested, are reported for compounds identified to be present and are not part of the method/program Target Compound List, even if only a subset of the TCL are being reported. If a sample was re-analyzed or re-extracted due to a required quality control corrective action and if both sets of data are reported, the Laboratory ID of the re-analysis or re-extraction is designated with an "R" or "RE", respectively. When multiple Batch Quality Control elements are reported (e.g. more than one LCS), the associated samples for each element are noted in the grey shaded header line of each data table. Any Laboratory Batch, Sample Specific % recovery or RPD value that is outside the listed Acceptance Criteria is bolded in the report. All specific QC information is also incorporated in the Data Usability format of our Data Merger tool where it can be reviewed along with any associated usability implications. Soil/sediments, solids and tissues are reported on a dry weight basis unless otherwise noted. Definitions of all data qualifiers and acronyms used in this report are provided in the Glossary located at the back of the report.

In reference to questions H (CAM) or 4 (RCP) when "NO" is checked, the performance criteria for CAM and RCP methods allow for some quality control failures to occur and still be within method compliance. In these instances the specific failure is not narrated but noted in the associated QC table. The information is also incorporated in the Data Usability format of our Data Merger tool where it can be reviewed along with any associated usability implications.

Please see the associated ADEx data file for a comparison of laboratory reporting limits that were achieved with the regulatory Numerical Standards requested on the Chain of Custody.

HOLD POLICY
For samples submitted on hold, Alpha's policy is to hold samples (with the exception of Air canisters) free of charge for 21 calendar days from the date the project is completed. After 21 calendar days, we will dispose of all samples submitted including those put on hold unless you have contacted your Client Service Representative and made arrangements for Alpha to continue to hold the samples. Air canisters will be disposed after 3 business days from the date the project is completed.

Please contact Client Services at 800-624-9220 with any questions.

Project Name: WAKEFIELD **Lab Number:** L1829511
Project Number: 8908 **Report Date:** 08/13/18

Case Narrative (continued)

Report Submission

The analysis of Ethanol was subcontracted. A copy of the laboratory report is included as an addendum.

Please note: This data is only available in PDF format and is not available on Data Merger.

Sample Receipt

L1829511-02: The sample identified as "SW-1" on the chain of custody was identified as "SF-1" on the container label. At the client's request, the sample is reported as "SW-1".

Total Metals

The WG1144510-7 MS recovery for iron (0%), performed on L1829511-01, does not apply because the sample concentration is greater than four times the spike amount added.

I, the undersigned, attest under the pains and penalties of perjury that, to the best of my knowledge and belief and based upon my personal inquiry of those responsible for providing the information contained in this analytical report, such information is accurate and complete. This certificate of analysis is not complete unless this page accompanies any and all pages of this report.

Authorized Signature: Cristin Walker

Title: Technical Director/Representative Date: 08/13/18

ORGANICS

VOLATILES

Project Name: WAKEFIELD **Lab Number:** L1829511

Project Number: 8908 **Report Date:** 08/13/18

SAMPLE RESULTS

Lab ID: L1829511-01 Date Collected: 07/31/18 09:30
Client ID: MW-TP1 Date Received: 07/31/18
Sample Location: 356 LOWELL ST., WAKEFIELD, MA Field Prep: Not Specified

Sample Depth:
Matrix: Water
Analytical Method: 128,624.1
Analytical Date: 08/06/18 14:50
Analyst: GT

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by GC/MS - Westborough Lab						
Methylene chloride	ND		ug/l	1.0	--	1
1,1-Dichloroethane	ND		ug/l	1.5	--	1
Carbon tetrachloride	ND		ug/l	1.0	--	1
1,1,2-Trichloroethane	ND		ug/l	1.5	--	1
Tetrachloroethene	ND		ug/l	1.5	--	1
1,2-Dichloroethane	ND		ug/l	1.5	--	1
1,1,1-Trichloroethane	ND		ug/l	2.0	--	1
Benzene	ND		ug/l	1.0	--	1
Toluene	ND		ug/l	1.0	--	1
Ethylbenzene	ND		ug/l	1.0	--	1
Vinyl chloride	ND		ug/l	1.0	--	1
1,1-Dichloroethene	ND		ug/l	1.0	--	1
cis-1,2-Dichloroethene	ND		ug/l	1.0	--	1
Trichloroethene	ND		ug/l	1.0	--	1
1,2-Dichlorobenzene	ND		ug/l	5.0	--	1
1,3-Dichlorobenzene	ND		ug/l	5.0	--	1
1,4-Dichlorobenzene	ND		ug/l	5.0	--	1
p/m-Xylene	ND		ug/l	2.0	--	1
o-xylene	ND		ug/l	1.0	--	1
Xylenes, Total	ND		ug/l	1.0	--	1
Acetone	ND		ug/l	10	--	1
Methyl tert butyl ether	ND		ug/l	10	--	1
Tert-Butyl Alcohol	ND		ug/l	100	--	1
Tertiary-Amyl Methyl Ether	ND		ug/l	20	--	1

Project Name: WAKEFIELD **Lab Number:** L1829511

Project Number: 8908 **Report Date:** 08/13/18

SAMPLE RESULTS

Lab ID: L1829511-01 Date Collected: 07/31/18 09:30

Client ID: MW-TP1 Date Received: 07/31/18

Sample Location: 356 LOWELL ST., WAKEFIELD, MA Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by GC/MS - Westborough Lab						

Surrogate	% Recovery	Qualifier	Acceptance Criteria
Pentafluorobenzene	101		60-140
Fluorobenzene	111		60-140
4-Bromofluorobenzene	92		60-140

Project Name: WAKEFIELD **Lab Number:** L1829511

Project Number: 8908 **Report Date:** 08/13/18

SAMPLE RESULTS

Lab ID: L1829511-01 Date Collected: 07/31/18 09:30

Client ID: MW-TP1 Date Received: 07/31/18

Sample Location: 356 LOWELL ST., WAKEFIELD, MA Field Prep: Not Specified

Sample Depth:

Matrix: Water

Analytical Method: 128,624.1-SIM

Analytical Date: 08/06/18 14:50

Analyst: GT

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by GC/MS-SIM - Westborough Lab						
1,4-Dioxane	ND		ug/l	50	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
Fluorobenzene	119		60-140
4-Bromofluorobenzene	97		60-140

Project Name: WAKEFIELD
Project Number: 8908
Lab Number: L1829511
Report Date: 08/13/18

SAMPLE RESULTS

Lab ID: L1829511-01
Client ID: MW-TP1
Sample Location: 356 LOWELL ST., WAKEFIELD, MA

Date Collected: 07/31/18 09:30
Date Received: 07/31/18
Field Prep: Not Specified

Sample Depth:
Matrix: Water
Analytical Method: 14,504.1
Analytical Date: 08/02/18 18:06
Analyst: AWS

Extraction Method: EPA 504.1
Extraction Date: 08/02/18 16:22

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
Microextractables by GC - Westborough Lab							
1,2-Dibromoethane	ND		ug/l	0.010	--	1	A
1,2-Dibromo-3-chloropropane	ND		ug/l	0.010	--	1	A

Project Name: WAKEFIELD
Project Number: 8908
Lab Number: L1829511
Report Date: 08/13/18

Method Blank Analysis
Batch Quality Control

Analytical Method: 14,504.1
Analytical Date: 08/02/18 17:21
Analyst: AWS

Extraction Method: EPA 504.1
Extraction Date: 08/02/18 16:22

Parameter	Result	Qualifier	Units	RL	MDL	
Microextractables by GC - Westborough Lab for sample(s): 01 Batch: WG1142382-1						
1,2-Dibromoethane	ND		ug/l	0.010	--	A
1,2-Dibromo-3-chloropropane	ND		ug/l	0.010	--	A

Project Name: WAKEFIELD
Project Number: 8908
Lab Number: L1829511
Report Date: 08/13/18

Method Blank Analysis
Batch Quality Control

Analytical Method: 128,624.1
Analytical Date: 08/06/18 10:29
Analyst: GT

Parameter	Result	Qualifier	Units	RL	MDL
Volatile Organics by GC/MS - Westborough Lab for sample(s): 01 Batch: WG1143745-4					
Methylene chloride	ND		ug/l	1.0	--
1,1-Dichloroethane	ND		ug/l	1.5	--
Carbon tetrachloride	ND		ug/l	1.0	--
1,1,2-Trichloroethane	ND		ug/l	1.5	--
Tetrachloroethene	ND		ug/l	1.5	--
1,2-Dichloroethane	ND		ug/l	1.5	--
1,1,1-Trichloroethane	ND		ug/l	2.0	--
Benzene	ND		ug/l	1.0	--
Toluene	ND		ug/l	1.0	--
Ethylbenzene	ND		ug/l	1.0	--
Vinyl chloride	ND		ug/l	1.0	--
1,1-Dichloroethene	ND		ug/l	1.0	--
cis-1,2-Dichloroethene	ND		ug/l	1.0	--
Trichloroethene	ND		ug/l	1.0	--
1,2-Dichlorobenzene	ND		ug/l	5.0	--
1,3-Dichlorobenzene	ND		ug/l	5.0	--
1,4-Dichlorobenzene	ND		ug/l	5.0	--
p/m-Xylene	ND		ug/l	2.0	--
o-xylene	ND		ug/l	1.0	--
Xylenes, Total	ND		ug/l	1.0	--
Acetone	ND		ug/l	10	--
Methyl tert butyl ether	ND		ug/l	10	--
Tert-Butyl Alcohol	ND		ug/l	100	--
Tertiary-Amyl Methyl Ether	ND		ug/l	20	--

Project Name: WAKEFIELD
Project Number: 8908
Lab Number: L1829511
Report Date: 08/13/18

Method Blank Analysis
Batch Quality Control

Analytical Method: 128,624.1
Analytical Date: 08/06/18 10:29
Analyst: GT

Parameter	Result	Qualifier	Units	RL	MDL
Volatile Organics by GC/MS - Westborough Lab for sample(s): 01 Batch: WG1143745-4					

Surrogate	%Recovery	Qualifier	Acceptance Criteria
Pentafluorobenzene	101		60-140
Fluorobenzene	111		60-140
4-Bromofluorobenzene	93		60-140

Project Name: WAKEFIELD
Project Number: 8908
Lab Number: L1829511
Report Date: 08/13/18

Method Blank Analysis
Batch Quality Control

Analytical Method: 128,624.1-SIM
Analytical Date: 08/06/18 10:29
Analyst: GT

Parameter	Result	Qualifier	Units	RL	MDL
Volatile Organics by GC/MS-SIM - Westborough Lab for sample(s): 01 Batch: WG1143749-4					
1,4-Dioxane	ND		ug/l	50	--

Surrogate	%Recovery	Qualifier	Acceptance Criteria
Fluorobenzene	123		60-140
4-Bromofluorobenzene	98		60-140

Lab Control Sample Analysis

Batch Quality Control

Project Name: WAKEFIELD

Project Number: 8908

Lab Number: L1829511

Report Date: 08/13/18

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits	Column
Microextractables by GC - Westborough Lab	Associated sample(s): 01		Batch: WG1142382-2						
1,2-Dibromoethane	106		-		80-120	-			A
1,2-Dibromo-3-chloropropane	108		-		80-120	-			A

Lab Control Sample Analysis
Batch Quality Control

Project Name: WAKEFIELD
Project Number: 8908

Lab Number: L1829511
Report Date: 08/13/18

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Volatile Organics by GC/MS - Westborough Lab Associated sample(s): 01 Batch: WG1143745-3								
Methylene chloride	100		-		60-140	-		28
1,1-Dichloroethane	95		-		50-150	-		49
Carbon tetrachloride	100		-		70-130	-		41
1,1,2-Trichloroethane	85		-		70-130	-		45
Tetrachloroethene	95		-		70-130	-		39
1,2-Dichloroethane	100		-		70-130	-		49
1,1,1-Trichloroethane	105		-		70-130	-		36
Benzene	105		-		65-135	-		61
Toluene	100		-		70-130	-		41
Ethylbenzene	100		-		60-140	-		63
Vinyl chloride	100		-		5-195	-		66
1,1-Dichloroethene	95		-		50-150	-		32
cis-1,2-Dichloroethene	100		-		60-140	-		30
Trichloroethene	90		-		65-135	-		48
1,2-Dichlorobenzene	85		-		65-135	-		57
1,3-Dichlorobenzene	85		-		70-130	-		43
1,4-Dichlorobenzene	90		-		65-135	-		57
p/m-Xylene	98		-		60-140	-		30
o-xylene	95		-		60-140	-		30
Acetone	92		-		40-160	-		30
Methyl tert butyl ether	95		-		60-140	-		30
Tert-Butyl Alcohol	84		-		60-140	-		30
Tertiary-Amyl Methyl Ether	100		-		60-140	-		30

Lab Control Sample Analysis

Batch Quality Control

Project Name: WAKEFIELD
Project Number: 8908

Lab Number: L1829511
Report Date: 08/13/18

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits

Volatile Organics by GC/MS - Westborough Lab Associated sample(s): 01 Batch: WG1143745-3

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
Pentafluorobenzene	100				60-140
Fluorobenzene	111				60-140
4-Bromofluorobenzene	95				60-140

Lab Control Sample Analysis

Batch Quality Control

Project Name: WAKEFIELD
Project Number: 8908

Lab Number: L1829511
Report Date: 08/13/18

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Volatile Organics by GC/MS-SIM - Westborough Lab Associated sample(s): 01 Batch: WG1143749-3								
1,4-Dioxane	110		-		60-140	-		20

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
Fluorobenzene	123				60-140
4-Bromofluorobenzene	93				60-140

Matrix Spike Analysis

Batch Quality Control

Project Name: WAKEFIELD

Project Number: 8908

Lab Number: L1829511

Report Date: 08/13/18

Parameter	*Native Sample*	*MS Added*	*MS Found*	*MS %Recovery*	*Qual*	*MSD Found*	*MSD %Recovery*	*Qual*	*Recovery Limits*	*RPD*	*Qual*	*RPD Limits*	*Column*
Microextractables by GC - Westborough Lab	Associated sample(s): 01	QC Batch ID: WG1142382-3	QC Sample: L1829553-01	Client ID: MS Sample									
1,2-Dibromoethane	ND	0.25	0.253	101		-	-		80-120	-		20	A
1,2-Dibromo-3-chloropropane	ND	0.25	0.270	108		-	-		80-120	-		20	A

SEMIVOLATILES

Project Name: WAKEFIELD **Lab Number:** L1829511

Project Number: 8908 **Report Date:** 08/13/18

SAMPLE RESULTS

Lab ID: L1829511-01
Client ID: MW-TP1
Sample Location: 356 LOWELL ST., WAKEFIELD, MA

Date Collected: 07/31/18 09:30
Date Received: 07/31/18
Field Prep: Not Specified

Sample Depth:
Matrix: Water
Analytical Method: 129,625.1
Analytical Date: 08/07/18 17:45
Analyst: SZ

Extraction Method: EPA 625.1
Extraction Date: 08/06/18 18:47

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Semivolatile Organics by GC/MS - Westborough Lab						
Bis(2-ethylhexyl)phthalate	ND		ug/l	2.2	--	1
Butyl benzyl phthalate	ND		ug/l	5.0	--	1
Di-n-butylphthalate	ND		ug/l	5.0	--	1
Di-n-octylphthalate	ND		ug/l	5.0	--	1
Diethyl phthalate	ND		ug/l	5.0	--	1
Dimethyl phthalate	ND		ug/l	5.0	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
Nitrobenzene-d5	86		42-122
2-Fluorobiphenyl	84		46-121
4-Terphenyl-d14	98		47-138

Project Name: WAKEFIELD
Project Number: 8908
Lab Number: L1829511
Report Date: 08/13/18

SAMPLE RESULTS

Lab ID: L1829511-01
Client ID: MW-TP1
Sample Location: 356 LOWELL ST., WAKEFIELD, MA

Date Collected: 07/31/18 09:30
Date Received: 07/31/18
Field Prep: Not Specified

Sample Depth:
Matrix: Water
Analytical Method: 129,625.1-SIM
Analytical Date: 08/08/18 20:50
Analyst: DV

