



April 11, 2019

Ms. Shauna Little
Environmental Protection Agency
Office of Environmental Stewardship (OES)
Water Technical Unit
5 Post Office Square, Suite 100 (OES4-SMR)
Boston, MA 02109-3912

Re: Green Line Extension Project – Washington and Tufts Streets
Notice of Intent for Coverage under the
Remediation General Permit for Massachusetts
Discharge of Treated Groundwater to Millers River, Cambridge, Massachusetts

Dear Ms. Little:

On behalf of the Massachusetts Bay Transportation Authority (MBTA), GLX Constructors (GLXC), has prepared the attached National Pollutant Discharge Elimination System (NPDES) Notice of Intent (NOI) (Attachment A) for coverage under the Remediation General Permit (RGP) for a segment of the MBTA Green Line Extension (GLX) Project in Somerville, Massachusetts (the Project). This submittal is a request to discharge treated groundwater generated during Project construction activities in the vicinity of Washington and Tufts Streets. Additional NOIs for the GLX project will be submitted under separate cover for the other sections of the Project where treated groundwater is proposed to be discharged to other surface water bodies.

Site Plans and a Massachusetts Department of Environmental Protection (MassDEP) Priority Resources Map are provided as Figures 1 and 2 in Attachment B. Excavation dewatering and discharge of treated groundwater are expected to begin in April 2019 and end in April 2021.

Project Background

The GLX Project will extend the existing Green Line Light Rail System on two new branches from the proposed relocated Lechmere Station in Cambridge to Union Square Station in Somerville and College Avenue Station in Medford. The new Medford Branch will extend along the existing Lowell Branch Commuter Railroad Right-of Way (ROW) into Medford. The Union Square Branch will extend along the existing Fitchburg Branch Commuter Railroad ROW into Somerville. The work of the GLX Project also includes construction of retaining walls and noise walls along the ROWs; relocation of existing railroad tracks and utilities; construction of new track with sections on both existing viaducts and at grade; installation of new or replacement utilities, including sewer, water, and drain; installation of new traction power, overhead catenary, and signal systems; the replacement or reconstruction of seven roadway bridges and three railroad bridges; and the construction of seven new stations along the proposed route as well as a Vehicle Maintenance Facility and associated parking to support transportation operations.

Massachusetts Contingency Plan Applicability

The projected dewatering areas will include one existing Massachusetts Contingency Plan (MCP; 310 CMR 40.0000) Disposal Site. Groundwater in the vicinity of Washington Street in Somerville has been impacted by a release of chlorinated volatile organic compounds (CVOCs) from the property at 50 Tufts Street owned by UniFirst Corporation. Release Tracking Number 3-23246 has been assigned to this release. The predominant contaminants present in groundwater include tetrachloroethylene (PCE), trichloroethylene

(TCE), 1,1,1-trichloroethane (TCA), and 1,1-dichloroethylene (DCA). Other CVOCs as well as non-chlorinated VOCs are also present in the groundwater.

Groundwater Characterization

Groundwater samples were collected from monitoring wells KE-210 and MW-18 in May and August 2018, respectively via low flow sampling methodology. The groundwater samples were submitted to Alpha Analytical Laboratory in Westborough, Massachusetts (Alpha) and were analyzed for RGP parameters and several additional components (e.g. MassDEP Extractable Petroleum Hydrocarbons and pesticides via EPA 608) to simultaneously meet the requirements of a Massachusetts Water Resources Authority Construction Dewatering Permit Application should one be necessary. The monitoring wells are located in the proposed area of dewatering associated with the construction of new catch basins, underdrains, and manholes.

Summaries of groundwater sampling results are included as Table 1 and the supporting laboratory analytical reports are provided in Attachment C and Attachment D, respectively. Laboratory analytical results were compared to the RGP Technology Based Effluent Limitations (TBELs) and Water Quality Based Effluent Limitations (WQBELs). The WQBELs were calculated in accordance with Appendix V of the RGP, for sites in Massachusetts discharging to freshwater surface water bodies.

Constituents of concern identified in the groundwater samples include total suspended solids, VOCs, high pH, and metals (arsenic, copper, iron, lead, nickel, and selenium). Bis(2-ethylhexyl) phthalate was not detected at well KE-210; however, the laboratory method detection limit did not resolve to the Minimum Detection Levels in the RGP. The method detection limit is below the applicable TBEL standard. Elevated method detection limits were encountered for the results of the groundwater sample collected from monitoring well KE-210 because a dilution was performed due to the presence of elevated CVOCs. Post-treatment analytical results are not likely to require a dilution so the minimum method detection levels for treated effluent are expected to be achieved during operations.

Receiving Water Classification

The Millers River (ID: MA72-31) is listed on the Massachusetts 303(d) list as an impaired water body for the following constituents:

- Foam/Flocs/Scum/Oil Slicks;
- Other (Unspecified Metals);
- Petroleum Hydrocarbons;
- Polychlorinated biphenyls;
- Polycyclic Aromatic Hydrocarbons (PAHs);
- Sedimentation/Siltation;
- Taste and Odor; and
- Turbidity.

On May 24, 2018, TRC personnel collected a surface water sample from the Millers River outfall and submitted it for laboratory analysis of RGP metals, ammonia, and hardness (pH and temperature were measured in the field). Surface water sampling results are summarized in Table 2 in Attachment C and the supporting laboratory analytical report is included in Attachment D.

MassDEP indicated that the Millers River has not been granted a dilution factor. Correspondence with MassDEP concerning this topic is included in Attachment E.

Proposed Treatment System

A Design Flow treatment system discharge rate of 100 gallons per minute (gpm) (i.e. 0.144 million gallons per day) was used to evaluate the applicable RGP discharge standards. Source water from the construction dewatering system will initially be pumped to a 21,000-gallon frac tank at head of the system for pH adjustment and chemical-aided settling of total suspended solids (TSS) prior to treatment to reduce metals and organic compound concentrations. Groundwater analyses indicate that the pH adjustment may be needed to lower the pH of the treated effluent. Sulfuric acid will be used, as needed, to lower the pH within discharge requirements (6.5 to 8.3). Dosing of sulfuric acid will be automatically controlled using a meter pump, pH controller and probe. The sulfuric acid will be stored in a 55-gallon drum within secondary containment. Dosing will depend on the pH of the influent water, the flow rate, and if the system operates continuously or intermittently. Assuming the influent pH is 10 and the system operates at 100 gpm continuously, the sulfuric acid will be dosed up to 0.019 milligram per liter (mg/L) (equivalent to 1.5 gallons per day). GLXC chose the flow rate of 100 gallons per minute was chosen based on the system successfully utilized in the previous phase of the GLX Project and a discussion with that contractor.

The chemical-aided settling system will utilize LRT-E-50 coagulant and LRT-823 series flocculant. The coagulant will be injected into the influent stream prior to entering the frac tank for rapid mixing while the flocculant will be injected directly into the tank for slow mixing. The system will include two chemical feed metering pumps, an in-line mixer, and two 55-gallon drums stored within secondary containment. Assuming the system operates at 100 gpm continuously, the LRT E-50 coagulant will be dosed up to 20 mg/L (equivalent to 2 gallons per day) and the LRT-823 series flocculant will be dosed up to 50 mg/L (equivalent to 5 gallons per day).

Part F of the RGP NOI requires that chemical additives be identified if applied to the effluent prior to discharge. To satisfy the confirmation requirements of RGP Part 2.5.3.d.ii:

1. The addition of pH conditioners, flocculant and coagulant will not add any pollutants in concentrations which exceed permit effluent limitations;
2. The use of these chemicals will not result in the exceedance of any applicable water quality standard; and
3. These chemicals will not add any pollutants that would justify the application of permit conditions that are different from or absent in this permit.

Safety data sheets for chemical used on-site and specifications on pH adjustment equipment are attached in Attachment F. Granular activated carbon/clay filters and ion exchange resin will be used to remove organic compounds and metals, respectively. A proposed groundwater treatment system schematic is provided as Figure 3 in Attachment B. Based on effluent monitoring results, the treatment system or flow rate will be modified to comply with the effluent limits.

GLXC anticipates the dewatering system will be required to operate periodically from April 2019 through April 2021. Treated groundwater will be directed to the proposed MBTA Washington Street Pump Station which is located on private property at the intersection of Washington and New Washington Streets. The discharge from this pump station flows along the MBTA ROW to the proposed Red Bridge Pump Station and then to the Millers River (see Figure 4A). If the proposed Washington Street and Red Bridge Pump Stations are not online prior to the initiation of this work, then the water will be discharged through the old Washington Street Pump Station which is currently in operation (see Figure 4B). If the new pump stations are online during this work, dewatered groundwater will be discharged into a stormwater drainage system managed by the MBTA via on-site catch basins. If the new pump stations are not online the water will be conveyed by the City of Somerville stormwater system. Both drainage systems eventually discharge to the Millers River.

A Work Plan for the groundwater extraction and treatment systems satisfying the requirements of Section 2.5 of the RGP will be available at the Site prior to initiating dewatering activities.

Owner and Operator

Owner

GLX Constructors
200 Inner Belt
Somerville, Massachusetts

Operator

Strategic Environmental Services, Inc.
362 Putnam Hill Road
Sutton, Massachusetts

Notice of Intent

Preparation of this NOI has included a review of the literature pertaining to Areas of Critical Environmental Concern (ACECs), the Endangered Species Act, and the National Historic Preservation Act, as documented below:

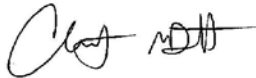
- Review of a Massachusetts Geographic Information Systems MassDEP Priority Resources Map, Figure 2 in Attachment B, shows the Site is not within an ACEC.
- According to the United States Fish and Wildlife Service Information, Planning and Conservation (USFWS) tool, there are no critical habitats at the Site. USFWS confirmed there are no critical habitats in the area and confirmed permit eligibility meets "Criterion A" (Attachment G).
- Additionally, according to the MassDEP Priority Resources Map, no Natural Heritage & Endangered Species Program Priority Habitats for Rare Species or Estimated Habitats for Rare Wildlife were present within half a mile downstream of the discharge location. Therefore, permit eligibility meets "Criterion A."
- This work will not affect historical properties that are listed by the United States Park Service or Massachusetts Cultural Resources. Cultural resources in the vicinity of the Site are listed in Attachment H.

The proposed treatment system has been designed to reduce contaminants of concern below the applicable effluent limits. Effluent compliance monitoring will be conducted in compliance with the RGP. Additionally, the flow rate, pH, and temperature levels will be monitored in the field and recorded.

Your assistance in processing this application is greatly appreciated. If you have any questions or would like additional information please feel free to contact me at (617) 350-3406 or via email at CMcDermott@TRCSolutions.com.

Sincerely,

TRC Environmental Corporation



Christopher McDermott
Office Practice Leader

cc: Eileen London, GLX Constructors
Greg Mischel, Annie Cornell, Samantha Slater, Jamie Stapleton - TRC

Attachments:

Attachment A – RGP NOI Form and Calculation Spreadsheet

Attachment B – Figures

Figures 1A & 1B - Site Plans

Figure 2 - MassDEP Priority Resources Map

Figure 3 - Generalized Treatment System Schematic

Figures 4A & 4B – GLX RGP Discharge Paths

Attachment C – Tables

Table 1 - Summary of Analytical Results for Groundwater Samples – May and August 2018

Table 2 - Summary of Analytical Results of Surface Water Samples – May 2018

Attachment D – Laboratory Analytical Reports

Attachment E – Correspondence with MassDEP regarding the Millers River

Attachment F – SDS and pH Adjustment Equipment Specifications

Attachment G – Letter from US Fish and Wildlife Service

Attachment H – Massachusetts Cultural Resources Database Search Results

ATTACHMENT A
NOI FORM AND CALCULATION SPREADSHEET

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

A. General site information:

<p>1. Name of site: Green Line Extension Project at Washington Street and the MBTA Right of Way near the MBTA Railroad Bridge</p>	<p>Site address: Washington Street and the MBTA Right of Way near the MBTA Railroad Bridge</p> <p>Street:</p>		
	<p>City: Somerville</p>	<p>State: MA</p>	<p>Zip: 02145</p>
<p>2. Site owner Massachusetts Bay Transportation Authority and City of Somerville</p> <p>Owner is (check one): <input type="checkbox"/> Federal <input checked="" type="checkbox"/> State/Tribal <input type="checkbox"/> Private <input type="checkbox"/> Other; if so, specify:</p>	<p>Contact Person: Eileen London</p>		
	<p>Telephone: 617-684-3153</p>	<p>Email: Eileen.London@glxconstruct.com</p>	
	<p>Mailing address: 200 Inner Belt Drive</p> <p>Street:</p>		
	<p>City: Somerville</p>	<p>State: MA</p>	<p>Zip: 02143</p>
<p>3. Site operator, if different than owner Strategic Environmental Services, Inc.</p>	<p>Contact Person: Chris Glod</p>		
	<p>Telephone: 508-757-7782</p>	<p>Email: cglod@strategic-es.com</p>	
	<p>Mailing address: 362 Putnam Hill Road</p> <p>Street:</p>		
	<p>City: Sutton</p>	<p>State: MA</p>	<p>Zip: 01590</p>
<p>4. NPDES permit number assigned by EPA:</p> <p>NPDES permit is (check all that apply): <input checked="" type="checkbox"/> RGP <input type="checkbox"/> DGP <input type="checkbox"/> CGP <input type="checkbox"/> MSGP <input type="checkbox"/> Individual NPDES permit <input type="checkbox"/> Other; if so, specify:</p>	<p>5. Other regulatory program(s) that apply to the site (check all that apply):</p> <p><input checked="" type="checkbox"/> MA Chapter 21e; list RTN(s): 3-28231 3-23246</p> <p><input type="checkbox"/> NH Groundwater Management Permit or Groundwater Release Detection Permit:</p> <p><input type="checkbox"/> CERCLA <input type="checkbox"/> UIC Program <input type="checkbox"/> POTW Pretreatment <input type="checkbox"/> CWA Section 404</p>		

B. Receiving water information:

1. Name of receiving water(s): Millers River	Waterbody identification of receiving water(s): MA72-31	Classification of receiving water(s): B
Receiving water is (check any that apply): <input type="checkbox"/> Outstanding Resource Water <input type="checkbox"/> Ocean Sanctuary <input type="checkbox"/> territorial sea <input type="checkbox"/> Wild and Scenic River		
2. Has the operator attached a location map in accordance with the instructions in B, above? (check one): <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Are sensitive receptors present near the site? (check one): <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If yes, specify:		
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.		
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.	0	
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.	0	
6. Has the operator received confirmation from the appropriate State for the 7Q10 and dilution factor indicated? (check one): <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No If yes, indicate date confirmation received: February 27, 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): <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		

C. Source water information:

1. Source water(s) is (check any that apply):			
<input checked="" type="checkbox"/> 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): <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> 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): <input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> The receiving water <input type="checkbox"/> A surface water other than the receiving water; if so, indicate waterbody:	<input type="checkbox"/> Potable water; if so, indicate municipality or origin: <input type="checkbox"/> Other; if so, specify:

2. Source water contaminants: VOCs, metals, high pH, TSS	
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): <input type="checkbox"/> Yes <input checked="" type="checkbox"/> 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): <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
3. Has the source water been previously chlorinated or otherwise contains residual chlorine? (check one): <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	

D. Discharge information

1.The discharge(s) is a(n) (check any that apply): <input type="checkbox"/> Existing discharge <input checked="" type="checkbox"/> New discharge <input type="checkbox"/> New source	
Outfall(s): Millers River	Outfall location(s): (Latitude, Longitude) 42.371196, -71.066076
Discharges enter the receiving water(s) via (check any that apply): <input type="checkbox"/> Direct discharge to the receiving water <input checked="" type="checkbox"/> Indirect discharge, if so, specify: Proposed Washington Street/Red Bridge Pump Stations to Millers River. If not online then existing Washington Street Pump Station to Millers River. <input type="checkbox"/> A private storm sewer system <input checked="" type="checkbox"/> 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): <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Has the operator has received permission from the owner to use such system for discharges? (check one): <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No, if so, explain, with an estimated timeframe for obtaining permission: Has the operator attached a summary of any additional requirements the owner of this system has specified? (check one): <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
Provide the expected start and end dates of discharge(s) (month/year): April 2019 - April 2021	
Indicate if the discharge is expected to occur over a duration of: <input type="checkbox"/> less than 12 months <input checked="" type="checkbox"/> 12 months or more <input type="checkbox"/> is an emergency discharge	
Has the operator attached a site plan in accordance with the instructions in D, above? (check one): <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	

2. Activity Category: (check all that apply)	3. Contamination Type Category: (check all that apply)	
<input type="checkbox"/> I – Petroleum-Related Site Remediation <input type="checkbox"/> II – Non-Petroleum-Related Site Remediation <input checked="" type="checkbox"/> III – Contaminated Site Dewatering <input type="checkbox"/> IV – Dewatering of Pipelines and Tanks <input type="checkbox"/> V – Aquifer Pump Testing <input type="checkbox"/> VI – Well Development/Rehabilitation <input type="checkbox"/> VII – Collection Structure Dewatering/Remediation <input type="checkbox"/> VIII – Dredge-Related Dewatering	<p style="text-align: center;">a. If Activity Category I or II: (check all that apply)</p> <input type="checkbox"/> A. Inorganics <input type="checkbox"/> B. Non-Halogenated Volatile Organic Compounds <input type="checkbox"/> C. Halogenated Volatile Organic Compounds <input type="checkbox"/> D. Non-Halogenated Semi-Volatile Organic Compounds <input type="checkbox"/> E. Halogenated Semi-Volatile Organic Compounds <input type="checkbox"/> F. Fuels Parameters	
	<p style="text-align: center;">b. If Activity Category III, IV, V, VI, VII or VIII: (check either G or H)</p>	
	<input checked="" type="checkbox"/> G. Sites with Known Contamination	<input type="checkbox"/> H. Sites with Unknown Contamination
	<p>c. If Category III-G, IV-G, V-G, VI-G, VII-G or VIII-G: (check all that apply)</p> <input checked="" type="checkbox"/> A. Inorganics <input type="checkbox"/> B. Non-Halogenated Volatile Organic Compounds <input checked="" type="checkbox"/> C. Halogenated Volatile Organic Compounds <input type="checkbox"/> D. Non-Halogenated Semi-Volatile Organic Compounds <input type="checkbox"/> E. Halogenated Semi-Volatile Organic Compounds <input type="checkbox"/> F. Fuels Parameters	<p>d. If Category III-H, IV-H, V-H, VI-H, VII-H or VIII-H Contamination Type Categories A through F apply</p>

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		✓	2	4500NH3-	0.150	3,850	2,151	Report mg/L	---
Chloride	✓		2	300.0	12,500	502,000	422,500	Report µg/l	---
Total Residual Chlorine	✓		2	4500CL-D	20	0	0	0.2 mg/L	11
Total Suspended Solids		✓	2	2540D	20,000	2,200,000	1,750,000	30 mg/L	
Antimony	✓		2	200.8	4	0	0	206 µg/L	640
Arsenic		✓	2	200.8	1	30.36	20.48	104 µg/L	10
Cadmium		✓	2	200.8	0.2	0.59	0.5	10.2 µg/L	0.7319
Chromium III		✓	2	200.8	10	215	127.5	323 µg/L	258.8
Chromium VI	✓		2	200.8	10	0	0	323 µg/L	11.4
Copper		✓	2	200.8	1	93.77	77.72	242 µg/L	29.4
Iron		✓	2	200.7	50	68,000	56,300	5,000 µg/L	1,000
Lead		✓	2	200.8	1	76.32	55.60	160 µg/L	17.58
Mercury	✓		2	245.1	0.2	0	0	0.739 µg/L	0.91
Nickel		✓	2	200.8	2	92.22	60.73	1,450 µg/L	162.5
Selenium		✓	2	200.8	5	20.98	10.49	235.8 µg/L	5.0
Silver		✓	2	200.8	0.4	0.45	0.225	35.1 µg/L	38.1
Zinc		✓	2	200.8	10	208.7	1663.7	420 µg/L	373.8
Cyanide	✓		2	4500CN-C	5	0	0	178 mg/L	5.2
B. Non-Halogenated VOCs									
Total BTEX	✓		2	8260C	25	0	0	100 µg/L	---
Benzene	✓		2	8260C	25	0	0	5.0 µg/L	---
1,4 Dioxane	✓		2	8260CSIM	150	0	0	200 µg/L	---
Acetone	✓		2	8260C	250	0	0	7.97 mg/L	---
Phenol	✓		2	625.1	5	0	0	1,080 µg/L	300

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	✓		2	8260C/624	25	ND (25)	0	4.4 µg/L	1.6
1,2 Dichlorobenzene	✓		2	8260C/624	120	ND (120)	0	600 µg/L	---
1,3 Dichlorobenzene	✓		2	8260C/624	120	ND (120)	0	320 µg/L	---
1,4 Dichlorobenzene	✓		2	8260C/624	120	ND (120)	0	5.0 µg/L	---
Total dichlorobenzene	✓		2	8260C/624	120	ND (120)	0	763 µg/L in NH	---
1,1 Dichloroethane		✓	2	8260C/624	25	360	180	70 µg/L	---
1,2 Dichloroethane	✓		2	8260C/624	25	ND (25)	0	5.0 µg/L	---
1,1 Dichloroethylene		✓	2	8260C/624	25	480	240	3.2 µg/L	---
Ethylene Dibromide	✓		2	504.1	0.503	ND (0.503)	0	0.05 µg/L	---
Methylene Chloride	✓		2	8260C/624	150	ND (150)	0	4.6 µg/L	---
1,1,1 Trichloroethane		✓	2	8260C/624	25	390	195	200 µg/L	---
1,1,2 Trichloroethane	✓		2	8260C/624	38	0	0	5.0 µg/L	---
Trichloroethylene		✓	2	8260C/624	25	990	495	5.0 µg/L	---
Tetrachloroethylene		✓	2	8260C/624	25	7,400	3700	5.0 µg/L	3.3
cis-1,2 Dichloroethylene	✓		2	8260C/624	25	0	0	70 µg/L	---
Vinyl Chloride	✓		2	8260C/624	50	0	0	2.0 µg/L	---
D. Non-Halogenated SVOCs									
Total Phthalates	✓		2	625/8270D	5	0	0	190 µg/L	
Diethylhexyl phthalate	✓		2	625/8270D	3	0	0	101 µg/L	2.2
Total Group I PAHs	✓		2	625/8270D	0.10	0	0	1.0 µg/L	---
Benzo(a)anthracene	✓		2	625/8270D	0.10	0	0	As Total PAHs	0.0038
Benzo(a)pyrene	✓		2	625/8270D	0.10	0	0		0.0038
Benzo(b)fluoranthene	✓		2	625/8270D	0.10	0	0		0.0038
Benzo(k)fluoranthene	✓		2	625/8270D	0.10	0	0		0.0038
Chrysene	✓		2	625/8270D	0.10	0	0		0.0038
Dibenzo(a,h)anthracene	✓		2	625/8270D	0.10	0	0		0.0038
Indeno(1,2,3-cd)pyrene	✓		2	625/8270D	0.10	0	0		0.0038

E. Treatment system information

<p>1. Indicate the type(s) of treatment that will be applied to effluent prior to discharge: (check all that apply)</p> <p><input type="checkbox"/> Adsorption/Absorption <input type="checkbox"/> Advanced Oxidation Processes <input type="checkbox"/> Air Stripping <input checked="" type="checkbox"/> Granulated Activated Carbon (“GAC”)/Liquid Phase Carbon Adsorption <input checked="" type="checkbox"/> Ion Exchange <input checked="" type="checkbox"/> Precipitation/Coagulation/Flocculation <input checked="" type="checkbox"/> Separation/Filtration <input type="checkbox"/> Other; if so, specify:</p>	
<p>2. Provide a written description of all treatment system(s) or processes that will be applied to the effluent prior to discharge. Fractionation and/or weir tank, bag filter, pH adjustment, liquid phase GAC, and Ion Exchange Resin</p> <p>Identify each major treatment component (check any that apply): <input checked="" type="checkbox"/> Fractionation tanks <input type="checkbox"/> Equalization tank <input type="checkbox"/> Oil/water separator <input type="checkbox"/> Mechanical filter <input checked="" type="checkbox"/> Media filter <input type="checkbox"/> Chemical feed tank <input type="checkbox"/> Air stripping unit <input checked="" type="checkbox"/> Bag filter <input type="checkbox"/> Other; if so, specify:</p> <p>Indicate if either of the following will occur (check any that apply): <input type="checkbox"/> Chlorination <input type="checkbox"/> De-chlorination</p>	
<p>3. Provide the design flow capacity in gallons per minute (gpm) of the most limiting component. Indicate the most limiting component: Ion Exchange Resin Is use of a flow meter feasible? (check one): <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No, if so, provide justification:</p>	100
<p>Provide the proposed maximum effluent flow in gpm.</p>	100
<p>Provide the average effluent flow in gpm.</p>	50
<p>If Activity Category IV applies, indicate the estimated total volume of water that will be discharged:</p>	
<p>4. Has the operator attached a schematic of flow in accordance with the instructions in E, above? (check one): <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No</p>	

F. Chemical and additive information

<p>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)</p> <p><input type="checkbox"/> Algacides/biocides <input type="checkbox"/> Antifoams <input checked="" type="checkbox"/> Coagulants <input type="checkbox"/> Corrosion/scale inhibitors <input type="checkbox"/> Disinfectants <input checked="" type="checkbox"/> Flocculants <input type="checkbox"/> Neutralizing agents <input type="checkbox"/> Oxidants <input type="checkbox"/> Oxygen <input type="checkbox"/> scavengers <input checked="" type="checkbox"/> pH conditioners <input type="checkbox"/> Bioremedial agents, including microbes <input type="checkbox"/> Chlorine or chemicals containing chlorine <input type="checkbox"/> Other; if so, specify:</p>
<p>2. Provide the following information for each chemical/additive, using attachments, if necessary:</p> <ul style="list-style-type: none">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; andf. If available, the vendor's reported aquatic toxicity (NOAEL and/or LC50 in percent for aquatic organism(s)).
<p>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): <input checked="" type="checkbox"/> Yes <input type="checkbox"/> 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): <input type="checkbox"/> Yes <input type="checkbox"/> No</p>

G. Endangered Species Act eligibility determination

<p>1. Indicate under which criterion the discharge(s) is eligible for coverage under this general permit:</p> <ul style="list-style-type: none"><input checked="" type="checkbox"/> 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”.<input type="checkbox"/> 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): <input type="checkbox"/> Yes <input type="checkbox"/> No; if no, is consultation underway? (check one): <input type="checkbox"/> Yes <input type="checkbox"/> No<input type="checkbox"/> 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) <input type="checkbox"/> the operator <input type="checkbox"/> EPA <input type="checkbox"/> 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 developed and 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: *Eileen London*

Date: 04/11/2019

Print Name and Title: Eileen London - Environmental Manager

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



0

Enter values in the units specified



383	C_d = Enter influent hardness in mg/L CaCO_3
125	C_s = Enter receiving water hardness in mg/L CaCO_3

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



7.67	pH in Standard Units
16.96	Temperature in °C
0.296	Ammonia in mg/L
125	Hardness in mg/L CaCO_3
	Salinity in ppt
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
3.65	Copper in µg/L
709	Iron in µg/L
1.7	Lead in µg/L
0	Mercury in µg/L
0	Nickel in µg/L
0	Selenium in µg/L
0	Silver in µg/L
15.23	Zinc in µg/L

Enter **influent** concentrations in the units specified

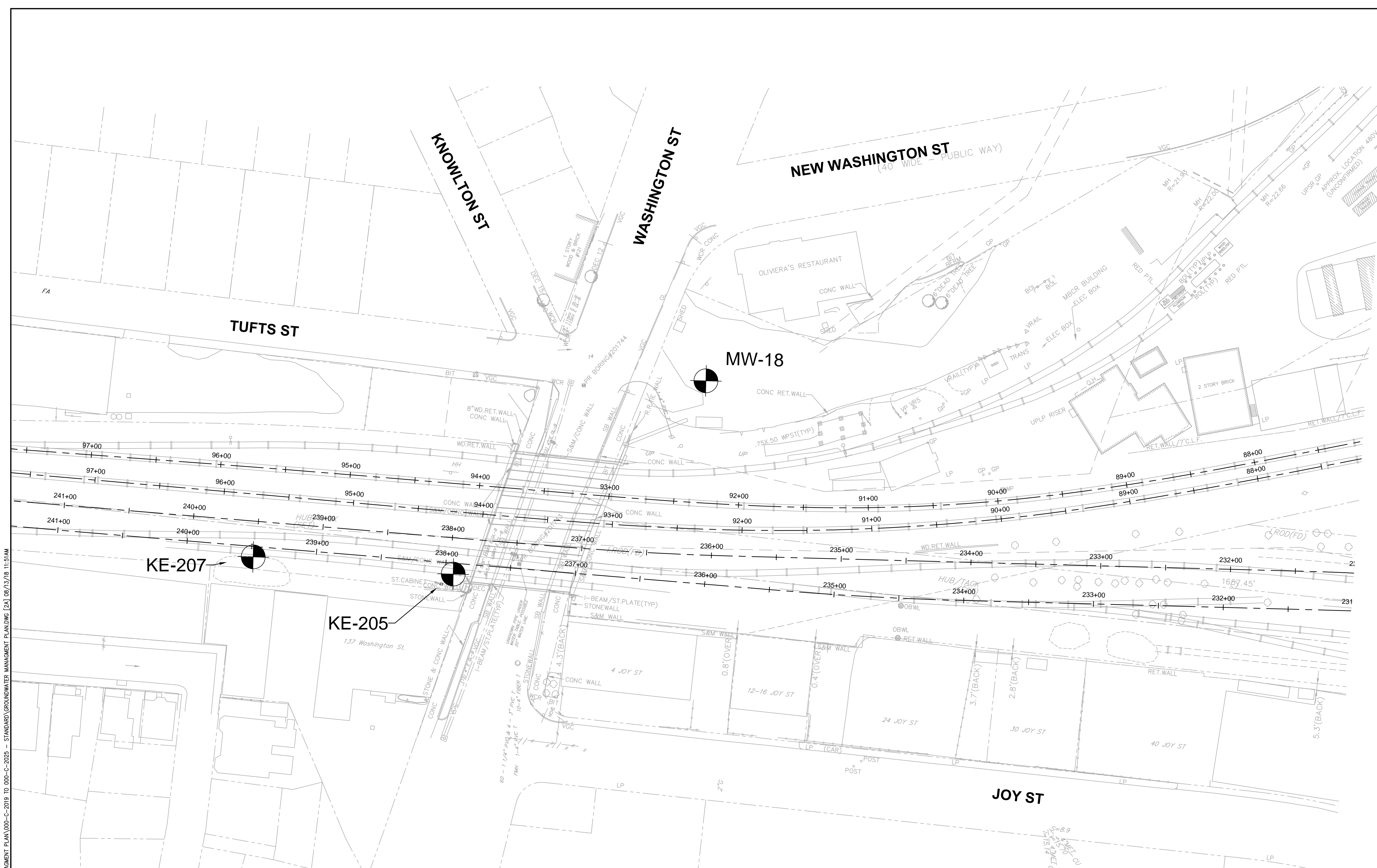
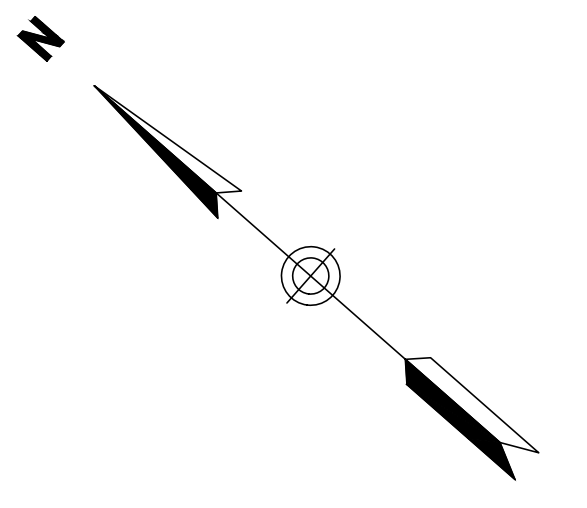
↓

0	TRC in µg/L
3.85	Ammonia in mg/L
0	Antimony in µg/L
30.36	Arsenic in µg/L
0.59	Cadmium in µg/L
215	Chromium III in µg/L
0	Chromium VI in µg/L
93.77	Copper in µg/L
68000	Iron in µg/L
76.32	Lead in µg/L
0	Mercury in µg/L
92.22	Nickel in µg/L
20.98	Selenium in µg/L
0.45	Silver in µg/L
208.7	Zinc in µg/L
0	Cyanide in µg/L
0	Phenol in µg/L
0	Carbon Tetrachloride in µg/L
7400	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

Dilution Factor	1.0					
	TBEL applies if bolded		QBEL applies if bolded		Compliance Level applies if shown	
A. Inorganics						
Ammonia	Report	mg/L	---			
Chloride	Report	µg/L	---			
Total Residual Chlorine	0.2	mg/L	11	µg/L	50	µg/L
Total Suspended Solids	30	mg/L	---			
Antimony	206	µg/L	640	µg/L		
Arsenic	104	µg/L	10	µg/L		
Cadmium	10.2	µg/L	0.7319	µg/L		
Chromium III	323	µg/L	258.8	µg/L		
Chromium VI	323	µg/L	11.4	µg/L		
Copper	242	µg/L	29.4	µg/L		
Iron	5000	µg/L	1000	µg/L		
Lead	160	µg/L	17.58	µg/L		
Mercury	0.739	µg/L	0.91	µg/L		
Nickel	1450	µg/L	162.5	µg/L		
Selenium	235.8	µg/L	5.0	µg/L		
Silver	35.1	µg/L	38.1	µg/L		
Zinc	420	µg/L	373.8	µg/L		
Cyanide	178	mg/L	5.2	µg/L	---	µg/L
B. Non-Halogenated VOCs						
Total BTEX	100	µg/L	---			
Benzene	5.0	µg/L	---			
1,4 Dioxane	200	µg/L	---			
Acetone	7970	µg/L	---			
Phenol	1,080	µg/L	300	µg/L		
C. Halogenated VOCs						
Carbon Tetrachloride	4.4	µg/L	1.6	µg/L		
1,2 Dichlorobenzene	600	µg/L	---			
1,3 Dichlorobenzene	320	µg/L	---			
1,4 Dichlorobenzene	5.0	µg/L	---			
Total dichlorobenzene	---	µg/L	---			
1,1 Dichloroethane	70	µg/L	---			
1,2 Dichloroethane	5.0	µg/L	---			
1,1 Dichloroethylene	3.2	µg/L	---			
Ethylene Dibromide	0.05	µg/L	---			
Methylene Chloride	4.6	µg/L	---			
1,1,1 Trichloroethane	200	µg/L	---			
1,1,2 Trichloroethane	5.0	µg/L	---			
Trichloroethylene	5.0	µg/L	---			
Tetrachloroethylene	5.0	µg/L	3.3	µg/L		
cis-1,2 Dichloroethylene	70	µg/L	---			
Vinyl Chloride	2.0	µg/L	---			
D. Non-Halogenated SVOCs						
Total Phthalates	190	µg/L	---	µg/L		
Diethylhexyl phthalate	101	µg/L	2.2	µg/L		
Total Group I Polycyclic Aromatic Hydrocarbons	1.0	µg/L	---			
Benzo(a)anthracene	1.0	µg/L	0.0038	µg/L	---	µg/L
Benzo(a)pyrene	1.0	µg/L	0.0038	µg/L	---	µg/L
Benzo(b)fluoranthene	1.0	µg/L	0.0038	µg/L	---	µg/L
Benzo(k)fluoranthene	1.0	µg/L	0.0038	µg/L	---	µg/L
Chrysene	1.0	µg/L	0.0038	µg/L	---	µg/L
Dibenzo(a,h)anthracene	1.0	µg/L	0.0038	µg/L	---	µg/L
Indeno(1,2,3-cd)pyrene	1.0	µg/L	0.0038	µg/L	---	µg/L
Total Group II Polycyclic Aromatic Hydrocarbons	100	µg/L	---			
Naphthalene	20	µg/L	---			
E. Halogenated SVOCs						
Total Polychlorinated Biphenyls	0.000064	µg/L	---		0.5	µg/L
Pentachlorophenol	1.0	µg/L	---			
F. Fuels Parameters						
Total Petroleum Hydrocarbons	5.0	mg/L	---			
Ethanol	Report	mg/L	---			
Methyl-tert-Butyl Ether	70	µg/L	20	µg/L		
tert-Butyl Alcohol	120	µg/L	---			
tert-Amyl Methyl Ether	90	µg/L	---			

ATTACHMENT B

FIGURES



LEGEND

MONITORING WELL

NOTE:
KE-207 AND KE-205
LOCATIONS ARE
APPROXIMATE

MASSACHUSETTS BAY TRANSPORTATION AUTHORITY

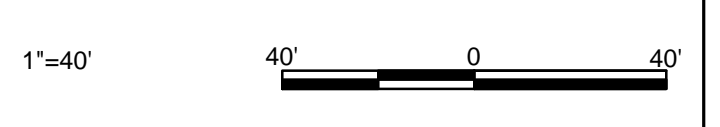
GREEN LINE EXTENSION PROJECT
MBTA CONTRACT NO. E22CN07
CAMBRIDGE / SOMERVILLE / MEDFORD, MASSACHUSETTS

SITE PLAN
1A

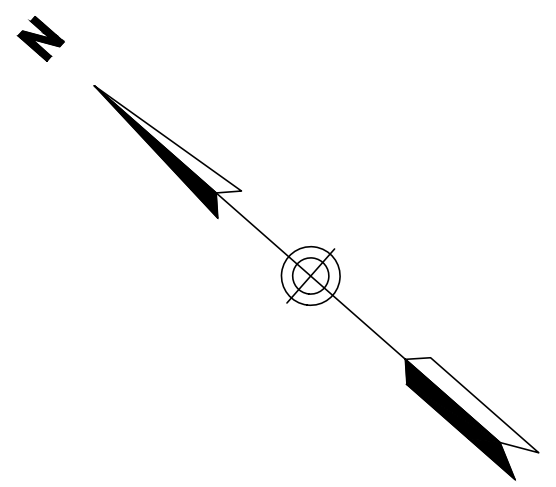
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DATE: 8/09/18	RI	SS	SS	SHEET:	1

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AUTHORIZED
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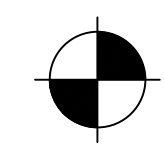
ISSUE	DATE	DESCRIPTION	BY	CHKD	APP.



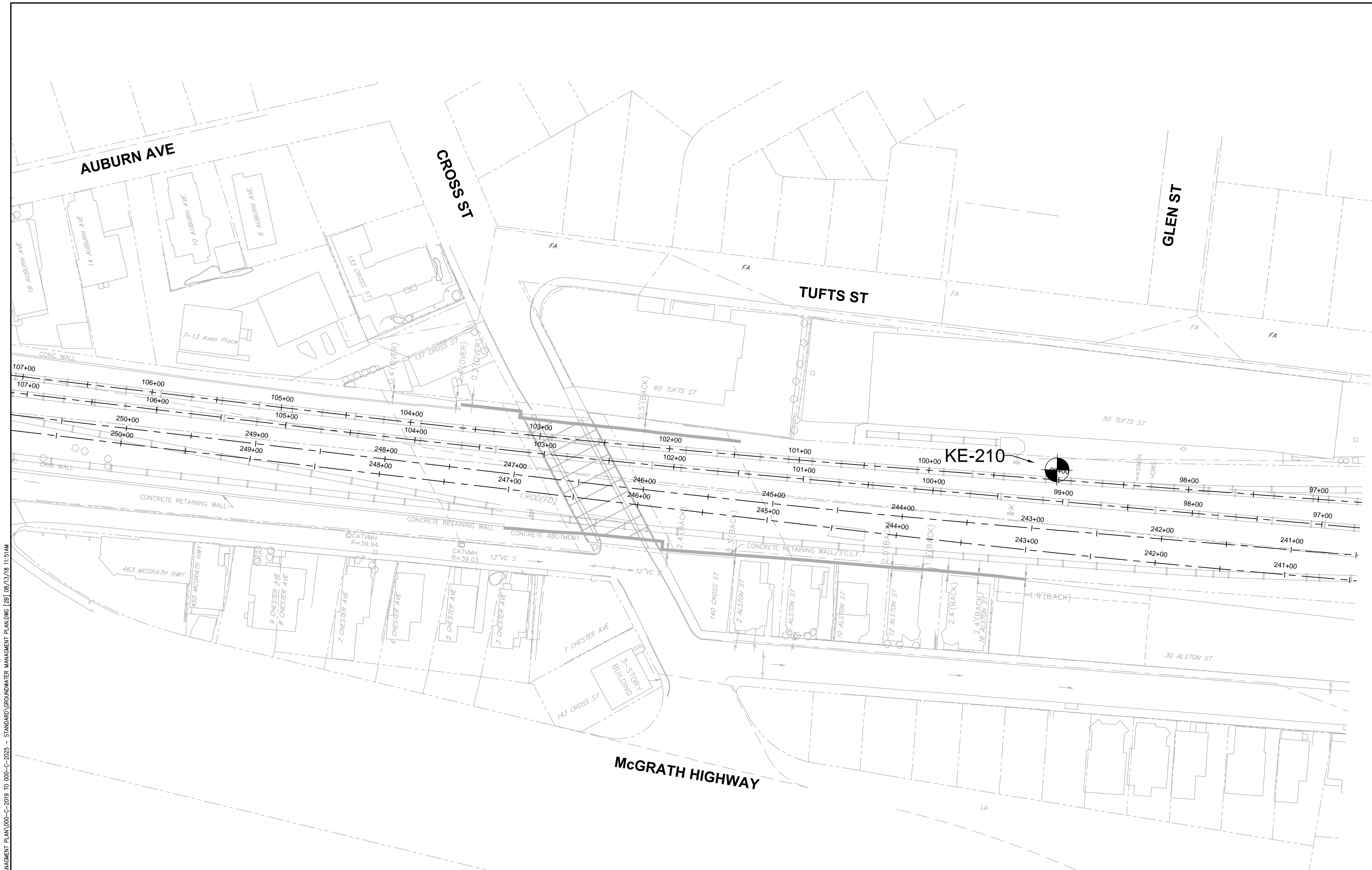
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LEGEND



MONITORING WELL



NOTE:
KE-210 LOCATION IS
APPROXIMATE

T	MASSACHUSETTS BAY TRANSPORTATION AUTHORITY
	GREEN LINE EXTENSION PROJECT MBTA CONTRACT NO. E22CN07 CAMBRIDGE / SOMERVILLE / MEDFORD, MASSACHUSETTS

**SITE PLAN
1B**

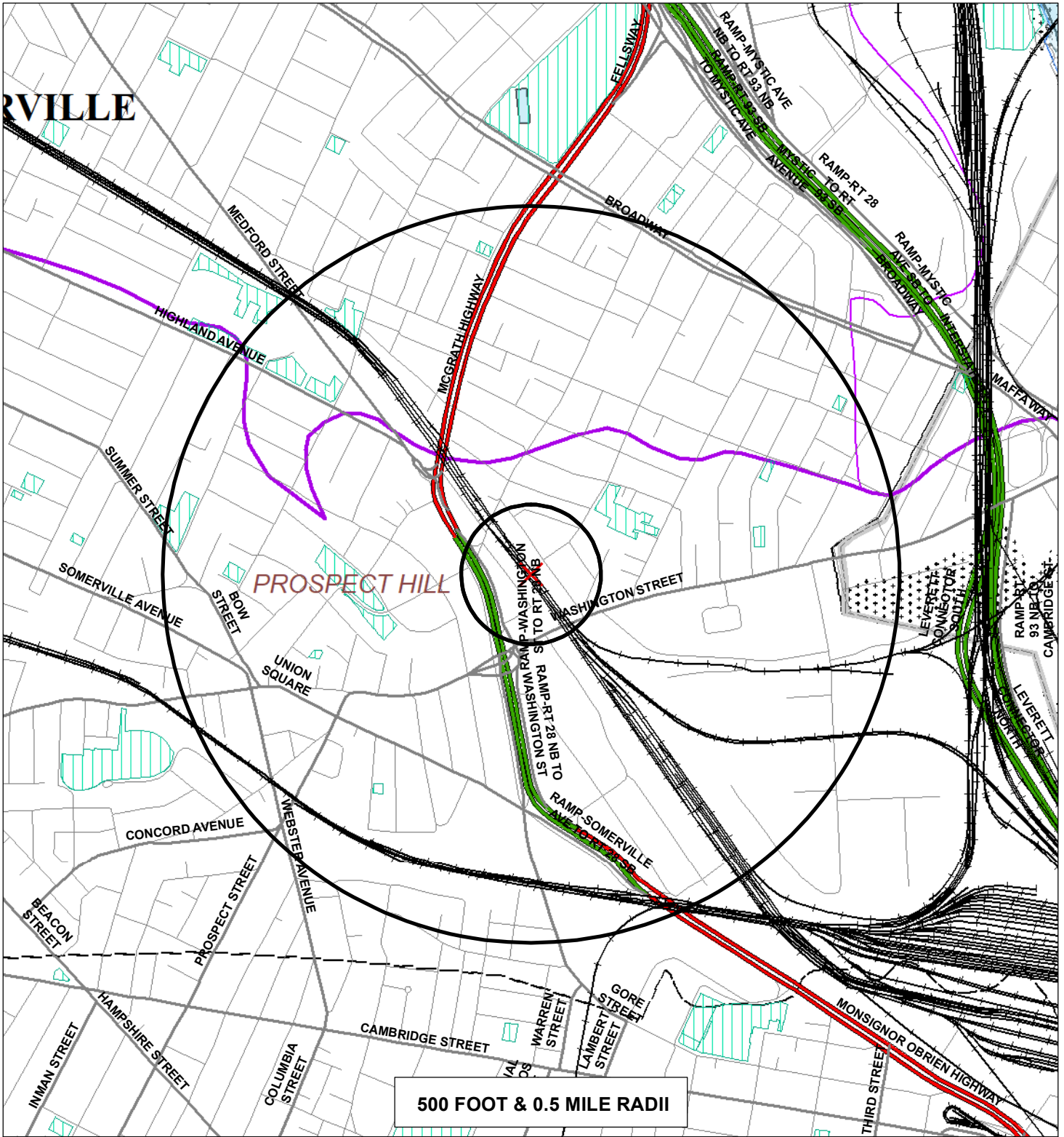
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FOR
CONSTRUCTION**



ISSUE	DATE	DESCRIPTION	BY	CHK'D	APP.	SCALE: 1"=40'	DRAWN BY	DESIGN BY	CHECK BY	PLAN NO.	ISSUE
						DATE: 8/09/18	RI	SS	SS	SHEET:	1



- Roads: Limited Access, Multi-Lane, Major/Minor, Track, Trail
- Railroad, Pipeline, Powerline
- Major Basin, Sub Basin, Perennial Stream, Intermittent Stream, Shoreline, Man made Shore, Dam, Aqueduct
- Wetland, Salt Wetland, Submerged Wetland, Open Water, Reservoir, Tidal Flat/Shoal
- Potentially Productive Aquifers: Medium, High Yield
- Non-Potential Drinking Water Source Area: Medium, High Yield
- EPA Sole Source Aquifer, FEMA 100 Yr. Floodplain, DEP Solid Waste Facility
- Approved Zone II, IWPA, Surface Water Supply Zone A
- Protected Open Space, ACEC
- Priority Habitat, Certified Vernal Pool
- Boundaries: County and Town
- Public Water Supplies: Ground, Surface, Non-Community (NTNC, TNC) Source: MassGIS/EOEA



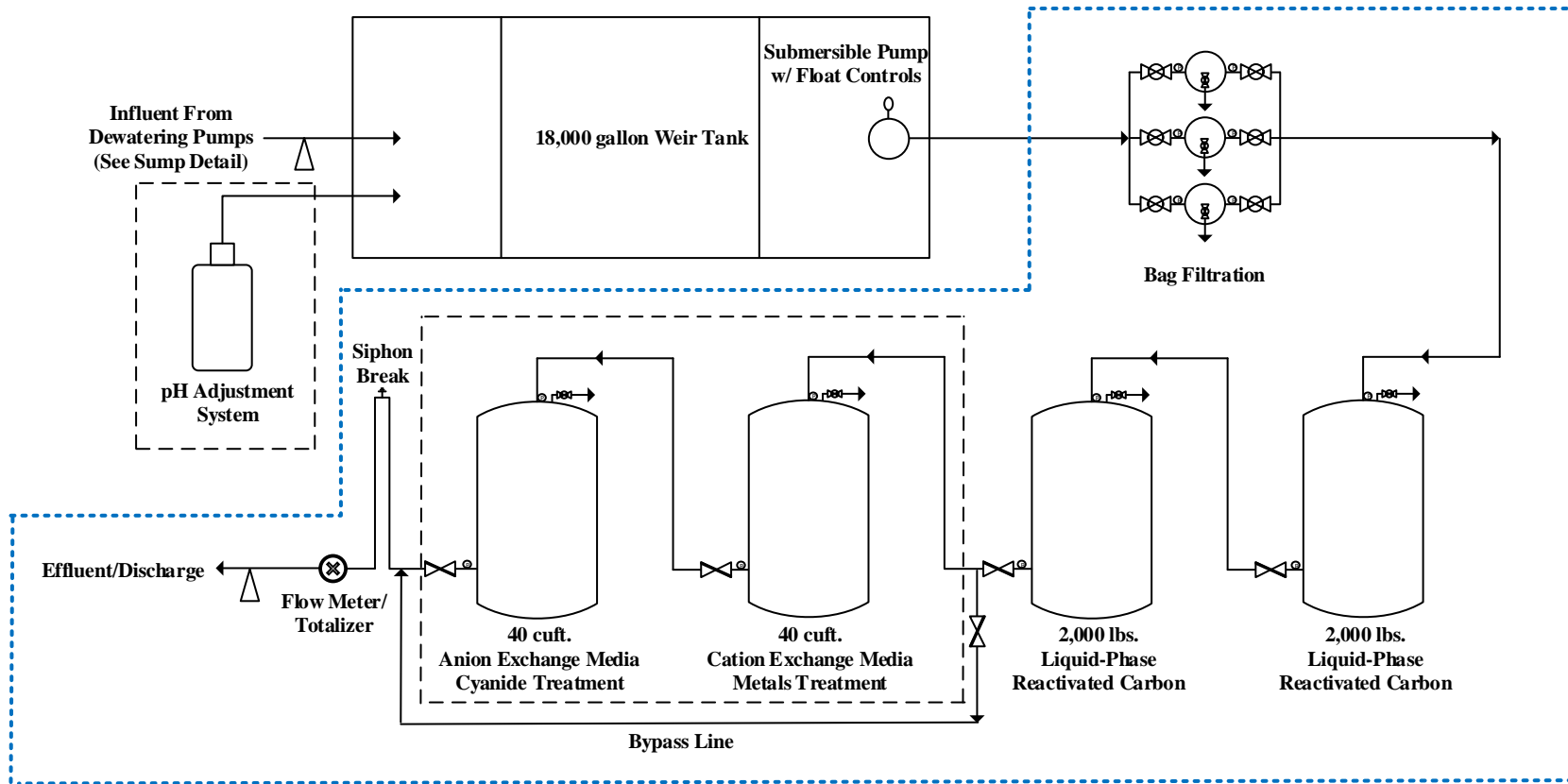
2 Liberty Square
6th Floor
Boston, MA 02109
(617) 385-6045

FIGURE 2

MASSDEP PRIORITY RESOURCES MAP
GLX
R.O.W. 50 TUFTS STREET
SOMERVILLE, MA



AUG
2018



Notes:

- 1.) Figure is not to scale
- 2.) System rated for 100 GPM

Key:

Piping/Hose	—————	Ball Valve		Check Valve	
Contingent	- - - - -	Butterfly Valve		Y-Strain/Cleanout	
Heated Enclosure	- · - · -	Gate Valve		Siphon Break	
Sample Port	△	Bleed Valve Assembly			
		Pressure Gauge			



Strategic Environmental Services, Inc.
 362 Putnam Hill Rd.
 Sutton, MA 01590
 Office: 508-757-7782

DESIGNED BY: LRT
 CHECKED BY: CG

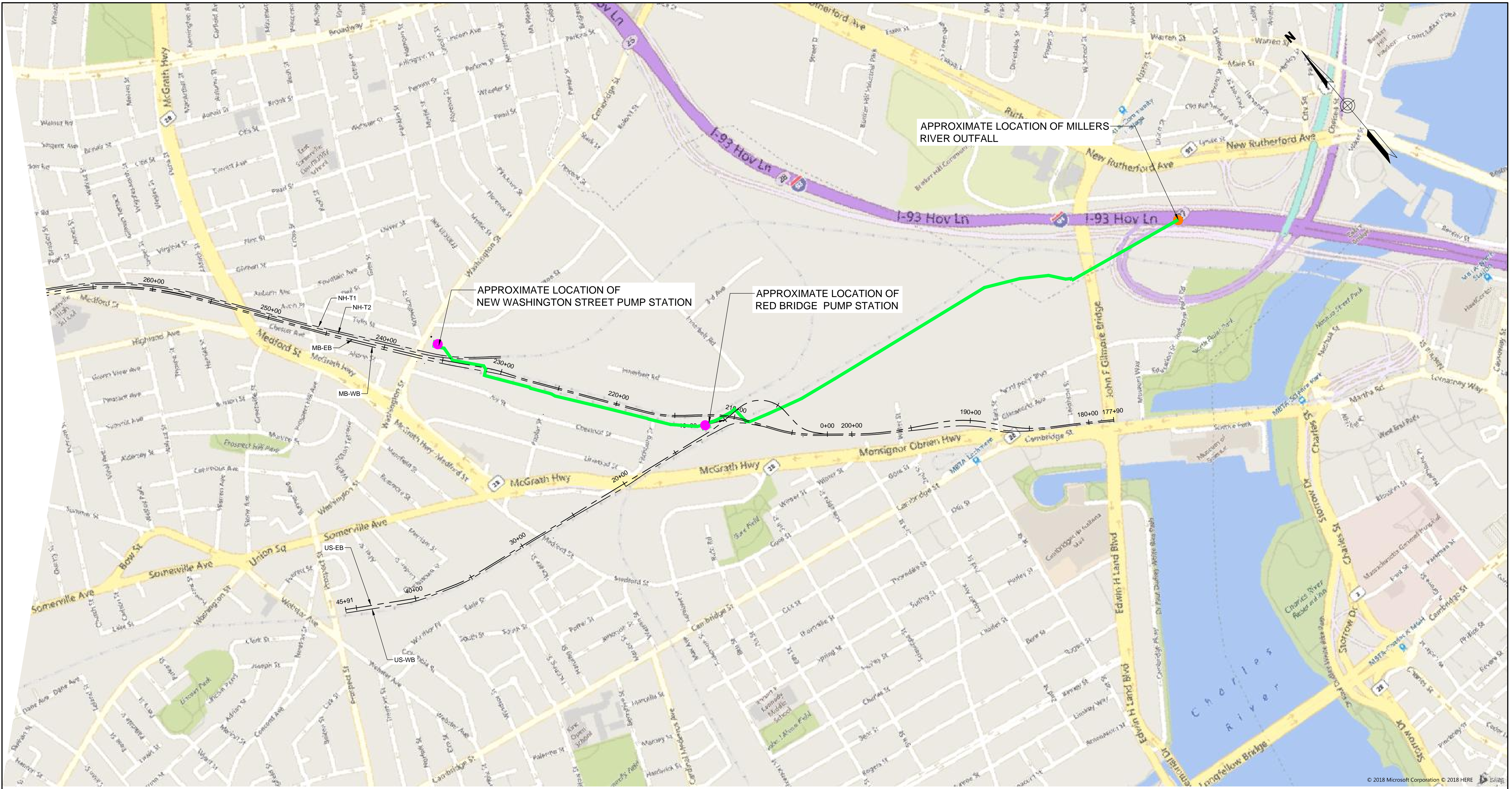
DRAWN BY: B. Watkins
 DATE:

Water Treatment System Schematic Task 3: Carbon Treatment System

MBTA Greenline Extension
 Cambridge, Massachusetts
 Somerville, Massachusetts
 Medford, Massachusetts

PROJECT No.

FIGURE No. **3**






APPROXIMATE LOCATION OF MILLERS RIVER OUTFALL

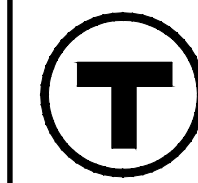
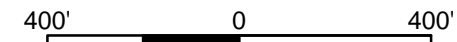
APPROXIMATE LOCATION OF NEW WASHINGTON STREET PUMP STATION

APPROXIMATE LOCATION OF RED BRIDGE PUMP STATION

LEGEND

-  DRAIN LINE
-  DISCHARGE LOCATION
-  OUTFALL LOCATION

1"=400'



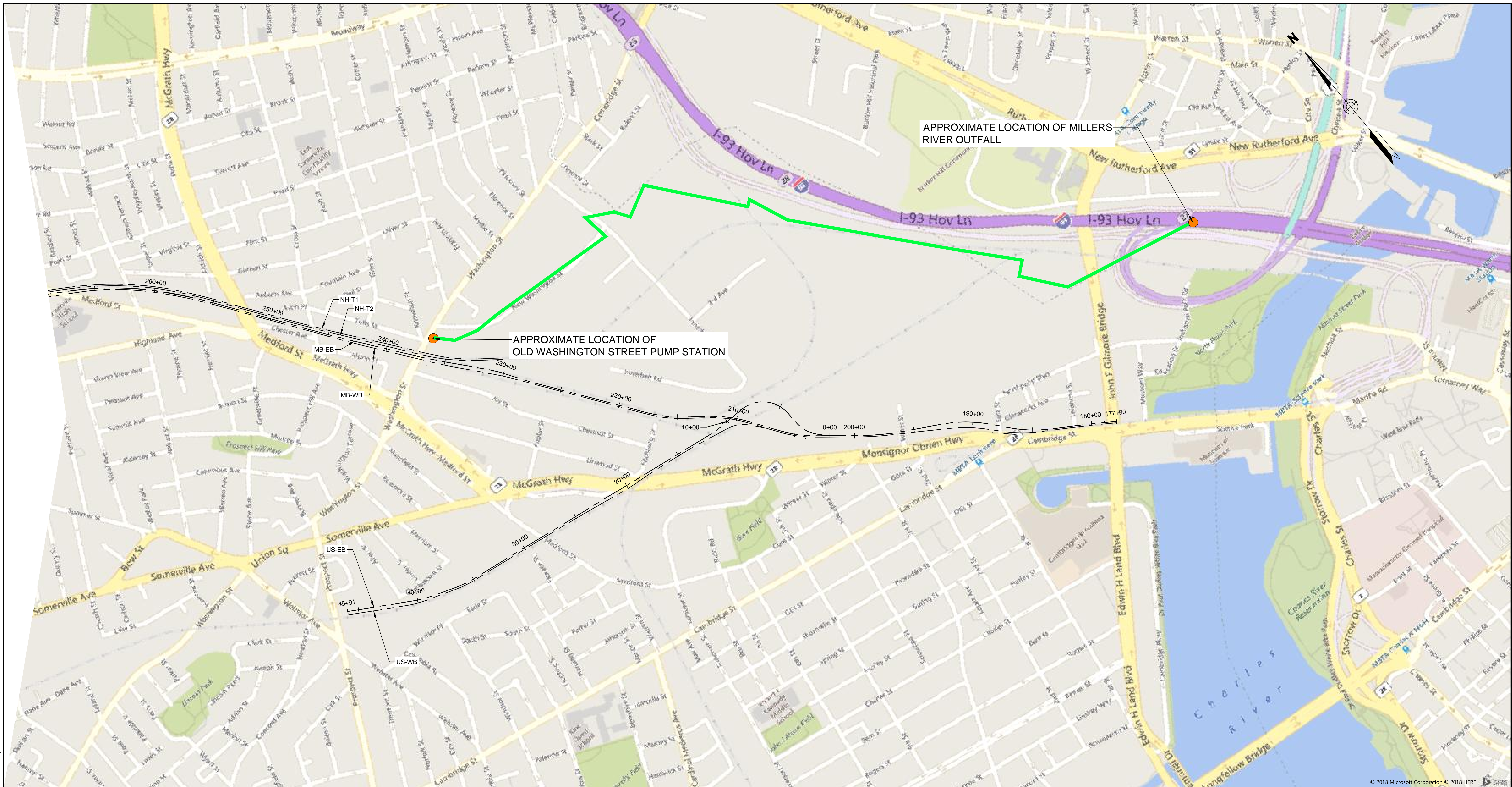
MASSACHUSETTS BAY TRANSPORTATION AUTHORITY
 GREEN LINE EXTENSION PROJECT
 MBTA CONTRACT NO. E22CN07
 CAMBRIDGE / SOMERVILLE / MEDFORD,
 MASSACHUSETTS

FIGURE 4A - PROPOSED GLX RGP DISCHARGE PATH

NOT AUTHORIZED FOR CONSTRUCTION



ISSUE	DATE	DESCRIPTION	BY	CHKD	APP.	DATE	SCAL E= 400'	DRAWN BY	DESIGN BY	CHECK BY	PLAN NO.	ISSUE
						9/12/18		RI	SS	SS		



APPROXIMATE LOCATION OF MILLERS RIVER OUTFALL

APPROXIMATE LOCATION OF OLD WASHINGTON STREET PUMP STATION

LEGEND
 DRAIN LINE

1"=400'

MASSACHUSETTS BAY TRANSPORTATION AUTHORITY
GREEN LINE EXTENSION PROJECT
 MBTA CONTRACT NO. E22CN07
 CAMBRIDGE / SOMERVILLE / MEDFORD,
 MASSACHUSETTS

FIGURE 4B - ALTERNATE GLX RGP DISCHARGE PATH

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 AUTHORIZED
 FOR
 CONSTRUCTION



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						1" = 400'					
	9/12/18		RI	SS	SS					SHEET:	

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 DRAWING: 1805201825348ENVIRONMNTAL/PROJECTS/MBTA/GLX/CONSTRUCTION/PLANNING/FIGURE 4B.DWG (A) 1809218 6:53PM

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ATTACHMENT C

TABLES

Table 1
Summary of Analytical Results for Groundwater Samples - May and August 2018
MBTA - GLX
Somerville, Medford, Cambridge, Massachusetts

		LOCATION:		MW-18					
		SAMPLING DATE:		8/17/2018	8/17/2018				
		LAB SAMPLE ID*:		L1832437-01/ 490-157808-1	L1832437-02/ 490-157808-2				
Analysis	Analyte	Units	RGP for Freshwater ¹			RGP Required Minimum Level ⁴	Field Dup		
			TBEL	WQBEL ²	Compliance Level ³				
Volatile Organics									
	Benzene	ug/l	<u>5</u>	N/A	N/A	5	25 U ^A	1 U	1 U
	Toluene	ug/l	N/A	N/A	N/A	N/A	38 U	1 U	1 U
	Ethylbenzene	ug/l	N/A	N/A	N/A	N/A	25 U	1 U	1 U
	p/m-Xylene	ug/l	N/A	N/A	N/A	N/A	50 U	2 U	2 U
	o-Xylene	ug/l	N/A	N/A	N/A	N/A	50 U	1 U	1 U
	Total BTEX	ug/l	100	N/A	N/A	100	ND	ND	ND
	Methylene chloride	ug/l	4.6	N/A	N/A	4.6	150 U ^A	1 U	1 U
	1,1-Dichloroethane	ug/l	70	N/A	N/A	70	360	1.5 U	1.5 U
	Chloroform	ug/l	N/A	N/A	N/A	N/A	38 U	1 U	1 U
	Carbon tetrachloride	ug/l	4.4	1.6	N/A	1.6	25 U ^A	1 U	1 U
	1,2-Dichloropropane	ug/l	N/A	N/A	N/A	N/A	88 U	3.5 U	3.5 U
	Dibromochloromethane	ug/l	N/A	N/A	N/A	N/A	25 U	1 U	1 U
	1,1,2-Trichloroethane	ug/l	5	N/A	N/A	5	38 U ^A	1.5 U	1.5 U
	2-Chloroethylvinyl ether	ug/l	N/A	N/A	N/A	N/A	500 U	10 U	10 U
	Tetrachloroethene	ug/l	5	3.3	N/A	3.3	7,400	1 U	1.1
	Chlorobenzene	ug/l	N/A	N/A	N/A	N/A	25 U	3.5 U	3.5 U
	Trichlorofluoromethane	ug/l	N/A	N/A	N/A	N/A	120 U	5 U	5 U
	1,2-Dichloroethane	ug/l	5	N/A	N/A	5	25 U ^A	1.5 U	1.5 U
	1,1,1-Trichloroethane	ug/l	200	N/A	N/A	200	390	2 U	2 U
	Bromodichloromethane	ug/l	N/A	N/A	N/A	N/A	25 U	1 U	1 U
	trans-1,3-Dichloropropene	ug/l	N/A	N/A	N/A	N/A	25 U	1.5 U	1.5 U
	cis-1,3-Dichloropropene	ug/l	N/A	N/A	N/A	N/A	25 U	1.5 U	1.5 U
	1,1-Dichloropropene	ug/l	N/A	N/A	N/A	N/A	120 U	2.5 U	2.5 U
	Bromoform	ug/l	N/A	N/A	N/A	N/A	100 U	1 U	1 U
	1,1,2,2-Tetrachloroethane	ug/l	N/A	N/A	N/A	N/A	25 U	1 U	1 U
	Chloromethane	ug/l	N/A	N/A	N/A	N/A	120 U	5 U	5 U
	Bromomethane	ug/l	N/A	N/A	N/A	N/A	50 U	5 U	5 U
	Vinyl chloride	ug/l	2	N/A	N/A	2	50 U ^A	1 U	1 U
	Chloroethane	ug/l	N/A	N/A	N/A	N/A	50 U	2 U	2 U
	1,1-Dichloroethene	ug/l	3.2	N/A	N/A	3.2	480	1 U	1 U
	trans-1,2-Dichloroethene	ug/l	N/A	N/A	N/A	N/A	38 U	1.5 U	1.5 U
	Trichloroethene	ug/l	5	N/A	N/A	5	990	1 U	1 U
	1,2-Dichlorobenzene	ug/l	600	N/A	N/A	600	120 U	5 U	5 U
	1,3-Dichlorobenzene	ug/l	320	N/A	N/A	320	120 U	5 U	5 U
	1,4-Dichlorobenzene	ug/l	5	N/A	N/A	5	120 U ^A	5 U	5 U
	Methyl tert butyl ether	ug/l	70	20	N/A	20	50 U ^A	10 U	10 U
	cis-1,2-Dichloroethene	ug/l	70	N/A	N/A	70	25 U	1 U	1 U
	Dibromomethane	ug/l	N/A	N/A	N/A	N/A	250 U	1 U	1 U
	1,2,3-Trichloropropane	ug/l	N/A	N/A	N/A	N/A	250 U	5 U	5 U
	Styrene	ug/l	N/A	N/A	N/A	N/A	50 U	1 U	1 U
	Dichlorodifluoromethane	ug/l	N/A	N/A	N/A	N/A	250 U	1 U	1 U
	Acetone	ug/l	7,970	N/A	N/A	7,970	250 U	10 U	10 U
	Carbon disulfide	ug/l	N/A	N/A	N/A	N/A	250 U	5 U	5 U
	2-Butanone	ug/l	N/A	N/A	N/A	N/A	250 U	10 U	10 U
	4-Methyl-2-pentanone	ug/l	N/A	N/A	N/A	N/A	250 U	10 U	10 U
	2-Hexanone	ug/l	N/A	N/A	N/A	N/A	250 U	10 U	10 U
	Acrolein	ug/l	N/A	N/A	N/A	N/A	250 U	8 U	8 U
	Acrylonitrile	ug/l	N/A	N/A	N/A	N/A	250 U	10 U	10 U
	Bromochloromethane	ug/l	N/A	N/A	N/A	N/A	120 U	2.5 U	2.5 U
	Tetrahydrofuran	ug/l	N/A	N/A	N/A	N/A	250 U	5 U	5 U
	2,2-Dichloropropane	ug/l	N/A	N/A	N/A	N/A	120 U	2.5 U	2.5 U
	1,3-Dichloropropane	ug/l	N/A	N/A	N/A	N/A	120 U	1 U	1 U
	1,1,1,2-Tetrachloroethane	ug/l	N/A	N/A	N/A	N/A	25 U	0.5 U	0.5 U
	Bromobenzene	ug/l	N/A	N/A	N/A	N/A	120 U	2.5 U	2.5 U
	n-Butylbenzene	ug/l	N/A	N/A	N/A	N/A	25 U	0.5 U	0.5 U
	sec-Butylbenzene	ug/l	N/A	N/A	N/A	N/A	25 U	0.5 U	0.5 U
	tert-Butylbenzene	ug/l	N/A	N/A	N/A	N/A	120 U	2.5 U	2.5 U
	o-Chlorotoluene	ug/l	N/A	N/A	N/A	N/A	120 U	2.5 U	2.5 U

Table 1
Summary of Analytical Results for Groundwater Samples - May and August 2018
MBTA - GLX
Somerville, Medford, Cambridge, Massachusetts

		LOCATION:		KE210		MW-18			
		SAMPLING DATE:		5/18/2018		8/17/2018			
		LAB SAMPLE ID*:		L1818403-01/ 490-152378-1		L1832437-01/ 490-157808-1			
						L1832437-02/ 490-157808-2			
						Field Dup			
		RGP for Freshwater ¹				RGP Required Minimum Level ⁴			
Analysis	Analyte	Units	TBEL	WQBEL ²	Compliance Level ³				
	p-Chlorotoluene	ug/l	N/A	N/A	N/A	N/A	120 U	2.5 U	2.5 U
	1,2-Dibromo-3-chloropropane	ug/l	N/A	N/A	N/A	N/A	120 U	2 U	2 U
	Hexachlorobutadiene	ug/l	N/A	N/A	N/A	N/A	25 U	0.5 U	0.5 U
	Isopropylbenzene	ug/l	N/A	N/A	N/A	N/A	25 U	1 U	1 U
	p-Isopropyltoluene	ug/l	N/A	N/A	N/A	N/A	25 U	0.5 U	0.5 U
	Naphthalene	ug/l	20	N/A	N/A	20	120 U [^]	2.5 U	2.5 U
	n-Propylbenzene	ug/l	N/A	N/A	N/A	N/A	25 U	0.5 U	0.5 U
	1,2,3-Trichlorobenzene	ug/l	N/A	N/A	N/A	N/A	120 U	1 U	1 U
	1,2,4-Trichlorobenzene	ug/l	N/A	N/A	N/A	N/A	120 U	1 U	1 U
	1,3,5-Trimethylbenzene	ug/l	N/A	N/A	N/A	N/A	120 U	2.5 U	2.5 U
	1,2,4-Trimethylbenzene	ug/l	N/A	N/A	N/A	N/A	120 U	2.5 U	2.5 U
	Ethyl ether	ug/l	N/A	N/A	N/A	N/A	120 U	2.5 U	2.5 U
	Diisopropyl Ether	ug/l	N/A	N/A	N/A	N/A	100 U	2 U	2 U
	Tert-Butyl Alcohol	ug/l	120	N/A	N/A	120	500 U [^]	100 U	100 U
	Ethyl-Tert-Butyl-Ether	ug/l	N/A	N/A	N/A	N/A	100 U	2 U	2 U
	Tertiary-Amyl Methyl Ether	ug/l	90	N/A	N/A	90	100 U [^]	20 U	20 U
	1,2-Dibromoethane	ug/l	0.05	N/A	N/A	0.05	0.503 U [^]	0.01 U	0.01 U
	1,4-Dioxane	ug/l	200	N/A	N/A	50	150 U [^]	50 U	50 U
Extractable Petroleum Hydrocarbons									
	C9-C18 Aliphatics	ug/l	N/A	N/A	N/A	N/A	100 U	100 U	100 U
	C19-C36 Aliphatics	ug/l	N/A	N/A	N/A	N/A	100 U	100 U	100 U
	C11-C22 Aromatics	ug/l	N/A	N/A	N/A	N/A	100 U	100 U	100 U
	C11-C22 Aromatics, Adjusted	ug/l	N/A	N/A	N/A	N/A	100 U	100 U	100 U
Semivolatile Organics by GC/MS									
	Bis(2-ethylhexyl)phthalate	ug/l	101	2.2	N/A	2.2	3 U [^]	2.2 U	2.2 U
	Butyl benzyl phthalate	ug/l	N/A	N/A	N/A	N/A	5 U	5 U	5 U
	Di-n-butylphthalate	ug/l	N/A	N/A	N/A	N/A	5 U	5 U	5 U
	Diethyl phthalate	ug/l	N/A	N/A	N/A	N/A	5 U	5 U	5 U
	Dimethyl phthalate	ug/l	N/A	N/A	N/A	N/A	5 U	5 U	5 U
	Di-n-octylphthalate	ug/l	N/A	N/A	N/A	N/A	5 U	5 U	5 U
	Total Phthalates	ug/l	190	N/A	N/A	190	ND	ND	ND
	Benzidine	ug/l	N/A	N/A	N/A	N/A	20 U	20 U	20 U
	1,2,4-Trichlorobenzene	ug/l	N/A	N/A	N/A	N/A	5 U	5 U	5 U
	Bis(2-chloroethyl)ether	ug/l	N/A	N/A	N/A	N/A	2 U	2 U	2 U
	1,2-Dichlorobenzene	ug/l	600	N/A	N/A	600	2 U	NA	NA
	1,3-Dichlorobenzene	ug/l	320	N/A	N/A	320	2 U	NA	NA
	1,4-Dichlorobenzene	ug/l	5	N/A	N/A	5	2 U	NA	NA
	3,3'-Dichlorobenzidine	ug/l	N/A	N/A	N/A	N/A	5 U	5 U	5 U
	2,4-Dinitrotoluene	ug/l	N/A	N/A	N/A	N/A	5 U	5 U	5 U
	2,6-Dinitrotoluene	ug/l	N/A	N/A	N/A	N/A	5 U	5 U	5 U
	Azobenzene	ug/l	N/A	N/A	N/A	N/A	2 U	2 U	2 U
	4-Bromophenyl phenyl ether	ug/l	N/A	N/A	N/A	N/A	2 U	2 U	2 U
	Bis(2-chloroisopropyl)ether	ug/l	N/A	N/A	N/A	N/A	2 U	2 U	2 U
	Bis(2-chloroethoxy)methane	ug/l	N/A	N/A	N/A	N/A	5 U	5 U	5 U
	Hexachlorocyclopentadiene	ug/l	N/A	N/A	N/A	N/A	20 U	10 U	10 U
	Isophorone	ug/l	N/A	N/A	N/A	N/A	5 U	5 U	5 U
	Nitrobenzene	ug/l	N/A	N/A	N/A	N/A	2 U	2 U	2 U
	NDPA/DPA	ug/l	N/A	N/A	N/A	N/A	2 U	2 U	2 U
	n-Nitrosodi-n-propylamine	ug/l	N/A	N/A	N/A	N/A	5 U	5 U	5 U
	Aniline	ug/l	N/A	N/A	N/A	N/A	2 U	2 U	2 U
	4-Chloroaniline	ug/l	N/A	N/A	N/A	N/A	5 U	5 U	5 U
	Dibenzofuran	ug/l	N/A	N/A	N/A	N/A	2 U	2 U	2 U
	Acetophenone	ug/l	N/A	N/A	N/A	N/A	5 U	5 U	5 U
	n-Nitrosodimethylamine	ug/l	N/A	N/A	N/A	N/A	2 U	2 U	2 U
	2,4,6-Trichlorophenol	ug/l	N/A	N/A	N/A	N/A	5 U	5 U	5 U
	p-Chloro-m-cresol	ug/l	N/A	N/A	N/A	N/A	2 U	2 U	2 U
	2-Chlorophenol	ug/l	N/A	N/A	N/A	N/A	2 U	2 U	2 U
	2,4-Dichlorophenol	ug/l	N/A	N/A	N/A	N/A	5 U	5 U	5 U
	2,4-Dimethylphenol	ug/l	N/A	N/A	N/A	N/A	5 U	5 U	5 U
	2-Nitrophenol	ug/l	N/A	N/A	N/A	N/A	10 U	5 U	5 U
	4-Nitrophenol	ug/l	N/A	N/A	N/A	N/A	10 U	10 U	10 U
	2,4-Dinitrophenol	ug/l	N/A	N/A	N/A	N/A	20 U	20 U	20 U
	Phenol	ug/l	1,080	300	N/A	300	5 U	5 U	5 U

Table 1
Summary of Analytical Results for Groundwater Samples - May and August 2018
MBTA - GLX
Somerville, Medford, Cambridge, Massachusetts

		LOCATION:		MW-18					
		SAMPLING DATE:		8/17/2018	8/17/2018				
		LAB SAMPLE ID*:		L1832437-01/ 490-157808-1	L1832437-02/ 490-157808-2				
Analysis	Analyte	Units	RGP for Freshwater ¹			RGP Required Minimum Level ⁴			Field Dup
			TBEL	WQBEL ²	Compliance Level ³				
	2-Methylphenol	ug/l	N/A	N/A	N/A	N/A	5 U	5 U	5 U
	3-Methylphenol/4-Methylphenol	ug/l	N/A	N/A	N/A	N/A	5 U	5 U	5 U
	2,4,5-Trichlorophenol	ug/l	N/A	N/A	N/A	N/A	5 U	5 U	5 U
	2-Methylnaphthalene	ug/l	N/A	N/A	N/A	N/A	NA	2 U	2 U
	2-Chloronaphthalene	ug/l	N/A	N/A	N/A	N/A	NA	2 U	2 U
	Hexachlorobutadiene	ug/l	N/A	N/A	N/A	N/A	NA	2 U	2 U
	Hexachloroethane	ug/l	N/A	N/A	N/A	N/A	NA	2 U	2 U
Semivolatile Organics by GC/MS-SIM									
	Benzo(a)anthracene	ug/l	1	0.0038	N/A	0.1	0.1 U	0.1 U	0.1 U
	Benzo(a)pyrene	ug/l	1	0.0038	N/A	0.1	0.1 U	0.1 U	0.1 U
	Benzo(b)fluoranthene	ug/l	1	0.0038	N/A	0.1	0.1 U	0.1 U	0.1 U
	Benzo(k)fluoranthene	ug/l	1	0.0038	N/A	0.1	0.1 U	0.1 U	0.1 U
	Chrysene	ug/l	1	0.0038	N/A	0.1	0.1 U	0.1 U	0.1 U
	Dibenzo(a,h)anthracene	ug/l	1	0.0038	N/A	0.1	0.1 U	0.1 U	0.1 U
	Indeno(1,2,3-cd)pyrene	ug/l	1	0.0038	N/A	0.1	0.1 U	0.1 U	0.1 U
	Total Group I PAHs	ug/l	1	N/A	N/A	1	ND	ND	ND
	Acenaphthene	ug/l	N/A	N/A	N/A	N/A	0.1 U	0.1 U	0.1 U
	Fluoranthene	ug/l	N/A	N/A	N/A	N/A	0.1 U	0.1 U	0.1 U
	Naphthalene	ug/l	20	N/A	N/A	20	0.1 U	0.1 U	0.1 U
	Acenaphthylene	ug/l	N/A	N/A	N/A	N/A	0.1 U	0.1 U	0.1 U
	Anthracene	ug/l	N/A	N/A	N/A	N/A	0.1 U	0.1 U	0.1 U
	Benzo(ghi)perylene	ug/l	N/A	N/A	N/A	N/A	0.1 U	0.1 U	0.1 U
	Fluorene	ug/l	N/A	N/A	N/A	N/A	0.1 U	0.1 U	0.1 U
	Phenanthrene	ug/l	N/A	N/A	N/A	N/A	0.1 U	0.1 U	0.1 U
	Pyrene	ug/l	N/A	N/A	N/A	N/A	0.1 U	0.1 U	0.1 U
	Total Group II PAHs	ug/l	100	N/A	N/A	100	ND	ND	ND
	2-Methylnaphthalene	ug/l	N/A	N/A	N/A	N/A	0.1 U	NA	NA
	2-Chloronaphthalene	ug/l	N/A	N/A	N/A	N/A	0.2 U	NA	NA
	Pentachlorophenol	ug/l	1	N/A	N/A	1	0.8 U	1 U	1 U
	Hexachlorobenzene	ug/l	N/A	N/A	N/A	N/A	0.8 U	0.1 U	0.1 U
	Hexachlorobutadiene	ug/l	N/A	N/A	N/A	N/A	0.5 U	NA	NA
	Hexachloroethane	ug/l	N/A	N/A	N/A	N/A	0.8 U	NA	NA
Organochlorine Pesticides by GC									
	Delta-BHC	ug/l	N/A	N/A	N/A	N/A	0.02 U	0.02 U	0.02 U
	Lindane	ug/l	N/A	N/A	N/A	N/A	0.02 U	0.02 U	0.02 U
	Alpha-BHC	ug/l	N/A	N/A	N/A	N/A	0.02 U	0.02 U	0.02 U
	Beta-BHC	ug/l	N/A	N/A	N/A	N/A	0.02 U	0.02 U	0.02 U
	Heptachlor	ug/l	N/A	N/A	N/A	N/A	0.02 U	0.02 U	0.02 U
	Aldrin	ug/l	N/A	N/A	N/A	N/A	0.02 U	0.02 U	0.02 U
	Heptachlor epoxide	ug/l	N/A	N/A	N/A	N/A	0.02 U	0.02 U	0.02 U
	Endrin	ug/l	N/A	N/A	N/A	N/A	0.04 U	0.04 U	0.04 U
	Endrin aldehyde	ug/l	N/A	N/A	N/A	N/A	0.04 U	0.04 U	0.04 U
	Endrin ketone	ug/l	N/A	N/A	N/A	N/A	0.04 U	0.04 U	0.04 U
	Dieldrin	ug/l	N/A	N/A	N/A	N/A	0.04 U	0.04 U	0.04 U
	4,4'-DDE	ug/l	N/A	N/A	N/A	N/A	0.04 U	0.04 U	0.04 U
	4,4'-DDD	ug/l	N/A	N/A	N/A	N/A	0.04 U	0.04 U	0.04 U
	4,4'-DDT	ug/l	N/A	N/A	N/A	N/A	0.04 U	0.04 U	0.04 U
	Endosulfan I	ug/l	N/A	N/A	N/A	N/A	0.02 U	0.02 U	0.02 U
	Endosulfan II	ug/l	N/A	N/A	N/A	N/A	0.04 U	0.04 U	0.04 U
	Endosulfan sulfate	ug/l	N/A	N/A	N/A	N/A	0.04 U	0.04 U	0.04 U
	Methoxychlor	ug/l	N/A	N/A	N/A	N/A	0.1 U	0.1 U	0.1 U
	Toxaphene	ug/l	N/A	N/A	N/A	N/A	0.4 U	0.4 U	0.4 U
	Chlordane	ug/l	N/A	N/A	N/A	N/A	0.2 U	0.2 U	0.2 U
	cis-Chlordane	ug/l	N/A	N/A	N/A	N/A	0.02 U	0.02 U	0.02 U
	trans-Chlordane	ug/l	N/A	N/A	N/A	N/A	0.02 U	0.02 U	0.02 U

Table 1
Summary of Analytical Results for Groundwater Samples - May and August 2018
MBTA - GLX
Somerville, Medford, Cambridge, Massachusetts

		LOCATION:		KE210		MW-18			
		SAMPLING DATE:		5/18/2018		8/17/2018			
		LAB SAMPLE ID*:		L1818403-01/ 490-152378-1		L1832437-01/ 490-157808-1			
				L1832437-02/ 490-157808-2		Field Dup			
Analysis	Analyte	Units	RGP for Freshwater ¹			RGP Required Minimum Level ⁴			
			TBEL	WQBEL ²	Compliance Level ³				
PCBs									
	Aroclor 1016	ug/l	N/A	N/A	N/A	N/A	0.25 U	0.272 U	0.25 U
	Aroclor 1221	ug/l	N/A	N/A	N/A	N/A	0.25 U	0.272 U	0.25 U
	Aroclor 1232	ug/l	N/A	N/A	N/A	N/A	0.25 U	0.272 U	0.25 U
	Aroclor 1242	ug/l	N/A	N/A	N/A	N/A	0.25 U	0.272 U	0.25 U
	Aroclor 1248	ug/l	N/A	N/A	N/A	N/A	0.25 U	0.272 U	0.25 U
	Aroclor 1254	ug/l	N/A	N/A	N/A	N/A	0.25 U	0.272 U	0.25 U
	Aroclor 1260	ug/l	N/A	N/A	N/A	N/A	0.2 U	0.217 U	0.2 U
	Total PCBs	ug/l	0.000064	N/A	0.5	0.5	0.25 U	0.272 U	0.25 U
Total Metals									
	Antimony	ug/l	206	640	N/A	206	4 U	4 U	4 U
	Arsenic	ug/l	104	10	N/A	10	10.59	23.24	30.36
	Cadmium	ug/l	10.2	0.7319	N/A	0.25	0.59	0.37	0.41
	Chromium	ug/l	N/A	N/A	N/A	N/A	34.73	214.8	209.4
	Copper	ug/l	242	29.4	N/A	9	61.66	92.29	93.77
	Iron	ug/l	5,000	1,000	N/A	1,000	44,600	60,600	68,000
	Lead	ug/l	160	17.58	N/A	2.5	34.87	74.84	76.32
	Mercury	ug/l	0.739	0.91	N/A	0.77	0.2 U	0.2 U	0.2 U
	Nickel	ug/l	1,450	162.5	N/A	52	29.23	88.86	92.22
	Selenium	ug/l	235.8	5	N/A	5	5 U	20.1	20.98
	Silver	ug/l	35.1	38.1	N/A	3.2	0.4 U	0.4 U	0.45
	Zinc	ug/l	420	373.8	N/A	120	124.6	194.2	208.7
Dissolved Metals									
	Antimony	ug/l	206	640	N/A	206	4 U	4 U	4 U
	Arsenic	ug/l	104	10	N/A	10	1 U	2.6	1.4
	Cadmium	ug/l	10.2	0.7319	N/A	0.25	0.2 U	0.2 U	0.2 U
	Chromium	ug/l	N/A	N/A	N/A	N/A	2.3	12.3	3.2
	Copper	ug/l	242	29.4	N/A	9	4.2	9	6.3
	Iron	ug/l	5,000	1,000	N/A	1,000	2,790	5,140	1,280
	Lead	ug/l	160	17.58	N/A	2.5	2.2	3.8	2
	Mercury	ug/l	0.739	0.91	N/A	0.77	0.2 U	0.2 U	0.2 U
	Nickel	ug/l	1,450	162.5	N/A	52	2.4	11	4.8
	Selenium	ug/l	235.8	5	N/A	5	5 U	5 U	5 U
	Silver	ug/l	35.1	38.1	N/A	3.2	0.4 U	0.4 U	0.4 U
	Zinc	ug/l	420	373.8	N/A	120	10 U	16.2	11.5
General Chemistry									
	pH	su	6.5-8.3	N/A	N/A	N/A	9.94	6.63**	6.63**
	Temperature	deg. C	N/A	N/A	N/A	N/A	11.84	13.3**	13.3**
	Ethanol	ug/l	N/A	N/A	N/A	400	2,000 U [^]	2000 U [^]	2000 U [^]
	Chloride	ug/l	N/A	N/A	N/A	230,000	343,000	412,000	502,000
	Hardness	ug/l	N/A	N/A	N/A	N/A	383,000	139,000	170,000
	Solids, Total Dissolved	ug/l	N/A	N/A	N/A	N/A	870,000	1,200,000	1,400,000
	Solids, Total Suspended	ug/l	30,000	N/A	N/A	30,000	1,300,000	2,200,000	2,100,000
	Cyanide, Dissolved	ug/l	178,000	5.2	N/A	5.2	5 U	5 U	5 U
	Cyanide, Total	ug/l	178,000	5.2	N/A	5.2	5 U	5 U	5 U
	Chlorine, Total Residual	ug/l	200	11	50	50	20 U	20 U	20 U
	Nitrogen, Ammonia	ug/l	N/A	N/A	N/A	100	452	3,440	3,850
	Oil & Grease, Hem-Grav	ug/l	5,000	N/A	N/A	5,000	4,000 U	4,400 U	4,000 U
	TPH, SGT-HEM	ug/l	5,000	N/A	N/A	5,000	4,000 U	4,400 U	4,000 U
	Phenolics, Total	ug/l	1,080	300	N/A	300	30 U	30 U	30 U
	Chromium (III) (Filtered)	ug/l	323	258.8	N/A	74	10 U	12	10 U
	Chromium (III) (Unfiltered)	ug/l	323	258.8	N/A	74	40	215	209
	Chromium, Hexavalent (Filtered)	ug/l	323	11.4	N/A	11	10 U	10 U	10 U
	Chromium, Hexavalent (Unfiltered)	ug/l	323	11.4	N/A	11	10 U	10 U	10 U

**Table 1
Summary of Analytical Results for Groundwater Samples - May and August 2018
MBTA - GLX
Somerville, Medford, Cambridge, Massachusetts**

			LOCATION:			KE210	MW-18	
			SAMPLING DATE:			5/18/2018	8/17/2018	8/17/2018
			LAB SAMPLE ID*:			L1818403-01/ 490-152378-1	L1832437-01/ 490-157808-1	L1832437-02/ 490-157808-2
			RGP for Freshwater ¹			RGP Required Minimum Level ⁴	Field Dup	
Analysis	Analyte	Units	TBEL	WQBEL ²	Compliance Level ³			

Notes:

- ug/L - micrograms per liter.
- su - Standard unit.
- J - Estimated value; detected below quantitation limit.
- NM - Not measured.
- NA - Sample not analyzed for the listed analyte.
- N/A - Not applicable/available.
- ND - Not detected.
- U - Analyte was not detected at specified quantitation limit.
- Values in **bold** indicate the analyte was detected.

Values shown in bold and shaded black exceed the applicable bolded and underlined RGP Effluent Limits.

[^] - Quantitation limit value exceeds the RGP Required Minimum Level.

GC - Gas Chromatography.

MS - Mass Spectrometry.

PAHs - Polycyclic Aromatic Hydrocarbons.

PCBs - Polychlorinated Biphenyls

RGP - EPA Remediation General Permit, Effluent Limits, 2016.

SIM - Selected Ion Monitoring.

TBEL - Technology-Based Effluent Limitation.

WQBEL - Water Quality-Based Effluent Limitation.

* - Lab sample ID for other analysis/ethanol; otherwise, for all the analyses.

** - The sample was collected on November 19, 2018 for pH and temperature.

The above standards apply to discharge to freshwater receiving waters. The RGP contains separate discharge standards for discharges to saltwater receiving waters.

¹ RGP for Freshwater standards are an average monthly discharge limitation in Massachusetts only.

² No Dilution Factor has been applied based on the flow rate of the Miller's River. The WQBEL standards have been modified by the hardness of the Miller's River and the hardness of the groundwater proposed for treatment and discharge.

³ The compliance level is a discharge standard for analytes with detection limits above the RGP discharge standard.

⁴ Additional Resource for Selecting Sufficiently Sensitive Test Methods for RGP Notice of Intent (NOI) Sampling Requirements, Table 1.

Table 2
Summary of Analytical Results for Surface Water Samples - May 2018
MBTA - GLX
Somerville, Medford, Cambridge, Massachusetts

Analysis	Sample ID: Sample Date:	MILLERS RIVER 5/24/2018
Analyte		
Metals, total		
(ug/L)	Antimony	4 U
	Arsenic	1 U
	Cadmium	0.2 U
	Chromium	1 U
	Chromium (III)	10 U
	Chromium (VI)	10 U
	Copper	3.65
	Iron	709
	Lead	1.7
	Mercury	0.2 U
	Nickel	2 U
	Selenium	5 U
	Silver	0.4 U
	Zinc	15.23
General Chemistry		
(ug/L)	Hardness	125,000
	Ammonia as N	296

Notes:

ug/L - micrograms per liter.

U - Analyte was not detected at specified quantitation/detection limit.

Values in **bold** indicate the analyte was detected.

ATTACHMENT D
LABORATORY ANALYTICAL REPORTS



ANALYTICAL REPORT

Lab Number:	L1818403
Client:	TRC Environmental Consultants Wannalancit Mills 650 Suffolk Street Lowell, MA 01854
ATTN:	Matt Oliveira
Phone:	(978) 621-9259
Project Name:	MBTA GLX GW PRE-CHAR
Project Number:	290762.1000.0000
Report Date:	06/12/18

The original project report/data package is held by Alpha Analytical. This report/data package is paginated and should be reproduced only in its entirety. Alpha Analytical holds no responsibility for results and/or data that are not consistent with the original.

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: MBTA GLX GW PRE-CHAR
Project Number: 290762.1000.0000

Lab Number: L1818403
Report Date: 06/12/18

Alpha Sample ID	Client ID	Matrix	Sample Location	Collection Date/Time	Receive Date
L1818403-01	KE210	WATER	SOMERVILLE, MEDFORD, CAMBRIDGE	05/18/18 11:20	05/18/18
L1818403-02	MW11	WATER	SOMERVILLE, MEDFORD, CAMBRIDGE	05/18/18 08:30	05/18/18
L1818403-03	MW11	WATER	SOMERVILLE, MEDFORD, CAMBRIDGE	05/24/18 08:05	05/24/18

Project Name: MBTA GLX GW PRE-CHAR

Lab Number: L1818403

Project Number: 290762.1000.0000

Report Date: 06/12/18

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?	NO
B	Were the analytical method(s) and all associated QC requirements specified in the selected CAM protocol(s) followed?	NO
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).	YES
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)?	NO
H	Were all QC performance standards specified in the CAM protocol(s) achieved?	NO
I	Were results reported for the complete analyte list specified in the selected CAM protocol(s)?	NO

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: MBTA GLX GW PRE-CHAR
Project Number: 290762.1000.0000

Lab Number: L1818403
Report Date: 06/12/18

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: MBTA GLX GW PRE-CHAR
Project Number: 290762.1000.0000

Lab Number: L1818403
Report Date: 06/12/18

Case Narrative (continued)

Report Revision

June 12, 2018: The Volatile Organics by SIM analysis has been amended to include surrogate recoveries.

Report Submission

May 30, 2018: This final report includes the results of all requested analyses.

May 25, 2018: This is a preliminary report.

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.

MCP Related Narratives

Sample Receipt

The analyses performed were specified by the client.

L1818403-02: Containers identified as "MW11" were not received for Pesticides, PCBs and Total Suspended Solids analysis. This was verified by the client. Additional volume for PCBs and Total Suspended Solids was received at the laboratory 05/24/18 and will be reported as L1818403-03.

In reference to question A:

L1818403-01 and -02: The sample was received below the appropriate pH for the Dissolved Cyanide analysis. The laboratory added NaOH to a pH >12.

Volatile Organics

L1818403-01: The sample has elevated detection limits due to the dilution required by the elevated concentrations of target compounds in the sample.

In reference to question B:

At the client's request, the analytical method specified in the CAM protocol was not followed.

In reference to question G:

L1818403-01 and -02: One or more of the target analytes did not achieve the requested CAM reporting limits.

In reference to question H:

Project Name: MBTA GLX GW PRE-CHAR
Project Number: 290762.1000.0000

Lab Number: L1818403
Report Date: 06/12/18

Case Narrative (continued)

The WG1118108-3/-4 LCS/LCSD recoveries, associated with L1818403-01 and -02, are below the individual acceptance criteria 1,2,4-trichlorobenzene (67%/66%), but within the overall method allowances. The results of the associated samples are reported; however, all results are considered to have a potentially low bias for this compound.

Volatile Organics by SIM

L1818403-01: The sample has an elevated detection limit due to the dilution required by the elevated concentrations of non-target compounds in the sample.

In reference to question G:

L1818403-01 and -02: One or more of the target analytes did not achieve the requested CAM reporting limits.

Microextractables

L1818403-01: The sample has an elevated detection limit due to the dilution required by the elevated concentrations of non-target compounds in the sample.

In reference to question B:

At the client's request, the analytical method specified in the CAM protocol was not followed.

In reference to question H:

The WG1117842-2 LCS recovery for 1,2-dibromoethane (75), associated with L1818403-01 and -02, is outside Alpha's acceptance criteria but within the acceptance criteria specified in the method.

Semivolatile Organics

In reference to question B:

At the client's request, the analytical method specified in the CAM protocol was not followed.

In reference to question H:

The WG1119146-2/-3 LCS/LCSD recoveries, associated with L1818403-01 and -02, are below the acceptance criteria for benzidine (6%/1%); however, it has been identified as a "difficult" analyte. The results of the associated samples are reported.

The WG1119146-3 LCSD recovery, associated with L1818403-01 and -02, is below the individual acceptance

Project Name: MBTA GLX GW PRE-CHAR
Project Number: 290762.1000.0000

Lab Number: L1818403
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Case Narrative (continued)

criteria for aniline (39%) but within the overall method allowances. The results of the associated samples are reported; however, all results are considered to have a potentially low bias for this compound.

The WG1119146-2/-3 LCS/LCSD RPD, associated with L1818403-01 and -02, is above the acceptance criteria for benzidine (146%).

EPH

In reference to question I:

All samples were analyzed for a subset of MCP analytes per client request.

PCBs

In reference to question B:

At the client's request, the analytical method specified in the CAM protocol was not followed.

Pesticides

In reference to question B:

At the client's request, the analytical method specified in the CAM protocol was not followed.

Total Metals

In reference to question B:

At the client's request, the analytical method specified in the CAM protocol was not followed.

In reference to question I:

All samples were analyzed for a subset of MCP analytes per client request.

Dissolved Metals

In reference to question B:

At the client's request, the analytical method specified in the CAM protocol was not followed.

In reference to question H:

The WG1118725-2 LCS recovery, associated with L1818403-01 and -02, is above the acceptance criteria for

Project Name: MBTA GLX GW PRE-CHAR
Project Number: 290762.1000.0000

Lab Number: L1818403
Report Date: 06/12/18

Case Narrative (continued)

mercury (126%); however, the associated samples are non-detect to the RL for this target analyte. The results of the original analysis are reported.

The WG1118717-3 MS recovery, performed on L1818403-01, is outside the acceptance criteria for iron (27%). A post digestion spike was performed and was within acceptance criteria.

In reference to question I:

All samples were analyzed for a subset of MCP analytes per client request.

Cyanide

In reference to question B:

At the client's request, the analytical method specified in the CAM protocol was not followed.

Chromium, Hexavalent

In reference to question B:

At the client's request, the analytical method specified in the CAM protocol was not followed.

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:

 Melissa Cripps

Title: Technical Director/Representative

Date: 06/12/18

ORGANICS

VOLATILES

Project Name: MBTA GLX GW PRE-CHAR**Lab Number:** L1818403**Project Number:** 290762.1000.0000**Report Date:** 06/12/18**SAMPLE RESULTS**

Lab ID: L1818403-01 D
 Client ID: KE210
 Sample Location: SOMERVILLE, MEDFORD, CAMBRIDGE

Date Collected: 05/18/18 11:20
 Date Received: 05/18/18
 Field Prep: Field Filtered (Dissolved Metals,SCN,HexCr)

Sample Depth:

Matrix: Water
 Analytical Method: 1,8260C
 Analytical Date: 05/21/18 13:39
 Analyst: MM

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by GC/MS - Westborough Lab						
Methylene chloride	ND		ug/l	150	--	50
1,1-Dichloroethane	360		ug/l	38	--	50
Chloroform	ND		ug/l	38	--	50
Carbon tetrachloride	ND		ug/l	25	--	50
1,2-Dichloropropane	ND		ug/l	88	--	50
Dibromochloromethane	ND		ug/l	25	--	50
1,1,2-Trichloroethane	ND		ug/l	38	--	50
2-Chloroethylvinyl ether	ND		ug/l	500	--	50
Tetrachloroethene	7400		ug/l	25	--	50
Chlorobenzene	ND		ug/l	25	--	50
Trichlorofluoromethane	ND		ug/l	120	--	50
1,2-Dichloroethane	ND		ug/l	25	--	50
1,1,1-Trichloroethane	390		ug/l	25	--	50
Bromodichloromethane	ND		ug/l	25	--	50
trans-1,3-Dichloropropene	ND		ug/l	25	--	50
cis-1,3-Dichloropropene	ND		ug/l	25	--	50
1,1-Dichloropropene	ND		ug/l	120	--	50
Bromoform	ND		ug/l	100	--	50
1,1,1,2,2-Tetrachloroethane	ND		ug/l	25	--	50
Benzene	ND		ug/l	25	--	50
Toluene	ND		ug/l	38	--	50
Ethylbenzene	ND		ug/l	25	--	50
Chloromethane	ND		ug/l	120	--	50
Bromomethane	ND		ug/l	50	--	50
Vinyl chloride	ND		ug/l	50	--	50
Chloroethane	ND		ug/l	50	--	50
1,1-Dichloroethene	480		ug/l	25	--	50
trans-1,2-Dichloroethene	ND		ug/l	38	--	50

Project Name: MBTA GLX GW PRE-CHAR**Lab Number:** L1818403**Project Number:** 290762.1000.0000**Report Date:** 06/12/18**SAMPLE RESULTS**

Lab ID: L1818403-01 D
 Client ID: KE210
 Sample Location: SOMERVILLE, MEDFORD, CAMBRIDGE

Date Collected: 05/18/18 11:20
 Date Received: 05/18/18
 Field Prep: Field Filtered (Dissolved Metals,SCN,HexCr)

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by GC/MS - Westborough Lab						
Trichloroethene	990		ug/l	25	--	50
1,2-Dichlorobenzene	ND		ug/l	120	--	50
1,3-Dichlorobenzene	ND		ug/l	120	--	50
1,4-Dichlorobenzene	ND		ug/l	120	--	50
Methyl tert butyl ether	ND		ug/l	50	--	50
p/m-Xylene	ND		ug/l	50	--	50
o-Xylene	ND		ug/l	50	--	50
cis-1,2-Dichloroethene	ND		ug/l	25	--	50
Dibromomethane	ND		ug/l	250	--	50
1,2,3-Trichloropropane	ND		ug/l	250	--	50
Styrene	ND		ug/l	50	--	50
Dichlorodifluoromethane	ND		ug/l	250	--	50
Acetone	ND		ug/l	250	--	50
Carbon disulfide	ND		ug/l	250	--	50
2-Butanone	ND		ug/l	250	--	50
4-Methyl-2-pentanone	ND		ug/l	250	--	50
2-Hexanone	ND		ug/l	250	--	50
Acrolein	ND		ug/l	250	--	50
Acrylonitrile	ND		ug/l	250	--	50
Bromochloromethane	ND		ug/l	120	--	50
Tetrahydrofuran	ND		ug/l	250	--	50
2,2-Dichloropropane	ND		ug/l	120	--	50
1,3-Dichloropropane	ND		ug/l	120	--	50
1,1,1,2-Tetrachloroethane	ND		ug/l	25	--	50
Bromobenzene	ND		ug/l	120	--	50
n-Butylbenzene	ND		ug/l	25	--	50
sec-Butylbenzene	ND		ug/l	25	--	50
tert-Butylbenzene	ND		ug/l	120	--	50
o-Chlorotoluene	ND		ug/l	120	--	50
p-Chlorotoluene	ND		ug/l	120	--	50
1,2-Dibromo-3-chloropropane	ND		ug/l	120	--	50
Hexachlorobutadiene	ND		ug/l	25	--	50
Isopropylbenzene	ND		ug/l	25	--	50
p-Isopropyltoluene	ND		ug/l	25	--	50
Naphthalene	ND		ug/l	120	--	50
n-Propylbenzene	ND		ug/l	25	--	50
1,2,3-Trichlorobenzene	ND		ug/l	120	--	50

Project Name: MBTA GLX GW PRE-CHAR
Project Number: 290762.1000.0000

Lab Number: L1818403
Report Date: 06/12/18

SAMPLE RESULTS

Lab ID: L1818403-01 D
 Client ID: KE210
 Sample Location: SOMERVILLE, MEDFORD, CAMBRIDGE

Date Collected: 05/18/18 11:20
 Date Received: 05/18/18
 Field Prep: Field Filtered (Dissolved Metals,SCN,HexCr)

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by GC/MS - Westborough Lab						
1,2,4-Trichlorobenzene	ND		ug/l	120	--	50
1,3,5-Trimethylbenzene	ND		ug/l	120	--	50
1,2,4-Trimethylbenzene	ND		ug/l	120	--	50
Ethyl ether	ND		ug/l	120	--	50
Diisopropyl Ether	ND		ug/l	100	--	50
Tert-Butyl Alcohol	ND		ug/l	500	--	50
Ethyl-Tert-Butyl-Ether	ND		ug/l	100	--	50
Tertiary-Amyl Methyl Ether	ND		ug/l	100	--	50

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	106		70-130
Toluene-d8	107		70-130
4-Bromofluorobenzene	119		70-130
Dibromofluoromethane	99		70-130

Project Name: MBTA GLX GW PRE-CHAR
Project Number: 290762.1000.0000

Lab Number: L1818403
Report Date: 06/12/18

SAMPLE RESULTS

Lab ID: L1818403-01 D
 Client ID: KE210
 Sample Location: SOMERVILLE, MEDFORD, CAMBRIDGE

Date Collected: 05/18/18 11:20
 Date Received: 05/18/18
 Field Prep: Field Filtered (Dissolved Metals,SCN,HexCr)

Sample Depth:

Matrix: Water
 Analytical Method: 1,8260C-SIM(M)
 Analytical Date: 05/21/18 13:39
 Analyst: MM

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
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Volatile Organics by GC/MS-SIM - Westborough Lab						
1,4-Dioxane	ND		ug/l	150	--	50

Surrogate	% Recovery	Qualifier	Acceptance Criteria
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1,2-Dichloroethane-d4	115		70-130
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Project Name: MBTA GLX GW PRE-CHAR
Project Number: 290762.1000.0000

Lab Number: L1818403
Report Date: 06/12/18

SAMPLE RESULTS

Lab ID: L1818403-01 D
Client ID: KE210
Sample Location: SOMERVILLE, MEDFORD, CAMBRIDGE

Date Collected: 05/18/18 11:20
Date Received: 05/18/18
Field Prep: Field Filtered (Dissolved Metals,SCN,HexCr)

Sample Depth:
Matrix: Water
Analytical Method: 14,504.1
Analytical Date: 05/21/18 14:02
Analyst: AWS

Extraction Method: EPA 504.1
Extraction Date: 05/21/18 10:40

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
Microextractables by GC - Westborough Lab							
1,2-Dibromoethane	ND		ug/l	0.503	--	50	A

Project Name: MBTA GLX GW PRE-CHAR**Lab Number:** L1818403**Project Number:** 290762.1000.0000**Report Date:** 06/12/18**SAMPLE RESULTS**

Lab ID: L1818403-02
 Client ID: MW11
 Sample Location: SOMERVILLE, MEDFORD, CAMBRIDGE

Date Collected: 05/18/18 08:30
 Date Received: 05/18/18
 Field Prep: Field Filtered (Dissolved Metals,SCN,HexCr)

Sample Depth:

Matrix: Water
 Analytical Method: 1,8260C
 Analytical Date: 05/21/18 13:13
 Analyst: MM

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by GC/MS - Westborough Lab						
Methylene chloride	ND		ug/l	3.0	--	1
1,1-Dichloroethane	ND		ug/l	0.75	--	1
Chloroform	ND		ug/l	0.75	--	1
Carbon tetrachloride	ND		ug/l	0.50	--	1
1,2-Dichloropropane	ND		ug/l	1.8	--	1
Dibromochloromethane	ND		ug/l	0.50	--	1
1,1,2-Trichloroethane	ND		ug/l	0.75	--	1
2-Chloroethylvinyl ether	ND		ug/l	10	--	1
Tetrachloroethene	ND		ug/l	0.50	--	1
Chlorobenzene	ND		ug/l	0.50	--	1
Trichlorofluoromethane	ND		ug/l	2.5	--	1
1,2-Dichloroethane	ND		ug/l	0.50	--	1
1,1,1-Trichloroethane	ND		ug/l	0.50	--	1
Bromodichloromethane	ND		ug/l	0.50	--	1
trans-1,3-Dichloropropene	ND		ug/l	0.50	--	1
cis-1,3-Dichloropropene	ND		ug/l	0.50	--	1
1,1-Dichloropropene	ND		ug/l	2.5	--	1
Bromoform	ND		ug/l	2.0	--	1
1,1,2,2-Tetrachloroethane	ND		ug/l	0.50	--	1
Benzene	ND		ug/l	0.50	--	1
Toluene	ND		ug/l	0.75	--	1
Ethylbenzene	ND		ug/l	0.50	--	1
Chloromethane	ND		ug/l	2.5	--	1
Bromomethane	ND		ug/l	1.0	--	1
Vinyl chloride	ND		ug/l	1.0	--	1
Chloroethane	ND		ug/l	1.0	--	1
1,1-Dichloroethene	ND		ug/l	0.50	--	1
trans-1,2-Dichloroethene	ND		ug/l	0.75	--	1

Project Name: MBTA GLX GW PRE-CHAR**Lab Number:** L1818403**Project Number:** 290762.1000.0000**Report Date:** 06/12/18**SAMPLE RESULTS**

Lab ID: L1818403-02
 Client ID: MW11
 Sample Location: SOMERVILLE, MEDFORD, CAMBRIDGE

Date Collected: 05/18/18 08:30
 Date Received: 05/18/18
 Field Prep: Field Filtered (Dissolved Metals,SCN,HexCr)

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by GC/MS - Westborough Lab						
Trichloroethene	ND		ug/l	0.50	--	1
1,2-Dichlorobenzene	ND		ug/l	2.5	--	1
1,3-Dichlorobenzene	ND		ug/l	2.5	--	1
1,4-Dichlorobenzene	ND		ug/l	2.5	--	1
Methyl tert butyl ether	ND		ug/l	1.0	--	1
p/m-Xylene	ND		ug/l	1.0	--	1
o-Xylene	ND		ug/l	1.0	--	1
cis-1,2-Dichloroethene	ND		ug/l	0.50	--	1
Dibromomethane	ND		ug/l	5.0	--	1
1,2,3-Trichloropropane	ND		ug/l	5.0	--	1
Styrene	ND		ug/l	1.0	--	1
Dichlorodifluoromethane	ND		ug/l	5.0	--	1
Acetone	ND		ug/l	5.0	--	1
Carbon disulfide	ND		ug/l	5.0	--	1
2-Butanone	ND		ug/l	5.0	--	1
4-Methyl-2-pentanone	ND		ug/l	5.0	--	1
2-Hexanone	ND		ug/l	5.0	--	1
Acrolein	ND		ug/l	5.0	--	1
Acrylonitrile	ND		ug/l	5.0	--	1
Bromochloromethane	ND		ug/l	2.5	--	1
Tetrahydrofuran	ND		ug/l	5.0	--	1
2,2-Dichloropropane	ND		ug/l	2.5	--	1
1,3-Dichloropropane	ND		ug/l	2.5	--	1
1,1,1,2-Tetrachloroethane	ND		ug/l	0.50	--	1
Bromobenzene	ND		ug/l	2.5	--	1
n-Butylbenzene	ND		ug/l	0.50	--	1
sec-Butylbenzene	ND		ug/l	0.50	--	1
tert-Butylbenzene	ND		ug/l	2.5	--	1
o-Chlorotoluene	ND		ug/l	2.5	--	1
p-Chlorotoluene	ND		ug/l	2.5	--	1
1,2-Dibromo-3-chloropropane	ND		ug/l	2.5	--	1
Hexachlorobutadiene	ND		ug/l	0.50	--	1
Isopropylbenzene	ND		ug/l	0.50	--	1
p-Isopropyltoluene	ND		ug/l	0.50	--	1
Naphthalene	ND		ug/l	2.5	--	1
n-Propylbenzene	ND		ug/l	0.50	--	1
1,2,3-Trichlorobenzene	ND		ug/l	2.5	--	1

Project Name: MBTA GLX GW PRE-CHAR
Project Number: 290762.1000.0000

Lab Number: L1818403
Report Date: 06/12/18

SAMPLE RESULTS

Lab ID: L1818403-02
Client ID: MW11
Sample Location: SOMERVILLE, MEDFORD, CAMBRIDGE

Date Collected: 05/18/18 08:30
Date Received: 05/18/18
Field Prep: Field Filtered (Dissolved Metals,SCN,HexCr)

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by GC/MS - Westborough Lab						
1,2,4-Trichlorobenzene	ND		ug/l	2.5	--	1
1,3,5-Trimethylbenzene	ND		ug/l	2.5	--	1
1,2,4-Trimethylbenzene	ND		ug/l	2.5	--	1
Ethyl ether	ND		ug/l	2.5	--	1
Diisopropyl Ether	ND		ug/l	2.0	--	1
Tert-Butyl Alcohol	ND		ug/l	10	--	1
Ethyl-Tert-Butyl-Ether	ND		ug/l	2.0	--	1
Tertiary-Amyl Methyl Ether	ND		ug/l	2.0	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	107		70-130
Toluene-d8	106		70-130
4-Bromofluorobenzene	116		70-130
Dibromofluoromethane	96		70-130

Project Name: MBTA GLX GW PRE-CHAR
Project Number: 290762.1000.0000

Lab Number: L1818403
Report Date: 06/12/18

SAMPLE RESULTS

Lab ID: L1818403-02
 Client ID: MW11
 Sample Location: SOMERVILLE, MEDFORD, CAMBRIDGE

Date Collected: 05/18/18 08:30
 Date Received: 05/18/18
 Field Prep: Field Filtered (Dissolved Metals,SCN,HexCr)

Sample Depth:
 Matrix: Water
 Analytical Method: 1,8260C-SIM(M)
 Analytical Date: 05/21/18 13:13
 Analyst: MM

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by GC/MS-SIM - Westborough Lab						
1,4-Dioxane	ND		ug/l	3.0	--	1
Surrogate			% Recovery	Qualifier	Acceptance Criteria	
1,2-Dichloroethane-d4			112		70-130	

Project Name: MBTA GLX GW PRE-CHAR
Project Number: 290762.1000.0000

Lab Number: L1818403
Report Date: 06/12/18

SAMPLE RESULTS

Lab ID: L1818403-02
 Client ID: MW11
 Sample Location: SOMERVILLE, MEDFORD, CAMBRIDGE

Date Collected: 05/18/18 08:30
 Date Received: 05/18/18
 Field Prep: Field Filtered (Dissolved Metals,SCN,HexCr)

Sample Depth:
 Matrix: Water
 Analytical Method: 14,504.1
 Analytical Date: 05/21/18 13:30
 Analyst: AWS

Extraction Method: EPA 504.1
 Extraction Date: 05/21/18 10:40

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

Project Name: MBTA GLX GW PRE-CHAR**Lab Number:** L1818403**Project Number:** 290762.1000.0000**Report Date:** 06/12/18**Method Blank Analysis
Batch Quality Control****Analytical Method:** 14,504.1
Analytical Date: 05/21/18 11:22
Analyst: AWS**Extraction Method:** EPA 504.1
Extraction Date: 05/21/18 10:40

Parameter	Result	Qualifier	Units	RL	MDL
Microextractables by GC - Westborough Lab for sample(s): 01-02 Batch: WG1117842-1					
1,2-Dibromoethane	ND		ug/l	0.010	-- A

Project Name: MBTA GLX GW PRE-CHAR

Lab Number: L1818403

Project Number: 290762.1000.0000

Report Date: 06/12/18

**Method Blank Analysis
Batch Quality Control**

Analytical Method: 1,8260C-SIM(M)

Analytical Date: 05/21/18 07:37

Analyst: MM

Parameter	Result	Qualifier	Units	RL	MDL
Volatile Organics by GC/MS-SIM - Westborough Lab for sample(s): 01-02 Batch: WG1118102-5					
1,4-Dioxane	ND		ug/l	3.0	--

Surrogate	%Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	113		70-130

Project Name: MBTA GLX GW PRE-CHAR
Project Number: 290762.1000.0000

Lab Number: L1818403
Report Date: 06/12/18

Method Blank Analysis
Batch Quality Control

Analytical Method: 1,8260C
Analytical Date: 05/21/18 07:37
Analyst: MM

Parameter	Result	Qualifier	Units	RL	MDL
Volatile Organics by GC/MS - Westborough Lab for sample(s): 01-02 Batch: WG1118108-5					
Methylene chloride	ND		ug/l	3.0	--
1,1-Dichloroethane	ND		ug/l	0.75	--
Chloroform	ND		ug/l	0.75	--
Carbon tetrachloride	ND		ug/l	0.50	--
1,2-Dichloropropane	ND		ug/l	1.8	--
Dibromochloromethane	ND		ug/l	0.50	--
1,1,2-Trichloroethane	ND		ug/l	0.75	--
2-Chloroethylvinyl ether	ND		ug/l	10	--
Tetrachloroethene	ND		ug/l	0.50	--
Chlorobenzene	ND		ug/l	0.50	--
Trichlorofluoromethane	ND		ug/l	2.5	--
1,2-Dichloroethane	ND		ug/l	0.50	--
1,1,1-Trichloroethane	ND		ug/l	0.50	--
Bromodichloromethane	ND		ug/l	0.50	--
trans-1,3-Dichloropropene	ND		ug/l	0.50	--
cis-1,3-Dichloropropene	ND		ug/l	0.50	--
1,1-Dichloropropene	ND		ug/l	2.5	--
Bromoform	ND		ug/l	2.0	--
1,1,2,2-Tetrachloroethane	ND		ug/l	0.50	--
Benzene	ND		ug/l	0.50	--
Toluene	ND		ug/l	0.75	--
Ethylbenzene	ND		ug/l	0.50	--
Chloromethane	ND		ug/l	2.5	--
Bromomethane	ND		ug/l	1.0	--
Vinyl chloride	ND		ug/l	1.0	--
Chloroethane	ND		ug/l	1.0	--
1,1-Dichloroethene	ND		ug/l	0.50	--
trans-1,2-Dichloroethene	ND		ug/l	0.75	--
Trichloroethene	ND		ug/l	0.50	--

Project Name: MBTA GLX GW PRE-CHAR
Project Number: 290762.1000.0000

Lab Number: L1818403
Report Date: 06/12/18

**Method Blank Analysis
Batch Quality Control**

Analytical Method: 1,8260C
Analytical Date: 05/21/18 07:37
Analyst: MM

Parameter	Result	Qualifier	Units	RL	MDL
Volatile Organics by GC/MS - Westborough Lab for sample(s): 01-02 Batch: WG1118108-5					
1,2-Dichlorobenzene	ND		ug/l	2.5	--
1,3-Dichlorobenzene	ND		ug/l	2.5	--
1,4-Dichlorobenzene	ND		ug/l	2.5	--
Methyl tert butyl ether	ND		ug/l	1.0	--
p/m-Xylene	ND		ug/l	1.0	--
o-Xylene	ND		ug/l	1.0	--
cis-1,2-Dichloroethene	ND		ug/l	0.50	--
Dibromomethane	ND		ug/l	5.0	--
1,2,3-Trichloropropane	ND		ug/l	5.0	--
Styrene	ND		ug/l	1.0	--
Dichlorodifluoromethane	ND		ug/l	5.0	--
Acetone	ND		ug/l	5.0	--
Carbon disulfide	ND		ug/l	5.0	--
2-Butanone	ND		ug/l	5.0	--
4-Methyl-2-pentanone	ND		ug/l	5.0	--
2-Hexanone	ND		ug/l	5.0	--
Acrolein	ND		ug/l	5.0	--
Acrylonitrile	ND		ug/l	5.0	--
Bromochloromethane	ND		ug/l	2.5	--
Tetrahydrofuran	ND		ug/l	5.0	--
2,2-Dichloropropane	ND		ug/l	2.5	--
1,3-Dichloropropane	ND		ug/l	2.5	--
1,1,1,2-Tetrachloroethane	ND		ug/l	0.50	--
Bromobenzene	ND		ug/l	2.5	--
n-Butylbenzene	ND		ug/l	0.50	--
sec-Butylbenzene	ND		ug/l	0.50	--
tert-Butylbenzene	ND		ug/l	2.5	--
o-Chlorotoluene	ND		ug/l	2.5	--
p-Chlorotoluene	ND		ug/l	2.5	--

Project Name: MBTA GLX GW PRE-CHAR

Lab Number: L1818403

Project Number: 290762.1000.0000

Report Date: 06/12/18

**Method Blank Analysis
Batch Quality Control**

Analytical Method: 1,8260C
 Analytical Date: 05/21/18 07:37
 Analyst: MM

Parameter	Result	Qualifier	Units	RL	MDL
Volatile Organics by GC/MS - Westborough Lab for sample(s): 01-02 Batch: WG1118108-5					
1,2-Dibromo-3-chloropropane	ND		ug/l	2.5	--
Hexachlorobutadiene	ND		ug/l	0.50	--
Isopropylbenzene	ND		ug/l	0.50	--
p-Isopropyltoluene	ND		ug/l	0.50	--
Naphthalene	ND		ug/l	2.5	--
n-Propylbenzene	ND		ug/l	0.50	--
1,2,3-Trichlorobenzene	ND		ug/l	2.5	--
1,2,4-Trichlorobenzene	ND		ug/l	2.5	--
1,3,5-Trimethylbenzene	ND		ug/l	2.5	--
1,2,4-Trimethylbenzene	ND		ug/l	2.5	--
Ethyl ether	ND		ug/l	2.5	--
Diisopropyl Ether	ND		ug/l	2.0	--
Tert-Butyl Alcohol	ND		ug/l	10	--
Ethyl-Tert-Butyl-Ether	ND		ug/l	2.0	--
Tertiary-Amyl Methyl Ether	ND		ug/l	2.0	--

Surrogate	%Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	107		70-130
Toluene-d8	107		70-130
4-Bromofluorobenzene	120		70-130
Dibromofluoromethane	95		70-130

Lab Control Sample Analysis

Batch Quality Control

Project Name: MBTA GLX GW PRE-CHAR

Lab Number: L1818403

Project Number: 290762.1000.0000

Report Date: 06/12/18

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits	Column
Microextractables by GC - Westborough Lab Associated sample(s): 01-02 Batch: WG1117842-2									
1,2-Dibromoethane	75	Q	-		80-120	-			A

Lab Control Sample Analysis

Batch Quality Control

Project Name: MBTA GLX GW PRE-CHAR

Lab Number: L1818403

Project Number: 290762.1000.0000

Report Date: 06/12/18

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Volatile Organics by GC/MS-SIM - Westborough Lab Associated sample(s): 01-02 Batch: WG1118102-3 WG1118102-4								
1,4-Dioxane	92		88		70-130	4		25

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
1,2-Dichloroethane-d4	113		110		70-130

Lab Control Sample Analysis

Batch Quality Control

Project Name: MBTA GLX GW PRE-CHAR

Lab Number: L1818403

Project Number: 290762.1000.0000

Report Date: 06/12/18

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Volatile Organics by GC/MS - Westborough Lab Associated sample(s): 01-02 Batch: WG1118108-3 WG1118108-4								
Methylene chloride	100		100		70-130	0		20
1,1-Dichloroethane	120		120		70-130	0		20
Chloroform	99		100		70-130	1		20
Carbon tetrachloride	90		89		63-132	1		20
1,2-Dichloropropane	110		110		70-130	0		20
Dibromochloromethane	86		89		63-130	3		20
1,1,2-Trichloroethane	100		110		70-130	10		20
2-Chloroethylvinyl ether	98		100		70-130	2		20
Tetrachloroethene	78		77		70-130	1		20
Chlorobenzene	90		92		75-130	2		25
Trichlorofluoromethane	86		86		62-150	0		20
1,2-Dichloroethane	100		100		70-130	0		20
1,1,1-Trichloroethane	93		95		67-130	2		20
Bromodichloromethane	99		99		67-130	0		20
trans-1,3-Dichloropropene	99		100		70-130	1		20
cis-1,3-Dichloropropene	99		100		70-130	1		20
1,1-Dichloropropene	100		100		70-130	0		20
Bromoform	74		74		54-136	0		20
1,1,1,2-Tetrachloroethane	110		120		67-130	9		20
Benzene	100		100		70-130	0		25
Toluene	97		99		70-130	2		25
Ethylbenzene	94		97		70-130	3		20
Chloromethane	110		110		64-130	0		20

Lab Control Sample Analysis

Batch Quality Control

Project Name: MBTA GLX GW PRE-CHAR

Lab Number: L1818403

Project Number: 290762.1000.0000

Report Date: 06/12/18

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Volatile Organics by GC/MS - Westborough Lab Associated sample(s): 01-02 Batch: WG1118108-3 WG1118108-4								
Bromomethane	100		99		39-139	1		20
Vinyl chloride	110		110		55-140	0		20
Chloroethane	110		110		55-138	0		20
1,1-Dichloroethene	100		100		61-145	0		25
trans-1,2-Dichloroethene	96		92		70-130	4		20
Trichloroethene	99		98		70-130	1		25
1,2-Dichlorobenzene	88		91		70-130	3		20
1,3-Dichlorobenzene	86		86		70-130	0		20
1,4-Dichlorobenzene	88		89		70-130	1		20
Methyl tert butyl ether	97		100		63-130	3		20
p/m-Xylene	90		95		70-130	5		20
o-Xylene	90		90		70-130	0		20
cis-1,2-Dichloroethene	94		94		70-130	0		20
Dibromomethane	92		91		70-130	1		20
1,2,3-Trichloropropane	110		120		64-130	9		20
Styrene	85		85		70-130	0		20
Dichlorodifluoromethane	84		81		36-147	4		20
Acetone	100		110		58-148	10		20
Carbon disulfide	100		100		51-130	0		20
2-Butanone	110		120		63-138	9		20
4-Methyl-2-pentanone	93		96		59-130	3		20
2-Hexanone	100		110		57-130	10		20
Acrolein	110		120		70-130	9		20

Lab Control Sample Analysis

Batch Quality Control

Project Name: MBTA GLX GW PRE-CHAR

Lab Number: L1818403

Project Number: 290762.1000.0000

Report Date: 06/12/18

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Volatile Organics by GC/MS - Westborough Lab Associated sample(s): 01-02 Batch: WG1118108-3 WG1118108-4								
Acrylonitrile	110		110		70-130	0		20
Bromochloromethane	89		88		70-130	1		20
Tetrahydrofuran	110		120		58-130	9		20
2,2-Dichloropropane	120		120		63-133	0		20
1,3-Dichloropropane	110		110		70-130	0		20
1,1,1,2-Tetrachloroethane	83		86		64-130	4		20
Bromobenzene	88		89		70-130	1		20
n-Butylbenzene	90		91		53-136	1		20
sec-Butylbenzene	97		99		70-130	2		20
tert-Butylbenzene	98		100		70-130	2		20
o-Chlorotoluene	100		100		70-130	0		20
p-Chlorotoluene	100		100		70-130	0		20
1,2-Dibromo-3-chloropropane	77		82		41-144	6		20
Hexachlorobutadiene	83		76		63-130	9		20
Isopropylbenzene	99		99		70-130	0		20
p-Isopropyltoluene	80		82		70-130	2		20
Naphthalene	85		88		70-130	3		20
n-Propylbenzene	100		100		69-130	0		20
1,2,3-Trichlorobenzene	77		80		70-130	4		20
1,2,4-Trichlorobenzene	67	Q	66	Q	70-130	2		20
1,3,5-Trimethylbenzene	96		97		64-130	1		20
1,2,4-Trimethylbenzene	96		97		70-130	1		20
Ethyl ether	100		100		59-134	0		20

Lab Control Sample Analysis

Batch Quality Control

Project Name: MBTA GLX GW PRE-CHAR

Lab Number: L1818403

Project Number: 290762.1000.0000

Report Date: 06/12/18

Parameter	LCS		LCSD		%Recovery Limits	RPD	RPD	
	%Recovery	Qual	%Recovery	Qual			Qual	Limits
Volatile Organics by GC/MS - Westborough Lab Associated sample(s): 01-02 Batch: WG1118108-3 WG1118108-4								
Diisopropyl Ether	120		120		70-130	0		20
Tert-Butyl Alcohol	104		110		70-130	6		20
Ethyl-Tert-Butyl-Ether	100		100		70-130	0		20
Tertiary-Amyl Methyl Ether	93		95		66-130	2		20

Surrogate	LCS		LCSD		Acceptance Criteria
	%Recovery	Qual	%Recovery	Qual	
1,2-Dichloroethane-d4	105		103		70-130
Toluene-d8	104		108		70-130
4-Bromofluorobenzene	116		117		70-130
Dibromofluoromethane	92		92		70-130

Matrix Spike Analysis

Batch Quality Control

Project Name: MBTA GLX GW PRE-CHAR

Lab Number: L1818403

Project Number: 290762.1000.0000

Report Date: 06/12/18

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): 01-02 QC Batch ID: WG1117842-3 QC Sample: L1818203-01 Client ID: MS Sample													
1,2-Dibromoethane	ND	0.252	0.226	90		-	-		80-120	-		20	A
1,2-Dibromo-3-chloropropane	ND	0.252	0.219	87		-	-		80-120	-		20	A

SEMIVOLATILES

Project Name: MBTA GLX GW PRE-CHAR**Lab Number:** L1818403**Project Number:** 290762.1000.0000**Report Date:** 06/12/18**SAMPLE RESULTS**

Lab ID: L1818403-01
 Client ID: KE210
 Sample Location: SOMERVILLE, MEDFORD, CAMBRIDGE

Date Collected: 05/18/18 11:20
 Date Received: 05/18/18
 Field Prep: Field Filtered (Dissolved Metals,SCN,HexCr)

Sample Depth:

Matrix: Water
 Analytical Method: 1,8270D
 Analytical Date: 05/24/18 20:00
 Analyst: SZ

Extraction Method: EPA 3510C
 Extraction Date: 05/24/18 10:32

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Semivolatile Organics by GC/MS - Westborough Lab						
Benzidine	ND		ug/l	20	--	1
1,2,4-Trichlorobenzene	ND		ug/l	5.0	--	1
Bis(2-chloroethyl)ether	ND		ug/l	2.0	--	1
1,2-Dichlorobenzene	ND		ug/l	2.0	--	1
1,3-Dichlorobenzene	ND		ug/l	2.0	--	1
1,4-Dichlorobenzene	ND		ug/l	2.0	--	1
3,3'-Dichlorobenzidine	ND		ug/l	5.0	--	1
2,4-Dinitrotoluene	ND		ug/l	5.0	--	1
2,6-Dinitrotoluene	ND		ug/l	5.0	--	1
Azobenzene	ND		ug/l	2.0	--	1
4-Bromophenyl phenyl ether	ND		ug/l	2.0	--	1
Bis(2-chloroisopropyl)ether	ND		ug/l	2.0	--	1
Bis(2-chloroethoxy)methane	ND		ug/l	5.0	--	1
Hexachlorocyclopentadiene	ND		ug/l	20	--	1
Isophorone	ND		ug/l	5.0	--	1
Nitrobenzene	ND		ug/l	2.0	--	1
NDPA/DPA	ND		ug/l	2.0	--	1
n-Nitrosodi-n-propylamine	ND		ug/l	5.0	--	1
Bis(2-ethylhexyl)phthalate	ND		ug/l	3.0	--	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
Aniline	ND		ug/l	2.0	--	1
4-Chloroaniline	ND		ug/l	5.0	--	1
Dibenzofuran	ND		ug/l	2.0	--	1
Acetophenone	ND		ug/l	5.0	--	1

Project Name: MBTA GLX GW PRE-CHAR
Project Number: 290762.1000.0000

Lab Number: L1818403
Report Date: 06/12/18

SAMPLE RESULTS

Lab ID: L1818403-01
Client ID: KE210
Sample Location: SOMERVILLE, MEDFORD, CAMBRIDGE

Date Collected: 05/18/18 11:20
Date Received: 05/18/18
Field Prep: Field Filtered (Dissolved Metals,SCN,HexCr)

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Semivolatile Organics by GC/MS - Westborough Lab						
n-Nitrosodimethylamine	ND		ug/l	2.0	--	1
2,4,6-Trichlorophenol	ND		ug/l	5.0	--	1
p-Chloro-m-cresol	ND		ug/l	2.0	--	1
2-Chlorophenol	ND		ug/l	2.0	--	1
2,4-Dichlorophenol	ND		ug/l	5.0	--	1
2,4-Dimethylphenol	ND		ug/l	5.0	--	1
2-Nitrophenol	ND		ug/l	10	--	1
4-Nitrophenol	ND		ug/l	10	--	1
2,4-Dinitrophenol	ND		ug/l	20	--	1
Phenol	ND		ug/l	5.0	--	1
2-Methylphenol	ND		ug/l	5.0	--	1
3-Methylphenol/4-Methylphenol	ND		ug/l	5.0	--	1
2,4,5-Trichlorophenol	ND		ug/l	5.0	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Fluorophenol	40		21-120
Phenol-d6	28		10-120
Nitrobenzene-d5	70		23-120
2-Fluorobiphenyl	75		15-120
2,4,6-Tribromophenol	68		10-120
4-Terphenyl-d14	77		41-149

Project Name: MBTA GLX GW PRE-CHAR
Project Number: 290762.1000.0000

Lab Number: L1818403
Report Date: 06/12/18

SAMPLE RESULTS

Lab ID: L1818403-01
Client ID: KE210
Sample Location: SOMERVILLE, MEDFORD, CAMBRIDGE

Date Collected: 05/18/18 11:20
Date Received: 05/18/18
Field Prep: Field Filtered (Dissolved Metals,SCN,HexCr)

Sample Depth:

Matrix: Water
Analytical Method: 1,8270D-SIM
Analytical Date: 05/20/18 17:11
Analyst: KL

Extraction Method: EPA 3510C
Extraction Date: 05/20/18 02:44

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Semivolatile Organics by GC/MS-SIM - Westborough Lab						
Acenaphthene	ND		ug/l	0.10	--	1
2-Chloronaphthalene	ND		ug/l	0.20	--	1
Fluoranthene	ND		ug/l	0.10	--	1
Hexachlorobutadiene	ND		ug/l	0.50	--	1
Naphthalene	ND		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
2-Methylnaphthalene	ND		ug/l	0.10	--	1
Pentachlorophenol	ND		ug/l	0.80	--	1
Hexachlorobenzene	ND		ug/l	0.80	--	1
Hexachloroethane	ND		ug/l	0.80	--	1

Project Name: MBTA GLX GW PRE-CHAR**Lab Number:** L1818403**Project Number:** 290762.1000.0000**Report Date:** 06/12/18**SAMPLE RESULTS**

Lab ID: L1818403-01

Date Collected: 05/18/18 11:20

Client ID: KE210

Date Received: 05/18/18

Sample Location: SOMERVILLE, MEDFORD, CAMBRIDGE

Field Prep: Field Filtered (Dissolved Metals,SCN,HexCr)

Sample Depth:

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

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Fluorophenol	27		21-120
Phenol-d6	18		10-120
Nitrobenzene-d5	47		23-120
2-Fluorobiphenyl	65		15-120
2,4,6-Tribromophenol	67		10-120
4-Terphenyl-d14	68		41-149

Project Name: MBTA GLX GW PRE-CHAR**Lab Number:** L1818403**Project Number:** 290762.1000.0000**Report Date:** 06/12/18**SAMPLE RESULTS**

Lab ID: L1818403-02
 Client ID: MW11
 Sample Location: SOMERVILLE, MEDFORD, CAMBRIDGE

Date Collected: 05/18/18 08:30
 Date Received: 05/18/18
 Field Prep: Field Filtered (Dissolved Metals,SCN,HexCr)

Sample Depth:

Matrix: Water
 Analytical Method: 1,8270D
 Analytical Date: 05/24/18 20:26
 Analyst: SZ

Extraction Method: EPA 3510C
 Extraction Date: 05/24/18 10:32

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Semivolatile Organics by GC/MS - Westborough Lab						
Benzidine	ND		ug/l	20	--	1
1,2,4-Trichlorobenzene	ND		ug/l	5.0	--	1
Bis(2-chloroethyl)ether	ND		ug/l	2.0	--	1
1,2-Dichlorobenzene	ND		ug/l	2.0	--	1
1,3-Dichlorobenzene	ND		ug/l	2.0	--	1
1,4-Dichlorobenzene	ND		ug/l	2.0	--	1
3,3'-Dichlorobenzidine	ND		ug/l	5.0	--	1
2,4-Dinitrotoluene	ND		ug/l	5.0	--	1
2,6-Dinitrotoluene	ND		ug/l	5.0	--	1
Azobenzene	ND		ug/l	2.0	--	1
4-Bromophenyl phenyl ether	ND		ug/l	2.0	--	1
Bis(2-chloroisopropyl)ether	ND		ug/l	2.0	--	1
Bis(2-chloroethoxy)methane	ND		ug/l	5.0	--	1
Hexachlorocyclopentadiene	ND		ug/l	20	--	1
Isophorone	ND		ug/l	5.0	--	1
Nitrobenzene	ND		ug/l	2.0	--	1
NDPA/DPA	ND		ug/l	2.0	--	1
n-Nitrosodi-n-propylamine	ND		ug/l	5.0	--	1
Bis(2-ethylhexyl)phthalate	ND		ug/l	3.0	--	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
Aniline	ND		ug/l	2.0	--	1
4-Chloroaniline	ND		ug/l	5.0	--	1
Dibenzofuran	ND		ug/l	2.0	--	1
Acetophenone	ND		ug/l	5.0	--	1

Project Name: MBTA GLX GW PRE-CHAR
Project Number: 290762.1000.0000

Lab Number: L1818403
Report Date: 06/12/18

SAMPLE RESULTS

Lab ID: L1818403-02
 Client ID: MW11
 Sample Location: SOMERVILLE, MEDFORD, CAMBRIDGE

Date Collected: 05/18/18 08:30
 Date Received: 05/18/18
 Field Prep: Field Filtered (Dissolved Metals,SCN,HexCr)

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Semivolatile Organics by GC/MS - Westborough Lab						
n-Nitrosodimethylamine	ND		ug/l	2.0	--	1
2,4,6-Trichlorophenol	ND		ug/l	5.0	--	1
p-Chloro-m-cresol	ND		ug/l	2.0	--	1
2-Chlorophenol	ND		ug/l	2.0	--	1
2,4-Dichlorophenol	ND		ug/l	5.0	--	1
2,4-Dimethylphenol	ND		ug/l	5.0	--	1
2-Nitrophenol	ND		ug/l	10	--	1
4-Nitrophenol	ND		ug/l	10	--	1
2,4-Dinitrophenol	ND		ug/l	20	--	1
Phenol	ND		ug/l	5.0	--	1
2-Methylphenol	ND		ug/l	5.0	--	1
3-Methylphenol/4-Methylphenol	ND		ug/l	5.0	--	1
2,4,5-Trichlorophenol	ND		ug/l	5.0	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Fluorophenol	48		21-120
Phenol-d6	34		10-120
Nitrobenzene-d5	75		23-120
2-Fluorobiphenyl	81		15-120
2,4,6-Tribromophenol	85		10-120
4-Terphenyl-d14	86		41-149

Project Name: MBTA GLX GW PRE-CHAR
Project Number: 290762.1000.0000

Lab Number: L1818403
Report Date: 06/12/18

SAMPLE RESULTS

Lab ID: L1818403-02
Client ID: MW11
Sample Location: SOMERVILLE, MEDFORD, CAMBRIDGE

Date Collected: 05/18/18 08:30
Date Received: 05/18/18
Field Prep: Field Filtered (Dissolved Metals,SCN,HexCr)

Sample Depth:
Matrix: Water
Analytical Method: 1,8270D-SIM
Analytical Date: 05/20/18 17:37
Analyst: KL

Extraction Method: EPA 3510C
Extraction Date: 05/20/18 02:44

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Semivolatile Organics by GC/MS-SIM - Westborough Lab						
Acenaphthene	ND		ug/l	0.10	--	1
2-Chloronaphthalene	ND		ug/l	0.20	--	1
Fluoranthene	ND		ug/l	0.10	--	1
Hexachlorobutadiene	ND		ug/l	0.50	--	1
Naphthalene	ND		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
2-Methylnaphthalene	ND		ug/l	0.10	--	1
Pentachlorophenol	ND		ug/l	0.80	--	1
Hexachlorobenzene	ND		ug/l	0.80	--	1
Hexachloroethane	ND		ug/l	0.80	--	1

Project Name: MBTA GLX GW PRE-CHAR**Lab Number:** L1818403**Project Number:** 290762.1000.0000**Report Date:** 06/12/18**SAMPLE RESULTS**

Lab ID: L1818403-02

Date Collected: 05/18/18 08:30

Client ID: MW11

Date Received: 05/18/18

Sample Location: SOMERVILLE, MEDFORD, CAMBRIDGE

Field Prep: Field Filtered (Dissolved Metals,SCN,HexCr)

Sample Depth:

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

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Fluorophenol	30		21-120
Phenol-d6	19		10-120
Nitrobenzene-d5	46		23-120
2-Fluorobiphenyl	64		15-120
2,4,6-Tribromophenol	63		10-120
4-Terphenyl-d14	59		41-149

Project Name: MBTA GLX GW PRE-CHAR
Project Number: 290762.1000.0000

Lab Number: L1818403
Report Date: 06/12/18

Method Blank Analysis
Batch Quality Control

Analytical Method: 1,8270D-SIM
Analytical Date: 05/21/18 09:37
Analyst: KL

Extraction Method: EPA 3510C
Extraction Date: 05/19/18 15:21

Parameter	Result	Qualifier	Units	RL	MDL
Semivolatile Organics by GC/MS-SIM - Westborough Lab for sample(s): 01-02 Batch: WG1117614-1					
Acenaphthene	ND		ug/l	0.10	--
2-Chloronaphthalene	ND		ug/l	0.20	--
Fluoranthene	ND		ug/l	0.10	--
Hexachlorobutadiene	ND		ug/l	0.50	--
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	--
2-Methylnaphthalene	ND		ug/l	0.10	--
Pentachlorophenol	ND		ug/l	0.80	--
Hexachlorobenzene	ND		ug/l	0.80	--
Hexachloroethane	ND		ug/l	0.80	--

Project Name: MBTA GLX GW PRE-CHAR**Lab Number:** L1818403**Project Number:** 290762.1000.0000**Report Date:** 06/12/18**Method Blank Analysis
Batch Quality Control**

Analytical Method: 1,8270D-SIM
 Analytical Date: 05/21/18 09:37
 Analyst: KL

Extraction Method: EPA 3510C
 Extraction Date: 05/19/18 15:21

Parameter	Result	Qualifier	Units	RL	MDL
Semivolatile Organics by GC/MS-SIM - Westborough Lab for sample(s): 01-02 Batch: WG1117614-1					

Surrogate	%Recovery	Qualifier	Acceptance Criteria
2-Fluorophenol	48		21-120
Phenol-d6	34		10-120
Nitrobenzene-d5	74		23-120
2-Fluorobiphenyl	81		15-120
2,4,6-Tribromophenol	101		10-120
4-Terphenyl-d14	77		41-149

Project Name: MBTA GLX GW PRE-CHAR
Project Number: 290762.1000.0000

Lab Number: L1818403
Report Date: 06/12/18

Method Blank Analysis
Batch Quality Control

Analytical Method: 1,8270D
Analytical Date: 05/24/18 13:22
Analyst: ALS

Extraction Method: EPA 3510C
Extraction Date: 05/23/18 18:24

Parameter	Result	Qualifier	Units	RL	MDL
Semivolatile Organics by GC/MS - Westborough Lab for sample(s): 01-02 Batch: WG1119146-1					
Benzidine	ND		ug/l	20	--
1,2,4-Trichlorobenzene	ND		ug/l	5.0	--
Bis(2-chloroethyl)ether	ND		ug/l	2.0	--
1,2-Dichlorobenzene	ND		ug/l	2.0	--
1,3-Dichlorobenzene	ND		ug/l	2.0	--
1,4-Dichlorobenzene	ND		ug/l	2.0	--
3,3'-Dichlorobenzidine	ND		ug/l	5.0	--
2,4-Dinitrotoluene	ND		ug/l	5.0	--
2,6-Dinitrotoluene	ND		ug/l	5.0	--
Azobenzene	ND		ug/l	2.0	--
4-Bromophenyl phenyl ether	ND		ug/l	2.0	--
Bis(2-chloroisopropyl)ether	ND		ug/l	2.0	--
Bis(2-chloroethoxy)methane	ND		ug/l	5.0	--
Hexachlorocyclopentadiene	ND		ug/l	20	--
Isophorone	ND		ug/l	5.0	--
Nitrobenzene	ND		ug/l	2.0	--
NDPA/DPA	ND		ug/l	2.0	--
n-Nitrosodi-n-propylamine	ND		ug/l	5.0	--
Bis(2-ethylhexyl)phthalate	ND		ug/l	3.0	--
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	--
Aniline	ND		ug/l	2.0	--
4-Chloroaniline	ND		ug/l	5.0	--
Dibenzofuran	ND		ug/l	2.0	--
Acetophenone	ND		ug/l	5.0	--
n-Nitrosodimethylamine	ND		ug/l	2.0	--

Project Name: MBTA GLX GW PRE-CHAR
Project Number: 290762.1000.0000

Lab Number: L1818403
Report Date: 06/12/18

**Method Blank Analysis
Batch Quality Control**

Analytical Method: 1,8270D
Analytical Date: 05/24/18 13:22
Analyst: ALS

Extraction Method: EPA 3510C
Extraction Date: 05/23/18 18:24

Parameter	Result	Qualifier	Units	RL	MDL
Semivolatile Organics by GC/MS - Westborough Lab for sample(s): 01-02 Batch: WG1119146-1					
2,4,6-Trichlorophenol	ND		ug/l	5.0	--
p-Chloro-m-cresol	ND		ug/l	2.0	--
2-Chlorophenol	ND		ug/l	2.0	--
2,4-Dichlorophenol	ND		ug/l	5.0	--
2,4-Dimethylphenol	ND		ug/l	5.0	--
2-Nitrophenol	ND		ug/l	10	--
4-Nitrophenol	ND		ug/l	10	--
2,4-Dinitrophenol	ND		ug/l	20	--
Phenol	ND		ug/l	5.0	--
2-Methylphenol	ND		ug/l	5.0	--
3-Methylphenol/4-Methylphenol	ND		ug/l	5.0	--
2,4,5-Trichlorophenol	ND		ug/l	5.0	--

Tentatively Identified Compounds

Total TIC Compounds	5.96	J	ug/l
Aldol Condensate	5.96	J	ug/l

Surrogate	%Recovery	Qualifier	Acceptance Criteria
2-Fluorophenol	38		21-120
Phenol-d6	26		10-120
Nitrobenzene-d5	72		23-120
2-Fluorobiphenyl	65		15-120
2,4,6-Tribromophenol	69		10-120
4-Terphenyl-d14	67		41-149