Extraction Method: EPA 625.1
Extraction Date: 08/06/18 19:05

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Semivolatile Organics by GC/MS-SIM - Westborough Lab						
Acenaphthene	ND		ug/l	0.10	--	1
Fluoranthene	ND		ug/l	0.10	--	1
Naphthalene	0.48		ug/l	0.10	--	1
Benzo(a)anthracene	ND		ug/l	0.10	--	1
Benzo(a)pyrene	ND		ug/l	0.10	--	1
Benzo(b)fluoranthene	ND		ug/l	0.10	--	1
Benzo(k)fluoranthene	ND		ug/l	0.10	--	1
Chrysene	ND		ug/l	0.10	--	1
Acenaphthylene	ND		ug/l	0.10	--	1
Anthracene	ND		ug/l	0.10	--	1
Benzo(ghi)perylene	ND		ug/l	0.10	--	1
Fluorene	ND		ug/l	0.10	--	1
Phenanthrene	ND		ug/l	0.10	--	1
Dibenzo(a,h)anthracene	ND		ug/l	0.10	--	1
Indeno(1,2,3-cd)pyrene	ND		ug/l	0.10	--	1
Pyrene	ND		ug/l	0.10	--	1
Pentachlorophenol	ND		ug/l	1.0	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Fluorophenol	38		35-77
Phenol-d6	31		24-61
Nitrobenzene-d5	89		15-314
2-Fluorobiphenyl	72		55-108
2,4,6-Tribromophenol	98		52-123
4-Terphenyl-d14	78		52-109

Project Name: WAKEFIELD
Project Number: 8908

Lab Number: L1829511
Report Date: 08/13/18

Method Blank Analysis
Batch Quality Control

Analytical Method: 129,625.1
Analytical Date: 08/07/18 11:03
Analyst: SZ

Extraction Method: EPA 625.1
Extraction Date: 08/06/18 18:47

Parameter	Result	Qualifier	Units	RL	MDL
Semivolatile Organics by GC/MS - Westborough Lab for sample(s): 01 Batch: WG1143405-1					
Bis(2-ethylhexyl)phthalate	ND		ug/l	2.2	--
Butyl benzyl phthalate	ND		ug/l	5.0	--
Di-n-butylphthalate	ND		ug/l	5.0	--
Di-n-octylphthalate	ND		ug/l	5.0	--
Diethyl phthalate	ND		ug/l	5.0	--
Dimethyl phthalate	ND		ug/l	5.0	--

Surrogate	%Recovery	Qualifier	Acceptance Criteria
Nitrobenzene-d5	92		42-122
2-Fluorobiphenyl	83		46-121
4-Terphenyl-d14	100		47-138

Project Name: WAKEFIELD
Project Number: 8908

Lab Number: L1829511
Report Date: 08/13/18

Method Blank Analysis
Batch Quality Control

Analytical Method: 129,625.1-SIM
Analytical Date: 08/07/18 17:49
Analyst: DV

Extraction Method: EPA 625.1
Extraction Date: 08/06/18 19:05

Parameter	Result	Qualifier	Units	RL	MDL
Semivolatile Organics by GC/MS-SIM - Westborough Lab for sample(s): 01 Batch: WG1143409-1					
Acenaphthene	ND		ug/l	0.10	--
Fluoranthene	ND		ug/l	0.10	--
Naphthalene	ND		ug/l	0.10	--
Benzo(a)anthracene	ND		ug/l	0.10	--
Benzo(a)pyrene	ND		ug/l	0.10	--
Benzo(b)fluoranthene	ND		ug/l	0.10	--
Benzo(k)fluoranthene	ND		ug/l	0.10	--
Chrysene	ND		ug/l	0.10	--
Acenaphthylene	ND		ug/l	0.10	--
Anthracene	ND		ug/l	0.10	--
Benzo(ghi)perylene	ND		ug/l	0.10	--
Fluorene	ND		ug/l	0.10	--
Phenanthrene	ND		ug/l	0.10	--
Dibenzo(a,h)anthracene	ND		ug/l	0.10	--
Indeno(1,2,3-cd)pyrene	ND		ug/l	0.10	--
Pyrene	ND		ug/l	0.10	--
Pentachlorophenol	ND		ug/l	1.0	--

Surrogate	%Recovery	Qualifier	Acceptance Criteria
2-Fluorophenol	42		35-77
Phenol-d6	33		24-61
Nitrobenzene-d5	95		15-314
2-Fluorobiphenyl	67		55-108
2,4,6-Tribromophenol	87		52-123
4-Terphenyl-d14	80		52-109

Lab Control Sample Analysis
Batch Quality Control

Project Name: WAKEFIELD
Project Number: 8908
Lab Number: L1829511
Report Date: 08/13/18

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Semivolatile Organics by GC/MS - Westborough Lab Associated sample(s): 01 Batch: WG1143405-2								
Bis(2-ethylhexyl)phthalate	96		-		29-137	-		30
Butyl benzyl phthalate	100		-		1-140	-		30
Di-n-butylphthalate	103		-		8-120	-		30
Di-n-octylphthalate	99		-		19-132	-		30
Diethyl phthalate	91		-		1-120	-		30
Dimethyl phthalate	82		-		1-120	-		30

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
Nitrobenzene-d5	87				42-122
2-Fluorobiphenyl	77				46-121
4-Terphenyl-d14	93				47-138

Lab Control Sample Analysis
Batch Quality Control

Project Name: WAKEFIELD
Project Number: 8908

Lab Number: L1829511
Report Date: 08/13/18

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Semivolatile Organics by GC/MS-SIM - Westborough Lab Associated sample(s): 01 Batch: WG1143409-2								
Acenaphthene	79		-		60-132	-		30
Fluoranthene	83		-		43-121	-		30
Naphthalene	75		-		36-120	-		30
Benzo(a)anthracene	73		-		42-133	-		30
Benzo(a)pyrene	82		-		32-148	-		30
Benzo(b)fluoranthene	80		-		42-140	-		30
Benzo(k)fluoranthene	86		-		25-146	-		30
Chrysene	80		-		44-140	-		30
Acenaphthylene	82		-		54-126	-		30
Anthracene	85		-		43-120	-		30
Benzo(ghi)perylene	86		-		1-195	-		30
Fluorene	83		-		70-120	-		30
Phenanthrene	81		-		65-120	-		30
Dibenzo(a,h)anthracene	82		-		1-200	-		30
Indeno(1,2,3-cd)pyrene	98		-		1-151	-		30
Pyrene	82		-		70-120	-		30
Pentachlorophenol	62		-		38-152	-		30

Lab Control Sample Analysis

Batch Quality Control

Project Name: WAKEFIELD

Project Number: 8908

Lab Number: L1829511

Report Date: 08/13/18

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Semivolatile Organics by GC/MS-SIM - Westborough Lab Associated sample(s): 01 Batch: WG1143409-2								

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
2-Fluorophenol	40				35-77
Phenol-d6	31				24-61
Nitrobenzene-d5	90				15-314
2-Fluorobiphenyl	63				55-108
2,4,6-Tribromophenol	79				52-123
4-Terphenyl-d14	72				52-109

PCBS

Project Name: WAKEFIELD
Project Number: 8908
Lab Number: L1829511
Report Date: 08/13/18

SAMPLE RESULTS

Lab ID: L1829511-01
Client ID: MW-TP1
Sample Location: 356 LOWELL ST., WAKEFIELD, MA

Date Collected: 07/31/18 09:30
Date Received: 07/31/18
Field Prep: Not Specified

Sample Depth:
Matrix: Water
Analytical Method: 127,608.3
Analytical Date: 08/07/18 00:29
Analyst: KB

Extraction Method: EPA 608.3
Extraction Date: 08/06/18 15:31
Cleanup Method: EPA 3665A
Cleanup Date: 08/06/18
Cleanup Method: EPA 3660B
Cleanup Date: 08/06/18

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
Polychlorinated Biphenyls by GC - Westborough Lab							
Aroclor 1016	ND		ug/l	0.250	--	1	A
Aroclor 1221	ND		ug/l	0.250	--	1	A
Aroclor 1232	ND		ug/l	0.250	--	1	A
Aroclor 1242	ND		ug/l	0.250	--	1	A
Aroclor 1248	ND		ug/l	0.250	--	1	A
Aroclor 1254	ND		ug/l	0.250	--	1	A
Aroclor 1260	ND		ug/l	0.200	--	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	83		37-123	A
Decachlorobiphenyl	80		38-114	A
2,4,5,6-Tetrachloro-m-xylene	84		37-123	B
Decachlorobiphenyl	84		38-114	B

Project Name: WAKEFIELD
Project Number: 8908

Lab Number: L1829511
Report Date: 08/13/18

Method Blank Analysis
Batch Quality Control

Analytical Method: 127,608.3
Analytical Date: 08/06/18 23:52
Analyst: WR

Extraction Method: EPA 608.3
Extraction Date: 08/06/18 15:31
Cleanup Method: EPA 3665A
Cleanup Date: 08/06/18
Cleanup Method: EPA 3660B
Cleanup Date: 08/06/18

Parameter	Result	Qualifier	Units	RL	MDL	Column
Polychlorinated Biphenyls by GC - Westborough Lab for sample(s): 01 Batch: WG1143343-1						
Aroclor 1016	ND		ug/l	0.250	--	A
Aroclor 1221	ND		ug/l	0.250	--	A
Aroclor 1232	ND		ug/l	0.250	--	A
Aroclor 1242	ND		ug/l	0.250	--	A
Aroclor 1248	ND		ug/l	0.250	--	A
Aroclor 1254	ND		ug/l	0.250	--	A
Aroclor 1260	ND		ug/l	0.200	--	A

Surrogate	%Recovery	Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	63		37-123	A
Decachlorobiphenyl	74		38-114	A
2,4,5,6-Tetrachloro-m-xylene	65		37-123	B
Decachlorobiphenyl	78		38-114	B

Lab Control Sample Analysis

Batch Quality Control

Project Name: WAKEFIELD

Project Number: 8908

Lab Number: L1829511

Report Date: 08/13/18

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits	Column
Polychlorinated Biphenyls by GC - Westborough Lab Associated sample(s): 01 Batch: WG1143343-2									
Aroclor 1016	76		-		50-140	-		36	A
Aroclor 1260	76		-		8-140	-		38	A

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	63				37-123	A
Decachlorobiphenyl	65				38-114	A
2,4,5,6-Tetrachloro-m-xylene	66				37-123	B
Decachlorobiphenyl	71				38-114	B

METALS

Project Name: WAKEFIELD **Lab Number:** L1829511

Project Number: 8908 **Report Date:** 08/13/18

SAMPLE RESULTS

Lab ID: L1829511-01 Date Collected: 07/31/18 09:30

Client ID: MW-TP1 Date Received: 07/31/18

Sample Location: 356 LOWELL ST., WAKEFIELD, MA Field Prep: Not Specified

Sample Depth:

Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Antimony, Total	ND		mg/l	0.00400	--	1	08/09/18 09:40	08/10/18 17:52	EPA 3005A	3,200.8	MG
Arsenic, Total	ND		mg/l	0.00100	--	1	08/09/18 09:40	08/10/18 17:52	EPA 3005A	3,200.8	MG
Cadmium, Total	ND		mg/l	0.00020	--	1	08/09/18 09:40	08/10/18 17:52	EPA 3005A	3,200.8	MG
Chromium, Total	ND		mg/l	0.00100	--	1	08/09/18 09:40	08/10/18 17:52	EPA 3005A	3,200.8	MG
Copper, Total	0.00152		mg/l	0.00100	--	1	08/09/18 09:40	08/10/18 17:52	EPA 3005A	3,200.8	MG
Iron, Total	113		mg/l	0.050	--	1	08/09/18 09:40	08/09/18 14:43	EPA 3005A	19,200.7	LC
Lead, Total	ND		mg/l	0.00100	--	1	08/09/18 09:40	08/10/18 17:52	EPA 3005A	3,200.8	MG
Mercury, Total	ND		mg/l	0.00020	--	1	08/01/18 14:07	08/01/18 21:10	EPA 245.1	3,245.1	EA
Nickel, Total	ND		mg/l	0.00200	--	1	08/09/18 09:40	08/10/18 17:52	EPA 3005A	3,200.8	MG
Selenium, Total	ND		mg/l	0.00500	--	1	08/09/18 09:40	08/10/18 17:52	EPA 3005A	3,200.8	MG
Silver, Total	ND		mg/l	0.00040	--	1	08/09/18 09:40	08/10/18 17:52	EPA 3005A	3,200.8	MG
Zinc, Total	0.2048		mg/l	0.01000	--	1	08/09/18 09:40	08/10/18 17:52	EPA 3005A	3,200.8	MG
General Chemistry - Mansfield Lab											
Chromium, Trivalent	ND		mg/l	0.010	--	1		08/10/18 17:52	NA	107,-	

Project Name: WAKEFIELD **Lab Number:** L1829511

Project Number: 8908 **Report Date:** 08/13/18

SAMPLE RESULTS

Lab ID: L1829511-02 Date Collected: 07/31/18 11:45

Client ID: SW-1 Date Received: 07/31/18

Sample Location: 356 LOWELL ST., WAKEFIELD, MA Field Prep: Not Specified

Sample Depth:

Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Antimony, Total	ND		mg/l	0.00400	--	1	08/09/18 09:40	08/10/18 17:56	EPA 3005A	3,200.8	MG
Arsenic, Total	0.00340		mg/l	0.00100	--	1	08/09/18 09:40	08/10/18 17:56	EPA 3005A	3,200.8	MG
Cadmium, Total	ND		mg/l	0.00020	--	1	08/09/18 09:40	08/10/18 17:56	EPA 3005A	3,200.8	MG
Chromium, Total	ND		mg/l	0.00100	--	1	08/09/18 09:40	08/10/18 17:56	EPA 3005A	3,200.8	MG
Copper, Total	ND		mg/l	0.00100	--	1	08/09/18 09:40	08/10/18 17:56	EPA 3005A	3,200.8	MG
Iron, Total	3.12		mg/l	0.050	--	1	08/09/18 09:40	08/09/18 16:54	EPA 3005A	19,200.7	LC
Lead, Total	ND		mg/l	0.00100	--	1	08/09/18 09:40	08/10/18 17:56	EPA 3005A	3,200.8	MG
Mercury, Total	ND		mg/l	0.00020	--	1	08/01/18 14:07	08/01/18 21:12	EPA 245.1	3,245.1	EA
Nickel, Total	0.00201		mg/l	0.00200	--	1	08/09/18 09:40	08/10/18 17:56	EPA 3005A	3,200.8	MG
Selenium, Total	ND		mg/l	0.00500	--	1	08/09/18 09:40	08/10/18 17:56	EPA 3005A	3,200.8	MG
Silver, Total	ND		mg/l	0.00040	--	1	08/09/18 09:40	08/10/18 17:56	EPA 3005A	3,200.8	MG
Zinc, Total	ND		mg/l	0.01000	--	1	08/09/18 09:40	08/10/18 17:56	EPA 3005A	3,200.8	MG
Total Hardness by SM 2340B - Mansfield Lab											
Hardness	120		mg/l	0.660	NA	1	08/09/18 09:40	08/09/18 16:54	EPA 3005A	19,200.7	LC

Project Name: WAKEFIELD **Lab Number:** L1829511

Project Number: 8908 **Report Date:** 08/13/18

Method Blank Analysis
Batch Quality Control

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Metals - Mansfield Lab for sample(s): 01-02 Batch: WG1141790-1										
Mercury, Total	ND		mg/l	0.00020	--	1	08/01/18 14:07	08/01/18 20:48	3,245.1	EA

Prep Information

Digestion Method: EPA 245.1

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Metals - Mansfield Lab for sample(s): 01-02 Batch: WG1144505-1										
Antimony, Total	ND		mg/l	0.00400	--	1	08/09/18 09:40	08/10/18 17:36	3,200.8	MG
Arsenic, Total	ND		mg/l	0.00100	--	1	08/09/18 09:40	08/10/18 17:36	3,200.8	MG
Cadmium, Total	ND		mg/l	0.00020	--	1	08/09/18 09:40	08/10/18 17:36	3,200.8	MG
Chromium, Total	ND		mg/l	0.00100	--	1	08/09/18 09:40	08/10/18 17:36	3,200.8	MG
Copper, Total	ND		mg/l	0.00100	--	1	08/09/18 09:40	08/10/18 17:36	3,200.8	MG
Lead, Total	ND		mg/l	0.00100	--	1	08/09/18 09:40	08/10/18 17:36	3,200.8	MG
Nickel, Total	ND		mg/l	0.00200	--	1	08/09/18 09:40	08/10/18 17:36	3,200.8	MG
Selenium, Total	ND		mg/l	0.00500	--	1	08/09/18 09:40	08/10/18 17:36	3,200.8	MG
Silver, Total	ND		mg/l	0.00040	--	1	08/09/18 09:40	08/10/18 17:36	3,200.8	MG
Zinc, Total	ND		mg/l	0.01000	--	1	08/09/18 09:40	08/10/18 17:36	3,200.8	MG

Prep Information

Digestion Method: EPA 3005A

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Metals - Mansfield Lab for sample(s): 01-02 Batch: WG1144510-1										
Iron, Total	ND		mg/l	0.050	--	1	08/09/18 09:40	08/09/18 14:03	19,200.7	LC

Prep Information

Digestion Method: EPA 3005A

Project Name: WAKEFIELD
Project Number: 8908
Lab Number: L1829511
Report Date: 08/13/18

Method Blank Analysis
Batch Quality Control

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Hardness by SM 2340B - Mansfield Lab for sample(s): 01-02 Batch: WG1144510-1										
Hardness	ND		mg/l	0.660	NA	1	08/09/18 09:40	08/09/18 14:03	19,200.7	LC

Prep Information

Digestion Method: EPA 3005A

Lab Control Sample Analysis

Batch Quality Control

Project Name: WAKEFIELD
Project Number: 8908

Lab Number: L1829511
Report Date: 08/13/18

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Total Metals - Mansfield Lab Associated sample(s): 01-02 Batch: WG1141790-2								
Mercury, Total	104		-		85-115	-		
Total Metals - Mansfield Lab Associated sample(s): 01-02 Batch: WG1144505-2								
Antimony, Total	95		-		85-115	-		
Arsenic, Total	110		-		85-115	-		
Cadmium, Total	108		-		85-115	-		
Chromium, Total	107		-		85-115	-		
Copper, Total	108		-		85-115	-		
Lead, Total	109		-		85-115	-		
Nickel, Total	106		-		85-115	-		
Selenium, Total	108		-		85-115	-		
Silver, Total	112		-		85-115	-		
Zinc, Total	114		-		85-115	-		
Total Metals - Mansfield Lab Associated sample(s): 01-02 Batch: WG1144510-2								
Iron, Total	115		-		85-115	-		
Total Hardness by SM 2340B - Mansfield Lab Associated sample(s): 01-02 Batch: WG1144510-2								
Hardness	111		-		85-115	-		

Matrix Spike Analysis
Batch Quality Control

Project Name: WAKEFIELD
Project Number: 8908

Lab Number: L1829511
Report Date: 08/13/18

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	Qual	MSD Found	MSD %Recovery	Qual	Recovery Limits	RPD	Qual	RPD Limits
Total Metals - Mansfield Lab Associated sample(s): 01-02 QC Batch ID: WG1141790-3 QC Sample: L1829299-01 Client ID: MS Sample												
Mercury, Total	ND	0.005	0.0047	93		-	-		70-130	-		20
Total Metals - Mansfield Lab Associated sample(s): 01-02 QC Batch ID: WG1141790-5 QC Sample: L1829299-02 Client ID: MS Sample												
Mercury, Total	0.00025	0.005	0.0046	88		-	-		70-130	-		20
Total Metals - Mansfield Lab Associated sample(s): 01-02 QC Batch ID: WG1144505-3 QC Sample: L1829511-01 Client ID: MW-TP1												
Antimony, Total	ND	0.5	0.5465	109		-	-		70-130	-		20
Arsenic, Total	ND	0.12	0.1174	98		-	-		70-130	-		20
Cadmium, Total	ND	0.051	0.05278	103		-	-		70-130	-		20
Chromium, Total	ND	0.2	0.2103	105		-	-		70-130	-		20
Copper, Total	0.00152	0.25	0.2713	108		-	-		70-130	-		20
Lead, Total	ND	0.51	0.5433	106		-	-		70-130	-		20
Nickel, Total	ND	0.5	0.5359	107		-	-		70-130	-		20
Selenium, Total	ND	0.12	0.1123	94		-	-		70-130	-		20
Silver, Total	ND	0.05	0.05679	114		-	-		70-130	-		20
Zinc, Total	0.2048	0.5	0.8042	120		-	-		70-130	-		20
Total Metals - Mansfield Lab Associated sample(s): 01-02 QC Batch ID: WG1144510-3 QC Sample: L1829459-01 Client ID: MS Sample												
Iron, Total	11.7	1	9.77	**0**	Q	-	-		75-125	-		20
Total Hardness by SM 2340B - Mansfield Lab Associated sample(s): 01-02 QC Batch ID: WG1144510-3 QC Sample: L1829459-01 Client ID: MS Sample												
Hardness	368	66.2	424	85		-	-		75-125	-		20
Total Metals - Mansfield Lab Associated sample(s): 01-02 QC Batch ID: WG1144510-7 QC Sample: L1829511-01 Client ID: MW-TP1												
Iron, Total	113	1	105	**0**	Q	-	-		75-125	-		20

Matrix Spike Analysis
Batch Quality Control

Project Name: WAKEFIELD
Project Number: 8908

Lab Number: L1829511
Report Date: 08/13/18

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	MSD Found	MSD %Recovery	Recovery Limits	RPD	RPD Limits
Total Hardness by SM 2340B - Mansfield Lab Associated sample(s): 01-02 QC Batch ID: WG1144510-7 QC Sample: L1829511-01 Client ID: MW-TP1									
Hardness	135	66.2	198	95	-	-	75-125	-	20

Lab Duplicate Analysis

Batch Quality Control

Project Name: WAKEFIELD
Project Number: 8908

Lab Number: L1829511
Report Date: 08/13/18

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
Total Metals - Mansfield Lab Associated sample(s): 01-02 QC Batch ID: WG1141790-4 QC Sample: L1829299-01 Client ID: DUP Sample						
Mercury, Total	ND	ND	mg/l	NC		20
Total Metals - Mansfield Lab Associated sample(s): 01-02 QC Batch ID: WG1141790-6 QC Sample: L1829299-02 Client ID: DUP Sample						
Mercury, Total	0.00025	ND	mg/l	NC		20
Total Metals - Mansfield Lab Associated sample(s): 01-02 QC Batch ID: WG1144505-4 QC Sample: L1829511-01 Client ID: MW-TP1						
Antimony, Total	ND	ND	mg/l	NC		20
Arsenic, Total	ND	ND	mg/l	NC		20
Cadmium, Total	ND	ND	mg/l	NC		20
Chromium, Total	ND	ND	mg/l	NC		20
Copper, Total	0.00152	0.00163	mg/l	7		20
Lead, Total	ND	ND	mg/l	NC		20
Nickel, Total	ND	ND	mg/l	NC		20
Selenium, Total	ND	ND	mg/l	NC		20
Silver, Total	ND	ND	mg/l	NC		20
Zinc, Total	0.2048	0.2000	mg/l	2		20
Total Metals - Mansfield Lab Associated sample(s): 01-02 QC Batch ID: WG1144510-8 QC Sample: L1829511-01 Client ID: MW-TP1						
Iron, Total	113	110	mg/l	3		20

INORGANICS
&
MISCELLANEOUS

Project Name: WAKEFIELD
Project Number: 8908
Lab Number: L1829511
Report Date: 08/13/18

SAMPLE RESULTS

Lab ID: L1829511-01
Client ID: MW-TP1
Sample Location: 356 LOWELL ST., WAKEFIELD, MA
Sample Depth:
Matrix: Water
Date Collected: 07/31/18 09:30
Date Received: 07/31/18
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total Suspended	12.		mg/l	5.0	NA	1	-	08/02/18 03:32	121,2540D	UN
Cyanide, Total	ND		mg/l	0.005	--	1	08/01/18 11:25	08/01/18 13:54	121,4500CN-CE	LH
Chlorine, Total Residual	ND		mg/l	0.02	--	1	-	08/01/18 02:30	121,4500CL-D	MA
pH (H)	5.0		SU	-	NA	1	-	08/03/18 02:12	121,4500H+-B	UN
Nitrogen, Ammonia	0.713		mg/l	0.075	--	1	08/02/18 16:00	08/02/18 22:26	121,4500NH3-BH	AT
TPH, SGT-HEM	ND		mg/l	4.40	--	1.1	08/06/18 12:30	08/06/18 17:30	74,1664A	ML
Phenolics, Total	ND		mg/l	0.030	--	1	08/01/18 05:20	08/01/18 09:59	4,420.1	GD
Chromium, Hexavalent	ND		mg/l	0.010	--	1	08/01/18 01:30	08/01/18 02:05	1,7196A	MA
Anions by Ion Chromatography - Westborough Lab										
Chloride	678.		mg/l	12.5	--	25	-	08/01/18 02:50	44,300.0	JR

Project Name: WAKEFIELD **Lab Number:** L1829511

Project Number: 8908 **Report Date:** 08/13/18

Method Blank Analysis
Batch Quality Control

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab for sample(s): 01 Batch: WG1141552-1										
Chromium, Hexavalent	ND		mg/l	0.010	--	1	08/01/18 01:30	08/01/18 02:04	1,7196A	MA
General Chemistry - Westborough Lab for sample(s): 01 Batch: WG1141590-1										
Phenolics, Total	ND		mg/l	0.030	--	1	08/01/18 05:20	08/01/18 09:29	4,420.1	GD
General Chemistry - Westborough Lab for sample(s): 01 Batch: WG1141657-1										
Chlorine, Total Residual	ND		mg/l	0.02	--	1	-	08/01/18 02:30	121,4500CL-D	MA
General Chemistry - Westborough Lab for sample(s): 01 Batch: WG1141713-1										
Cyanide, Total	ND		mg/l	0.005	--	1	08/01/18 11:25	08/01/18 13:42	121,4500CN-CE	LH
Anions by Ion Chromatography - Westborough Lab for sample(s): 01 Batch: WG1141938-1										
Chloride	ND		mg/l	0.500	--	1	-	07/31/18 18:50	44,300.0	JR
General Chemistry - Westborough Lab for sample(s): 01 Batch: WG1142035-1										
Solids, Total Suspended	ND		mg/l	5.0	NA	1	-	08/02/18 03:32	121,2540D	UN
General Chemistry - Westborough Lab for sample(s): 01 Batch: WG1142133-1										
Nitrogen, Ammonia	ND		mg/l	0.075	--	1	08/02/18 16:00	08/02/18 22:18	121,4500NH3-BH	AT
General Chemistry - Westborough Lab for sample(s): 01 Batch: WG1143287-1										
TPH, SGT-HEM	ND		mg/l	4.00	--	1	08/06/18 12:30	08/06/18 17:30	74,1664A	ML

Lab Control Sample Analysis

Batch Quality Control

Project Name: WAKEFIELD
Project Number: 8908

Lab Number: L1829511
Report Date: 08/13/18

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01 Batch: WG1141552-2								
Chromium, Hexavalent	96		-		85-115	-		20
General Chemistry - Westborough Lab Associated sample(s): 01 Batch: WG1141590-2								
Phenolics, Total	79		-		70-130	-		
General Chemistry - Westborough Lab Associated sample(s): 01 Batch: WG1141657-2								
Chlorine, Total Residual	93		-		90-110	-		
General Chemistry - Westborough Lab Associated sample(s): 01 Batch: WG1141713-2								
Cyanide, Total	102		-		90-110	-		
Anions by Ion Chromatography - Westborough Lab Associated sample(s): 01 Batch: WG1141938-2								
Chloride	104		-		90-110	-		
General Chemistry - Westborough Lab Associated sample(s): 01 Batch: WG1142133-2								
Nitrogen, Ammonia	102		-		80-120	-		20
General Chemistry - Westborough Lab Associated sample(s): 01 Batch: WG1142522-1								
pH	100		-		99-101	-		5

Lab Control Sample Analysis

Batch Quality Control

Project Name: WAKEFIELD

Project Number: 8908

Lab Number: L1829511

Report Date: 08/13/18

Parameter	LCS %Recovery	LCSD %Recovery	%Recovery Limits	RPD	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01 Batch: WG1143287-2					
TPH	94	-	64-132	-	34

Matrix Spike Analysis
Batch Quality Control

Project Name: WAKEFIELD
Project Number: 8908

Lab Number: L1829511
Report Date: 08/13/18

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	Qual	MSD Found	MSD %Recovery	Qual	Recovery Limits	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1141552-4 QC Sample: L1829511-01 Client ID: MW-TP1												
Chromium, Hexavalent	ND	0.1	0.096	96		-	-		85-115	-		20
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1141590-4 QC Sample: L1829553-01 Client ID: MS Sample												
Phenolics, Total	ND	0.4	0.34	86		-	-		70-130	-		20
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1141657-4 QC Sample: L1829542-01 Client ID: MS Sample												
Chlorine, Total Residual	ND	0.248	0.23	93		-	-		80-120	-		20
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1141713-4 QC Sample: L1829542-02 Client ID: MS Sample												
Cyanide, Total	ND	0.2	0.138	**69**	Q	-	-		90-110	-		30
Anions by Ion Chromatography - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1141938-3 QC Sample: L1829299-01 Client ID: MS Sample												
Chloride	459	100	543	**83**	Q	-	-		90-110	-		18
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1142133-4 QC Sample: L1829667-02 Client ID: MS Sample												
Nitrogen, Ammonia	0.078	4	3.90	96		-	-		80-120	-		20
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1143287-4 QC Sample: L1829913-02 Client ID: MS Sample												
TPH	4.80	20	22.7	90		-	-		64-132	-		34

Lab Duplicate Analysis

Batch Quality Control

Project Name: WAKEFIELD
Project Number: 8908

Lab Number: L1829511
Report Date: 08/13/18

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1141552-3 QC Sample: L1829511-01 Client ID: MW-TP1						
Chromium, Hexavalent	ND	ND	mg/l	NC		20
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1141590-3 QC Sample: L1829553-01 Client ID: DUP Sample						
Phenolics, Total	ND	ND	mg/l	NC		20
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1141657-3 QC Sample: L1829542-02 Client ID: DUP Sample						
Chlorine, Total Residual	0.21	0.22	mg/l	5		20
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1141713-3 QC Sample: L1829542-01 Client ID: DUP Sample						
Cyanide, Total	ND	ND	mg/l	NC		30
Anions by Ion Chromatography - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1141938-4 QC Sample: L1829299-01 Client ID: DUP Sample						
Chloride	459	461	mg/l	0		18
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1142035-2 QC Sample: L1829410-01 Client ID: DUP Sample						
Solids, Total Suspended	210	230	mg/l	9		29
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1142133-3 QC Sample: L1829667-02 Client ID: DUP Sample						
Nitrogen, Ammonia	0.078	0.133	mg/l	**52**	Q	20
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1142522-2 QC Sample: L1830037-01 Client ID: DUP Sample						
pH	7.4	7.4	SU	0		5
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1143287-3 QC Sample: L1829913-02 Client ID: DUP Sample						
TPH	4.80	4.70	mg/l	2		34

Project Name: WAKEFIELD
Project Number: 8908

Lab Number: L1829511
Report Date: 08/13/18

Sample Receipt and Container Information

Were project specific reporting limits specified? YES

Cooler Information

Cooler	Custody Seal
A	Absent

Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L1829511-01A	Vial Na2S2O3 preserved	A	NA		3.4	Y	Absent		624.1-RGP(7),624.1-SIM-RGP(7)
L1829511-01B	Vial Na2S2O3 preserved	A	NA		3.4	Y	Absent		624.1-RGP(7),624.1-SIM-RGP(7)
L1829511-01C	Vial Na2S2O3 preserved	A	NA		3.4	Y	Absent		624.1-RGP(7),624.1-SIM-RGP(7)
L1829511-01D	Vial Na2S2O3 preserved	A	NA		3.4	Y	Absent		504(14)
L1829511-01E	Vial Na2S2O3 preserved	A	NA		3.4	Y	Absent		504(14)
L1829511-01F	Vial HCl preserved	A	NA		3.4	Y	Absent		SUB-ETHANOL(14)
L1829511-01G	Vial HCl preserved	A	NA		3.4	Y	Absent		SUB-ETHANOL(14)
L1829511-01H	Vial HCl preserved	A	NA		3.4	Y	Absent		SUB-ETHANOL(14)
L1829511-01J	Plastic 250ml HNO3 preserved	A	<2	<2	3.4	Y	Absent		CD-2008T(180),NI-2008T(180),ZN-2008T(180),CU-2008T(180),FE-UI(180),AG-2008T(180),AS-2008T(180),HG-U(28),SE-2008T(180),CR-2008T(180),PB-2008T(180),SB-2008T(180)
L1829511-01K	Plastic 250ml NaOH preserved	A	>12	>12	3.4	Y	Absent		TCN-4500(14)
L1829511-01L	Plastic 500ml H2SO4 preserved	A	<2	<2	3.4	Y	Absent		NH3-4500(28)
L1829511-01M	Plastic 950ml unpreserved	A	7	7	3.4	Y	Absent		PH-4500(.01),TSS-2540(7)
L1829511-01N	Plastic 950ml unpreserved	A	7	7	3.4	Y	Absent		CL-300(28),HEXCR-7196(1),TRC-4500(1)
L1829511-01P	Amber 950ml H2SO4 preserved	A	<2	<2	3.4	Y	Absent		TPHENOL-420(28)
L1829511-01Q	Amber 1000ml HCl preserved	A	NA		3.4	Y	Absent		TPH-1664(28)
L1829511-01R	Amber 1000ml HCl preserved	A	NA		3.4	Y	Absent		TPH-1664(28)
L1829511-01S	Amber 1000ml Na2S2O3	A	7	7	3.4	Y	Absent		625.1-RGP(7),625.1-SIM-RGP(7)
L1829511-01T	Amber 1000ml Na2S2O3	A	7	7	3.4	Y	Absent		625.1-RGP(7),625.1-SIM-RGP(7)
L1829511-01U	Amber 1000ml Na2S2O3	A	7	7	3.4	Y	Absent		PCB-608.3(7)
L1829511-01V	Amber 1000ml Na2S2O3	A	7	7	3.4	Y	Absent		PCB-608.3(7)
L1829511-01X	Vial unpreserved	A	NA		3.4	Y	Absent		ARCHIVE()