Lab Control Sample Analysis

Batch Quality Control

Project Name: MBTA GLX GW PRE-CHAR

Lab Number: L1818403

Project Number: 290762.1000.0000

Report Date: 06/12/18

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Semivolatile Organics by GC/MS-SIM - Westborough Lab Associated sample(s): 01-02 Batch: WG1117614-2 WG1117614-3								
Acenaphthene	64		62		40-140	3		40
2-Chloronaphthalene	72		69		40-140	4		40
Fluoranthene	70		68		40-140	3		40
Hexachlorobutadiene	60		60		40-140	0		40
Naphthalene	62		61		40-140	2		40
Benzo(a)anthracene	60		57		40-140	5		40
Benzo(a)pyrene	64		60		40-140	6		40
Benzo(b)fluoranthene	55		53		40-140	4		40
Benzo(k)fluoranthene	65		62		40-140	5		40
Chrysene	63		60		40-140	5		40
Acenaphthylene	69		68		40-140	1		40
Anthracene	67		64		40-140	5		40
Benzo(ghi)perylene	64		61		40-140	5		40
Fluorene	74		71		40-140	4		40
Phenanthrene	64		61		40-140	5		40
Dibenzo(a,h)anthracene	66		62		40-140	6		40
Indeno(1,2,3-cd)pyrene	64		61		40-140	5		40
Pyrene	71		68		40-140	4		40
2-Methylnaphthalene	65		63		40-140	3		40
Pentachlorophenol	80		77		40-140	4		40
Hexachlorobenzene	69		64		40-140	8		40
Hexachloroethane	59		59		40-140	0		40

Lab Control Sample Analysis

Batch Quality Control

Project Name: MBTA GLX GW PRE-CHAR

Lab Number: L1818403

Project Number: 290762.1000.0000

Report Date: 06/12/18

Parameter	<i>LCS</i> %Recovery	<i>Qual</i>	<i>LCSD</i> %Recovery	<i>Qual</i>	<i>%Recovery</i> Limits	<i>RPD</i>	<i>Qual</i>	<i>RPD</i> Limits
Semivolatile Organics by GC/MS-SIM - Westborough Lab Associated sample(s): 01-02 Batch: WG1117614-2 WG1117614-3								

<i>Surrogate</i>	<i>LCS</i> %Recovery	<i>Qual</i>	<i>LCSD</i> %Recovery	<i>Qual</i>	<i>Acceptance</i> Criteria
2-Fluorophenol	42		40		21-120
Phenol-d6	25		24		10-120
Nitrobenzene-d5	60		59		23-120
2-Fluorobiphenyl	70		70		15-120
2,4,6-Tribromophenol	69		66		10-120
4-Terphenyl-d14	71		69		41-149

Lab Control Sample Analysis

Batch Quality Control

Project Name: MBTA GLX GW PRE-CHAR

Lab Number: L1818403

Project Number: 290762.1000.0000

Report Date: 06/12/18

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Semivolatile Organics by GC/MS - Westborough Lab Associated sample(s): 01-02 Batch: WG1119146-2 WG1119146-3								
Benzidine	6	Q	1	Q	10-75	146	Q	30
1,2,4-Trichlorobenzene	72		72		39-98	0		30
Bis(2-chloroethyl)ether	76		75		40-140	1		30
1,2-Dichlorobenzene	68		69		40-140	1		30
1,3-Dichlorobenzene	67		67		40-140	0		30
1,4-Dichlorobenzene	68		67		36-97	1		30
3,3'-Dichlorobenzidine	66		70		40-140	6		30
2,4-Dinitrotoluene	102		100		48-143	2		30
2,6-Dinitrotoluene	105		101		40-140	4		30
Azobenzene	82		80		40-140	2		30
4-Bromophenyl phenyl ether	74		73		40-140	1		30
Bis(2-chloroisopropyl)ether	86		86		40-140	0		30
Bis(2-chloroethoxy)methane	79		78		40-140	1		30
Hexachlorocyclopentadiene	62		61		40-140	2		30
Isophorone	83		82		40-140	1		30
Nitrobenzene	84		83		40-140	1		30
NDPA/DPA	80		78		40-140	3		30
n-Nitrosodi-n-propylamine	81		80		29-132	1		30
Bis(2-ethylhexyl)phthalate	94		92		40-140	2		30
Butyl benzyl phthalate	90		90		40-140	0		30
Di-n-butylphthalate	85		86		40-140	1		30
Di-n-octylphthalate	88		87		40-140	1		30
Diethyl phthalate	84		82		40-140	2		30

Lab Control Sample Analysis

Batch Quality Control

Project Name: MBTA GLX GW PRE-CHAR

Lab Number: L1818403

Project Number: 290762.1000.0000

Report Date: 06/12/18

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Semivolatile Organics by GC/MS - Westborough Lab Associated sample(s): 01-02 Batch: WG1119146-2 WG1119146-3								
Dimethyl phthalate	85		82		40-140	4		30
Aniline	45		39	Q	40-140	14		30
4-Chloroaniline	78		79		40-140	1		30
Dibenzofuran	77		76		40-140	1		30
Acetophenone	81		80		39-129	1		30
n-Nitrosodimethylamine	45		46		22-74	2		30
2,4,6-Trichlorophenol	87		84		30-130	4		30
p-Chloro-m-cresol	83		83		23-97	0		30
2-Chlorophenol	73		74		27-123	1		30
2,4-Dichlorophenol	86		84		30-130	2		30
2,4-Dimethylphenol	81		80		30-130	1		30
2-Nitrophenol	94		94		30-130	0		30
4-Nitrophenol	62		61		10-80	2		30
2,4-Dinitrophenol	90		86		20-130	5		30
Phenol	33		33		12-110	0		30
2-Methylphenol	70		70		30-130	0		30
3-Methylphenol/4-Methylphenol	73		71		30-130	3		30
2,4,5-Trichlorophenol	88		83		30-130	6		30

Lab Control Sample Analysis

Batch Quality Control

Project Name: MBTA GLX GW PRE-CHAR

Lab Number: L1818403

Project Number: 290762.1000.0000

Report Date: 06/12/18

Parameter	<i>LCS</i> %Recovery	<i>Qual</i>	<i>LCSD</i> %Recovery	<i>Qual</i>	<i>%Recovery</i> Limits	<i>RPD</i>	<i>Qual</i>	<i>RPD</i> Limits
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Semivolatile Organics by GC/MS - Westborough Lab Associated sample(s): 01-02 Batch: WG1119146-2 WG1119146-3

<i>Surrogate</i>	<i>LCS</i> %Recovery	<i>Qual</i>	<i>LCSD</i> %Recovery	<i>Qual</i>	<i>Acceptance</i> Criteria
2-Fluorophenol	47		48		21-120
Phenol-d6	34		34		10-120
Nitrobenzene-d5	84		85		23-120
2-Fluorobiphenyl	77		76		15-120
2,4,6-Tribromophenol	80		80		10-120
4-Terphenyl-d14	74		74		41-149

PETROLEUM HYDROCARBONS

Project Name: MBTA GLX GW PRE-CHAR**Lab Number:** L1818403**Project Number:** 290762.1000.0000**Report Date:** 06/12/18**SAMPLE RESULTS**

Lab ID: L1818403-01
 Client ID: KE210
 Sample Location: SOMERVILLE, MEDFORD, CAMBRIDGE

Date Collected: 05/18/18 11:20
 Date Received: 05/18/18
 Field Prep: Field Filtered (Dissolved Metals,SCN,HexCr)

Sample Depth:
 Matrix: Water
 Analytical Method: 98,EPH-04-1.1
 Analytical Date: 05/20/18 14:33
 Analyst: MEO

Extraction Method: EPA 3510C
 Extraction Date: 05/19/18 13:28
 Cleanup Method1: EPH-04-1
 Cleanup Date1: 05/20/18

Quality Control Information

Condition of sample received: Satisfactory
 Aqueous Preservative: Laboratory Provided Preserved Container
 Sample Temperature upon receipt: Received on Ice
 Sample Extraction method: Extracted Per the Method

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
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Extractable Petroleum Hydrocarbons - Westborough Lab

C9-C18 Aliphatics	ND		ug/l	100	--	1
C19-C36 Aliphatics	ND		ug/l	100	--	1
C11-C22 Aromatics	ND		ug/l	100	--	1
C11-C22 Aromatics, Adjusted	ND		ug/l	100	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
Chloro-Octadecane	42		40-140
o-Terphenyl	59		40-140
2-Fluorobiphenyl	75		40-140
2-Bromonaphthalene	72		40-140

Project Name: MBTA GLX GW PRE-CHAR**Lab Number:** L1818403**Project Number:** 290762.1000.0000**Report Date:** 06/12/18**SAMPLE RESULTS**

Lab ID: L1818403-02
 Client ID: MW11
 Sample Location: SOMERVILLE, MEDFORD, CAMBRIDGE

Date Collected: 05/18/18 08:30
 Date Received: 05/18/18
 Field Prep: Field Filtered (Dissolved Metals,SCN,HexCr)

Sample Depth:
 Matrix: Water
 Analytical Method: 98,EPH-04-1.1
 Analytical Date: 05/20/18 15:12
 Analyst: MEO

Extraction Method: EPA 3510C
 Extraction Date: 05/19/18 13:28
 Cleanup Method1: EPH-04-1
 Cleanup Date1: 05/20/18

Quality Control Information

Condition of sample received: Satisfactory
 Aqueous Preservative: Laboratory Provided Preserved Container
 Sample Temperature upon receipt: Received on Ice
 Sample Extraction method: Extracted Per the Method

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Extractable Petroleum Hydrocarbons - Westborough Lab						
C9-C18 Aliphatics	ND		ug/l	100	--	1
C19-C36 Aliphatics	ND		ug/l	100	--	1
C11-C22 Aromatics	ND		ug/l	100	--	1
C11-C22 Aromatics, Adjusted	ND		ug/l	100	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
Chloro-Octadecane	65		40-140
o-Terphenyl	80		40-140
2-Fluorobiphenyl	93		40-140
2-Bromonaphthalene	91		40-140

Project Name: MBTA GLX GW PRE-CHAR**Lab Number:** L1818403**Project Number:** 290762.1000.0000**Report Date:** 06/12/18

**Method Blank Analysis
Batch Quality Control**

Analytical Method: 98,EPH-04-1.1

Analytical Date: 05/19/18 21:18

Analyst: MEO

Extraction Method: EPA 3510C

Extraction Date: 05/18/18 17:35

Cleanup Method: EPH-04-1

Cleanup Date: 05/19/18

Parameter	Result	Qualifier	Units	RL	MDL
Extractable Petroleum Hydrocarbons - Westborough Lab for sample(s): 01-02 Batch: WG1117367-1					
C9-C18 Aliphatics	ND		ug/l	100	--
C19-C36 Aliphatics	ND		ug/l	100	--
C11-C22 Aromatics	ND		ug/l	100	--
C11-C22 Aromatics, Adjusted	ND		ug/l	100	--

Surrogate	%Recovery	Qualifier	Acceptance Criteria
Chloro-Octadecane	70		40-140
o-Terphenyl	72		40-140
2-Fluorobiphenyl	70		40-140
2-Bromonaphthalene	63		40-140

Lab Control Sample Analysis

Batch Quality Control

Project Name: MBTA GLX GW PRE-CHAR

Lab Number: L1818403

Project Number: 290762.1000.0000

Report Date: 06/12/18

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Extractable Petroleum Hydrocarbons - Westborough Lab Associated sample(s): 01-02 Batch: WG1117367-2 WG1117367-3								
C9-C18 Aliphatics	80		82		40-140	2		25
C19-C36 Aliphatics	89		90		40-140	1		25
C11-C22 Aromatics	80		84		40-140	5		25
Naphthalene	63		67		40-140	6		25
2-Methylnaphthalene	65		69		40-140	6		25
Acenaphthylene	70		75		40-140	7		25
Acenaphthene	71		77		40-140	8		25
Fluorene	72		79		40-140	9		25
Phenanthrene	76		81		40-140	6		25
Anthracene	77		82		40-140	6		25
Fluoranthene	80		84		40-140	5		25
Pyrene	81		85		40-140	5		25
Benzo(a)anthracene	79		83		40-140	5		25
Chrysene	80		84		40-140	5		25
Benzo(b)fluoranthene	83		86		40-140	4		25
Benzo(k)fluoranthene	80		84		40-140	5		25
Benzo(a)pyrene	79		83		40-140	5		25
Indeno(1,2,3-cd)Pyrene	81		84		40-140	4		25
Dibenzo(a,h)anthracene	79		83		40-140	5		25
Benzo(ghi)perylene	76		80		40-140	5		25
Nonane (C9)	69		68		30-140	1		25
Decane (C10)	74		74		40-140	0		25
Dodecane (C12)	77		78		40-140	1		25

Lab Control Sample Analysis Batch Quality Control

Project Name: MBTA GLX GW PRE-CHAR
Project Number: 290762.1000.0000

Lab Number: L1818403
Report Date: 06/12/18

Parameter	LCS		LCSD		%Recovery Limits	RPD	RPD	
	%Recovery	Qual	%Recovery	Qual			Qual	Limits
Extractable Petroleum Hydrocarbons - Westborough Lab Associated sample(s): 01-02 Batch: WG1117367-2 WG1117367-3								
Tetradecane (C14)	78		81		40-140	4		25
Hexadecane (C16)	82		85		40-140	4		25
Octadecane (C18)	86		88		40-140	2		25
Nonadecane (C19)	86		87		40-140	1		25
Eicosane (C20)	87		88		40-140	1		25
Docosane (C22)	87		88		40-140	1		25
Tetracosane (C24)	87		88		40-140	1		25
Hexacosane (C26)	87		88		40-140	1		25
Octacosane (C28)	87		88		40-140	1		25
triacontane (C30)	86		88		40-140	2		25
Hexatriacontane (C36)	86		86		40-140	0		25

Surrogate	LCS		LCSD		Acceptance Criteria
	%Recovery	Qual	%Recovery	Qual	
Chloro-Octadecane	70		69		40-140
o-Terphenyl	74		79		40-140
2-Fluorobiphenyl	70		73		40-140
2-Bromonaphthalene	65		71		40-140
% Naphthalene Breakthrough	0		0		
% 2-Methylnaphthalene Breakthrough	0		0		



PCBS

Project Name: MBTA GLX GW PRE-CHAR**Lab Number:** L1818403**Project Number:** 290762.1000.0000**Report Date:** 06/12/18**SAMPLE RESULTS**

Lab ID: L1818403-01
 Client ID: KE210
 Sample Location: SOMERVILLE, MEDFORD, CAMBRIDGE

Date Collected: 05/18/18 11:20
 Date Received: 05/18/18
 Field Prep: Field Filtered (Dissolved Metals,SCN,HexCr)

Sample Depth:

Matrix: Water
 Analytical Method: 5,608
 Analytical Date: 05/21/18 07:17
 Analyst: JW

Extraction Method: EPA 608
 Extraction Date: 05/19/18 13:19
 Cleanup Method: EPA 3665A
 Cleanup Date: 05/20/18
 Cleanup Method: EPA 3660B
 Cleanup Date: 05/20/18

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	77		30-150	A
Decachlorobiphenyl	45		30-150	A

Project Name: MBTA GLX GW PRE-CHAR**Lab Number:** L1818403**Project Number:** 290762.1000.0000**Report Date:** 06/12/18**SAMPLE RESULTS**

Lab ID: L1818403-03
 Client ID: MW11
 Sample Location: SOMERVILLE, MEDFORD, CAMBRIDGE

Date Collected: 05/24/18 08:05
 Date Received: 05/24/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Water
 Analytical Method: 5,608
 Analytical Date: 05/25/18 14:17
 Analyst: JW

Extraction Method: EPA 608
 Extraction Date: 05/25/18 02:50
 Cleanup Method: EPA 3665A
 Cleanup Date: 05/25/18
 Cleanup Method: EPA 3660B
 Cleanup Date: 05/25/18

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	82		30-150	A
Decachlorobiphenyl	102		30-150	A

Project Name: MBTA GLX GW PRE-CHAR
Project Number: 290762.1000.0000

Lab Number: L1818403
Report Date: 06/12/18

**Method Blank Analysis
Batch Quality Control**

Analytical Method: 5,608
Analytical Date: 05/21/18 05:01
Analyst: HT

Extraction Method: EPA 608
Extraction Date: 05/18/18 15:30
Cleanup Method: EPA 3665A
Cleanup Date: 05/18/18
Cleanup Method: EPA 3660B
Cleanup Date: 05/18/18

Parameter	Result	Qualifier	Units	RL	MDL	Column
Polychlorinated Biphenyls by GC - Westborough Lab for sample(s): 01 Batch: WG1117333-1						
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	94		30-150	A
Decachlorobiphenyl	101		30-150	A

Project Name: MBTA GLX GW PRE-CHAR
Project Number: 290762.1000.0000

Lab Number: L1818403
Report Date: 06/12/18

**Method Blank Analysis
Batch Quality Control**

Analytical Method: 5,608
Analytical Date: 05/25/18 13:15
Analyst: JW

Extraction Method: EPA 608
Extraction Date: 05/25/18 02:50
Cleanup Method: EPA 3665A
Cleanup Date: 05/25/18
Cleanup Method: EPA 3660B
Cleanup Date: 05/25/18

Parameter	Result	Qualifier	Units	RL	MDL	Column
Polychlorinated Biphenyls by GC - Westborough Lab for sample(s): 03 Batch: WG1119399-1						
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	84		30-150	A
Decachlorobiphenyl	94		30-150	A

Lab Control Sample Analysis

Batch Quality Control

Project Name: MBTA GLX GW PRE-CHAR

Lab Number: L1818403

Project Number: 290762.1000.0000

Report Date: 06/12/18

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: WG1117333-2									
Aroclor 1016	95		-		30-150	-		30	A
Aroclor 1260	100		-		30-150	-		30	A

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	110				30-150	A
Decachlorobiphenyl	120				30-150	A

Lab Control Sample Analysis

Batch Quality Control

Project Name: MBTA GLX GW PRE-CHAR

Lab Number: L1818403

Project Number: 290762.1000.0000

Report Date: 06/12/18

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits	Column
Polychlorinated Biphenyls by GC - Westborough Lab Associated sample(s): 03 Batch: WG1119399-2									
Aroclor 1016	82		-		30-150	-		30	A
Aroclor 1260	82		-		30-150	-		30	A

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	84				30-150	A
Decachlorobiphenyl	90				30-150	A

Matrix Spike Analysis Batch Quality Control

Project Name: MBTA GLX GW PRE-CHAR
Project Number: 290762.1000.0000

Lab Number: L1818403
Report Date: 06/12/18

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	Qual	MSD Found	MSD %Recovery	Qual	Recovery Limits	RPD	Qual	RPD Limits	Column
Polychlorinated Biphenyls by GC - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1117333-3 QC Sample: L1800005-108 Client ID: MS Sample													
Aroclor 1016	ND	3.12	2.66	85		-	-		40-126	-		30	A
Aroclor 1260	ND	3.12	2.64	84		-	-		40-127	-		30	A

Surrogate	MS % Recovery	Qualifier	MSD % Recovery	Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	101				30-150	A
Decachlorobiphenyl	109				30-150	A

Matrix Spike Analysis Batch Quality Control

Project Name: MBTA GLX GW PRE-CHAR
Project Number: 290762.1000.0000

Lab Number: L1818403
Report Date: 06/12/18

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	Qual	MSD Found	MSD %Recovery	Qual	Recovery Limits	RPD	Qual	RPD Limits	Column
Polychlorinated Biphenyls by GC - Westborough Lab Associated sample(s): 03 QC Batch ID: WG1119399-3 QC Sample: L1800005-16 Client ID: MS Sample													
Aroclor 1016	ND	3.12	2.46	79		-	-		40-126	-		30	A
Aroclor 1260	ND	3.12	2.56	82		-	-		40-127	-		30	A

Surrogate	MS % Recovery	Qualifier	MSD % Recovery	Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	82				30-150	A
Decachlorobiphenyl	87				30-150	A

Lab Duplicate Analysis

Batch Quality Control

Project Name: MBTA GLX GW PRE-CHAR

Project Number: 290762.1000.0000

Lab Number: L1818403

Report Date: 06/12/18

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
Polychlorinated Biphenyls by GC - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1117333-4 QC Sample: L1800005-108 Client ID: DUP Sample						
Aroclor 1016	ND	ND	ug/l	NC		30 A
Aroclor 1221	ND	ND	ug/l	NC		30 A
Aroclor 1232	ND	ND	ug/l	NC		30 A
Aroclor 1242	ND	ND	ug/l	NC		30 A
Aroclor 1248	ND	ND	ug/l	NC		30 A
Aroclor 1254	ND	ND	ug/l	NC		30 A
Aroclor 1260	ND	ND	ug/l	NC		30 A

Surrogate	%Recovery	Qualifier	%Recovery	Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	100		99		30-150	A
Decachlorobiphenyl	113		116		30-150	A

Lab Duplicate Analysis

Batch Quality Control

Project Name: MBTA GLX GW PRE-CHAR

Project Number: 290762.1000.0000

Lab Number: L1818403

Report Date: 06/12/18

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
Polychlorinated Biphenyls by GC - Westborough Lab Associated sample(s): 03 QC Batch ID: WG1119399-4 QC Sample: L1800005-16 Client ID: DUP Sample						
Aroclor 1016	ND	ND	ug/l	NC		30 A
Aroclor 1221	ND	ND	ug/l	NC		30 A
Aroclor 1232	ND	ND	ug/l	NC		30 A
Aroclor 1242	ND	ND	ug/l	NC		30 A
Aroclor 1248	ND	ND	ug/l	NC		30 A
Aroclor 1254	ND	ND	ug/l	NC		30 A
Aroclor 1260	ND	ND	ug/l	NC		30 A

Surrogate	%Recovery	Qualifier	%Recovery	Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	79		81		30-150	A
Decachlorobiphenyl	87		89		30-150	A

PESTICIDES

Project Name: MBTA GLX GW PRE-CHAR
Project Number: 290762.1000.0000

Lab Number: L1818403
Report Date: 06/12/18

SAMPLE RESULTS

Lab ID: L1818403-01
Client ID: KE210
Sample Location: SOMERVILLE, MEDFORD, CAMBRIDGE

Date Collected: 05/18/18 11:20
Date Received: 05/18/18
Field Prep: Field Filtered (Dissolved Metals,SCN,HexCr)

Sample Depth:

Matrix: Water
Analytical Method: 5,608
Analytical Date: 05/22/18 15:10
Analyst: JW

Extraction Method: EPA 608
Extraction Date: 05/21/18 00:23
Cleanup Method: EPA 3620B
Cleanup Date: 05/22/18

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
Organochlorine Pesticides by GC - Westborough Lab							
Delta-BHC	ND		ug/l	0.020	--	1	B
Lindane	ND		ug/l	0.020	--	1	B
Alpha-BHC	ND		ug/l	0.020	--	1	B
Beta-BHC	ND		ug/l	0.020	--	1	B
Heptachlor	ND		ug/l	0.020	--	1	B
Aldrin	ND		ug/l	0.020	--	1	B
Heptachlor epoxide	ND		ug/l	0.020	--	1	B
Endrin	ND		ug/l	0.040	--	1	B
Endrin aldehyde	ND		ug/l	0.040	--	1	B
Endrin ketone ¹	ND		ug/l	0.040	--	1	B
Dieldrin	ND		ug/l	0.040	--	1	B
4,4'-DDE	ND		ug/l	0.040	--	1	B
4,4'-DDD	ND		ug/l	0.040	--	1	B
4,4'-DDT	ND		ug/l	0.040	--	1	B
Endosulfan I	ND		ug/l	0.020	--	1	B
Endosulfan II	ND		ug/l	0.040	--	1	B
Endosulfan sulfate	ND		ug/l	0.040	--	1	B
Methoxychlor ¹	ND		ug/l	0.100	--	1	B
Toxaphene	ND		ug/l	0.400	--	1	B
Chlordane	ND		ug/l	0.200	--	1	B
cis-Chlordane ¹	ND		ug/l	0.020	--	1	B
trans-Chlordane ¹	ND		ug/l	0.020	--	1	B

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	85		30-150	B
Decachlorobiphenyl	81		30-150	B

Project Name: MBTA GLX GW PRE-CHAR
Project Number: 290762.1000.0000

Lab Number: L1818403
Report Date: 06/12/18

Method Blank Analysis
Batch Quality Control

Analytical Method: 5,608
Analytical Date: 05/22/18 16:01
Analyst: JW

Extraction Method: EPA 608
Extraction Date: 05/21/18 00:23
Cleanup Method: EPA 3620B
Cleanup Date: 05/22/18

Parameter	Result	Qualifier	Units	RL	MDL	Column
Organochlorine Pesticides by GC - Westborough Lab for sample(s): 01 Batch: WG1117753-1						
Delta-BHC	ND		ug/l	0.020	--	B
Lindane	ND		ug/l	0.020	--	B
Alpha-BHC	ND		ug/l	0.020	--	B
Beta-BHC	ND		ug/l	0.020	--	B
Heptachlor	ND		ug/l	0.020	--	B
Aldrin	ND		ug/l	0.020	--	B
Heptachlor epoxide	ND		ug/l	0.020	--	B
Endrin	ND		ug/l	0.040	--	B
Endrin aldehyde	ND		ug/l	0.040	--	B
Endrin ketone ¹	ND		ug/l	0.040	--	B
Dieldrin	ND		ug/l	0.040	--	B
4,4'-DDE	ND		ug/l	0.040	--	B
4,4'-DDD	ND		ug/l	0.040	--	B
4,4'-DDT	ND		ug/l	0.040	--	B
Endosulfan I	ND		ug/l	0.020	--	B
Endosulfan II	ND		ug/l	0.040	--	B
Endosulfan sulfate	ND		ug/l	0.040	--	B
Methoxychlor ¹	ND		ug/l	0.100	--	B
Toxaphene	ND		ug/l	0.400	--	B
Chlordane	ND		ug/l	0.200	--	B
cis-Chlordane ¹	ND		ug/l	0.020	--	B
trans-Chlordane ¹	ND		ug/l	0.020	--	B

Surrogate	%Recovery	Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	102		30-150	B
Decachlorobiphenyl	148		30-150	B



Lab Control Sample Analysis

Batch Quality Control

Project Name: MBTA GLX GW PRE-CHAR

Lab Number: L1818403

Project Number: 290762.1000.0000

Report Date: 06/12/18

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits	Column
Organochlorine Pesticides by GC - Westborough Lab Associated sample(s): 01 Batch: WG1117753-2									
Delta-BHC	96		-		30-150	-		30	B
Lindane	92		-		30-150	-		30	B
Alpha-BHC	94		-		30-150	-		30	B
Beta-BHC	95		-		30-150	-		30	B
Heptachlor	86		-		30-150	-		30	B
Aldrin	87		-		30-150	-		30	B
Heptachlor epoxide	93		-		30-150	-		30	B
Endrin	109		-		30-150	-		30	B
Endrin aldehyde	106		-		30-150	-		30	B
Endrin ketone ¹	108		-		30-150	-		30	B
Dieldrin	111		-		30-150	-		30	B
4,4'-DDE	102		-		30-150	-		30	B
4,4'-DDD	109		-		30-150	-		30	B
4,4'-DDT	110		-		30-150	-		30	B
Endosulfan I	97		-		30-150	-		30	B
Endosulfan II	114		-		30-150	-		30	B
Endosulfan sulfate	103		-		30-150	-		30	B
Methoxychlor ¹	96		-		30-150	-		30	B
cis-Chlordane ¹	105		-		30-150	-		30	B
trans-Chlordane ¹	103		-		30-150	-		30	B

Lab Control Sample Analysis Batch Quality Control

Project Name: MBTA GLX GW PRE-CHAR
Project Number: 290762.1000.0000

Lab Number: L1818403
Report Date: 06/12/18

Parameter	<i>LCS</i> %Recovery	<i>Qual</i>	<i>LCSD</i> %Recovery	<i>Qual</i>	<i>%Recovery</i> Limits	<i>RPD</i>	<i>Qual</i>	<i>RPD</i> Limits
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Organochlorine Pesticides by GC - Westborough Lab Associated sample(s): 01 Batch: WG1117753-2

<i>Surrogate</i>	<i>LCS</i> %Recovery	<i>Qual</i>	<i>LCSD</i> %Recovery	<i>Qual</i>	<i>Acceptance</i> Criteria	<i>Column</i>
2,4,5,6-Tetrachloro-m-xylene	88				30-150	B
Decachlorobiphenyl	128				30-150	B

Matrix Spike Analysis

Batch Quality Control

Project Name: MBTA GLX GW PRE-CHAR

Lab Number: L1818403

Project Number: 290762.1000.0000

Report Date: 06/12/18

<i>Parameter</i>	<i>Native Sample</i>	<i>MS Added</i>	<i>MS Found</i>	<i>MS %Recovery</i>	<i>Qual</i>	<i>MSD Found</i>	<i>MSD %Recovery</i>	<i>Qual</i>	<i>Recovery Limits</i>	<i>RPD</i>	<i>Qual</i>	<i>RPD Limits</i>	<i>Column</i>
Organochlorine Pesticides by GC - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1117753-3 QC Sample: L1800005-01 Client ID: MS Sample													
Delta-BHC	ND	0.5	0.547	109		-	-		19-140	-		30	B
Lindane	ND	0.5	0.510	102		-	-		56-123	-		30	B
Alpha-BHC	ND	0.5	0.520	104		-	-		37-134	-		30	B
Beta-BHC	ND	0.5	0.535	107		-	-		17-147	-		30	B
Heptachlor	ND	0.5	0.490	98		-	-		40-111	-		30	B
Aldrin	ND	0.5	0.494	99		-	-		40-120	-		30	B
Heptachlor epoxide	ND	0.5	0.519	104		-	-		37-142	-		30	B
Endrin	ND	0.5	0.603	121		-	-		56-121	-		30	B
Endrin aldehyde	ND	0.5	0.587	117		-	-		42-122	-		30	B
Endrin ketone ¹	ND	0.5	0.586	117		-	-		30-150	-		30	B
Dieldrin	ND	0.5	0.621	124		-	-		52-126	-		30	B
4,4'-DDE	ND	0.5	0.578	116		-	-		30-145	-		30	B
4,4'-DDD	ND	0.5	0.616	123		-	-		31-141	-		30	B
4,4'-DDT	ND	0.5	0.623	125		-	-		38-127	-		30	B
Endosulfan I	ND	0.5	0.547	109		-	-		45-153	-		30	B
Endosulfan II	ND	0.5	0.630	126		-	-		.1-202	-		30	B
Endosulfan sulfate	ND	0.5	0.565	113		-	-		26-144	-		30	B
Methoxychlor ¹	ND	0.5	0.609	122		-	-		30-150	-		30	B
cis-Chlordane ¹	ND	0.5	0.591	118		-	-		30-150	-		30	B
trans-Chlordane ¹	ND	0.5	0.585	117		-	-		30-150	-		30	B

Matrix Spike Analysis Batch Quality Control

Project Name: MBTA GLX GW PRE-CHAR
Project Number: 290762.1000.0000

Lab Number: L1818403
Report Date: 06/12/18

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	Qual	MSD Found	MSD %Recovery	Qual	Recovery Limits	RPD	Qual	RPD Limits
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Organochlorine Pesticides by GC - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1117753-3 QC Sample: L1800005-01 Client ID: MS Sample

Surrogate	MS % Recovery	Qualifier	MSD % Recovery	Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	93				30-150	B
Decachlorobiphenyl	134				30-150	B

Lab Duplicate Analysis

Batch Quality Control

Project Name: MBTA GLX GW PRE-CHAR

Project Number: 290762.1000.0000

Lab Number: L1818403

Report Date: 06/12/18

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
Organochlorine Pesticides by GC - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1117753-4 QC Sample: L180005-01 Client ID: DUP Sample						
Delta-BHC	ND	ND	ug/l	NC		30 B
Lindane	ND	ND	ug/l	NC		30 B
Alpha-BHC	ND	ND	ug/l	NC		30 B
Beta-BHC	ND	ND	ug/l	NC		30 B
Heptachlor	ND	ND	ug/l	NC		30 B
Aldrin	ND	ND	ug/l	NC		30 B
Heptachlor epoxide	ND	ND	ug/l	NC		30 B
Endrin	ND	ND	ug/l	NC		30 B
Endrin aldehyde	ND	ND	ug/l	NC		30 B
Endrin ketone ¹	ND	ND	ug/l	NC		30 B
Dieldrin	ND	ND	ug/l	NC		30 B
4,4'-DDE	ND	ND	ug/l	NC		30 B
4,4'-DDD	ND	ND	ug/l	NC		30 B
4,4'-DDT	ND	ND	ug/l	NC		30 B
Endosulfan I	ND	ND	ug/l	NC		30 B
Endosulfan II	ND	ND	ug/l	NC		30 B
Endosulfan sulfate	ND	ND	ug/l	NC		30 B
Methoxychlor ¹	ND	ND	ug/l	NC		30 B
Toxaphene	ND	ND	ug/l	NC		30 B
Chlordane	ND	ND	ug/l	NC		30 B
cis-Chlordane ¹	ND	ND	ug/l	NC		30 B

Lab Duplicate Analysis Batch Quality Control

Project Name: MBTA GLX GW PRE-CHAR

Project Number: 290762.1000.0000

Lab Number: L1818403

Report Date: 06/12/18

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
Organochlorine Pesticides by GC - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1117753-4 QC Sample: L1800005-01 Client ID: DUP Sample						
trans-Chlordane ¹	ND	ND	ug/l	NC		30 B

Surrogate	%Recovery	Qualifier	%Recovery	Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	96		91		30-150	B
Decachlorobiphenyl	147		135		30-150	B

METALS

Project Name: MBTA GLX GW PRE-CHAR**Lab Number:** L1818403**Project Number:** 290762.1000.0000**Report Date:** 06/12/18**SAMPLE RESULTS**

Lab ID: L1818403-01

Date Collected: 05/18/18 11:20

Client ID: KE210

Date Received: 05/18/18

Sample Location: SOMERVILLE, MEDFORD, CAMBRIDGE

Field Prep: Field Filtered (Dissolved Metals,SCN,HexCr)

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	05/23/18 10:40	05/23/18 18:21	EPA 3005A	3,200.8	AM
Arsenic, Total	0.01059		mg/l	0.00100	--	1	05/23/18 10:40	05/23/18 18:21	EPA 3005A	3,200.8	AM
Cadmium, Total	0.00059		mg/l	0.00020	--	1	05/23/18 10:40	05/23/18 18:21	EPA 3005A	3,200.8	AM
Chromium, Total	0.03473		mg/l	0.00100	--	1	05/23/18 10:40	05/23/18 18:21	EPA 3005A	3,200.8	AM
Copper, Total	0.06166		mg/l	0.00100	--	1	05/23/18 10:40	05/23/18 18:21	EPA 3005A	3,200.8	AM
Iron, Total	44.6		mg/l	0.050	--	1	05/23/18 10:40	05/24/18 13:09	EPA 3005A	19,200.7	LC
Lead, Total	0.03487		mg/l	0.00100	--	1	05/23/18 10:40	05/23/18 18:21	EPA 3005A	3,200.8	AM
Mercury, Total	ND		mg/l	0.00020	--	1	05/21/18 10:46	05/22/18 21:51	EPA 245.1	3,245.1	EA
Nickel, Total	0.02923		mg/l	0.00200	--	1	05/23/18 10:40	05/23/18 18:21	EPA 3005A	3,200.8	AM
Selenium, Total	ND		mg/l	0.00500	--	1	05/23/18 10:40	05/23/18 18:21	EPA 3005A	3,200.8	AM
Silver, Total	ND		mg/l	0.00040	--	1	05/23/18 10:40	05/23/18 18:21	EPA 3005A	3,200.8	AM
Zinc, Total	0.1246		mg/l	0.01000	--	1	05/23/18 10:40	05/23/18 18:21	EPA 3005A	3,200.8	AM
Total Hardness by SM 2340B - Mansfield Lab											
Hardness	383		mg/l	0.660	NA	1	05/23/18 10:40	05/24/18 13:09	EPA 3005A	19,200.7	LC
Dissolved Metals - Mansfield Lab											
Antimony, Dissolved	ND		mg/l	0.0040	--	1	05/23/18 11:15	05/23/18 17:12	EPA 3005A	3,200.8	AM
Arsenic, Dissolved	ND		mg/l	0.0010	--	1	05/23/18 11:15	05/23/18 17:12	EPA 3005A	3,200.8	AM
Cadmium, Dissolved	ND		mg/l	0.0002	--	1	05/23/18 11:15	05/23/18 17:12	EPA 3005A	3,200.8	AM
Chromium, Dissolved	0.0023		mg/l	0.0010	--	1	05/23/18 11:15	05/23/18 17:12	EPA 3005A	3,200.8	AM
Copper, Dissolved	0.0042		mg/l	0.0010	--	1	05/23/18 11:15	05/23/18 17:12	EPA 3005A	3,200.8	AM
Iron, Dissolved	2.79		mg/l	0.050	--	1	05/23/18 11:15	05/24/18 13:02	EPA 3005A	19,200.7	PE
Lead, Dissolved	0.0022		mg/l	0.0010	--	1	05/23/18 11:15	05/23/18 17:12	EPA 3005A	3,200.8	AM
Mercury, Dissolved	ND		mg/l	0.00020	--	1	05/23/18 11:26	05/23/18 19:04	EPA 245.1	3,245.1	MG
Nickel, Dissolved	0.0024		mg/l	0.0020	--	1	05/23/18 11:15	05/23/18 17:12	EPA 3005A	3,200.8	AM
Selenium, Dissolved	ND		mg/l	0.0050	--	1	05/23/18 11:15	05/23/18 17:12	EPA 3005A	3,200.8	AM
Silver, Dissolved	ND		mg/l	0.0004	--	1	05/23/18 11:15	05/23/18 17:12	EPA 3005A	3,200.8	AM
Zinc, Dissolved	ND		mg/l	0.0100	--	1	05/23/18 11:15	05/23/18 17:12	EPA 3005A	3,200.8	AM



Project Name: MBTA GLX GW PRE-CHAR

Lab Number: L1818403

Project Number: 290762.1000.0000

Report Date: 06/12/18

SAMPLE RESULTS

Lab ID: L1818403-01

Date Collected: 05/18/18 11:20

Client ID: KE210

Date Received: 05/18/18

Sample Location: SOMERVILLE, MEDFORD, CAMBRIDGE

Field Prep: Field Filtered (Dissolved Metals,SCN,HexCr)

Sample Depth:

Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
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- - Westborough Lab

Chromium, Trivalent (Filtered)	ND		mg/l	0.010	--	1		05/24/18 12:10	NA	107,-	ED
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Project Name: MBTA GLX GW PRE-CHAR**Lab Number:** L1818403**Project Number:** 290762.1000.0000**Report Date:** 06/12/18**SAMPLE RESULTS**

Lab ID: L1818403-02

Date Collected: 05/18/18 08:30

Client ID: MW11

Date Received: 05/18/18

Sample Location: SOMERVILLE, MEDFORD, CAMBRIDGE

Field Prep: Field Filtered (Dissolved Metals,SCN,HexCr)

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	05/23/18 10:40	05/23/18 18:25	EPA 3005A	3,200.8	AM
Arsenic, Total	0.01911		mg/l	0.00100	--	1	05/23/18 10:40	05/23/18 18:25	EPA 3005A	3,200.8	AM
Cadmium, Total	0.00125		mg/l	0.00020	--	1	05/23/18 10:40	05/23/18 18:25	EPA 3005A	3,200.8	AM
Chromium, Total	0.2313		mg/l	0.00100	--	1	05/23/18 10:40	05/23/18 18:25	EPA 3005A	3,200.8	AM
Copper, Total	0.1600		mg/l	0.00100	--	1	05/23/18 10:40	05/23/18 18:25	EPA 3005A	3,200.8	AM
Iron, Total	63.8		mg/l	0.050	--	1	05/23/18 10:40	05/24/18 13:14	EPA 3005A	19,200.7	LC
Lead, Total	0.2505		mg/l	0.00100	--	1	05/23/18 10:40	05/23/18 18:25	EPA 3005A	3,200.8	AM
Mercury, Total	ND		mg/l	0.00020	--	1	05/21/18 10:46	05/22/18 21:53	EPA 245.1	3,245.1	EA
Nickel, Total	0.07754		mg/l	0.00200	--	1	05/23/18 10:40	05/23/18 18:25	EPA 3005A	3,200.8	AM
Selenium, Total	0.00549		mg/l	0.00500	--	1	05/23/18 10:40	05/23/18 18:25	EPA 3005A	3,200.8	AM
Silver, Total	ND		mg/l	0.00040	--	1	05/23/18 10:40	05/23/18 18:25	EPA 3005A	3,200.8	AM
Zinc, Total	0.3966		mg/l	0.01000	--	1	05/23/18 10:40	05/23/18 18:25	EPA 3005A	3,200.8	AM
Total Hardness by SM 2340B - Mansfield Lab											
Hardness	483		mg/l	0.660	NA	1	05/23/18 10:40	05/24/18 13:14	EPA 3005A	19,200.7	LC
Dissolved Metals - Mansfield Lab											
Antimony, Dissolved	ND		mg/l	0.0040	--	1	05/23/18 11:15	05/23/18 17:16	EPA 3005A	3,200.8	AM
Arsenic, Dissolved	0.0038		mg/l	0.0010	--	1	05/23/18 11:15	05/23/18 17:16	EPA 3005A	3,200.8	AM
Cadmium, Dissolved	ND		mg/l	0.0002	--	1	05/23/18 11:15	05/23/18 17:16	EPA 3005A	3,200.8	AM
Chromium, Dissolved	ND		mg/l	0.0010	--	1	05/23/18 11:15	05/23/18 17:16	EPA 3005A	3,200.8	AM
Copper, Dissolved	0.0013		mg/l	0.0010	--	1	05/23/18 11:15	05/23/18 17:16	EPA 3005A	3,200.8	AM
Iron, Dissolved	ND		mg/l	0.050	--	1	05/23/18 11:15	05/24/18 13:34	EPA 3005A	19,200.7	AB
Lead, Dissolved	ND		mg/l	0.0010	--	1	05/23/18 11:15	05/23/18 17:16	EPA 3005A	3,200.8	AM
Mercury, Dissolved	ND		mg/l	0.00020	--	1	05/23/18 11:26	05/23/18 19:09	EPA 245.1	3,245.1	MG
Nickel, Dissolved	0.0031		mg/l	0.0020	--	1	05/23/18 11:15	05/23/18 17:16	EPA 3005A	3,200.8	AM
Selenium, Dissolved	ND		mg/l	0.0050	--	1	05/23/18 11:15	05/23/18 17:16	EPA 3005A	3,200.8	AM
Silver, Dissolved	ND		mg/l	0.0004	--	1	05/23/18 11:15	05/23/18 17:16	EPA 3005A	3,200.8	AM
Zinc, Dissolved	ND		mg/l	0.0100	--	1	05/23/18 11:15	05/23/18 17:16	EPA 3005A	3,200.8	AM



Project Name: MBTA GLX GW PRE-CHAR

Lab Number: L1818403

Project Number: 290762.1000.0000

Report Date: 06/12/18

SAMPLE RESULTS

Lab ID: L1818403-02

Date Collected: 05/18/18 08:30

Client ID: MW11

Date Received: 05/18/18

Sample Location: SOMERVILLE, MEDFORD, CAMBRIDGE

Field Prep: Field Filtered (Dissolved Metals,SCN,HexCr)

Sample Depth:

Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
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- - Westborough Lab

Chromium, Trivalent (Filtered)	ND		mg/l	0.010	--	1		05/24/18 12:10	NA	107,-	ED
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Project Name: MBTA GLX GW PRE-CHAR
Project Number: 290762.1000.0000

Lab Number: L1818403
Report Date: 06/12/18

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: WG1118232-1									
Mercury, Total	ND	mg/l	0.00020	--	1	05/21/18 10:46	05/22/18 21:07	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: WG1118667-1									
Iron, Total	ND	mg/l	0.050	--	1	05/23/18 10:40	05/24/18 14:44	19,200.7	LC

Prep Information

Digestion Method: EPA 3005A

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: WG1118667-1									
Hardness	ND	mg/l	0.660	NA	1	05/23/18 10:40	05/24/18 14:44	19,200.7	LC

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: WG1118671-1									
Antimony, Total	ND	mg/l	0.00400	--	1	05/23/18 10:40	05/23/18 16:39	3,200.8	AM
Arsenic, Total	ND	mg/l	0.00100	--	1	05/23/18 10:40	05/23/18 16:39	3,200.8	AM
Cadmium, Total	ND	mg/l	0.00020	--	1	05/23/18 10:40	05/23/18 16:39	3,200.8	AM
Chromium, Total	ND	mg/l	0.00100	--	1	05/23/18 10:40	05/23/18 16:39	3,200.8	AM
Copper, Total	ND	mg/l	0.00100	--	1	05/23/18 10:40	05/23/18 16:39	3,200.8	AM
Lead, Total	ND	mg/l	0.00050	--	1	05/23/18 10:40	05/23/18 16:39	3,200.8	AM

Project Name: MBTA GLX GW PRE-CHAR
Project Number: 290762.1000.0000

Lab Number: L1818403
Report Date: 06/12/18

Method Blank Analysis Batch Quality Control

Nickel, Total	ND	mg/l	0.00200	--	1	05/23/18 10:40	05/23/18 16:39	3,200.8	AM
Selenium, Total	ND	mg/l	0.00500	--	1	05/23/18 10:40	05/23/18 16:39	3,200.8	AM
Silver, Total	ND	mg/l	0.00040	--	1	05/23/18 10:40	05/23/18 16:39	3,200.8	AM
Zinc, Total	ND	mg/l	0.01000	--	1	05/23/18 10:40	05/23/18 16:39	3,200.8	AM

Prep Information

Digestion Method: EPA 3005A

Parameter	Result Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Dissolved Metals - Mansfield Lab for sample(s): 01-02 Batch: WG1118717-1									
Iron, Dissolved	ND	mg/l	0.050	--	1	05/23/18 11:15	05/24/18 12:53	19,200.7	PE

Prep Information

Digestion Method: EPA 3005A

Parameter	Result Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Dissolved Metals - Mansfield Lab for sample(s): 01-02 Batch: WG1118719-1									
Antimony, Dissolved	ND	mg/l	0.0040	--	1	05/23/18 11:15	05/23/18 15:33	3,200.8	AM
Arsenic, Dissolved	ND	mg/l	0.0010	--	1	05/23/18 11:15	05/23/18 15:33	3,200.8	AM
Cadmium, Dissolved	ND	mg/l	0.0002	--	1	05/23/18 11:15	05/23/18 15:33	3,200.8	AM
Chromium, Dissolved	ND	mg/l	0.0010	--	1	05/23/18 11:15	05/23/18 15:33	3,200.8	AM
Copper, Dissolved	ND	mg/l	0.0010	--	1	05/23/18 11:15	05/23/18 15:33	3,200.8	AM
Lead, Dissolved	ND	mg/l	0.0010	--	1	05/23/18 11:15	05/23/18 15:33	3,200.8	AM
Nickel, Dissolved	ND	mg/l	0.0020	--	1	05/23/18 11:15	05/23/18 15:33	3,200.8	AM
Selenium, Dissolved	ND	mg/l	0.0050	--	1	05/23/18 11:15	05/23/18 15:33	3,200.8	AM
Silver, Dissolved	ND	mg/l	0.0004	--	1	05/23/18 11:15	05/23/18 15:33	3,200.8	AM
Zinc, Dissolved	ND	mg/l	0.0100	--	1	05/23/18 11:15	05/23/18 15:33	3,200.8	AM

Prep Information

Digestion Method: EPA 3005A

Project Name: MBTA GLX GW PRE-CHAR

Lab Number: L1818403

Project Number: 290762.1000.0000

Report Date: 06/12/18

Method Blank Analysis Batch Quality Control

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Dissolved Metals - Mansfield Lab for sample(s): 01-02 Batch: WG1118725-1										
Mercury, Dissolved	ND		mg/l	0.00020	--	1	05/23/18 11:26	05/23/18 18:58	3,245.1	MG

Prep Information

Digestion Method: EPA 245.1

Lab Control Sample Analysis

Batch Quality Control

Project Name: MBTA GLX GW PRE-CHAR
Project Number: 290762.1000.0000

Lab Number: L1818403
Report Date: 06/12/18

Parameter	LCS		LCSD		%Recovery Limits	RPD	Qual	RPD Limits
	%Recovery	Qual	%Recovery	Qual				
Total Metals - Mansfield Lab Associated sample(s): 01-02 Batch: WG1118232-2								
Mercury, Total	107		-		85-115	-		
Total Metals - Mansfield Lab Associated sample(s): 01-02 Batch: WG1118667-2								
Iron, Total	97		-		85-115	-		
Total Hardness by SM 2340B - Mansfield Lab Associated sample(s): 01-02 Batch: WG1118667-2								
Hardness	97		-		85-115	-		
Total Metals - Mansfield Lab Associated sample(s): 01-02 Batch: WG1118671-2								
Antimony, Total	97		-		85-115	-		
Arsenic, Total	108		-		85-115	-		
Cadmium, Total	107		-		85-115	-		
Chromium, Total	100		-		85-115	-		
Copper, Total	97		-		85-115	-		
Lead, Total	111		-		85-115	-		
Nickel, Total	100		-		85-115	-		
Selenium, Total	103		-		85-115	-		
Silver, Total	97		-		85-115	-		
Zinc, Total	109		-		85-115	-		



Lab Control Sample Analysis

Batch Quality Control

Project Name: MBTA GLX GW PRE-CHAR

Lab Number: L1818403

Project Number: 290762.1000.0000

Report Date: 06/12/18

Parameter	LCS %Recovery	LCSD %Recovery	%Recovery Limits	RPD	RPD Limits
Dissolved Metals - Mansfield Lab Associated sample(s): 01-02 Batch: WG1118717-2					
Iron, Dissolved	107	-	85-115	-	
Dissolved Metals - Mansfield Lab Associated sample(s): 01-02 Batch: WG1118719-2					
Antimony, Dissolved	106	-	85-115	-	
Arsenic, Dissolved	111	-	85-115	-	
Cadmium, Dissolved	111	-	85-115	-	
Chromium, Dissolved	102	-	85-115	-	
Copper, Dissolved	103	-	85-115	-	
Lead, Dissolved	108	-	85-115	-	
Nickel, Dissolved	105	-	85-115	-	
Selenium, Dissolved	104	-	85-115	-	
Silver, Dissolved	100	-	85-115	-	
Zinc, Dissolved	112	-	85-115	-	
Dissolved Metals - Mansfield Lab Associated sample(s): 01-02 Batch: WG1118725-2					
Mercury, Dissolved	126	Q	85-115	-	

Matrix Spike Analysis Batch Quality Control

Project Name: MBTA GLX GW PRE-CHAR
Project Number: 290762.1000.0000

Lab Number: L1818403
Report Date: 06/12/18

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	MSD Qual	MSD Found	MSD %Recovery	MSD Qual	Recovery Limits	RPD	RPD Qual	RPD Limits
Dissolved Metals - Mansfield Lab Associated sample(s): 01-02 QC Batch ID: WG1118717-3 QC Sample: L1818403-01 Client ID: KE210												
Iron, Dissolved	2.79	1	3.06	27	Q	-	-		75-125	-		20
Dissolved Metals - Mansfield Lab Associated sample(s): 01-02 QC Batch ID: WG1118719-3 QC Sample: L1818403-01 Client ID: KE210												
Antimony, Dissolved	ND	0.5	0.5556	111		-	-		70-130	-		20
Arsenic, Dissolved	ND	0.12	0.1309	109		-	-		70-130	-		20
Cadmium, Dissolved	ND	0.051	0.0537	105		-	-		70-130	-		20
Chromium, Dissolved	0.0023	0.2	0.1970	97		-	-		70-130	-		20
Copper, Dissolved	0.0042	0.25	0.2451	96		-	-		70-130	-		20
Lead, Dissolved	0.0022	0.51	0.5680	111		-	-		70-130	-		20
Nickel, Dissolved	0.0024	0.5	0.5024	100		-	-		70-130	-		20
Selenium, Dissolved	ND	0.12	0.1210	101		-	-		70-130	-		20
Silver, Dissolved	ND	0.05	0.0484	97		-	-		70-130	-		20
Zinc, Dissolved	ND	0.5	0.5371	107		-	-		70-130	-		20
Dissolved Metals - Mansfield Lab Associated sample(s): 01-02 QC Batch ID: WG1118725-3 QC Sample: L1818403-02 Client ID: MW11												
Mercury, Dissolved	ND	0.005	0.00547	109		-	-		75-125	-		20

Lab Duplicate Analysis

Batch Quality Control

Project Name: MBTA GLX GW PRE-CHAR

Project Number: 290762.1000.0000

Lab Number: L1818403

Report Date: 06/12/18

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
Dissolved Metals - Mansfield Lab Associated sample(s): 01-02 QC Batch ID: WG1118717-4 QC Sample: L1818403-01 Client ID: KE210						
Iron, Dissolved	2.79	2.40	mg/l	15		20
Dissolved Metals - Mansfield Lab Associated sample(s): 01-02 QC Batch ID: WG1118719-4 QC Sample: L1818403-01 Client ID: KE210						
Antimony, Dissolved	ND	ND	mg/l	NC		20
Arsenic, Dissolved	ND	ND	mg/l	NC		20
Cadmium, Dissolved	ND	ND	mg/l	NC		20
Chromium, Dissolved	0.0023	0.0020	mg/l	14		20
Copper, Dissolved	0.0042	0.004	mg/l	6		20
Lead, Dissolved	0.0022	0.0021	mg/l	4		20
Nickel, Dissolved	0.0024	0.0023	mg/l	6		20
Selenium, Dissolved	ND	ND	mg/l	NC		20
Silver, Dissolved	ND	ND	mg/l	NC		20
Zinc, Dissolved	ND	ND	mg/l	NC		20
Dissolved Metals - Mansfield Lab Associated sample(s): 01-02 QC Batch ID: WG1118725-4 QC Sample: L1818403-02 Client ID: MW11						
Mercury, Dissolved	ND	ND	mg/l	NC		20

INORGANICS & MISCELLANEOUS

Project Name: MBTA GLX GW PRE-CHAR
Project Number: 290762.1000.0000

Lab Number: L1818403
Report Date: 06/12/18

SAMPLE RESULTS

Lab ID: L1818403-01
Client ID: KE210
Sample Location: SOMERVILLE, MEDFORD, CAMBRIDGE

Date Collected: 05/18/18 11:20
Date Received: 05/18/18
Field Prep: Field Filtered
 (Dissolved
 Metals,SCN,HexCr)

Sample Depth:
Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total Dissolved	870		mg/l	20	--	2	-	05/22/18 12:45	121,2540C	DW
Solids, Total Suspended	1300		mg/l	20	NA	4	-	05/24/18 12:10	121,2540D	JT
Cyanide, Dissolved	ND		mg/l	0.005	--	1	05/23/18 15:15	05/24/18 14:08	1,9010C/9012B	LH
Cyanide, Total	ND		mg/l	0.005	--	1	05/20/18 13:50	05/21/18 11:40	121,4500CN-CE	LH
Chlorine, Total Residual	ND		mg/l	0.02	--	1	-	05/18/18 23:54	121,4500CL-D	AS
Nitrogen, Ammonia	0.452		mg/l	0.375	--	5	05/23/18 12:30	05/23/18 23:15	121,4500NH3-BH	AT
Oil & Grease, Hem-Grav	ND		mg/l	4.0	--	1	05/22/18 17:00	05/22/18 18:00	74,1664A	ML
TPH, SGT-HEM	ND		mg/l	4.00	--	1	05/22/18 17:00	05/22/18 21:50	74,1664A	ML
Phenolics, Total	ND		mg/l	0.030	--	1	05/21/18 09:25	05/22/18 05:33	4,420.1	GD
Chromium, Hexavalent (Filtered)	ND		mg/l	0.010	--	1	05/19/18 02:09	05/19/18 02:47	1,7196A	UN
Chromium, Hexavalent (Unfiltered)	ND		mg/l	0.010	--	1	05/19/18 02:09	05/19/18 02:44	1,7196A	UN
Chromium, Trivalent (Unfiltered)	0.04		mg/l	0.01	--	1	-	05/24/18 12:05	107,-	ED
Anions by Ion Chromatography - Westborough Lab										
Chloride	343.		mg/l	5.00	--	10	-	05/20/18 22:04	44,300.0	JR



Project Name: MBTA GLX GW PRE-CHAR
Project Number: 290762.1000.0000

Lab Number: L1818403
Report Date: 06/12/18

SAMPLE RESULTS

Lab ID: L1818403-02
Client ID: MW11
Sample Location: SOMERVILLE, MEDFORD, CAMBRIDGE

Date Collected: 05/18/18 08:30
Date Received: 05/18/18
Field Prep: Field Filtered
 (Dissolved
 Metals,SCN,HexCr)

Sample Depth:
Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total Dissolved	610		mg/l	20	--	2	-	05/22/18 12:45	121,2540C	DW
Cyanide, Dissolved	ND		mg/l	0.005	--	1	05/23/18 15:15	05/24/18 14:09	1,9010C/9012B	LH
Cyanide, Total	ND		mg/l	0.005	--	1	05/20/18 13:50	05/21/18 12:31	121,4500CN-CE	LH
Chlorine, Total Residual	ND		mg/l	0.02	--	1	-	05/18/18 23:54	121,4500CL-D	AS
Nitrogen, Ammonia	0.235		mg/l	0.075	--	1	05/23/18 12:30	05/23/18 22:59	121,4500NH3-BH	AT
Oil & Grease, Hem-Grav	ND		mg/l	4.0	--	1	05/22/18 17:00	05/22/18 18:00	74,1664A	ML
TPH, SGT-HEM	ND		mg/l	4.00	--	1	05/22/18 17:00	05/22/18 21:50	74,1664A	ML
Phenolics, Total	ND		mg/l	0.030	--	1	05/21/18 09:25	05/22/18 05:34	4,420.1	GD
Chromium, Trivalent (Unfiltered)	0.23		mg/l	0.01	--	1	-	05/24/18 12:05	107,-	ED
Anions by Ion Chromatography - Westborough Lab										
Chloride	220.		mg/l	5.00	--	10	-	05/20/18 22:16	44,300.0	JR



Project Name: MBTA GLX GW PRE-CHAR**Lab Number:** L1818403**Project Number:** 290762.1000.0000**Report Date:** 06/12/18**SAMPLE RESULTS**

Lab ID: L1818403-03

Date Collected: 05/24/18 08:05

Client ID: MW11

Date Received: 05/24/18

Sample Location: SOMERVILLE, MEDFORD, CAMBRIDGE

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										
Solids, Total Suspended	720		mg/l	25	NA	5	-	05/25/18 05:50	121,2540D	JT



Project Name: MBTA GLX GW PRE-CHAR
Project Number: 290762.1000.0000

Lab Number: L1818403
Report Date: 06/12/18

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): 01-02 Batch: WG1117435-1										
Chlorine, Total Residual	ND		mg/l	0.02	--	1	-	05/18/18 23:54	121,4500CL-D	AS
General Chemistry - Westborough Lab for sample(s): 01-02 Batch: WG1117457-1										
Chromium, Hexavalent	ND		mg/l	0.010	--	1	05/19/18 02:09	05/19/18 02:34	1,7196A	UN
General Chemistry - Westborough Lab for sample(s): 01-02 Batch: WG1117458-1										
Chromium, Hexavalent (Unfiltered)	ND		mg/l	0.010	--	1	05/19/18 02:09	05/19/18 02:34	1,7196A	UN
General Chemistry - Westborough Lab for sample(s): 01-02 Batch: WG1117713-1										
Cyanide, Total	ND		mg/l	0.005	--	1	05/20/18 13:50	05/21/18 11:17	121,4500CN-CE	LH
General Chemistry - Westborough Lab for sample(s): 01-02 Batch: WG1117922-1										
Phenolics, Total	ND		mg/l	0.030	--	1	05/21/18 09:25	05/22/18 05:20	4,420.1	GD
Anions by Ion Chromatography - Westborough Lab for sample(s): 01-02 Batch: WG1118011-1										
Chloride	ND		mg/l	0.500	--	1	-	05/20/18 17:04	44,300.0	JR
General Chemistry - Westborough Lab for sample(s): 01-02 Batch: WG1118128-1										
Solids, Total Dissolved	ND		mg/l	10	--	1	-	05/22/18 12:45	121,2540C	DW
General Chemistry - Westborough Lab for sample(s): 01-02 Batch: WG1118278-1										
Cyanide, Dissolved	ND		mg/l	0.005	--	1	05/23/18 15:15	05/24/18 14:03	1,9010C/9012B	LH
General Chemistry - Westborough Lab for sample(s): 01-02 Batch: WG1118378-1										
Oil & Grease, Hem-Grav	ND		mg/l	4.0	--	1	05/22/18 17:00	05/22/18 18:00	74,1664A	ML
General Chemistry - Westborough Lab for sample(s): 01-02 Batch: WG1118383-1										
TPH, SGT-HEM	ND		mg/l	4.00	--	1	05/22/18 17:00	05/22/18 21:50	74,1664A	ML
General Chemistry - Westborough Lab for sample(s): 01 Batch: WG1118575-1										
Solids, Total Suspended	ND		mg/l	5.0	NA	1	-	05/24/18 12:10	121,2540D	JT
General Chemistry - Westborough Lab for sample(s): 01-02 Batch: WG1118662-1										
Nitrogen, Ammonia	ND		mg/l	0.075	--	1	05/23/18 12:30	05/23/18 22:44	121,4500NH3-BH	AT
General Chemistry - Westborough Lab for sample(s): 03 Batch: WG1119418-1										
Solids, Total Suspended	ND		mg/l	5.0	NA	1	-	05/25/18 05:50	121,2540D	JT

Lab Control Sample Analysis

Batch Quality Control

Project Name: MBTA GLX GW PRE-CHAR
Project Number: 290762.1000.0000

Lab Number: L1818403
Report Date: 06/12/18

Parameter	LCS		LCSD		%Recovery Limits	RPD	Qual	RPD Limits
	%Recovery	Qual	%Recovery	Qual				
General Chemistry - Westborough Lab Associated sample(s): 01-02 Batch: WG1117435-2								
Chlorine, Total Residual	93		-		90-110	-		
General Chemistry - Westborough Lab Associated sample(s): 01-02 Batch: WG1117457-2								
Chromium, Hexavalent	93		-		85-115	-		20
General Chemistry - Westborough Lab Associated sample(s): 01-02 Batch: WG1117458-2								
Chromium, Hexavalent (Unfiltered)	93		-		85-115	-		20
General Chemistry - Westborough Lab Associated sample(s): 01-02 Batch: WG1117713-2								
Cyanide, Total	90		-		90-110	-		
General Chemistry - Westborough Lab Associated sample(s): 01-02 Batch: WG1117922-2								
Phenolics, Total	81		-		70-130	-		
Anions by Ion Chromatography - Westborough Lab Associated sample(s): 01-02 Batch: WG1118011-2								
Chloride	103		-		90-110	-		
General Chemistry - Westborough Lab Associated sample(s): 01-02 Batch: WG1118128-2								
Solids, Total Dissolved	85		-		80-120	-		



Lab Control Sample Analysis

Batch Quality Control

Project Name: MBTA GLX GW PRE-CHAR

Lab Number: L1818403

Project Number: 290762.1000.0000

Report Date: 06/12/18

Parameter	LCS %Recovery	LCSD %Recovery	%Recovery Limits	RPD	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01-02 Batch: WG1118278-2 WG1118278-3					
Cyanide, Dissolved	95	93	80-120	2	20
General Chemistry - Westborough Lab Associated sample(s): 01-02 Batch: WG1118378-2					
Oil & Grease, Hem-Grav	95	-	78-114	-	18
General Chemistry - Westborough Lab Associated sample(s): 01-02 Batch: WG1118383-2					
TPH	92	-	64-132	-	34
General Chemistry - Westborough Lab Associated sample(s): 01-02 Batch: WG1118662-2					
Nitrogen, Ammonia	91	-	80-120	-	20

Matrix Spike Analysis Batch Quality Control

Project Name: MBTA GLX GW PRE-CHAR
Project Number: 290762.1000.0000

Lab Number: L1818403
Report Date: 06/12/18

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	MSD Qual	MSD Found	MSD %Recovery	MSD Qual	Recovery Limits	RPD	RPD Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01-02 QC Batch ID: WG1117435-4 QC Sample: L1818403-02 Client ID: MW11												
Chlorine, Total Residual	ND	0.248	0.27	109	-	-	-	-	80-120	-	-	20
General Chemistry - Westborough Lab Associated sample(s): 01-02 QC Batch ID: WG1117457-4 QC Sample: L1818403-02 Client ID: MW11												
Chromium, Hexavalent	ND	0.1	0.097	97	-	-	-	-	85-115	-	-	20
General Chemistry - Westborough Lab Associated sample(s): 01-02 QC Batch ID: WG1117458-4 QC Sample: L1818403-02 Client ID: MW11												
Chromium, Hexavalent (Unfiltered)	ND	0.1	0.090	90	-	-	-	-	85-115	-	-	20
General Chemistry - Westborough Lab Associated sample(s): 01-02 QC Batch ID: WG1118278-4 WG1118278-5 QC Sample: L1818403-02 Client ID: MW11												
Cyanide, Dissolved	ND	0.2	0.192	96	0.202	101	-	-	80-120	5	-	20
General Chemistry - Westborough Lab Associated sample(s): 01-02 QC Batch ID: WG1118378-4 QC Sample: L1818403-02 Client ID: MW11												
Oil & Grease, Hem-Grav	ND	43	36	84	-	-	-	-	78-114	-	-	18
General Chemistry - Westborough Lab Associated sample(s): 01-02 QC Batch ID: WG1118383-4 QC Sample: L1818403-02 Client ID: MW11												
TPH	ND	21.5	15.8	74	-	-	-	-	64-132	-	-	34



Lab Duplicate Analysis

Batch Quality Control

Project Name: MBTA GLX GW PRE-CHAR

Project Number: 290762.1000.0000

Lab Number: L1818403

Report Date: 06/12/18

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01-02 QC Batch ID: WG1117435-3 QC Sample: L1818403-01 Client ID: KE210						
Chlorine, Total Residual	ND	ND	mg/l	NC		20
General Chemistry - Westborough Lab Associated sample(s): 01-02 QC Batch ID: WG1117457-3 QC Sample: L1818403-01 Client ID: KE210						
Chromium, Hexavalent	ND	ND	mg/l	NC		20
General Chemistry - Westborough Lab Associated sample(s): 01-02 QC Batch ID: WG1117458-3 QC Sample: L1818403-01 Client ID: KE210						
Chromium, Hexavalent (Unfiltered)	ND	ND	mg/l	NC		20
General Chemistry - Westborough Lab Associated sample(s): 01-02 QC Batch ID: WG1118378-3 QC Sample: L1818403-02 Client ID: MW11						
Oil & Grease, Hem-Grav	ND	ND	mg/l	NC		18
General Chemistry - Westborough Lab Associated sample(s): 01-02 QC Batch ID: WG1118383-3 QC Sample: L1818403-02 Client ID: MW11						
TPH, SGT-HEM	ND	ND	mg/l	NC		34
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1118575-2 QC Sample: L1818403-01 Client ID: KE210						
Solids, Total Suspended	1300	1400	mg/l	7		29
General Chemistry - Westborough Lab Associated sample(s): 03 QC Batch ID: WG1119418-2 QC Sample: L1818403-03 Client ID: MW11						
Solids, Total Suspended	720	730	mg/l	1		29

Project Name: MBTA GLX GW PRE-CHAR**Lab Number:** L1818403**Project Number:** 290762.1000.0000**Report Date:** 06/12/18**Sample Receipt and Container Information**

Were project specific reporting limits specified?

YES

Cooler Information

Cooler	Custody Seal
B	Absent
C	Absent
D	Absent
E	Absent

Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L1818403-01A	Vial HCl preserved	C	NA		2.3	Y	Absent		8260-SIM(14),8260(14)
L1818403-01B	Vial HCl preserved	C	NA		2.3	Y	Absent		8260-SIM(14),8260(14)
L1818403-01C	Vial HCl preserved	C	NA		2.3	Y	Absent		8260-SIM(14),8260(14)
L1818403-01D	Vial Na2S2O3 preserved	C	NA		2.3	Y	Absent		504(14)
L1818403-01E	Vial Na2S2O3 preserved	C	NA		2.3	Y	Absent		504(14)
L1818403-01F	Vial HCl preserved	C	NA		2.3	Y	Absent		SUB-ETHANOL(14)
L1818403-01G	Vial HCl preserved	C	NA		2.3	Y	Absent		SUB-ETHANOL(14)
L1818403-01H	Vial HCl preserved	C	NA		2.3	Y	Absent		SUB-ETHANOL(14)
L1818403-01I	Amber 1000ml H2SO4 preserved	E	<2	<2	3.1	Y	Absent		TPHENOL-420(28)
L1818403-01J	Amber 1000ml HCl preserved	C	NA		2.3	Y	Absent		TPH-1664(28)
L1818403-01K	Amber 1000ml HCl preserved	C	NA		2.3	Y	Absent		TPH-1664(28)
L1818403-01L	Amber 1000ml HCl preserved	C	NA		2.3	Y	Absent		OG-1664(28)
L1818403-01M	Amber 1000ml HCl preserved	C	NA		2.3	Y	Absent		OG-1664(28)
L1818403-01N	Amber 1000ml HCl preserved	C	<2	<2	2.3	Y	Absent		EPH-10(14)
L1818403-01O	Amber 1000ml HCl preserved	C	<2	<2	2.3	Y	Absent		EPH-10(14)
L1818403-01P	Plastic 950ml unpreserved	D	7	7	2.1	Y	Absent		TSS-2540(7)
L1818403-01Q	Plastic 950ml unpreserved	D	7	7	2.1	Y	Absent		CL-300(28),HEXCR-7196-UF(1),TRC-4500(1),TDS-2540(7)
L1818403-01R	Plastic 250ml NaOH preserved	D	>12	>12	2.1	Y	Absent		TCN-4500(14)
L1818403-01R1	Plastic 500ml unpreserved	D	7	7	2.1	Y	Absent		HEXCR-7196(1)

Project Name: MBTA GLX GW PRE-CHAR**Lab Number:** L1818403**Project Number:** 290762.1000.0000**Report Date:** 06/12/18**Container Information**

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L1818403-01S	Plastic 250ml unpreserved	D	7	7	2.1	Y	Absent		SCN-9010(14)
L1818403-01T	Plastic 500ml H2SO4 preserved	D	<2	<2	2.1	Y	Absent		NH3-4500(28)
L1818403-01U	Amber 1000ml unpreserved	D	7	7	2.1	Y	Absent		8270TCL(7),8270TCL-SIM(7)
L1818403-01V	Amber 1000ml unpreserved	D	7	7	2.1	Y	Absent		8270TCL(7),8270TCL-SIM(7)
L1818403-01X	Amber 1000ml Na2S2O3	D	7	7	2.1	Y	Absent		PESTICIDE-608(7)
L1818403-01Y	Amber 1000ml Na2S2O3	D	7	7	2.1	Y	Absent		PCB-608(7)
L1818403-01Z	Amber 1000ml Na2S2O3	D	7	7	2.1	Y	Absent		PCB-608(7)
L1818403-01Z1	Plastic 250ml HNO3 preserved	D	<2	<2	2.1	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)
L1818403-01Z2	Plastic 250ml HNO3 preserved	E	<2	<2	3.1	Y	Absent		AG-2008S(180),CR-2008S(180),FE-RI(180),AS-2008S(180),PB-2008S(180),ZN-2008S(180),NI-2008S(180),SE-2008S(180),CD-2008S(180),CU-2008S(180),SB-2008S(180),HG-R(28)
L1818403-01Z3	Plastic 250ml HNO3 preserved	E	<2	<2	3.1	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)
L1818403-02A	Vial HCl preserved	E	NA		3.1	Y	Absent		8260-SIM(14),8260(14)
L1818403-02B	Vial HCl preserved	E	NA		3.1	Y	Absent		8260-SIM(14),8260(14)
L1818403-02C	Vial HCl preserved	E	NA		3.1	Y	Absent		8260-SIM(14),8260(14)
L1818403-02D	Vial Na2S2O3 preserved	E	NA		3.1	Y	Absent		504(14)
L1818403-02E	Vial Na2S2O3 preserved	E	NA		3.1	Y	Absent		504(14)
L1818403-02F	Vial HCl preserved	E	NA		3.1	Y	Absent		SUB-ETHANOL(14)
L1818403-02G	Vial HCl preserved	E	NA		3.1	Y	Absent		SUB-ETHANOL(14)
L1818403-02H	Vial HCl preserved	E	NA		3.1	Y	Absent		SUB-ETHANOL(14)
L1818403-02I	Amber 1000ml H2SO4 preserved	E	<2	<2	3.1	Y	Absent		TPHENOL-420(28)
L1818403-02J	Amber 1000ml HCl preserved	E	NA		3.1	Y	Absent		TPH-1664(28)
L1818403-02K	Amber 1000ml HCl preserved	E	NA		3.1	Y	Absent		TPH-1664(28)
L1818403-02L	Amber 1000ml HCl preserved	E	NA		3.1	Y	Absent		OG-1664(28)
L1818403-02M	Amber 1000ml HCl preserved	E	NA		3.1	Y	Absent		OG-1664(28)

Project Name: MBTA GLX GW PRE-CHAR
Project Number: 290762.1000.0000

Serial_No:06121817:36
Lab Number: L1818403
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Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L1818403-02N	Amber 1000ml HCl preserved	E	<2	<2	3.1	Y	Absent		EPH-10(14)
L1818403-02O	Amber 1000ml HCl preserved	E	<2	<2	3.1	Y	Absent		EPH-10(14)
L1818403-02Q	Amber 1000ml unpreserved	E	7	7	3.1	Y	Absent		CL-300(28),HOLD-WETCHEM(),TRC-4500(1),TDS-2540(7)
L1818403-02R	Plastic 250ml NaOH preserved	E	>12	>12	3.1	Y	Absent		TCN-4500(14)
L1818403-02S	Plastic 250ml unpreserved	E	7	7	3.1	Y	Absent		SCN-9010(14),HOLD-WETCHEM()
L1818403-02T	Plastic 500ml H2SO4 preserved	E	<2	<2	3.1	Y	Absent		NH3-4500(28)
L1818403-02U	Plastic 500ml unpreserved	E	7	7	3.1	Y	Absent		ARCHIVE()
L1818403-02V	Amber 1000ml unpreserved	E	7	7	3.1	Y	Absent		8270TCL(7),8270TCL-SIM(7)
L1818403-02Z1	Plastic 250ml HNO3 preserved	E	<2	<2	3.1	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)
L1818403-02Z2	Plastic 250ml HNO3 preserved	E	<2	<2	3.1	Y	Absent		AG-2008S(180),CR-2008S(180),FE-RI(180),AS-2008S(180),PB-2008S(180),ZN-2008S(180),NI-2008S(180),SE-2008S(180),CD-2008S(180),CU-2008S(180),SB-2008S(180),HG-R(28)
L1818403-02Z3	Plastic 250ml HNO3 preserved	E	<2	<2	3.1	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)
L1818403-03A	Plastic 950ml unpreserved	B	7	7	3.3	Y	Absent		TSS-2540(7)
L1818403-03B	Amber 1000ml Na2S2O3	B	7	7	3.3	Y	Absent		PCB-608(7)
L1818403-03C	Amber 1000ml Na2S2O3	B	7	7	3.3	Y	Absent		PCB-608(7)

Project Name: MBTA GLX GW PRE-CHAR
Project Number: 290762.1000.0000

Lab Number: L1818403
Report Date: 06/12/18

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).
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.
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.