*Values in parentheses indicate holding time in days

Project Name: WAKEFIELD
Project Number: 8908

Lab Number: L1829511
Report Date: 08/13/18

Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L1829511-02A	Plastic 250ml HNO3 preserved	A	<2	<2	3.4	Y	Absent		CD-2008T(180),NI-2008T(180),ZN-2008T(180),CU-2008T(180),FE-UI(180),HARDU(180),AG-2008T(180),AS-2008T(180),HG-U(28),SE-2008T(180),CR-2008T(180),PB-2008T(180),SB-2008T(180)

*Values in parentheses indicate holding time in days

Project Name:	WAKEFIELD	**Lab Number:**	L1829511
Project Number:	8908	**Report Date:**	08/13/18

GLOSSARY

Acronyms

EDL	- Estimated Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The EDL includes any adjustments from dilutions, concentrations or moisture content, where applicable. The use of EDLs is specific to the analysis of PAHs using Solid-Phase Microextraction (SPME).
EMPC	- Estimated Maximum Possible Concentration: The concentration that results from the signal present at the retention time of an analyte when the ions meet all of the identification criteria except the ion abundance ratio criteria. An EMPC is a worst-case estimate of the concentration.
EPA	- Environmental Protection Agency.
LCS	- Laboratory Control Sample: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
LCSD	- Laboratory Control Sample Duplicate: Refer to LCS.
LFB	- Laboratory Fortified Blank: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
MDL	- Method Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The MDL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
MS	- Matrix Spike Sample: A sample prepared by adding a known mass of target analyte to a specified amount of matrix sample for which an independent estimate of target analyte concentration is available.
MSD	- Matrix Spike Sample Duplicate: Refer to MS.
NA	- Not Applicable.
NC	- Not Calculated: Term is utilized when one or more of the results utilized in the calculation are non-detect at the parameter's reporting unit.
NDPA/DPA	- N-Nitrosodiphenylamine/Diphenylamine.
NI	- Not Ignitable.
NP	- Non-Plastic: Term is utilized for the analysis of Atterberg Limits in soil.
RL	- Reporting Limit: The value at which an instrument can accurately measure an analyte at a specific concentration. The RL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
RPD	- Relative Percent Difference: The results from matrix and/or matrix spike duplicates are primarily designed to assess the precision of analytical results in a given matrix and are expressed as relative percent difference (RPD). Values which are less than five times the reporting limit for any individual parameter are evaluated by utilizing the absolute difference between the values; although the RPD value will be provided in the report.
SRM	- Standard Reference Material: A reference sample of a known or certified value that is of the same or similar matrix as the associated field samples.
STLP	- Semi-dynamic Tank Leaching Procedure per EPA Method 1315.
TEF	- Toxic Equivalency Factors: The values assigned to each dioxin and furan to evaluate their toxicity relative to 2,3,7,8-TCDD.
TEQ	- Toxic Equivalent: The measure of a sample¿s toxicity derived by multiplying each dioxin and furan by its corresponding TEF and then summing the resulting values.
TIC	- Tentatively Identified Compound: A compound that has been identified to be present and is not part of the target compound list (TCL) for the method and/or program. All TICs are qualitatively identified and reported as estimated concentrations.

Footnotes

1	- The reference for this analyte should be considered modified since this analyte is absent from the target analyte list of the original method.

Terms

Analytical Method: Both the document from which the method originates and the analytical reference method. (Example: EPA 8260B is shown as 1,8260B.) The codes for the reference method documents are provided in the References section of the Addendum.

Final pH: As it pertains to Sample Receipt & Container Information section of the report, Final pH reflects pH of container determined after adjustment at the laboratory, if applicable. If no adjustment required, value reflects Initial pH.

Frozen Date/Time: With respect to Volatile Organics in soil, Frozen Date/Time reflects the date/time at which associated Reagent Water-preserved vials were initially frozen. Note: If frozen date/time is beyond 48 hours from sample collection, value will be reflected in 'bold'.

Initial pH: As it pertains to Sample Receipt & Container Information section of the report, Initial pH reflects pH of container determined upon receipt, if applicable.

Total: With respect to Organic analyses, a 'Total' result is defined as the summation of results for individual isomers or Aroclors. If a 'Total' result is requested, the results of its individual components will also be reported. This is applicable to 'Total' results for methods 8260, 8081 and 8082.

Report Format: Data Usability Report

Project Name:	WAKEFIELD	**Lab Number:**	L1829511
Project Number:	8908	**Report Date:**	08/13/18

Data Qualifiers

A - Spectra identified as "Aldol Condensation Product".

B - The analyte was detected above the reporting limit in the associated method blank. Flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For MCP-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For DOD-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank AND the analyte was detected above one-half the reporting limit (or above the reporting limit for common lab contaminants) in the associated method blank. For NJ-Air-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte above the reporting limit. For NJ-related projects (excluding Air), flag only applies to associated field samples that have detectable concentrations of the analyte, which was detected above the reporting limit in the associated method blank or above five times the reporting limit for common lab contaminants (Phthalates, Acetone, Methylene Chloride, 2-Butanone).

C - Co-elution: The target analyte co-elutes with a known lab standard (i.e. surrogate, internal standards, etc.) for co-extracted analyses.

D - Concentration of analyte was quantified from diluted analysis. Flag only applies to field samples that have detectable concentrations of the analyte.

E - Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.

G - The concentration may be biased high due to matrix interferences (i.e, co-elution) with non-target compound(s). The result should be considered estimated.

H - The analysis of pH was performed beyond the regulatory-required holding time of 15 minutes from the time of sample collection.

I - The lower value for the two columns has been reported due to obvious interference.

M - Reporting Limit (RL) exceeds the MCP CAM Reporting Limit for this analyte.

NJ - Presumptive evidence of compound. This represents an estimated concentration for Tentatively Identified Compounds (TICs), where the identification is based on a mass spectral library search.

P - The RPD between the results for the two columns exceeds the method-specified criteria.

Q - The quality control sample exceeds the associated acceptance criteria. For DOD-related projects, LCS and/or Continuing Calibration Standard exceedences are also qualified on all associated sample results. Note: This flag is not applicable for matrix spike recoveries when the sample concentration is greater than 4x the spike added or for batch duplicate RPD when the sample concentrations are less than 5x the RL. (Metals only.)

R - Analytical results are from sample re-analysis.

RE - Analytical results are from sample re-extraction.

S - Analytical results are from modified screening analysis.

J - Estimated value. This represents an estimated concentration for Tentatively Identified Compounds (TICs).

ND - Not detected at the reporting limit (RL) for the sample.

Report Format: Data Usability Report

Project Name:	WAKEFIELD	**Lab Number:**	L1829511
Project Number:	8908	**Report Date:**	08/13/18

REFERENCES

1 Test Methods for Evaluating Solid Waste: Physical/Chemical Methods. EPA SW-846. Third Edition. Updates I - IV, 2007.

3 Methods for the Determination of Metals in Environmental Samples, Supplement I. EPA/600/R-94/111. May 1994.

4 Methods for Chemical Analysis of Water and Wastes. EPA 600/4-79-020. Revised March 1983.

14 Methods for the Determination of Organic Compounds in Finished Drinking Water and Raw Source Water. EPA/600/4-88/039, Revised July 1991.

19 Inductively Coupled Plasma Atomic Emission Spectrometric Method for Trace Element Analysis of Water and Wastes. Appendix C, Part 136, 40 CFR (Code of Federal Regulations). July 1, 1999 edition.

44 Methods for the Determination of Inorganic Substances in Environmental Samples, EPA/600/R-93/100, August 1993.

74 Method 1664,Revision A: N-Hexane Extractable Material (HEM; Oil & Grease) and Silica Gel Treated N-Hexane Extractable Material (SGT-HEM; Non-polar Material) by Extraction and Gravimetry, EPA-821-R-98-002, February 1999.

107 Alpha Analytical - In-house calculation method.

121 Standard Methods for the Examination of Water and Wastewater. APHA-AWWA-WEF. Standard Methods Online.

127 Method 608.3: Organochlorine Pesticides and PCBs by GC/HSD, EPA 821-R-16-009, December 2016.

128 Method 624.1: Purgeables by GC/MS, EPA 821-R-16-008, December 2016.

129 Method 625.1: Base/Neutrals and Acids by GC/MS, EPA 821-R-16-007, December 2016.

LIMITATION OF LIABILITIES

Alpha Analytical performs services with reasonable care and diligence normal to the analytical testing laboratory industry. In the event of an error, the sole and exclusive responsibility of Alpha Analytical shall be to re-perform the work at it's own expense. In no event shall Alpha Analytical be held liable for any incidental, consequential or special damages, including but not limited to, damages in any way connected with the use of, interpretation of, information or analysis provided by Alpha Analytical.

We strongly urge our clients to comply with EPA protocol regarding sample volume, preservation, cooling, containers, sampling procedures, holding time and splitting of samples in the field.

Certification Information

The following analytes are not included in our Primary NELAP Scope of Accreditation:

Westborough Facility
EPA 624: m/p-xylene, o-xylene
EPA 8260C: NPW: 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene, Azobenzene; SCM: Iodomethane (methyl iodide), Methyl methacrylate, 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene.
EPA 8270D: NPW: Dimethylnaphthalene,1,4-Diphenylhydrazine; SCM: Dimethylnaphthalene,1,4-Diphenylhydrazine.
EPA 300: DW: Bromide
EPA 6860: SCM: Perchlorate
EPA 9010: NPW and SCM: Amenable Cyanide Distillation
SM4500: NPW: Amenable Cyanide, Dissolved Oxygen; SCM: Total Phosphorus, TKN, NO2, NO3.

Mansfield Facility
SM 2540D: TSS
EPA 8082A: NPW: PCB: 1, 5, 31, 87,101, 110, 141, 151, 153, 180, 183, 187.
EPA TO-15: Halothane, 2,4,4-Trimethyl-2-pentene, 2,4,4-Trimethyl-1-pentene, Thiophene, 2-Methylthiophene, 3-Methylthiophene, 2-Ethylthiophene, 1,2,3-Trimethylbenzene, Indan, Indene, 1,2,4,5-Tetramethylbenzene, Benzothiophene, 1-Methylnaphthalene.
Biological Tissue Matrix: EPA 3050B

The following analytes are included in our Massachusetts DEP Scope of Accreditation

Westborough Facility:

Drinking Water
EPA 300.0: Chloride, Nitrate-N, Fluoride, Sulfate; **EPA 353.2**: Nitrate-N, Nitrite-N; **SM4500NO3-F**: Nitrate-N, Nitrite-N; **SM4500F-C, SM4500CN-CE, EPA 180.1, SM2130B, SM4500CI-D, SM2320B, SM2540C, SM4500H-B**
EPA 332: Perchlorate; **EPA 524.2:** THMs and VOCs; **EPA 504.1:** EDB, DBCP.
Microbiology: **SM9215B; SM9223-P/A, SM9223B-Colilert-QT,SM9222D**.

Non-Potable Water
SM4500H,B, EPA 120.1, SM2510B, SM2540C, SM2320B, SM4500CL-E, SM4500F-BC, SM4500NH3-BH: Ammonia-N and Kjeldahl-N, **EPA 350.1**: Ammonia-N, **LACHAT 10-107-06-1-B**: Ammonia-N, **EPA 351.1, SM4500NO3-F, EPA 353.2**: Nitrate-N**, EPA 351.1, SM4500P-E, SM4500P-B, E, SM4500SO4-E, SM5220D, EPA 410.4, SM5210B, SM5310C, SM4500CL-D, EPA 1664, EPA 420.1, SM4500-CN-CE, SM2540D.**
EPA 624: Volatile Halocarbons & Aromatics,
EPA 608: Chlordane, Toxaphene, Aldrin, alpha-BHC, beta-BHC, gamma-BHC, delta-BHC, Dieldrin, DDD, DDE, DDT, Endosulfan I, Endosulfan II, Endosulfan sulfate, Endrin, Endrin Aldehyde, Heptachlor, Heptachlor Epoxide, PCBs
EPA 625: SVOC (Acid/Base/Neutral Extractables), **EPA 600/4-81-045**: PCB-Oil.
Microbiology: **SM9223B-Colilert-QT; Enterolert-QT, SM9221E, SM9222D.**

Mansfield Facility:

Drinking Water
EPA 200.7: Al, Ba, Be, Cd, Cr, Cu, Mn, Ni, Na, Ag, Ca, Zn. **EPA 200.8:** Al, Sb, As, Ba, Be, Cd, Cr, Cu, Pb, Mn, Ni, Se, Ag, TL, Zn. **EPA 245.1** Hg.
EPA 522.

Non-Potable Water
EPA 200.7: Al, Sb, As, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Mo, Ni, K, Se, Ag, Na, Sr, TL, Ti, V, Zn.
EPA 200.8: Al, Sb, As, Be, Cd, Cr, Cu, Pb, Mn, Ni, Se, Ag, TL, Zn.
EPA 245.1 Hg.
SM2340B

For a complete listing of analytes and methods, please contact your Alpha Project Manager.

CHAIN OF CUSTODY

PAGE 1 OF 1

Date Rec'd in Lab: 07/31/18

ALPHA Job #: L1829511

8 Walkup Drive
Westboro, MA 01581
Tel: 508-898-9220

320 Forbes Blvd
Mansfield, MA 02048
Tel: 508-822-9300

Client Information

Client: GeoInsight, Inc.

Address: 1 Monarch Dr. Suite 201
Littleton, MA 01460

Phone: 978-679-1600

Email: lcgulich@geoinc.com
rcreynolds@geoinc.com

Additional Project Information:

Project Information

Project Name: Wakefield

Project Location: 356 Lowell St., Wakefield MA

Project #: 8908

Project Manager: Robert Reynolds

ALPHA Quote #:

Turn-Around Time

☒ Standard ☐ RUSH (only confirmed if pre-approved)

Date Due:

Report Information - Data Deliverables

☒ ADEx ☒ EMAIL

Billing Information

☐ Same as Client info PO #:

Regulatory Requirements & Project Information Requirements

☒ Yes ☐ No MA MCP Analytical Methods ☐ Yes ☐ No CT RCP Analytical Methods
☐ Yes ☐ No Matrix Spike Required on this SDG? (Required for MCP Inorganics)
☐ Yes ☐ No GW1 Standards (Info Required for Metals & EPH with Targets)
☐ Yes ☐ No NPDES RGP
☐ Other State /Fed Program _____ Criteria _____

ANALYSIS

VOC: ☐ 8260 ☐ 624 ☐ 524.2
SVOC: ☐ ABN ☐ PAH
METALS: ☐ MCP 13 ☐ MCP 14 ☐ RCP 15
METALS: ☐ RCRA5 ☐ RCRA8 ☐ PP13
EPH: ☐ Ranges & Targets ☐ Ranges Only
VPH: ☐ Ranges & Targets ☐ Ranges Only
☐ PCB ☐ PEST
TPH: ☐ Quant Only ☐ Fingerprint
NPDES RGP Package
RGP Metals
Total Hardness

SAMPLE INFO
Filtration
☐ Field
☐ Lab to do
Preservation
☐ Lab to do

ALPHA Lab ID (Lab Use Only)	Sample ID	Collection Date	Collection Time	Sample Matrix	Sampler Initials	Sample Comments	TOTAL # BOTTLES
29511-01	MW-TP1	7/31/18	9:30	GW	LCG	X	21
02	SW-1	1	11:45	W	LCG	X X	1

Container Type		P P
Preservative		

Container Type
P= Plastic
A= Amber glass
V= Vial
G= Glass
B= Bacteria cup
C= Cube
O= Other
E= Encore
D= BOD Bottle

Preservative
A= None
B= HCl
C= HNO_3
D= H_2SO_4
E= NaOH
F= MeOH
G= $NaHSO_4$
H = $Na_2S_2O_3$
I= Ascorbic Acid
J = NH_4Cl
K= Zn Acetate
O= Other

Relinquished By:	Date/Time	Received By:	Date/Time
	7/31/18 14:00		7-31-18 14:00
AM	7-31-18 14:55	Erin Tolman	7/31/18 14:55

All samples submitted are subject to Alpha's Terms and Conditions. See reverse side.