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

Report Format: Data Usability Report



Project Name: MBTA GLX GW PRE-CHAR
Project Number: 290762.1000.0000

Lab Number: L1818403
Report Date: 06/12/18

Data Qualifiers

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.

Project Name: MBTA GLX GW PRE-CHAR
Project Number: 290762.1000.0000

Lab Number: L1818403
Report Date: 06/12/18

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.
- 5 Methods for the Organic Chemical Analysis of Municipal and Industrial Wastewater. Appendix A, Part 136, 40 CFR (Code of Federal Regulations).
- 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.
- 98 Method for the Determination of Extractable Petroleum Hydrocarbons (EPH), MassDEP, May 2004, Revision 1.1 with QC Requirements & Performance Standards for the Analysis of EPH under the Massachusetts Contingency Plan, WSC-CAM-IVB, July 2010.
- 107 Alpha Analytical - In-house calculation method.
- 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 OF

Project Information

Westborough, MA Mansfield, MA
 TEL: 508-898-9220 TEL: 508-822-9300
 FAX: 508-898-9193 FAX: 508-822-3288

Client Information

Client: TRC Environmental Corp
 Address: 650 Suffolk Street
 Lowell, MA
 Phone: 978-970-5600

Fax: _____
 Email: moliveira@trcsolutions.com

These samples have been Previously analyzed by Alpha

Other Project Specific Requirements/Comments/Detection Limits:

RLs must meet EPA RGP Appendix VII limits.
 Please report both Total and Dissolved RGP metals (including trivalent chromium)
 5 day TAT standard per quote.
 Report project-specific VOC/SVOC analyte lists.
 Add'l emails: KMorin@trcsolutions.com & SNabozny@trcsolutions.com

Due Date: _____ Time: _____

Project Name: MBTA GLX GW Pre-char
 Project Location: Somerville, Medford, Cambridge
 Project #: 290762.1000.0000
 Project Manager: Matt Oliveira
 ALPHA Quote #: 3742

Turn-Around Time
 Standard Rush (ONLY IF PRE-APPROVED)

Date Rec'd in Lab: 5/18/18 ALPHA Job #: C18184B

Report Information Data Deliverables Billing Information

FAX EMAIL
 ADEX Add'l Deliverables

Same as Client info PO #: 119800

Regulatory Requirements/Report Limits

State/Fed Program Criteria
 EPA / MCP EPA RGP / RCGW-1

MCP PRESUMPTIVE CERTAINTY-CT REASONABLE CONFIDENCE PROTOCOLS

Yes No Are MCP Analytical Methods Required?
 Yes No Are CT RCP (Reasonable Confidence Protocols) Required?


ANALYSIS												SAMPLE HANDLING		TOTAL BOTTLES
NPDES RGP GW 2017 per quote	Pesticides by 608	EPH (Fractions Only) by MassDEP	Oil and Grease (HEM) by 1664A	TDS by SM2540C	Hardness by 200.7	Dissolved RGP Metals by 200.8/245.1	Dissolved Cyanide by 9010	Total and Diss Hex. Chrom. by 7196A					Filtration <input checked="" type="checkbox"/> Done <input type="checkbox"/> Not Needed <input type="checkbox"/> Lab to do Preservation <input type="checkbox"/> Lab to do (Please specify below)	
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PLEASE ANSWER QUESTIONS ABOVE!

IS YOUR PROJECT MA MCP or CT RCP?

Container Type	-	A	A	A	G	P	P	P	P	-	-	-
Preservative	-	H	B	B	A	C	C	E	A	-	-	-
Relinquished By:	Date/Time		Received By:		Date/Time							
<i>[Signature]</i>	5-18 15:08		<i>[Signature]</i>		5/18/18 15:20							
<i>[Signature]</i>	5/18/18 15:20		<i>[Signature]</i>		5/18/18 18:20							

Please print clearly, legibly and completely. Samples can not be logged in and turnaround time clock will not start until any ambiguities are resolved. All samples submitted are subject to Alpha's Payment Terms.

 <p>ALPHA ANALYTICAL <small>World Class Chemistry</small></p>	<p>Subcontract Chain of Custody</p> <p>Test America (Nashville) 2960 Foster Creighton Drive Nashville, TN 37204</p>	<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <td style="padding: 5px;"> <p>Alpha Job Number L1818403</p> </td> </tr> </table>	<p>Alpha Job Number L1818403</p>		
<p>Alpha Job Number L1818403</p>					
Client Information	Project Information	Regulatory Requirements/Report Limits			
Client: Alpha Analytical Labs Address: Eight Walkup Drive Westborough, MA 01581-1019 Phone: 508-439-5132 Email: akane@alphalab.com	Project Location: MA Project Manager: Ashaley Kane <table border="1" style="width:100%; border-collapse: collapse;"> <tr> <td style="text-align: center;">Turnaround & Deliverables Information</td> </tr> <tr> <td style="padding: 5px;"> Due Date: 05/25/18 Deliverables: </td> </tr> </table>	Turnaround & Deliverables Information	Due Date: 05/25/18 Deliverables:	State/Federal Program: Regulatory Criteria: RCS-1-14	
Turnaround & Deliverables Information					
Due Date: 05/25/18 Deliverables:					
Project Specific Requirements and/or Report Requirements					
Reference following Alpha Job Number on final report/deliverables: L1818403		Report to include Method Blank, LCS/LCSD:			
Additional Comments: Send all results/reports to subreports@alphalab.com					
Table Header					
Lab ID	Client ID	Collection Date/Time	Sample Matrix	Analysis	Batch QC
	KE210 MW11	05-18-18 11:20 05-18-18 08:30	WATER WATER	Ethanol by EPA 1671 Revision A Ethanol by EPA 1671 Revision A	
Relinquished By:		Date/Time:	Received By:	Date/Time:	
<i>[Signature]</i> AAL		5/21/18			
Form No: AL_subcoc					

CHAIN OF CUSTODY

PAGE OF



Project Information

Date Rec'd in Lab: 05/24/18 ALPHA Job #: 1818403

Report Information Data Deliverables Billing Information

FAX EMAIL Same as Client Info PO #: 119800
 ADEx Add'l Deliverables

Regulatory Requirements/Report Limits

State/Fed Program: EPA / MCP Criteria: EPA RGP / RCGW-1

MCP PRESUMPTIVE CERTAINTY-CT REASONABLE CONFIDENCE PROTOCOLS

Yes No Are MCP Analytical Methods Required?
 Yes No Are CT RCP (Reasonable Confidence Protocols) Required?

ANALYSIS

NPDES RGP GW 2017 per quote	Pesticides by 608	EPH (Fractions Only) by MassDEP	Oil and Grease (HEM) by 1664A	TDS by SM2540C	Hardness by 200.7	Dissolved RGP Metals by 200.8/245.1	Dissolved Cyanide by 9010	Total and Diss Hex. Chrom. by 7196A	PCB	TSS	SO4	SAMPLE HANDLING	TOTAL # BOTTLES
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/> Done <input type="checkbox"/> Not Needed <input type="checkbox"/> Lab to do Preservation <input type="checkbox"/> Lab to do (Please specify below)	
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
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Westborough, MA Mansfield, MA
 TEL: 508-898-9220 TEL: 508-822-9300
 FAX: 508-898-9193 FAX: 508-822-3288

Client Information

Client: TRC Environmental Corp
 Address: 650 Suffolk Street
 Lowell, MA
 Phone: 978-970-5600

Project Name: MBTA GLX GW Pre-char

Project Location: Somerville, Medford, Cambridge

Project #: 290762.1000.0000

Project Manager: Matt Oliveira

ALPHA Quote #: 3742

Turn-Around Time

Fax: Standard Rush (ONLY IF PRE-APPROVED)

Email: moliveira@trcsolutions.com

These samples have been Previously analyzed by Alpha Due Date: Time:

Other Project Specific Requirements/Comments/Detection Limits:

RLs must meet EPA RGP Appendix VII limits.
 Please report both Total and Dissolved RGP metals (including trivalent chromium)
 5 day TAT standard per quote.
 Report project-specific VOC/SVOC analyte lists.
 Add'l emails: KMorin@trcsolutions.com & SNabozny@trcsolutions.com *MW11 additional vol*

ALPHA Lab ID (Lab Use Only)	Sample ID	Collection		Sample Matrix	Sampler's Initials
		Date	Time		
	MW 2	5-24	855	GW	EP
	MW 2 Dup	5-24	1045	GW	EP
18403-03	MW11	5-24	0805	GW	EP
	TAP Blank	5-23			
	Tap Blank				

PLEASE ANSWER QUESTIONS ABOVE!

Container Type	-	A	A	A	G	P	P	P	P	-	-	-
Preservative	-	H	B	B	A	C	C	E	A	-	-	-

IS YOUR PROJECT MA MCP or CT RCP?

Relinquished By:	Date/Time	Received By:	Date/Time
<i>[Signature]</i>	5-24/18 1835	<i>[Signature]</i>	5/24/18 1600
AAI	5/24/18 1835		5-24-18 1635

Please print clearly, legibly and completely. Samples can not be logged in and turnaround time clock will not start until any ambiguities are resolved. All samples submitted are subject to Alpha's Payment Terms.

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: 490-152378-1
 Client Project/Site: L1818403

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

Attn: Ashaley Kane



Authorized for release by:
 5/30/2018 9:37:16 AM

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

LINKS

Review your project
 results through
TotalAccess

Have a Question?



Visit us at:
www.testamericainc.com

The test results in this report meet all 2003 NELAC and 2009 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.



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Certification Summary	12
Chain of Custody	13
Receipt Checklists	15

Sample Summary

Client: Alpha Analytical Inc
Project/Site: L1818403

TestAmerica Job ID: 490-152378-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
490-152378-1	KE210	Water	05/18/18 11:20	05/22/18 09:15
490-152378-2	MW11	Water	05/18/18 08:30	05/22/18 09:15

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Case Narrative

Client: Alpha Analytical Inc
Project/Site: L1818403

TestAmerica Job ID: 490-152378-1

Job ID: 490-152378-1

Laboratory: TestAmerica Nashville

Narrative

Job Narrative
490-152378-1

Comments

No additional comments.

Receipt

The samples were received on 5/22/2018 9:15 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 2.1° C.

GC Semi VOA

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

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Definitions/Glossary

Client: Alpha Analytical Inc
Project/Site: L1818403

TestAmerica Job ID: 490-152378-1

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
α	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: L1818403

TestAmerica Job ID: 490-152378-1

Client Sample ID: KE210**Date Collected: 05/18/18 11:20****Date Received: 05/22/18 09:15****Lab Sample ID: 490-152378-1****Matrix: Water****Method: 1671A - Ethanol (GC/FID)**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ethanol	ND		2000	500	ug/L			05/24/18 11:44	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
Isopropyl acetate (Surr)	85		70 - 130					05/24/18 11:44	1

Client Sample Results

Client: Alpha Analytical Inc
Project/Site: L1818403

TestAmerica Job ID: 490-152378-1

Client Sample ID: MW11
Date Collected: 05/18/18 08:30
Date Received: 05/22/18 09:15

Lab Sample ID: 490-152378-2
Matrix: Water

Method: 1671A - Ethanol (GC/FID)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ethanol	ND		2000	500	ug/L			05/24/18 11:50	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
Isopropyl acetate (Surr)	83		70 - 130					05/24/18 11:50	1

QC Sample Results

Client: Alpha Analytical Inc
Project/Site: L1818403

TestAmerica Job ID: 490-152378-1

Method: 1671A - Ethanol (GC/FID)

Lab Sample ID: MB 490-517340/4
Matrix: Water
Analysis Batch: 517340

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			05/24/18 11:10	1
Surrogate	MB %Recovery	MB Qualifier	Limits				Prepared	Analyzed	Dil Fac
Isopropyl acetate (Surr)	91		70 - 130					05/24/18 11:10	1

Lab Sample ID: LCS 490-517340/5
Matrix: Water
Analysis Batch: 517340

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Ethanol	50200	49470		ug/L		98	70 - 130
Surrogate	LCS %Recovery	LCS Qualifier	Limits				
Isopropyl acetate (Surr)	103		70 - 130				

Lab Sample ID: 490-152378-2 MS
Matrix: Water
Analysis Batch: 517340

Client Sample ID: MW11
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Ethanol	ND		50200	53080		ug/L		106	70 - 130
Surrogate	MS %Recovery	MS Qualifier	Limits						
Isopropyl acetate (Surr)	92		70 - 130						

Lab Sample ID: 490-152378-2 MSD
Matrix: Water
Analysis Batch: 517340

Client Sample ID: MW11
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Ethanol	ND		50200	48390		ug/L		96	70 - 130	9	20
Surrogate	MSD %Recovery	MSD Qualifier	Limits								
Isopropyl acetate (Surr)	89		70 - 130								

QC Association Summary

Client: Alpha Analytical Inc
Project/Site: L1818403

TestAmerica Job ID: 490-152378-1

GC VOA

Analysis Batch: 517340

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-152378-1	KE210	Total/NA	Water	1671A	
490-152378-2	MW11	Total/NA	Water	1671A	
MB 490-517340/4	Method Blank	Total/NA	Water	1671A	
LCS 490-517340/5	Lab Control Sample	Total/NA	Water	1671A	
490-152378-2 MS	MW11	Total/NA	Water	1671A	
490-152378-2 MSD	MW11	Total/NA	Water	1671A	

Lab Chronicle

Client: Alpha Analytical Inc
Project/Site: L1818403

TestAmerica Job ID: 490-152378-1

Client Sample ID: KE210

Date Collected: 05/18/18 11:20

Date Received: 05/22/18 09:15

Lab Sample ID: 490-152378-1

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			517340	05/24/18 11:44	NMB	TAL NSH

Client Sample ID: MW11

Date Collected: 05/18/18 08:30

Date Received: 05/22/18 09:15

Lab Sample ID: 490-152378-2

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			517340	05/24/18 11:50	NMB	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: L1818403

TestAmerica Job ID: 490-152378-1

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

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Accreditation/Certification Summary

Client: Alpha Analytical Inc
Project/Site: L1818403

TestAmerica Job ID: 490-152378-1

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
Maine	State Program	1	TN00032	11-03-19

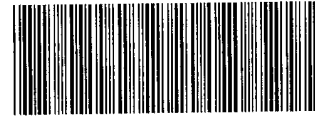
The following analytes are included in this report, but accreditation/certification is not offered by the governing authority:

Analysis Method	Prep Method	Matrix	Analyte
1671A		Water	Ethanol



THE LEADER IN ENVIRONMENTAL TESTING
Nashville, TN

COOLER RECEIPT FORM



490-152378 Chain of Custody

Cooler Received/Opened On 05-22-2018 @ 0915

Time Samples Removed From Cooler 1340 Time Samples Placed In Storage 1355 (2 Hour Window)

1. Tracking # 1ZE30654019585 (last 4 digits, FedEx) Courier: VPS NDA
IR Gun ID 17960358 pH Strip Lot N/A Chlorine Strip Lot N/A

2. Temperature of rep. sample or temp blank when opened: 2.1 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 (initial) ADH

7. Were custody seals on containers: YES NO 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



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 (initial) [Signature]

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 (initial) [Signature]

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 (initial) [Signature]

I certify that I attached a label with the unique LIMS number to each container (initial) [Signature]

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

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Subcontract Chain of Custody

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

Alpha Job Number
L1818403

Client Information

Client: Alpha Analytical Labs
Address: Eight Walkup Drive
Westborough, MA 01581-1019
Phone: 508-439-5132
Email: akane@alphalab.com

Project Information

Project Location: MA
Project Manager: Ashaley Kane
Turnaround & Deliverables Information
Due Date: 05/25/18
Deliverables:

Regulatory Requirements/Report Limits

State/Federal Program:
Regulatory Criteria: RCS-1-14

Project Specific Requirements and/or Report Requirements

Reference following Alpha Job Number on final report/deliverables: L1818403
Report to include Method Blank, LCS/LCSD:
Additional Comments: Send all results/reports to subreports@alphalab.com

Loc: 490
152378

Lab ID	Client ID	Collection Date/Time	Sample Matrix	Analysis	Batch
	KE210 MMW11	05-18-18 11:20 05-18-18 08:30	WATER WATER	Ethanol by EPA 1671 Revision A Ethanol by EPA 1671 Revision A	QC
Relinquished By:		Date/Time:		Received By:	Date/Time:
<i>AK</i>		<i>5/21/18</i>		<i>AK</i>	<i>5-22-18</i>
Form No: AL_subcoc					

2.1

Login Sample Receipt Checklist

Client: Alpha Analytical Inc

Job Number: 490-152378-1

Login Number: 152378**List Source: TestAmerica Nashville****List Number: 1****Creator: West, Derrick D**

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.		
The cooler's custody seal, if present, is intact.		
Sample custody seals, if present, are intact.		
The cooler or samples do not appear to have been compromised or tampered with.		
Samples were received on ice.		
Cooler Temperature is acceptable.		
Cooler Temperature is recorded.		
COC is present.		
COC is filled out in ink and legible.		
COC is filled out with all pertinent information.		
Is the Field Sampler's name present on COC?		
There are no discrepancies between the containers received and the COC.		
Samples are received within Holding Time (excluding tests with immediate HTs)		
Sample containers have legible labels.		
Containers are not broken or leaking.		
Sample collection date/times are provided.		
Appropriate sample containers are used.		
Sample bottles are completely filled.		
Sample Preservation Verified.		
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs		
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").		
Multiphasic samples are not present.		
Samples do not require splitting or compositing.		
Residual Chlorine Checked.		



ANALYTICAL REPORT

Lab Number:	L1832437
Client:	TRC Environmental Consultants 650 Suffolk Street Lowell, MA 01854
ATTN:	Diane Stallings
Phone:	(978) 970-5600
Project Name:	MBTA GLX GW PRE-CHAR
Project Number:	290762.1000.0000
Report Date:	08/27/18

The original project report/data package is held by Alpha Analytical. This report/data package is paginated and should be reproduced only in its entirety. Alpha Analytical holds no responsibility for results and/or data that are not consistent with the original.

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: MBTA GLX GW PRE-CHAR
Project Number: 290762.1000.0000

Lab Number: L1832437
Report Date: 08/27/18

Alpha Sample ID	Client ID	Matrix	Sample Location	Collection Date/Time	Receive Date
L1832437-01	MW-18	WATER	SOMERVILLE, MEDFORD, CAMBRIDGE	08/17/18 09:00	08/17/18
L1832437-02	DUP-18	WATER	SOMERVILLE, MEDFORD, CAMBRIDGE	08/17/18 10:30	08/17/18
L1832437-03	TRIP BLANKS	WATER	SOMERVILLE, MEDFORD, CAMBRIDGE	08/17/18 00:00	08/17/18

Project Name: MBTA GLX GW PRE-CHAR

Lab Number: L1832437

Project Number: 290762.1000.0000

Report Date: 08/27/18

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?	NO
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).	YES
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?	NO
I	Were results reported for the complete analyte list specified in the selected CAM protocol(s)?	NO
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: MBTA GLX GW PRE-CHAR
Project Number: 290762.1000.0000

Lab Number: L1832437
Report Date: 08/27/18

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: MBTA GLX GW PRE-CHAR
Project Number: 290762.1000.0000

Lab Number: L1832437
Report Date: 08/27/18

Case Narrative (continued)

Report Submission

August 27, 2018: This final report includes the results of all requested analyses.

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.

Report Revision

August 27, 2018: The EPH narratives have been revised to include additional information regarding insufficient sample volume.

Report Submission

August 26, 2018: This is a preliminary report.

August 24, 2018: This is a preliminary report.

MCP Related Narratives

Report Submission

In reference to question B:

At the client's request, the analytical method(s) specified in the CAM protocol were not followed, with the exception of the EPH analysis.

EPH

In reference to question H:

L1832437-01, -02: The surrogate recoveries for Chloro-Octadecane (19% and 20%, respectively) were below acceptance criteria for the method. A re-extraction was performed; however, due to a batch QC failure the results could not be reported. Insufficient sample remained for an additional re-extraction.

In reference to question I:

All samples were analyzed for a subset of MCP analytes per client request.

Project Name: MBTA GLX GW PRE-CHAR
Project Number: 290762.1000.0000

Lab Number: L1832437
Report Date: 08/27/18

Case Narrative (continued)

Non-Non-MCP Related Narratives

Sample Receipt

L1832437-03: Due to insufficient sample volume received, Volatile Organics by Method 8260C could not be performed.

Total Metals

The WG1149130-7 MS recovery for iron (0%), performed on L1832437-01, does not apply because the sample concentration is greater than four times the spike amount added.

The WG1149132-3 MS recovery for antimony (46%), performed on L1832437-01, recovered outside the 70-130% acceptance criteria. The result for this analyte is considered suspect due to either the heterogeneous nature of the sample or matrix interference.

Dissolved Metals

The WG1149672-2 LCS recovery, associated with L1832437-01 and -02, is above the acceptance criteria for silver (119%); however, the associated samples are non-detect to the RL for this target analyte. The results of the original analysis are reported.

The WG1149416-3 MS recovery, performed on L1832437-01, is outside the acceptance criteria for mercury (71%). A post digestion spike was performed and was within acceptance criteria.

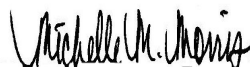
The WG1149676-3 MS recovery for iron (0%), performed on L1832437-01, does not apply because the sample concentration is greater than four times the spike amount added.

The WG1149672-4 Laboratory Duplicate RPDs for chromium (25%) and zinc (23%), performed on L1832437-01, are outside the acceptance criteria. The elevated RPDs have been attributed to the non-homogeneous nature of the native sample.

The WG1149676-4 Laboratory Duplicate RPD for iron (31%), performed on L1832437-01, is outside the acceptance criteria. The elevated RPD has been attributed to the non-homogeneous nature of the native sample.

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: 08/27/18

ORGANICS

VOLATILES

Project Name: MBTA GLX GW PRE-CHAR
Project Number: 290762.1000.0000

Lab Number: L1832437
Report Date: 08/27/18

SAMPLE RESULTS

Lab ID: L1832437-01
Client ID: MW-18
Sample Location: SOMERVILLE, MEDFORD, CAMBRIDGE

Date Collected: 08/17/18 09:00
Date Received: 08/17/18
Field Prep: Refer to COC

Sample Depth:

Matrix: Water
Analytical Method: 1,8260C
Analytical Date: 08/21/18 09:47
Analyst: NLK

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by GC/MS - Westborough Lab						
1,1-Dichloropropene	ND		ug/l	2.5	--	1
1,2,3-Trichloropropane	ND		ug/l	5.0	--	1
Bromochloromethane	ND		ug/l	2.5	--	1
Tetrahydrofuran	ND		ug/l	5.0	--	1
2,2-Dichloropropane	ND		ug/l	2.5	--	1
1,1,1,2-Tetrachloroethane	ND		ug/l	0.50	--	1
Bromobenzene	ND		ug/l	2.5	--	1
n-Butylbenzene	ND		ug/l	0.50	--	1
sec-Butylbenzene	ND		ug/l	0.50	--	1
tert-Butylbenzene	ND		ug/l	2.5	--	1
o-Chlorotoluene	ND		ug/l	2.5	--	1
p-Chlorotoluene	ND		ug/l	2.5	--	1
Hexachlorobutadiene	ND		ug/l	0.50	--	1
p-Isopropyltoluene	ND		ug/l	0.50	--	1
Naphthalene	ND		ug/l	2.5	--	1
n-Propylbenzene	ND		ug/l	0.50	--	1
1,3,5-Trimethylbenzene	ND		ug/l	2.5	--	1
1,2,4-Trimethylbenzene	ND		ug/l	2.5	--	1
Ethyl ether	ND		ug/l	2.5	--	1
Diisopropyl Ether	ND		ug/l	2.0	--	1
Ethyl-Tert-Butyl-Ether	ND		ug/l	2.0	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	97		70-130
Toluene-d8	103		70-130
4-Bromofluorobenzene	102		70-130
Dibromofluoromethane	102		70-130

Project Name: MBTA GLX GW PRE-CHAR**Lab Number:** L1832437**Project Number:** 290762.1000.0000**Report Date:** 08/27/18**SAMPLE RESULTS**

Lab ID: L1832437-01
 Client ID: MW-18
 Sample Location: SOMERVILLE, MEDFORD, CAMBRIDGE

Date Collected: 08/17/18 09:00
 Date Received: 08/17/18
 Field Prep: Refer to COC

Sample Depth:

Matrix: Water
 Analytical Method: 128,624.1
 Analytical Date: 08/20/18 16:55
 Analyst: NLK

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
Chloroform	ND		ug/l	1.0	--	1
Carbon tetrachloride	ND		ug/l	1.0	--	1
1,2-Dichloropropane	ND		ug/l	3.5	--	1
Dibromochloromethane	ND		ug/l	1.0	--	1
1,1,2-Trichloroethane	ND		ug/l	1.5	--	1
2-Chloroethylvinyl ether	ND		ug/l	10	--	1
Tetrachloroethene	ND		ug/l	1.0	--	1
Chlorobenzene	ND		ug/l	3.5	--	1
Trichlorofluoromethane	ND		ug/l	5.0	--	1
1,2-Dichloroethane	ND		ug/l	1.5	--	1
1,1,1-Trichloroethane	ND		ug/l	2.0	--	1
Bromodichloromethane	ND		ug/l	1.0	--	1
trans-1,3-Dichloropropene	ND		ug/l	1.5	--	1
cis-1,3-Dichloropropene	ND		ug/l	1.5	--	1
Bromoform	ND		ug/l	1.0	--	1
1,1,1,2-Tetrachloroethane	ND		ug/l	1.0	--	1
Benzene	ND		ug/l	1.0	--	1
Toluene	ND		ug/l	1.0	--	1
Ethylbenzene	ND		ug/l	1.0	--	1
Chloromethane	ND		ug/l	5.0	--	1
Bromomethane	ND		ug/l	5.0	--	1
Vinyl chloride	ND		ug/l	1.0	--	1
Chloroethane	ND		ug/l	2.0	--	1
1,1-Dichloroethene	ND		ug/l	1.0	--	1
trans-1,2-Dichloroethene	ND		ug/l	1.5	--	1
cis-1,2-Dichloroethene	ND		ug/l	1.0	--	1

Project Name: MBTA GLX GW PRE-CHAR
Project Number: 290762.1000.0000

Lab Number: L1832437
Report Date: 08/27/18

SAMPLE RESULTS

Lab ID: L1832437-01
Client ID: MW-18
Sample Location: SOMERVILLE, MEDFORD, CAMBRIDGE

Date Collected: 08/17/18 09:00
Date Received: 08/17/18
Field Prep: Refer to COC

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by GC/MS - Westborough Lab						
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
Styrene	ND		ug/l	1.0	--	1
Acetone	ND		ug/l	10	--	1
Carbon disulfide	ND		ug/l	5.0	--	1
2-Butanone	ND		ug/l	10	--	1
4-Methyl-2-pentanone	ND		ug/l	10	--	1
2-Hexanone	ND		ug/l	10	--	1
Acrolein	ND		ug/l	8.0	--	1
Acrylonitrile	ND		ug/l	10	--	1
Methyl tert butyl Ether	ND		ug/l	10	--	1
Dibromomethane	ND		ug/l	1.0	--	1
Tert-Butyl Alcohol	ND		ug/l	100	--	1
Tertiary-Amyl Methyl Ether	ND		ug/l	20	--	1
Dichlorodifluoromethane ¹	ND		ug/l	1.0	--	1
1,2,3-Trichlorobenzene	ND		ug/l	1.0	--	1
1,2,4-Trichlorobenzene	ND		ug/l	1.0	--	1
Isopropylbenzene	ND		ug/l	1.0	--	1
1,3-Dichloropropane	ND		ug/l	1.0	--	1
1,2-Dibromo-3-chloropropane	ND		ug/l	2.0	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
Pentafluorobenzene	100		60-140
Fluorobenzene	110		60-140
4-Bromofluorobenzene	96		60-140

Project Name: MBTA GLX GW PRE-CHAR
Project Number: 290762.1000.0000

Lab Number: L1832437
Report Date: 08/27/18

SAMPLE RESULTS

Lab ID: L1832437-01
 Client ID: MW-18
 Sample Location: SOMERVILLE, MEDFORD, CAMBRIDGE

Date Collected: 08/17/18 09:00
 Date Received: 08/17/18
 Field Prep: Refer to COC

Sample Depth:

Matrix: Water
 Analytical Method: 128,624.1-SIM
 Analytical Date: 08/20/18 16:55
 Analyst: NLK

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

Surrogate	% Recovery	Qualifier	Acceptance Criteria
Fluorobenzene	118		60-140
4-Bromofluorobenzene	96		60-140

Project Name: MBTA GLX GW PRE-CHAR**Lab Number:** L1832437**Project Number:** 290762.1000.0000**Report Date:** 08/27/18**SAMPLE RESULTS**

Lab ID: L1832437-01
 Client ID: MW-18
 Sample Location: SOMERVILLE, MEDFORD, CAMBRIDGE

Date Collected: 08/17/18 09:00
 Date Received: 08/17/18
 Field Prep: Refer to COC

Sample Depth:

Matrix: Water
 Analytical Method: 14,504.1
 Analytical Date: 08/21/18 14:16
 Analyst: AWS

Extraction Method: EPA 504.1
 Extraction Date: 08/21/18 10:01

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

Project Name: MBTA GLX GW PRE-CHAR
Project Number: 290762.1000.0000

Lab Number: L1832437
Report Date: 08/27/18

SAMPLE RESULTS

Lab ID: L1832437-02
Client ID: DUP-18
Sample Location: SOMERVILLE, MEDFORD, CAMBRIDGE

Date Collected: 08/17/18 10:30
Date Received: 08/17/18
Field Prep: Refer to COC

Sample Depth:

Matrix: Water
Analytical Method: 1,8260C
Analytical Date: 08/21/18 10:12
Analyst: NLK

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by GC/MS - Westborough Lab						
1,1-Dichloropropene	ND		ug/l	2.5	--	1
1,2,3-Trichloropropane	ND		ug/l	5.0	--	1
Bromochloromethane	ND		ug/l	2.5	--	1
Tetrahydrofuran	ND		ug/l	5.0	--	1
2,2-Dichloropropane	ND		ug/l	2.5	--	1
1,1,1,2-Tetrachloroethane	ND		ug/l	0.50	--	1
Bromobenzene	ND		ug/l	2.5	--	1
n-Butylbenzene	ND		ug/l	0.50	--	1
sec-Butylbenzene	ND		ug/l	0.50	--	1
tert-Butylbenzene	ND		ug/l	2.5	--	1
o-Chlorotoluene	ND		ug/l	2.5	--	1
p-Chlorotoluene	ND		ug/l	2.5	--	1
Hexachlorobutadiene	ND		ug/l	0.50	--	1
p-Isopropyltoluene	ND		ug/l	0.50	--	1
Naphthalene	ND		ug/l	2.5	--	1
n-Propylbenzene	ND		ug/l	0.50	--	1
1,3,5-Trimethylbenzene	ND		ug/l	2.5	--	1
1,2,4-Trimethylbenzene	ND		ug/l	2.5	--	1
Ethyl ether	ND		ug/l	2.5	--	1
Diisopropyl Ether	ND		ug/l	2.0	--	1
Ethyl-Tert-Butyl-Ether	ND		ug/l	2.0	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	101		70-130
Toluene-d8	104		70-130
4-Bromofluorobenzene	101		70-130
Dibromofluoromethane	105		70-130

Project Name: MBTA GLX GW PRE-CHAR
Project Number: 290762.1000.0000

Lab Number: L1832437
Report Date: 08/27/18

SAMPLE RESULTS

Lab ID: L1832437-02
Client ID: DUP-18
Sample Location: SOMERVILLE, MEDFORD, CAMBRIDGE

Date Collected: 08/17/18 10:30
Date Received: 08/17/18
Field Prep: Refer to COC

Sample Depth:

Matrix: Water
Analytical Method: 128,624.1
Analytical Date: 08/20/18 17:31
Analyst: NLK

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
Chloroform	ND		ug/l	1.0	--	1
Carbon tetrachloride	ND		ug/l	1.0	--	1
1,2-Dichloropropane	ND		ug/l	3.5	--	1
Dibromochloromethane	ND		ug/l	1.0	--	1
1,1,2-Trichloroethane	ND		ug/l	1.5	--	1
2-Chloroethylvinyl ether	ND		ug/l	10	--	1
Tetrachloroethene	1.1		ug/l	1.0	--	1
Chlorobenzene	ND		ug/l	3.5	--	1
Trichlorofluoromethane	ND		ug/l	5.0	--	1
1,2-Dichloroethane	ND		ug/l	1.5	--	1
1,1,1-Trichloroethane	ND		ug/l	2.0	--	1
Bromodichloromethane	ND		ug/l	1.0	--	1
trans-1,3-Dichloropropene	ND		ug/l	1.5	--	1
cis-1,3-Dichloropropene	ND		ug/l	1.5	--	1
Bromoform	ND		ug/l	1.0	--	1
1,1,1,2-Tetrachloroethane	ND		ug/l	1.0	--	1
Benzene	ND		ug/l	1.0	--	1
Toluene	ND		ug/l	1.0	--	1
Ethylbenzene	ND		ug/l	1.0	--	1
Chloromethane	ND		ug/l	5.0	--	1
Bromomethane	ND		ug/l	5.0	--	1
Vinyl chloride	ND		ug/l	1.0	--	1
Chloroethane	ND		ug/l	2.0	--	1
1,1-Dichloroethene	ND		ug/l	1.0	--	1
trans-1,2-Dichloroethene	ND		ug/l	1.5	--	1
cis-1,2-Dichloroethene	ND		ug/l	1.0	--	1

Project Name: MBTA GLX GW PRE-CHAR
Project Number: 290762.1000.0000

Lab Number: L1832437
Report Date: 08/27/18

SAMPLE RESULTS

Lab ID: L1832437-02
Client ID: DUP-18
Sample Location: SOMERVILLE, MEDFORD, CAMBRIDGE

Date Collected: 08/17/18 10:30
Date Received: 08/17/18
Field Prep: Refer to COC

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by GC/MS - Westborough Lab						
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
Styrene	ND		ug/l	1.0	--	1
Acetone	ND		ug/l	10	--	1
Carbon disulfide	ND		ug/l	5.0	--	1
2-Butanone	ND		ug/l	10	--	1
4-Methyl-2-pentanone	ND		ug/l	10	--	1
2-Hexanone	ND		ug/l	10	--	1
Acrolein	ND		ug/l	8.0	--	1
Acrylonitrile	ND		ug/l	10	--	1
Methyl tert butyl Ether	ND		ug/l	10	--	1
Dibromomethane	ND		ug/l	1.0	--	1
Tert-Butyl Alcohol	ND		ug/l	100	--	1
Tertiary-Amyl Methyl Ether	ND		ug/l	20	--	1
Dichlorodifluoromethane ¹	ND		ug/l	1.0	--	1
1,2,3-Trichlorobenzene	ND		ug/l	1.0	--	1
1,2,4-Trichlorobenzene	ND		ug/l	1.0	--	1
Isopropylbenzene	ND		ug/l	1.0	--	1
1,3-Dichloropropane	ND		ug/l	1.0	--	1
1,2-Dibromo-3-chloropropane	ND		ug/l	2.0	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
Pentafluorobenzene	99		60-140
Fluorobenzene	109		60-140
4-Bromofluorobenzene	97		60-140

Project Name: MBTA GLX GW PRE-CHAR
Project Number: 290762.1000.0000

Lab Number: L1832437
Report Date: 08/27/18

SAMPLE RESULTS

Lab ID: L1832437-02
 Client ID: DUP-18
 Sample Location: SOMERVILLE, MEDFORD, CAMBRIDGE

Date Collected: 08/17/18 10:30
 Date Received: 08/17/18
 Field Prep: Refer to COC

Sample Depth:

Matrix: Water
 Analytical Method: 128,624.1-SIM
 Analytical Date: 08/20/18 17:31
 Analyst: NLK

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	117		60-140
4-Bromofluorobenzene	97		60-140

Project Name: MBTA GLX GW PRE-CHAR
Project Number: 290762.1000.0000

Lab Number: L1832437
Report Date: 08/27/18

SAMPLE RESULTS

Lab ID: L1832437-02
 Client ID: DUP-18
 Sample Location: SOMERVILLE, MEDFORD, CAMBRIDGE

Date Collected: 08/17/18 10:30
 Date Received: 08/17/18
 Field Prep: Refer to COC

Sample Depth:

Matrix: Water
 Analytical Method: 14,504.1
 Analytical Date: 08/21/18 14:33
 Analyst: AWS

Extraction Method: EPA 504.1
 Extraction Date: 08/21/18 10:01

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

Project Name: MBTA GLX GW PRE-CHAR
Project Number: 290762.1000.0000

Lab Number: L1832437
Report Date: 08/27/18

SAMPLE RESULTS

Lab ID: L1832437-03
Client ID: TRIP BLANKS
Sample Location: SOMERVILLE, MEDFORD, CAMBRIDGE

Date Collected: 08/17/18 00:00
Date Received: 08/17/18
Field Prep: Not Specified

Sample Depth:

Matrix: Water
Analytical Method: 128,624.1
Analytical Date: 08/20/18 16:18
Analyst: NLK

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
Chloroform	ND		ug/l	1.0	--	1
Carbon tetrachloride	ND		ug/l	1.0	--	1
1,2-Dichloropropane	ND		ug/l	3.5	--	1
Dibromochloromethane	ND		ug/l	1.0	--	1
1,1,2-Trichloroethane	ND		ug/l	1.5	--	1
2-Chloroethylvinyl ether	ND		ug/l	10	--	1
Tetrachloroethene	ND		ug/l	1.0	--	1
Chlorobenzene	ND		ug/l	3.5	--	1
Trichlorofluoromethane	ND		ug/l	5.0	--	1
1,2-Dichloroethane	ND		ug/l	1.5	--	1
1,1,1-Trichloroethane	ND		ug/l	2.0	--	1
Bromodichloromethane	ND		ug/l	1.0	--	1
trans-1,3-Dichloropropene	ND		ug/l	1.5	--	1
cis-1,3-Dichloropropene	ND		ug/l	1.5	--	1
Bromoform	ND		ug/l	1.0	--	1
1,1,2,2-Tetrachloroethane	ND		ug/l	1.0	--	1
Benzene	ND		ug/l	1.0	--	1
Toluene	ND		ug/l	1.0	--	1
Ethylbenzene	ND		ug/l	1.0	--	1
Chloromethane	ND		ug/l	5.0	--	1
Bromomethane	ND		ug/l	5.0	--	1
Vinyl chloride	ND		ug/l	1.0	--	1
Chloroethane	ND		ug/l	2.0	--	1
1,1-Dichloroethene	ND		ug/l	1.0	--	1
trans-1,2-Dichloroethene	ND		ug/l	1.5	--	1
cis-1,2-Dichloroethene	ND		ug/l	1.0	--	1

Project Name: MBTA GLX GW PRE-CHAR
Project Number: 290762.1000.0000

Lab Number: L1832437
Report Date: 08/27/18

SAMPLE RESULTS

Lab ID: L1832437-03
Client ID: TRIP BLANKS
Sample Location: SOMERVILLE, MEDFORD, CAMBRIDGE

Date Collected: 08/17/18 00:00
Date Received: 08/17/18
Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by GC/MS - Westborough Lab						
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
Styrene	ND		ug/l	1.0	--	1
Acetone	ND		ug/l	10	--	1
Carbon disulfide	ND		ug/l	5.0	--	1
2-Butanone	ND		ug/l	10	--	1
4-Methyl-2-pentanone	ND		ug/l	10	--	1
2-Hexanone	ND		ug/l	10	--	1
Acrolein	ND		ug/l	8.0	--	1
Acrylonitrile	ND		ug/l	10	--	1
Methyl tert butyl Ether	ND		ug/l	10	--	1
Dibromomethane	ND		ug/l	1.0	--	1
Tert-Butyl Alcohol	ND		ug/l	100	--	1
Tertiary-Amyl Methyl Ether	ND		ug/l	20	--	1
Dichlorodifluoromethane ¹	ND		ug/l	1.0	--	1
1,2,3-Trichlorobenzene	ND		ug/l	1.0	--	1
1,2,4-Trichlorobenzene	ND		ug/l	1.0	--	1
Isopropylbenzene	ND		ug/l	1.0	--	1
1,3-Dichloropropane	ND		ug/l	1.0	--	1
1,2-Dibromo-3-chloropropane	ND		ug/l	2.0	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
Pentafluorobenzene	100		60-140
Fluorobenzene	112		60-140
4-Bromofluorobenzene	96		60-140

Project Name: MBTA GLX GW PRE-CHAR
Project Number: 290762.1000.0000

Lab Number: L1832437
Report Date: 08/27/18

SAMPLE RESULTS

Lab ID: L1832437-03
Client ID: TRIP BLANKS
Sample Location: SOMERVILLE, MEDFORD, CAMBRIDGE

Date Collected: 08/17/18 00:00
Date Received: 08/17/18
Field Prep: Not Specified

Sample Depth:

Matrix: Water
Analytical Method: 128,624.1-SIM
Analytical Date: 08/20/18 16:18
Analyst: NLK

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	95		60-140

Project Name: MBTA GLX GW PRE-CHAR**Lab Number:** L1832437**Project Number:** 290762.1000.0000**Report Date:** 08/27/18**SAMPLE RESULTS**

Lab ID: L1832437-03
 Client ID: TRIP BLANKS
 Sample Location: SOMERVILLE, MEDFORD, CAMBRIDGE

Date Collected: 08/17/18 00:00
 Date Received: 08/17/18
 Field Prep: Not Specified

Sample Depth:

Matrix: Water
 Analytical Method: 14,504.1
 Analytical Date: 08/21/18 14:51
 Analyst: AWS

Extraction Method: EPA 504.1
 Extraction Date: 08/21/18 10:01

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

Project Name: MBTA GLX GW PRE-CHAR**Lab Number:** L1832437**Project Number:** 290762.1000.0000**Report Date:** 08/27/18**Method Blank Analysis
Batch Quality Control**

Analytical Method: 14,504.1
 Analytical Date: 08/21/18 11:44
 Analyst: AWS

Extraction Method: EPA 504.1
 Extraction Date: 08/21/18 10:01

Parameter	Result	Qualifier	Units	RL	MDL
Microextractables by GC - Westborough Lab for sample(s): 01-03 Batch: WG1148771-1					
1,2-Dibromoethane	ND		ug/l	0.010	-- A

Project Name: MBTA GLX GW PRE-CHAR

Lab Number: L1832437

Project Number: 290762.1000.0000

Report Date: 08/27/18

**Method Blank Analysis
Batch Quality Control**

Analytical Method: 128,624.1-SIM

Analytical Date: 08/20/18 15:42

Analyst: NLK

Parameter	Result	Qualifier	Units	RL	MDL
Volatile Organics by GC/MS-SIM - Westborough Lab for sample(s): 01-03 Batch: WG1148908-4					
1,4-Dioxane	ND		ug/l	50	--

Surrogate	%Recovery	Qualifier	Acceptance Criteria
Fluorobenzene	121		60-140
4-Bromofluorobenzene	95		60-140

Project Name: MBTA GLX GW PRE-CHAR
Project Number: 290762.1000.0000

Lab Number: L1832437
Report Date: 08/27/18

Method Blank Analysis
Batch Quality Control

Analytical Method: 128,624.1
Analytical Date: 08/20/18 15:42
Analyst: AD

Parameter	Result	Qualifier	Units	RL	MDL
Volatile Organics by GC/MS - Westborough Lab for sample(s): 01-03 Batch: WG1148915-4					
Methylene chloride	ND		ug/l	1.0	--
1,1-Dichloroethane	ND		ug/l	1.5	--
Chloroform	ND		ug/l	1.0	--
Carbon tetrachloride	ND		ug/l	1.0	--
1,2-Dichloropropane	ND		ug/l	3.5	--
Dibromochloromethane	ND		ug/l	1.0	--
1,1,2-Trichloroethane	ND		ug/l	1.5	--
2-Chloroethylvinyl ether	ND		ug/l	10	--
Tetrachloroethene	ND		ug/l	1.0	--
Chlorobenzene	ND		ug/l	3.5	--
Trichlorofluoromethane	ND		ug/l	5.0	--
1,2-Dichloroethane	ND		ug/l	1.5	--
1,1,1-Trichloroethane	ND		ug/l	2.0	--
Bromodichloromethane	ND		ug/l	1.0	--
trans-1,3-Dichloropropene	ND		ug/l	1.5	--
cis-1,3-Dichloropropene	ND		ug/l	1.5	--
Bromoform	ND		ug/l	1.0	--
1,1,2,2-Tetrachloroethane	ND		ug/l	1.0	--
Benzene	ND		ug/l	1.0	--
Toluene	ND		ug/l	1.0	--
Ethylbenzene	ND		ug/l	1.0	--
Chloromethane	ND		ug/l	5.0	--
Bromomethane	ND		ug/l	5.0	--
Vinyl chloride	ND		ug/l	1.0	--
Chloroethane	ND		ug/l	2.0	--
1,1-Dichloroethene	ND		ug/l	1.0	--
trans-1,2-Dichloroethene	ND		ug/l	1.5	--
cis-1,2-Dichloroethene	ND		ug/l	1.0	--
Trichloroethene	ND		ug/l	1.0	--

Project Name: MBTA GLX GW PRE-CHAR
Project Number: 290762.1000.0000

Lab Number: L1832437
Report Date: 08/27/18

**Method Blank Analysis
Batch Quality Control**

Analytical Method: 128,624.1
Analytical Date: 08/20/18 15:42
Analyst: AD

Parameter	Result	Qualifier	Units	RL	MDL
Volatile Organics by GC/MS - Westborough Lab for sample(s): 01-03 Batch: WG1148915-4					
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	--
Styrene	ND		ug/l	1.0	--
Acetone	ND		ug/l	10	--
Carbon disulfide	ND		ug/l	5.0	--
2-Butanone	ND		ug/l	10	--
4-Methyl-2-pentanone	ND		ug/l	10	--
2-Hexanone	ND		ug/l	10	--
Acrolein	ND		ug/l	8.0	--
Acrylonitrile	ND		ug/l	10	--
Methyl tert butyl Ether	ND		ug/l	10	--
Dibromomethane	ND		ug/l	1.0	--
Tert-Butyl Alcohol	ND		ug/l	100	--
Tertiary-Amyl Methyl Ether	ND		ug/l	20	--
Dichlorodifluoromethane ¹	ND		ug/l	1.0	--
1,2,3-Trichlorobenzene	ND		ug/l	1.0	--
1,2,4-Trichlorobenzene	ND		ug/l	1.0	--
Isopropylbenzene	ND		ug/l	1.0	--
1,3-Dichloropropane	ND		ug/l	1.0	--
1,2-Dibromo-3-chloropropane	ND		ug/l	2.0	--

Project Name: MBTA GLX GW PRE-CHAR**Lab Number:** L1832437**Project Number:** 290762.1000.0000**Report Date:** 08/27/18

**Method Blank Analysis
Batch Quality Control**

Analytical Method: 128,624.1
 Analytical Date: 08/20/18 15:42
 Analyst: AD

Parameter	Result	Qualifier	Units	RL	MDL
Volatile Organics by GC/MS - Westborough Lab for sample(s): 01-03 Batch: WG1148915-4					

Surrogate	%Recovery	Qualifier	Acceptance Criteria
Pentafluorobenzene	99		60-140
Fluorobenzene	112		60-140
4-Bromofluorobenzene	92		60-140

Project Name: MBTA GLX GW PRE-CHAR
Project Number: 290762.1000.0000

Lab Number: L1832437
Report Date: 08/27/18

**Method Blank Analysis
Batch Quality Control**

Analytical Method: 1,8260C
Analytical Date: 08/21/18 09:22
Analyst: PD

Parameter	Result	Qualifier	Units	RL	MDL
Volatile Organics by GC/MS - Westborough Lab for sample(s): 01-02 Batch: WG1148935-5					
1,1-Dichloropropene	ND		ug/l	2.5	--
1,2,3-Trichloropropane	ND		ug/l	5.0	--
Bromochloromethane	ND		ug/l	2.5	--
Tetrahydrofuran	ND		ug/l	5.0	--
2,2-Dichloropropane	ND		ug/l	2.5	--
1,1,1,2-Tetrachloroethane	ND		ug/l	0.50	--
Bromobenzene	ND		ug/l	2.5	--
n-Butylbenzene	ND		ug/l	0.50	--
sec-Butylbenzene	ND		ug/l	0.50	--
tert-Butylbenzene	ND		ug/l	2.5	--
o-Chlorotoluene	ND		ug/l	2.5	--
p-Chlorotoluene	ND		ug/l	2.5	--
Hexachlorobutadiene	ND		ug/l	0.50	--
p-Isopropyltoluene	ND		ug/l	0.50	--
Naphthalene	ND		ug/l	2.5	--
n-Propylbenzene	ND		ug/l	0.50	--
1,3,5-Trimethylbenzene	ND		ug/l	2.5	--
1,2,4-Trimethylbenzene	ND		ug/l	2.5	--
Ethyl ether	ND		ug/l	2.5	--
Diisopropyl Ether	ND		ug/l	2.0	--
Ethyl-Tert-Butyl-Ether	ND		ug/l	2.0	--

Surrogate	%Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	97		70-130
Toluene-d8	104		70-130
4-Bromofluorobenzene	103		70-130
Dibromofluoromethane	102		70-130



Lab Control Sample Analysis

Batch Quality Control

Project Name: MBTA GLX GW PRE-CHAR

Lab Number: L1832437

Project Number: 290762.1000.0000

Report Date: 08/27/18

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits	Column
Microextractables by GC - Westborough Lab Associated sample(s): 01-03 Batch: WG1148771-2									
1,2-Dibromoethane	103		-		80-120	-			A

Lab Control Sample Analysis Batch Quality Control

Project Name: MBTA GLX GW PRE-CHAR
Project Number: 290762.1000.0000

Lab Number: L1832437
Report Date: 08/27/18

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Volatile Organics by GC/MS-SIM - Westborough Lab Associated sample(s): 01-03 Batch: WG1148908-3								
1,4-Dioxane	110		-		60-140	-		20

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
Fluorobenzene	122				60-140
4-Bromofluorobenzene	92				60-140

Lab Control Sample Analysis

Batch Quality Control

Project Name: MBTA GLX GW PRE-CHAR

Lab Number: L1832437

Project Number: 290762.1000.0000

Report Date: 08/27/18

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Volatile Organics by GC/MS - Westborough Lab Associated sample(s): 01-03 Batch: WG1148915-3								
Methylene chloride	100		-		60-140	-		28
1,1-Dichloroethane	95		-		50-150	-		49
Chloroform	105		-		70-135	-		54
Carbon tetrachloride	110		-		70-130	-		41
1,2-Dichloropropane	110		-		35-165	-		55
Dibromochloromethane	90		-		70-135	-		50
1,1,2-Trichloroethane	85		-		70-130	-		45
2-Chloroethylvinyl ether	80		-		1-225	-		71
Tetrachloroethene	95		-		70-130	-		39
Chlorobenzene	90		-		65-135	-		53
Trichlorofluoromethane	100		-		50-150	-		84
1,2-Dichloroethane	110		-		70-130	-		49
1,1,1-Trichloroethane	110		-		70-130	-		36
Bromodichloromethane	105		-		65-135	-		56
trans-1,3-Dichloropropene	90		-		50-150	-		86
cis-1,3-Dichloropropene	105		-		25-175	-		58
Bromoform	85		-		70-130	-		42
1,1,2,2-Tetrachloroethane	80		-		60-140	-		61
Benzene	110		-		65-135	-		61
Toluene	100		-		70-130	-		41
Ethylbenzene	100		-		60-140	-		63
Chloromethane	90		-		1-205	-		60
Bromomethane	47		-		15-185	-		61

Lab Control Sample Analysis

Batch Quality Control

Project Name: MBTA GLX GW PRE-CHAR

Lab Number: L1832437

Project Number: 290762.1000.0000

Report Date: 08/27/18

Parameter	LCS		LCSD		%Recovery Limits	RPD	RPD	
	%Recovery	Qual	%Recovery	Qual			Qual	Limits
Volatile Organics by GC/MS - Westborough Lab Associated sample(s): 01-03 Batch: WG1148915-3								
Vinyl chloride	105		-		5-195	-		66
Chloroethane	95		-		40-160	-		78
1,1-Dichloroethene	90		-		50-150	-		32
trans-1,2-Dichloroethene	100		-		70-130	-		45
cis-1,2-Dichloroethene	95		-		60-140	-		30
Trichloroethene	95		-		65-135	-		48
1,2-Dichlorobenzene	85		-		65-135	-		57
1,3-Dichlorobenzene	85		-		70-130	-		43
1,4-Dichlorobenzene	85		-		65-135	-		57
p/m-Xylene	100		-		60-140	-		30
o-xylene	95		-		60-140	-		30
Styrene	85		-		60-140	-		30
Acetone	92		-		40-160	-		30
Carbon disulfide	95		-		60-140	-		30
2-Butanone	114		-		60-140	-		30
4-Methyl-2-pentanone	96		-		60-140	-		30
2-Hexanone	104		-		60-140	-		30
Acrolein	90		-		60-140	-		30
Acrylonitrile	98		-		60-140	-		60
Methyl tert butyl Ether	85		-		60-140	-		30
Dibromomethane	90		-		70-130	-		30
Tert-Butyl Alcohol	78		-		60-140	-		30
Tertiary-Amyl Methyl Ether	100		-		60-140	-		30

Lab Control Sample Analysis

Batch Quality Control

Project Name: MBTA GLX GW PRE-CHAR

Lab Number: L1832437

Project Number: 290762.1000.0000

Report Date: 08/27/18

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Volatile Organics by GC/MS - Westborough Lab Associated sample(s): 01-03 Batch: WG1148915-3								
Dichlorodifluoromethane ¹	70		-		70-130	-		30
1,2,3-Trichlorobenzene	80		-		60-140	-		30
1,2,4-Trichlorobenzene	90		-		60-140	-		30
Isopropylbenzene	90		-		60-140	-		30
1,3-Dichloropropane	95		-		60-140	-		30
1,2-Dibromo-3-chloropropane	75		-		60-140	-		30

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
Pentafluorobenzene	99				60-140
Fluorobenzene	113				60-140
4-Bromofluorobenzene	94				60-140

Lab Control Sample Analysis

Batch Quality Control

Project Name: MBTA GLX GW PRE-CHAR

Lab Number: L1832437

Project Number: 290762.1000.0000

Report Date: 08/27/18

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Volatile Organics by GC/MS - Westborough Lab Associated sample(s): 01-02 Batch: WG1148935-3 WG1148935-4								
1,1-Dichloropropene	110		110		70-130	0		20
1,2,3-Trichloropropane	99		100		64-130	1		20
Bromochloromethane	110		100		70-130	10		20
Tetrahydrofuran	89		90		58-130	1		20
2,2-Dichloropropane	110		110		63-133	0		20
1,1,1,2-Tetrachloroethane	110		100		64-130	10		20
Bromobenzene	110		110		70-130	0		20
n-Butylbenzene	120		120		53-136	0		20
sec-Butylbenzene	120		110		70-130	9		20
tert-Butylbenzene	120		120		70-130	0		20
o-Chlorotoluene	120		120		70-130	0		20
p-Chlorotoluene	120		120		70-130	0		20
Hexachlorobutadiene	110		110		63-130	0		20
p-Isopropyltoluene	110		100		70-130	10		20
Naphthalene	82		82		70-130	0		20
n-Propylbenzene	120		120		69-130	0		20
1,3,5-Trimethylbenzene	120		120		64-130	0		20
1,2,4-Trimethylbenzene	120		120		70-130	0		20
Ethyl ether	110		110		59-134	0		20
Diisopropyl Ether	110		100		70-130	10		20
Ethyl-Tert-Butyl-Ether	100		99		70-130	1		20

Lab Control Sample Analysis

Batch Quality Control

Project Name: MBTA GLX GW PRE-CHAR

Lab Number: L1832437

Project Number: 290762.1000.0000

Report Date: 08/27/18

Parameter	<i>LCS</i> %Recovery	<i>Qual</i>	<i>LCSD</i> %Recovery	<i>Qual</i>	<i>%Recovery</i> Limits	<i>RPD</i>	<i>Qual</i>	<i>RPD</i> Limits
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Volatile Organics by GC/MS - Westborough Lab Associated sample(s): 01-02 Batch: WG1148935-3 WG1148935-4

<i>Surrogate</i>	<i>LCS</i> %Recovery	<i>Qual</i>	<i>LCSD</i> %Recovery	<i>Qual</i>	<i>Acceptance</i> Criteria
1,2-Dichloroethane-d4	98		99		70-130
Toluene-d8	105		106		70-130
4-Bromofluorobenzene	103		105		70-130
Dibromofluoromethane	101		101		70-130

Matrix Spike Analysis

Batch Quality Control

Project Name: MBTA GLX GW PRE-CHAR

Lab Number: L1832437

Project Number: 290762.1000.0000

Report Date: 08/27/18

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): 01-03 QC Batch ID: WG1148771-3 QC Sample: L1831972-01 Client ID: MS Sample													
1,2-Dibromoethane	ND	0.253	0.263	104		-	-		80-120	-		20	A
1,2-Dibromo-3-chloropropane	ND	0.253	0.252	100		-	-		80-120	-		20	A

SEMIVOLATILES

Project Name: MBTA GLX GW PRE-CHAR
Project Number: 290762.1000.0000

Lab Number: L1832437
Report Date: 08/27/18

SAMPLE RESULTS

Lab ID: L1832437-01
Client ID: MW-18
Sample Location: SOMERVILLE, MEDFORD, CAMBRIDGE

Date Collected: 08/17/18 09:00
Date Received: 08/17/18
Field Prep: Refer to COC

Sample Depth:

Matrix: Water
Analytical Method: 129,625.1
Analytical Date: 08/24/18 03:54
Analyst: ALS

Extraction Method: EPA 625.1
Extraction Date: 08/22/18 20:46

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Semivolatile Organics by GC/MS - Westborough Lab						
Benzidine ¹	ND		ug/l	20	--	1
1,2,4-Trichlorobenzene	ND		ug/l	5.0	--	1
Bis(2-chloroethyl)ether	ND		ug/l	2.0	--	1
2-Chloronaphthalene	ND		ug/l	2.0	--	1
3,3'-Dichlorobenzidine	ND		ug/l	5.0	--	1
2,4-Dinitrotoluene	ND		ug/l	5.0	--	1
2,6-Dinitrotoluene	ND		ug/l	5.0	--	1
Azobenzene ¹	ND		ug/l	2.0	--	1
4-Bromophenyl phenyl ether	ND		ug/l	2.0	--	1
Bis(2-chloroisopropyl)ether	ND		ug/l	2.0	--	1
Bis(2-chloroethoxy)methane	ND		ug/l	5.0	--	1
Hexachlorobutadiene	ND		ug/l	2.0	--	1
Hexachlorocyclopentadiene ¹	ND		ug/l	10	--	1
Hexachloroethane	ND		ug/l	2.0	--	1
Isophorone	ND		ug/l	5.0	--	1
Nitrobenzene	ND		ug/l	2.0	--	1
NDPA/DPA ¹	ND		ug/l	2.0	--	1
n-Nitrosodi-n-propylamine	ND		ug/l	5.0	--	1
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
Aniline ¹	ND		ug/l	2.0	--	1
4-Chloroaniline ¹	ND		ug/l	5.0	--	1
Dibenzofuran ¹	ND		ug/l	2.0	--	1
2-Methylnaphthalene ¹	ND		ug/l	2.0	--	1

Project Name: MBTA GLX GW PRE-CHAR**Lab Number:** L1832437**Project Number:** 290762.1000.0000**Report Date:** 08/27/18**SAMPLE RESULTS**

Lab ID: L1832437-01

Date Collected: 08/17/18 09:00

Client ID: MW-18

Date Received: 08/17/18

Sample Location: SOMERVILLE, MEDFORD, CAMBRIDGE

Field Prep: Refer to COC

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Semivolatile Organics by GC/MS - Westborough Lab						
Acetophenone ¹	ND		ug/l	5.0	--	1
n-Nitrosodimethylamine ¹	ND		ug/l	2.0	--	1
2,4,6-Trichlorophenol	ND		ug/l	5.0	--	1
p-Chloro-m-cresol ¹	ND		ug/l	2.0	--	1
2-Chlorophenol	ND		ug/l	2.0	--	1
2,4-Dichlorophenol	ND		ug/l	5.0	--	1
2,4-Dimethylphenol	ND		ug/l	5.0	--	1
2-Nitrophenol	ND		ug/l	5.0	--	1
4-Nitrophenol	ND		ug/l	10	--	1
2,4-Dinitrophenol	ND		ug/l	20	--	1
Phenol	ND		ug/l	5.0	--	1
2-Methylphenol ¹	ND		ug/l	5.0	--	1
3-Methylphenol/4-Methylphenol ¹	ND		ug/l	5.0	--	1
2,4,5-Trichlorophenol ¹	ND		ug/l	5.0	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Fluorophenol	59		25-87
Phenol-d6	43		16-65
Nitrobenzene-d5	98		42-122
2-Fluorobiphenyl	87		46-121
2,4,6-Tribromophenol	90		45-128
4-Terphenyl-d14	91		47-138

Project Name: MBTA GLX GW PRE-CHAR
Project Number: 290762.1000.0000

Lab Number: L1832437
Report Date: 08/27/18

SAMPLE RESULTS

Lab ID: L1832437-01
Client ID: MW-18
Sample Location: SOMERVILLE, MEDFORD, CAMBRIDGE

Date Collected: 08/17/18 09:00
Date Received: 08/17/18
Field Prep: Refer to COC

Sample Depth:

Matrix: Water
Analytical Method: 129,625.1-SIM
Analytical Date: 08/25/18 10:04
Analyst: CB

Extraction Method: EPA 625.1
Extraction Date: 08/24/18 15:05

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	ND		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
Hexachlorobenzene ¹	ND		ug/l	0.10	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Fluorophenol	37		25-87
Phenol-d6	28		16-65
Nitrobenzene-d5	75		42-122
2-Fluorobiphenyl	72		46-121
2,4,6-Tribromophenol	96		45-128
4-Terphenyl-d14	86		47-138

Project Name: MBTA GLX GW PRE-CHAR
Project Number: 290762.1000.0000

Lab Number: L1832437
Report Date: 08/27/18

SAMPLE RESULTS

Lab ID: L1832437-02
Client ID: DUP-18
Sample Location: SOMERVILLE, MEDFORD, CAMBRIDGE

Date Collected: 08/17/18 10:30
Date Received: 08/17/18
Field Prep: Refer to COC

Sample Depth:

Matrix: Water
Analytical Method: 129,625.1
Analytical Date: 08/24/18 04:20
Analyst: ALS

Extraction Method: EPA 625.1
Extraction Date: 08/22/18 20:46

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Semivolatile Organics by GC/MS - Westborough Lab						
Benzidine ¹	ND		ug/l	20	--	1
1,2,4-Trichlorobenzene	ND		ug/l	5.0	--	1
Bis(2-chloroethyl)ether	ND		ug/l	2.0	--	1
2-Chloronaphthalene	ND		ug/l	2.0	--	1
3,3'-Dichlorobenzidine	ND		ug/l	5.0	--	1
2,4-Dinitrotoluene	ND		ug/l	5.0	--	1
2,6-Dinitrotoluene	ND		ug/l	5.0	--	1
Azobenzene ¹	ND		ug/l	2.0	--	1
4-Bromophenyl phenyl ether	ND		ug/l	2.0	--	1
Bis(2-chloroisopropyl)ether	ND		ug/l	2.0	--	1
Bis(2-chloroethoxy)methane	ND		ug/l	5.0	--	1
Hexachlorobutadiene	ND		ug/l	2.0	--	1
Hexachlorocyclopentadiene ¹	ND		ug/l	10	--	1
Hexachloroethane	ND		ug/l	2.0	--	1
Isophorone	ND		ug/l	5.0	--	1
Nitrobenzene	ND		ug/l	2.0	--	1
NDPA/DPA ¹	ND		ug/l	2.0	--	1
n-Nitrosodi-n-propylamine	ND		ug/l	5.0	--	1
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
Aniline ¹	ND		ug/l	2.0	--	1
4-Chloroaniline ¹	ND		ug/l	5.0	--	1
Dibenzofuran ¹	ND		ug/l	2.0	--	1
2-Methylnaphthalene ¹	ND		ug/l	2.0	--	1

Project Name: MBTA GLX GW PRE-CHAR**Lab Number:** L1832437**Project Number:** 290762.1000.0000**Report Date:** 08/27/18**SAMPLE RESULTS**

Lab ID: L1832437-02
 Client ID: DUP-18
 Sample Location: SOMERVILLE, MEDFORD, CAMBRIDGE

Date Collected: 08/17/18 10:30
 Date Received: 08/17/18
 Field Prep: Refer to COC

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Semivolatile Organics by GC/MS - Westborough Lab						
Acetophenone ¹	ND		ug/l	5.0	--	1
n-Nitrosodimethylamine ¹	ND		ug/l	2.0	--	1
2,4,6-Trichlorophenol	ND		ug/l	5.0	--	1
p-Chloro-m-cresol ¹	ND		ug/l	2.0	--	1
2-Chlorophenol	ND		ug/l	2.0	--	1
2,4-Dichlorophenol	ND		ug/l	5.0	--	1
2,4-Dimethylphenol	ND		ug/l	5.0	--	1
2-Nitrophenol	ND		ug/l	5.0	--	1
4-Nitrophenol	ND		ug/l	10	--	1
2,4-Dinitrophenol	ND		ug/l	20	--	1
Phenol	ND		ug/l	5.0	--	1
2-Methylphenol ¹	ND		ug/l	5.0	--	1
3-Methylphenol/4-Methylphenol ¹	ND		ug/l	5.0	--	1
2,4,5-Trichlorophenol ¹	ND		ug/l	5.0	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Fluorophenol	52		25-87
Phenol-d6	39		16-65
Nitrobenzene-d5	88		42-122
2-Fluorobiphenyl	80		46-121
2,4,6-Tribromophenol	86		45-128
4-Terphenyl-d14	92		47-138

Project Name: MBTA GLX GW PRE-CHAR
Project Number: 290762.1000.0000

Lab Number: L1832437
Report Date: 08/27/18

SAMPLE RESULTS

Lab ID: L1832437-02
Client ID: DUP-18
Sample Location: SOMERVILLE, MEDFORD, CAMBRIDGE

Date Collected: 08/17/18 10:30
Date Received: 08/17/18
Field Prep: Refer to COC

Sample Depth:

Matrix: Water
Analytical Method: 129,625.1-SIM
Analytical Date: 08/25/18 10:30
Analyst: CB

Extraction Method: EPA 625.1
Extraction Date: 08/24/18 15:05

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	ND		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
Hexachlorobenzene ¹	ND		ug/l	0.10	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Fluorophenol	41		25-87
Phenol-d6	32		16-65
Nitrobenzene-d5	78		42-122
2-Fluorobiphenyl	73		46-121
2,4,6-Tribromophenol	99		45-128
4-Terphenyl-d14	83		47-138

Project Name: MBTA GLX GW PRE-CHAR
Project Number: 290762.1000.0000

Lab Number: L1832437
Report Date: 08/27/18

Method Blank Analysis
Batch Quality Control

Analytical Method: 129,625.1
Analytical Date: 08/24/18 02:08
Analyst: ALS

Extraction Method: EPA 625.1
Extraction Date: 08/22/18 20:46

Parameter	Result	Qualifier	Units	RL	MDL
Semivolatile Organics by GC/MS - Westborough Lab for sample(s): 01-02 Batch: WG1149539-1					
Benzidine ¹	ND		ug/l	20	--
1,2,4-Trichlorobenzene	ND		ug/l	5.0	--
Bis(2-chloroethyl)ether	ND		ug/l	2.0	--
2-Chloronaphthalene	ND		ug/l	2.0	--
3,3'-Dichlorobenzidine	ND		ug/l	5.0	--
2,4-Dinitrotoluene	ND		ug/l	5.0	--
2,6-Dinitrotoluene	ND		ug/l	5.0	--
Azobenzene ¹	ND		ug/l	2.0	--
4-Bromophenyl phenyl ether	ND		ug/l	2.0	--
Bis(2-chloroisopropyl)ether	ND		ug/l	2.0	--
Bis(2-chloroethoxy)methane	ND		ug/l	5.0	--
Hexachlorobutadiene	ND		ug/l	2.0	--
Hexachlorocyclopentadiene ¹	ND		ug/l	10	--
Hexachloroethane	ND		ug/l	2.0	--
Isophorone	ND		ug/l	5.0	--
Nitrobenzene	ND		ug/l	2.0	--
NDPA/DPA ¹	ND		ug/l	2.0	--
n-Nitrosodi-n-propylamine	ND		ug/l	5.0	--
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	--
Aniline ¹	ND		ug/l	2.0	--
4-Chloroaniline ¹	ND		ug/l	5.0	--
Dibenzofuran ¹	ND		ug/l	2.0	--
2-Methylnaphthalene ¹	ND		ug/l	2.0	--
Acetophenone ¹	ND		ug/l	5.0	--

Project Name: MBTA GLX GW PRE-CHAR
Project Number: 290762.1000.0000

Lab Number: L1832437
Report Date: 08/27/18

**Method Blank Analysis
Batch Quality Control**

Analytical Method: 129,625.1
Analytical Date: 08/24/18 02:08
Analyst: ALS

Extraction Method: EPA 625.1
Extraction Date: 08/22/18 20:46

Parameter	Result	Qualifier	Units	RL	MDL
Semivolatile Organics by GC/MS - Westborough Lab for sample(s): 01-02 Batch: WG1149539-1					
n-Nitrosodimethylamine ¹	ND		ug/l	2.0	--
2,4,6-Trichlorophenol	ND		ug/l	5.0	--
p-Chloro-m-cresol ¹	ND		ug/l	2.0	--
2-Chlorophenol	ND		ug/l	2.0	--
2,4-Dichlorophenol	ND		ug/l	5.0	--
2,4-Dimethylphenol	ND		ug/l	5.0	--
2-Nitrophenol	ND		ug/l	5.0	--
4-Nitrophenol	ND		ug/l	10	--
2,4-Dinitrophenol	ND		ug/l	20	--
Phenol	ND		ug/l	5.0	--
2-Methylphenol ¹	ND		ug/l	5.0	--
3-Methylphenol/4-Methylphenol ¹	ND		ug/l	5.0	--
2,4,5-Trichlorophenol ¹	ND		ug/l	5.0	--

Surrogate	%Recovery	Qualifier	Acceptance Criteria
2-Fluorophenol	53		25-87
Phenol-d6	39		16-65
Nitrobenzene-d5	93		42-122
2-Fluorobiphenyl	91		46-121
2,4,6-Tribromophenol	80		45-128
4-Terphenyl-d14	97		47-138

Project Name: MBTA GLX GW PRE-CHAR
Project Number: 290762.1000.0000

Lab Number: L1832437
Report Date: 08/27/18

Method Blank Analysis
Batch Quality Control

Analytical Method: 129,625.1-SIM
Analytical Date: 08/25/18 08:46
Analyst: CB

Extraction Method: EPA 625.1
Extraction Date: 08/24/18 11:35

Parameter	Result	Qualifier	Units	RL	MDL
Semivolatile Organics by GC/MS-SIM - Westborough Lab for sample(s): 01-02 Batch: WG1150303-1					
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	--
Hexachlorobenzene ¹	ND		ug/l	0.10	--

Surrogate	%Recovery	Qualifier	Acceptance Criteria
2-Fluorophenol	42		25-87
Phenol-d6	30		16-65
Nitrobenzene-d5	75		42-122
2-Fluorobiphenyl	72		46-121
2,4,6-Tribromophenol	86		45-128
4-Terphenyl-d14	90		47-138

Lab Control Sample Analysis

Batch Quality Control

Project Name: MBTA GLX GW PRE-CHAR

Lab Number: L1832437

Project Number: 290762.1000.0000

Report Date: 08/27/18

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Semivolatile Organics by GC/MS - Westborough Lab Associated sample(s): 01-02 Batch: WG1149539-2								
Benzidine ¹	1		-		0-70	-		30
1,2,4-Trichlorobenzene	91		-		57-130	-		30
Bis(2-chloroethyl)ether	94		-		43-126	-		30
2-Chloronaphthalene	95		-		65-120	-		30
3,3'-Dichlorobenzidine	44		-		8-213	-		30
2,4-Dinitrotoluene	107		-		48-127	-		30
2,6-Dinitrotoluene	107		-		68-137	-		30
Azobenzene ¹	102		-		44-115	-		30
4-Bromophenyl phenyl ether	95		-		65-120	-		30
Bis(2-chloroisopropyl)ether	92		-		63-139	-		30
Bis(2-chloroethoxy)methane	105		-		49-165	-		30
Hexachlorobutadiene	91		-		38-120	-		30
Hexachlorocyclopentadiene ¹	75		-		7-118	-		30
Hexachloroethane	82		-		55-120	-		30
Isophorone	113		-		47-180	-		30
Nitrobenzene	107		-		54-158	-		30
NDPA/DPA ¹	95		-		45-112	-		30
n-Nitrosodi-n-propylamine	112		-		14-198	-		30
Bis(2-ethylhexyl)phthalate	101		-		29-137	-		30
Butyl benzyl phthalate	102		-		1-140	-		30
Di-n-butylphthalate	103		-		8-120	-		30
Di-n-octylphthalate	108		-		19-132	-		30
Diethyl phthalate	100		-		1-120	-		30