FORM NO: 01-01 (rev. 12-Mar-2012)

ALPHA ANALYTICAL
World Class Chemistry

Subcontract Chain of Custody

Test America (Nashville)
2960 Foster Creighton Drive
Nashville, TN 37204

Alpha Job Number
L1829511

Client Information

Client: Alpha Analytical Labs
Address: Eight Walkup Drive
Westborough, MA 01581-1019

Phone: 508.439.5157
Email: dsanford@alphalab.com

Project Information

Project Location: MA
Project Manager: Dave Sanford

Turnaround & Deliverables Information

Due Date: 08/14/18
Deliverables:

Regulatory Requirements/Report Limits

State/Federal Program:
Regulatory Criteria:

Project Specific Requirements and/or Report Requirements

Reference following Alpha Job Number on final report/deliverables: L1829511

Report to include Method Blank, LCS/LCSD:

Additional Comments: Send all results/reports to subreports@alphalab.com

Lab ID	Client ID	Collection Date/Time	Sample Matrix	Analysis	Batch QC
	MW-TP1	07-31-18 09:30	WATER	Ethanol by EPA 1671 Revision A	

	Relinquished By:	Date/Time:	Received By:	Date/Time:
	Chris Gelbear	8/1/18 1423		
Form No: AL_subcoc				

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Nashville
2960 Foster Creighton Drive
Nashville, TN 37204
Tel: (615)726-0177

TestAmerica Job ID: 490-156783-1
Client Project/Site: L1829511

For:
Alpha Analytical Inc
145 Flanders Road
Westborough, Massachusetts 01581-1019

Attn: Reports Dept.

Roxanne Cisneros

Authorized for release by:
8/7/2018 4:30:37 PM
Roxanne Cisneros, Senior Project Manager
(615)301-5761
roxanne.cisneros@testamericainc.com

Designee for

Ken Hayes, Project Manager II
(615)301-5035
ken.hayes@testamericainc.com

Table of Contents

Sample Summary

Client: Alpha Analytical Inc
Project/Site: L1829511

TestAmerica Job ID: 490-156783-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
490-156783-1	MW-TP1	Water	07/31/18 09:30	08/02/18 09:40

Case Narrative

Client: Alpha Analytical Inc
Project/Site: L1829511

TestAmerica Job ID: 490-156783-1

Job ID: 490-156783-1

Laboratory: TestAmerica Nashville

Narrative

Job Narrative
490-156783-1

Comments
No additional comments.

Receipt
The sample was received on 8/2/2018 9:40 AM; the sample arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 3.4º C.

GC Semi VOA
Method(s) 1671A: Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate (MS/MSD) associated with analytical batch 490-534152.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Definitions/Glossary

Client: Alpha Analytical Inc
Project/Site: L1829511

TestAmerica Job ID: 490-156783-1

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Client Sample Results

Client: Alpha Analytical Inc
Project/Site: L1829511

TestAmerica Job ID: 490-156783-1

Client Sample ID: MW-TP1
Date Collected: 07/31/18 09:30
Date Received: 08/02/18 09:40

Lab Sample ID: 490-156783-1
Matrix: Water

Method: 1671A - Ethanol (GC/FID)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ethanol	ND		2000	500	ug/L			08/06/18 10:57	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Isopropyl acetate (Surr)	*105*		*70 - 130*		*08/06/18 10:57*	*1*

QC Sample Results

Client: Alpha Analytical Inc
Project/Site: L1829511

TestAmerica Job ID: 490-156783-1

Method: 1671A - Ethanol (GC/FID)

Lab Sample ID: MB 490-534152/6
Matrix: Water
Analysis Batch: 534152

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ethanol	ND		2000	500	ug/L			08/06/18 10:39	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Isopropyl acetate (Surr)	*109*		*70 - 130*		*08/06/18 10:39*	*1*

Lab Sample ID: LCS 490-534152/7
Matrix: Water
Analysis Batch: 534152

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Ethanol			50200	59020		ug/L		117	70 - 130		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
Isopropyl acetate (Surr)	*107*		*70 - 130*

Lab Sample ID: LCSD 490-534152/8
Matrix: Water
Analysis Batch: 534152

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Ethanol			50200	54030		ug/L		108	70 - 130	9	20

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
Isopropyl acetate (Surr)	*110*		*70 - 130*

QC Association Summary

Client: Alpha Analytical Inc
Project/Site: L1829511

TestAmerica Job ID: 490-156783-1

GC VOA

Analysis Batch: 534152

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-156783-1	MW-TP1	Total/NA	Water	1671A	
MB 490-534152/6	Method Blank	Total/NA	Water	1671A	
LCS 490-534152/7	Lab Control Sample	Total/NA	Water	1671A	
LCSD 490-534152/8	Lab Control Sample Dup	Total/NA	Water	1671A	

Lab Chronicle

Client: Alpha Analytical Inc
Project/Site: L1829511

TestAmerica Job ID: 490-156783-1

Client Sample ID: MW-TP1
Date Collected: 07/31/18 09:30
Date Received: 08/02/18 09:40

Lab Sample ID: 490-156783-1
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	1671A		1			534152	08/06/18 10:57	AAB	TAL NSH

Laboratory References:

TAL NSH = TestAmerica Nashville, 2960 Foster Creighton Drive, Nashville, TN 37204, TEL (615)726-0177

Method Summary

Client: Alpha Analytical Inc
Project/Site: L1829511

TestAmerica Job ID: 490-156783-1

Method	Method Description	Protocol	Laboratory
1671A	Ethanol (GC/FID)	EPA	TAL NSH

Protocol References:

EPA = US Environmental Protection Agency

Laboratory References:

TAL NSH = TestAmerica Nashville, 2960 Foster Creighton Drive, Nashville, TN 37204, TEL (615)726-0177

Accreditation/Certification Summary

Client: Alpha Analytical Inc
Project/Site: L1829511

TestAmerica Job ID: 490-156783-1

Laboratory: TestAmerica Nashville

Unless otherwise noted, all analytes for this laboratory were covered under each accreditation/certification below.

Authority	Program	EPA Region	Identification Number	Expiration Date
California	State Program	9	2938	10-31-18

The following analytes are included in this report, but accreditation/certification is not offered by the governing authority:

Analysis Method	Prep Method	Matrix	Analyte
1671A		Water	Ethanol

Maine	State Program	1	TN00032	11-03-19

The following analytes are included in this report, but accreditation/certification is not offered by the governing authority:

Analysis Method	Prep Method	Matrix	Analyte
1671A		Water	Ethanol

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING
Nashville, TN

COOLER RECEIPT FORM

490-156783 Chain of Custody

Cooler Received/Opened On 08-02-2018 @ 0940

Time Samples Removed From Cooler 16:13 Time Samples Placed In Storage 16:18 (2 Hour Window)

1. Tracking # 1ZE306540197189697 (last 4 digits, FedEx) Courier: UPS NDA

IR Gun ID 31470368 pH Strip Lot _____ Chlorine Strip Lot _____

2. Temperature of rep. sample or temp blank when opened: 3.4 *Degrees Celsius*

3. If Item #2 temperature is 0°C or less, was the representative sample or temp blank frozen? YES NO (NA)

4. Were custody seals on outside of cooler? YES (NO) NA

If yes, how many and where: _____

5. Were the seals intact, signed, and dated correctly? YES...NO...(NA)

6. Were custody papers inside cooler? (YES)...NO...NA

I certify that I opened the cooler and answered questions 1-6 (intial) AOH

7. Were custody seals on containers: YES (NO) and Intact YES...NO...(NA)

Were these signed and dated correctly? YES...NO...(NA)

8. Packing mat'l used? (Bubblewrap) Plastic bag Peanuts Vermiculite Foam Insert Paper Other None

9. Cooling process: (Ice) Ice-pack Ice (direct contact) Dry ice Other None

10. Did all containers arrive in good condition (unbroken)? (YES)...NO...NA

11. Were all container labels complete (#, date, signed, pres., etc)? (YES)...NO...NA

12. Did all container labels and tags agree with custody papers? (YES)...NO...NA

13a. Were VOA vials received? (YES)...NO...NA

b. Was there any observable headspace present in any VOA vial? YES...(NO)...NA


Larger than this.

14. Was there a Trip Blank in this cooler? YES...(NO)...NA If multiple coolers, sequence # _____

I certify that I unloaded the cooler and answered questions 7-14 (intial) JJ

15a. On pres'd bottles, did pH test strips suggest preservation reached the correct pH level? YES...NO...(NA)

b. Did the bottle labels indicate that the correct preservatives were used (YES)...NO...NA

16. Was residual chlorine present? YES...NO...(NA)

I certify that I checked for chlorine and pH as per SOP and answered questions 15-16 (intial) JJ

17. Were custody papers properly filled out (ink, signed, etc)? (YES)...NO...NA

18. Did you sign the custody papers in the appropriate place? (YES)...NO...NA

19. Were correct containers used for the analysis requested? (YES)...NO...NA

20. Was sufficient amount of sample sent in each container? (YES)...NO...NA

I certify that I entered this project into LIMS and answered questions 17-20 (intial) JJ

I certify that I attached a label with the unique LIMS number to each container (intial) JJ

21. Were there Non-Conformance issues at login? YES...(NO) Was a NCM generated? YES...(NO)...# _____

BIS = Broken in shipment
Cooler Receipt Form.doc

LF-1
End of Form

Revised 8/23/17

ALPHA ANALYTICAL
World Class Chemistry

Subcontract Chain of Custody

Test America (Nashville)
2960 Foster Creighton Drive
Nashville, TN 37204

490-156783

ha Job Number
329511

Client Information	Project Information	Regulatory Requirements/Report Limits
Client: Alpha Analytical Labs Address: Eight Walkup Drive Westborough, MA 01581-1019 Phone: 508.439.5157 Email: dsanford@alphalab.com	Project Location: MA Project Manager: Dave Sanford **Turnaround & Deliverables Information** Due Date: 08/14/18 Deliverables:	State/Federal Program: Regulatory Criteria:

Project Specific Requirements and/or Report Requirements

Reference following Alpha Job Number on final report/deliverables: L1829511

Report to include Method Blank, LCS/LCSD:

Additional Comments: Send all results/reports to subreports@alphalab.com

Lab ID	Client ID	Collection Date/Time	Sample Matrix	Analysis	Batch QC
	MW-TP1	07-31-18 09:30	WATER	Ethanol by EPA 1671 Revision A	

	Relinquished By:	Date/Time:	Received By:	Date/Time:
	Cheri Tebeau	8/1/18 1423	[illegible]	08/02/18 09:40
Form No: AL_subcoc				

TA-NAS 3.4

ANALYTICAL REPORT

Lab Number:	L1831108
Client:	GeoInsight One Monarch Drive Littleton, MA 01460
ATTN:	Robert Reynolds
Phone:	(978) 679-1600
Project Name:	WAKEFIELD
Project Number:	8905
Report Date:	08/13/18

Certifications & Approvals: MA (M-MA086), NH NELAP (2064), CT (PH-0574), IL (200077), ME (MA00086), MD (348), NJ (MA935), NY (11148), NC (25700/666), PA (68-03671), RI (LAO00065), TX (T104704476), VT (VT-0935), VA (460195), USDA (Permit #P330-17-00196).

Eight Walkup Drive, Westborough, MA 01581-1019
508-898-9220 (Fax) 508-898-9193 800-624-9220 - www.alphalab.com

Project Name: WAKEFIELD
Project Number: 8905

Lab Number: L1831108
Report Date: 08/13/18

Alpha Sample ID	Client ID	Matrix	Sample Location	Collection Date/Time	Receive Date
L1831108-01	SW-1	WATER	356 LOWELL ST., WAKEFIELD	08/09/18 10:45	08/09/18

Project Name: WAKEFIELD **Lab Number:** L1831108

Project Number: 8905 **Report Date:** 08/13/18

MADEP MCP Response Action Analytical Report Certification

This form provides certifications for all samples performed by MCP methods. Please refer to the Sample Results and Container Information sections of this report for specification of MCP methods used for each analysis. The following questions pertain only to MCP Analytical Methods.

An affirmative response to questions A through F is required for "Presumptive Certainty" status		
A	Were all samples received in a condition consistent with those described on the Chain-of-Custody, properly preserved (including temperature) in the field or laboratory, and prepared/analyzed within method holding times?	YES
B	Were the analytical method(s) and all associated QC requirements specified in the selected CAM protocol(s) followed?	YES
C	Were all required corrective actions and analytical response actions specified in the selected CAM protocol(s) implemented for all identified performance standard non-conformances?	YES
D	Does the laboratory report comply with all the reporting requirements specified in CAM VII A, "Quality Assurance and Quality Control Guidelines for the Acquisition and Reporting of Analytical Data?"	YES
E a.	VPH, EPH, and APH Methods only: Was each method conducted without significant modification(s)? (Refer to the individual method(s) for a list of significant modifications).	N/A
E b.	APH and TO-15 Methods only: Was the complete analyte list reported for each method?	N/A
F	Were all applicable CAM protocol QC and performance standard non-conformances identified and evaluated in a laboratory narrative (including all "No" responses to Questions A through E)?	YES

A response to questions G, H and I is required for "Presumptive Certainty" status		
G	Were the reporting limits at or below all CAM reporting limits specified in the selected CAM protocol(s)?	YES
H	Were all QC performance standards specified in the CAM protocol(s) achieved?	YES
I	Were results reported for the complete analyte list specified in the selected CAM protocol(s)?	YES

For any questions answered "No", please refer to the case narrative section on the following page(s).

Please note that sample matrix information is located in the Sample Results section of this report.

Project Name: WAKEFIELD
Project Number: 8905

Lab Number: L1831108
Report Date: 08/13/18

Case Narrative

The samples were received in accordance with the Chain of Custody and no significant deviations were encountered during the preparation or analysis unless otherwise noted. Sample Receipt, Container Information, and the Chain of Custody are located at the back of the report.

Results contained within this report relate only to the samples submitted under this Alpha Lab Number and meet NELAP requirements for all NELAP accredited parameters unless otherwise noted in the following narrative. The data presented in this report is organized by parameter (i.e. VOC, SVOC, etc.). Sample specific Quality Control data (i.e. Surrogate Spike Recovery) is reported at the end of the target analyte list for each individual sample, followed by the Laboratory Batch Quality Control at the end of each parameter. Tentatively Identified Compounds (TICs), if requested, are reported for compounds identified to be present and are not part of the method/program Target Compound List, even if only a subset of the TCL are being reported. If a sample was re-analyzed or re-extracted due to a required quality control corrective action and if both sets of data are reported, the Laboratory ID of the re-analysis or re-extraction is designated with an "R" or "RE", respectively. When multiple Batch Quality Control elements are reported (e.g. more than one LCS), the associated samples for each element are noted in the grey shaded header line of each data table. Any Laboratory Batch, Sample Specific % recovery or RPD value that is outside the listed Acceptance Criteria is bolded in the report. All specific QC information is also incorporated in the Data Usability format of our Data Merger tool where it can be reviewed along with any associated usability implications. Soil/sediments, solids and tissues are reported on a dry weight basis unless otherwise noted. Definitions of all data qualifiers and acronyms used in this report are provided in the Glossary located at the back of the report.

In reference to questions H (CAM) or 4 (RCP) when "NO" is checked, the performance criteria for CAM and RCP methods allow for some quality control failures to occur and still be within method compliance. In these instances the specific failure is not narrated but noted in the associated QC table. The information is also incorporated in the Data Usability format of our Data Merger tool where it can be reviewed along with any associated usability implications.

Please see the associated ADEx data file for a comparison of laboratory reporting limits that were achieved with the regulatory Numerical Standards requested on the Chain of Custody.

HOLD POLICY
For samples submitted on hold, Alpha's policy is to hold samples (with the exception of Air canisters) free of charge for 21 calendar days from the date the project is completed. After 21 calendar days, we will dispose of all samples submitted including those put on hold unless you have contacted your Client Service Representative and made arrangements for Alpha to continue to hold the samples. Air canisters will be disposed after 3 business days from the date the project is completed.

Please contact Client Services at 800-624-9220 with any questions.

Project Name:	WAKEFIELD	**Lab Number:**	L1831108
Project Number:	8905	**Report Date:**	08/13/18

Case Narrative (continued)

MCP Related Narratives

Report Submission

All MCP required questions were answered with affirmative responses; therefore, there are no relevant protocol-specific QC and/or performance standard non-conformances to report.

I, the undersigned, attest under the pains and penalties of perjury that, to the best of my knowledge and belief and based upon my personal inquiry of those responsible for providing the information contained in this analytical report, such information is accurate and complete. This certificate of analysis is not complete unless this page accompanies any and all pages of this report.

Authorized Signature: Michelle M. Morris

Title: Technical Director/Representative Date: 08/13/18

INORGANICS
&
MISCELLANEOUS

Project Name: WAKEFIELD
Project Number: 8905

Lab Number: L1831108
Report Date: 08/13/18

SAMPLE RESULTS

Lab ID: L1831108-01
Client ID: SW-1
Sample Location: 356 LOWELL ST., WAKEFIELD

Date Collected: 08/09/18 10:45
Date Received: 08/09/18
Field Prep: Not Specified

Sample Depth:
Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Nitrogen, Ammonia	0.097		mg/l	0.075	--	1	08/10/18 01:00	08/10/18 23:36	121,4500NH3-BH	AT

Project Name: WAKEFIELD
Project Number: 8905
Lab Number: L1831108
Report Date: 08/13/18

Method Blank Analysis
Batch Quality Control

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab for sample(s): 01 Batch: WG1144908-1										
Nitrogen, Ammonia	ND		mg/l	0.075	--	1	08/10/18 01:00	08/10/18 23:34	121,4500NH3-BH	AT

Lab Control Sample Analysis

Batch Quality Control

Project Name: WAKEFIELD

Project Number: 8905

Lab Number: L1831108

Report Date: 08/13/18

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01 Batch: WG1144908-2								
Nitrogen, Ammonia	94		-		80-120	-		20

Project Name: WAKEFIELD
Project Number: 8905

Lab Number: L1831108
Report Date: 08/13/18

Sample Receipt and Container Information

Were project specific reporting limits specified? YES

Cooler Information

Cooler	*Custody Seal*
A	Absent

Container Information

Container ID	*Container Type*	*Cooler*	*Initial pH*	*Final pH*	*Temp deg C*	*Pres*	*Seal*	*Frozen Date/Time*	*Analysis(*)*
L1831108-01A	Plastic 500ml H2SO4 preserved	A	<2	<2	5.4	Y	Absent		NH3-4500(28)

*Values in parentheses indicate holding time in days

Project Name:	WAKEFIELD	**Lab Number:**	L1831108
Project Number:	8905	**Report Date:**	08/13/18

GLOSSARY

Acronyms

EDL	- Estimated Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The EDL includes any adjustments from dilutions, concentrations or moisture content, where applicable. The use of EDLs is specific to the analysis of PAHs using Solid-Phase Microextraction (SPME).
EMPC	- Estimated Maximum Possible Concentration: The concentration that results from the signal present at the retention time of an analyte when the ions meet all of the identification criteria except the ion abundance ratio criteria. An EMPC is a worst-case estimate of the concentration.
EPA	- Environmental Protection Agency.
LCS	- Laboratory Control Sample: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
LCSD	- Laboratory Control Sample Duplicate: Refer to LCS.
LFB	- Laboratory Fortified Blank: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
MDL	- Method Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The MDL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
MS	- Matrix Spike Sample: A sample prepared by adding a known mass of target analyte to a specified amount of matrix sample for which an independent estimate of target analyte concentration is available.
MSD	- Matrix Spike Sample Duplicate: Refer to MS.
NA	- Not Applicable.
NC	- Not Calculated: Term is utilized when one or more of the results utilized in the calculation are non-detect at the parameter's reporting unit.
NDPA/DPA	- N-Nitrosodiphenylamine/Diphenylamine.
NI	- Not Ignitable.
NP	- Non-Plastic: Term is utilized for the analysis of Atterberg Limits in soil.
RL	- Reporting Limit: The value at which an instrument can accurately measure an analyte at a specific concentration. The RL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
RPD	- Relative Percent Difference: The results from matrix and/or matrix spike duplicates are primarily designed to assess the precision of analytical results in a given matrix and are expressed as relative percent difference (RPD). Values which are less than five times the reporting limit for any individual parameter are evaluated by utilizing the absolute difference between the values; although the RPD value will be provided in the report.
SRM	- Standard Reference Material: A reference sample of a known or certified value that is of the same or similar matrix as the associated field samples.
STLP	- Semi-dynamic Tank Leaching Procedure per EPA Method 1315.
TEF	- Toxic Equivalency Factors: The values assigned to each dioxin and furan to evaluate their toxicity relative to 2,3,7,8-TCDD.
TEQ	- Toxic Equivalent: The measure of a sample¿s toxicity derived by multiplying each dioxin and furan by its corresponding TEF and then summing the resulting values.
TIC	- Tentatively Identified Compound: A compound that has been identified to be present and is not part of the target compound list (TCL) for the method and/or program. All TICs are qualitatively identified and reported as estimated concentrations.

Footnotes

1	- The reference for this analyte should be considered modified since this analyte is absent from the target analyte list of the original method.

Terms

Analytical Method: Both the document from which the method originates and the analytical reference method. (Example: EPA 8260B is shown as 1,8260B.) The codes for the reference method documents are provided in the References section of the Addendum.

Final pH: As it pertains to Sample Receipt & Container Information section of the report, Final pH reflects pH of container determined after adjustment at the laboratory, if applicable. If no adjustment required, value reflects Initial pH.

Frozen Date/Time: With respect to Volatile Organics in soil, Frozen Date/Time reflects the date/time at which associated Reagent Water-preserved vials were initially frozen. Note: If frozen date/time is beyond 48 hours from sample collection, value will be reflected in 'bold'.

Initial pH: As it pertains to Sample Receipt & Container Information section of the report, Initial pH reflects pH of container determined upon receipt, if applicable.

Total: With respect to Organic analyses, a 'Total' result is defined as the summation of results for individual isomers or Aroclors. If a 'Total' result is requested, the results of its individual components will also be reported. This is applicable to 'Total' results for methods 8260, 8081 and 8082.

Report Format: Data Usability Report

Project Name:	WAKEFIELD	**Lab Number:**	L1831108
Project Number:	8905	**Report Date:**	08/13/18

Data Qualifiers

A - Spectra identified as "Aldol Condensation Product".

B - The analyte was detected above the reporting limit in the associated method blank. Flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For MCP-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For DOD-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank AND the analyte was detected above one-half the reporting limit (or above the reporting limit for common lab contaminants) in the associated method blank. For NJ-Air-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte above the reporting limit. For NJ-related projects (excluding Air), flag only applies to associated field samples that have detectable concentrations of the analyte, which was detected above the reporting limit in the associated method blank or above five times the reporting limit for common lab contaminants (Phthalates, Acetone, Methylene Chloride, 2-Butanone).

C - Co-elution: The target analyte co-elutes with a known lab standard (i.e. surrogate, internal standards, etc.) for co-extracted analyses.

D - Concentration of analyte was quantified from diluted analysis. Flag only applies to field samples that have detectable concentrations of the analyte.

E - Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.

G - The concentration may be biased high due to matrix interferences (i.e, co-elution) with non-target compound(s). The result should be considered estimated.

H - The analysis of pH was performed beyond the regulatory-required holding time of 15 minutes from the time of sample collection.

I - The lower value for the two columns has been reported due to obvious interference.

M - Reporting Limit (RL) exceeds the MCP CAM Reporting Limit for this analyte.

NJ - Presumptive evidence of compound. This represents an estimated concentration for Tentatively Identified Compounds (TICs), where the identification is based on a mass spectral library search.

P - The RPD between the results for the two columns exceeds the method-specified criteria.

Q - The quality control sample exceeds the associated acceptance criteria. For DOD-related projects, LCS and/or Continuing Calibration Standard exceedences are also qualified on all associated sample results. Note: This flag is not applicable for matrix spike recoveries when the sample concentration is greater than 4x the spike added or for batch duplicate RPD when the sample concentrations are less than 5x the RL. (Metals only.)

R - Analytical results are from sample re-analysis.

RE - Analytical results are from sample re-extraction.

S - Analytical results are from modified screening analysis.

J - Estimated value. This represents an estimated concentration for Tentatively Identified Compounds (TICs).

ND - Not detected at the reporting limit (RL) for the sample.

Report Format: Data Usability Report

Project Name:	WAKEFIELD	**Lab Number:**	L1831108
Project Number:	8905	**Report Date:**	08/13/18

REFERENCES

121 Standard Methods for the Examination of Water and Wastewater. APHA-AWWA-WEF. Standard Methods Online.

LIMITATION OF LIABILITIES

Alpha Analytical performs services with reasonable care and diligence normal to the analytical testing laboratory industry. In the event of an error, the sole and exclusive responsibility of Alpha Analytical shall be to re-perform the work at it's own expense. In no event shall Alpha Analytical be held liable for any incidental, consequential or special damages, including but not limited to, damages in any way connected with the use of, interpretation of, information or analysis provided by Alpha Analytical.

We strongly urge our clients to comply with EPA protocol regarding sample volume, preservation, cooling, containers, sampling procedures, holding time and splitting of samples in the field.

Certification Information

The following analytes are not included in our Primary NELAP Scope of Accreditation:

Westborough Facility
EPA 624: m/p-xylene, o-xylene
EPA 8260C: NPW: 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene, Azobenzene; SCM: Iodomethane (methyl iodide), Methyl methacrylate, 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene.
EPA 8270D: NPW: Dimethylnaphthalene,1,4-Diphenylhydrazine; SCM: Dimethylnaphthalene,1,4-Diphenylhydrazine.
EPA 300: DW: Bromide
EPA 6860: SCM: Perchlorate
EPA 9010: NPW and SCM: Amenable Cyanide Distillation
SM4500: NPW: Amenable Cyanide, Dissolved Oxygen; SCM: Total Phosphorus, TKN, NO2, NO3.

Mansfield Facility
SM 2540D: TSS
EPA 8082A: NPW: PCB: 1, 5, 31, 87,101, 110, 141, 151, 153, 180, 183, 187.
EPA TO-15: Halothane, 2,4,4-Trimethyl-2-pentene, 2,4,4-Trimethyl-1-pentene, Thiophene, 2-Methylthiophene, 3-Methylthiophene, 2-Ethylthiophene, 1,2,3-Trimethylbenzene, Indan, Indene, 1,2,4,5-Tetramethylbenzene, Benzothiophene, 1-Methylnaphthalene.
Biological Tissue Matrix: EPA 3050B

The following analytes are included in our Massachusetts DEP Scope of Accreditation

Westborough Facility:

Drinking Water
EPA 300.0: Chloride, Nitrate-N, Fluoride, Sulfate; **EPA 353.2**: Nitrate-N, Nitrite-N; **SM4500NO3-F**: Nitrate-N, Nitrite-N; **SM4500F-C, SM4500CN-CE, EPA 180.1, SM2130B, SM4500CI-D, SM2320B, SM2540C, SM4500H-B**
EPA 332: Perchlorate; **EPA 524.2:** THMs and VOCs; **EPA 504.1:** EDB, DBCP.
Microbiology: **SM9215B; SM9223-P/A, SM9223B-Colilert-QT,SM9222D**.

Non-Potable Water
SM4500H,B, EPA 120.1, SM2510B, SM2540C, SM2320B, SM4500CL-E, SM4500F-BC, SM4500NH3-BH: Ammonia-N and Kjeldahl-N, **EPA 350.1**: Ammonia-N, **LACHAT 10-107-06-1-B**: Ammonia-N, **EPA 351.1, SM4500NO3-F, EPA 353.2**: Nitrate-N**, EPA 351.1, SM4500P-E, SM4500P-B, E, SM4500SO4-E, SM5220D, EPA 410.4, SM5210B, SM5310C, SM4500CL-D, EPA 1664, EPA 420.1, SM4500-CN-CE, SM2540D.**
EPA 624: Volatile Halocarbons & Aromatics,
EPA 608: Chlordane, Toxaphene, Aldrin, alpha-BHC, beta-BHC, gamma-BHC, delta-BHC, Dieldrin, DDD, DDE, DDT, Endosulfan I, Endosulfan II, Endosulfan sulfate, Endrin, Endrin Aldehyde, Heptachlor, Heptachlor Epoxide, PCBs
EPA 625: SVOC (Acid/Base/Neutral Extractables), **EPA 600/4-81-045**: PCB-Oil.
Microbiology: **SM9223B-Colilert-QT; Enterolert-QT, SM9221E, SM9222D.**

Mansfield Facility:

Drinking Water
EPA 200.7: Al, Ba, Be, Cd, Cr, Cu, Mn, Ni, Na, Ag, Ca, Zn. **EPA 200.8:** Al, Sb, As, Ba, Be, Cd, Cr, Cu, Pb, Mn, Ni, Se, Ag, TL, Zn. **EPA 245.1** Hg.
EPA 522.

Non-Potable Water
EPA 200.7: Al, Sb, As, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Mo, Ni, K, Se, Ag, Na, Sr, TL, Ti, V, Zn.
EPA 200.8: Al, Sb, As, Be, Cd, Cr, Cu, Pb, Mn, Ni, Se, Ag, TL, Zn.
EPA 245.1 Hg.
SM2340B

For a complete listing of analytes and methods, please contact your Alpha Project Manager.

CHAIN OF CUSTODY

PAGE 1 OF 1

Date Rec'd in Lab: 8/9/18

ALPHA Job #: L1831108

ALPHA
8 Walkup Drive
Westboro, MA 01581
Tel: 508-898-9220

320 Forbes Blvd
Mansfield, MA 02048
Tel: 508-822-9300

Client Information

Client: GeoInsight Inc.
Address: 1 Monarch Dr Suite 201
Littleton, MA 01460
Phone: 978-679-1600
Email: twmaus@geoinc.com
rcreynolds@geoinc.com

Additional Project Information:
3-Day TAT

Project Information

Project Name: Wakefield
Project Location: 356 Lowell St, Wakefield
Project #: 8908
Project Manager: Rob Reynolds
ALPHA Quote #:

Turn-Around Time

☐ Standard ☒ RUSH (only confirmed if pre-approved!)
Date Due: EOD 8/14

Report Information - Data Deliverables

☐ ADEx ☒ EMAIL

Billing Information

☐ Same as Client info PO #:

Regulatory Requirements & Project Information Requirements

☒ Yes ☐ No MA MCP Analytical Methods ☐ Yes ☐ No CT RCP Analytical Methods
☐ Yes ☐ No Matrix Spike Required on this SDG? (Required for MCP Inorganics)
☐ Yes ☐ No GW1 Standards (Info Required for Metals & EPH with Targets)
☐ Yes ☐ No NPDES RGP
☐ Other State /Fed Program _____ Criteria _____

ALPHA Lab ID (Lab Use Only)	Sample ID	Collection Date	Collection Time	Sample Matrix	Sampler Initials	ANALYSIS: VOC: ☐ 8260 ☐ 624 ☐ 524.2	SVOC: ☐ ABN ☐ PAH	METALS: ☐ MCP 13 ☐ MCP 14 ☐ RCP 15	METALS: ☐ RCRA5 ☐ RCRA8 ☐ PP13	EPH: ☐ Ranges & Targets ☐ Ranges Only	VPH: ☐ Ranges & Targets ☐ Ranges Only	☐ PCB ☐ PEST	TPH: ☐ Quant Only ☐ Fingerprint	Ammonia	SAMPLE INFO: Filtration ☐ Field ☐ Lab to do; Preservation ☐ Lab to do	Sample Comments	TOTAL # BOTTLES
31108-01	SW-1	8/9/18	10:45	W	LCG									X			1

Container Type												P					
Preservative												D					

Container Type
P= Plastic
A= Amber glass
V= Vial
G= Glass
B= Bacteria cup
C= Cube
O= Other
E= Encore
D= BOD Bottle

Preservative
A= None
B= HCl
C= HNO_3
D= H_2SO_4
E= NaOH
F= MeOH
G= $NaHSO_4$
H = $Na_2S_2O_3$
I= Ascorbic Acid
J = NH_4Cl
K= Zn Acetate
O= Other

Relinquished By:	Date/Time	Received By:	Date/Time
[signature]	8/9/18 12:00	[signature] AAL	8/9/18 15:05
[signature]	8/9/18 1605	[signature]	8/9/18 1605

All samples submitted are subject to Alpha's Terms and Conditions. See reverse side.