Lab Control Sample Analysis

Batch Quality Control

Project Name: MBTA GLX GW PRE-CHAR

Lab Number: L1832437

Project Number: 290762.1000.0000

Report Date: 08/27/18

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Semivolatile Organics by GC/MS - Westborough Lab Associated sample(s): 01-02 Batch: WG1149539-2								
Dimethyl phthalate	105		-		1-120	-		30
Aniline ¹	57		-		1-75	-		30
4-Chloroaniline ¹	77		-		10-100	-		30
Dibenzofuran ¹	90		-		23-126	-		30
2-Methylnaphthalene ¹	89		-		40-109	-		30
Acetophenone ¹	107		-		46-113	-		30
n-Nitrosodimethylamine ¹	58		-		15-68	-		30
2,4,6-Trichlorophenol	113		-		52-129	-		30
p-Chloro-m-cresol ¹	117		-		68-130	-		30
2-Chlorophenol	91		-		36-120	-		30
2,4-Dichlorophenol	106		-		53-122	-		30
2,4-Dimethylphenol	108		-		42-120	-		30
2-Nitrophenol	93		-		45-167	-		30
4-Nitrophenol	69		-		13-129	-		30
2,4-Dinitrophenol	89		-		1-173	-		30
Phenol	47		-		17-120	-		30
2-Methylphenol ¹	94		-		38-102	-		30
3-Methylphenol/4-Methylphenol ¹	96		-		35-103	-		30
2,4,5-Trichlorophenol ¹	113		-		47-126	-		30

Lab Control Sample Analysis

Batch Quality Control

Project Name: MBTA GLX GW PRE-CHAR

Lab Number: L1832437

Project Number: 290762.1000.0000

Report Date: 08/27/18

Parameter	<i>LCS</i> %Recovery	<i>Qual</i>	<i>LCSD</i> %Recovery	<i>Qual</i>	<i>%Recovery</i> Limits	<i>RPD</i>	<i>Qual</i>	<i>RPD</i> Limits
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Semivolatile Organics by GC/MS - Westborough Lab Associated sample(s): 01-02 Batch: WG1149539-2

<i>Surrogate</i>	<i>LCS</i> %Recovery	<i>Qual</i>	<i>LCSD</i> %Recovery	<i>Qual</i>	<i>Acceptance</i> Criteria
2-Fluorophenol	65				25-87
Phenol-d6	49				16-65
Nitrobenzene-d5	112				42-122
2-Fluorobiphenyl	99				46-121
2,4,6-Tribromophenol	97				45-128
4-Terphenyl-d14	101				47-138

Lab Control Sample Analysis

Batch Quality Control

Project Name: MBTA GLX GW PRE-CHAR

Lab Number: L1832437

Project Number: 290762.1000.0000

Report Date: 08/27/18

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Semivolatile Organics by GC/MS-SIM - Westborough Lab Associated sample(s): 01-02 Batch: WG1150303-2 WG1150303-3								
Acenaphthene	93		87		60-132	7		30
Fluoranthene	92		84		43-121	9		30
Naphthalene	75		72		36-120	4		30
Benzo(a)anthracene	80		73		42-133	9		30
Benzo(a)pyrene	87		80		32-148	8		30
Benzo(b)fluoranthene	81		75		42-140	8		30
Benzo(k)fluoranthene	92		83		25-146	10		30
Chrysene	88		80		44-140	10		30
Acenaphthylene	86		81		54-126	6		30
Anthracene	92		85		43-120	8		30
Benzo(ghi)perylene	88		80		1-195	10		30
Fluorene	98		90		70-120	9		30
Phenanthrene	86		80		65-120	7		30
Dibenzo(a,h)anthracene	91		83		1-200	9		30
Indeno(1,2,3-cd)pyrene	86		78		1-151	10		30
Pyrene	90		83		70-120	8		30
Pentachlorophenol	94		86		38-152	9		30
Hexachlorobenzene ¹	84		78		8-142	7		30

Lab Control Sample Analysis

Batch Quality Control

Project Name: MBTA GLX GW PRE-CHAR

Lab Number: L1832437

Project Number: 290762.1000.0000

Report Date: 08/27/18

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Semivolatile Organics by GC/MS-SIM - Westborough Lab Associated sample(s): 01-02 Batch: WG1150303-2 WG1150303-3								

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
2-Fluorophenol	46		47		25-87
Phenol-d6	32		32		16-65
Nitrobenzene-d5	86		84		42-122
2-Fluorobiphenyl	79		77		46-121
2,4,6-Tribromophenol	104		98		45-128
4-Terphenyl-d14	96		91		47-138

PETROLEUM HYDROCARBONS

Project Name: MBTA GLX GW PRE-CHAR**Lab Number:** L1832437**Project Number:** 290762.1000.0000**Report Date:** 08/27/18**SAMPLE RESULTS**

Lab ID: L1832437-01
 Client ID: MW-18
 Sample Location: SOMERVILLE, MEDFORD, CAMBRIDGE

Date Collected: 08/17/18 09:00
 Date Received: 08/17/18
 Field Prep: Refer to COC

Sample Depth:
 Matrix: Water
 Analytical Method: 98,EPH-04-1.1
 Analytical Date: 08/23/18 21:12
 Analyst: SR

Extraction Method: EPA 3510C
 Extraction Date: 08/22/18 21:44
 Cleanup Method1: EPH-04-1
 Cleanup Date1: 08/23/18

Quality Control Information

Condition of sample received: Satisfactory
 Aqueous Preservative: Laboratory Provided Preserved Container
 Sample Temperature upon receipt: Received on Ice
 Sample Extraction method: Extracted Per the Method

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Extractable Petroleum Hydrocarbons - Westborough Lab						
C9-C18 Aliphatics	ND		ug/l	100	--	1
C19-C36 Aliphatics	ND		ug/l	100	--	1
C11-C22 Aromatics	ND		ug/l	100	--	1
C11-C22 Aromatics, Adjusted	ND		ug/l	100	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
Chloro-Octadecane	19	Q	40-140
o-Terphenyl	65		40-140
2-Fluorobiphenyl	82		40-140
2-Bromonaphthalene	83		40-140

Project Name: MBTA GLX GW PRE-CHAR**Lab Number:** L1832437**Project Number:** 290762.1000.0000**Report Date:** 08/27/18**SAMPLE RESULTS**

Lab ID: L1832437-02
 Client ID: DUP-18
 Sample Location: SOMERVILLE, MEDFORD, CAMBRIDGE

Date Collected: 08/17/18 10:30
 Date Received: 08/17/18
 Field Prep: Refer to COC

Sample Depth:
 Matrix: Water
 Analytical Method: 98,EPH-04-1.1
 Analytical Date: 08/23/18 21:54
 Analyst: SR

Extraction Method: EPA 3510C
 Extraction Date: 08/22/18 21:44
 Cleanup Method1: EPH-04-1
 Cleanup Date1: 08/23/18

Quality Control Information

Condition of sample received: Satisfactory
 Aqueous Preservative: Laboratory Provided Preserved Container
 Sample Temperature upon receipt: Received on Ice
 Sample Extraction method: Extracted Per the Method

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Extractable Petroleum Hydrocarbons - Westborough Lab						
C9-C18 Aliphatics	ND		ug/l	100	--	1
C19-C36 Aliphatics	ND		ug/l	100	--	1
C11-C22 Aromatics	ND		ug/l	100	--	1
C11-C22 Aromatics, Adjusted	ND		ug/l	100	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
Chloro-Octadecane	20	Q	40-140
o-Terphenyl	67		40-140
2-Fluorobiphenyl	77		40-140
2-Bromonaphthalene	78		40-140

Project Name: MBTA GLX GW PRE-CHAR
Project Number: 290762.1000.0000

Lab Number: L1832437
Report Date: 08/27/18

**Method Blank Analysis
Batch Quality Control**

Analytical Method: 98,EPH-04-1.1
Analytical Date: 08/23/18 16:23
Analyst: SR

Extraction Method: EPA 3510C
Extraction Date: 08/22/18 03:16
Cleanup Method: EPH-04-1
Cleanup Date: 08/23/18

Parameter	Result	Qualifier	Units	RL	MDL
Extractable Petroleum Hydrocarbons - Westborough Lab for sample(s): 01-02 Batch: WG1149743-1					
C9-C18 Aliphatics	ND		ug/l	100	--
C19-C36 Aliphatics	ND		ug/l	100	--
C11-C22 Aromatics	ND		ug/l	100	--
C11-C22 Aromatics, Adjusted	ND		ug/l	100	--

Surrogate	%Recovery	Qualifier	Acceptance Criteria
Chloro-Octadecane	57		40-140
o-Terphenyl	84		40-140
2-Fluorobiphenyl	86		40-140
2-Bromonaphthalene	88		40-140

Lab Control Sample Analysis

Batch Quality Control

Project Name: MBTA GLX GW PRE-CHAR

Lab Number: L1832437

Project Number: 290762.1000.0000

Report Date: 08/27/18

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Extractable Petroleum Hydrocarbons - Westborough Lab Associated sample(s): 01-02 Batch: WG1149743-2 WG1149743-3								
C9-C18 Aliphatics	79		81		40-140	3		25
C19-C36 Aliphatics	92		85		40-140	8		25
C11-C22 Aromatics	126		110		40-140	14		25
Naphthalene	97		93		40-140	4		25
2-Methylnaphthalene	101		96		40-140	5		25
Acenaphthylene	106		98		40-140	8		25
Acenaphthene	106		98		40-140	8		25
Fluorene	116		106		40-140	9		25
Phenanthrene	123		109		40-140	12		25
Anthracene	125		112		40-140	11		25
Fluoranthene	128		109		40-140	16		25
Pyrene	128		109		40-140	16		25
Benzo(a)anthracene	120		104		40-140	14		25
Chrysene	123		108		40-140	13		25
Benzo(b)fluoranthene	129		112		40-140	14		25
Benzo(k)fluoranthene	122		108		40-140	12		25
Benzo(a)pyrene	116		101		40-140	14		25
Indeno(1,2,3-cd)Pyrene	116		100		40-140	15		25
Dibenzo(a,h)anthracene	115		103		40-140	11		25
Benzo(ghi)perylene	109		97		40-140	12		25
Nonane (C9)	47		54		30-140	14		25
Decane (C10)	56		64		40-140	13		25
Dodecane (C12)	66		74		40-140	11		25

Lab Control Sample Analysis Batch Quality Control

Project Name: MBTA GLX GW PRE-CHAR
Project Number: 290762.1000.0000

Lab Number: L1832437
Report Date: 08/27/18

Parameter	LCS		LCSD		%Recovery Limits	RPD	RPD	
	%Recovery	Qual	%Recovery	Qual			Qual	Limits
Extractable Petroleum Hydrocarbons - Westborough Lab Associated sample(s): 01-02 Batch: WG1149743-2 WG1149743-3								
Tetradecane (C14)	72		79		40-140	9		25
Hexadecane (C16)	78		83		40-140	6		25
Octadecane (C18)	84		84		40-140	0		25
Nonadecane (C19)	85		85		40-140	0		25
Eicosane (C20)	85		85		40-140	0		25
Docosane (C22)	84		83		40-140	1		25
Tetracosane (C24)	84		83		40-140	1		25
Hexacosane (C26)	83		82		40-140	1		25
Octacosane (C28)	82		81		40-140	1		25
Triacontane (C30)	84		84		40-140	0		25
Hexatriacontane (C36)	91		90		40-140	1		25

Surrogate	LCS		LCSD		Acceptance Criteria
	%Recovery	Qual	%Recovery	Qual	
Chloro-Octadecane	74		70		40-140
o-Terphenyl	105		87		40-140
2-Fluorobiphenyl	100		82		40-140
2-Bromonaphthalene	100		82		40-140
% Naphthalene Breakthrough	0		0		
% 2-Methylnaphthalene Breakthrough	0		0		



PCBS

Project Name: MBTA GLX GW PRE-CHAR
Project Number: 290762.1000.0000

Lab Number: L1832437
Report Date: 08/27/18

SAMPLE RESULTS

Lab ID: L1832437-01
Client ID: MW-18
Sample Location: SOMERVILLE, MEDFORD, CAMBRIDGE

Date Collected: 08/17/18 09:00
Date Received: 08/17/18
Field Prep: Refer to COC

Sample Depth:

Matrix: Water
Analytical Method: 127,608.3
Analytical Date: 08/24/18 14:02
Analyst: WR

Extraction Method: EPA 608.3
Extraction Date: 08/24/18 07:20
Cleanup Method: EPA 3665A
Cleanup Date: 08/24/18
Cleanup Method: EPA 3660B
Cleanup Date: 08/24/18

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
Polychlorinated Biphenyls by GC - Westborough Lab							
Aroclor 1016	ND		ug/l	0.272	--	1	A
Aroclor 1221	ND		ug/l	0.272	--	1	A
Aroclor 1232	ND		ug/l	0.272	--	1	A
Aroclor 1242	ND		ug/l	0.272	--	1	A
Aroclor 1248	ND		ug/l	0.272	--	1	A
Aroclor 1254	ND		ug/l	0.272	--	1	A
Aroclor 1260	ND		ug/l	0.217	--	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	76		37-123	A
Decachlorobiphenyl	39		38-114	A
2,4,5,6-Tetrachloro-m-xylene	78		37-123	B
Decachlorobiphenyl	43		38-114	B

Project Name: MBTA GLX GW PRE-CHAR
Project Number: 290762.1000.0000

Lab Number: L1832437
Report Date: 08/27/18

SAMPLE RESULTS

Lab ID: L1832437-02
Client ID: DUP-18
Sample Location: SOMERVILLE, MEDFORD, CAMBRIDGE

Date Collected: 08/17/18 10:30
Date Received: 08/17/18
Field Prep: Refer to COC

Sample Depth:

Matrix: Water
Analytical Method: 127,608.3
Analytical Date: 08/24/18 00:49
Analyst: HT

Extraction Method: EPA 608.3
Extraction Date: 08/23/18 13:11
Cleanup Method: EPA 3665A
Cleanup Date: 08/23/18
Cleanup Method: EPA 3660B
Cleanup Date: 08/23/18

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	66		37-123	A
Decachlorobiphenyl	40		38-114	A
2,4,5,6-Tetrachloro-m-xylene	66		37-123	B
Decachlorobiphenyl	39		38-114	B

Project Name: MBTA GLX GW PRE-CHAR
Project Number: 290762.1000.0000

Lab Number: L1832437
Report Date: 08/27/18

**Method Blank Analysis
Batch Quality Control**

Analytical Method: 127,608.3
Analytical Date: 08/24/18 00:11
Analyst: HT

Extraction Method: EPA 608.3
Extraction Date: 08/23/18 10:50
Cleanup Method: EPA 3665A
Cleanup Date: 08/23/18
Cleanup Method: EPA 3660B
Cleanup Date: 08/23/18

Parameter	Result	Qualifier	Units	RL	MDL	Column
Polychlorinated Biphenyls by GC - Westborough Lab for sample(s): 02 Batch: WG1149806-1						
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	80		38-114	A
2,4,5,6-Tetrachloro-m-xylene	63		37-123	B
Decachlorobiphenyl	83		38-114	B

Project Name: MBTA GLX GW PRE-CHAR
Project Number: 290762.1000.0000

Lab Number: L1832437
Report Date: 08/27/18

**Method Blank Analysis
Batch Quality Control**

Analytical Method: 127,608.3
Analytical Date: 08/24/18 13:50
Analyst: WR

Extraction Method: EPA 608.3
Extraction Date: 08/24/18 07:20
Cleanup Method: EPA 3665A
Cleanup Date: 08/24/18
Cleanup Method: EPA 3660B
Cleanup Date: 08/24/18

Parameter	Result	Qualifier	Units	RL	MDL	Column
Polychlorinated Biphenyls by GC - Westborough Lab for sample(s): 01 Batch: WG1150144-1						
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	72		37-123	A
Decachlorobiphenyl	78		38-114	A
2,4,5,6-Tetrachloro-m-xylene	75		37-123	B
Decachlorobiphenyl	84		38-114	B

Lab Control Sample Analysis

Batch Quality Control

Project Name: MBTA GLX GW PRE-CHAR

Lab Number: L1832437

Project Number: 290762.1000.0000

Report Date: 08/27/18

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits	Column
Polychlorinated Biphenyls by GC - Westborough Lab Associated sample(s): 02 Batch: WG1149806-2									
Aroclor 1016	80		-		50-140	-		36	A
Aroclor 1260	71		-		8-140	-		38	A

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	74				37-123	A
Decachlorobiphenyl	70				38-114	A
2,4,5,6-Tetrachloro-m-xylene	74				37-123	B
Decachlorobiphenyl	70				38-114	B

Lab Control Sample Analysis

Batch Quality Control

Project Name: MBTA GLX GW PRE-CHAR

Lab Number: L1832437

Project Number: 290762.1000.0000

Report Date: 08/27/18

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: WG1150144-2									
Aroclor 1016	75		-		50-140	-		36	A
Aroclor 1260	77		-		8-140	-		38	A

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	67				37-123	A
Decachlorobiphenyl	79				38-114	A
2,4,5,6-Tetrachloro-m-xylene	69				37-123	B
Decachlorobiphenyl	87				38-114	B

PESTICIDES

Project Name: MBTA GLX GW PRE-CHAR
Project Number: 290762.1000.0000

Lab Number: L1832437
Report Date: 08/27/18

SAMPLE RESULTS

Lab ID: L1832437-01
Client ID: MW-18
Sample Location: SOMERVILLE, MEDFORD, CAMBRIDGE

Date Collected: 08/17/18 09:00
Date Received: 08/17/18
Field Prep: Refer to COC

Sample Depth:

Matrix: Water
Analytical Method: 127,608.3
Analytical Date: 08/24/18 14:44
Analyst: KEG

Extraction Method: EPA 608.3
Extraction Date: 08/23/18 16:12
Cleanup Method: EPA 3620B
Cleanup Date: 08/24/18

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
Organochlorine Pesticides by GC - Westborough Lab							
Delta-BHC	ND		ug/l	0.020	--	1	A
Lindane	ND		ug/l	0.020	--	1	A
Alpha-BHC	ND		ug/l	0.020	--	1	A
Beta-BHC	ND		ug/l	0.020	--	1	A
Heptachlor	ND		ug/l	0.020	--	1	A
Aldrin	ND		ug/l	0.020	--	1	A
Heptachlor epoxide	ND		ug/l	0.020	--	1	A
Endrin	ND		ug/l	0.040	--	1	A
Endrin aldehyde	ND		ug/l	0.040	--	1	A
Endrin ketone ¹	ND		ug/l	0.040	--	1	A
Dieldrin	ND		ug/l	0.040	--	1	A
4,4'-DDE	ND		ug/l	0.040	--	1	A
4,4'-DDD	ND		ug/l	0.040	--	1	A
4,4'-DDT	ND		ug/l	0.040	--	1	A
Endosulfan I	ND		ug/l	0.020	--	1	A
Endosulfan II	ND		ug/l	0.040	--	1	A
Endosulfan sulfate	ND		ug/l	0.040	--	1	A
Methoxychlor ¹	ND		ug/l	0.100	--	1	A
Toxaphene	ND		ug/l	0.400	--	1	A
Chlordane	ND		ug/l	0.200	--	1	A
cis-Chlordane ¹	ND		ug/l	0.020	--	1	A
trans-Chlordane ¹	ND		ug/l	0.020	--	1	A

Project Name: MBTA GLX GW PRE-CHAR**Lab Number:** L1832437**Project Number:** 290762.1000.0000**Report Date:** 08/27/18**SAMPLE RESULTS**

Lab ID: L1832437-01

Date Collected: 08/17/18 09:00

Client ID: MW-18

Date Received: 08/17/18

Sample Location: SOMERVILLE, MEDFORD, CAMBRIDGE

Field Prep: Refer to COC

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
Organochlorine Pesticides by GC - Westborough Lab							

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	74		47-124	A
Decachlorobiphenyl	39		32-167	A
2,4,5,6-Tetrachloro-m-xylene	76		47-124	B
Decachlorobiphenyl	40		32-167	B

Project Name: MBTA GLX GW PRE-CHAR
Project Number: 290762.1000.0000

Lab Number: L1832437
Report Date: 08/27/18

SAMPLE RESULTS

Lab ID: L1832437-02
Client ID: DUP-18
Sample Location: SOMERVILLE, MEDFORD, CAMBRIDGE

Date Collected: 08/17/18 10:30
Date Received: 08/17/18
Field Prep: Refer to COC

Sample Depth:

Matrix: Water
Analytical Method: 127,608.3
Analytical Date: 08/24/18 14:57
Analyst: KEG

Extraction Method: EPA 608.3
Extraction Date: 08/23/18 16:12
Cleanup Method: EPA 3620B
Cleanup Date: 08/24/18

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
Organochlorine Pesticides by GC - Westborough Lab							
Delta-BHC	ND		ug/l	0.020	--	1	A
Lindane	ND		ug/l	0.020	--	1	A
Alpha-BHC	ND		ug/l	0.020	--	1	A
Beta-BHC	ND		ug/l	0.020	--	1	A
Heptachlor	ND		ug/l	0.020	--	1	A
Aldrin	ND		ug/l	0.020	--	1	A
Heptachlor epoxide	ND		ug/l	0.020	--	1	A
Endrin	ND		ug/l	0.040	--	1	A
Endrin aldehyde	ND		ug/l	0.040	--	1	A
Endrin ketone ¹	ND		ug/l	0.040	--	1	A
Dieldrin	ND		ug/l	0.040	--	1	A
4,4'-DDE	ND		ug/l	0.040	--	1	A
4,4'-DDD	ND		ug/l	0.040	--	1	A
4,4'-DDT	ND		ug/l	0.040	--	1	A
Endosulfan I	ND		ug/l	0.020	--	1	A
Endosulfan II	ND		ug/l	0.040	--	1	A
Endosulfan sulfate	ND		ug/l	0.040	--	1	A
Methoxychlor ¹	ND		ug/l	0.100	--	1	A
Toxaphene	ND		ug/l	0.400	--	1	A
Chlordane	ND		ug/l	0.200	--	1	A
cis-Chlordane ¹	ND		ug/l	0.020	--	1	A
trans-Chlordane ¹	ND		ug/l	0.020	--	1	A

Project Name: MBTA GLX GW PRE-CHAR**Lab Number:** L1832437**Project Number:** 290762.1000.0000**Report Date:** 08/27/18**SAMPLE RESULTS**

Lab ID: L1832437-02

Date Collected: 08/17/18 10:30

Client ID: DUP-18

Date Received: 08/17/18

Sample Location: SOMERVILLE, MEDFORD, CAMBRIDGE

Field Prep: Refer to COC

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
Organochlorine Pesticides by GC - Westborough Lab							

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	94		47-124	A
Decachlorobiphenyl	61		32-167	A
2,4,5,6-Tetrachloro-m-xylene	95		47-124	B
Decachlorobiphenyl	60		32-167	B

Project Name: MBTA GLX GW PRE-CHAR
Project Number: 290762.1000.0000

Lab Number: L1832437
Report Date: 08/27/18

Method Blank Analysis
Batch Quality Control

Analytical Method: 127,608.3
Analytical Date: 08/24/18 15:09
Analyst: KEG

Extraction Method: EPA 608.3
Extraction Date: 08/23/18 16:12
Cleanup Method: EPA 3620B
Cleanup Date: 08/24/18

Parameter	Result	Qualifier	Units	RL	MDL	Column
Organochlorine Pesticides by GC - Westborough Lab for sample(s): 01-02 Batch: WG1149936-1						
Delta-BHC	ND		ug/l	0.020	--	A
Lindane	ND		ug/l	0.020	--	A
Alpha-BHC	ND		ug/l	0.020	--	A
Beta-BHC	ND		ug/l	0.020	--	A
Heptachlor	ND		ug/l	0.020	--	A
Aldrin	ND		ug/l	0.020	--	A
Heptachlor epoxide	ND		ug/l	0.020	--	A
Endrin	ND		ug/l	0.040	--	A
Endrin aldehyde	ND		ug/l	0.040	--	A
Endrin ketone ¹	ND		ug/l	0.040	--	A
Dieldrin	ND		ug/l	0.040	--	A
4,4'-DDE	ND		ug/l	0.040	--	A
4,4'-DDD	ND		ug/l	0.040	--	A
4,4'-DDT	ND		ug/l	0.040	--	A
Endosulfan I	ND		ug/l	0.020	--	A
Endosulfan II	ND		ug/l	0.040	--	A
Endosulfan sulfate	ND		ug/l	0.040	--	A
Methoxychlor ¹	ND		ug/l	0.100	--	A
Toxaphene	ND		ug/l	0.400	--	A
Chlordane	ND		ug/l	0.200	--	A
cis-Chlordane ¹	ND		ug/l	0.020	--	A
trans-Chlordane ¹	ND		ug/l	0.020	--	A

Project Name: MBTA GLX GW PRE-CHAR**Lab Number:** L1832437**Project Number:** 290762.1000.0000**Report Date:** 08/27/18**Method Blank Analysis
Batch Quality Control**

Analytical Method: 127,608.3
 Analytical Date: 08/24/18 15:09
 Analyst: KEG

Extraction Method: EPA 608.3
 Extraction Date: 08/23/18 16:12
 Cleanup Method: EPA 3620B
 Cleanup Date: 08/24/18

Parameter	Result	Qualifier	Units	RL	MDL	Column
Organochlorine Pesticides by GC - Westborough Lab for sample(s): 01-02 Batch: WG1149936-1						

Surrogate	%Recovery	Qualifier	Acceptance	
			Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	71		47-124	A
Decachlorobiphenyl	69		32-167	A
2,4,5,6-Tetrachloro-m-xylene	79		47-124	B
Decachlorobiphenyl	77		32-167	B

Lab Control Sample Analysis

Batch Quality Control

Project Name: MBTA GLX GW PRE-CHAR

Lab Number: L1832437

Project Number: 290762.1000.0000

Report Date: 08/27/18

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits	Column
Organochlorine Pesticides by GC - Westborough Lab Associated sample(s): 01-02 Batch: WG1149936-2									
Delta-BHC	63		-		19-140	-		52	A
Lindane	61		-		32-140	-		39	A
Alpha-BHC	66		-		37-140	-		36	A
Beta-BHC	68		-		17-147	-		44	A
Heptachlor	52		-		34-140	-		43	A
Aldrin	61		-		42-140	-		35	A
Heptachlor epoxide	56		-		37-142	-		26	A
Endrin	67		-		30-147	-		48	A
Endrin aldehyde	52		-		30-150	-		30	A
Endrin ketone ¹	64		-		30-150	-		30	A
Dieldrin	70		-		36-146	-		49	A
4,4'-DDE	67		-		30-145	-		35	A
4,4'-DDD	66		-		31-141	-		39	A
4,4'-DDT	66		-		25-160	-		42	A
Endosulfan I	63		-		45-153	-		28	A
Endosulfan II	63		-		1-202	-		53	A
Endosulfan sulfate	65		-		26-144	-		38	A
Methoxychlor ¹	71		-		30-150	-		30	A
cis-Chlordane ¹	56		-		45-140	-		35	A
trans-Chlordane ¹	65		-		45-140	-		35	A

Lab Control Sample Analysis

Batch Quality Control

Project Name: MBTA GLX GW PRE-CHAR

Lab Number: L1832437

Project Number: 290762.1000.0000

Report Date: 08/27/18

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
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Organochlorine Pesticides by GC - Westborough Lab Associated sample(s): 01-02 Batch: WG1149936-2

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	68				47-124	A
Decachlorobiphenyl	67				32-167	A
2,4,5,6-Tetrachloro-m-xylene	77				47-124	B
Decachlorobiphenyl	76				32-167	B

METALS

Project Name: MBTA GLX GW PRE-CHAR**Lab Number:** L1832437**Project Number:** 290762.1000.0000**Report Date:** 08/27/18**SAMPLE RESULTS**

Lab ID: L1832437-01

Date Collected: 08/17/18 09:00

Client ID: MW-18

Date Received: 08/17/18

Sample Location: SOMERVILLE, MEDFORD, CAMBRIDGE

Field Prep: Refer to COC

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	08/22/18 08:00	08/22/18 12:05	EPA 3005A	3,200.8	AM
Arsenic, Total	0.02324		mg/l	0.00100	--	1	08/22/18 08:00	08/22/18 12:05	EPA 3005A	3,200.8	AM
Cadmium, Total	0.00037		mg/l	0.00020	--	1	08/22/18 08:00	08/22/18 12:05	EPA 3005A	3,200.8	AM
Chromium, Total	0.2148		mg/l	0.00100	--	1	08/22/18 08:00	08/22/18 12:05	EPA 3005A	3,200.8	AM
Copper, Total	0.09229		mg/l	0.00100	--	1	08/22/18 08:00	08/22/18 12:05	EPA 3005A	3,200.8	AM
Iron, Total	60.6		mg/l	0.050	--	1	08/22/18 08:00	08/22/18 12:44	EPA 3005A	19,200.7	PE
Lead, Total	0.07484		mg/l	0.00100	--	1	08/22/18 08:00	08/22/18 12:05	EPA 3005A	3,200.8	AM
Mercury, Total	ND		mg/l	0.00020	--	1	08/22/18 13:50	08/23/18 13:02	EPA 245.1	3,245.1	MG
Nickel, Total	0.08886		mg/l	0.00200	--	1	08/22/18 08:00	08/22/18 12:05	EPA 3005A	3,200.8	AM
Selenium, Total	0.02010		mg/l	0.00500	--	1	08/22/18 08:00	08/22/18 12:05	EPA 3005A	3,200.8	AM
Silver, Total	ND		mg/l	0.00040	--	1	08/22/18 08:00	08/22/18 12:05	EPA 3005A	3,200.8	AM
Zinc, Total	0.1942		mg/l	0.01000	--	1	08/22/18 08:00	08/22/18 12:05	EPA 3005A	3,200.8	AM
Total Hardness by SM 2340B - Mansfield Lab											
Hardness	139		mg/l	0.660	NA	1	08/22/18 08:00	08/22/18 12:44	EPA 3005A	19,200.7	PE
General Chemistry - Mansfield Lab											
Chromium, Trivalent (Filtered)	0.012		mg/l	0.010	--	1		08/23/18 12:40	NA	107,-	
Chromium, Trivalent (Unfiltered)	0.215		mg/l	0.010	--	1		08/22/18 12:05	NA	107,-	
Dissolved Metals - Mansfield Lab											
Antimony, Dissolved	ND		mg/l	0.0040	--	1	08/23/18 07:15	08/23/18 12:40	EPA 3005A	3,200.8	AM
Arsenic, Dissolved	0.0026		mg/l	0.0010	--	1	08/23/18 07:15	08/23/18 12:40	EPA 3005A	3,200.8	AM
Cadmium, Dissolved	ND		mg/l	0.0002	--	1	08/23/18 07:15	08/23/18 12:40	EPA 3005A	3,200.8	AM
Chromium, Dissolved	0.0123		mg/l	0.0010	--	1	08/23/18 07:15	08/23/18 12:40	EPA 3005A	3,200.8	AM
Copper, Dissolved	0.0090		mg/l	0.0010	--	1	08/23/18 07:15	08/23/18 12:40	EPA 3005A	3,200.8	AM
Iron, Dissolved	5.14		mg/l	0.050	--	1	08/23/18 07:15	08/23/18 11:34	EPA 3005A	19,200.7	LC
Lead, Dissolved	0.0038		mg/l	0.0010	--	1	08/23/18 07:15	08/23/18 12:40	EPA 3005A	3,200.8	AM
Mercury, Dissolved	ND		mg/l	0.00020	--	1	08/22/18 15:56	08/22/18 20:34	EPA 245.1	3,245.1	EA



Project Name: MBTA GLX GW PRE-CHAR**Lab Number:** L1832437**Project Number:** 290762.1000.0000**Report Date:** 08/27/18**SAMPLE RESULTS**

Lab ID: L1832437-01

Date Collected: 08/17/18 09:00

Client ID: MW-18

Date Received: 08/17/18

Sample Location: SOMERVILLE, MEDFORD, CAMBRIDGE

Field Prep: Refer to COC

Sample Depth:

Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Nickel, Dissolved	0.0110		mg/l	0.0020	--	1	08/23/18 07:15	08/23/18 12:40	EPA 3005A	3,200.8	AM
Selenium, Dissolved	ND		mg/l	0.0050	--	1	08/23/18 07:15	08/23/18 12:40	EPA 3005A	3,200.8	AM
Silver, Dissolved	ND		mg/l	0.0004	--	1	08/23/18 07:15	08/23/18 12:40	EPA 3005A	3,200.8	AM
Zinc, Dissolved	0.0162		mg/l	0.0100	--	1	08/23/18 07:15	08/23/18 12:40	EPA 3005A	3,200.8	AM



Project Name: MBTA GLX GW PRE-CHAR**Lab Number:** L1832437**Project Number:** 290762.1000.0000**Report Date:** 08/27/18**SAMPLE RESULTS**

Lab ID: L1832437-02

Date Collected: 08/17/18 10:30

Client ID: DUP-18

Date Received: 08/17/18

Sample Location: SOMERVILLE, MEDFORD, CAMBRIDGE

Field Prep: Refer to COC

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	08/22/18 08:00	08/22/18 13:15	EPA 3005A	3,200.8	AM
Arsenic, Total	0.03036		mg/l	0.00100	--	1	08/22/18 08:00	08/22/18 13:15	EPA 3005A	3,200.8	AM
Cadmium, Total	0.00041		mg/l	0.00020	--	1	08/22/18 08:00	08/22/18 13:15	EPA 3005A	3,200.8	AM
Chromium, Total	0.2094		mg/l	0.00100	--	1	08/22/18 08:00	08/22/18 13:15	EPA 3005A	3,200.8	AM
Copper, Total	0.09377		mg/l	0.00100	--	1	08/22/18 08:00	08/22/18 13:15	EPA 3005A	3,200.8	AM
Iron, Total	68.0		mg/l	0.050	--	1	08/22/18 08:00	08/22/18 15:42	EPA 3005A	19,200.7	AB
Lead, Total	0.07632		mg/l	0.00100	--	1	08/22/18 08:00	08/22/18 13:15	EPA 3005A	3,200.8	AM
Mercury, Total	ND		mg/l	0.00020	--	1	08/22/18 13:50	08/23/18 13:07	EPA 245.1	3,245.1	MG
Nickel, Total	0.09222		mg/l	0.00200	--	1	08/22/18 08:00	08/22/18 13:15	EPA 3005A	3,200.8	AM
Selenium, Total	0.02098		mg/l	0.00500	--	1	08/22/18 08:00	08/22/18 13:15	EPA 3005A	3,200.8	AM
Silver, Total	0.00045		mg/l	0.00040	--	1	08/22/18 08:00	08/22/18 13:15	EPA 3005A	3,200.8	AM
Zinc, Total	0.2087		mg/l	0.01000	--	1	08/22/18 08:00	08/22/18 13:15	EPA 3005A	3,200.8	AM
Total Hardness by SM 2340B - Mansfield Lab											
Hardness	170		mg/l	0.660	NA	1	08/22/18 08:00	08/22/18 15:42	EPA 3005A	19,200.7	AB
General Chemistry - Mansfield Lab											
Chromium, Trivalent (Filtered)	ND		mg/l	0.010	--	1		08/23/18 12:45	NA	107,-	
Chromium, Trivalent (Unfiltered)	0.209		mg/l	0.010	--	1		08/22/18 13:15	NA	107,-	
Dissolved Metals - Mansfield Lab											
Antimony, Dissolved	ND		mg/l	0.0040	--	1	08/23/18 07:15	08/23/18 12:45	EPA 3005A	3,200.8	AM
Arsenic, Dissolved	0.0014		mg/l	0.0010	--	1	08/23/18 07:15	08/23/18 12:45	EPA 3005A	3,200.8	AM
Cadmium, Dissolved	ND		mg/l	0.0002	--	1	08/23/18 07:15	08/23/18 12:45	EPA 3005A	3,200.8	AM
Chromium, Dissolved	0.0032		mg/l	0.0010	--	1	08/23/18 07:15	08/23/18 12:45	EPA 3005A	3,200.8	AM
Copper, Dissolved	0.0063		mg/l	0.0010	--	1	08/23/18 07:15	08/23/18 12:45	EPA 3005A	3,200.8	AM
Iron, Dissolved	1.28		mg/l	0.050	--	1	08/23/18 07:15	08/23/18 12:17	EPA 3005A	19,200.7	LC
Lead, Dissolved	0.0020		mg/l	0.0010	--	1	08/23/18 07:15	08/23/18 12:45	EPA 3005A	3,200.8	AM
Mercury, Dissolved	ND		mg/l	0.00020	--	1	08/22/18 15:56	08/22/18 20:39	EPA 245.1	3,245.1	EA



Project Name: MBTA GLX GW PRE-CHAR**Lab Number:** L1832437**Project Number:** 290762.1000.0000**Report Date:** 08/27/18**SAMPLE RESULTS**

Lab ID: L1832437-02

Date Collected: 08/17/18 10:30

Client ID: DUP-18

Date Received: 08/17/18

Sample Location: SOMERVILLE, MEDFORD, CAMBRIDGE

Field Prep: Refer to COC

Sample Depth:

Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Nickel, Dissolved	0.0048		mg/l	0.0020	--	1	08/23/18 07:15	08/23/18 12:45	EPA 3005A	3,200.8	AM
Selenium, Dissolved	ND		mg/l	0.0050	--	1	08/23/18 07:15	08/23/18 12:45	EPA 3005A	3,200.8	AM
Silver, Dissolved	ND		mg/l	0.0004	--	1	08/23/18 07:15	08/23/18 12:45	EPA 3005A	3,200.8	AM
Zinc, Dissolved	0.0115		mg/l	0.0100	--	1	08/23/18 07:15	08/23/18 12:45	EPA 3005A	3,200.8	AM



Project Name: MBTA GLX GW PRE-CHAR
Project Number: 290762.1000.0000

Lab Number: L1832437
Report Date: 08/27/18

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: WG1149130-1									
Iron, Total	ND	mg/l	0.050	--	1	08/22/18 08:00	08/22/18 11:40	19,200.7	PE

Prep Information

Digestion Method: EPA 3005A

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: WG1149130-1									
Hardness	ND	mg/l	0.660	NA	1	08/22/18 08:00	08/22/18 11:40	19,200.7	PE

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: WG1149132-1									
Antimony, Total	ND	mg/l	0.00400	--	1	08/22/18 08:00	08/22/18 11:47	3,200.8	AM
Arsenic, Total	ND	mg/l	0.00100	--	1	08/22/18 08:00	08/22/18 11:47	3,200.8	AM
Cadmium, Total	ND	mg/l	0.00020	--	1	08/22/18 08:00	08/22/18 11:47	3,200.8	AM
Chromium, Total	ND	mg/l	0.00100	--	1	08/22/18 08:00	08/22/18 11:47	3,200.8	AM
Copper, Total	ND	mg/l	0.00100	--	1	08/22/18 08:00	08/22/18 11:47	3,200.8	AM
Lead, Total	ND	mg/l	0.00100	--	1	08/22/18 08:00	08/22/18 11:47	3,200.8	AM
Nickel, Total	ND	mg/l	0.00200	--	1	08/22/18 08:00	08/22/18 11:47	3,200.8	AM
Selenium, Total	ND	mg/l	0.00500	--	1	08/22/18 08:00	08/22/18 11:47	3,200.8	AM
Silver, Total	ND	mg/l	0.00040	--	1	08/22/18 08:00	08/22/18 11:47	3,200.8	AM
Zinc, Total	ND	mg/l	0.01000	--	1	08/22/18 08:00	08/22/18 11:47	3,200.8	AM

Prep Information

Digestion Method: EPA 3005A

Project Name: MBTA GLX GW PRE-CHAR
Project Number: 290762.1000.0000

Lab Number: L1832437
Report Date: 08/27/18

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: WG1149390-1									
Mercury, Total	ND	mg/l	0.0002	--	1	08/22/18 13:50	08/23/18 12:59	3,245.1	MG

Prep Information

Digestion Method: EPA 245.1

Parameter	Result Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Dissolved Metals - Mansfield Lab for sample(s): 01-02 Batch: WG1149416-1									
Mercury, Dissolved	ND	mg/l	0.00020	--	1	08/22/18 15:56	08/22/18 20:31	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
Dissolved Metals - Mansfield Lab for sample(s): 01-02 Batch: WG1149672-1									
Antimony, Dissolved	ND	mg/l	0.0040	--	1	08/23/18 07:15	08/23/18 11:32	3,200.8	AM
Arsenic, Dissolved	ND	mg/l	0.0010	--	1	08/23/18 07:15	08/23/18 11:32	3,200.8	AM
Cadmium, Dissolved	ND	mg/l	0.0002	--	1	08/23/18 07:15	08/23/18 11:32	3,200.8	AM
Chromium, Dissolved	ND	mg/l	0.0010	--	1	08/23/18 07:15	08/23/18 11:32	3,200.8	AM
Copper, Dissolved	ND	mg/l	0.0010	--	1	08/23/18 07:15	08/23/18 11:32	3,200.8	AM
Lead, Dissolved	ND	mg/l	0.0010	--	1	08/23/18 07:15	08/23/18 11:32	3,200.8	AM
Nickel, Dissolved	ND	mg/l	0.0020	--	1	08/23/18 07:15	08/23/18 11:32	3,200.8	AM
Selenium, Dissolved	ND	mg/l	0.0050	--	1	08/23/18 07:15	08/23/18 11:32	3,200.8	AM
Silver, Dissolved	ND	mg/l	0.0005	--	1	08/23/18 07:15	08/23/18 11:32	3,200.8	AM
Zinc, Dissolved	ND	mg/l	0.0100	--	1	08/23/18 07:15	08/23/18 11:32	3,200.8	AM

Prep Information

Digestion Method: EPA 3005A



Project Name: MBTA GLX GW PRE-CHAR

Lab Number: L1832437

Project Number: 290762.1000.0000

Report Date: 08/27/18

Method Blank Analysis Batch Quality Control

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Dissolved Metals - Mansfield Lab for sample(s): 01-02 Batch: WG1149676-1										
Iron, Dissolved	ND		mg/l	0.050	--	1	08/23/18 07:15	08/23/18 11:00	19,200.7	LC

Prep Information

Digestion Method: EPA 3005A

Lab Control Sample Analysis

Batch Quality Control

Project Name: MBTA GLX GW PRE-CHAR

Lab Number: L1832437

Project Number: 290762.1000.0000

Report Date: 08/27/18

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Total Metals - Mansfield Lab Associated sample(s): 01-02 Batch: WG1149130-2								
Iron, Total	106		-		85-115	-		
Total Hardness by SM 2340B - Mansfield Lab Associated sample(s): 01-02 Batch: WG1149130-2								
Hardness	104		-		85-115	-		
Total Metals - Mansfield Lab Associated sample(s): 01-02 Batch: WG1149132-2								
Antimony, Total	88		-		85-115	-		
Arsenic, Total	101		-		85-115	-		
Cadmium, Total	106		-		85-115	-		
Chromium, Total	100		-		85-115	-		
Copper, Total	98		-		85-115	-		
Lead, Total	106		-		85-115	-		
Nickel, Total	98		-		85-115	-		
Selenium, Total	96		-		85-115	-		
Silver, Total	110		-		85-115	-		
Zinc, Total	102		-		85-115	-		
Total Metals - Mansfield Lab Associated sample(s): 01-02 Batch: WG1149390-2								
Mercury, Total	86		-		85-115	-		

Lab Control Sample Analysis

Batch Quality Control

Project Name: MBTA GLX GW PRE-CHAR

Lab Number: L1832437

Project Number: 290762.1000.0000

Report Date: 08/27/18

Parameter	LCS %Recovery	LCSD %Recovery	%Recovery Limits	RPD	RPD Limits
Dissolved Metals - Mansfield Lab Associated sample(s): 01-02 Batch: WG1149416-2					
Mercury, Dissolved	104	-	85-115	-	
Dissolved Metals - Mansfield Lab Associated sample(s): 01-02 Batch: WG1149672-2					
Antimony, Dissolved	104	-	85-115	-	
Arsenic, Dissolved	110	-	85-115	-	
Cadmium, Dissolved	110	-	85-115	-	
Chromium, Dissolved	108	-	85-115	-	
Copper, Dissolved	108	-	85-115	-	
Lead, Dissolved	112	-	85-115	-	
Nickel, Dissolved	108	-	85-115	-	
Selenium, Dissolved	106	-	85-115	-	
Silver, Dissolved	119	Q	85-115	-	
Zinc, Dissolved	114	-	85-115	-	
Dissolved Metals - Mansfield Lab Associated sample(s): 01-02 Batch: WG1149676-2					
Iron, Dissolved	109	-	85-115	-	

Matrix Spike Analysis Batch Quality Control

Project Name: MBTA GLX GW PRE-CHAR
Project Number: 290762.1000.0000

Lab Number: L1832437
Report Date: 08/27/18

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: WG1149130-7 QC Sample: L1832437-01 Client ID: MW-18												
Iron, Total	60.6	1	58.1	0	Q	-	-		75-125	-		20
Total Hardness by SM 2340B - Mansfield Lab Associated sample(s): 01-02 QC Batch ID: WG1149130-7 QC Sample: L1832437-01 Client ID: MW-18												
Hardness	139	66.2	190	77		-	-		75-125	-		20
Total Metals - Mansfield Lab Associated sample(s): 01-02 QC Batch ID: WG1149132-3 QC Sample: L1832437-01 Client ID: MW-18												
Antimony, Total	ND	0.5	0.2275	46	Q	-	-		70-130	-		20
Arsenic, Total	0.02324	0.12	0.1317	90		-	-		70-130	-		20
Cadmium, Total	0.00037	0.051	0.05553	108		-	-		70-130	-		20
Chromium, Total	0.2148	0.2	0.4063	96		-	-		70-130	-		20
Copper, Total	0.09229	0.25	0.3376	98		-	-		70-130	-		20
Lead, Total	0.07484	0.51	0.6101	105		-	-		70-130	-		20
Nickel, Total	0.08886	0.5	0.5769	98		-	-		70-130	-		20
Selenium, Total	0.02010	0.12	0.1355	96		-	-		70-130	-		20
Silver, Total	ND	0.05	0.05662	113		-	-		70-130	-		20
Zinc, Total	0.1942	0.5	0.7162	104		-	-		70-130	-		20
Total Metals - Mansfield Lab Associated sample(s): 01-02 QC Batch ID: WG1149390-3 QC Sample: L1832437-01 Client ID: MW-18												
Mercury, Total	ND	0.005	0.0043	87		-	-		70-130	-		20
Total Metals - Mansfield Lab Associated sample(s): 01-02 QC Batch ID: WG1149390-5 QC Sample: L1832437-02 Client ID: DUP-18												
Mercury, Total	ND	0.005	0.0038	76		-	-		70-130	-		20
Dissolved Metals - Mansfield Lab Associated sample(s): 01-02 QC Batch ID: WG1149416-3 QC Sample: L1832437-01 Client ID: MW-18												
Mercury, Dissolved	ND	0.005	0.00353	71	Q	-	-		75-125	-		20



Matrix Spike Analysis Batch Quality Control

Project Name: MBTA GLX GW PRE-CHAR
Project Number: 290762.1000.0000

Lab Number: L1832437
Report Date: 08/27/18

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	MSD Found	MSD %Recovery	Recovery Limits	RPD	RPD Limits
Dissolved Metals - Mansfield Lab Associated sample(s): 01-02 QC Batch ID: WG1149672-3 QC Sample: L1832437-01 Client ID: MW-18									
Antimony, Dissolved	ND	0.5	0.6421	128	-	-	70-130	-	20
Arsenic, Dissolved	0.0026	0.12	0.1373	112	-	-	70-130	-	20
Cadmium, Dissolved	ND	0.051	0.0585	115	-	-	70-130	-	20
Chromium, Dissolved	0.0123	0.2	0.2129	100	-	-	70-130	-	20
Copper, Dissolved	0.0090	0.25	0.2754	106	-	-	70-130	-	20
Lead, Dissolved	0.0038	0.51	0.5924	115	-	-	70-130	-	20
Nickel, Dissolved	0.0110	0.5	0.5263	103	-	-	70-130	-	20
Selenium, Dissolved	ND	0.12	0.1309	109	-	-	70-130	-	20
Silver, Dissolved	ND	0.05	0.0543	109	-	-	70-130	-	20
Zinc, Dissolved	0.0162	0.5	0.5757	112	-	-	70-130	-	20
Dissolved Metals - Mansfield Lab Associated sample(s): 01-02 QC Batch ID: WG1149676-3 QC Sample: L1832437-01 Client ID: MW-18									
Iron, Dissolved	5.14	1	2.92	0	Q	-	75-125	-	20

Lab Duplicate Analysis Batch Quality Control

Project Name: MBTA GLX GW PRE-CHAR
Project Number: 290762.1000.0000

Lab Number: L1832437
Report Date: 08/27/18

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
Total Metals - Mansfield Lab Associated sample(s): 01-02 QC Batch ID: WG1149130-8 QC Sample: L1832437-01 Client ID: MW-18						
Iron, Total	60.6	58.7	mg/l	3		20
Total Hardness by SM 2340B - Mansfield Lab Associated sample(s): 01-02 QC Batch ID: WG1149130-8 QC Sample: L1832437-01 Client ID: MW-18						
Hardness	139	138	mg/l	1		20
Total Metals - Mansfield Lab Associated sample(s): 01-02 QC Batch ID: WG1149132-4 QC Sample: L1832437-01 Client ID: MW-18						
Antimony, Total	ND	ND	mg/l	NC		20
Arsenic, Total	0.02324	0.02333	mg/l	0		20
Cadmium, Total	0.00037	0.00037	mg/l	0		20
Chromium, Total	0.2148	0.2130	mg/l	1		20
Copper, Total	0.09229	0.08931	mg/l	3		20
Lead, Total	0.07484	0.07545	mg/l	1		20
Nickel, Total	0.08886	0.08446	mg/l	5		20
Selenium, Total	0.02010	0.02160	mg/l	7		20
Silver, Total	ND	ND	mg/l	NC		20
Zinc, Total	0.1942	0.1901	mg/l	2		20
Total Metals - Mansfield Lab Associated sample(s): 01-02 QC Batch ID: WG1149390-4 QC Sample: L1832437-01 Client ID: MW-18						
Mercury, Total	ND	ND	mg/l	NC		20
Total Metals - Mansfield Lab Associated sample(s): 01-02 QC Batch ID: WG1149390-6 QC Sample: L1832437-02 Client ID: DUP-18						
Mercury, Total	ND	ND	mg/l	NC		20



Lab Duplicate Analysis Batch Quality Control

Project Name: MBTA GLX GW PRE-CHAR
Project Number: 290762.1000.0000

Lab Number: L1832437
Report Date: 08/27/18

Parameter	Native Sample	Duplicate Sample	Units	RPD	RPD Limits
Dissolved Metals - Mansfield Lab Associated sample(s): 01-02 QC Batch ID: WG1149416-4 QC Sample: L1832437-01 Client ID: MW-18					
Mercury, Dissolved	ND	ND	mg/l	NC	20
Dissolved Metals - Mansfield Lab Associated sample(s): 01-02 QC Batch ID: WG1149672-4 QC Sample: L1832437-01 Client ID: MW-18					
Antimony, Dissolved	ND	ND	mg/l	NC	20
Arsenic, Dissolved	0.0026	0.0022	mg/l	16	20
Cadmium, Dissolved	ND	ND	mg/l	NC	20
Chromium, Dissolved	0.0123	0.0096	mg/l	25 Q	20
Copper, Dissolved	0.0090	0.0076	mg/l	17	20
Lead, Dissolved	0.0038	0.0035	mg/l	6	20
Nickel, Dissolved	0.0110	0.0095	mg/l	15	20
Selenium, Dissolved	ND	ND	mg/l	NC	20
Silver, Dissolved	ND	ND	mg/l	NC	20
Zinc, Dissolved	0.0162	0.0128	mg/l	23 Q	20
Dissolved Metals - Mansfield Lab Associated sample(s): 01-02 QC Batch ID: WG1149676-4 QC Sample: L1832437-01 Client ID: MW-18					
Iron, Dissolved	5.14	3.77	mg/l	31 Q	20



INORGANICS & MISCELLANEOUS

Project Name: MBTA GLX GW PRE-CHAR
Project Number: 290762.1000.0000

Lab Number: L1832437
Report Date: 08/27/18

SAMPLE RESULTS

Lab ID: L1832437-01
Client ID: MW-18
Sample Location: SOMERVILLE, MEDFORD, CAMBRIDGE

Date Collected: 08/17/18 09:00
Date Received: 08/17/18
Field Prep: Refer to COC

Sample Depth:
Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total Dissolved	1200		mg/l	20	--	2	-	08/20/18 14:35	121,2540C	DW
Solids, Total Suspended	2200		mg/l	50	NA	10	-	08/18/18 12:10	121,2540D	JT
Cyanide, Dissolved	ND		mg/l	0.005	--	1	08/19/18 13:45	08/20/18 13:10	1,9010C/9012B	LH
Cyanide, Total	ND		mg/l	0.005	--	1	08/19/18 14:30	08/20/18 13:43	121,4500CN-CE	LH
Chlorine, Total Residual	ND		mg/l	0.02	--	1	-	08/17/18 23:14	121,4500CL-D	AS
Nitrogen, Ammonia	3.44		mg/l	0.150	--	2	08/19/18 16:46	08/20/18 20:26	121,4500NH3-BH	AT
Oil & Grease, Hem-Grav	ND		mg/l	4.4	--	1.1	08/21/18 16:21	08/21/18 17:15	74,1664A	ML
TPH, SGT-HEM	ND		mg/l	4.40	--	1.1	08/21/18 16:21	08/21/18 21:00	74,1664A	ML
Phenolics, Total	ND		mg/l	0.030	--	1	08/21/18 04:29	08/21/18 08:22	4,420.1	GD
Chromium, Hexavalent	ND		mg/l	0.010	--	1	08/18/18 00:50	08/18/18 01:31	1,7196A	UN
Chromium, Hexavalent (Unfiltered)	ND		mg/l	0.010	--	1	08/18/18 00:50	08/18/18 01:32	1,7196A	UN
Anions by Ion Chromatography - Westborough Lab										
Chloride	412.		mg/l	12.5	--	25	-	08/20/18 02:21	44,300.0	JR



Project Name: MBTA GLX GW PRE-CHAR
Project Number: 290762.1000.0000

Lab Number: L1832437
Report Date: 08/27/18

SAMPLE RESULTS

Lab ID: L1832437-02
Client ID: DUP-18
Sample Location: SOMERVILLE, MEDFORD, CAMBRIDGE

Date Collected: 08/17/18 10:30
Date Received: 08/17/18
Field Prep: Refer to COC

Sample Depth:
Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total Dissolved	1400		mg/l	20	--	2	-	08/20/18 14:35	121,2540C	DW
Solids, Total Suspended	2100		mg/l	50	NA	10	-	08/18/18 12:10	121,2540D	JT
Cyanide, Dissolved	ND		mg/l	0.005	--	1	08/19/18 13:45	08/20/18 13:14	1,9010C/9012B	LH
Cyanide, Total	ND		mg/l	0.005	--	1	08/19/18 14:30	08/20/18 12:51	121,4500CN-CE	LH
Chlorine, Total Residual	ND		mg/l	0.02	--	1	-	08/17/18 23:14	121,4500CL-D	AS
Nitrogen, Ammonia	3.85		mg/l	0.150	--	2	08/19/18 16:46	08/20/18 20:27	121,4500NH3-BH	AT
Oil & Grease, Hem-Grav	ND		mg/l	4.0	--	1	08/21/18 16:21	08/21/18 17:15	74,1664A	ML
TPH, SGT-HEM	ND		mg/l	4.00	--	1	08/21/18 16:21	08/21/18 21:00	74,1664A	ML
Phenolics, Total	ND		mg/l	0.030	--	1	08/21/18 04:29	08/21/18 08:23	4,420.1	GD
Chromium, Hexavalent	ND		mg/l	0.010	--	1	08/18/18 00:50	08/18/18 01:31	1,7196A	UN
Chromium, Hexavalent (Unfiltered)	ND		mg/l	0.010	--	1	08/18/18 00:50	08/18/18 01:34	1,7196A	UN
Anions by Ion Chromatography - Westborough Lab										
Chloride	502.		mg/l	12.5	--	25	-	08/20/18 02:57	44,300.0	JR



Project Name: MBTA GLX GW PRE-CHAR
Project Number: 290762.1000.0000

Lab Number: L1832437
Report Date: 08/27/18

**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): 01-02 Batch: WG1147983-1										
Chlorine, Total Residual	ND		mg/l	0.02	--	1	-	08/17/18 23:14	121,4500CL-D	AS
General Chemistry - Westborough Lab for sample(s): 01-02 Batch: WG1147991-1										
Chromium, Hexavalent (Unfiltered)	ND		mg/l	0.010	--	1	08/18/18 00:50	08/18/18 01:24	1,7196A	UN
General Chemistry - Westborough Lab for sample(s): 01-02 Batch: WG1147992-1										
Chromium, Hexavalent	ND		mg/l	0.010	--	1	08/18/18 00:50	08/18/18 01:24	1,7196A	UN
General Chemistry - Westborough Lab for sample(s): 01-02 Batch: WG1148038-1										
Solids, Total Suspended	ND		mg/l	5.0	NA	1	-	08/18/18 12:10	121,2540D	JT
General Chemistry - Westborough Lab for sample(s): 01-02 Batch: WG1148204-1										
Nitrogen, Ammonia	ND		mg/l	0.075	--	1	08/19/18 16:46	08/20/18 19:47	121,4500NH3-BH	AT
General Chemistry - Westborough Lab for sample(s): 01-02 Batch: WG1148228-1										
Cyanide, Total	ND		mg/l	0.005	--	1	08/19/18 14:30	08/20/18 12:33	121,4500CN-CE	LH
General Chemistry - Westborough Lab for sample(s): 01-02 Batch: WG1148229-1										
Cyanide, Dissolved	ND		mg/l	0.005	--	1	08/19/18 13:45	08/20/18 13:00	1,9010C/9012B	LH
General Chemistry - Westborough Lab for sample(s): 01-02 Batch: WG1148293-1										
Solids, Total Dissolved	ND		mg/l	10	--	1	-	08/20/18 14:35	121,2540C	DW
General Chemistry - Westborough Lab for sample(s): 01-02 Batch: WG1148303-1										
Phenolics, Total	ND		mg/l	0.030	--	1	08/21/18 04:29	08/21/18 08:20	4,420.1	GD
Anions by Ion Chromatography - Westborough Lab for sample(s): 01-02 Batch: WG1148578-1										
Chloride	ND		mg/l	0.500	--	1	-	08/19/18 18:07	44,300.0	JR
General Chemistry - Westborough Lab for sample(s): 01-02 Batch: WG1148961-1										
Oil & Grease, Hem-Grav	ND		mg/l	4.0	--	1	08/21/18 16:21	08/21/18 17:15	74,1664A	ML
General Chemistry - Westborough Lab for sample(s): 01-02 Batch: WG1148963-1										
TPH, SGT-HEM	ND		mg/l	4.00	--	1	08/21/18 16:21	08/21/18 21:00	74,1664A	ML

Lab Control Sample Analysis

Batch Quality Control

Project Name: MBTA GLX GW PRE-CHAR

Lab Number: L1832437

Project Number: 290762.1000.0000

Report Date: 08/27/18

Parameter	LCS		LCSD		%Recovery Limits	RPD	Qual	RPD Limits
	%Recovery	Qual	%Recovery	Qual				
General Chemistry - Westborough Lab Associated sample(s): 01-02 Batch: WG1147983-2								
Chlorine, Total Residual	93		-		90-110	-		
General Chemistry - Westborough Lab Associated sample(s): 01-02 Batch: WG1147991-2								
Chromium, Hexavalent (Unfiltered)	98		-		85-115	-		20
General Chemistry - Westborough Lab Associated sample(s): 01-02 Batch: WG1147992-2								
Chromium, Hexavalent	98		-		85-115	-		20
General Chemistry - Westborough Lab Associated sample(s): 01-02 Batch: WG1148204-2								
Nitrogen, Ammonia	93		-		80-120	-		20
General Chemistry - Westborough Lab Associated sample(s): 01-02 Batch: WG1148228-2								
Cyanide, Total	103		-		90-110	-		
General Chemistry - Westborough Lab Associated sample(s): 01-02 Batch: WG1148229-2 WG1148229-3								
Cyanide, Dissolved	101		101		80-120	0		20
General Chemistry - Westborough Lab Associated sample(s): 01-02 Batch: WG1148293-2								
Solids, Total Dissolved	97		-		80-120	-		

Lab Control Sample Analysis

Batch Quality Control

Project Name: MBTA GLX GW PRE-CHAR

Lab Number: L1832437

Project Number: 290762.1000.0000

Report Date: 08/27/18

Parameter	LCS %Recovery	LCSD %Recovery	%Recovery Limits	RPD	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01-02 Batch: WG1148303-2					
Phenolics, Total	95	-	70-130	-	
Anions by Ion Chromatography - Westborough Lab Associated sample(s): 01-02 Batch: WG1148578-2					
Chloride	102	-	90-110	-	
General Chemistry - Westborough Lab Associated sample(s): 01-02 Batch: WG1148961-2					
Oil & Grease, Hem-Grav	93	-	78-114	-	18
General Chemistry - Westborough Lab Associated sample(s): 01-02 Batch: WG1148963-2					
TPH	90	-	64-132	-	34

Matrix Spike Analysis Batch Quality Control

Project Name: MBTA GLX GW PRE-CHAR
Project Number: 290762.1000.0000

Lab Number: L1832437
Report Date: 08/27/18

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	MSD Qual	MSD Found	MSD %Recovery	MSD Qual	Recovery Limits	RPD	RPD Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01-02 QC Batch ID: WG1147983-4 QC Sample: L1832437-02 Client ID: DUP-18												
Chlorine, Total Residual	ND	0.248	0.25	101	-	-	-	-	80-120	-	-	20
General Chemistry - Westborough Lab Associated sample(s): 01-02 QC Batch ID: WG1147991-4 QC Sample: L1832437-01 Client ID: MW-18												
Chromium, Hexavalent (Unfiltered)	ND	0.1	0.094	94	-	-	-	-	85-115	-	-	20
General Chemistry - Westborough Lab Associated sample(s): 01-02 QC Batch ID: WG1147992-4 QC Sample: L1832437-01 Client ID: MW-18												
Chromium, Hexavalent	ND	0.1	0.099	99	-	-	-	-	85-115	-	-	20
General Chemistry - Westborough Lab Associated sample(s): 01-02 QC Batch ID: WG1148229-4 WG1148229-5 QC Sample: L1832437-01 Client ID: MW-18												
Cyanide, Dissolved	ND	0.2	0.200	100	0.200	100	100	-	80-120	0	-	20
General Chemistry - Westborough Lab Associated sample(s): 01-02 QC Batch ID: WG1148303-4 QC Sample: L1832437-01 Client ID: MW-18												
Phenolics, Total	ND	0.4	0.37	93	-	-	-	-	70-130	-	-	20
General Chemistry - Westborough Lab Associated sample(s): 01-02 QC Batch ID: WG1148961-4 QC Sample: L1832437-01 Client ID: MW-18												
Oil & Grease, Hem-Grav	ND	44.4	48	107	-	-	-	-	78-114	-	-	18
General Chemistry - Westborough Lab Associated sample(s): 01-02 QC Batch ID: WG1148963-4 QC Sample: L1832437-01 Client ID: MW-18												
TPH	ND	22.2	22.9	103	-	-	-	-	64-132	-	-	34

Lab Duplicate Analysis

Batch Quality Control

Project Name: MBTA GLX GW PRE-CHAR

Project Number: 290762.1000.0000

Lab Number: L1832437

Report Date: 08/27/18

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab	Associated sample(s): 01-02	QC Batch ID: WG1147983-3	QC Sample: L1832437-01	Client ID: MW-18		
Chlorine, Total Residual	ND	ND	mg/l	NC		20
General Chemistry - Westborough Lab	Associated sample(s): 01-02	QC Batch ID: WG1147991-3	QC Sample: L1832437-02	Client ID: DUP-18		
Chromium, Hexavalent (Unfiltered)	ND	ND	mg/l	NC		20
General Chemistry - Westborough Lab	Associated sample(s): 01-02	QC Batch ID: WG1147992-3	QC Sample: L1832437-02	Client ID: DUP-18		
Chromium, Hexavalent	ND	ND	mg/l	NC		20
General Chemistry - Westborough Lab	Associated sample(s): 01-02	QC Batch ID: WG1148038-2	QC Sample: L1832437-01	Client ID: MW-18		
Solids, Total Suspended	2200	2200	mg/l	0		29
General Chemistry - Westborough Lab	Associated sample(s): 01-02	QC Batch ID: WG1148303-3	QC Sample: L1832437-01	Client ID: MW-18		
Phenolics, Total	ND	ND	mg/l	NC		20
General Chemistry - Westborough Lab	Associated sample(s): 01-02	QC Batch ID: WG1148961-3	QC Sample: L1832437-02	Client ID: DUP-18		
Oil & Grease, Hem-Grav	ND	ND	mg/l	NC		18
General Chemistry - Westborough Lab	Associated sample(s): 01-02	QC Batch ID: WG1148963-3	QC Sample: L1832437-02	Client ID: DUP-18		
TPH, SGT-HEM	ND	ND	mg/l	NC		34

Project Name: MBTA GLX GW PRE-CHAR**Lab Number:** L1832437**Project Number:** 290762.1000.0000**Report Date:** 08/27/18**Sample Receipt and Container Information**

Were project specific reporting limits specified?

YES

Cooler Information

Cooler	Custody Seal
A	Absent
B	Absent
C	Absent

Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L1832437-01A	Vial HCl preserved	A	NA		4.2	Y	Absent		8260(14)
L1832437-01B	Vial HCl preserved	A	NA		4.2	Y	Absent		8260(14)
L1832437-01C	Vial HCl preserved	A	NA		4.2	Y	Absent		8260(14)
L1832437-01D	Vial Na2S2O3 preserved	A	NA		4.2	Y	Absent		624.1-SIM-RGP(7),624.1-RGP(3)
L1832437-01D1	Vial Na2S2O3 preserved	A	NA		4.2	Y	Absent		624.1-SIM-RGP(7),624.1-RGP(3)
L1832437-01E	Vial Na2S2O3 preserved	A	NA		4.2	Y	Absent		624.1-SIM-RGP(7),624.1-RGP(3)
L1832437-01E1	Vial Na2S2O3 preserved	A	NA		4.2	Y	Absent		624.1-SIM-RGP(7),624.1-RGP(3)
L1832437-01F	Vial Na2S2O3 preserved	A	NA		4.2	Y	Absent		624.1-SIM-RGP(7),624.1-RGP(3)
L1832437-01F1	Vial Na2S2O3 preserved	A	NA		4.2	Y	Absent		624.1-SIM-RGP(7),624.1-RGP(3)
L1832437-01G	Vial Na2S2O3 preserved	A	NA		4.2	Y	Absent		504(14)
L1832437-01H	Vial Na2S2O3 preserved	A	NA		4.2	Y	Absent		504(14)
L1832437-01I	Plastic 120ml unpreserved	C	7	7	4.6	Y	Absent		HEXCR-7196(1)
L1832437-01J	Plastic 500ml HNO3 preserved	C	<2	<2	4.6	Y	Absent		AG-2008S(180),CR-2008S(180),FE-RI(180),AS-2008S(180),PB-2008S(180),ZN-2008S(180),NI-2008S(180),SE-2008S(180),CD-2008S(180),CU-2008S(180),SB-2008S(180),HG-R(28)
L1832437-01K	Plastic 250ml HNO3 preserved	C	<2	<2	4.6	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)
L1832437-01L	Plastic 500ml H2SO4 preserved	C	<2	<2	4.6	Y	Absent		NH3-4500(28)
L1832437-01M	Plastic 250ml NaOH preserved	C	>12	>12	4.6	Y	Absent		TCN-4500(14)
L1832437-01M1	Plastic 250ml NaOH preserved	C	>12	>12	4.6	Y	Absent		SCN-9010(14)

Project Name: MBTA GLX GW PRE-CHAR

Lab Number: L1832437

Project Number: 290762.1000.0000

Report Date: 08/27/18

Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L1832437-01N	Amber 1000ml HCl preserved	A	NA		4.2	Y	Absent		TPH-1664(28)
L1832437-01N1	Amber 1000ml HCl preserved	A	NA		4.2	Y	Absent		TPH-1664(28)
L1832437-01N2	Amber 1000ml HCl preserved	A	NA		4.2	Y	Absent		OG-1664(28)
L1832437-01N3	Amber 1000ml HCl preserved	A	NA		4.2	Y	Absent		OG-1664(28)
L1832437-01P	Plastic 950ml unpreserved	C	7	7	4.6	Y	Absent		CL-300(28),HEXCR-7196-UF(1),TRC-4500(1),TDS-2540(7)
L1832437-01Q	Amber 1000ml H2SO4 preserved	A	<2	<2	4.2	Y	Absent		TPHENOL-420(28)
L1832437-01R	Plastic 950ml unpreserved	C	7	7	4.6	Y	Absent		TSS-2540(7)
L1832437-01S	Amber 1000ml Na2S2O3	A	7	7	4.2	Y	Absent		PCB-608.3(7)
L1832437-01S1	Amber 1000ml Na2S2O3	A	7	7	4.2	Y	Absent		PCB-608.3(7)
L1832437-01U	Amber 1000ml Na2S2O3	A	7	7	4.2	Y	Absent		PESTICIDE-608.3(7),625.1-SIM-RGP(7)
L1832437-01U1	Amber 1000ml Na2S2O3	A	7	7	4.2	Y	Absent		625.1-SIM-RGP(7)
L1832437-01V	Amber 1000ml Na2S2O3	A	7	7	4.2	Y	Absent		PESTICIDE-608.3(7),625.1-RGP(7)
L1832437-01V1	Amber 1000ml Na2S2O3	A	7	7	4.2	Y	Absent		625.1-RGP(7)
L1832437-01W	Amber 1000ml HCl preserved	A	<2	<2	4.2	Y	Absent		EPH-10(14)
L1832437-01W1	Amber 1000ml HCl preserved	A	<2	<2	4.2	Y	Absent		EPH-10(14)
L1832437-01X	Vial HCl preserved	A	NA		4.2	Y	Absent		SUB-ETHANOL(14)
L1832437-01Y	Vial HCl preserved	A	NA		4.2	Y	Absent		SUB-ETHANOL(14)
L1832437-01Z	Vial HCl preserved	A	NA		4.2	Y	Absent		SUB-ETHANOL(14)
L1832437-02A	Vial HCl preserved	B	NA		4.5	Y	Absent		8260(14)
L1832437-02B	Vial HCl preserved	B	NA		4.5	Y	Absent		8260(14)
L1832437-02C	Vial HCl preserved	B	NA		4.5	Y	Absent		8260(14)
L1832437-02D	Vial Na2S2O3 preserved	B	NA		4.5	Y	Absent		624.1-SIM-RGP(7),624.1-RGP(3)
L1832437-02D1	Vial Na2S2O3 preserved	B	NA		4.5	Y	Absent		624.1-SIM-RGP(7),624.1-RGP(3)
L1832437-02E	Vial Na2S2O3 preserved	B	NA		4.5	Y	Absent		624.1-SIM-RGP(7),624.1-RGP(3)
L1832437-02E1	Vial Na2S2O3 preserved	B	NA		4.5	Y	Absent		624.1-SIM-RGP(7),624.1-RGP(3)
L1832437-02F	Vial Na2S2O3 preserved	B	NA		4.5	Y	Absent		624.1-SIM-RGP(7),624.1-RGP(3)
L1832437-02F1	Vial Na2S2O3 preserved	B	NA		4.5	Y	Absent		624.1-SIM-RGP(7),624.1-RGP(3)
L1832437-02G	Vial Na2S2O3 preserved	B	NA		4.5	Y	Absent		504(14)

Project Name: MBTA GLX GW PRE-CHAR

Lab Number: L1832437

Project Number: 290762.1000.0000

Report Date: 08/27/18

Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L1832437-02H	Vial Na2S2O3 preserved	B	NA		4.5	Y	Absent		504(14)
L1832437-02I	Plastic 120ml unpreserved	C	7	7	4.6	Y	Absent		HEXCR-7196(1)
L1832437-02J	Plastic 500ml HNO3 preserved	C	<2	<2	4.6	Y	Absent		AG-2008S(180),CR-2008S(180),FE-RI(180),AS-2008S(180),PB-2008S(180),ZN-2008S(180),NI-2008S(180),SE-2008S(180),CD-2008S(180),CU-2008S(180),SB-2008S(180),HG-R(28)
L1832437-02K	Plastic 250ml HNO3 preserved	C	<2	<2	4.6	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)
L1832437-02L	Plastic 500ml H2SO4 preserved	C	<2	<2	4.6	Y	Absent		NH3-4500(28)
L1832437-02M	Plastic 250ml NaOH preserved	C	>12	>12	4.6	Y	Absent		TCN-4500(14)
L1832437-02M1	Plastic 250ml NaOH preserved	C	>12	>12	4.6	Y	Absent		SCN-9010(14)
L1832437-02N	Amber 1000ml HCl preserved	B	NA		4.5	Y	Absent		TPH-1664(28)
L1832437-02N1	Amber 1000ml HCl preserved	B	NA		4.5	Y	Absent		TPH-1664(28)
L1832437-02N2	Amber 1000ml HCl preserved	B	NA		4.5	Y	Absent		OG-1664(28)
L1832437-02N3	Amber 1000ml HCl preserved	B	NA		4.5	Y	Absent		OG-1664(28)
L1832437-02P	Plastic 950ml unpreserved	C	7	7	4.6	Y	Absent		CL-300(28),HEXCR-7196-UF(1),TRC-4500(1),TDS-2540(7)
L1832437-02Q	Amber 1000ml H2SO4 preserved	B	<2	<2	4.5	Y	Absent		TPHENOL-420(28)
L1832437-02R	Plastic 950ml unpreserved	C	7	7	4.6	Y	Absent		TSS-2540(7)
L1832437-02S	Amber 1000ml Na2S2O3	B	7	7	4.5	Y	Absent		PCB-608.3(7)
L1832437-02S1	Amber 1000ml Na2S2O3	B	7	7	4.5	Y	Absent		PCB-608.3(7)
L1832437-02U	Amber 1000ml Na2S2O3	B	7	7	4.5	Y	Absent		PESTICIDE-608.3(7),625.1-SIM-RGP(7)
L1832437-02U1	Amber 1000ml Na2S2O3	B	7	7	4.5	Y	Absent		625.1-SIM-RGP(7)
L1832437-02V	Amber 1000ml Na2S2O3	B	7	7	4.5	Y	Absent		PESTICIDE-608.3(7),625.1-RGP(7)
L1832437-02V1	Amber 1000ml Na2S2O3	B	7	7	4.5	Y	Absent		625.1-RGP(7)
L1832437-02W	Amber 1000ml HCl preserved	B	<2	<2	4.5	Y	Absent		EPH-10(14)
L1832437-02W1	Amber 1000ml HCl preserved	B	<2	<2	4.5	Y	Absent		EPH-10(14)
L1832437-02X	Vial HCl preserved	B	NA		4.5	Y	Absent		SUB-ETHANOL(14)
L1832437-02Y	Vial HCl preserved	B	NA		4.5	Y	Absent		SUB-ETHANOL(14)

Project Name: MBTA GLX GW PRE-CHAR

Project Number: 290762.1000.0000

Serial_No:08271814:57

Lab Number: L1832437

Report Date: 08/27/18

Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L1832437-02Z	Vial HCl preserved	B	NA		4.5	Y	Absent		SUB-ETHANOL(14)
L1832437-03A	Vial Na2S2O3 preserved	B	NA		4.5	Y	Absent		624.1-SIM-RGP(7),624.1-RGP(3),504(14)
L1832437-03B	Vial Na2S2O3 preserved	B	NA		4.5	Y	Absent		624.1-SIM-RGP(7),624.1-RGP(3),504(14)

Project Name: MBTA GLX GW PRE-CHAR
Project Number: 290762.1000.0000

Lab Number: L1832437
Report Date: 08/27/18

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: MBTA GLX GW PRE-CHAR
Project Number: 290762.1000.0000

Lab Number: L1832437
Report Date: 08/27/18

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 exceedances 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.

Project Name: MBTA GLX GW PRE-CHAR**Lab Number:** L1832437**Project Number:** 290762.1000.0000**Report Date:** 08/27/18

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.
- 98 Method for the Determination of Extractable Petroleum Hydrocarbons (EPH), MassDEP, May 2004, Revision 1.1 with QC Requirements & Performance Standards for the Analysis of EPH under the Massachusetts Contingency Plan, WSC-CAM-IVB, July 2010.
- 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**



Project Information

Westborough, MA
TEL: 508-898-9220
FAX: 508-898-9193

Mansfield, MA
TEL: 508-822-9300
FAX: 508-822-3288

Project Name: MBTA GLX GW Pre-char

Client Information

Client: TRC Environmental Corp

Project Location: Somerville, Medford, Cambridge

Address: 650 Suffolk Street

Project #: 290762.1000.0000

Lowell, MA

Project Manager: Diane Stallings

Phone: 978-970-5600

ALPHA Quote #: 3742

Fax:

Turn-Around Time

Standard Rush (ONLY IF PRE-APPROVED)

Email: DStallings@trcsolutions.com

These samples have been Previously analyzed by Alpha

Due Date: Time:

Other Project Specific Requirements/Comments/Detection Limits: **VOCs: 624.1, 624.1 SIM, TRIP BLANKS: 8/17/18 and 8/24/18**
 RLs must meet EPA RGP Appendix VII limits.
 Please report both Total and Dissolved RGP metals (including trivalent chromium)
 5 day TAT standard per quote.
 Report project-specific VOC/SVOC analyte lists.
 Add'l email: KMorin@trcsolutions.com
Results needed by noon 8/24

Date Rec'd in Lab: **8/17/18**

ALPHA Job #: **L1832437**

Report Information Data Deliverables

FAX EMAIL
 ADEx Add'l Deliverables

Billing Information

Same as Client info PO #: 119800

Regulatory Requirements/Report Limits

State/Fed Program: EPA / MCP
 Criteria: EPA RGP / RCGW-1

MCP PRESUMPTIVE CERTAINTY-CT REASONABLE CONFIDENCE PROTOCOLS

Yes No Are MCP Analytical Methods Required?
 Yes No Are CT RCP (Reasonable Confidence Protocols) Required?

ANALYSIS

NPDES RGP GW 2017 per quote	Pesticides by 608	EPH (Fractions Only) by MassDEP	Oil and Grease (HEM) by 1664A	TDS by SM2540C	Hardness by 200.7	Dissolved RGP Metals by 200.8/245.1	Dissolved Cyanide by 9010	Total and Diss Hex. Chrom. by 7196A				
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

SAMPLE HANDLING
 Filtration
 Done
 Not Needed
 Lab to do
 Preservation
 Lab to do
 (Please specify below)

TOTAL # BOTTLES

Sample Specific Comments

ALPHA Lab ID (Lab Use Only)	Sample ID	Collection		Sample Matrix	Sampler's Initials
		Date	Time		
32437-01	MW-18	8/17/18	1000	GW	BA
02	DUP-18	↓	1030	↓	BA
03	TRIP BLANKS			DI	

VOCs 624.1, 624.1 SIM, 8200, 804.1


PLEASE ANSWER QUESTIONS ABOVE!

Container Type	-	A	A	A	G	P	P	P	P	-	-	-
Preservative	-	H	B	B	A	C	C	E	A	-	-	-

IS YOUR PROJECT MA MCP or CT RCP?

Relinquished By: Date/Time: **8/17/18 1748**
 Received By: Date/Time: **8/17/18 1300**

Please print clearly, legibly and completely. Samples can not be logged in and turnaround time clock will not start until any ambiguities are resolved. All samples submitted are subject to Alpha's Payment Terms

		Subcontract Chain of Custody Test America (Nashville) 2960 Foster Creighton Drive Nashville, TN 37204		Alpha Job Number L1832437	
Client Information		Project Information		Regulatory Requirements/Report Limits	
Client: Alpha Analytical Labs Address: Eight Walkup Drive Westborough, MA 01581-1019 Phone: 508-439-5132 Email: akane@alphalab.com		Project Location: MA Project Manager: Ashaley Kane		State/Federal Program: Regulatory Criteria: RCS-1-14	
		Turnaround & Deliverables Information			
		Due Date: 08/27/18 (RUSH) Deliverables:			
Project Specific Requirements and/or Report Requirements					
Reference following Alpha Job Number on final report/deliverables: L1832437			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-18 DUP-18	08-17-18 09:00 08-17-18 10:30	WATER WATER	Ethanol by EPA 1671 Revision A Ethanol by EPA 1671 Revision A	
		Relinquished By:	Date/Time:	Received By:	Date/Time:
		<i>[Signature]</i> AAL	8/20/18		
Form No: AL_subcoc					

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

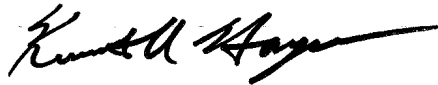
ANALYTICAL REPORT

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

TestAmerica Job ID: 490-157808-1
 Client Project/Site: L1832437

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

Attn: Ashaley Kane



Authorized for release by:
 8/27/2018 12:22:45 PM

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

LINKS

Review your project
 results through
TotalAccess

Have a Question?



Visit us at:
www.testamericainc.com

The test results in this report meet all 2003 NELAC and 2009 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.



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Sample Summary

Client: Alpha Analytical Inc
Project/Site: L1832437

TestAmerica Job ID: 490-157808-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
490-157808-1	MW-18	Water	08/17/18 09:00	08/21/18 09:15
490-157808-2	DUP-18	Water	08/17/18 10:30	08/21/18 09:15

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Case Narrative

Client: Alpha Analytical Inc
Project/Site: L1832437

TestAmerica Job ID: 490-157808-1

Job ID: 490-157808-1

Laboratory: TestAmerica Nashville

Narrative

Job Narrative
490-157808-1

Comments

No additional comments.

Receipt

The samples were received on 8/21/2018 9:15 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 3.0° C.

GC Semi VOA

Method 1671A: Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate (MS/MSD) associated with analytical batch 490-538473.

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: L1832437

TestAmerica Job ID: 490-157808-1

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
α	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: L1832437

TestAmerica Job ID: 490-157808-1

Client Sample ID: MW-18
Date Collected: 08/17/18 09:00
Date Received: 08/21/18 09:15

Lab Sample ID: 490-157808-1
Matrix: Water

Method: 1671A - Ethanol (GC/FID)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ethanol	ND		2000	500	ug/L			08/24/18 12:51	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
Isopropyl acetate (Surr)	114		70 - 130					08/24/18 12:51	1

Client Sample Results

Client: Alpha Analytical Inc
Project/Site: L1832437

TestAmerica Job ID: 490-157808-1

Client Sample ID: DUP-18**Lab Sample ID: 490-157808-2****Date Collected: 08/17/18 10:30****Matrix: Water****Date Received: 08/21/18 09:15****Method: 1671A - Ethanol (GC/FID)**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ethanol	ND		2000	500	ug/L			08/24/18 12:57	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
Isopropyl acetate (Surr)	95		70 - 130					08/24/18 12:57	1

QC Sample Results

Client: Alpha Analytical Inc
Project/Site: L1832437

TestAmerica Job ID: 490-157808-1

Method: 1671A - Ethanol (GC/FID)

Lab Sample ID: MB 490-538473/4

Matrix: Water

Analysis Batch: 538473

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			08/24/18 12:08	1
Surrogate	MB %Recovery	MB Qualifier	Limits				Prepared	Analyzed	Dil Fac
Isopropyl acetate (Surr)	104		70 - 130					08/24/18 12:08	1

Lab Sample ID: LCS 490-538473/5

Matrix: Water

Analysis Batch: 538473

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Ethanol	50200	62140		ug/L		124	70 - 130		
Surrogate	LCS %Recovery	LCS Qualifier	Limits						
Isopropyl acetate (Surr)	92		70 - 130						

Lab Sample ID: LCSD 490-538473/6

Matrix: Water

Analysis Batch: 538473

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	64770		ug/L		129	70 - 130	4	20
Surrogate	LCSD %Recovery	LCSD Qualifier	Limits						
Isopropyl acetate (Surr)	102		70 - 130						

TestAmerica Nashville

QC Association Summary

Client: Alpha Analytical Inc
Project/Site: L1832437

TestAmerica Job ID: 490-157808-1

GC VOA

Analysis Batch: 538473

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-157808-1	MW-18	Total/NA	Water	1671A	
490-157808-2	DUP-18	Total/NA	Water	1671A	
MB 490-538473/4	Method Blank	Total/NA	Water	1671A	
LCS 490-538473/5	Lab Control Sample	Total/NA	Water	1671A	
LCSD 490-538473/6	Lab Control Sample Dup	Total/NA	Water	1671A	

Lab Chronicle

Client: Alpha Analytical Inc
Project/Site: L1832437

TestAmerica Job ID: 490-157808-1

Client Sample ID: MW-18
Date Collected: 08/17/18 09:00
Date Received: 08/21/18 09:15

Lab Sample ID: 490-157808-1
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			538473	08/24/18 12:51	AAB	TAL NSH

Client Sample ID: DUP-18
Date Collected: 08/17/18 10:30
Date Received: 08/21/18 09:15

Lab Sample ID: 490-157808-2
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			538473	08/24/18 12:57	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: L1832437

TestAmerica Job ID: 490-157808-1

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

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Accreditation/Certification Summary

Client: Alpha Analytical Inc
Project/Site: L1832437

TestAmerica Job ID: 490-157808-1

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
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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



490-157808 Chain of Custody

COOLER RECEIPT FORM

Cooler Received/Opened On 08-21-2018 @ 0915

Time Samples Removed From Cooler 1141 Time Samples Placed In Storage 1144 (2 Hour Window)

1. Tracking # 12E30654019984602 (last 4 digits, FedEx) Courier: UPS NAA

IR Gun ID 17960358 pH Strip Lot _____ Chlorine Strip Lot _____

2. Temperature of rep. sample or temp blank when opened: 3.0 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 (initial) GH

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



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 (initial) TR

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 (initial) TR

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 (initial) TR

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

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



		<p>Subcontract Chain of Custody</p> <p>Test America (Nashville) 2960 Foster Creighton Drive Nashville, TN 37204</p>		<p>Alpha Job Number L1832437</p>	
<p>Client Information</p> <p>Client: Alpha Analytical Labs Address: Eight Walkup Drive Westborough, MA 01581-1019 Phone: 508-439-5132 Email: akane@alphalab.com</p>		<p>Project Information</p> <p>Project Location: MA Project Manager: Ashaley Kane Turnaround & Deliverables Information Due Date: 08/27/18 (RUSH) Deliverables:</p>		<p>Regulatory Requirements/Report Limits</p> <p>State/Federal Program: Regulatory Criteria: RCS-1-14</p>	
<p>Project Specific Requirements and/or Report Requirements</p> <p>Reference following Alpha Job Number on final report/deliverables: L1832437 Report to include Method Blank, LCS/LCSD:</p> <p>Additional Comments: Send all results/reports to subreports@alphalab.com</p>					
<p>Lab ID</p> <p>MW-18 DUP-18</p>	<p>Client ID</p>	<p>Collection Date/Time</p> <p>08-17-18 09:00 08-17-18 10:30</p>	<p>Sample Matrix</p> <p>WATER WATER</p>	<p>Analysis</p> <p>Ethanol by EPA 1671 Revision A Ethanol by EPA 1671 Revision A</p>	<p>Batch QC</p>
<p>Relinquished By: <i>[Signature]</i></p>		<p>Date/Time: 8/21/18</p>		<p>Received By: <i>[Signature]</i></p>	
<p>Date/Time: 8/21/18 9:30</p>		<p>TA-NAS (3.0)</p>		<p>Loc: 490 157808</p>	
<p>Form No: AL_subcoc</p>					



ANALYTICAL REPORT

Lab Number:	L1819306
Client:	TRC Environmental Consultants Wannalancit Mills 650 Suffolk Street Lowell, MA 01854
ATTN:	Matt Oliveira
Phone:	(978) 621-9259
Project Name:	MBTA GLX SW SAMPLING
Project Number:	290762.1000.0000
Report Date:	06/01/18

The original project report/data package is held by Alpha Analytical. This report/data package is paginated and should be reproduced only in its entirety. Alpha Analytical holds no responsibility for results and/or data that are not consistent with the original.

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: MBTA GLX SW SAMPLING
Project Number: 290762.1000.0000

Lab Number: L1819306
Report Date: 06/01/18

Alpha Sample ID	Client ID	Matrix	Sample Location	Collection Date/Time	Receive Date
L1819306-01	MILLERS RIVER	WATER	SOMERVILLE, MEDFORD, CAMBRIDGE	05/24/18 13:45	05/24/18
L1819306-02	TRIP BLANK	WATER	SOMERVILLE, MEDFORD, CAMBRIDGE	05/23/18 00:00	05/24/18

Project Name: MBTA GLX SW SAMPLING

Lab Number: L1819306

Project Number: 290762.1000.0000

Report Date: 06/01/18

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?	NO
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)?	NO
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)?	NO

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: MBTA GLX SW SAMPLING
Project Number: 290762.1000.0000

Lab Number: L1819306
Report Date: 06/01/18

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: MBTA GLX SW SAMPLING
Project Number: 290762.1000.0000

Lab Number: L1819306
Report Date: 06/01/18

Case Narrative (continued)

Report Revision

June 01, 2018: The Project Name has been amended. In addition, the MADEP MCP Response Action Analytical Report Certification has been added.

MCP Related Narratives

Total Metals

In reference to question G:

L1819306-01: One or more of the target analytes did not achieve the requested CAM reporting limits.

In reference to question B:

At the client's request, the analytical method specified in the CAM protocol was not followed.

In reference to question I:

All samples were analyzed for a subset of MCP analytes per client request.

Hexavalent Chromium

In reference to question B:

At the client's request, the analytical method specified in the CAM protocol was not followed.

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:

 Melissa Cripps

Title: Technical Director/Representative

Date: 06/01/18

METALS

Project Name: MBTA GLX SW SAMPLING**Lab Number:** L1819306**Project Number:** 290762.1000.0000**Report Date:** 06/01/18**SAMPLE RESULTS**

Lab ID: L1819306-01

Date Collected: 05/24/18 13:45

Client ID: MILLERS RIVER

Date Received: 05/24/18

Sample Location: SOMERVILLE, MEDFORD, CAMBRIDGE

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	05/31/18 09:00	05/31/18 17:18	EPA 3005A	3,200.8	AM
Arsenic, Total	ND		mg/l	0.00100	--	1	05/31/18 09:00	05/31/18 17:18	EPA 3005A	3,200.8	AM
Cadmium, Total	ND		mg/l	0.00020	--	1	05/31/18 09:00	05/31/18 17:18	EPA 3005A	3,200.8	AM
Chromium, Total	ND		mg/l	0.00100	--	1	05/31/18 09:00	05/31/18 17:18	EPA 3005A	3,200.8	AM
Copper, Total	0.00365		mg/l	0.00100	--	1	05/31/18 09:00	05/31/18 17:18	EPA 3005A	3,200.8	AM
Iron, Total	0.709		mg/l	0.050	--	1	05/31/18 09:00	05/31/18 19:04	EPA 3005A	19,200.7	AB
Lead, Total	0.00170		mg/l	0.00100	--	1	05/31/18 09:00	05/31/18 17:18	EPA 3005A	3,200.8	AM
Mercury, Total	ND		mg/l	0.00020	--	1	05/25/18 11:33	05/29/18 15:46	EPA 245.1	3,245.1	BV
Nickel, Total	ND		mg/l	0.00200	--	1	05/31/18 09:00	05/31/18 17:18	EPA 3005A	3,200.8	AM
Selenium, Total	ND		mg/l	0.00500	--	1	05/31/18 09:00	05/31/18 17:18	EPA 3005A	3,200.8	AM
Silver, Total	ND		mg/l	0.00040	--	1	05/31/18 09:00	05/31/18 17:18	EPA 3005A	3,200.8	AM
Zinc, Total	0.01523		mg/l	0.01000	--	1	05/31/18 09:00	05/31/18 17:18	EPA 3005A	3,200.8	AM
Total Hardness by SM 2340B - Mansfield Lab											
Hardness	125		mg/l	0.660	NA	1	05/31/18 09:00	05/31/18 19:04	EPA 3005A	19,200.7	AB



Project Name: MBTA GLX SW SAMPLING
Project Number: 290762.1000.0000

Lab Number: L1819306
Report Date: 06/01/18

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 Batch: WG1119578-1									
Mercury, Total	ND	mg/l	0.00020	--	1	05/25/18 11:33	05/29/18 14:47	3,245.1	BV

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 Batch: WG1120981-1									
Antimony, Total	ND	mg/l	0.00400	--	1	05/31/18 09:00	05/31/18 15:35	3,200.8	AM
Arsenic, Total	ND	mg/l	0.00100	--	1	05/31/18 09:00	05/31/18 15:35	3,200.8	AM
Cadmium, Total	ND	mg/l	0.00020	--	1	05/31/18 09:00	05/31/18 15:35	3,200.8	AM
Chromium, Total	ND	mg/l	0.00100	--	1	05/31/18 09:00	05/31/18 15:35	3,200.8	AM
Copper, Total	ND	mg/l	0.00100	--	1	05/31/18 09:00	05/31/18 15:35	3,200.8	AM
Lead, Total	ND	mg/l	0.00100	--	1	05/31/18 09:00	05/31/18 15:35	3,200.8	AM
Nickel, Total	ND	mg/l	0.00200	--	1	05/31/18 09:00	05/31/18 15:35	3,200.8	AM
Selenium, Total	ND	mg/l	0.00500	--	1	05/31/18 09:00	05/31/18 15:35	3,200.8	AM
Silver, Total	ND	mg/l	0.00040	--	1	05/31/18 09:00	05/31/18 15:35	3,200.8	AM
Zinc, Total	ND	mg/l	0.01000	--	1	05/31/18 09:00	05/31/18 15:35	3,200.8	AM

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 Batch: WG1120984-1									
Iron, Total	ND	mg/l	0.050	--	1	05/31/18 09:00	05/31/18 17:00	19,200.7	AB

Prep Information

Digestion Method: EPA 3005A

Project Name: MBTA GLX SW SAMPLING

Lab Number: L1819306

Project Number: 290762.1000.0000

Report Date: 06/01/18

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: WG1120984-1										
Hardness	ND		mg/l	0.660	NA	1	05/31/18 09:00	05/31/18 17:00	19,200.7	AB

Prep Information

Digestion Method: EPA 3005A

Lab Control Sample Analysis

Batch Quality Control

Project Name: MBTA GLX SW SAMPLING

Lab Number: L1819306

Project Number: 290762.1000.0000

Report Date: 06/01/18

Parameter	LCS		LCSD		%Recovery Limits	RPD	Qual	RPD Limits
	%Recovery	Qual	%Recovery	Qual				
Total Metals - Mansfield Lab Associated sample(s): 01 Batch: WG1119578-2								
Mercury, Total	94		-		85-115	-		
Total Metals - Mansfield Lab Associated sample(s): 01 Batch: WG1120981-2								
Antimony, Total	104		-		85-115	-		
Arsenic, Total	107		-		85-115	-		
Cadmium, Total	108		-		85-115	-		
Chromium, Total	100		-		85-115	-		
Copper, Total	98		-		85-115	-		
Lead, Total	103		-		85-115	-		
Nickel, Total	104		-		85-115	-		
Selenium, Total	109		-		85-115	-		
Silver, Total	98		-		85-115	-		
Zinc, Total	106		-		85-115	-		
Total Metals - Mansfield Lab Associated sample(s): 01 Batch: WG1120984-2								
Iron, Total	113		-		85-115	-		
Total Hardness by SM 2340B - Mansfield Lab Associated sample(s): 01 Batch: WG1120984-2								
Hardness	100		-		85-115	-		

INORGANICS & MISCELLANEOUS

Project Name: MBTA GLX SW SAMPLING
Project Number: 290762.1000.0000

Lab Number: L1819306
Report Date: 06/01/18

SAMPLE RESULTS

Lab ID: L1819306-01
Client ID: MILLERS RIVER
Sample Location: SOMERVILLE, MEDFORD, CAMBRIDGE

Date Collected: 05/24/18 13:45
Date Received: 05/24/18
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	0.296		mg/l	0.075	--	1	05/26/18 12:00	05/29/18 20:20	121,4500NH3-BH	AT
Chromium, Hexavalent (Unfiltered)	ND		mg/l	0.010	--	1	05/25/18 00:44	05/25/18 01:53	1,7196A	UN
Chromium, Trivalent (Unfiltered)	ND		mg/l	0.01	--	1	-	06/01/18 12:00	107,-	ED



Project Name: MBTA GLX SW SAMPLING

Lab Number: L1819306

Project Number: 290762.1000.0000

Report Date: 06/01/18

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: WG1119383-1										
Chromium, Hexavalent (Unfiltered)	ND		mg/l	0.010	--	1	05/25/18 00:44	05/25/18 01:42	1,7196A	UN
General Chemistry - Westborough Lab for sample(s): 01 Batch: WG1119834-1										
Nitrogen, Ammonia	ND		mg/l	0.075	--	1	05/26/18 12:00	05/29/18 20:08	121,4500NH3-BH	AT

Lab Control Sample Analysis

Batch Quality Control

Project Name: MBTA GLX SW SAMPLING

Lab Number: L1819306

Project Number: 290762.1000.0000

Report Date: 06/01/18

Parameter	LCS		LCSD		%Recovery Limits	RPD	Qual	RPD Limits
	%Recovery	Qual	%Recovery	Qual				
General Chemistry - Westborough Lab Associated sample(s): 01 Batch: WG1119383-2								
Chromium, Hexavalent (Unfiltered)	96		-		85-115	-		20
General Chemistry - Westborough Lab Associated sample(s): 01 Batch: WG1119834-2								
Nitrogen, Ammonia	100		-		80-120	-		20

Matrix Spike Analysis
Batch Quality Control

Project Name: MBTA GLX SW SAMPLING

Lab Number: L1819306

Project Number: 290762.1000.0000

Report Date: 06/01/18

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	MSD Qual	MSD Found	MSD %Recovery	MSD Qual	Recovery Limits	RPD	RPD Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1119383-4 QC Sample: L1819306-01 Client ID: MILLERS RIVER												
Chromium, Hexavalent (Unfiltered)	ND	0.1	0.095	95	-	-	-	-	85-115	-	-	20
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1119834-4 QC Sample: L1819306-01 Client ID: MILLERS RIVER												
Nitrogen, Ammonia	0.296	4	4.14	96	-	-	-	-	80-120	-	-	20

Lab Duplicate Analysis *Batch Quality Control*

Project Name: MBTA GLX SW SAMPLING

Project Number: 290762.1000.0000

Lab Number: L1819306

Report Date: 06/01/18

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1119383-3 QC Sample: L1819306-01 Client ID: MILLERS RIVER						
Chromium, Hexavalent (Unfiltered)	ND	ND	mg/l	NC		20
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1119834-3 QC Sample: L1819306-01 Client ID: MILLERS RIVER						
Nitrogen, Ammonia	0.296	0.320	mg/l	8		20



Project Name: MBTA GLX SW SAMPLING**Lab Number:** L1819306**Project Number:** 290762.1000.0000**Report Date:** 06/01/18**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(*)
L1819306-01A	Plastic 250ml HNO3 preserved	A	<2	<2	3.1	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)
L1819306-01B	Plastic 500ml H2SO4 preserved	A	<2	<2	3.1	Y	Absent		NH3-4500(28)
L1819306-01C	Plastic 950ml unpreserved	A	7	7	3.1	Y	Absent		HEXCR-7196-UF(1)
L1819306-02A	Vial HCl preserved	A	NA		3.1	Y	Absent		HOLD(14)
L1819306-02B	Vial HCl preserved	A	NA		3.1	Y	Absent		HOLD(14)

Project Name: MBTA GLX SW SAMPLING
Project Number: 290762.1000.0000

Lab Number: L1819306
Report Date: 06/01/18

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).
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.
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.

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

Report Format: Data Usability Report



Project Name: MBTA GLX SW SAMPLING
Project Number: 290762.1000.0000

Lab Number: L1819306
Report Date: 06/01/18

Data Qualifiers

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.

Project Name: MBTA GLX SW SAMPLING

Lab Number: L1819306

Project Number: 290762.1000.0000

Report Date: 06/01/18

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.
- 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.
- 107 Alpha Analytical - In-house calculation method.
- 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 OF

Project Information

Project Name: MBTA GLX SW Sampling

Project Location: Somerville, Medford, Cambridge

Project #: 290762.1000.0000

Project Manager: Matt Oliveira

ALPHA Quote #: 3742

Turn-Around Time

Standard Rush (ONLY IF PRE-APPROVED)

Due Date: Time:

Westborough, MA Mansfield, MA
 TEL: 508-898-9220 TEL: 508-822-9300
 FAX: 508-898-9193 FAX: 508-822-3288

Client Information

Client: TRC Environmental Corp

Address: 650 Suffolk Street

Lowell, MA

Phone: 978-970-5600

Fax:

Email: moliveira@trcsolutions.com

These samples have been Previously analyzed by Alpha

Other Project Specific Requirements/Comments/Detection Limits:

RLs must meet EPA RGP Appendix VII limits.
 Total NPDES Metals per quote: Ag, Pb, Cu, Cr, Cd, As, Ni, Hg, Fe, Sb, Se, Zn.
 5 day TAT standard per quote.

Add'l emails: KMorin@trcsolutions.com & SNabozny@trcsolutions.com

Date Rec'd in Lab: 05/24/18

ALPHA Job #: L1819306

Report Information Data Deliverables

FAX EMAIL
 ADEx Add'l Deliverables

Billing Information

Same as Client info PO #: 119800

Regulatory Requirements/Report Limits

State/Fed Program

Criteria

EPA / MCP

EPA RGP / RCGW-1

MCP PRESUMPTIVE CERTAINTY-CT REASONABLE CONFIDENCE PROTOCOLS

Yes No Are MCP Analytical Methods Required?
 Yes No Are CT RCP (Reasonable Confidence Protocols) Required?

ANALYSIS

Total NPDES Metals by 200.8/245.1	Hardness by 200.7	Total Hexavalent Chrom. by 7196A	Ammonia Nitrogen by SM 4500	Trivalent Chromium Calculation	8160-5.1													
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SAMPLE HANDLING
 Filtration
 Done
 Not Needed
 Lab to do
 Preservation
 Lab to do
 (Please specify below)

TOTAL # BOTTLES

Sample Specific Comments

PLEASE ANSWER QUESTIONS ABOVE!

IS YOUR PROJECT MA MCP or CT RCP?

Container Type	P	P	P	P	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Preservative	C	C	A	D	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Relinquished By:	Date/Time	Received By:	Date/Time
<i>[Signature]</i>	5/24/18 1440	<i>[Signature]</i> AAL	5/24/18 1600
<i>[Signature]</i> AAL	5/24/18 1835	<i>[Signature]</i>	5/24/18 1835

Please print clearly, legibly and completely. Samples can not be logged in and turnaround time clock will not start until any ambiguities are resolved. All samples submitted are subject to Alpha's Payment Terms.

ATTACHMENT E
CORRESPONDENCE WITH MASSDEP REGARDING MILLERS RIVER

From: [Vakalopoulos, Catherine \(DEP\)](#)
To: [Stapleton, Jamie](#)
Subject: RE: Miller's River 7Q10?
Date: Tuesday, February 27, 2018 2:31:52 PM

Hi Jamie,

I've worked on individual NPDES permits that discharge to the Millers River (ID: MA72-31) and though there is some influence from the Charles, it is definitely most influenced by stormwater flows. Because of this, discharges to Millers River have not been granted a DF.

Cathy

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

 Please consider the environment before printing this e-mail

From: Stapleton, Jamie [mailto:JStapleton@trcsolutions.com]
Sent: Tuesday, February 27, 2018 2:18 PM
To: Vakalopoulos, Catherine (DEP)
Cc: Ruan, Xiaodan (DEP)
Subject: Miller's River 7Q10?

Hi Cathy,

I've attached a plan retrieved from an MCP report in the MassDEP BWSC database that depicts the location of Miller's River in Somerville and a proposed drainage system and outfall to the River which may be utilized under the RGP. I am not representing the PRP listed in this document – I'm just using the publicly available map for communication purposes. I am under the impression that the Miller's River is a partially filled in basin connected to the Charles and the level of the river is dependent upon the Charles. I checked StreamStats and the Miller's River does not show up. If the outfall depicted on page 2 is utilized to discharge treated groundwater to surface water would the Miller's River be considered part of the Charles and the 7Q10 of the Charles would be used to calculate DFs? Not a rush request. Thank you. -Jamie

[https://en.wikipedia.org/wiki/Millers_River_\(Middlesex\)](https://en.wikipedia.org/wiki/Millers_River_(Middlesex))

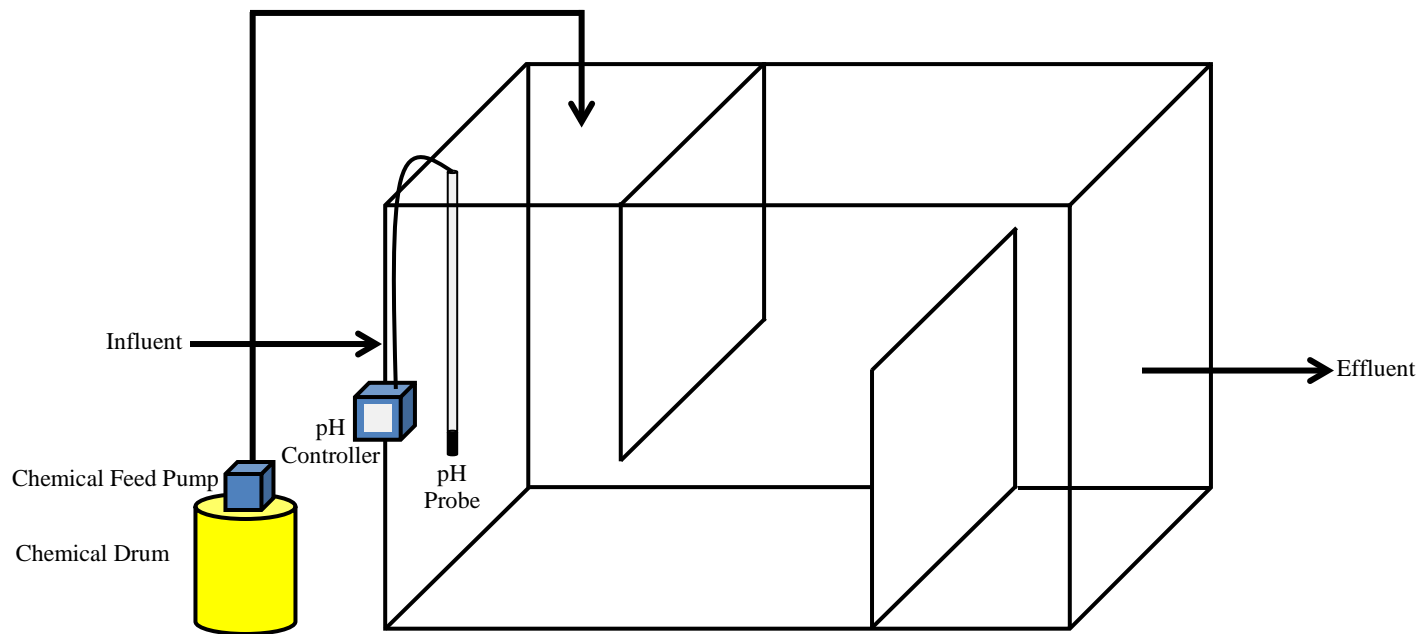
Jamie Stapleton, PG
Project Manager/Senior Geologist
Engineering, Construction, and Remediation



670 N. Commercial Street, Suite 203, Manchester, NH 03101
C: 603.325.5480

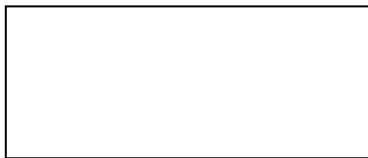
[LinkedIn](#) | [Twitter](#) | [Blog](#) | [Flickr](#) | www.trcsolutions.com

**ATTACHMENT F
SDS AND pH
ADJUSTEMENT EQUIPMENT**



Notes:

- 1.) Figure is not to scale.
- 2.) System layout can vary with site conditions.



Configuration of pH Adjustment System



One Controller for the Broadest Range of Sensors.

Choose from 30 digital and analog sensor families for up to 17 different parameters.

Maximum Versatility

The sc200 controller allows the use of digital and analog sensors, either alone or in combination, to provide compatibility with Hach's broad range of sensors, eliminating the need for dedicated, parameter-specific controllers.

Ease of Use and Confidence in Results

Large, high-resolution, transreflective display provides optimal viewing resolution in any lighting condition. Guided calibration procedures in 19 languages minimize complexity and reduce operator error. Password-protected SD card reader offers a simple solution for data download and transfer. Visual warning system provides critical alerts.

Wide Variety of Communication Options

Utilize two to five analog outputs to transmit primary and secondary values for each sensor, or integrate Hach sensors and analyzers into MODBUS RS232/RS485, Profibus® DP, and HART networks.



Password protected SD card reader offers a simple solution for data download and transfer, and sc200 and digital sensor configuration file duplication and backup.

Controller Comparison



Features	Previous Models		sc200™ Controller	Benefits
	sc100™ Controller	GLI53 Controller		
Display	64 x 128 pixels 33 x 66 mm (1.3 x 2.6 in.)	64 x 128 pixels 33 x 66 mm (1.3 x 2.6 in.)	160 x 240 pixels 48 x 68 mm (1.89 x 2.67 in.) Transreflective	<ul style="list-style-type: none"> Improved user interface—50% bigger Easier to read in daylight and sunlight
Data Management	irDA Port/PDA Service Cable	N/A	SD Card Service Cable	<ul style="list-style-type: none"> Simplifies data transfer Standardized accessories/ max compatibility
Sensor Inputs	2 Max Direct Digital Analog via External Gateway	2 Max Analog Depending on Parameter	2 Max Digital and/or Analog with Sensor Card	<ul style="list-style-type: none"> Simplifies analog sensor connections Works with analog and digital sensors
Analog Inputs	N/A	N/A	1 Analog Input Signal Analog 4-20mA Card	<ul style="list-style-type: none"> Enables non-sc analyzer monitoring Accepts mA signals from other analyzers for local display Consolidates analog mA signals to a digital output
4-20 mA Outputs	2 Standard	2 Standard	2 Standard Optional 3 Additional	<ul style="list-style-type: none"> Total of five (5) 4-20 mA outputs allows multiple mA outputs per sensor input
Digital Communication	MODBUS RS232/RS485 Profibus DP V1.0	HART	MODBUS RS232/RS485 Profibus DP V1.0 HART 7.2	<ul style="list-style-type: none"> Unprecedented combination of sensor breadth and digital communication options

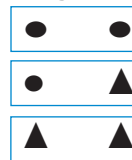
Choose from Hach's Broad Range of Digital and Analog Sensors

Parameter	Sensor	Digital or Analog
Ammonia	AMTAX™ sc, NH4D sc, AISE sc, AN-ISE sc	●
Chlorine	CLF10 sc, CLT10 sc, 9184 sc	●
Chlorine Dioxide	9185 sc	●
Conductivity	GLI 3400 Contacting, GLI 3700 Inductive	▲
Dissolved Oxygen	LDO® Model 2, 5740 sc	●
Dissolved Oxygen	5500	▲
Flow	U53, F53 Sensors	▲
Nitrate	NITRATAX™ sc, NO3D sc, NISE sc, AN-ISE sc	●
Oil in Water	FP360 sc	●
Organics	UVAS sc	●
Ozone	9187 sc	●
pH/ORP	pHD	●
pH/ORP	pHD, pH Combination, LCP	▲
Phosphate	PHOSPHAX™ sc	●
Sludge Level	SONATAX™ sc	●
Suspended Solids	SOLITAX™ sc, TSS sc	●
Turbidity	1720E, FT660 sc, SS7 sc, ULTRATURB sc, SOLITAX sc, TSS sc	●
Ultra Pure Conductivity	8310, 8311, 8312, 8315, 8316, 8317 Contacting	▲
Ultra Pure pH/ORP	8362	▲

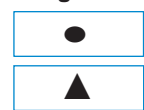
● = Digital ▲ = Analog

Connect up to two of any of the sensors listed above, in any combination, to meet your application needs. The diagrams below demonstrate the potential configurations. Operation of analog sensors requires the controller to be equipped with the appropriate sensor module. Contact Hach Technical Support for help with selecting the appropriate module.

2 Channel Configurations



1 Channel Configurations



Specifications*

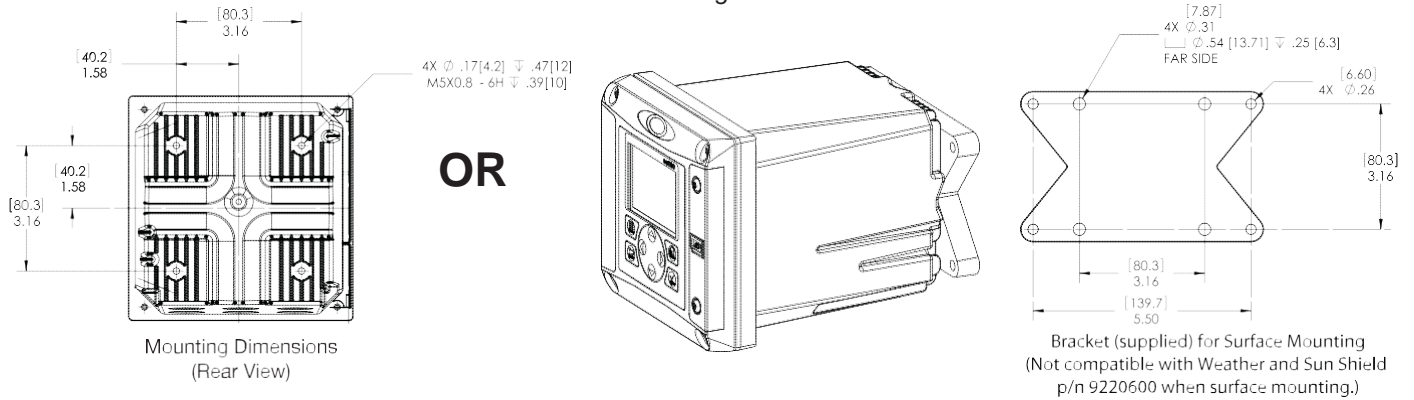
Dimensions (H x W x D)	5.7 in x 5.7 in x 7.1 in (144 mm x 144 mm x 181 mm)
Display	Graphic dot matrix LCD with LED backlighting, transreflective
Display Size	1.9 x 2.7 in. (48 mm x 68 mm)
Display Resolution	240 x 160 pixels
Weight	3.75 lbs. (1.70 kg)
Power Requirements (Voltage)	100 - 240 V AC, 24 V DC
Power Requirements (Hz)	50/60 Hz
Operating Temperature Range	-20 to 60 °C , 0 to 95% RH non-condensing
Analog Outputs	Two (Five with optional expansion module) to isolated current outputs, max 550 Ω , Accuracy: ± 0.1% of FS (20mA) at 25 °C, ± 0.5% of FS over -20 °C to 60 °C range Operational Mode: measurement or calculated value
Analog Output Functional Mode	Linear, Logarithmic, Bi-linear, PID
Security Levels	2 password-protected levels
Mounting Configurations	Wall, pole, and panel mounting
Enclosure Rating	NEMA 4X/IP66
Conduit Openings	1/2 in NPT Conduit
Relay: Operational Mode	Primary or secondary measurement, calculated value (dual channel only) or timer

Relay Functions	Scheduler (Timer), Alarm, Feeder Control, Event Control, Pulse Width Modulation, Frequency Control, and Warning
Relays	Four electromechanical SPDT (Form C) contacts, 1200 W, 5 A
Communication	MODBUS RS232/RS485, PROFIBUSDPV1, or HART 7.2 optional
Memory Backup	Flash memory
Electrical Certifications	EMC CE compliant for conducted and radiated emissions: - CISPR 11 (Class A limits) - EMC Immunity EN 61326-1 (Industrial limits) Safety cETLus safety mark for: - General Locations per ANSI/UL 61010-1 & CAN/CSA C22.2. No. 61010-1 - Hazardous Location Class I, Division 2, Groups A,B,C & D (Zone 2, Group IIC) per FM 3600 / FM 3611 & CSA C22.2 No. 213 M1987 with approved options and appropriately rated Class I, Division 2 or Zone 2 sensors cULus safety mark - General Locations per UL 61010-1 & CAN/CSA C22.2. No. 61010-1

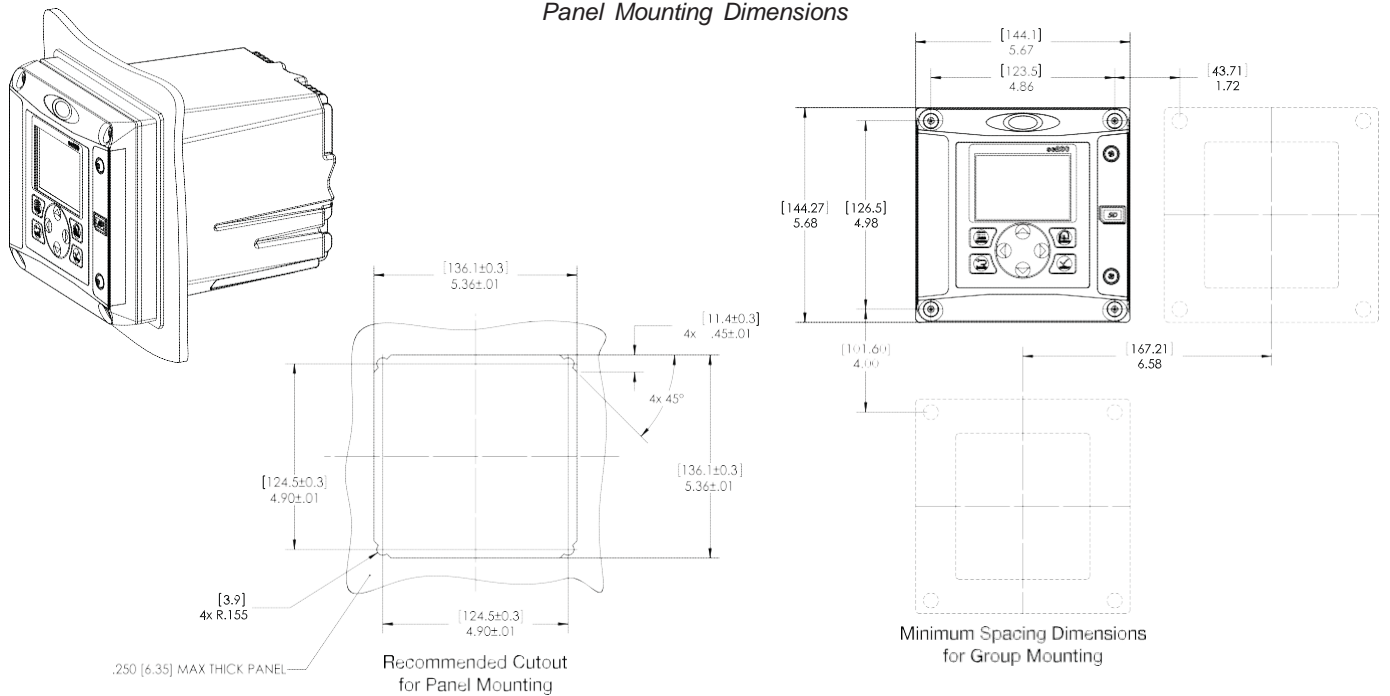
**Subject to change without notice.*

Dimensions

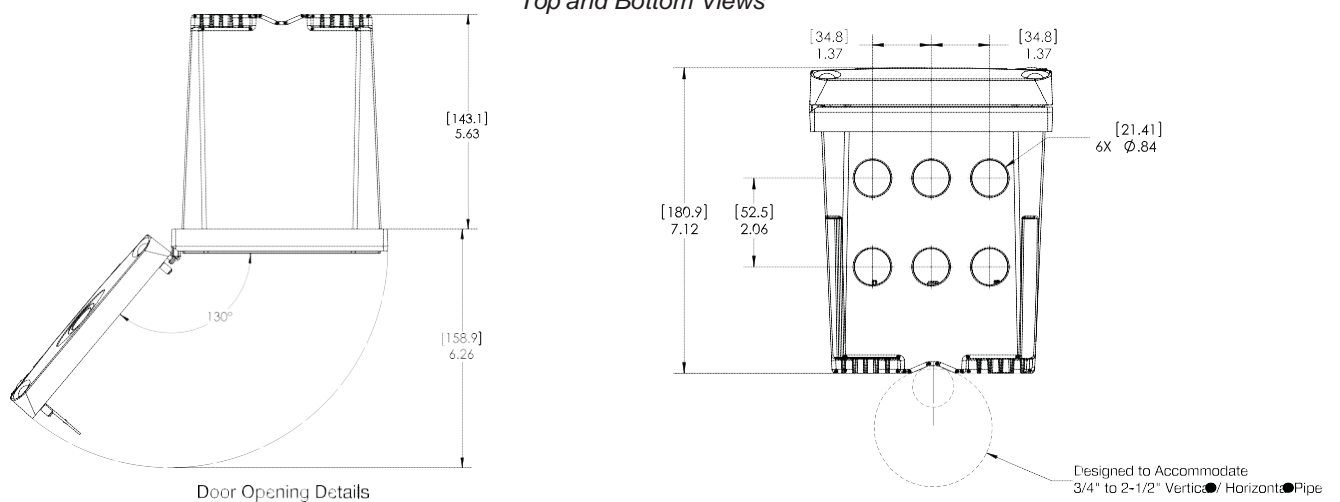
Surface Mounting Dimensions



Panel Mounting Dimensions



Top and Bottom Views



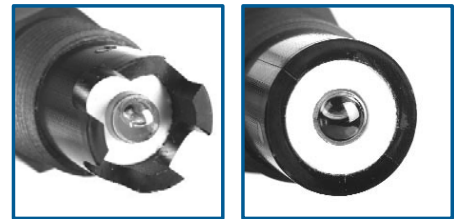


3/4-inch Combination pH and ORP Sensor Kits

pH/ORP



Use the Digital Gateway to make any Hach analog combination pH or ORP sensor compatible with the Hach sc1000 Controller.



Digital combination pH and ORP sensors are available in convertible, insertion, and sanitary mounting styles. Choose from rugged dome electrodes or "easy-to-clean" flat glass electrodes.

DW

WW

PW

IW

Features and Benefits

Low Price—High Performance

These combination sensors are designed for specialty applications for immersion or in-line mounting. The reference cell features a double-junction design for extended service life, and a built-in solution ground. The body is molded from chemically-resistant Ryton® or PVDF, and the reference junction is coaxial porous Teflon®. All sensors are rated 0 to 105°C up to 100 psig, and have integral 4.5 m (15 ft.) cables with tinned leads. The PC-series (for pH) and RC-series (for ORP) combination sensors are ideal for measuring mild and aggressive media.

Special Electrode Configurations

Sensors with rugged dome electrodes, "easy-to-clean" flat glass electrodes, and even HF (hydrofluoric acid) resistant glass electrodes are available for a wide variety of process solutions.

Temperature Compensation Element Option

The PC-series combination pH sensors are available with or without a Pt 1000 ohm RTD temperature element. The RC-series combination ORP sensors are supplied without a temperature element.

Versatile Mounting Styles

Sensors are available in three mounting styles—convertible, insertion, and sanitary. Please turn to page 3 for more information.

Full-Featured "Plug and Play" Hach sc Digital Controllers

There are no complicated wiring or set up procedures with any Hach sc controller. Just plug in any combination of Hach digital sensors and it's ready to use—it's "plug and play."

One or multiple sensors—The sc controller family allows you to receive data from up to eight Hach digital sensors in any combination using a single controller.

Communications—Multiple alarm/control schemes are available using the relays and PID control outputs. Available communications include analog 4-20 mA, digital MODBUS® (RS485 and RS232) or Profibus DP protocols. (Other digital protocols are available. Contact your Hach representative for details.)

Data logger—A built-in data logger collects measurement data, calibration, verification points, and alarm history.

Specifications*

Most pH applications fall in the 2.5-12.5 pH range. General purpose pH glass electrodes perform well in this range. Some industrial applications require accurate measurements and control at pH values below 2 or above 12. Consult Hach Technical Support for details on these applications.

Combination pH Sensors

Measuring Range

0 to 14 pH

Accuracy

Less than 0.1 pH under reference conditions

Temperature Range

0 to 105°C (32 to 221°F)

Flow Rate

0 to 2 m/s (0 to 6.6 ft./s); non-abrasive

Pressure Range

0 to 6.9 bar at 100°C (0 to 100 psig at 212°F)

Signal Transmission Distance

100 m (328 ft.) when used with the Hach Digital Gateway and a Hach sc Digital Controller.

1000 m (3280 ft.) when used with the Hach Digital Gateway, Termination Box, and a Hach sc Digital Controller.

Sensor Cable

Integral coaxial cable (plus two conductors for temperature compensator option); 4.5 m (15 ft.) long

Wetted Materials

Convertible style: Ryton® body (glass filled)

Insertion style: PVDF body (Kynar®)

Sanitary style: 316 stainless steel sleeved PVDF body

Common materials for all sensor styles include PTFE Teflon double junction, glass process electrode, and Viton® O-rings

Warranty

90 days

Combination ORP Sensors

Measuring Range

-2000 to +2000 millivolts

Accuracy

Limited to calibration solution accuracy (± 20 mV)

Temperature Range

0 to 105°C (32 to 221°F)

Flow Rate

0 to 2 m/s (0 to 6.6 ft./s); non-abrasive

Pressure Range

0 to 6.9 bar at 100°C (0 to 100 psig at 212°F)

Signal Transmission Distance

100 m (328 ft.) when used with the Hach Digital Gateway and a Hach sc Digital Controller.

1000 m (3280 ft.) when used with the Hach Digital Gateway, Termination Box, and a Hach sc Digital Controller.

Sensor Cable

Integral coaxial cable; 4.5 m (15 ft.) long; terminated with stripped and tinned wires

Wetted Materials

Convertible style: Ryton® body (glass filled)

Insertion style: PVDF body (Kynar®)

Common materials for all sensor styles include PTFE Teflon double junction, glass with platinum process electrode, and Viton® O-rings

Warranty

90 days

*Specifications subject to change without notice.

Ryton® is a registered trademark of Phillips 66 Co.; Viton® is a registered trademark of E.I. DuPont de Nemours + Co.; Kynar® is a registered trademark of Pennwalt Corp.

Engineering Specifications

- The pH sensor shall be available in convertible, insertion or sanitary styles. The ORP sensor shall be available in only convertible or insertion styles.
- The convertible style sensor shall have a Ryton® body. The insertion style sensor shall have a PVDF body. The sanitary style sensor shall have a 316 stainless steel sleeved PVDF body. Common materials for all sensor styles shall include a PTFE Teflon® double junction, and Viton® O-rings. The pH sensor shall have a glass pH electrode. The ORP sensor shall have a platinum ORP electrode.
- The convertible style pH sensor shall be available with or without a built-in Pt 1000 ohm RTD temperature element. Insertion and sanitary style pH sensors shall have a built-in Pt 1000 ohm RTD temperature element. Convertible and insertion style ORP sensors shall not have a built-in temperature element.
- The sensor shall communicate via MODBUS® RS-485 to a Hach sc Digital Controller.
- The sensor shall be Hach Company Model PC sc or PC-series for pH measurement or Model PC sc or RC-series for ORP measurement.

Dimensions

Convertible Style Sensor

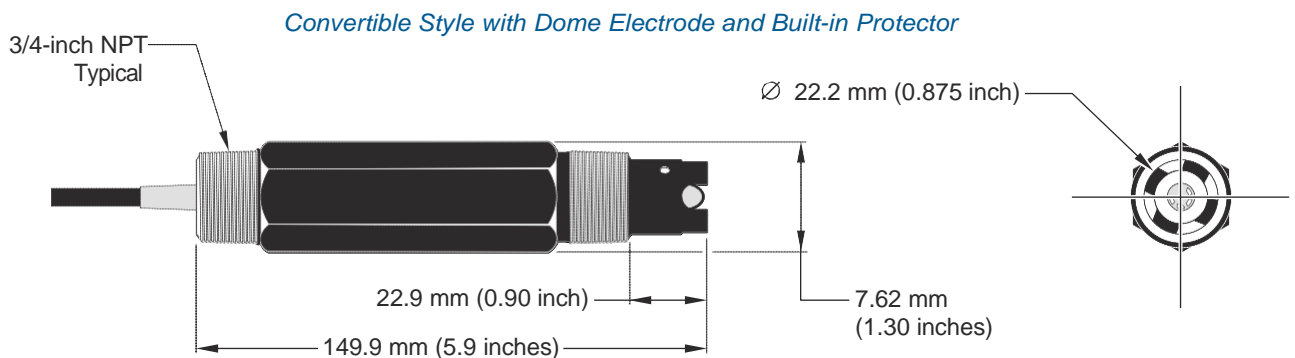
The convertible style sensor has a Ryton® body that features 3/4-inch NPT threads on both ends. The sensor can be directly mounted into a standard 3/4-inch pipe tee for flow-through mounting or fastened onto the end of a pipe for immersion mounting. The convertible style sensor enables inventory consolidation, thereby reducing associated costs. Mounting tees and immersion mounting hardware are offered in a variety of materials to suit application requirements.

Insertion Style Sensor

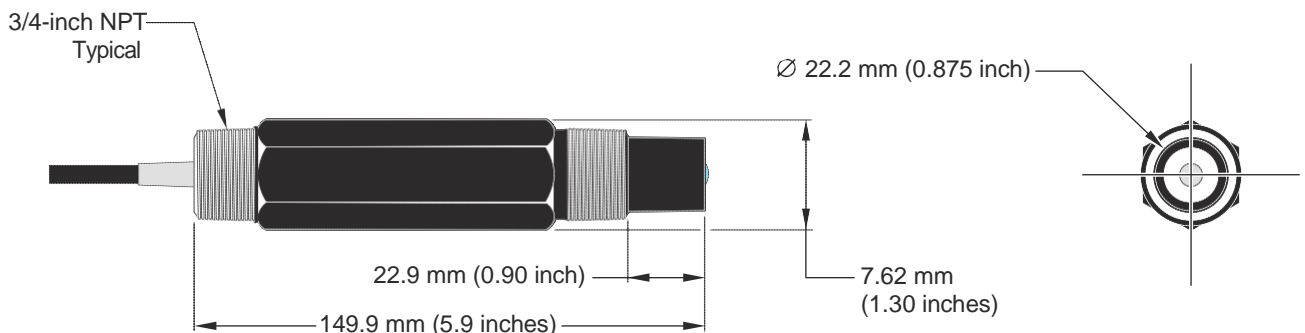
Insertion style sensors feature a longer, non-threaded PVDF body with two Viton® O-rings, providing a seal when used with the optional Hach insertion mount hardware assembly. This ball valve hardware enables sensor insertion and retraction from a pipe or vessel without having to stop the process flow.

Sanitary Style Sensor

The sanitary style sensor, offered for pH measurement, has a 316 stainless steel-sleeved PVDF body with a 2-inch flange. The sensor mates to a standard 2-inch Tri-Clover fitting. The optional Hach sanitary mounting hardware includes a standard 2-inch sanitary tee, sanitary clamp, and Viton® sanitary gasket.



Convertible Style with Flat Electrode





The Pulsatron Series A Plus offers manual function controls over stroke length and stroke rate as standard with the option to select external pace for automatic control.

Ten distinct models are available, having pressure capabilities to 250 PSIG (17 BAR) @ 12 GPO (1.9 lph), and flow capacities to 58 GPO (9.1 lph) @ 100 PSIG (7.0 BAR), with a standard turndown ratio of 100:1, and optional ratio of 1000:1. Metering performance is reproducible to within $\pm 3\%$ of maximum capacity.

Features

- Manual Control by on-line adjustable stroke rate and stroke length.
- Highly Reliable timing circuit.
- Circuit Protection against voltage and current upsets.
- Solenoid Protection by thermal overload with auto-reset.
- Water Resistant, for outdoor and indoor applications.
- Internally Dampened To Reduce Noise.
- Guided Ball Check Valve Systems, to reduce back flow and enhance outstanding priming characteristics.
- Few Moving Parts and Wall Mountable.
- Safe & Easy Priming with durable leak-free bleed valve assembly (standard).
- Optional Control: External pace with auto/manual selection.

Controls



Manual Stroke Rate

Manual Stroke Length

External Pacing- Optional

External Pace With Stop-
Optional (125 SPM only)

Controls Options

Feature	Standard Configuration	Optional Configuration ¹
External Pacing	--	Auto / Manual Selection ¹
External Pace w/ Stop (125SPM only)	--	Auto / Manual Selection ²
Manual Stroke Rate	10:1 Ratio	100:1 Ratio
Manual Stroke Length	10:1 Ratio	10:1 Ratio
Total Turndown Ratio	100:1 Ratio	1000:1 Ratio

Note 1: On S2, S3 & S4 sizes only.

Note 2: Not available on 1000:1 turndown pumps.

Operating Benefits

- Reliable metering performance.
- Rated "hot" for continuous duty.
- High viscosity capability.
- Leak-free, sealless, liquid end.



Aftermarket

- KOPkits
- Gauges
- Dampeners
- Pressure Relief Valves
- Tanks
- Pre-Engineered Systems
- Process Controllers (PULSAblue, MicroVision)



Series A Plus Electronic Metering Pumps



Series A Plus Specifications and Model Selection

MODEL		LBC2	LB02	LBC3	LB03	LB04	LB64	LBC4	LBS2	LBS3	LBS4	
Capacity nominal (max.)	GPH	0.25	0.25	0.42	0.50	1.00	125	2.00	0.50	1.38	2.42	
	GPO	6	6	10	12	24	30	48	12	33	58	
	LPH	0.9	0.9	1.6	1.9	3.8	4.7	7.6	1.9	5.2	9.14	
Pressure ³ (max.)	GFPP, PVDF, 316SS or PVC (<N/code) w/TFE Seats)	PSIG (Bar)	250 (17)	150 (10)	250 (17)	150 (10)	100 (7)	100 (7)	50 (33)	250 (17)	150 (10)	100 (7)
	PVC (V code) Viton or CSPE Seats IDegas Liquid End		150 (10)							150 (10)		
Connections:		Tubina	14" ID X 38" OD					38" ID X 12" OD		14" ID X 38" OD		
		Picina						114" FNPT				
Strokes/Minute		SPM	125							250		

Note 3: Pumps with rated pressure above 150 PSI will be de-rated to 150 PSI Max. when selecting certain valve options, see Price Book for details.

Engineering Data

Pump Head Materials Available: GFPP, PVC, PVDF, 316 SS, PTFE-faced CSPE-backed

Diaphragm: PTFE-faced CSPE-backed

Check Valves Materials Available: Seats/O-Rings: PTFE, CSPE, Viton

Balls: Ceramic, PTFE, 316 SS, Alloy C

Fittings Materials Available: GFPP, PVC, PVDF

Bleed Valve: Same as fitting and check valve selected, except 316SS

Injection Valve & Foot Valve Assy: Same as fitting and check valve selected

Tubing: Clear PVC, White PE

Important: Material Code - GFPP=Glass-filled Polypropylene, PVC=Polyvinyl Chloride, PE=Polyethylene, PVDF=Polyvinylidene Fluoride, CSPE=Generic formulation of Hypalon, a registered trademark of E.I. DuPont Company. Viton is a registered trademark of E.I. DuPont Company. PVC wetted end recommended for sodium hypochlorite.

Engineering Data

Reproducibility: +/- 3% at maximum capacity

Viscosity Max CPS: 1000 CPS

Stroke Frequency Max SPM: 125 / 250 by Model

Stroke Frequency Turn-Down Ratio: 10:1/100:1 by Model

Stroke Length Turn-Down Ratio: 10:1

Power Input: 115 VAC/50-60 HZ/1 ph, 230 VAC/50-60 HZ/1 ph

Average Current Draw: @ 115 VAC; Amps: 0.6 Amps, @ 230 VAC; Amps: 0.3 Amps

Peak hput Power: 130 Watts

Average Input Power @ Max SPM: 50 Watts

Custom Engineered Designs- Pre-Engineered Systems

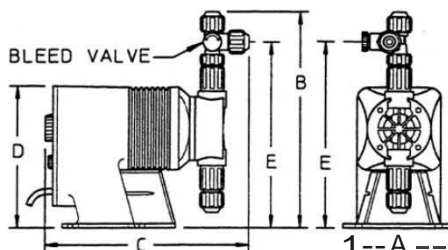


Pre-Engineered Systems Pulsafeeder's Pre-Engineered Systems are designed to provide complete chemical feed solutions for all electronic metering applications. From stand alone simplex pH control applications to full-featured, redundant sodium hypochlorite disinfection metering, these rugged fabricated assemblies offer turn-key simplicity and industrial-grade durability. The UV-stabilized, high-grade HOPE frame offers maximum chemical compatibility and structural rigidity. Each system is factory assembled and hydrostatically tested prior to shipment.

Dimensions

Series A PLUS Dimensions (inches)						
Model No.	A	B	C	D	E	Shipping Weight
LB02 IS2	5.0	9.6	9.5	6.5	8.2	10
LBC2	5.0	9.9	9.5	6.5	8.5	10
LBC3	5.0	9.9	9.5	6.5	8.5	10
LB03 IS3	5.0	9.9	9.5	6.5	8.5	10
LB04	5.0	9.9	9.5	6.5	8.5	10
LB64	5.0	9.9	9.5	6.5	8.5	10
LBC4	5.0	9.9	9.5	6.5	8.5	10

NOTE: inches X 2.54 cm





95-Gallon OverPack - 32" dia x 41.5", 1 each/package



Stock a SpillTech® OverPack with sorbents for emergency spill response, or use it as a salvage drum to ship damaged containers or hazardous waste.

- **DOT-Approved for Salvage:** All SpillTech® OverPacks are DOT-approved and X-rated for use as salvage drums. Helps companies conform to federal regulations when shipping damaged or leaking containers of hazardous materials, or absorbents contaminated with hazardous substances.
- **Perfect for Spill Kits:** Stores sorbent products (not included) for easy access as needed for spill control. Saves time when quick response is necessary.
- **Sturdy Construction:** 100% polyethylene OverPack resists chemicals, rust and corrosion for years of use. Integrated handles make them easy to lift, move or carry with standard material handling equipment. Twist-on, double-wall lid with closed-cell gasket provides sealed, secure closure to prevent leaks and protect contents from moisture, dirt and damage. Durable to withstand rough handling.
- **Customized for You:** We can customize a Spill Kit to your exact specifications, including the container, its contents and accessories, with no upcharge! Contact your local Distributor for details.

A95OVER Specifications

Dimensions:	ext. dia. 32" x 41.5" H
Shipping Dimensions:	31.75" W x 41.5" L x 31.75" H
Sold as:	1 per package
Color:	Yellow
Composition:	Polyethylene
# per Pallet:	3
Incinerable:	No
Ship Class:	250

Metric Equivalent Specifications

Dimensions:	ext. dia. 81.3cm x 105.4cm H
Shipping Dimensions:	80.6cm W x 105.4cm L x 80.6cm H
Dimensions:	





A95OVER Technical Information

Warnings & Restrictions:

There are no known warnings and restrictions for this product.

Regulations and Compliance:

49 CFR 173.3(c)(1) - If a container of hazardous waste is damaged or leaking, it can be placed in a compatible salvage drum that meets UN criteria for shipping

49 CFR 173.12(b)(2)(iv) - When labpacking, "Inner packagings...must be surrounded by a chemically compatible absorbent material in sufficient quantity to absorb the total liquid contents."

49 CFR 173.12(b) - A container used for labpacking must be "a UN 1A2 or UN 1B2 metal drum, a UN 1D plywood drum, a UN 1G fiber drum or a UN 1H2 plastic drum tested and marked at least for the Packing Group III performance level for liquids or solids."



SECTION 1: IDENTIFICATION

Product Identifier

Product Name: Sulfuric Acid, 70-100%

Formula: H₂SO₄

Intended Use of the Product

Use of the Substance/Mixture: Industrial use.

Name, Address, and Telephone of the Responsible Party

Manufacturer

CHEMTRADE LOGISTICS INC.

155 Gordon Baker Road

Suite 300

Toronto, Ontario M2H 3N5

For SDS Info: (416) 496-5856

www.chemtradelogistics.com

Emergency Telephone Number

Emergency Number : Canada: CANUTEC +1-613-996-6666 / US: CHEMTREC +1-800-424-9300

Chemtrade Emergency Contact: (866) 416-4404

For Chemical Emergency, Spill, Leak, Fire, Exposure, or Accident, call CHEMTREC – Day or Night

SECTION 2: HAZARDS IDENTIFICATION

Classification of the Substance or Mixture

GHS-US classification

Skin Corr. 1A H314

Eye Dam. 1 H318

Aquatic Acute 3 H402

Full text of H-phrases: see section 16

Label Elements

GHS-US Labeling

Hazard Pictograms (GHS-US) :



Signal Word (GHS-US) : Danger

Hazard Statements (GHS-US) : H314 - Causes severe skin burns and eye damage

H402 - Harmful to aquatic life

Precautionary Statements (GHS-US) : P260 - Do not breathe fume, mist, vapors, spray.

P264 - Wash hands and forearms thoroughly after handling.

P273 - Avoid release to the environment.

P280 - Wear eye protection, face protection, protective gloves, protective clothing.

P301+P330+P331 - If swallowed: rinse mouth. Do NOT induce vomiting.

P303+P361+P353 - If on skin (or hair): Take off immediately all contaminated clothing.

Rinse skin with water/shower.

P304+P340 - If inhaled: Remove person to fresh air and keep at rest in a position comfortable for breathing.

P305+P351+P338 - If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

P310 - Immediately call a poison center or doctor.

P321 - Specific treatment (see section 4 on this SDS).

P363 - Wash contaminated clothing before reuse.

P405 - Store locked up.

P501 - Dispose of contents/container in accordance with local, regional, national, and

Sulfuric Acid, 70-100%

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international regulations.

Other Hazards

Other Hazards Not Contributing to the Classification: Not available

Unknown Acute Toxicity (GHS-US) Not available

SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

Name	Product identifier	% (w/w)	GHS-US classification
Sulfuric acid	(CAS No) 7664-93-9	70 - 100	Skin Corr. 1A, H314 Aquatic Acute 3, H402

Full text of H-phrases: see section 16

SECTION 4: FIRST AID MEASURES

Description of First Aid Measures

General: IF exposed or concerned: Get medical advice/attention. If you feel unwell, seek medical advice (show the label where possible).

Inhalation: Using proper respiratory protection, immediately move the exposed person to fresh air. . Keep at rest and in a position comfortable for breathing. Give oxygen or artificial respiration if necessary. Seek immediate medical advice. Symptoms may be delayed.

Skin Contact: Remove/Take off immediately all contaminated clothing. Rinse immediately with plenty of water (for at least 15 minutes). Seek medical attention immediately if exposure is severe. Obtain medical attention if irritation develops or persists. Wash contaminated clothing before reuse.

Eye Contact: Immediately rinse with water for a prolonged period (at least 15 minutes) while holding the eyelids wide open. Seek medical attention immediately if exposure is severe. Obtain medical attention if irritation develops or persists.

Ingestion: If swallowed, do not induce vomiting; seek medical advice immediately and show this container or label.

Most Important Symptoms and Effects Both Acute and Delayed

General: Corrosive. Causes burns.

Inhalation: Causes severe respiratory irritation if inhaled. Symptoms may include burning of nose and throat, constriction of airway, difficulty breathing, shortness of breath, bronchial spasms, chest pain, and pink frothy sputum.

Skin Contact: Contact may cause immediate severe irritation progressing quickly to chemical burns.

Eye Contact: Contact may cause immediate severe irritation progressing quickly to chemical burns. Can cause blindness.

Ingestion: May cause burns or irritation of the linings of the mouth, throat, and gastrointestinal tract. Swallowing a small quantity of this material will result in serious health hazard.

Chronic Symptoms: Repeated or prolonged inhalation may damage lungs. Prolonged and repeated contact will eventually cause permanent tissue damage.

Indication of Any Immediate Medical Attention and Special Treatment Needed

If medical advice is needed, have product container or label at hand.

SECTION 5: FIRE-FIGHTING MEASURES

Extinguishing Media

Suitable Extinguishing Media: Use extinguishing media appropriate for surrounding fire.

Unsuitable Extinguishing Media: Do not get water inside containers. Do not apply water stream directly at source of leak. Do not use a heavy water stream. A direct water stream will cause violent splattering and generation of heat.

Special Hazards Arising From the Substance or Mixture

Fire Hazard: Not flammable. Under conditions of fire this material may produce: Sulphur oxides.

Explosion Hazard: Product is not explosive.

Reactivity: Reacts with water.

Advice for Firefighters

Precautionary Measures Fire: Not available

Firefighting Instructions: Keep upwind. Use water spray or fog for cooling exposed containers.

Protection During Firefighting: Firefighters must use full bunker gear including NIOSH-approved positive-pressure self-contained breathing apparatus to protect against potential hazardous combustion and decomposition products.

Hazardous Combustion Products: Sulphur oxides.

Other Information: Do not allow run-off from fire fighting to enter drains or water courses.

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Reference to Other Sections

Refer to section 9 for flammability properties.

SECTION 6: ACCIDENTAL RELEASE MEASURES

Personal Precautions, Protective Equipment and Emergency Procedures

General Measures: Do not breathe vapour or mist.

For Non-Emergency Personnel

Protective Equipment: Use recommended respiratory protection. Wear suitable protective clothing, gloves and eye/face protection.

Emergency Procedures: Stop leak if safe to do so. Eliminate ignition sources. Evacuate unnecessary personnel. Ventilate area. Keep upwind.

For Emergency Personnel

Protective Equipment: Use recommended respiratory protection. Wear suitable protective clothing, gloves and eye/face protection.

Emergency Procedures: Stop leak if safe to do so. Eliminate ignition sources. Evacuate unnecessary personnel. Ventilate area.

Environmental Precautions

If spill could potentially enter any waterway, including intermittent dry creeks, contact the U.S. COAST GUARD NATIONAL RESPONSE CENTER at 800-424-8802. In case of accident or road spill notify CHEMTREC at 800-424-9300 (in USA) or CANUTEC at 613-996-6666 (in Canada). In other countries call CHEMTREC at (International code) +1-703-527-3887.

Methods and Material for Containment and Cleaning Up

For Containment: Contain any spills with dikes or absorbents to prevent migration and entry into sewers or streams.