FORM NO: 01-01 (rev. 12-Mar-2012)

ANALYTICAL REPORT

Lab Number:	L1831652
Client:	GeoInsight One Monarch Drive Littleton, MA 01460
ATTN:	Tim Maus
Phone:	(978) 679-1600
Project Name:	WAKEFIELD
Project Number:	8908
Report Date:	08/16/18

Certifications & Approvals: MA (M-MA086), NH NELAP (2064), CT (PH-0574), IL (200077), ME (MA00086), MD (348), NJ (MA935), NY (11148), NC (25700/666), PA (68-03671), RI (LAO00065), TX (T104704476), VT (VT-0935), VA (460195), USDA (Permit #P330-17-00196).

Eight Walkup Drive, Westborough, MA 01581-1019
508-898-9220 (Fax) 508-898-9193 800-624-9220 - www.alphalab.com

Project Name: WAKEFIELD
Project Number: 8908

Lab Number: L1831652
Report Date: 08/16/18

Alpha Sample ID	Client ID	Matrix	Sample Location	Collection Date/Time	Receive Date
L1831652-01	MW-TP1	WATER	356 LOWELL ST., WAKEFIELD, MA	07/31/18 09:30	07/31/18

Project Name: WAKEFIELD
Project Number: 8908

Lab Number: L1831652
Report Date: 08/16/18

Case Narrative

The samples were received in accordance with the Chain of Custody and no significant deviations were encountered during the preparation or analysis unless otherwise noted. Sample Receipt, Container Information, and the Chain of Custody are located at the back of the report.

Results contained within this report relate only to the samples submitted under this Alpha Lab Number and meet NELAP requirements for all NELAP accredited parameters unless otherwise noted in the following narrative. The data presented in this report is organized by parameter (i.e. VOC, SVOC, etc.). Sample specific Quality Control data (i.e. Surrogate Spike Recovery) is reported at the end of the target analyte list for each individual sample, followed by the Laboratory Batch Quality Control at the end of each parameter. Tentatively Identified Compounds (TICs), if requested, are reported for compounds identified to be present and are not part of the method/program Target Compound List, even if only a subset of the TCL are being reported. If a sample was re-analyzed or re-extracted due to a required quality control corrective action and if both sets of data are reported, the Laboratory ID of the re-analysis or re-extraction is designated with an "R" or "RE", respectively. When multiple Batch Quality Control elements are reported (e.g. more than one LCS), the associated samples for each element are noted in the grey shaded header line of each data table. Any Laboratory Batch, Sample Specific % recovery or RPD value that is outside the listed Acceptance Criteria is bolded in the report. All specific QC information is also incorporated in the Data Usability format of our Data Merger tool where it can be reviewed along with any associated usability implications. Soil/sediments, solids and tissues are reported on a dry weight basis unless otherwise noted. Definitions of all data qualifiers and acronyms used in this report are provided in the Glossary located at the back of the report.

In reference to questions H (CAM) or 4 (RCP) when "NO" is checked, the performance criteria for CAM and RCP methods allow for some quality control failures to occur and still be within method compliance. In these instances the specific failure is not narrated but noted in the associated QC table. The information is also incorporated in the Data Usability format of our Data Merger tool where it can be reviewed along with any associated usability implications.

Please see the associated ADEx data file for a comparison of laboratory reporting limits that were achieved with the regulatory Numerical Standards requested on the Chain of Custody.

HOLD POLICY
For samples submitted on hold, Alpha's policy is to hold samples (with the exception of Air canisters) free of charge for 21 calendar days from the date the project is completed. After 21 calendar days, we will dispose of all samples submitted including those put on hold unless you have contacted your Client Service Representative and made arrangements for Alpha to continue to hold the samples. Air canisters will be disposed after 3 business days from the date the project is completed.

Please contact Client Services at 800-624-9220 with any questions.

I, the undersigned, attest under the pains and penalties of perjury that, to the best of my knowledge and belief and based upon my personal inquiry of those responsible for providing the information contained in this analytical report, such information is accurate and complete. This certificate of analysis is not complete unless this page accompanies any and all pages of this report.

Authorized Signature:  Cristin Walker

Title: Technical Director/Representative Date: 08/16/18

METALS

Project Name: WAKEFIELD
Lab Number: L1831652
Project Number: 8908
Report Date: 08/16/18

SAMPLE RESULTS

Lab ID: L1831652-01
Client ID: MW-TP1
Sample Location: 356 LOWELL ST., WAKEFIELD, MA
Date Collected: 07/31/18 09:30
Date Received: 07/31/18
Field Prep: Not Specified

Sample Depth:
Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Hardness by SM 2340B - Mansfield Lab											
Hardness	124		mg/l	0.660	NA	1	08/15/18 17:00	08/16/18 01:36	EPA 3005A	19,200.7	AB

Project Name: WAKEFIELD
Project Number: 8908
Lab Number: L1831652
Report Date: 08/16/18

Method Blank Analysis
Batch Quality Control

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Hardness by SM 2340B - Mansfield Lab for sample(s): 01 Batch: WG1146905-1										
Hardness	ND		mg/l	0.660	NA	1	08/15/18 17:00	08/16/18 01:08	19,200.7	AB

Prep Information

Digestion Method: EPA 3005A

Lab Control Sample Analysis

Batch Quality Control

Project Name: WAKEFIELD

Project Number: 8908

Lab Number: L1831652

Report Date: 08/16/18

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Total Hardness by SM 2340B - Mansfield Lab Associated sample(s): 01 Batch: WG1146905-2								
Hardness	101		-		85-115	-		

Matrix Spike Analysis
Batch Quality Control

Project Name: WAKEFIELD
Project Number: 8908

Lab Number: L1831652
Report Date: 08/16/18

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	Qual	MSD Found	MSD %Recovery	Qual	Recovery Limits	RPD	Qual	RPD Limits
Total Hardness by SM 2340B - Mansfield Lab Associated sample(s): 01 QC Batch ID: WG1146905-3 QC Sample: L1831386-01 Client ID: MS Sample												
Hardness	146	66.2	202	85		-	-		75-125	-		20

Project Name: WAKEFIELD
Project Number: 8908

Lab Number: L1831652
Report Date: 08/16/18

Sample Receipt and Container Information

Were project specific reporting limits specified? YES

Cooler Information

Cooler	Custody Seal
A	Absent

Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L1831652-01A	Plastic 250ml HNO3 preserved	A	<2	<2	3.4	Y	Absent		HARDU(180)

*Values in parentheses indicate holding time in days

Project Name:	WAKEFIELD	**Lab Number:**	L1831652
Project Number:	8908	**Report Date:**	08/16/18

GLOSSARY

Acronyms

EDL	- Estimated Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The EDL includes any adjustments from dilutions, concentrations or moisture content, where applicable. The use of EDLs is specific to the analysis of PAHs using Solid-Phase Microextraction (SPME).
EMPC	- Estimated Maximum Possible Concentration: The concentration that results from the signal present at the retention time of an analyte when the ions meet all of the identification criteria except the ion abundance ratio criteria. An EMPC is a worst-case estimate of the concentration.
EPA	- Environmental Protection Agency.
LCS	- Laboratory Control Sample: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
LCSD	- Laboratory Control Sample Duplicate: Refer to LCS.
LFB	- Laboratory Fortified Blank: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
MDL	- Method Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The MDL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
MS	- Matrix Spike Sample: A sample prepared by adding a known mass of target analyte to a specified amount of matrix sample for which an independent estimate of target analyte concentration is available.
MSD	- Matrix Spike Sample Duplicate: Refer to MS.
NA	- Not Applicable.
NC	- Not Calculated: Term is utilized when one or more of the results utilized in the calculation are non-detect at the parameter's reporting unit.
NDPA/DPA	- N-Nitrosodiphenylamine/Diphenylamine.
NI	- Not Ignitable.
NP	- Non-Plastic: Term is utilized for the analysis of Atterberg Limits in soil.
RL	- Reporting Limit: The value at which an instrument can accurately measure an analyte at a specific concentration. The RL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
RPD	- Relative Percent Difference: The results from matrix and/or matrix spike duplicates are primarily designed to assess the precision of analytical results in a given matrix and are expressed as relative percent difference (RPD). Values which are less than five times the reporting limit for any individual parameter are evaluated by utilizing the absolute difference between the values; although the RPD value will be provided in the report.
SRM	- Standard Reference Material: A reference sample of a known or certified value that is of the same or similar matrix as the associated field samples.
STLP	- Semi-dynamic Tank Leaching Procedure per EPA Method 1315.
TEF	- Toxic Equivalency Factors: The values assigned to each dioxin and furan to evaluate their toxicity relative to 2,3,7,8-TCDD.
TEQ	- Toxic Equivalent: The measure of a sample¿s toxicity derived by multiplying each dioxin and furan by its corresponding TEF and then summing the resulting values.
TIC	- Tentatively Identified Compound: A compound that has been identified to be present and is not part of the target compound list (TCL) for the method and/or program. All TICs are qualitatively identified and reported as estimated concentrations.

Footnotes

1	- The reference for this analyte should be considered modified since this analyte is absent from the target analyte list of the original method.

Terms

Analytical Method: Both the document from which the method originates and the analytical reference method. (Example: EPA 8260B is shown as 1,8260B.) The codes for the reference method documents are provided in the References section of the Addendum.

Final pH: As it pertains to Sample Receipt & Container Information section of the report, Final pH reflects pH of container determined after adjustment at the laboratory, if applicable. If no adjustment required, value reflects Initial pH.

Frozen Date/Time: With respect to Volatile Organics in soil, Frozen Date/Time reflects the date/time at which associated Reagent Water-preserved vials were initially frozen. Note: If frozen date/time is beyond 48 hours from sample collection, value will be reflected in 'bold'.

Initial pH: As it pertains to Sample Receipt & Container Information section of the report, Initial pH reflects pH of container determined upon receipt, if applicable.

Total: With respect to Organic analyses, a 'Total' result is defined as the summation of results for individual isomers or Aroclors. If a 'Total' result is requested, the results of its individual components will also be reported. This is applicable to 'Total' results for methods 8260, 8081 and 8082.

Report Format: Data Usability Report

Project Name:	WAKEFIELD	**Lab Number:**	L1831652
Project Number:	8908	**Report Date:**	08/16/18

Data Qualifiers

A - Spectra identified as "Aldol Condensation Product".

B - The analyte was detected above the reporting limit in the associated method blank. Flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For MCP-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For DOD-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank AND the analyte was detected above one-half the reporting limit (or above the reporting limit for common lab contaminants) in the associated method blank. For NJ-Air-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte above the reporting limit. For NJ-related projects (excluding Air), flag only applies to associated field samples that have detectable concentrations of the analyte, which was detected above the reporting limit in the associated method blank or above five times the reporting limit for common lab contaminants (Phthalates, Acetone, Methylene Chloride, 2-Butanone).

C - Co-elution: The target analyte co-elutes with a known lab standard (i.e. surrogate, internal standards, etc.) for co-extracted analyses.

D - Concentration of analyte was quantified from diluted analysis. Flag only applies to field samples that have detectable concentrations of the analyte.

E - Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.

G - The concentration may be biased high due to matrix interferences (i.e, co-elution) with non-target compound(s). The result should be considered estimated.

H - The analysis of pH was performed beyond the regulatory-required holding time of 15 minutes from the time of sample collection.

I - The lower value for the two columns has been reported due to obvious interference.

M - Reporting Limit (RL) exceeds the MCP CAM Reporting Limit for this analyte.

NJ - Presumptive evidence of compound. This represents an estimated concentration for Tentatively Identified Compounds (TICs), where the identification is based on a mass spectral library search.

P - The RPD between the results for the two columns exceeds the method-specified criteria.

Q - The quality control sample exceeds the associated acceptance criteria. For DOD-related projects, LCS and/or Continuing Calibration Standard exceedences are also qualified on all associated sample results. Note: This flag is not applicable for matrix spike recoveries when the sample concentration is greater than 4x the spike added or for batch duplicate RPD when the sample concentrations are less than 5x the RL. (Metals only.)

R - Analytical results are from sample re-analysis.

RE - Analytical results are from sample re-extraction.

S - Analytical results are from modified screening analysis.

J - Estimated value. This represents an estimated concentration for Tentatively Identified Compounds (TICs).

ND - Not detected at the reporting limit (RL) for the sample.

Report Format: Data Usability Report

Project Name:	WAKEFIELD	**Lab Number:**	L1831652
Project Number:	8908	**Report Date:**	08/16/18

REFERENCES

19 Inductively Coupled Plasma Atomic Emission Spectrometric Method for Trace Element Analysis of Water and Wastes. Appendix C, Part 136, 40 CFR (Code of Federal Regulations). July 1, 1999 edition.

LIMITATION OF LIABILITIES

Alpha Analytical performs services with reasonable care and diligence normal to the analytical testing laboratory industry. In the event of an error, the sole and exclusive responsibility of Alpha Analytical shall be to re-perform the work at it's own expense. In no event shall Alpha Analytical be held liable for any incidental, consequential or special damages, including but not limited to, damages in any way connected with the use of, interpretation of, information or analysis provided by Alpha Analytical.

We strongly urge our clients to comply with EPA protocol regarding sample volume, preservation, cooling, containers, sampling procedures, holding time and splitting of samples in the field.

Certification Information

The following analytes are not included in our Primary NELAP Scope of Accreditation:

Westborough Facility
EPA 624: m/p-xylene, o-xylene
EPA 8260C: NPW: 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene, Azobenzene; SCM: Iodomethane (methyl iodide), Methyl methacrylate, 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene.
EPA 8270D: NPW: Dimethylnaphthalene,1,4-Diphenylhydrazine; SCM: Dimethylnaphthalene,1,4-Diphenylhydrazine.
EPA 300: DW: Bromide
EPA 6860: SCM: Perchlorate
EPA 9010: NPW and SCM: Amenable Cyanide Distillation
SM4500: NPW: Amenable Cyanide, Dissolved Oxygen; SCM: Total Phosphorus, TKN, NO2, NO3.

Mansfield Facility
SM 2540D: TSS
EPA 8082A: NPW: PCB: 1, 5, 31, 87,101, 110, 141, 151, 153, 180, 183, 187.
EPA TO-15: Halothane, 2,4,4-Trimethyl-2-pentene, 2,4,4-Trimethyl-1-pentene, Thiophene, 2-Methylthiophene, 3-Methylthiophene, 2-Ethylthiophene, 1,2,3-Trimethylbenzene, Indan, Indene, 1,2,4,5-Tetramethylbenzene, Benzothiophene, 1-Methylnaphthalene.
Biological Tissue Matrix: EPA 3050B

The following analytes are included in our Massachusetts DEP Scope of Accreditation

Westborough Facility:

Drinking Water
EPA 300.0: Chloride, Nitrate-N, Fluoride, Sulfate; **EPA 353.2**: Nitrate-N, Nitrite-N; **SM4500NO3-F**: Nitrate-N, Nitrite-N; **SM4500F-C, SM4500CN-CE, EPA 180.1, SM2130B, SM4500CI-D, SM2320B, SM2540C, SM4500H-B**
EPA 332: Perchlorate; **EPA 524.2:** THMs and VOCs; **EPA 504.1:** EDB, DBCP.
Microbiology: **SM9215B; SM9223-P/A, SM9223B-Colilert-QT,SM9222D**.

Non-Potable Water
SM4500H,B, EPA 120.1, SM2510B, SM2540C, SM2320B, SM4500CL-E, SM4500F-BC, SM4500NH3-BH: Ammonia-N and Kjeldahl-N, **EPA 350.1**: Ammonia-N, **LACHAT 10-107-06-1-B**: Ammonia-N, **EPA 351.1, SM4500NO3-F, EPA 353.2**: Nitrate-N**, EPA 351.1, SM4500P-E, SM4500P-B, E, SM4500SO4-E, SM5220D, EPA 410.4, SM5210B, SM5310C, SM4500CL-D, EPA 1664, EPA 420.1, SM4500-CN-CE, SM2540D.**
EPA 624: Volatile Halocarbons & Aromatics,
EPA 608: Chlordane, Toxaphene, Aldrin, alpha-BHC, beta-BHC, gamma-BHC, delta-BHC, Dieldrin, DDD, DDE, DDT, Endosulfan I, Endosulfan II, Endosulfan sulfate, Endrin, Endrin Aldehyde, Heptachlor, Heptachlor Epoxide, PCBs
EPA 625: SVOC (Acid/Base/Neutral Extractables), **EPA 600/4-81-045**: PCB-Oil.
Microbiology: **SM9223B-Colilert-QT; Enterolert-QT, SM9221E, SM9222D.**

Mansfield Facility:

Drinking Water
EPA 200.7: Al, Ba, Be, Cd, Cr, Cu, Mn, Ni, Na, Ag, Ca, Zn. **EPA 200.8:** Al, Sb, As, Ba, Be, Cd, Cr, Cu, Pb, Mn, Ni, Se, Ag, TL, Zn. **EPA 245.1** Hg.
EPA 522.