Methods for Cleaning Up: Ventilate area. Small quantities of liquid spill: take up in non-combustible absorbent material and shovel into container for disposal. Collect absorbed material and place into a sealed, labelled container for proper disposal. Practice good housekeeping - spillage can be slippery on smooth surface either wet or dry. Liquid spill: neutralize with powdered limestone or sodium bicarbonate.

Reference to Other Sections

SECTION 7: HANDLING AND STORAGE

Precautions for Safe Handling

Hygiene Measures: Handle in accordance with good industrial hygiene and safety procedures. Emergency eye wash fountains and safety showers should be available in the immediate vicinity of any potential exposure. Wash contaminated clothing before reuse.

Conditions for Safe Storage, Including Any Incompatibilities

Storage Conditions: Detached outside storage is preferable.

Incompatible Materials: Reducing agents. Organic materials. Alkalis. Moisture.

Storage Area: Store in dry, cool area. Store in a well-ventilated place. Keep away from combustible materials.

Specific End Use(s)

Industrial use.

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

Control Parameters

For substances listed in section 3 that are not listed here, there are no established Exposure limits from the manufacturer, supplier, importer, or the appropriate advisory agency including: ACGIH (TLV), AIHA (WEEL), NIOSH (REL), OSHA (PEL), Canadian provincial governments, or the Mexican government.

Sulfuric acid (7664-93-9)		
Mexico	OEL TWA (mg/m ³)	1 mg/m ³
USA ACGIH	ACGIH TWA (mg/m ³)	0.2 mg/m ³ (thoracic fraction)
USA ACGIH	ACGIH chemical category	Suspected Human Carcinogen contained in strong inorganic acid mists
USA OSHA	OSHA PEL (TWA) (mg/m ³)	1 mg/m ³
USA NIOSH	NIOSH REL (TWA) (mg/m ³)	1 mg/m ³
USA IDLH	US IDLH (mg/m ³)	15 mg/m ³
Alberta	OEL STEL (mg/m ³)	3 mg/m ³
Alberta	OEL TWA (mg/m ³)	1 mg/m ³
British Columbia	OEL TWA (mg/m ³)	0.2 mg/m ³ (Thoracic, contained in strong inorganic acid mists)
Manitoba	OEL TWA (mg/m ³)	0.2 mg/m ³ (thoracic fraction)

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New Brunswick	OEL STEL (mg/m ³)	3 mg/m ³
New Brunswick	OEL TWA (mg/m ³)	1 mg/m ³
Newfoundland & Labrador	OEL TWA (mg/m ³)	0.2 mg/m ³ (thoracic fraction)
Nova Scotia	OEL TWA (mg/m ³)	0.2 mg/m ³ (thoracic fraction)
Nunavut	OEL STEL (mg/m ³)	3 mg/m ³
Nunavut	OEL TWA (mg/m ³)	1 mg/m ³
Northwest Territories	OEL STEL (mg/m ³)	0.6 mg/m ³ (thoracic fraction)
Northwest Territories	OEL TWA (mg/m ³)	0.2 mg/m ³ (thoracic fraction)
Ontario	OEL TWA (mg/m ³)	0.2 mg/m ³ (thoracic)
Prince Edward Island	OEL TWA (mg/m ³)	0.2 mg/m ³ (thoracic fraction)
Québec	VECD (mg/m ³)	3 mg/m ³
Québec	VEMP (mg/m ³)	1 mg/m ³
Saskatchewan	OEL STEL (mg/m ³)	0.6 mg/m ³ (thoracic fraction)
Saskatchewan	OEL TWA (mg/m ³)	0.2 mg/m ³ (thoracic fraction)
Yukon	OEL STEL (mg/m ³)	1 mg/m ³
Yukon	OEL TWA (mg/m ³)	1 mg/m ³

Exposure Controls

Appropriate Engineering Controls: Ensure adequate ventilation, especially in confined areas.

Personal Protective Equipment: Face shield. Gas mask at concentration in the air >> TLV. Corrosionproof clothing.

Materials for Protective Clothing: Acid-resistant clothing.

Hand Protection: Impermeable protective gloves.

Eye Protection: Face shield.

Skin and Body Protection: Wear suitable protective clothing. Chemical resistant suit. Rubber apron, boots.

Respiratory Protection: Use a NIOSH-approved respirator or self-contained breathing apparatus whenever exposure may exceed established Occupational Exposure Limits.

Environmental Exposure Controls: Emergency eye wash fountains and safety showers should be available in the immediate vicinity of any potential exposure.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

Information on Basic Physical and Chemical Properties

Physical State	: Liquid
Appearance	: Clear, Colorless to Amber, Oily
Odor	: Pungent.
Odor Threshold	: Not available
pH	: 0.3
Melting Point	: 10.56°C (51.08°F)
Freezing Point	: -11.2°C (-11.6°F) @ 77.67%; -29.5°C (-21.1°F) @ 93.19%; -1.0°C (30.0°F) @ 98.0%
Boiling Point	: 290 °C (554°F)
Flash Point	: Not available
Auto-ignition Temperature	: Not available
Decomposition Temperature	: Not available
Flammability (solid, gas)	: Not available
Lower Flammable Limit	: Not available
Upper Flammable Limit	: Not available
Vapor Pressure	: 0.00027 - 0.16 kPa at 25 °C (77 °F)
Relative Vapor Density at 20 °C	: 3.4
Relative Density	: Not available
Specific Gravity	: 1.84 g/l
Solubility	: Water: Miscible
Partition Coefficient: N-Octanol/Water	: Not available

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Viscosity	: Not available
Explosion Data – Sensitivity to Mechanical Impact	: Not expected to present an explosion hazard due to mechanical impact.
Explosion Data – Sensitivity to Static Discharge	: Not expected to present an explosion hazard due to static discharge.

SECTION 10: STABILITY AND REACTIVITY

Reactivity:	Reacts with water.
Chemical Stability:	Stable at standard temperature and pressure.
Possibility of Hazardous Reactions:	Hazardous polymerization can occur in contact with certain incompatible materials.
Conditions to Avoid:	Protect from moisture.
Incompatible Materials:	Avoid contact with most metals, carbides, hydrogen sulfide, turpentine, organic acids, combustibles (wood, paper, cotton) and other organic and readily oxidized materials.
Hazardous Decomposition Products:	Under conditions of fire this material may produce: Sulphur oxides.

SECTION 11: TOXICOLOGICAL INFORMATION

Information on Toxicological Effects - Product

Acute Toxicity:	Not classified
LD50 and LC50 Data:	Not available
Skin Corrosion/Irritation:	Causes severe skin burns and eye damage.
pH:	0.3
Serious Eye Damage/Irritation:	Causes serious eye damage.
pH:	0.3
Respiratory or Skin Sensitization:	Not classified
Germ Cell Mutagenicity:	Not classified
Teratogenicity:	Not available
Carcinogenicity:	Not classified
Specific Target Organ Toxicity (Repeated Exposure):	Not classified
Reproductive Toxicity:	Not classified
Specific Target Organ Toxicity (Single Exposure):	Not classified
Aspiration Hazard:	Not classified
Symptoms/Injuries After Inhalation:	Causes severe respiratory irritation if inhaled. Symptoms may include burning of nose and throat, constriction of airway, difficulty breathing, shortness of breath, bronchial spasms, chest pain, and pink frothy sputum.
Symptoms/Injuries After Skin Contact:	Contact may cause immediate severe irritation progressing quickly to chemical burns.
Symptoms/Injuries After Eye Contact:	Contact may cause immediate severe irritation progressing quickly to chemical burns. Can cause blindness.
Symptoms/Injuries After Ingestion:	May cause burns or irritation of the linings of the mouth, throat, and gastrointestinal tract. Swallowing a small quantity of this material will result in serious health hazard.
Chronic Symptoms:	Repeated or prolonged inhalation may damage lungs. Prolonged and repeated contact will eventually cause permanent tissue damage.

Information on Toxicological Effects - Ingredient(s)

LD50 and LC50 Data:

Sulfuric acid (7664-93-9)	
LD50 Oral Rat	2140 mg/kg
LC50 Inhalation Rat (mg/l)	510 mg/m ³ (Exposure time: 2 h)
ATE US (dust, mist)	0.347 mg/l/4h
Sulfuric acid (7664-93-9)	
IARC Group	1
OSHA Hazard Communication Carcinogen List	In OSHA Hazard Communication Carcinogen list.

SECTION 12: ECOLOGICAL INFORMATION

Toxicity Not classified

Sulfuric acid (7664-93-9)	
LC50 Fish 1	500 mg/l (Exposure time: 96 h - Species: Brachydanio rerio [static])

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LC 50 Fish 2	42 mg/l (Exposure time: 96 h - Species: Gambusia affinis [static])
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Persistence and Degradability

Sulfuric Acid, 70-100%	
Persistence and Degradability	Product is biodegradable.

Bioaccumulative Potential

Sulfuric Acid, 70-100%	
Bioaccumulative Potential	Not expected to bioaccumulate.
Sulfuric acid (7664-93-9)	
BCF Fish 1	(no bioaccumulation)

Mobility in Soil Not available

Other Adverse Effects Not available

SECTION 13: DISPOSAL CONSIDERATIONS

Sewage Disposal Recommendations: This material is hazardous to the aquatic environment. Keep out of sewers and waterways.

Waste Disposal Recommendations: Dispose of waste material in accordance with all local, regional, national, and international regulations.

SECTION 14: TRANSPORT INFORMATION

14.1 In Accordance with DOT

Proper Shipping Name : SULFURIC ACID, WITH MORE THAN 51 PERCENT ACID
Hazard Class : 8
Identification Number : UN1830
Label Codes : 8
Packing Group : II
ERG Number : 137



14.2 In Accordance with IMDG

Proper Shipping Name : SULPHURIC ACID, WITH MORE THAN 51 PERCENT ACID
Hazard Class : 8
Identification Number : UN1830
Packing Group : II
Label Codes : 8
EmS-No. (Fire) : F-A
EmS-No. (Spillage) : S-B



14.3 In Accordance with IATA

Proper Shipping Name : SULPHURIC ACID, WITH MORE THAN 51 PERCENT ACID
Packing Group : II
Identification Number : UN1830
Hazard Class : 8
Label Codes : 8
ERG Code (IATA) : 8L



14.4 In Accordance with TDG

Proper Shipping Name : SULPHURIC ACID, WITH MORE THAN 51 PER CENT ACID
Packing Group : II
Hazard Class : 8
Identification Number : UN1830
Label Codes : 8



SECTION 15: REGULATORY INFORMATION

US Federal Regulations

Sulfuric Acid, 70-100%	
SARA Section 311/312 Hazard Classes	Immediate (acute) health hazard

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	Delayed (chronic) health hazard Reactive hazard
Sulfuric acid (7664-93-9)	
Listed on the United States TSCA (Toxic Substances Control Act) inventory Listed on the United States SARA Section 302 Subject to reporting requirements of United States SARA Section 313	
SARA Section 302 Threshold Planning Quantity (TPQ)	1000
SARA Section 311/312 Hazard Classes	Immediate (acute) health hazard Delayed (chronic) health hazard
SARA Section 313 - Emission Reporting	1.0 % (acid aerosols including mists, vapors, gas, fog, and other airborne forms of any particle size)

US State Regulations

Sulfuric Acid, 70-100%	
Sulfuric acid (7664-93-9)	
U.S. - California - Proposition 65 - Carcinogens List	WARNING: This product contains chemicals known to the State of California to cause cancer.
Sulfuric acid (7664-93-9)	
U.S. - Massachusetts - Right To Know List U.S. - New Jersey - Right to Know Hazardous Substance List U.S. - Pennsylvania - RTK (Right to Know) - Environmental Hazard List U.S. - Pennsylvania - RTK (Right to Know) List	

Canadian Regulations

Sulfuric Acid, 70-100%	
WHMIS Classification	Class E - Corrosive Material
	
Sulfuric acid (7664-93-9)	
Listed on the Canadian DSL (Domestic Substances List) Listed on the Canadian IDL (Ingredient Disclosure List)	
IDL Concentration 1 %	
WHMIS Classification	Class D Division 2 Subdivision A - Very toxic material causing other toxic effects Class E - Corrosive Material Class D Division 2 Subdivision B - Toxic material causing other toxic effects

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations (CPR) and the SDS contains all of the information required by CPR.

SECTION 16: OTHER INFORMATION, INCLUDING DATE OF PREPARATION OR LAST REVISION

Revision Date	: 05/31/16
Revision Summary	: Section 9, add Freezing Points
Other Information	: This document has been prepared in accordance with the SDS requirements of the OSHA Hazard Communication Standard 29 CFR 1910.1200.

GHS Full Text Phrases:

Aquatic Acute 3	Hazardous to the aquatic environment - Acute Hazard Category 3
Eye Dam. 1	Serious eye damage/eye irritation Category 1
Skin Corr. 1A	Skin corrosion/irritation Category 1A
H290	May be corrosive to metals
H314	Causes severe skin burns and eye damage

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H318	Causes serious eye damage
H402	Harmful to aquatic life

Party Responsible for the Preparation of This Document

CHEMTRADE LOGISTICS, INC.

For SDS Info: (416) 496-5856

Handle product with due care and avoid unnecessary contact. This information is supplied under U.S. OSHA'S "Right to Know" (29 CFR 1910.1200) and Canada's WHMIS regulations. Although certain hazards are described herein, we cannot guarantee these are the only hazards that exist. The information contained herein is based on data available to us and is believed to be true and accurate but it is not offered as a product specification. No warranty, expressed or implied, regarding the accuracy of this data, the hazards connected with the use of the product, or the results to be obtained from the use thereof, is made and Chemtrade and its affiliates assume no responsibility. Chemtrade is a member of the CIAC (Chemistry Industry Association of Canada) and adheres to the codes and principles of Responsible Care™.



Chemtrade NA GHS SDS



The Pulsatron Series HV designed for high viscosity applications for precise and accurate metering control. The Series HV offers manual control over stroke length and stroke rate as standard with the option to choose between 4-20mA and external pace inputs for automatic control.

Five distinct models are available, having pressure capabilities to 150 PSIG (10 BAR) @ 12 GPD (1.9 lph), and flow capacities to 240 GPD (37.9 lph) @ 80 PSIG (5.6 BAR), with a turndown ratio of 100:1. Metering performance is reproducible to within $\pm 2\%$ of maximum capacity.

Features

- Automatic Control, available with 4-20mADC direct or external pacing, with stop function.
- Manual Control by on-line adjustable stroke rate and stroke length.
- Auto-Off-Manual switch.
- Highly Reliable timing circuit.
- Circuit Protection against voltage and current upsets.
- Panel Mounted Fuse.
- Solenoid Protection by thermal overload with auto-reset.
- Water Resistant, for outdoor and indoor applications.
- Indicator Lights, panel mounted.
- Guided Ball Check Valve Systems, to reduce back flow and enhance outstanding priming characteristics.
- Viscosities to 20,000 CPS.

Controls



Manual Stroke Rate

- Turn-Down Ratio 10:1

Manual Stroke Length

- Turn-Down Ratio 10:1

4-20mA or 20-4mA Input

- Automatic Control

Operating Benefits

- Reliable metering performance.
- Rated "hot" for continuous duty.
- High viscosity capability.
- Leak-free, sealless, liquid end.



Aftermarket

- KOPkits
- Gauges
- Dampeners
- Pressure Relief Valves
- Tanks
- Pre-Engineered Systems
- Process Controllers (PULSAbLue, MicroVision)



Series HV

Specifications and Model Selection

MODEL		LVB3	LVF4	LVG4	LVG5	LVH7
Capacity nominal (max.)	GPH	0.50	1.00	2.00	4.00	10.00
	GPD	12	24	48	96	240
Pressure (max.)	LPH	1.9	3.8	7.6	15.1	37.9
	PSIG	150	150	110	110	80
Connections:	BAR	10	10	7	7	5.6
	Tubing	(S) .50" I.D. X .75" O.D. .38" I.D. X .50" OD (LVB3 & F4 only) (S & D) .50" I.D. X .75" O.D. (LVG4,G5 & H7 only)				



Engineering Data

Pump Head Materials Available:	GFPPL PVC PVDF 316 SS
Diaphragm:	PTFE-faced CSPE-backed
Check Valves Materials Available:	
Seats/O-Rings:	PTFE CSPE Viton
Balls:	Ceramic PTFE 316 SS Alloy C
Fittings Materials Available:	GFPPL PVC PVDF
Bleed Valve:	Same as fitting and check valve selected, except 316SS
Injection Valve & Foot Valve Assy:	Same as fitting and check valve selected
Tubing:	Clear PVC White PE

Important: Material Code - GFPPL=Glass-filled Polypropylene, PVC=Polyvinyl Chloride, PE=Polyethylene, PVDF=Polyvinylidene Fluoride, CSPE=Generic formulation of Hypalon, a registered trademark of E.I. DuPont Company. Viton is a registered trademark of E.I. DuPont Company. PVC wetted end recommended for sodium hypochlorite.

Engineering Data

Reproducibility:	+/- 2% at maximum capacity
Viscosity Max CPS:	20,000 CPS
Stroke Frequency Max SPM:	125
Stroke Frequency Turn-Down Ratio:	10:1
Stroke Length Turn-Down Ratio:	10:1
Power Input:	115 VAC/50-60 HZ/1 ph 230 VAC/50-60 HZ/1 ph
Average Current Draw:	
@ 115 VAC; Amps:	1.0 Amps
@ 230 VAC; Amps:	0.5 Amps @ 230 VAC
Peak Input Power:	300 Watts
Average Input Power @ Max SPM:	130 Watts

Custom Engineered Designs – Pre-Engineered Systems



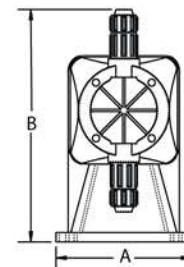
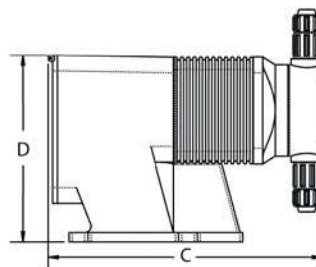
Pre-Engineered Systems

Pulsafeeder's Pre-Engineered Systems are designed to provide complete chemical feed solutions for all electronic metering applications. From stand alone simplex pH control applications to full-featured, redundant sodium hypochlorite disinfection metering, these rugged fabricated assemblies offer turn-key simplicity and industrial-grade durability. The UV-stabilized, high-grade HDPE frame offers maximum chemical compatibility and structural rigidity. Each system is factory assembled and hydrostatically tested prior to shipment.

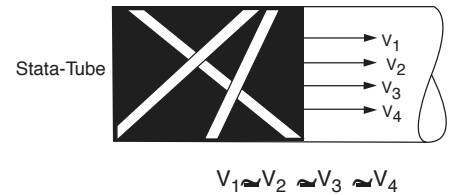
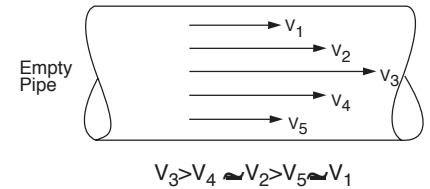
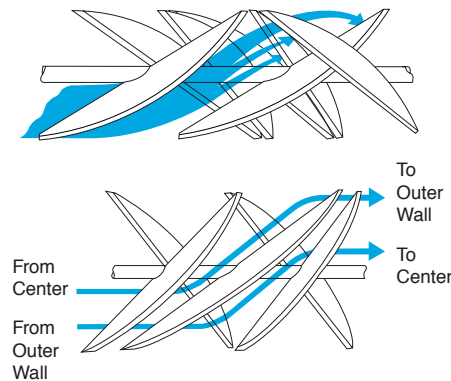
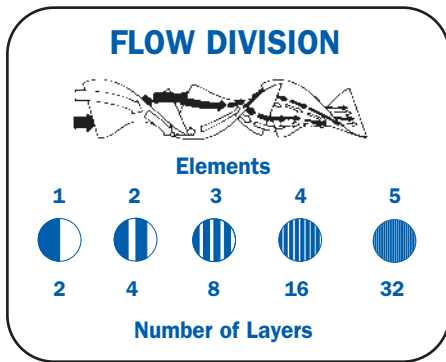
Dimensions

Series HV Dimensions (inches)					
Model No.	A	B	C	D	Shipping Weight
LVB3	5.4	9.3	9.5	7.5	13
LVF4	5.4	10.8	10.8	7.5	18
LVG4	5.4	9.5	10.6	7.5	18
LVG5	5.4	10.8	10.8	7.5	18
LVH7	6.1	11.5	11	8.2	25

NOTE: Inches X 2.54 = cm



Principles of Operation



$$\text{Blending} = f \left\{ \text{Re}, \mu, \frac{\mu_1}{\mu_2}, \frac{\rho_1}{\rho_2}, \frac{V_1}{V_2}, v, n, \frac{L}{D}, \text{Inj} \right\}$$

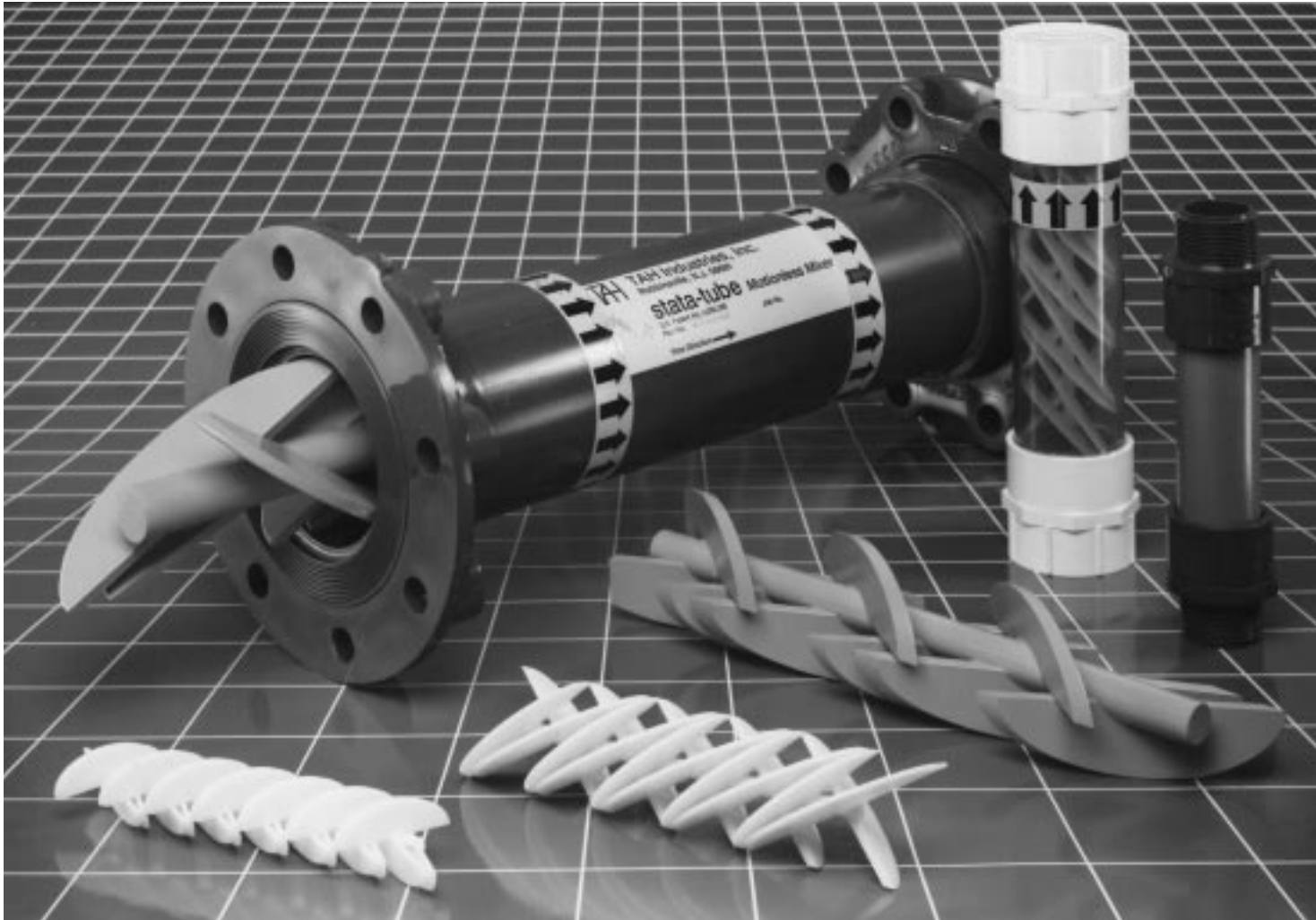
- Where Re = Reynolds Number
 μ = Absolute viscosity
 μ_1/μ_2 = Viscosity ration of unmixed streams
 ρ_1/ρ_2 = Density ration of unmixed streams
 V_1/V_2 = Volumetric ratio of unmixed streams
 v = Shear rate
 n = Number of elements
 L/D = Element length to diameter ratio
 Inj = Injection method of additive stream

Reynolds No	Spiral Mixer No Elements	Flow Characteristics
<10	18	Laminar (creeping flow)
10 to 100	12	Laminar through Transitional
100 to 1000	6	Transitional
1000 to 5000	4	Turbulent
>5000	2	Turbulent

TAH

50 SERIES

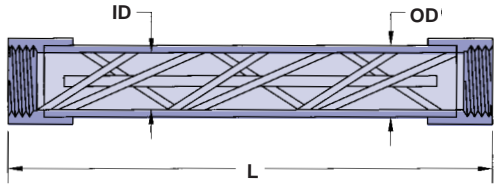
Stata-tube™ PVC Mixer



*The Series 50 Stata-tube™ is an effective answer to your mixing requirements. Operating in-line, with **no moving parts**, this mixer blends and disperses treatment chemicals into waste water streams. Compared to competitive mixers, its unique baffling design ensures complete mixing in a shorter length and lower pressure drop.*

The Series 50 are easily installed in new or existing process lines. They are available in pipe sizes from 3/8" to 18" diameter. Construction materials include PVC, CPVC and Polypropylene.

PIPE MIXERS 3/8" through 2"



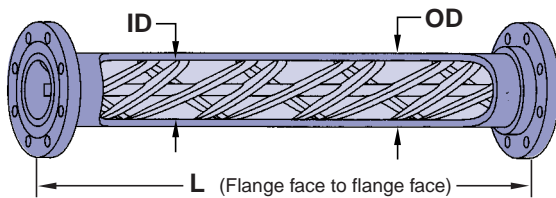
Elements: Polypropylene, Non Removable

Housing: PVC Type 1 (white or gray)

Clear PVC Housing is available, contact factory.
CPVC also Available.

PART NUMBER	NUMBER OF STAGES	ID INCH	OD INCH	END FNPT INCH	L INCH	PRESSURE LIMITATION psi @ 75°F	PIPE SCHEDULE
050-031F	7	0.43	0.675	3/8	5.7	850	80
050-032F	14	0.43	0.675	3/8	7.0	850	
050-061	7	0.69	1.050	3/4	7.0	690	80
050-062	14	0.69	1.050	3/4	10.5	690	
050-081	7	0.91	1.315	1	8.2	630	80
050-082	14	0.91	1.315	1	12.6	630	
050-121	7	1.38	1.660	1 1/4	10.3	370	40
050-122	14	1.38	1.660	1 1/4	17.5	370	
050-161	5	2.05	2.375	2	11.3	280	40
050-162	10	2.05	2.375	2	19.3	280	

PROCESS MIXERS 3" through 12"



Elements: PVC or CPVC Type 1, Removable

Housing: PVC, Type 1

Flanges: FFSO, Van Stone ASA #150 Drilling

Side Ports: Available upon request

Consult factory for Process Mixers greater than 12"

PART NUMBER	STATIC MIXER		HOUSING				
	Number of Stages	Material	Pipe	ID Inch	L Inch	Weight lbs.	Material
T-3-G57-H31	3	CPVC	3" Sch 80	2.90	17	9	PVC
T-3-G57-H61	6	CPVC	3" Sch 80	2.90	30	16	PVC
T-3-H57-H31	3	CPVC	3" Sch 80	2.90	17	9	CPVC
T-3-H57-H61	6	CPVC	3" Sch 80	2.90	30	16	CPVC
T-4-G57-H31	3	CPVC	4" Sch 80	3.83	20	16	PVC
T-4-G57-H61	6	CPVC	4" Sch 80	3.83	35	22	PVC
T-4-H57-H31	3	CPVC	4" Sch 80	3.83	20	16	CPVC
T-4-H57-H61	6	CPVC	4" Sch 80	3.83	35	22	CPVC
T-6-G57-H31	3	CPVC	6" Sch 80	5.76	28	33	PVC
T-6-G57-H61	6	CPVC	6" Sch 80	5.76	51	50	PVC
T-6-H57-H31	3	CPVC	6" Sch 80	5.76	28	33	CPVC
T-6-H57-H61	6	CPVC	6" Sch 80	5.76	51	50	CPVC
T-8-G57-G31	3	PVC	8" Sch 80	7.63	33	55	PVC
T-8-G57-G61	6	PVC	8" Sch 80	7.63	59	90	PVC
T-10-G57-G31	3	PVC	10" Sch 80	9.56	40	88	PVC
T-10-G57-G61	6	PVC	10" Sch 80	9.56	72	130	PVC
T-12-G57-G31	3	PVC	12" Sch 80	11.38	50	140	PVC
T-12-G57-G61	6	PVC	12" Sch 80	11.38	88.5	200	PVC

TAH Industries, Inc.
8 Applegate Drive
Robbinsville, NJ 08691
USA
Toll Free: 800-257-5238
Tel: 609-259-9222
Fax: 609-259-0957
Website: www.tah.com

TAH Europe, Inc.
2 Francis Court
Wellingborough Road
Rushden, Northamptonshire NN10 6AY
Great Britain
Tel: 44 (0) 1933 413233
Fax: 44 (0) 1933 413194
Website: www.tah.com

Distributed By:



Material Safety Data Sheet

Product Name: LRT E50
MSDS #: 40

Effective date: 3/15/2004
Page 1 of 5

Section 1 – Chemical Product and Company Information

PRODUCT NAME: LRT E50
SYNONYMS: Water And Wastewater Treatment Coagulant/Flocculant
DISTRIBUTOR: Lockwood Remediation Technologies, LLC
89 Crawford Street, Leominster, Massachusetts 01453
Tel: 774-450-7177
Fax: 885-835-0617

NFPA Rating

HEALTH: 1
FLAMMABILITY: 0
REACTIVITY: 0

HMS Rating

HEALTH: 1
FLAMMABILITY: 0
REACTIVITY: 0

EMERGENCY TELEPHONE NUMBER: CHEMTREC 1-800-424-9300

EMERGENCY OVERVIEW

Clear to slightly hazy, colorless to yellow liquid with no appreciable odor. May cause skin, eye and respiratory irritation.

Section 2 - Composition Information

<u>INGREDIENTS</u>	<u>CAS NO.</u>	<u>% WT/WT</u>	<u>PEL</u>	<u>TLV</u>
Trade Secret Ingredients	Trade Secret	100	*15 mg/m ³ (TD) *5 mg/m ³ (RF)	SOLUBLE SALTS: *2 mg/m ³ (TWA)

*Aluminum metal, (as Al) LISTED AS CARCINOGEN BY:

IARC: NO
OSHA: NO
NTP: NO
ACGIH: NO

PEL: OSHA Permissible Exposure Limit	TWA: Time Weighted Average, 8-hr	TD: Total dust
STEL: Short Term Exposure Limit	TLV: ACGIH Threshold Limit	ND: Nuisance dust
HI: Hazardous Ingredient	C.LIM: Ceiling Limit	INP: Inhalable Particulate
OM: Oil mist	WF: Wax fume	RF: Respirable fraction
ST: Skin TWA		

Material Safety Data Sheet

Product Name: LRT E50
MSDS #: 40

Effective date: 3/15/2004
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Section 3 - Hazards Identification

ROUTES OF EXPOSURE

INHALATION: Inhalation of mist or spray may irritate respiratory tract.
SKIN CONTACT: May cause skin irritation, especially on prolonged contact.
SKIN ABSORPTION: No Data
EYE CONTACT: Direct eye contact may cause irritation, redness, and swelling. Prolonged exposure to Aluminum salts may cause conjunctivitis.
INGESTION: May cause gastrointestinal irritation, nausea, vomiting and diarrhea.

EFFECTS OF OVEREXPOSURE

ACUTE OVEREXPOSURE: Possible eye, skin and respiratory tract irritation.
CHRONIC OVEREXPOSURE: May aggravate existing skin, eye, and lung conditions. Persons with kidney disorders have an increased risk from exposure based on general information found on aluminum salts.

Section 4 - First Aid Measures

EYES: Immediately flush with plenty of water for at least 15 minutes, holding eyelids apart to ensure flushing of the entire surface. Washing within one minute is essential to achieve maximum effectiveness. Seek medical attention.
SKIN: Wash thoroughly with soap and water, remove contaminated clothing and footwear. Wash clothing before reuse. Get medical attention if irritation should develop.
INHALATION: Remove to fresh air.
INGESTION: Seek medical attention immediately. Give large amounts of water to drink. If vomiting should occur spontaneously, keep airway clear. Never give anything by mouth to an unconscious person.
NOTES TO PHYSICIAN: Aluminum soluble salts may cause gastroenteritis if ingested. Treatment includes the use of demulcents. Note: Consideration should be given to the possibility that overexposure to materials other than this product may have occurred.

Section 5 - Fire Fighting Measures

FLASHPOINT: NAPL
AUTOIGNITION TEMPERATURE: NAPL
EXTINGUISHING MEDIA: Water Spray, Carbon Dioxide, Foam, Dry Chemical.

FLAMMABLE LIMITS IN AIR, % BY VOLUME:
LOWER FLAMMABILITY LIMIT: NAPL
UPPER FLAMMABILITY LIMIT: NAPL

FIRE OR EXPLOSION HAZARDS: May produce hazardous fumes or hazardous decomposition products.
FIRE FIGHTING PROCEDURES: Product is a water solution and nonflammable. In a fire, this product may build up pressure and rupture a sealed container; cool exposed containers with water spray. Use self-contained breathing apparatus in confined areas; avoid breathing vapors or dust.

Material Safety Data Sheet

Product Name: LRT E50
MSDS #: 40

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Section 6 - Accidental Release Measures

Stop leaks. Clean up spill immediately. Build dikes as necessary to contain flow of large spills. Do not allow liquid to enter stream or waterways. For small spills, use soda ash or lime to neutralize, an inert material to absorb, or wash product to a chemical sewer. Place contaminated materials into containers and store in a safe place to await proper disposal. Wear adequate personal protective clothing and equipment. Caution use of soda ash or lime may generate carbon dioxide gas. Provide adequate ventilation to spill area. Approved breathing apparatus may be necessary.

Section 7 - Handling and Storage

PRECAUTIONARY STATEMENTS:

CAUTION!

MAY CAUSE IRRITATION.

Avoid contact with eyes, skin, and clothing.

Avoid breathing mist or spray.

Wear chemical splash goggles, gloves, and protective clothing when handling.

Use with adequate ventilation and employ respiratory protection where mist or spray may be generated.

Wash thoroughly after handling.

May be harmful if swallowed or inhaled.

Keep away from heat and open flame.

Keep container closed when not in use.

FOR INDUSTRIAL USE ONLY.

HANDLING/STORAGE REQUIREMENTS:

Store in a cool, dry place away from direct heat. Keep container tightly closed when not in use. Do not store in unlined metal containers. Product may slowly corrode iron, brass, copper, aluminum and mild steel.

Section 8 - Exposure Controls/Personal Protection

VENTILATION REQUIREMENTS: Local exhaust ventilation recommended.

EYE PROTECTION: Chemical splash goggles and/or face shield.

SKIN PROTECTION: Chemical resistant gloves.

RESPIRATORY PROTECTION: When exposures exceed the PEL, use NIOSH/MSHA approved respirator in accordance with OSHA Respiratory Protection Requirements under 29 CFR 1910.134.

OTHER REQUIRED EQUIPMENT: Standard work clothing and work shoes. Safety shower and eye wash located in immediate area.

Material Safety Data Sheet

Product Name: LRT E50
MSDS #: 40

Effective date: 3/15/2004
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Section 12 - Ecological Information

BOD5:	mg O2/mg:	NAV
	ppm:	NAV
	Biodegradable, %:	NAV
BOD28:	mg O2/mg:	NAV
	ppm:	NAV
	Biodegradable, %:	NAV
COD:	mg O2/mg:	NAV
	ppm:	NAV
	Biodegradable, %:	NAV

Aquatic Toxicity:

LC 50 (24 hour, static)	50 mg/L	Ceriodaphnia dubia (1)
LC 50 (48 hour, static)	5 mg/L	Ceriodaphnia dubia (1)

LC 50: Lethal concentration at which 50% of the subjects die

Generated from tests conducted by SEAUS Testing Laboratories Nov., 1993 using EPA /600-4-90/027

Section 13 - Disposal Considerations

Dispose of in accordance with all applicable federal, state and local regulations.

Section 14 - Transportation Information

DOT Proper Shipping Name:

NOT APPLICABLE, NOT RESTRICTED

Harmonized Tariff Schedule Number: 2827.49.50 00

Section 15 - Regulatory Information

This product does not contain any ingredients subject to the reporting requirements of SARA Title III, Section 313 (40 CFR Part 372).

SARA Section 311/312: Acute Health Hazard.

TSCA: Components found in TSCA Inventory.



SDS

GHS Safety Data Sheet

Lockwood Remediation Technologies, LLC

LRT-820 Series Polymer

SDS Number: lrt820series

Revision Date: 3-2-16

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1 PRODUCT AND COMPANY IDENTIFICATION

Manufacturer

Lockwood Remediation Technologies, LLC
89 Crawford Street
Leominster, MA 01453

Contact: Paul Lockwood
Phone: 774-450-7177
Fax: 885-835-0617
Email: plockwood@lrt-llc.net

Product Name: LRT-820 Series Polymer
Revision Date: 3-2-16
SDS Number: lrt820series
Common Name: Blended Product
CAS Number: N/A
Product Code: N/A
EPA Number: N/A
RCRA Number: N/A
Chemical Family: Blended Product
Chemical Formula: Proprietary
Synonyms: Blended Product
Internal ID: N/A
Product Use: Water Treatment Compound

2 HAZARDS IDENTIFICATION

Route of Entry: Inhalation; Skin; Ingestion.

Target Organs: Esophagus; Eyes; Lungs; Mucous membranes; Respiratory system; Skin; Upper respiratory tract;

Inhalation: Can cause irritation and inflammation of the respiratory tract.

Skin Contact: May cause irritation. May cause burning.

Eye Contact: May cause irritation. May cause loss of vision. May cause permanent eye damage.

Ingestion: Aspiration hazard: Harmful or fatal if swallowed. Causes burns of the mouth, throat and stomach. Toxic if orally ingested.



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HMIS III:

H0/F0/PH0

HMIS III	
HEALTH <input type="checkbox"/>	0
FLAMMABILITY	0
PHYSICAL HAZARDS	0
PERSONAL PROTECTION B Safety Glasses, Gloves	

GHS Signal Word:
NONE

GHS Classifications:
None, None, None

GHS Phrases:
H000 - None

GHS Precautionary Statements:

P103 - Read label before use.

P235+410 - Keep cool. Protect from sunlight.

P260 - Do not breathe dust/fume/gas/mist/vapors/spray.

P262 - Do not get in eyes, on skin, or on clothing.

P304+340 - IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.

P305+351+338 - IF IN EYES: Rinse continuously with water for several minutes. Remove contact lenses if present and easy to do. Continue rinsing.

P306+360 - IF ON CLOTHING: Rinse immediately contaminated clothing and skin with plenty of water before removing clothes.

P314 - Get Medical advice/attention if you feel unwell.

P403+233 - Store in a well ventilated place. Keep container tightly closed.

This product is not classified as hazardous under the OSHA Hazard Communication Standard (29 CFR 1910.1200).



3	COMPOSITION/INFORMATION ON INGREDIENTS
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Ingredients:

This product is not classified as Hazardous under the OSHA Hazard Communication Standard (29 CFR 1910.1200).

All of the product's ingredients are either listed or exempt from the TSCA Inventory.

Specific chemical identity is being withheld as a trade secret

4	FIRST AID MEASURES
----------	---------------------------

- Inhalation:** Move victim to fresh air. No hazards which require special first aid measures.
- Skin Contact:** Promptly flush skin with soap and water until all chemical is removed.
Remove contaminated clothing and wash before reuse.
Get medical attention if irritation develops and persists.
- Eye Contact:** Flush with large amounts of water for at least 15 minutes, holding lids apart to ensure flushing of the entire surface. Washing eyes within 1 minute is essential to achieve maximum effectiveness. Get medical attention if eye irritation persists..
- Ingestion:** Do NOT induce vomiting or attempt chemical neutralization. For spontaneous vomiting, keep head below hips. Rinse mouth with water. No hazards which require special first aid measures.

5	FIRE FIGHTING MEASURES
----------	-------------------------------

- Flammability:** N/A
- Flash Point:** N/A
- Flash Point Method:** N/A
- Burning Rate:** N/A
- Autoignition Temp:** N/A.
- LEL:** N/A
- UEL:** N/A

Wear self contained breathing apparatus and other protective clothing. Approach the fire from upwind to avoid vapors. Use a water spray to keep fire exposed containers cool. Extinguish fire using water, carbon dioxide, alcohol-resistant foam, or dry powder. Recover with vacuum equipment such as a septic tank truck. Evacuate the area and fight the fire from a safe distance or a protected location.

Aqueous solutions or powders that become wet render surfaces extremely slippery.

Firefighters should wear proper protective equipment and In the event of a fire, wear self-contained breathing apparatus.



6 ACCIDENTAL RELEASE MEASURES

Pick up excess with inert absorbant material and place into separate waste container. Vacuum or sweep the material into a bag or other sealed container and dispose in accordance with local requirements. Restrict access to the area until completion of the clean-up process. Ensure that this clean-up is only conducted by trained personnel. Wear required protective clothing and equipment. Properly ventilate the area of the spill. If safely possible, contain the spill or leak. As with all chemical products, do not flush into surface water.

Aqueous solutions or powders that become wet render surfaces extremely slippery.

All Spills: DO NOT FLUSH WITH WATER. Clean up promptly by sweeping or vacuum. Keep in suitable, closed containers for disposal. After cleaning, flush away traces with water.

7 HANDLING AND STORAGE

Handling Precautions: Wear recommended protective equipment when handling. Keep material out of reach of children. Use approved containers only. Launder contaminated clothing. Wash thoroughly after handling. Store in a cool, dry and well ventilated area. Keep container closed when not in use.

Storage Requirements: Store in cool/dry and well ventilated area.

8 EXPOSURE CONTROLS/PERSONAL PROTECTION

Engineering Controls: Use mechanical (general) ventilation for storage areas.

Personal Protective Equip: HMIS PP, B | Safety Glasses, Gloves
HMIS PP, C | Safety Glasses with side shields, Gloves, Apron
HMIS PP, C | Goggles, Gloves, Apron
Chemical goggles; Apron; Chemical resistant gloves.
Work clothes protecting arms, legs and body.
No personal respiratory protective equipment normally required. Dust safety masks recommended where working powder concentration is more than 10 mg/m³.

Follow good work and hygiene practices. Provide a safety shower and wash basin in immediate work area. Workers should wash before eating or leaving the work area.

Do not allow uncontrolled discharge of product into the environment. Do not flush into surface water.



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GHS Safety Data Sheet

Lockwood Remediation Technologies, LLC

LRT-820 Series Polymer

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9 PHYSICAL AND CHEMICAL PROPERTIES

Appearance:	Granular white solid	Odor:	None
Physical State:	Solid	Molecular Formula:	N/A
Odor Threshold:	N/A	Solubility:	Soluble in water
Particle Size:	N/A	Softening Point:	N/A
Spec Grav./Density:	1.04 - 1.08	Percent Volatile:	NDA
Viscosity:	NDA	Heat Value:	NDA
Sat. Vap. Conc.:	N/A	Freezing/Melting Pt.:	Less than 32 degrees F.
Boiling Point:	N/A	Flash Point:	N/A
Flammability:	NDA	Octanol:	N/A
Partition Coefficient:	-2	Vapor Density:	N/A
Vapor Pressure:	N/A	VOC:	NDA
pH:	5 - 9 @ 5 g/L	Bulk Density:	0.6 - 0.9
Evap. Rate:	N/A	Auto-ignition Temp:	Does not self-ignite (based on th
Molecular weight:	N/A		

10 STABILITY AND REACTIVITY

Stability:	Product is stable under normal conditions.
Conditions to Avoid:	None known
Materials to Avoid:	Incompatible with oxidizing agents.
Hazardous Decomposition:	Thermal decomposition may produce: nitrogen oxides (NOx), carbon oxides (COx), hydrogen cyanide (hydrocyanic acid).
Hazardous Polymerization:	Will not occur.

11 TOXICOLOGICAL INFORMATION

Information on toxicological effects (product as supplied):

Acute oral toxicity:	LD50/oral/rat >5000 mg/kg
Acute dermal toxicity:	LD50/oral/rat >5000 mg/kg
Acute inhalation toxicity:	The product is not expected to be toxic by inhalation.
Skin corrosion/irritation:	Not irritating
Serious eye damage/eye irritation:	Not irritating
Respiratory/skin sensitisation:	Not sensitizing
Mutagenicity:	Not mutagenic
Carcinogenicity:	Not carcinogenic
Reproductive toxicity:	Not toxic for reproduction
STOT - single exposure:	No known effects
STOT = repeated exposure	No known effects
Aspiration hazard:	No hazards resulting from the material as supplied



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ECOLOGICAL INFORMATION

Information on the product as supplied:

Acute toxicity to fish:	LC50/Danio rerio/96 hours > 100 mg/L (OECD 203)
Acute toxicity to invertebrates:	EC50/Daphnia magna/48 hours > 100 mg/L (OECD 202)
Acute toxicity to algae:	IC50/Scenedesmus subspicatus/72 hours > 100 mg/L (OECD 201)
Chronic toxicity to fish:	No data available
Chronic toxicity to invertebrates:	No data available
Toxicity to microorganisms:	No data available
Effects on terrestrial organisms:	No known effects
Sediment toxicity:	No data available
Degradation:	Not readily biodegradable.
Hydrolysis:	Does not hydrolyse.
Photolysis:	No data available
Not bioaccumulating	
Partition co-efficient (Log Pow):	-2
Bioconcentration factor (BCF):	~0

13

DISPOSAL CONSIDERATIONS

Dispose of in accordance with local regulations. Can be landfilled or incinerated, when in compliance with local regulations.

Rinse empty containers with water and use the rinse-water to prepare the working solution.

The product and it's packaging are not suitable for recycling.

14

TRANSPORT INFORMATION

For all transportation accidents, call CHEMTREC at 800/424-9300. All spills and leaks of this material must be handled in accordance with local, state, and federal regulations.

DOT Shipping Designation:

Non-hazardous under 29-CFR 1910.1200. Water treatment compound.



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REGULATORY INFORMATION

All components of this product are either listed on the inventory or are exempt from listing.

According to our information this product is not a dangerous material and is not classified as hazardous under the OSHA Hazard Communication Standard (29 CFR 1910.1200).

REGULATORY KEY DESCRIPTIONS

CERCLA = Superfund clean up substance
CSWHS = Clean Water Act Hazardous substances
MASS = MA Massachusetts Hazardous Substances List
OSHAWAC = OSHA Workplace Air Contaminants
PA = PA Right-To-Know List of Hazardous Substances
TXAIR = TX Air Contaminants with Health Effects Screening Level
APP9 = Appendix 9
EPCRAWPC = EPCRA Water Priority Chemicals
HAP = Hazardous Air Pollutants
HWRCRA = RCRA Hazardous Wastes
NJHS = NJ Right-to-Know Hazardous Substances
NRC = Nationally Recognized Carcinogens
OSHAHTS = OSHA Hazardous and Toxic Substances
PRIPOL = Clean Water Act Priority Pollutants
PROP65 = CA Prop 65
SARA313 = SARA 313 Title III Toxic Chemicals
TOXICPOL = Clean Water Act Toxic Pollutants
TOXICRCRA = RCRA Toxic Hazardous Wastes (U-List)
TXHWL = TX Hazardous Waste List
TSCA = Toxic Substances Control Act



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OTHER INFORMATION

DISCLAIMER:

All information, recommendations and suggestion appearing herein concerning our product are based upon tests and data believed to be reliable. However, it is the user's responsibility to determine the safety, toxicity, and suitability for his own use of the product described herein. Since the actual use by others is beyond our control, no guarantee, expressed or implied, is made by Lockwood Remediation Technologies, LLC as to the effects of such use, the results to be obtained, or the safety and toxicity of the product; nor does Lockwood Remediation Technologies, LLC assume any liability arising out of use, by others, of the product referred to herein. The information herein is not to be construed as absolutely complete since additional information may be necessary or desirable when particular or exceptional conditions or circumstances exist or because of applicable laws or government regulations.

For manufacturing use only. Not for food or drug use.

ATTACHMENT G
LETTER FROM US FISH & WILDLIFE SERVICE



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:

May 10, 2018

Consultation Code: 05E1NE00-2018-SLI-1794

Event Code: 05E1NE00-2018-E-04141

Project Name: Miller's River Outfall - Somerville, MA

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-1794

Event Code: 05E1NE00-2018-E-04141

Project Name: Miller's River Outfall - Somerville, MA

Project Type: TRANSPORTATION

Project Description: Indirect discharge of treated groundwater via municipal storm sewer to Miller's River. Discharge from dewatering activities associated with construction of light railway extension.

Project Location:

Approximate location of the project can be viewed in Google Maps: <https://www.google.com/maps/place/42.37166833942037N71.06682802023968W>



Counties: Suffolk, MA

Endangered Species Act Species

There is a total of 0 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 Fisheries¹, 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.

Critical habitats

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

ATTACHMENT H

MASSACHUSETTS CULTURAL RESOURCES DATABASE SEARCH RESULTS

Massachusetts Cultural Resource Information System

MACRIS

MACRIS Search Results

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

Inv. No.	Property Name	Street	Town	Year
CAM.A	Cambridge Common Historic District		Cambridge	
CAM.B	Lockhart, William L. and Company Coffin Factory		Cambridge	
CAM.C	Blake and Knowles Steam Pump Company		Cambridge	
CAM.D	Fort Washington Historic District		Cambridge	
CAM.E	East Cambridge Historic District		Cambridge	
CAM.F	Winter Street Historic District		Cambridge	
CAM.G	Cambridge Multiple Resource Area		Cambridge	
CAM.H	Lechmere Point Corporation Houses		Cambridge	
CAM.I	Sacred Heart Church, Rectory, School and Convent		Cambridge	
CAM.J	Upper Magazine Street Historic District		Cambridge	
CAM.K	Hastings Square Historic District		Cambridge	
CAM.L	Salem - Auburn Streets Historic District		Cambridge	
CAM.M	Inman Square Historic District		Cambridge	
CAM.N	Old Cambridgeport Historic District		Cambridge	
CAM.O	Norfolk Street Historic District		Cambridge	
CAM.P	Massachusetts Institute of Technology		Cambridge	
CAM.Q	Central Square Historic District		Cambridge	
CAM.R	Bigelow Street Historic District		Cambridge	
CAM.S	Garfield Street Historic District		Cambridge	
CAM.T	Harvard Street Historic District		Cambridge	
CAM.U	Kirkland Place Historic District		Cambridge	
CAM.V	Maple Avenue Historic District		Cambridge	
CAM.W	City Hall Historic District		Cambridge	
CAM.X	Shady Hill Historic District		Cambridge	
CAM.Y	Ash Street Historic District		Cambridge	
CAM.Z	Avon Hill Historic District		Cambridge	

Inv. No.	Property Name	Street	Town	Year
CAM.AA	Berkeley Street Historic District		Cambridge	
CAM.AB	Harvard Square Historic District		Cambridge	
CAM.AC	Harvard Houses Historic District		Cambridge	
CAM.AD	Harvard Yard Historic District		Cambridge	
CAM.AE	Old Cambridge Historic District		Cambridge	
CAM.AF	Gray Gardens East and West Historic District		Cambridge	
CAM.AG	Memorial Drive Apartments Historic District		Cambridge	
CAM.AH	Follen Street Historic District		Cambridge	
CAM.AI	Bennink - Douglas Cottages		Cambridge	
CAM.AJ	Charles River Basin Historic District		Cambridge	
CAM.AK	Boston Woven Hose and Rubber Complex		Cambridge	
CAM.AL	Fresh Pond		Cambridge	
CAM.AM	Old Cambridge Historic District		Cambridge	
CAM.AN	Harvard Riverfront		Cambridge	
CAM.AO	East Cambridge		Cambridge	
CAM.AP	Hubbard Park Historic District		Cambridge	
CAM.AQ	Davenport - Allen and Endicott Factory		Cambridge	
CAM.AR	Mount Auburn Cemetery		Cambridge	
CAM.AS	Metropolitan Park System of Greater Boston		Cambridge	
CAM.AT	Elmwood (James Russell Lowell House)		Cambridge	
CAM.AU	Christ Church		Cambridge	
CAM.AV	Blake and Knowles Steam Pump Company		Cambridge	
CAM.AW	Alewife Brook Parkway		Cambridge	
CAM.AX	Fresh Pond Parkway		Cambridge	
CAM.AY	Church of the Blessed Sacrament Catholic Church		Cambridge	
CAM.AZ	Immaculate Conception Roman Catholic Church		Cambridge	
CAM.BA	Immaculate Conception (Lithuanian) Catholic Church		Cambridge	
CAM.BB	Orchard Street Area		Cambridge	
CAM.BC	Central Square Historic District		Cambridge	
CAM.BD	Cambridge Common Historic District		Cambridge	
CAM.BE	Old Harvard Yard		Cambridge	
CAM.BF	Berkeley Street Historic District		Cambridge	
CAM.BG	Harvard Square Historic District		Cambridge	
CAM.BH	Volpe Center		Cambridge	
CAM.1	Wyeth, John House	56 Aberdeen Ave	Cambridge	1841
CAM.1009		24 Agassiz St	Cambridge	1889

Inv. No.	Property Name	Street	Town	Year
CAM.1010	Shaw, Edward L. House	30 Agassiz St	Cambridge	1890
CAM.1011	Sands, M. Winslow House	32 Agassiz St	Cambridge	1891
CAM.1012	Blackman, Horace House	33 Agassiz St	Cambridge	1890
CAM.1353	Standard Plate Glass Company Building	270 Albany St	Cambridge	1920
CAM.902	Alewife Brook Parkway Bridge over B & M Railroad	Alewife Brook Pkwy	Cambridge	1929
CAM.903	Alewife Brook Parkway Bridge over B & M Railroad	Alewife Brook Pkwy	Cambridge	1929
CAM.9012	Alewife Brook Parkway - Northern Segment	Alewife Brook Pkwy	Cambridge	1908
CAM.9013	Alewife Brook Parkway Tree Border	Alewife Brook Pkwy	Cambridge	r 1920
CAM.1372	Immaculate Conception Roman Catholic Church	45 Alewife Brook Pkwy	Cambridge	1929
CAM.1373	Immaculate Conception Catholic Church Rectory	45 Alewife Brook Pkwy	Cambridge	1935
CAM.359		6-24 Allston St	Cambridge	1946
CAM.2	Fay, Isaac House	125 Antrim St	Cambridge	1843
CAM.3	Withey, S. B. House	10 Appian Way	Cambridge	1855
CAM.4	Howe, Lois Lilly House	6 Appleton St	Cambridge	1887
CAM.5	Cook, William House	71 Appleton St	Cambridge	1876
CAM.1016		8-10 Arlington St	Cambridge	1864
CAM.1027	Aldrich, Frank A. House	11 Arlington St	Cambridge	1899
CAM.1017		12-14 Arlington St	Cambridge	1864
CAM.1028	Graustein, Adolph H. House	19 Arlington St	Cambridge	1902
CAM.1018		22 Arlington St	Cambridge	1862
CAM.1019	Fillmore, Wellington House	24 Arlington St	Cambridge	1869
CAM.1347		25 Arlington St	Cambridge	
CAM.1020	Moor, Rev. Clark House	26 Arlington St	Cambridge	1869
CAM.1021	Blackman, Horace P. House	28 Arlington St	Cambridge	1876
CAM.1022		30 Arlington St	Cambridge	1876
CAM.1023	Jameson, Edwin A. L. House	32 Arlington St	Cambridge	1872
CAM.1029	Davis, John House	33 Arlington St	Cambridge	1869
CAM.1024		36 Arlington St	Cambridge	1872
CAM.1030	Kelsey, Albert House	37 Arlington St	Cambridge	1875
CAM.1025	Moor, Rev. Clark Double House	38-40 Arlington St	Cambridge	1874
CAM.1026	Boardman, Charles House	42 Arlington St	Cambridge	1871
CAM.1061	Harvard Catholic Student Center	20 Arrow St	Cambridge	c 1890
CAM.1062	Saint Paul's Church	24 Arrow St	Cambridge	r 1920
CAM.784	Brooks, John House	5 Ash St	Cambridge	1887
CAM.6	Johnson, Philip House	9 Ash St	Cambridge	1942
CAM.785	Ela, Lucia House	13 Ash St	Cambridge	1869

Inv. No.	Property Name	Street	Town	Year
CAM.787	Eliot, T. S. House	16 Ash St	Cambridge	1855
CAM.786	Nowell, Henry House	19 Ash St	Cambridge	1825
CAM.788	Hunnewell, James A. House	6 Ash Street Pl	Cambridge	1848
CAM.522		107 Auburn St	Cambridge	1803
CAM.523		108-110 Auburn St	Cambridge	1803
CAM.524		114 Auburn St	Cambridge	c 1844
CAM.525		119 Auburn St	Cambridge	c 1829
CAM.526		122 Auburn St	Cambridge	c 1840
CAM.527		131 Auburn St	Cambridge	c 1830
CAM.528		134 Auburn St	Cambridge	c 1845
CAM.7	Ellis, Asa House	158 Auburn St	Cambridge	1805
CAM.564	Hotel Eliot	66 Austin St	Cambridge	c 1885
CAM.565	Hotel Austin	70 Austin St	Cambridge	c 1885
CAM.8	Brabrook, Ezra H. House	42-44 Avon St	Cambridge	1849
CAM.352	Blake and Knowles Main Foundry	180 Bent St	Cambridge	c 1895
CAM.1035		1 Berkeley Pl	Cambridge	1892
CAM.1036		2 Berkeley Pl	Cambridge	1892
CAM.1037		3 Berkeley Pl	Cambridge	1892
CAM.1038		4 Berkeley Pl	Cambridge	1910
CAM.1039		5 Berkeley Pl	Cambridge	1900
CAM.1040		6 Berkeley Pl	Cambridge	1914
CAM.1041		7 Berkeley Pl	Cambridge	1913
CAM.1042		8 Berkeley Pl	Cambridge	1931
CAM.1043	Pryor - Brown House	1 Berkeley St	Cambridge	1852
CAM.10	Thayer, Prof. Studio	2 1/2 Berkeley St	Cambridge	1894
CAM.1044	Pryor - Howells House	3 Berkeley St	Cambridge	1856
CAM.1045	Dana, Richard H. House	4 Berkeley St	Cambridge	1851
CAM.1046	Wyeth - Allen House	5-7R Berkeley St	Cambridge	1852
CAM.1047		6 Berkeley St	Cambridge	1853
CAM.1048	Ware, Henry House	8 Berkeley St	Cambridge	1859
CAM.1049	Allyn, John House	11 Berkeley St	Cambridge	1886
CAM.1050		12 Berkeley St	Cambridge	1881
CAM.1051		13 Berkeley St	Cambridge	1898
CAM.1052	Williston, Lyman House	15 Berkeley St	Cambridge	1863
CAM.1053		16 Berkeley St	Cambridge	1905
CAM.1054		17 Berkeley St	Cambridge	1863
CAM.1055		19 Berkeley St	Cambridge	1854
CAM.1056	Newell, William House	20 Berkeley St	Cambridge	1856

Inv. No.	Property Name	Street	Town	Year
CAM.1057		21 Berkeley St	Cambridge	1854
CAM.1058	Fiske, John House	22 Berkeley St	Cambridge	1877
CAM.1059		23 Berkeley St	Cambridge	1854
CAM.1060		24 Berkeley St	Cambridge	1936
CAM.1355	Craft, William House	5 Bigelow St	Cambridge	1869
CAM.1356	Sharry, William J. House	5A Bigelow St	Cambridge	1940
CAM.663	Montague, Charles House	6 Bigelow St	Cambridge	1873
CAM.655	Snow, Simeon House	7 Bigelow St	Cambridge	1869
CAM.1360	Rhodes, Silas Jr. House	8 Bigelow St	Cambridge	1871
CAM.656	Pollard, John Double House	9-11 Bigelow St	Cambridge	1874
CAM.664	Hurd, Theodore House	10-12 Bigelow St	Cambridge	1884
CAM.657	Bird, Henry House	13 Bigelow St	Cambridge	1874
CAM.1361	Pike, Walter House	14 Bigelow St	Cambridge	1888
CAM.658	Davis, Curtis House	15 Bigelow St	Cambridge	1873
CAM.1362	Brazier, Abbie House	16 Bigelow St	Cambridge	1874
CAM.659	Whitely, Hiram House	17 Bigelow St	Cambridge	1873
CAM.1363	Sawyer - Dole House	18 Bigelow St	Cambridge	1876
CAM.1357	Oxford, Charles House	19 Bigelow St	Cambridge	1871
CAM.660	Snow - Twitchell Double House	21-23 Bigelow St	Cambridge	1873
CAM.665	Hyde, Edward House	22 Bigelow St	Cambridge	1870
CAM.1348	Robbins Block	24-46 Bigelow St	Cambridge	1871
CAM.661	Jessop, Joseph House	25 Bigelow St	Cambridge	1872
CAM.1358	Jessop Tenement House	29 Bigelow St	Cambridge	1891
CAM.1359	Whitcomb, Peter Double House	31-33 Bigelow St	Cambridge	1872
CAM.662	Davis, John W. House	35 Bigelow St	Cambridge	1870
CAM.1406	Volpe Center - Shipping and Receiving	182 Binney St	Cambridge	1965
CAM.357	Blake and Knowles Machine Shop #2	195 Binney St	Cambridge	1917
CAM.358	Blake and Knowles Machine Shop #3	199 Binney St	Cambridge	1918
CAM.356	Blake and Knowles Erecting and Assembling Building	201 Binney St	Cambridge	1903
CAM.1388		39 Bishop Allen Dr	Cambridge	
CAM.1397	Hotel Greyburn	77 Bishop Allen Dr	Cambridge	1891
CAM.577	Young Women's Christian Association Building	146 Bishop Allen Dr	Cambridge	c 1954
CAM.1386	Squirrel Brand Company Building	8 Boardman St	Cambridge	1915
CAM.11	Slowey, Patrick House	73 Bolton St	Cambridge	1852
CAM.1063	Bicycle Exchange Building	3-7 Bow St	Cambridge	1901
CAM.1064		9 Bow St	Cambridge	1884
CAM.1065	Farwell - Russell, Thomas Store	12 Bow St	Cambridge	c 1830

Inv. No.	Property Name	Street	Town	Year
CAM.1066	Westmorly Court - Harvard University	15-29 Bow St	Cambridge	c 1898
CAM.12	Harvard Lampoon Building	44 Bow St	Cambridge	1909
CAM.1067	Randolph Hall - Harvard University	47-57 Bow St	Cambridge	1897
CAM.13	Frost, Elizabeth Tenant House	35 Bowdoin St	Cambridge	1812
CAM.926	Anderson, Larz Bridge	Boylston St	Cambridge	1915
CAM.14	Hicks, John House	64 Boylston St	Cambridge	c 1761
CAM.294	Radcliffe College Graduate Center	Brattle St	Cambridge	1955
CAM.918	Longfellow Park	Brattle St	Cambridge	1887
CAM.987	Lowell Park	Brattle St	Cambridge	
CAM.1068	Brattle Building	4 Brattle St	Cambridge	1913
CAM.1069	Atrium Building	9-11 Brattle St	Cambridge	1979
CAM.1071		12-16 Brattle St	Cambridge	1887
CAM.1070	Estes Block	13-15 Brattle St	Cambridge	1875
CAM.1072	Dow Block	17-35 Brattle St	Cambridge	c 1936
CAM.1073		18 Brattle St	Cambridge	1922
CAM.1074		26 Brattle St	Cambridge	1909
CAM.1075	Hadley Building	28-36 Brattle St	Cambridge	1974
CAM.1076	Cambridge Federal Savings Bank	38A Brattle St	Cambridge	1937
CAM.1077		39-41 Brattle St	Cambridge	1925
CAM.15	Brattle Hall	40 Brattle St	Cambridge	1889
CAM.1078		40A Brattle St	Cambridge	c 1925
CAM.16	Brattle, William House	42 Brattle St	Cambridge	c 1727
CAM.1079	Sage Building	43-45 Brattle St	Cambridge	1926
CAM.1080		44 Brattle St	Cambridge	1970
CAM.1081		46R Brattle St	Cambridge	1966
CAM.1082		47-49 Brattle St	Cambridge	c 1926
CAM.1083	Design Research Building	48 Brattle St	Cambridge	1969
CAM.1084	Washington Court	51 Brattle St	Cambridge	1905
CAM.17	Pratt, Dexter House	54 Brattle St	Cambridge	1808
CAM.1229	Warland, John House	69 Brattle St	Cambridge	1838
CAM.1230	Greenleaf, James House	76 Brattle St	Cambridge	1859
CAM.1228	Chamberlin, John House	77 Brattle St	Cambridge	1821
CAM.18	Radcliffe College Alumnae House	79 Brattle St	Cambridge	1836
CAM.19	Wadsworth Chambers	81-83 Brattle St	Cambridge	1908
CAM.20	Burleigh House	85 Brattle St	Cambridge	1847
CAM.21	Stoughton, Mary Fisk House	90 Brattle St	Cambridge	1882
CAM.22		92 Brattle St	Cambridge	1882
CAM.23	Vassall, Henry House	94 Brattle St	Cambridge	1635

Inv. No.	Property Name	Street	Town	Year
CAM.24	Episcopal Divinity School - Washburn Hall	99 Brattle St	Cambridge	1960
CAM.25	Saint John's Chapel	99 Brattle St	Cambridge	1868
CAM.26	Episcopal Divinity School Library - Sherrill Hall	99 Brattle St	Cambridge	1965
CAM.27	Episcopal Divinity School - Wright Hall	99 Brattle St	Cambridge	1911
CAM.28	Episcopal Divinity School - Reed Hall	99 Brattle St	Cambridge	1873
CAM.29	Episcopal Divinity School - Lawrence Hall	99 Brattle St	Cambridge	1873
CAM.30	Episcopal Divinity School - Burnham Hall	99 Brattle St	Cambridge	1879
CAM.31	Hastings, Oliver House	101 Brattle St	Cambridge	1844
CAM.32	Longfellow National Historic Site	105 Brattle St	Cambridge	c 1759
CAM.33	Dana, Edith Longfellow House	113 Brattle St	Cambridge	1887
CAM.34		114 Brattle St	Cambridge	1903
CAM.35	Thorp, Annie Longfellow House	115 Brattle St	Cambridge	1887
CAM.36	Worcester, Joseph House	121 Brattle St	Cambridge	1843
CAM.37		121A Brattle St	Cambridge	1941
CAM.38		123 Brattle St	Cambridge	
CAM.39		124 Brattle St	Cambridge	1915
CAM.40		125 Brattle St	Cambridge	1939
CAM.41		126 Brattle St	Cambridge	1890
CAM.1235		127 Brattle St	Cambridge	1970
CAM.42		128 Brattle St	Cambridge	1892
CAM.43		130-130R Brattle St	Cambridge	1886
CAM.44		132 Brattle St	Cambridge	1886
CAM.45	Falxa, Dr. Martin House	133 Brattle St	Cambridge	1970
CAM.46		134-136 Brattle St	Cambridge	1857
CAM.47		138 Brattle St	Cambridge	1930
CAM.48		140 Brattle St	Cambridge	1930
CAM.49		142 Brattle St	Cambridge	1915
CAM.50	Cambridge Armenian Church	143 Brattle St	Cambridge	1959
CAM.51		144 Brattle St	Cambridge	1915
CAM.52	Brewster, William House	145 Brattle St	Cambridge	1887
CAM.53		146 Brattle St	Cambridge	1939
CAM.54		147 Brattle St	Cambridge	1887
CAM.55		148 Brattle St	Cambridge	1914
CAM.56	Lechmere, Richard House	149 Brattle St	Cambridge	c 1762
CAM.57		150 Brattle St	Cambridge	1908
CAM.58		152 Brattle St	Cambridge	1887
CAM.59	Lee, Thomas House	153 Brattle St	Cambridge	1803
CAM.60		154 Brattle St	Cambridge	r 1865

Inv. No.	Property Name	Street	Town	Year
CAM.1236		155 Brattle St	Cambridge	1889
CAM.61		156 Brattle St	Cambridge	1867
CAM.62		158 Brattle St	Cambridge	1884
CAM.63	Hooper - Lee - Nichols House	159 Brattle St	Cambridge	c 1685
CAM.64		160 Brattle St	Cambridge	1884
CAM.65		164 Brattle St	Cambridge	1868
CAM.1237	Bartlett, John House	165 Brattle St	Cambridge	1873
CAM.66	Van Brunt, Henry House	167 Brattle St	Cambridge	1883
CAM.67		168 Brattle St	Cambridge	1888
CAM.68	Wells, Judge Daniel House	170 Brattle St	Cambridge	1852
CAM.69		174 Brattle St	Cambridge	1885
CAM.70	Marrett - Ruggles - Fayerweather House	175 Brattle St	Cambridge	r 1765
CAM.1238	Fayerweather House Squash Court and Garage	177 Brattle St	Cambridge	1915
CAM.71		180 Brattle St	Cambridge	1888
CAM.72	Richards, R. A. House	182 Brattle St	Cambridge	1895
CAM.73		190 Brattle St	Cambridge	1898
CAM.74	Frankfurter, Justice Felix House	192 Brattle St	Cambridge	1907
CAM.75		193 Brattle St	Cambridge	1893
CAM.76		194 Brattle St	Cambridge	1917
CAM.77		195 Brattle St	Cambridge	1896
CAM.78		198 Brattle St	Cambridge	1912
CAM.79	Stubbins, Hugh House	199 Brattle St	Cambridge	1966
CAM.80		200 Brattle St	Cambridge	1901
CAM.81		202 Brattle St	Cambridge	1903
CAM.82		205 Brattle St	Cambridge	r 1925
CAM.83		209 Brattle St	Cambridge	r 1925
CAM.84		213-215 Brattle St	Cambridge	1896
CAM.85	Frost, Robert House	29-35 Brewster St	Cambridge	1884
CAM.1402	Volpe Center - Auditorium	33 Broadway	Cambridge	c 1965
CAM.1409	Close, George Candy Manufacturing Company Building	243 Broadway	Cambridge	1910
CAM.86	Cambridge Public Library	449 Broadway	Cambridge	1888
CAM.515		301 Brookline Ave	Cambridge	1869
CAM.516		302 Brookline Ave	Cambridge	1887
CAM.517		308 Brookline Ave	Cambridge	1870
CAM.623	Southwick Block	11-19 Brookline St	Cambridge	1911
CAM.88	Brown, Daniel House	7 Brown St	Cambridge	1845
CAM.89	Hill, Aaron House	17 Brown St	Cambridge	c 1754

Inv. No.	Property Name	Street	Town	Year
CAM.708		1 Bryant St	Cambridge	1911
CAM.709		5 Bryant St	Cambridge	1916
CAM.710		7 Bryant St	Cambridge	1915
CAM.711		20-24 Bryant St	Cambridge	1916
CAM.712		21 Bryant St	Cambridge	1932
CAM.90	Bridgman, Percy House	10 Buckingham Pl	Cambridge	c 1920
CAM.91	Koch, Carl House	4 Buckingham St	Cambridge	1939
CAM.92	Higginson, Col. Thomas Wentworth House	29 Buckingham St	Cambridge	1880
CAM.941	Bridge, John Statue	Cambridge Common	Cambridge	1882
CAM.942	Memorial Gateway	Cambridge Common	Cambridge	1906
CAM.943	Revolutionary War Cannons	Cambridge Common	Cambridge	c 1770
CAM.944	Soldiers Monument	Cambridge Common	Cambridge	1869
CAM.906	Cambridge Parkway Bridge over Broad Canal	Cambridge Pkwy	Cambridge	1957
CAM.931	Cambridge Parkway	Cambridge Pkwy	Cambridge	1900
CAM.97	Memorial Hall	Cambridge St	Cambridge	r 1875
CAM.379	Middlesex County Registry of Deeds Building	Cambridge St	Cambridge	1896
CAM.380	Middlesex County Clerk of Courts Building	Cambridge St	Cambridge	1889
CAM.912	Longfellow Bridge - West Boston Bridge	Cambridge St	Cambridge	c 1907
CAM.914	Lechmere Square Streetcar Station	Cambridge St	Cambridge	1922
CAM.372		82-84 Cambridge St	Cambridge	1937
CAM.373	Davenport, A. H. - Irving and Casson Company	88-134 Cambridge St	Cambridge	1866
CAM.378		160 Cambridge St	Cambridge	1965
CAM.93	East Cambridge Savings Bank	292 Cambridge St	Cambridge	1931
CAM.94	Union Railway Car Barn	613-621 Cambridge St	Cambridge	1869
CAM.535		1353-1369 Cambridge St	Cambridge	1894
CAM.532	Waite Building	1368 Cambridge St	Cambridge	1855
CAM.533	Middlesex Bank Building	1374-1385 Cambridge St	Cambridge	1874
CAM.95		1707-1709 Cambridge St	Cambridge	1845
CAM.96		1715-1717 Cambridge St	Cambridge	1845
CAM.635	Holmes Block II - Green Block	2-14 Central Sq	Cambridge	1798
CAM.636	Home Realty Building	14 Central Sq	Cambridge	1970
CAM.639	Southwick Building I	15-16 Central Sq	Cambridge	1896
CAM.640	Southwick Building II	17-24 Central Sq	Cambridge	c 1860
CAM.641	White Tower Restaurant	25 Central Sq	Cambridge	1932
CAM.98	Melvin, Isaac House	19 Centre St	Cambridge	1842
CAM.99	Boston and Maine Railroad Signal Tower A	Charles River	Cambridge	1931
CAM.911	Charles River Railroad Draw Bridge #1	Charles River	Cambridge	1931
CAM.920	Charles River Dam	Charles River	Cambridge	r 1905