Non-Potable Water
EPA 200.7: Al, Sb, As, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Mo, Ni, K, Se, Ag, Na, Sr, TL, Ti, V, Zn.
EPA 200.8: Al, Sb, As, Be, Cd, Cr, Cu, Pb, Mn, Ni, Se, Ag, TL, Zn.
EPA 245.1 Hg.
SM2340B

For a complete listing of analytes and methods, please contact your Alpha Project Manager.

L1831652 KB 8/13/18

CHAIN OF CUSTODY

PAGE 1 OF 1

ALPHA

8 Walkup Drive, Westboro, MA 01581, Tel: 508-898-9220
320 Forbes Blvd, Mansfield, MA 02048, Tel: 508-822-9300

Date Rec'd in Lab: 07/31/18

ALPHA Job #: ~~L1829511~~

Client Information

Client: GeoInsight, Inc.
Address: 1 Monarch Dr. Suite 201
Littleton, MA 01460
Phone: 978-679-1600
Email: lcgulrich@geoinc.com
rcreynolds@geoinc.com

Additional Project Information:

Project Information

Project Name: Wakefield
Project Location: 356 Lowell St., Wakefield MA
Project #: 8908
Project Manager: Robert Reynolds
ALPHA Quote #:

Turn-Around Time

X Standard ☐ RUSH (only confirmed if pre-approved)
Date Due:

Report Information - Data Deliverables

X ADEx X EMAIL

Billing Information

☐ Same as Client info PO #:

Regulatory Requirements & Project Information Requirements

X Yes ☐ No MA MCP Analytical Methods ☐ Yes ☐ No CT RCP Analytical Methods
☐ Yes ☐ No Matrix Spike Required on this SDG? (Required for MCP Inorganics)
☐ Yes ☐ No GW1 Standards (Info Required for Metals & EPH with Targets)
☐ Yes ☐ No NPDES RGP
☐ Other State /Fed Program _____ Criteria _____

ALPHA Lab ID (Lab Use Only)	Sample ID	Collection Date	Collection Time	Sample Matrix	Sampler Initials	ANALYSIS: VOC: ☐ 8260 ☐ 624 ☐ 524.2	SVOC: ☐ ABN ☐ PAH	METALS: ☐ MCP 13 ☐ MCP 14 ☐ RCP 15	METALS: ☐ RCRA5 ☐ RCRA8 ☐ PP13	EPH: ☐ Ranges & Targets ☐ Ranges Only	VPH: ☐ Ranges & Targets ☐ Ranges Only	☐ PCB ☐ PEST	TPH: ☐ Quant Only ☐ Fingerprint	NPDES RGP Package	RGP Metals	Total Hardness	SAMPLE INFO: Filtration ☐ Field ☐ Lab to do; Preservation ☐ Lab to do	Sample Comments	TOTAL # BOTTLES
~~29511-01~~	MW-TP1	7/31/18	9:30	GW	LCG									X		X			21
-02	SW-1	1	11:45	W	LCG										X	X			1

Container Type: P= Plastic, A= Amber glass, V= Vial, G= Glass, B= Bacteria cup, C= Cube, O= Other, E= Encore, D= BOD Bottle

Preservative: A= None, B= HCl, C= HNO_3, D= H_2SO_4, E= NaOH, F= MeOH, G= $NaHSO_4$, H= $Na_2S_2O_3$, I= Ascorbic Acid, J= NH_4Cl, K= Zn Acetate, O= Other

Container Type		P	P
Preservative			

Relinquished By:	Date/Time	Received By:	Date/Time
[signature]	7/31/18 14:00	[signature] AAL	7/31/18 14:00
[signature] AAL	7-31-18 14:55	[signature]	7/31/18 14:55

All samples submitted are subject to Alpha's Terms and Conditions. See reverse side.

FORM NO: 01-01 (rev. 12-Mar-2012)

ATTACHMENT H

MADEP CORRESPONDENCE

Timothy W. Maus

From: Vakalopoulos, Catherine (DEP) <Catherine.Vakalopoulos@MassMail.State.MA.US>
Sent: Thursday, August 09, 2018 2:48 PM
To: Timothy W. Maus
Subject: RE: Request for Low-Flow 7Q10 and Dilution Factor Confirmation - EPA RGP NOI

Hi Timothy,
Yes, you are correct, no dilution factor or 7Q10 for this discharge. I used StreamStats further downstream near Tobey Lane and came up with a 7Q10 of 0.0158 cfs and let's say you had a design flow of 100 gpm, you'd still only get a DF of 1.07. This is too far downstream anyway so just use a DF of 1.

To assist you with the NOI, the discharge is to an unnamed stream/wetlands that flows to the Mill River. This part of the Mill River is identified as segment ID MA93-31 and is classified as Class B. To see the impairments, go to: https://www.mass.gov/files/documents/2016/08/sa/14list2_0.pdf and search for "MA93-31". There you will also see that there is one TMDL for fecal coliform. Also, this discharge will not be going to an Outstanding Resource Water (ORW).

If this site is not *currently* an MCP site then in addition to sending the NOI to EPA, you will also have to send it to me, as well as a transmittal form and a $500 fee (unless fee exempt like municipalities). The instructions are located here: https://www.mass.gov/how-to/wm-15-npdes-general-permit-notice-of-intent and feel free to contact me if you have any additional questions.

Cathy

Cathy Vakalopoulos, Massachusetts Department of Environmental Protection
1 Winter St., Boston, MA 02108, 617-348-4026

From: Timothy W. Maus [mailto:twmaus@geoinc.com]
Sent: Wednesday, August 08, 2018 9:02 AM
To: Vakalopoulos, Catherine (DEP)
Subject: Request for Low-Flow 7Q10 and Dilution Factor Confirmation - EPA RGP NOI

Good Morning Catherine,

Working on an NOI for coverage to discharge under the RGP and wanted to check on the 7Q10 value and dilution factor we plan to use. The project location is 356 Lowell Street in Wakefield, MA and the discharge point is located along Lowell Street at the wetlands/headwaters of the Mill River (segment ID MA93-31). I've attached maps showing the catch basin flow path and map showing the river flow path. Stream Stats did not have a 7Q10 listed for the discharge point or the downstream headwaters of Mill River (Stream Stat Reports for both locations attached). Can you confirm that based on this data a dilution factor of 1 and a 7Q10 of zero will be appropriate for the NOI. Thanks in advance for any assistance you can provide. If you have any questions or need any additional information, please do not hesitate to contact me.

Regards,

TIMOTHY W. MAUS, P.G.
Project Geologist / Office Health & Safety Manager
O. 978.679.1600 | C. 954.647.6631
One Monarch Drive, Suite 201, Littleton, MA 01460

GeoInsight, Inc.
Environmental Strategy and Engineering
Environmental | Geotechnical + Civil Engineering | Water Supply | EHS Compliance
Manchester, NH | Middletown, CT | Littleton, MA | York, ME
Blog | Facebook | LinkedIn | Twitter

Get The Latest: *GeoInsight News*

ATTACHMENT I

USEPA APPENDIX V DILUTION FACTOR AND WQBEL SPREADSHEET

APPENDIX I
DILUTION FACTOR AND WQBEL SPREADSHEET
NOURIA RETAIL FUELING STATION
356 LOWELL STREET
WAKEFIELD, MASSACHUSETTS

Enter number values in green boxes below

Enter values in the units specified

↓

0	Q_R = Enter upstream flow in **MGD**
0.144	Q_P = Enter discharge flow in **MGD**
0	Downstream 7Q10

Enter a dilution factor, if other than zero

↓

1

Enter values in the units specified

↓

124	C_d = Enter influent hardness in **mg/L** $CaCO_3$
120	C_s = Enter receiving water hardness in **mg/L** $CaCO_3$

Enter **receiving water** concentrations in the units specified

↓

8.1	pH in **Standard Units**
24.3	Temperature in **°C**
0.097	Ammonia in **mg/L**
120	Hardness in **mg/L** $CaCO_3$
0	Salinity in **ppt**
0	Antimony in **µg/L**
3.4	Arsenic in **µg/L**
0	Cadmium in **µg/L**
0	Chromium III in **µg/L**
0	Chromium VI in **µg/L**
0	Copper in **µg/L**
3,120	Iron in **µg/L**
0	Lead in **µg/L**
0	Mercury in **µg/L**
2.01	Nickel in **µg/L**
0	Selenium in **µg/L**
0	Silver in **µg/L**
0	Zinc in **µg/L**

Notes:

Freshwater: Q_R equal to the 7Q10; enter alternate Q_R if approved by the State; enter 0 if no dilution factor approved
Saltwater (estuarine and marine): enter Q_R if approved by the State; enter 0 if no entry
Discharge flow is equal to the design flow or 1 MGD, whichever is less
Only if approved by State as the entry for Q_R; leave 0 if no entry

Saltwater (estuarine and marine): only if approved by the State
Leave 0 if no entry

Freshwater only

pH, temperature, and ammonia required for all discharges
Hardness required for freshwater
Salinity required for saltwater (estuarine and marine)
Metals required for all discharges if present and if dilution factor is > 1
Enter 0 if non-detect or testing not required

APPENDIX I
DILUTION FACTOR AND WQBEL SPREADSHEET
NOURIA RETAIL FUELING STATION
356 LOWELL STREET
WAKEFIELD, MASSACHUSETTS

Enter **influent** concentrations in the units specified

if >1 sample, enter maximum
if >10 samples, may enter 95th percentile
Enter 0 if non-detect or testing not required

↓	
200	TRC in **µg/L**
0.713	Ammonia in **mg/L**
0	Antimony in **µg/L**
0	Arsenic in **µg/L**
0	Cadmium in **µg/L**
0	Chromium III in **µg/L**
0	Chromium VI in **µg/L**
1.52	Copper in **µg/L**
113,000	Iron in **µg/L**
0	Lead in **µg/L**
0	Mercury in **µg/L**
0	Nickel in **µg/L**
0	Selenium in **µg/L**
0	Silver in **µg/L**
204.8	Zinc in **µg/L**
0	Cyanide in **µg/L**
0	Phenol in **µg/L**
0	Carbon Tetrachloride in **µg/L**
0	Tetrachloroethylene in **µg/L**
0	Total Phthalates in **µg/L**
0	Diethylhexylphthalate in **µg/L**
0	Benzo(a)anthracene in **µg/L**
0	Benzo(a)pyrene in **µg/L**
0	Benzo(b)fluoranthene in **µg/L**
0	Benzo(k)fluoranthene in **µg/L**
0	Chrysene in **µg/L**
0	Dibenzo(a,h)anthracene in **µg/L**
0	Indeno(1,2,3-cd)pyrene in **µg/L**
0	Methyl-tert butyl ether in **µg/L**

ATTACHMENT J

BWSC PHASE I SITE ASSESSMENT MAP

MassDEP - Bureau of Waste Site Cleanup

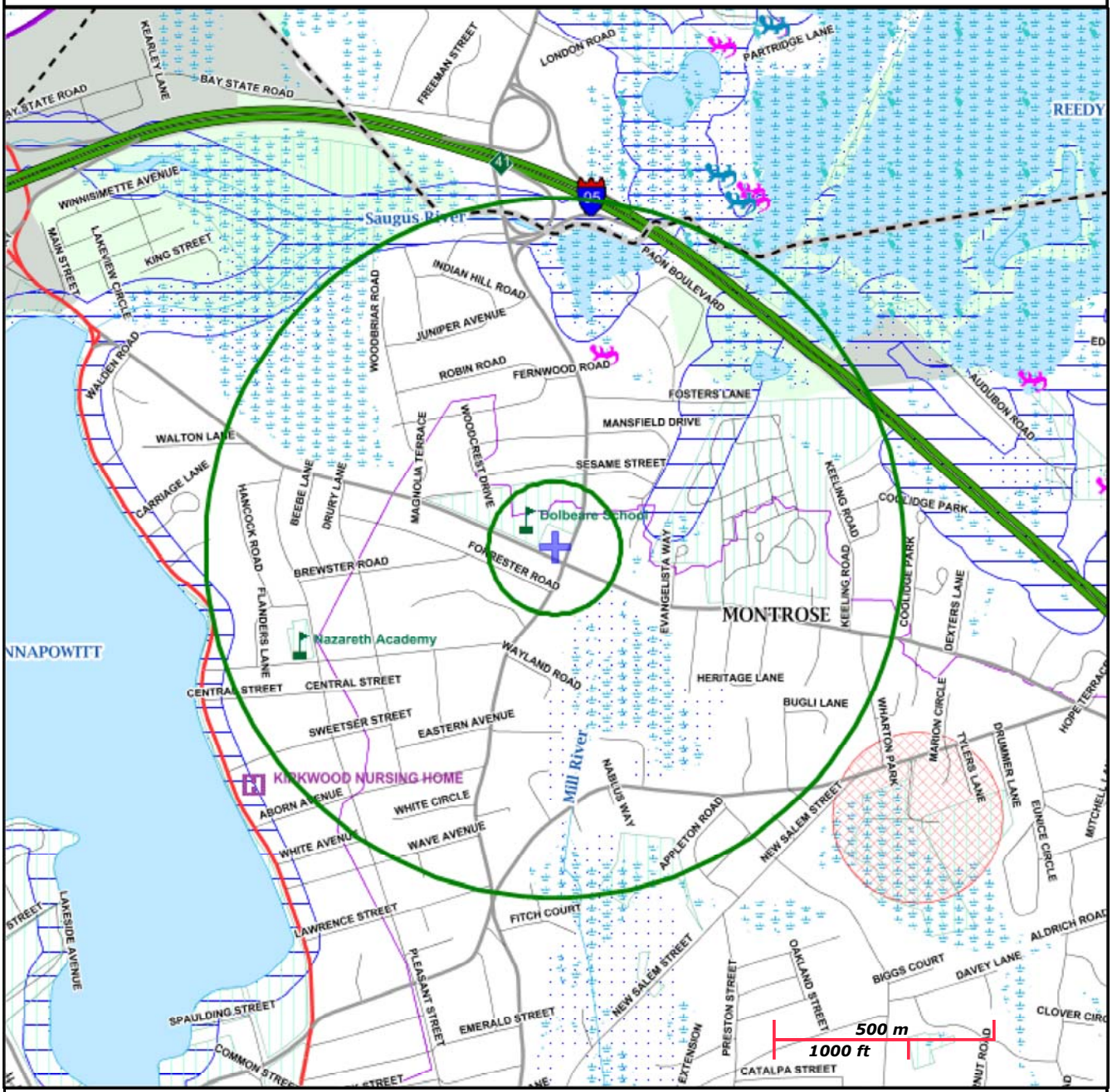
Phase 1 Site Assessment Map: 500 feet & 0.5 Mile Radii

Site Information:
NOURIA RETAIL FUELING STATION
356 LOWELL STREET WAKEFIELD, MA

NAD83 UTM Meters:
4709348mN , 330424mE (Zone: 19)
August 10, 2018

The information shown is the best available at the date of printing. However, it may be incomplete. The responsible party and LSP are ultimately responsible for ascertaining the true conditions surrounding the site. Metadata for data layers shown on this map can be found at: http://www.mass.gov/mgis/.

MassDEP
Commonwealth of Massachusetts
Department of Environmental Protection



Roads: Limited Access, Divided, Other Hwy, Major Road, Minor Road, Track, Trail
Boundaries: Town, County, DEP Region; Train; Powerline; Pipeline; Aqueduct
Basins: Major,PWS; Streams: Perennial, Intermittent, Man Made Shore, Dam
Aquifers: Medium Yield, High Yield, EPA Sole Source
Non Potential Drinking Water Source Area: Medium, High (Yield)
PWS Protection Areas: Zone II, IWPA, Zone A
Hydrography: Open Water, PWS Reservoir, Tidal Flat
Wetlands: Freshwater, Saltwater, Cranberry Bog
FEMA 100yr Floodplain; Protected Open Space; ACEC
Est. Rare Wetland Wildlife Hab; Vernal Pool: Cert., Potential
Solid Waste Landfill; PWS: Com.GW,SW, Emerg.,Non-Com.