Inv. No.	Property Name	Street	Town	Year
CAM.925	Weeks, John Wingate Foot Bridge	Charles River	Cambridge	1927
CAM.928	Lechmere Canal	Charles River	Cambridge	1909
CAM.929	Broad Canal	Charles River	Cambridge	1805
CAM.932	Charles River Basin Granite Seawall and Iron Fence	Charles River	Cambridge	
CAM.935	Metropolitan District Commission Swimming Pool	Charles River	Cambridge	
CAM.1320	Metropolitan District Commission Chlorination Plant	Charles River	Cambridge	
CAM.1325	M. I. T. - Pierce, Harold Whitworth Boat House	Charles River	Cambridge	1965
CAM.1326	M. I. T. - Wood, Walter C. Sailing Pavilion	Charles River	Cambridge	1976
CAM.1328	Riverside Boat Club	Charles River	Cambridge	r 1910
CAM.543	Boardman, James Double House	Cherry St	Cambridge	1843
CAM.100	Fuller, Margaret House	71 Cherry St	Cambridge	1806
CAM.546		87 Cherry St	Cambridge	c 1845
CAM.545		116-120 Cherry St	Cambridge	c 1845
CAM.544	Eaton, Jacob House	128 Cherry St	Cambridge	c 1844
CAM.542		137-139 Cherry St	Cambridge	c 1840
CAM.537		149-151 Cherry St	Cambridge	c 1830
CAM.538		159-161 Cherry St	Cambridge	c 1830
CAM.547		167 Cherry St	Cambridge	1850
CAM.548		169 Cherry St	Cambridge	1850
CAM.101	Kingsley, Chester House	10 Chester St	Cambridge	1866
CAM.518		105 Chestnut St	Cambridge	1875
CAM.519		111 Chestnut St	Cambridge	1875
CAM.102	First Parish Church, Unitarian	1-3 Church St	Cambridge	1833
CAM.103		23-25 Church St	Cambridge	1936
CAM.1085		26-28 Church St	Cambridge	1857
CAM.104		27-29 Church St	Cambridge	1922
CAM.105	Cambridge Police Station	31-33 Church St	Cambridge	1864
CAM.1086	Oxford Grill	32-42 Church St	Cambridge	1931
CAM.1087	Hancock - Torrey House	53 Church St	Cambridge	1827
CAM.1088		54-56 Church St	Cambridge	1925
CAM.1089		59-63 Church St	Cambridge	1949
CAM.1377	Cambridge Almshouse Caretaker's House	36 Churchill Ave	Cambridge	c 1886
CAM.106	Gale, George House	14-16 Clinton St	Cambridge	c 1853
CAM.1387		41-43 Columbia St	Cambridge	
CAM.107	Beth Israel Synagogue	238 Columbia St	Cambridge	1901
CAM.908	Commercial Avenue Bridge over Lechmere Canal	Commercial Ave	Cambridge	1907

Inv. No.	Property Name	Street	Town	Year
CAM.1318	Metropolitan District Commission Stables	Commercial Ave	Cambridge	
CAM.336		3 Concord Ave	Cambridge	1915
CAM.337		5 Concord Ave	Cambridge	c 1917
CAM.108	Howells, William Dean House	37 Concord Ave	Cambridge	1873
CAM.1365	Cambridge Home for the Aged and Infirm	650 Concord Ave	Cambridge	1928
CAM.111	Holmes, Joseph House	144 Coolidge Hill	Cambridge	1801
CAM.109	Orne, Sarah House	10 Coolidge Hill Rd	Cambridge	1807
CAM.110	Coolidge, Josiah House	24 Coolidge Hill Rd	Cambridge	c 1822
CAM.600	Coolidge, Flavel House	2 Coolidge Pl	Cambridge	1834
CAM.1369	Blessed Sacrament Roman Catholic Parish School	12 Corporal McTernan St	Cambridge	1924
CAM.112	Valentine Soap Workers' Cottage	5-7 Cottage St	Cambridge	1835
CAM.1212	Mather House - Harvard University	Cowperthwaite St	Cambridge	1967
CAM.113	Birkhoff, George D. House	22 Craigie St	Cambridge	r 1870
CAM.114	Ross, Denman House	24-26 Craigie St	Cambridge	1869
CAM.115		25 Craigie St	Cambridge	1856
CAM.116	Horsford, Eben House	27 Craigie St	Cambridge	1854
CAM.333	Day, Anna House	139 Cushing St	Cambridge	1856
CAM.117	Colburn, Sara Foster House	7 Dana St	Cambridge	1841
CAM.118	University Museum	11-25 Divinity Ave	Cambridge	1859
CAM.119	Divinity Hall	12 Divinity Ave	Cambridge	1825
CAM.120	Biological Laboratory	16 Divinity Ave	Cambridge	1930
CAM.121	Second Cambridge Savings Bank Building	11-21 Dunster St	Cambridge	1897
CAM.1090	Union Railway Car barn	25-33 Dunster St	Cambridge	1860
CAM.1091	Second D. U. Club	45 Dunster St	Cambridge	1930
CAM.1092	Metcalf, Eliab Wight House	46 Dunster St	Cambridge	1820
CAM.1093	Edwards, Abraham - Moore, Mary House	53 Dunster St	Cambridge	1841
CAM.1094	Alpha Sigma Phi Club	54 Dunster St	Cambridge	1900
CAM.122	Wyeth, Augustus House	69 Dunster St	Cambridge	1829
CAM.1095		71-77 Dunster St	Cambridge	1894
CAM.123		42 Edward J. Lopez Ave	Cambridge	c 1830
CAM.1096	Hotel Packard	10-14 Eliot St	Cambridge	1869
CAM.1097		14A Eliot St	Cambridge	1900
CAM.1098		16-18 Eliot St	Cambridge	1898
CAM.124	Sands, Ivory House	145 Elm St	Cambridge	1839
CAM.125	Foster, Dr. House	8 Elmwood Ave	Cambridge	1893
CAM.126	Greenough, J. J. House	9 Elmwood Ave	Cambridge	1903
CAM.127	Smyth, Herbert House	11-15 Elmwood Ave	Cambridge	1903

Inv. No.	Property Name	Street	Town	Year
CAM.128	Kempton, John House	14 Elmwood Ave	Cambridge	1895
CAM.129		20 Elmwood Ave	Cambridge	1892
CAM.130	Benson, Ruth House	26 Elmwood Ave	Cambridge	1899
CAM.131	Watson House	30 Elmwood Ave	Cambridge	c 1750
CAM.132	Elmwood - Lowell, James Russell House	33 Elmwood Ave	Cambridge	c 1767
CAM.133	Reardon, Edmund House	195 Erie St	Cambridge	1884
CAM.1371	Blessed Sacrament Roman Catholic Church Convent	203 Erie St	Cambridge	1954
CAM.134	Harvard Graduate Center	10-26 Everett St	Cambridge	1949
CAM.135	Jarvis, The	27 Everett St	Cambridge	1890
CAM.136	Newman, Andrew House	23 Fairmont St	Cambridge	1823
CAM.713		2-4 Farrar St	Cambridge	1927
CAM.714		9 Farrar St	Cambridge	1890
CAM.715		15 Farrar St	Cambridge	1898
CAM.716		16 Farrar St	Cambridge	1931
CAM.717		17 Farrar St	Cambridge	1897
CAM.718		18-20 Farrar St	Cambridge	1923
CAM.719		22 Farrar St	Cambridge	1928
CAM.720		26 Farrar St	Cambridge	1928
CAM.137		10-12 Farwell Pl	Cambridge	r 1870
CAM.138	Nichols House	11 Farwell Pl	Cambridge	1827
CAM.139		14-16 Farwell Pl	Cambridge	c 1855
CAM.140	Read, James House	15 Farwell Pl	Cambridge	c 1772
CAM.141	Child, N. K. House	17 Farwell Pl	Cambridge	1835
CAM.142		18-20 Farwell Pl	Cambridge	c 1855
CAM.143	Christ Church Parish House	19 Farwell Pl	Cambridge	1948
CAM.144	Toppan House	22-24 Farwell Pl	Cambridge	c 1900
CAM.1408	Carey, Agnes Whiteside House	50 Fayerweather St	Cambridge	
CAM.145	Deane, Ezra - Williams, George House	21-23 Fayette St	Cambridge	1848
CAM.146		26-28 Fayette St	Cambridge	1857
CAM.430	Cambridge Public Library - O'Connell Branch	Fifth St	Cambridge	1938
CAM.441		69-71 Fifth St	Cambridge	
CAM.452	Hall, Jesse House	75 Fifth St	Cambridge	1837
CAM.428		82 Fifth St	Cambridge	
CAM.429		83 Fifth St	Cambridge	
CAM.1405	Volpe Center - Center Service Building	259 Fifth St	Cambridge	c 1965
CAM.907	First Street Bridge over Broad Canal	First St	Cambridge	1924
CAM.147	Athenaeum Press Building	215 First St	Cambridge	1895

Inv. No.	Property Name	Street	Town	Year
CAM.910	Fitchburg Railroad Signal Bridge	Fitchburg Railroad	Cambridge	c 1930
CAM.148	Abbot, Edwin House	1 Follen St	Cambridge	1889
CAM.1271		5 Follen St	Cambridge	1853
CAM.1273		6 Follen St	Cambridge	1868
CAM.1338		8 Follen St	Cambridge	1871
CAM.149	Second Waterhouse House	9 Follen St	Cambridge	1844
CAM.150		10 Follen St	Cambridge	1875
CAM.1274		13 Follen St	Cambridge	1900
CAM.151	Richards, Theodore W. House	15 Follen St	Cambridge	1900
CAM.1275		19 Follen St	Cambridge	1844
CAM.1276		20 Follen St	Cambridge	1949
CAM.1277		21 Follen St	Cambridge	1841
CAM.1278		22 Follen St	Cambridge	1951
CAM.1279		25 Follen St	Cambridge	1889
CAM.152	Clover Den - Mann, Mary House	29 Follen St	Cambridge	1837
CAM.1280		34 Follen St	Cambridge	1946
CAM.1281		36 Follen St	Cambridge	1847
CAM.1282		44 Follen St	Cambridge	1862
CAM.338	Puritan Arms	46-50 Follen St	Cambridge	1940
CAM.1331	Homer - Lovell House	11 Forest St	Cambridge	1867
CAM.153	Francis, Ebenezer Houuse	1 Francis Ave	Cambridge	1836
CAM.721		6 Francis Ave	Cambridge	1940
CAM.722		7 Francis Ave	Cambridge	1894
CAM.723		8 Francis Ave	Cambridge	1940
CAM.724		9 Francis Ave	Cambridge	c 1875
CAM.725		10 Francis Ave	Cambridge	1894
CAM.726		11 Francis Ave	Cambridge	1894
CAM.1337		12-14 Francis Ave	Cambridge	1895
CAM.727		16 Francis Ave	Cambridge	1906
CAM.154	Davis, William Morris House	17 Francis Ave	Cambridge	r 1895
CAM.728		18 Francis Ave	Cambridge	1911
CAM.155	Hyatt, Prof. Alpheus - Durant, Prof. Will B. House	19 Francis Ave	Cambridge	1889
CAM.729		21 Francis Ave	Cambridge	1925
CAM.730		22 Francis Ave	Cambridge	1912
CAM.731		23 Francis Ave	Cambridge	1902
CAM.732		24 Francis Ave	Cambridge	1906
CAM.733		30 Francis Ave	Cambridge	1905
CAM.734		32 Francis Ave	Cambridge	1903

Inv. No.	Property Name	Street	Town	Year
CAM.735	Center for the Study of World Religions	42 Francis Ave	Cambridge	1959
CAM.736		44 Francis Ave	Cambridge	1913
CAM.737		53 Francis Ave	Cambridge	1913
CAM.738		56 Francis Ave	Cambridge	1914
CAM.739		57 Francis Ave	Cambridge	1913
CAM.740		59 Francis Ave	Cambridge	1916
CAM.741		60 Francis Ave	Cambridge	1961
CAM.742		63 Francis Ave	Cambridge	1913
CAM.743	Sert, Jose Luis House	64 Francis Ave	Cambridge	1957
CAM.744		65 Francis Ave	Cambridge	1916
CAM.745		67 Francis Ave	Cambridge	1926
CAM.746		68 Francis Ave	Cambridge	1921
CAM.747		70 Francis Ave	Cambridge	1879
CAM.748		73 Francis Ave	Cambridge	1926
CAM.749		75-77 Francis Ave	Cambridge	1925
CAM.1329	Kennedy, F. A. Steam Bakery	129 Franklin St	Cambridge	1875
CAM.919	Fresh Pond Lane over B & M Railroad	Fresh Pond Ln	Cambridge	1926
CAM.9014	Fresh Pond Parkway	Fresh Pond Pkwy	Cambridge	1899
CAM.9015	Fresh Pond Parkway - Concord Avenue Rotary Islands	Fresh Pond Pkwy	Cambridge	1928
CAM.9016	Fresh Pond Parkway - New Street Rotary	Fresh Pond Pkwy	Cambridge	1928
CAM.9017	Fresh Pond Parkway Tree Canopy	Fresh Pond Pkwy	Cambridge	r 1920
CAM.9018	Fresh Pond Parkway Median System	Fresh Pond Pkwy	Cambridge	c 1958
CAM.156	Wyeth - Eliot, Charles House	17 Fresh Pond Pkwy	Cambridge	1838
CAM.157	Frost, Walter House	10 Frost St	Cambridge	1807
CAM.800	Old Burying Ground	Garden St	Cambridge	r 1750
CAM.940	Milestone, 1767	Garden St	Cambridge	1734
CAM.158	Christ Church	0 Garden St	Cambridge	1760
CAM.159	Saunders, William House	1 Garden St	Cambridge	1821
CAM.339		2 Garden St	Cambridge	1835
CAM.340	Howe, Sarah House	3 Garden St	Cambridge	1851
CAM.160	First Church in Cambridge Congregational	11 Garden St	Cambridge	1870
CAM.341		17-19 Garden St	Cambridge	1926
CAM.161	Sears Tower - Harvard Observatory	60 Garden St	Cambridge	1843
CAM.162	Warner House	63 Garden St	Cambridge	1855
CAM.163	Gray, Asa House	88 Garden St	Cambridge	1810
CAM.1240		91 Garden St	Cambridge	1922
CAM.164	Taylor Square Firehouse	113 Garden St	Cambridge	1904

Inv. No.	Property Name	Street	Town	Year
CAM.165	Warren, H. Langford House	6 Garden Terr	Cambridge	1904
CAM.671	Rollins, John House	16 Garfield St	Cambridge	1891
CAM.672	Wood, Edward House	18 Garfield St	Cambridge	1886
CAM.1336	Shepherd, Herbert House	31-33 Garfield St	Cambridge	1886
CAM.673	Farquhar, Robert House	34 Garfield St	Cambridge	1890
CAM.674	Coon, Sarah House	36 Garfield St	Cambridge	1887
CAM.666	Shepherd, Edward House	39 Garfield St	Cambridge	1885
CAM.675	Thayer, Bertha House	44 Garfield St	Cambridge	1888
CAM.667	Estabrook, J. W. House	45 Garfield St	Cambridge	1886
CAM.668	Bartlett, A. S. House	49 Garfield St	Cambridge	1888
CAM.676	Green, Roscoe House	54 Garfield St	Cambridge	1890
CAM.669	Dewey House	55 Garfield St	Cambridge	1889
CAM.677	Worcester, George House	58 Garfield St	Cambridge	1890
CAM.678	Allen, Frank House	64 Garfield St	Cambridge	1891
CAM.670	Sullivan, Cornelius House	67 Garfield St	Cambridge	1889
CAM.679	Farnsworth, Charles House	74 Garfield St	Cambridge	1897
CAM.680	Ball, Elijah House	80 Garfield St	Cambridge	1887
CAM.502	Lechmere Point Corporation Row House	47 Gore St	Cambridge	c 1821
CAM.503	Lechmere Point Corporation Row House	49 Gore St	Cambridge	c 1821
CAM.504	Lechmere Point Corporation Row House	51 Gore St	Cambridge	c 1821
CAM.1407	Carr, M. W. and Company Factory - Building #4	63 Gorham St	Cambridge	r 1920
CAM.1241		1 Gray Gardens East	Cambridge	1925
CAM.1242		2 Gray Gardens East	Cambridge	1930
CAM.1243		3 Gray Gardens East	Cambridge	1923
CAM.1244		8 Gray Gardens East	Cambridge	1923
CAM.1245		9 Gray Gardens East	Cambridge	1922
CAM.1246		11 Gray Gardens East	Cambridge	1924
CAM.1247		12 Gray Gardens East	Cambridge	1922
CAM.1248		13 Gray Gardens East	Cambridge	1925
CAM.1249		16 Gray Gardens East	Cambridge	1922
CAM.1250		17 Gray Gardens East	Cambridge	1958
CAM.1251		19 Gray Gardens East	Cambridge	1927
CAM.1252		22 Gray Gardens East	Cambridge	1962
CAM.1253		25 Gray Gardens East	Cambridge	1926
CAM.1254		26 Gray Gardens East	Cambridge	1922
CAM.1255		27 Gray Gardens East	Cambridge	1923
CAM.1256		30 Gray Gardens East	Cambridge	1928
CAM.1257		31 Gray Gardens East	Cambridge	1924

Inv. No.	Property Name	Street	Town	Year
CAM.1258		37 Gray Gardens East	Cambridge	1923
CAM.1259		3 Gray Gardens West	Cambridge	1923
CAM.1260		4 Gray Gardens West	Cambridge	1922
CAM.1261		11 Gray Gardens West	Cambridge	1923
CAM.1262		14 Gray Gardens West	Cambridge	1924
CAM.1263		15 Gray Gardens West	Cambridge	1929
CAM.1264		16 Gray Gardens West	Cambridge	1925
CAM.167	Hall Tavern	20 Gray Gardens West	Cambridge	r 1800
CAM.1265		24 Gray Gardens West	Cambridge	1928
CAM.166	Frost, David House	26 Gray St	Cambridge	1815
CAM.618		133 Green St	Cambridge	c 1894
CAM.624	Raymond, T. H. Warehouse	175 Green St	Cambridge	1908
CAM.1389		205-207 Green St	Cambridge	
CAM.534	Inman Square Fire Station	Hampshire St	Cambridge	1912
CAM.168	Lamson, Rufus House	72-74 Hampshire St	Cambridge	1854
CAM.1367	Massachusetts Avenue Baptist Church	146 Hampshire St	Cambridge	1902
CAM.169	Opposition House	2-4 Hancock Pl	Cambridge	1807
CAM.170		104-106 Hancock St	Cambridge	1839
CAM.171	Atwood, Ephraim House	110 Hancock St	Cambridge	1839
CAM.536	Fay, Samuel P. P. House	172 Harvard St	Cambridge	1805
CAM.549	Allen Block	177-183 Harvard St	Cambridge	r 1875
CAM.1354	Courtney, Benjamin House	273 Harvard St	Cambridge	1867
CAM.172	Jones, William R. House	307 Harvard St	Cambridge	1865
CAM.173	Vinal, Albert House	325 Harvard St	Cambridge	1853
CAM.681	Melledge, James P. House	335 Harvard St	Cambridge	1850
CAM.684	Warner, Caleb House	336 Harvard St	Cambridge	1858
CAM.682		337 Harvard St	Cambridge	1887
CAM.685	Frothingham, Amos House	338 Harvard St	Cambridge	1859
CAM.686	Goepper, William House	340 Harvard St	Cambridge	1897
CAM.683		341-343 Harvard St	Cambridge	1855
CAM.687	Rindge, Samuel Baker House	342-344 Harvard St	Cambridge	1857
CAM.174	Bradbury, William F. House	369 Harvard St	Cambridge	1877
CAM.175	Hapgood, Richard House	382-392 Harvard St	Cambridge	1889
CAM.176	Ware Hall	383 Harvard St	Cambridge	1893
CAM.1099	Delta Upsilon Club	396 Harvard St	Cambridge	1914
CAM.177	Old Cambridge Baptist Church	398 Harvard St	Cambridge	1867
CAM.193	Austin Hall	Harvard University	Cambridge	1881
CAM.178	Holden Chapel - Harvard University	Harvard Yard	Cambridge	1764

Inv. No.	Property Name	Street	Town	Year
CAM.179	Sever Hall	Harvard Yard	Cambridge	1880
CAM.180	University Hall	Harvard Yard	Cambridge	1812
CAM.181	Harvard Hall - Harvard University	Harvard Yard	Cambridge	1764
CAM.182	Hollis Hall - Harvard University	Harvard Yard	Cambridge	1762
CAM.183	Massachusetts Hall	Harvard Yard	Cambridge	1718
CAM.184	Weld Hall - Harvard University	Harvard Yard	Cambridge	1870
CAM.185	Boylston Hall - Harvard University	Harvard Yard	Cambridge	1857
CAM.186	Holworthy Hall - Harvard University	Harvard Yard	Cambridge	1811
CAM.187	Grays Hall - Harvard University	Harvard Yard	Cambridge	1862
CAM.188	Lehman Hall - Harvard University	Harvard Yard	Cambridge	1924
CAM.189	Matthews House - Harvard University	Harvard Yard	Cambridge	1871
CAM.190	Straus Hall - Harvard University	Harvard Yard	Cambridge	1926
CAM.191	Thayer Hall - Harvard University	Harvard Yard	Cambridge	1869
CAM.192	Wigglesworth Hall - Harvard University	Harvard Yard	Cambridge	1930
CAM.953	Harvard University - 1857 Gate	Harvard Yard	Cambridge	1901
CAM.954	Harvard University - 1870 Gate	Harvard Yard	Cambridge	1901
CAM.955	Harvard University - 1873 Tablet	Harvard Yard	Cambridge	1901
CAM.956	Harvard University - 1874 Gate	Harvard Yard	Cambridge	1901
CAM.957	Harvard University - 1875 Gate	Harvard Yard	Cambridge	1901
CAM.958	Harvard University - 1881 Gate	Harvard Yard	Cambridge	1906
CAM.959	Harvard University - 1885 Gate	Harvard Yard	Cambridge	1904
CAM.960	Harvard University - 1886 Gate	Harvard Yard	Cambridge	1901
CAM.961	Harvard University - 1887 Gate	Harvard Yard	Cambridge	1906
CAM.962	Harvard University - 1888 Gate	Harvard Yard	Cambridge	1906
CAM.963	Harvard University - 1889 Gate	Harvard Yard	Cambridge	1901
CAM.964	Harvard University - 1890 Gate	Harvard Yard	Cambridge	1901
CAM.965	Harvard University - 1880 Gate	Harvard Yard	Cambridge	1902
CAM.966	Harvard University - Bradley Fountain	Harvard Yard	Cambridge	1910
CAM.967	Harvard University - Chinese Steel	Harvard Yard	Cambridge	r 1810
CAM.968	Harvard University - Delivery Gate	Harvard Yard	Cambridge	1948
CAM.969	Harvard University - Driveway Gate	Harvard Yard	Cambridge	1948
CAM.970	Harvard University - 1908 Gate	Harvard Yard	Cambridge	1936
CAM.971	Harvard University - Emerson Gate	Harvard Yard	Cambridge	1936
CAM.972	Harvard University - Fire Station Gate	Harvard Yard	Cambridge	1970
CAM.973	Harvard University - Hollis Pump	Harvard Yard	Cambridge	1936
CAM.974	Harvard University - 1876 Gate	Harvard Yard	Cambridge	1901
CAM.975	Harvard University - Harvard, John Statue	Harvard Yard	Cambridge	1884
CAM.976	Harvard University - Johnston Gate	Harvard Yard	Cambridge	1889

Inv. No.	Property Name	Street	Town	Year
CAM.977	Harvard University - Lamont Gate	Harvard Yard	Cambridge	1948
CAM.978	Harvard University - Gatehouse	Harvard Yard	Cambridge	1983
CAM.979	Harvard University - 1879 Gate	Harvard Yard	Cambridge	1891
CAM.980	Harvard University - Onion	Harvard Yard	Cambridge	1965
CAM.981	Harvard University - Porcellian Gate	Harvard Yard	Cambridge	1901
CAM.982	Harvard University - Reclining Figure	Harvard Yard	Cambridge	1972
CAM.983	Harvard University - Robinson Gate	Harvard Yard	Cambridge	1936
CAM.984	Harvard University - 1870 Sundial	Harvard Yard	Cambridge	1901
CAM.985	Harvard University - 1877 Gate	Harvard Yard	Cambridge	1901
CAM.1214	Harvard University - Canaday Hall	Harvard Yard	Cambridge	1973
CAM.1215	Harvard University - Emerson Hall	Harvard Yard	Cambridge	1904
CAM.1216	Harvard University - Houghton Library	Harvard Yard	Cambridge	1941
CAM.1217	Harvard University - Lamont Library	Harvard Yard	Cambridge	1947
CAM.1218	Harvard University - Lionel Hall	Harvard Yard	Cambridge	1924
CAM.1219	Harvard University - Memorial Church	Harvard Yard	Cambridge	1931
CAM.1220	Harvard University - Mower Hall	Harvard Yard	Cambridge	1924
CAM.1221	Brooks, Phillips House - Harvard University	Harvard Yard	Cambridge	1898
CAM.1222	Harvard University - Pusey Library	Harvard Yard	Cambridge	1973
CAM.1223	Harvard University - Robinson Hall	Harvard Yard	Cambridge	1900
CAM.1224	Harvard University - Stoughton Hall	Harvard Yard	Cambridge	1804
CAM.1227	Harvard University - Widener Library	Harvard Yard	Cambridge	1913
CAM.520		6 Hastings Sq	Cambridge	1884
CAM.1231	Bates, Jacob H. House	11 Hawthorn St	Cambridge	1813
CAM.194	Daly, Reginald A. House	23 Hawthorn St	Cambridge	c 1885
CAM.195	Wadsworth House	31 Hawthorn St	Cambridge	r 1935
CAM.196		35 Hawthorn St	Cambridge	r 1935
CAM.197	Glaser, Dorothy Merriless House	37 Hawthorn St	Cambridge	1937
CAM.198		41 Hawthorn St	Cambridge	1911
CAM.199	Maynardier, G. B. House	43 Hawthorn St	Cambridge	1900
CAM.1232		49 Hawthorn St	Cambridge	1900
CAM.521		75 Henry St	Cambridge	1892
CAM.1343		82-84 Henry St	Cambridge	
CAM.200	Noyes, J. A. House	1 Highland St	Cambridge	1894
CAM.796	Usher, Samuel House	11 Hillside Ave	Cambridge	1887
CAM.750		11 Holden St	Cambridge	1928
CAM.751		41 Holden St	Cambridge	1840
CAM.752		45 Holden St	Cambridge	1928
CAM.1383	Chadwick, Samuel E. House	10 Hollis St	Cambridge	1853

Inv. No.	Property Name	Street	Town	Year
CAM.1100	Alpha Delta Phi Club - Fly Club	2 Holyoke Pl	Cambridge	1896
CAM.1101		9 Holyoke Pl	Cambridge	c 1930
CAM.1197	Lowell House - Harvard University	10 Holyoke Pl	Cambridge	1929
CAM.1198	Indoor Athletic Building - Harvard University	35-41 Holyoke Pl	Cambridge	1929
CAM.1102		8-10 Holyoke St	Cambridge	1927
CAM.201	Hasty Pudding Club	12 Holyoke St	Cambridge	1887
CAM.1103	Apley Court	16 Holyoke St	Cambridge	1897
CAM.1104	Sawyer, Samuel F. House	20 Holyoke St	Cambridge	1818
CAM.1105		22 Holyoke St	Cambridge	1956
CAM.1106		24 Holyoke St	Cambridge	1963
CAM.1107	Owl Club	30 Holyoke St	Cambridge	1905
CAM.1302		2 Hubbard Pk	Cambridge	1909
CAM.1293		3 Hubbard Pk	Cambridge	1887
CAM.1306	Warren, John L. House	5 Hubbard Pk	Cambridge	1922
CAM.1305	Paine, George House	6 Hubbard Pk	Cambridge	c 1918
CAM.1295		8 Hubbard Pk	Cambridge	1888
CAM.1301	Nutting, Lillian House	12 Hubbard Pk	Cambridge	1908
CAM.1297		14 Hubbard Pk	Cambridge	1892
CAM.1304		15 Hubbard Pk	Cambridge	1914
CAM.1303	Beach, Revel W. House	19 Hubbard Pk	Cambridge	1913
CAM.1298		20 Hubbard Pk	Cambridge	1892
CAM.1299		26 Hubbard Pk	Cambridge	1894
CAM.1296		32 Hubbard Pk	Cambridge	1890
CAM.1346		15 Humboldt St	Cambridge	
CAM.904	Huron Avenue Bridge over B & M Railroad	Huron Ave	Cambridge	1892
CAM.202	Syrian Orthodox Catholic Church of Saint Mary	8 Inman St	Cambridge	1822
CAM.576	Matthews Apartments	12 Inman St	Cambridge	1966
CAM.1364	Bennett, James House	17 Inman St	Cambridge	1871
CAM.1349	Luke Rowhouse	19 Inman St	Cambridge	1877
CAM.1350	Luke Rowhouse	21 Inman St	Cambridge	1877
CAM.1351	Luke Rowhouse	21 1/2 Inman St	Cambridge	1877
CAM.203		102-104 Inman St	Cambridge	1845
CAM.204		106-108 Inman St	Cambridge	1845
CAM.205		110-112 Inman St	Cambridge	1845
CAM.753		80-82 Irving St	Cambridge	1927
CAM.754		81 Irving St	Cambridge	1916
CAM.755		84-86 Irving St	Cambridge	1927
CAM.756		89 Irving St	Cambridge	1916

Inv. No.	Property Name	Street	Town	Year
CAM.206	James, William House	95 Irving St	Cambridge	1889
CAM.757		99 Irving St	Cambridge	1889
CAM.758		103-103A Irving St	Cambridge	1889
CAM.207	cummings, e. e. House	104 Irving St	Cambridge	1893
CAM.759	Van Dael - DeSola Pool House	105 Irving St	Cambridge	1890
CAM.760		107 Irving St	Cambridge	1891
CAM.761		109 Irving St	Cambridge	1893
CAM.762	Davis, Robert House	110 Irving St	Cambridge	1889
CAM.763		114 Irving St	Cambridge	1911
CAM.764		133 Irving St	Cambridge	1963
CAM.765	American Academy of Arts and Sciences	136 Irving St	Cambridge	1980
CAM.766		138 Irving St	Cambridge	1912
CAM.297	Radcliffe College - Schlesinger Library	James St	Cambridge	1907
CAM.950	Winthrop Square Park	Kennedy St	Cambridge	1631
CAM.1108	Abbott Building	5 Kennedy St	Cambridge	1908
CAM.1109		9-25 Kennedy St	Cambridge	1887
CAM.1110	Farwell, Levi Tenant House	10-14 Kennedy St	Cambridge	c 1820
CAM.1111	Read Block	18-28 Kennedy St	Cambridge	1885
CAM.1112		29-41 Kennedy St	Cambridge	1971
CAM.1113		30 Kennedy St	Cambridge	1936
CAM.1114	Garage, The	34-42 Kennedy St	Cambridge	1924
CAM.1115	Fox Club	44 Kennedy St	Cambridge	1906
CAM.1116	Drayton Hall	48 Kennedy St	Cambridge	1901
CAM.1117		50 Kennedy St	Cambridge	1892
CAM.1118		52-54 Kennedy St	Cambridge	1884
CAM.1119	Galeria	55-57 Kennedy St	Cambridge	1974
CAM.1120		56 Kennedy St	Cambridge	1903
CAM.1121	S. A. E. Club	60 Kennedy St	Cambridge	1929
CAM.1122		63-65 Kennedy St	Cambridge	1984
CAM.1200	Hicks, John House - Harvard University	64 Kennedy St	Cambridge	1762
CAM.1199	Smith Hall - Harvard University	70-78 Kennedy St	Cambridge	1913
CAM.208	Loring, Judge Edward - Peirce, Benjamin House	4 Kirkland Pl	Cambridge	1856
CAM.688	Merrill, John House	9 Kirkland Pl	Cambridge	1855
CAM.689	Shaw, Southworth House	10 Kirkland Pl	Cambridge	1856
CAM.690	Green, Louise House	11 Kirkland Pl	Cambridge	1921
CAM.691	Cutler, Isaac House	12 Kirkland Pl	Cambridge	1857
CAM.692	Cutler, George House	13 Kirkland Pl	Cambridge	1857
CAM.693	Ware House	14 Kirkland Pl	Cambridge	1839

Inv. No.	Property Name	Street	Town	Year
CAM.209	Treadwell - Sparks House	21 Kirkland St	Cambridge	1838
CAM.210	Brooks, Luther House	34 Kirkland St	Cambridge	1840
CAM.211	Lovering, Joseph House	38 Kirkland St	Cambridge	1839
CAM.767		49 Kirkland St	Cambridge	1886
CAM.768		55 Kirkland St	Cambridge	1927
CAM.769		57-59 Kirkland St	Cambridge	1927
CAM.212	Eliot, Charles W. House	61 Kirkland St	Cambridge	1858
CAM.213	Child, Francis J. House	67 Kirkland St	Cambridge	1861
CAM.9019	Brown-Rhone, Jill Park	Lafayette Sq	Cambridge	2007
CAM.214	Fresh Pond Hotel	234 Lakeview Ave	Cambridge	1796
CAM.1013		13 Lancaster St	Cambridge	c 1880
CAM.1005		16 Lancaster St	Cambridge	1892
CAM.1006		18 Lancaster St	Cambridge	1885
CAM.1007		24 Lancaster St	Cambridge	1883
CAM.1014	Sawyer, Chester House	27 Lancaster St	Cambridge	1886
CAM.1015	Hovey, William B. House	29 Lancaster St	Cambridge	1887
CAM.1008		36 Lancaster St	Cambridge	1886
CAM.215	Yerxa House and Carriage House	37 Lancaster St	Cambridge	1887
CAM.216	Larches, The	22 Larch Rd	Cambridge	c 1808
CAM.1317	Metropolitan District Commission Boat House	Lechmere Canal	Cambridge	1910
CAM.217		15-17 Lee St	Cambridge	1856
CAM.218	Lowell, The	33 Lexington Ave	Cambridge	1900
CAM.1123		5-7 Linden St	Cambridge	c 1867
CAM.1124	Harvard Square Squash Court	8-10 Linden St	Cambridge	1908
CAM.1125	Delphic Club	9 Linden St	Cambridge	1902
CAM.219	Apthorp, Rev. East House	10 Linden St	Cambridge	c 1760
CAM.220	Cooper - Frost - Austin House	21 Linnaean St	Cambridge	1681
CAM.221	Peabody Court Apartments	41-43 Linnaean St	Cambridge	1922
CAM.1234	Cambridge Friends Meetinghouse and Center	5 Longfellow Pk	Cambridge	1914
CAM.1233		6 Longfellow Pk	Cambridge	1901
CAM.222	Lowell School	25 Lowell St	Cambridge	1883
CAM.1319	Magazine Beach Bath House	Magazine Beach	Cambridge	1899
CAM.223	First Baptist Church, Cambridge	5 Magazine St	Cambridge	1881
CAM.637	Church Corners Apartments	8-12 Magazine St	Cambridge	1985
CAM.510	Pilgrim Congregational Church	35 Magazine St	Cambridge	1871
CAM.511	Hinman, Joseph House	48 Magazine St	Cambridge	1875
CAM.512	Brewer, Isaac D. - Pulsifer, William Double House	50-52 Magazine St	Cambridge	1852

Inv. No.	Property Name	Street	Town	Year
CAM.513	Grace Methodist Church	56 Magazine St	Cambridge	1886
CAM.224	Flentje, Ernst House	129 Magazine St	Cambridge	1866
CAM.991	Shell Sign	187 Magazine St	Cambridge	1933
CAM.87	Kendall Square Subway Station	Main St	Cambridge	1912
CAM.225	Kendall Square Substation	Main St	Cambridge	1911
CAM.1308	Davenport - Allen and Endicott Factory Headhouse	Main St	Cambridge	1882
CAM.1309	Davenport - Allen and Endicott Factory East Wing	Main St	Cambridge	1848
CAM.1335	Luke Building	135-145 Main St	Cambridge	1874
CAM.1384	Engine House No. 7	350 Main St	Cambridge	c 1895
CAM.328	Union #2 Engine House	787-789 Main St	Cambridge	1852
CAM.609	Bright Building	853 Main St	Cambridge	1898
CAM.608	Wentworth Building	859-863 Main St	Cambridge	1897
CAM.610	Union Baptist Church	872 Main St	Cambridge	1882
CAM.607	Mellen Building	875 Main St	Cambridge	1897
CAM.606	Andelman, Ezra Building	877-881 Main St	Cambridge	1941
CAM.611	Sawyer, Charles Tenement	882-884 Main St	Cambridge	c 1873
CAM.605	Whitney, Lucretia and Henry Building	893-907 Main St	Cambridge	1870
CAM.703		6 Maple Ave	Cambridge	
CAM.694	Stevens, Charles B. House	8 Maple Ave	Cambridge	1873
CAM.704		12 Maple Ave	Cambridge	
CAM.705		14-16 Maple Ave	Cambridge	
CAM.702		15 Maple Ave	Cambridge	
CAM.701		19 Maple Ave	Cambridge	
CAM.697	Webster, Francis B. House	20 Maple Ave	Cambridge	1861
CAM.695	Hall, Lewis House	23 Maple Ave	Cambridge	1867
CAM.706		24 Maple Ave	Cambridge	
CAM.700		25 Maple Ave	Cambridge	r 1920
CAM.707		26 Maple Ave	Cambridge	
CAM.699		27 Maple Ave	Cambridge	
CAM.698		29 Maple Ave	Cambridge	
CAM.696	Munroe, Philip House	31 Maple Ave	Cambridge	1887
CAM.226	Mason, Josiah Jr. House	11 Market St	Cambridge	1831
CAM.295	Radcliffe College Gymnasium	Mason St	Cambridge	1898
CAM.296	Radcliffe College - Agassiz House	Mason St	Cambridge	1904
CAM.227	Norton House Ell	4 Mason St	Cambridge	1847
CAM.228		6-12 Mason St	Cambridge	

Inv. No.	Property Name	Street	Town	Year
CAM.260	M. I. T. Alumni Swimming Pool Building	Massachusetts Ave	Cambridge	1940
CAM.261	Kresge Auditorium	Massachusetts Ave	Cambridge	1953
CAM.262	M. I. T. Chapel	Massachusetts Ave	Cambridge	1954
CAM.901	Harvard Square Subway Kiosk	Massachusetts Ave	Cambridge	1928
CAM.905	Massachusetts Avenue Bridge over Conrail	Massachusetts Ave	Cambridge	1900
CAM.916	Central Square Subway Station	Massachusetts Ave	Cambridge	1912
CAM.921	Harvard Bridge	Massachusetts Ave	Cambridge	r 1890
CAM.938	Cambridge Common	Massachusetts Ave	Cambridge	1631
CAM.939	Cambridge Common South Traffic Island	Massachusetts Ave	Cambridge	1976
CAM.945	Burying Ground Fence	Massachusetts Ave	Cambridge	1891
CAM.946	Flagstaff Park	Massachusetts Ave	Cambridge	1913
CAM.947	North Little Common	Massachusetts Ave	Cambridge	c 1858
CAM.949	Central Square Street Pattern	Massachusetts Ave	Cambridge	c 1630
CAM.334	Cambridge Armory	120 Massachusetts Ave	Cambridge	1902
CAM.332	Metropolitan Storage Warehouse	134 Massachusetts Ave	Cambridge	1895
CAM.1366	New England Confectionery Company Factory	250 Massachusetts Ave	Cambridge	1927
CAM.612	Lamson, The	351-355 Massachusetts Ave	Cambridge	1907
CAM.614	Lafayette Square Fire Station	378 Massachusetts Ave	Cambridge	1893
CAM.613	Shell Gas Station	385 Massachusetts Ave	Cambridge	1948
CAM.615	Salvation Army - Cambridge Citadel	400-402 Massachusetts Ave	Cambridge	1968
CAM.604		401-409 Massachusetts Ave	Cambridge	1966
CAM.603	Taylor, William A. House and Shop	411-413 Massachusetts Ave	Cambridge	1887
CAM.602	Barkin and Gorfinkle Building	415-429 Massachusetts Ave	Cambridge	1925
CAM.616	Kennedy, Frank A. Store	424 Massachusetts Ave	Cambridge	1896
CAM.617	Kutz, Issac Store	428 Massachusetts Ave	Cambridge	c 1910
CAM.229	Kennedy, The	430-442 Massachusetts Ave	Cambridge	1890
CAM.601	Robbins Building	433-447 Massachusetts Ave	Cambridge	1923
CAM.619	Blanchard Building	448-450 Massachusetts Ave	Cambridge	c 1886
CAM.324	South Row	452-458 Massachusetts Ave	Cambridge	1807
CAM.1393	Dana Row - South Row	452-458 Massachusetts Ave	Cambridge	2003
CAM.599	Rogers, F. W. and G. M. Building	453-457 Massachusetts Ave	Cambridge	1885
CAM.620	Freedman Building	460-464 Massachusetts Ave	Cambridge	1933
CAM.598	McDonald's Restaurant	463-467 Massachusetts Ave	Cambridge	1974
CAM.621	Central Square Realty Trust Building	468-480 Massachusetts Ave	Cambridge	1929
CAM.597	Moller's Furniture Store	485 Massachusetts Ave	Cambridge	1926
CAM.622	Longfellow, The	492-498 Massachusetts Ave	Cambridge	1893
CAM.596	Kane's Furniture Store	493-507 Massachusetts Ave	Cambridge	1916
CAM.625	Burger King Restaraunt	506 Massachusetts Ave	Cambridge	1970

Inv. No.	Property Name	Street	Town	Year
CAM.1394	Hovey, Phineas Building	512-514 Massachusetts Ave	Cambridge	1842
CAM.595	Central Trust Building	515-527 Massachusetts Ave	Cambridge	1927
CAM.627	Miller Store	520 Massachusetts Ave	Cambridge	1924
CAM.628	Rosenwald Realty Corporation Building	522-526 Massachusetts Ave	Cambridge	1928
CAM.230	Odd Fellows Hall	536 Massachusetts Ave	Cambridge	1884
CAM.629	Clark - Lamb Building	546-550 Massachusetts Ave	Cambridge	c 1873
CAM.630	Albani Building	552-566 Massachusetts Ave	Cambridge	1925
CAM.592	Bullock, Charles Building	567-569 Massachusetts Ave	Cambridge	1859
CAM.591	Central Square Theater	571-577 Massachusetts Ave	Cambridge	1917
CAM.631	Ginsberg Building - Harvard Bazar	572-590 Massachusetts Ave	Cambridge	1913
CAM.590	Morse, Asa P. Building	579-587 Massachusetts Ave	Cambridge	1893
CAM.589	Cambridgeport National Bank Building	593-597 Massachusetts Ave	Cambridge	1869
CAM.632	Manhattan Market - Purity Supreme Super Market	596-610 Massachusetts Ave	Cambridge	1899
CAM.588	Morse, Asa Second Building	599-601 Massachusetts Ave	Cambridge	1905
CAM.587	Fisk and Coleman Building	603-605 Massachusetts Ave	Cambridge	1892
CAM.633	Prospect House	614-620 Massachusetts Ave	Cambridge	1869
CAM.586	Corcoran, John H. Building	615-627 Massachusetts Ave	Cambridge	1927
CAM.634	Holmes Block I	624-638 Massachusetts Ave	Cambridge	1915
CAM.1395	New Holmes Block	624-638 Massachusetts Ave	Cambridge	1998
CAM.585	Woolworth, F. W. Building	633-641 Massachusetts Ave	Cambridge	1950
CAM.584	Watriss Building	643-649 Massachusetts Ave	Cambridge	1880
CAM.583	Dowse, Thomas House	653-655 Massachusetts Ave	Cambridge	1814
CAM.581	New England Gas and Electric Association II Bldg	671-675 Massachusetts Ave	Cambridge	1966
CAM.642	Central Square Building	674 Massachusetts Ave	Cambridge	1926
CAM.643	Chamberlain - Hyde Building	684-688 Massachusetts Ave	Cambridge	1869
CAM.580	Cambridgeport Savings Bank	689 Massachusetts Ave	Cambridge	1904
CAM.644	Dana Building	692-698 Massachusetts Ave	Cambridge	1872
CAM.645	Southwick Building	700-706 Massachusetts Ave	Cambridge	1908
CAM.646	Norris Building	710-720 Massachusetts Ave	Cambridge	1916
CAM.579	Cambridge Electric Light Building	719 Massachusetts Ave	Cambridge	1912
CAM.647	Thayer Building I	722-724 Massachusetts Ave	Cambridge	1863
CAM.648	Thayer Building II	728-730 Massachusetts Ave	Cambridge	1868
CAM.578	Southwick Building	731-751 Massachusetts Ave	Cambridge	1896
CAM.649	Dobbins and Draper Store	736-750 Massachusetts Ave	Cambridge	1922
CAM.650	Dobbins and Draper Store	736-750 Massachusetts Ave	Cambridge	1922
CAM.231	Cambridge Mutual Fire Insurance Company Building	763 Massachusetts Ave	Cambridge	1888

Inv. No.	Property Name	Street	Town	Year
CAM.232	Central Square Post Office	770 Massachusetts Ave	Cambridge	1933
CAM.233	Cambridge City Hall	795 Massachusetts Ave	Cambridge	1889
CAM.651	Cambridge Senior Center	800-806 Massachusetts Ave	Cambridge	1925
CAM.652	Young Men's Christian Association Building	820-830 Massachusetts Ave	Cambridge	1896
CAM.1396	Brusch Medical Center	825-831 Massachusetts Ave	Cambridge	1951
CAM.653	Saint Peter's Episcopal Church	834 Massachusetts Ave	Cambridge	1867
CAM.654	Modern Manor Apartments	842-864 Massachusetts Ave	Cambridge	1925
CAM.900	Houghton Beech Tree	1000 Massachusetts Ave	Cambridge	
CAM.1127	Brentford Hall	1137 Massachusetts Ave	Cambridge	1899
CAM.1128	Dunham, Israel Houses	1156-1166 Massachusetts Ave	Cambridge	1858
CAM.1129		1168 Massachusetts Ave	Cambridge	c 1892
CAM.1130		1170-1174 Massachusetts Ave	Cambridge	c 1849
CAM.1131	Longfellow Court	1200 Massachusetts Ave	Cambridge	1916
CAM.1132	Gulf Gas Station	1201 Massachusetts Ave	Cambridge	1940
CAM.1133		1206 Massachusetts Ave	Cambridge	1965
CAM.1134		1208-1210 Massachusetts Ave	Cambridge	1842
CAM.1135	Quincy Hall	1218 Massachusetts Ave	Cambridge	1891
CAM.1136		1230 Massachusetts Ave	Cambridge	1907
CAM.1137		1234-1238 Massachusetts Ave	Cambridge	c 1894
CAM.1138	Hamden Hall	1246-1260 Massachusetts Ave	Cambridge	1902
CAM.1139	A. D. Club	1268-1270 Massachusetts Ave	Cambridge	1899
CAM.1140	Niles Building	1280 Massachusetts Ave	Cambridge	1984
CAM.234	Fairfax, The	1300-1306 Massachusetts Ave	Cambridge	1869
CAM.1141	Fairfax - Hilton Block	1310-1312 Massachusetts Ave	Cambridge	1883
CAM.1142	Fairfax - Hilton Block	1316 Massachusetts Ave	Cambridge	1885
CAM.235	Porcellian Club	1320-1324 Massachusetts Ave	Cambridge	1890
CAM.1143	Manter Hall	1325 Massachusetts Ave	Cambridge	1885
CAM.236	Wadsworth House	1341 Massachusetts Ave	Cambridge	1726
CAM.237	Holyoke Center	1350 Massachusetts Ave	Cambridge	1961
CAM.1144	Cambridge Savings Bank	1372-1376 Massachusetts Ave	Cambridge	1923
CAM.1145	Read, Joseph Stacey House	1380-1382 Massachusetts Ave	Cambridge	c 1783
CAM.1146	Bartlett, Joseph House	1384-1392 Massachusetts Ave	Cambridge	c 1800
CAM.1147	Harvard Coop Society	1400 Massachusetts Ave	Cambridge	1924
CAM.1148	Harvard Coop Society	1408-1410 Massachusetts Ave	Cambridge	1956
CAM.1149	Harvard Trust Company	1414 Massachusetts Ave	Cambridge	1923
CAM.1150	College House	1420-1442 Massachusetts Ave	Cambridge	1832
CAM.342	Gannett House	1511 Massachusetts Ave	Cambridge	1838
CAM.343	Hemenway Gymnasium	1517 Massachusetts Ave	Cambridge	1938

Inv. No.	Property Name	Street	Town	Year
CAM.344	Hastings Hall	1519 Massachusetts Ave	Cambridge	1888
CAM.345	Harvard Epworth Methodist Church	1555 Massachusetts Ave	Cambridge	1891
CAM.1334	Francis - Allyn House	1564 Massachusetts Ave	Cambridge	1831
CAM.1333	Sawin - Cobb - Wilson House	1626 Massachusetts Ave	Cambridge	1868
CAM.238	Saunders, Charles Hicks House	1627 Massachusetts Ave	Cambridge	1862
CAM.239	Montrose, The	1648 Massachusetts Ave	Cambridge	1898
CAM.240	Dunvegan, The	1654 Massachusetts Ave	Cambridge	1898
CAM.241	Worcester, Frederick House	1734 Massachusetts Ave	Cambridge	1886
CAM.242	North Avenue Congregational Church	1803 Massachusetts Ave	Cambridge	1845
CAM.243	Lovell Block	1853 Massachusetts Ave	Cambridge	1882
CAM.1385	Cambridge Masonic Temple	1950 Massachusetts Ave	Cambridge	1910
CAM.244	Saint James Episcopal Church	1991 Massachusetts Ave	Cambridge	1888
CAM.245	Henderson Carriage Repository	2067-2089 Massachusetts Ave	Cambridge	1892
CAM.246	Cornerstone Baptist Church	2114 Massachusetts Ave	Cambridge	1854
CAM.247	Mead, Alpheus House	2200 Massachusetts Ave	Cambridge	1867
CAM.248	Snow, Daniel House	2210 Massachusetts Ave	Cambridge	1868
CAM.249	McLean, Isaac House	2218 Massachusetts Ave	Cambridge	1894
CAM.250	Farwell, R. H. Double House	2222-2224 Massachusetts Ave	Cambridge	1891
CAM.251	Saint John's Roman Catholic Church	2270 Massachusetts Ave	Cambridge	1904
CAM.1390		2557 Massachusetts Ave	Cambridge	
CAM.1376	Matignon Central Catholic High School	1 Matignon Rd	Cambridge	1946
CAM.1375	Immaculate Conception Catholic Church Convent	33 Matignon Rd	Cambridge	1954
CAM.252	Cambridge Almshouse	45 Matignon Rd	Cambridge	1850
CAM.1374	Cambridge Almshouse Dormitory	45 Matignon Rd	Cambridge	c 1887
CAM.566	M. I. T. - Pierce, Henry L. Engineering Laboratory	Memorial Dr	Cambridge	1913
CAM.567	M. I. T. - Buildings #2 and #8	Memorial Dr	Cambridge	1913
CAM.568	M. I. T. - Pratt School of Naval Architecture	Memorial Dr	Cambridge	1919
CAM.569	M. I. T. - Homburg Infirmary	Memorial Dr	Cambridge	1927
CAM.570	M. I. T. - Eastman, George Research Laboratories	Memorial Dr	Cambridge	1931
CAM.571	M. I. T. - Rogers, William Barton Building	Memorial Dr	Cambridge	1937
CAM.572	M. I. T. - Walker Memorial	Memorial Dr	Cambridge	1913
CAM.573	M. I. T. - President's House	Memorial Dr	Cambridge	1913
CAM.574	M. I. T. - Senior House	Memorial Dr	Cambridge	1913
CAM.575	M. I. T. - Hayden Library	Memorial Dr	Cambridge	1949
CAM.930	Memorial Drive	Memorial Dr	Cambridge	1896
CAM.933	M. I. T. Memorial Underpass	Memorial Dr	Cambridge	1931

Inv. No.	Property Name	Street	Town	Year
CAM.934	Reid, William J. Overpass	Memorial Dr	Cambridge	1939
CAM.1332	Little, Arthur D. Inc. Building	Memorial Dr	Cambridge	1917
CAM.1398	Lever Brothers Company Administration Building	50 Memorial Dr	Cambridge	1938
CAM.253		100 Memorial Dr	Cambridge	1950
CAM.254	M. I. T. Main Courtyard	182-226 Memorial Dr	Cambridge	1913
CAM.255	Riverbank Court Hotel	305 Memorial Dr	Cambridge	1900
CAM.256	Baker House	362 Memorial Dr	Cambridge	1947
CAM.1327	Boston University Boat House	619 Memorial Dr	Cambridge	1913
CAM.257	B & B Chemical Company	780 Memorial Dr	Cambridge	1937
CAM.258	Peabody Terrace	900 Memorial Dr	Cambridge	1958
CAM.1201	Dunster House - Harvard University	945 Memorial Dr	Cambridge	1929
CAM.1202	Gore Hall - Harvard University	960 Memorial Dr	Cambridge	1913
CAM.1203	Standish Hall - Harvard University	966 Memorial Dr	Cambridge	1913
CAM.1204	Eliot House - Harvard University	967 Memorial Dr	Cambridge	1930
CAM.1324	Harvard University - Weld Boat House	971 Memorial Dr	Cambridge	1906
CAM.259	Conventual Church of Saint Mary and Saint John	980 Memorial Dr	Cambridge	1936
CAM.1267	Radnor Hall	983-984 Memorial Dr	Cambridge	1916
CAM.1268	Hampstead Hall	985-986 Memorial Dr	Cambridge	1916
CAM.1269	Barrington Court	987-989 Memorial Dr	Cambridge	1924
CAM.1270	Strathcona-on-the-Charles	992-993 Memorial Dr	Cambridge	1914
CAM.1300		2 Mercer Cir	Cambridge	1894
CAM.1287		3 Mercer Cir	Cambridge	1885
CAM.1288		4 Mercer Cir	Cambridge	1885
CAM.1294		5 Mercer Cir	Cambridge	1887
CAM.1291		6 Mercer Cir	Cambridge	1886
CAM.1307	Harris, William F. House	7 Mercer Cir	Cambridge	1922
CAM.1289		8 Mercer Cir	Cambridge	1885
CAM.1292		9 Mercer Cir	Cambridge	1886
CAM.1151		11-15 Mifflin Pl	Cambridge	1901
CAM.1152		12-14 Mifflin Pl	Cambridge	1913
CAM.1153		17-19 Mifflin Pl	Cambridge	1972
CAM.1205	McKinlock Hall - Harvard University	8 Mill St	Cambridge	1926
CAM.1206	Leverett House Library and Towers - Harvard Univ.	14-18 Mill St	Cambridge	1958
CAM.263	Cambridge Neighborhood House	79 Moore St	Cambridge	c 1821
CAM.264	Reversible Collar Company Building	25-27 Mount Auburn St	Cambridge	1860
CAM.1154	Saint Paul's Rectory	32-36 Mount Auburn St	Cambridge	1924
CAM.1155	Speakers Club	43-45 Mount Auburn St	Cambridge	1845

Inv. No.	Property Name	Street	Town	Year
CAM.1156		45 1/2 Mount Auburn St	Cambridge	1971
CAM.1157		47-49 Mount Auburn St	Cambridge	1926
CAM.1158	Claverly Hall	63 Mount Auburn St	Cambridge	1892
CAM.1159		65R Mount Auburn St	Cambridge	1957
CAM.1160	Ridgely Hall	65 Mount Auburn St	Cambridge	1904
CAM.1161	Manter Hall School	71-77 Mount Auburn St	Cambridge	1927
CAM.1162	Phoenix - S. K. Club	72 Mount Auburn St	Cambridge	1915
CAM.1163	Iroquois Club	74 Mount Auburn St	Cambridge	1916
CAM.1164	Spee Club	76 Mount Auburn St	Cambridge	1931
CAM.1165	Willard, Lucy House	78 Mount Auburn St	Cambridge	1839
CAM.1166		90 Mount Auburn St	Cambridge	1971
CAM.1167		92-96 Mount Auburn St	Cambridge	1895
CAM.1168		95-97 Mount Auburn St	Cambridge	1920
CAM.1169		99 Mount Auburn St	Cambridge	c 1919
CAM.1170	Cantabrigia Club	100 Mount Auburn St	Cambridge	c 1919
CAM.1171		102 Mount Auburn St	Cambridge	1869
CAM.1172		104 Mount Auburn St	Cambridge	1983
CAM.1173		110 Mount Auburn St	Cambridge	1959
CAM.9	Boston Elevated Railway Division 7 Headquarters	112 Mount Auburn St	Cambridge	c 1911
CAM.1175	Trinity Hall	114-120 Mount Auburn St	Cambridge	1892
CAM.1177	Waverly Hall	115 Mount Auburn St	Cambridge	1902
CAM.1178		119-123 Mount Auburn St	Cambridge	1988
CAM.1176		120R Mount Auburn St	Cambridge	1982
CAM.1126	U. S. Post Office - Cambridge Branch	125 Mount Auburn St	Cambridge	1953
CAM.791		151 Mount Auburn St	Cambridge	1853
CAM.792		153 Mount Auburn St	Cambridge	1874
CAM.789		154 Mount Auburn St	Cambridge	1852
CAM.790		156-158 Mount Auburn St	Cambridge	1856
CAM.265		173 Mount Auburn St	Cambridge	r 1905
CAM.266		175 Mount Auburn St	Cambridge	r 1895
CAM.267		259 Mount Auburn St	Cambridge	c 1850
CAM.268	Mount Auburn Hospital - Surgical Building	330 Mount Auburn St	Cambridge	1897
CAM.269	Mount Auburn Hospital - Main Building	330 Mount Auburn St	Cambridge	1886
CAM.801	Mount Auburn Cemetery	580 Mount Auburn St	Cambridge	1831
CAM.936	Mount Auburn Cemetery Fence and Gates	580 Mount Auburn St	Cambridge	1843
CAM.992	Mount Auburn Cemetery - Copenhagen, Maria Angel	580 Mount Auburn St	Cambridge	1872

Inv. No.	Property Name	Street	Town	Year
CAM.270	Mount Auburn Cemetery Reception House	583 Mount Auburn St	Cambridge	1870
CAM.1330	DeRosay - McNamee House	50 Mount Vernon St	Cambridge	1896
CAM.557		1-2 Norfolk Pl	Cambridge	1844
CAM.558		3 Norfolk Pl	Cambridge	1846
CAM.593	Powers, Hannah - Ginsberg, Harris Building	7-15 Norfolk St	Cambridge	c 1894
CAM.562	Hotel Norfolk	30 Norfolk St	Cambridge	1886
CAM.560		51 Norfolk St	Cambridge	c 1885
CAM.561		59 Norfolk St	Cambridge	1886
CAM.554		65-67 Norfolk St	Cambridge	1844
CAM.559	Pollard, John House	68-72 Norfolk St	Cambridge	1859
CAM.552		69 Norfolk St	Cambridge	1843
CAM.555		71-73 Norfolk St	Cambridge	1844
CAM.556		75-77 Norfolk St	Cambridge	1844
CAM.551	Fuller, Robert House	79 Norfolk St	Cambridge	1843
CAM.553		87 Norfolk St	Cambridge	1843
CAM.563	Hotel Franklin	90 Norfolk St	Cambridge	1886
CAM.1392	Saint Mary of the Annunciation Catholic Church	134 Norfolk St	Cambridge	r 1865
CAM.550		1-2 Norfolk Terr	Cambridge	1839
CAM.913	East Cambridge Viaduct - Lechmere Viaduct	O'Brien Hwy	Cambridge	1910
CAM.9020	Boston and Lowell Railroad Retaining Wall	O'Brien Hwy	Cambridge	c 1857
CAM.349	Lockhart, William L. Coffin Factory Warehouse	195-199 O'Brien Hwy	Cambridge	1873
CAM.271	Barnes, James B. House	200 O'Brien Hwy	Cambridge	1824
CAM.348	Lockhart, William L. Coffin Factory Main Building	201 O'Brien Hwy	Cambridge	r 1870
CAM.272	Lockart, William L. Company Building	209 O'Brien Hwy	Cambridge	c 1859
CAM.1400	Morrell, John and Company Branch House	221 O'Brien Hwy	Cambridge	1929
CAM.1399	Whitehead Metal Products Company	225 O'Brien Hwy	Cambridge	1929
CAM.273	Aborn, John House	41 Orchard St	Cambridge	1846
CAM.274	Billings, Frederick House	45 Orchard St	Cambridge	1846
CAM.1310	Davenport - Allen and Endicott Factory West Wing	Osborn St	Cambridge	1848
CAM.1311	Davenport - Allen Factory West Wing Extension	Osborn St	Cambridge	1848
CAM.1312	Allen and Endicott Factory Extension	Osborn St	Cambridge	1896
CAM.1313	Allen and Endicott Factory Extension	Osborn St	Cambridge	1896
CAM.461	Putnam School	Otis St	Cambridge	1889
CAM.465	Saint Hedwig's Parish Church	Otis St	Cambridge	1939
CAM.468	Otis Hospital	Otis St	Cambridge	
CAM.371	Woodbury, James A. - Geldowsky, Ferdinand Building	2-28 Otis St	Cambridge	1869

Inv. No.	Property Name	Street	Town	Year
CAM.374		31 Otis St	Cambridge	1900
CAM.473	Hall, Lewis and William A. Rowhouse	55 Otis St	Cambridge	1851
CAM.474	Hall, Lewis and William A. Rowhouse	57 Otis St	Cambridge	1851
CAM.475	Hall, Lewis and William A. Rowhouse	59 Otis St	Cambridge	1851
CAM.485	Hazard, Samuel L. House	60 Otis St	Cambridge	1871
CAM.476	Hall, Lewis and William A. Rowhouse	61 Otis St	Cambridge	1851
CAM.484		62 Otis St	Cambridge	
CAM.472	Sortwell, Daniel R. Double House	63-65 Otis St	Cambridge	1871
CAM.483		64 Otis St	Cambridge	
CAM.471		65 1/2 Otis St	Cambridge	
CAM.482	Jones, Andrew - Hall, William A. Double House	66-68 Otis St	Cambridge	1846
CAM.470	Goss, Abiel Double House	67-69 Otis St	Cambridge	1839
CAM.481		70 Otis St	Cambridge	
CAM.469		73-75 Otis St	Cambridge	
CAM.480		74 Otis St	Cambridge	
CAM.479		78 Otis St	Cambridge	
CAM.477	Clark, Josias - Cummings, Daniel P. Rowhouse	80 Otis St	Cambridge	1861
CAM.478	Clark, Josias - Cummings, Daniel P. Rowhouse	82 Otis St	Cambridge	1861
CAM.467	Deshon, Royal P. House	93 Otis St	Cambridge	1842
CAM.460		94 Otis St	Cambridge	
CAM.466		95-97 Otis St	Cambridge	
CAM.459		96 Otis St	Cambridge	
CAM.458		98 Otis St	Cambridge	
CAM.457	Taylor, Oliver House	100 Otis St	Cambridge	1848
CAM.455	Adams, Jabez F. - Atwood, Samuel S. Rowhouse	102 Otis St	Cambridge	1848
CAM.464	Bridgeman, John L. Double House	103-105 Otis St	Cambridge	1843
CAM.456	Adams, Jabez F. - Atwood, Samuel S. Rowhouse	104 Otis St	Cambridge	1848
CAM.454		106-108 Otis St	Cambridge	
CAM.463		107-109 Otis St	Cambridge	
CAM.453		110 Otis St	Cambridge	
CAM.462		113 Otis St	Cambridge	
CAM.439		117 1/2 Otis St	Cambridge	
CAM.440		117-119 Otis St	Cambridge	
CAM.451		118 Otis St	Cambridge	
CAM.450		120 Otis St	Cambridge	
CAM.448	Dennison, James Double House	122-124 Otis St	Cambridge	1870
CAM.449		122 1/2-124 1/2 Otis St	Cambridge	
CAM.438		123 Otis St	Cambridge	

Inv. No.	Property Name	Street	Town	Year
CAM.437		125-127 Otis St	Cambridge	
CAM.447		126-128 Otis St	Cambridge	
CAM.436		129-131 Otis St	Cambridge	
CAM.446		130 Otis St	Cambridge	
CAM.445		132 Otis St	Cambridge	
CAM.435		133-135 Otis St	Cambridge	
CAM.275	Hoyt, Benjamin House	134 Otis St	Cambridge	1868
CAM.443		136-138 Otis St	Cambridge	
CAM.434	Warren, Moses - Smith, Benjamin G. Rowhouse	137 Otis St	Cambridge	1852
CAM.1339	Warren, Moses - Smith, Benjamin G. Rowhouse	139 Otis St	Cambridge	1852
CAM.442		140 Otis St	Cambridge	1895
CAM.1340	Warren, Moses - Smith, Benjamin G. Rowhouse	141 Otis St	Cambridge	1852
CAM.1341	Warren, Moses - Smith, Benjamin G. Rowhouse	143 Otis St	Cambridge	1852
CAM.1342	Warren, Moses - Smith, Benjamin G. Rowhouse	145 Otis St	Cambridge	1852
CAM.433	Fraser, John B. Double House	147-149 Otis St	Cambridge	1846
CAM.432		151 Otis St	Cambridge	
CAM.1179	Coop Annex	18 Palmer St	Cambridge	1964
CAM.276	Urban Rowhouse	30-38 Pearl St	Cambridge	1874
CAM.277	Urban Rowhouse	40-50 Pearl St	Cambridge	1875
CAM.278	Valentine Soap Workers' Cottage	101 Pearl St	Cambridge	1835
CAM.1368	Blessed Sacrament Roman Catholic Church	175 Pearl St	Cambridge	1907
CAM.1370	Blessed Sacrament Roman Catholic Church Rectory	189 Pearl St	Cambridge	1868
CAM.279		3 Phillips Pl	Cambridge	
CAM.280		5 Phillips Pl	Cambridge	c 1845
CAM.281		7 Phillips Pl	Cambridge	1898
CAM.282		9 Phillips Pl	Cambridge	r 1870
CAM.1180	Harvard Crimson Newspaper Office	14-18 Plympton St	Cambridge	1915
CAM.1181	Crimson Building Annex	22 Plympton St	Cambridge	1961
CAM.1182	Adams House Dining Hall	28 Plympton St	Cambridge	1930
CAM.1183	Russell Hall	28 Plympton St	Cambridge	1931
CAM.1184	Russell Hall	30-30A Plympton St	Cambridge	1887
CAM.1207	Quincy House - Harvard University	58 Plympton St	Cambridge	1958
CAM.1208	Mather Hall - Harvard University	68-88 Plympton St	Cambridge	1930
CAM.1209		101-103 Plympton St	Cambridge	1870
CAM.1382	Brooks Apartments - Winthrop, John Chambers	78-80 Porter Rd	Cambridge	1915
CAM.283	Willis, Stillman House	1 Potter Pk	Cambridge	1839
CAM.1401	Volpe Center - High Rise Laboratory	2 Potter St	Cambridge	c 1965

Inv. No.	Property Name	Street	Town	Year
CAM.1403	Volpe Center - Space Guidance Building	2 Potter St	Cambridge	c 1965
CAM.1404	Volpe Center - Space Optics Building	2 Potter St	Cambridge	c 1965
CAM.284	Saunders, William House	6 Prentiss St	Cambridge	1843
CAM.1352	Beck - Warren House	1 Prescott St	Cambridge	1833
CAM.285		16 Prescott St	Cambridge	1873
CAM.291	Carpenter Center for the Visual Arts	19 Prescott St	Cambridge	1963
CAM.582	New England Gas and Electric Association I Bldg	45 Prospect St	Cambridge	1960
CAM.286	Prospect Congregational Church	99 Prospect St	Cambridge	1851
CAM.287	Baldwin, Maria House	196 Prospect St	Cambridge	r 1845
CAM.288	Sands, Hiram House	22 Putnam Ave	Cambridge	1848
CAM.293	Harvard Union	Quincy St	Cambridge	1900
CAM.986	Harvard University - Hallowell Gate	10 Quincy St	Cambridge	1928
CAM.289	Dana, Richard Henry - Palmer, George Herbert House	12-16 Quincy St	Cambridge	1822
CAM.952	Harvard University - Quincy Street Gate	17 Quincy St	Cambridge	1936
CAM.1213	Harvard University - President's House	17 Quincy St	Cambridge	1911
CAM.290	Fogg Art Museum	26-32 Quincy St	Cambridge	1925
CAM.292	Church of the New Jerusalem	50 Quincy St	Cambridge	1903
CAM.1266		60 Raymond St	Cambridge	1927
CAM.298	Mason, W. A. House	87 Raymond St	Cambridge	1846
CAM.299	Stickney, N. U. - Shepard, S. P. Double House	11-13 Remington St	Cambridge	1846
CAM.300	Hooper, Edward W. - Eliot, Rev. Samuel A. House	25-27 Reservoir Rd	Cambridge	1872
CAM.301		59 Rice St	Cambridge	1847
CAM.327	Hews Pottery Company Carriage House	202 Richdale Ave	Cambridge	1897
CAM.302	Kidder - Sargent - McCrehan House	146 Rindge Ave	Cambridge	1792
CAM.303	Wyeth Brickyard Superintendent's House	336 Rindge Ave	Cambridge	c 1848
CAM.923	River Street Bridge	River St	Cambridge	1926
CAM.304	Urban Rowhouse	26-32 River St	Cambridge	1860
CAM.330	Ricker, George and Jerediah House	109-113 River St	Cambridge	1844
CAM.305	River Street Firehouse	176 River St	Cambridge	1890
CAM.1211		11 Riverview Ave	Cambridge	1899
CAM.922	Boston University Bridge	Rt 2	Cambridge	1928
CAM.306	Soule, Lawrence Porter House	11 Russell St	Cambridge	1879
CAM.307	Wood, James A. House	3 Sacramento St	Cambridge	1888
CAM.1239	Winthrop Hall - Episcopal Theological School	Saint John's Rd	Cambridge	1892
CAM.529		6-8 Salem St	Cambridge	c 1829
CAM.530		10 Salem St	Cambridge	c 1840

Inv. No.	Property Name	Street	Town	Year
CAM.531		15 Salem St	Cambridge	c 1841
CAM.415	Hastings, Deborah House	72 Sciarappa St	Cambridge	1823
CAM.416		74 Sciarappa St	Cambridge	
CAM.401	Pendexter, Charles House	80-82 Sciarappa St	Cambridge	1847
CAM.1321	Boston Museum of Science	Science Park	Cambridge	1951
CAM.1322	Hayden Planetarium	Science Park	Cambridge	1958
CAM.770		2 Scott St	Cambridge	1889
CAM.771	Thaxter, Roland House	7 Scott St	Cambridge	1891
CAM.772		8 Scott St	Cambridge	1889
CAM.773		11 Scott St	Cambridge	1893
CAM.774		12 Scott St	Cambridge	1894
CAM.775		14 Scott St	Cambridge	1927
CAM.776		18 Scott St	Cambridge	1928
CAM.375	Roby, Ebenezer Rowhouse	30 Second St	Cambridge	1836
CAM.376	Roby, Ebenezer Rowhouse	32 Second St	Cambridge	1836
CAM.377	Roby, Ebenezer Rowhouse	34 Second St	Cambridge	1836
CAM.364	Hall, Jesse Rowhouse	36 Second St	Cambridge	1842
CAM.365	Hall, Jesse Rowhouse	38 Second St	Cambridge	1842
CAM.366	Hall, Jesse Rowhouse	40 Second St	Cambridge	1842
CAM.367	Hall, Jesse Rowhouse	42 Second St	Cambridge	1842
CAM.368	Hall, Jesse Rowhouse	44 Second St	Cambridge	1842
CAM.369	Hall, Jesse Rowhouse	46 Second St	Cambridge	1842
CAM.370		50 Second St	Cambridge	
CAM.308	American Net and Twine Company Factory	155R Second St	Cambridge	1875
CAM.777		1 Shady Hill Sq	Cambridge	1915
CAM.778		2-3 Shady Hill Sq	Cambridge	1915
CAM.779		4-5 Shady Hill Sq	Cambridge	1915
CAM.780		6-7 Shady Hill Sq	Cambridge	1915
CAM.781		8-9 Shady Hill Sq	Cambridge	1915
CAM.782		10-11 Shady Hill Sq	Cambridge	1915
CAM.783		12 Shady Hill Sq	Cambridge	1915
CAM.309	Eliot Hall	51 Shepard St	Cambridge	1907
CAM.310	Bertram Hall	53 Shepard St	Cambridge	1901
CAM.311	Watson, Abraham Jr. House	181-183 Sherman St	Cambridge	c 1750
CAM.506	Sacred Heart Roman Catholic Church	39 Sixth St	Cambridge	1874
CAM.431		40 Sixth St	Cambridge	
CAM.508	Sacred Heart Roman Catholic Church Rectory	49 Sixth St	Cambridge	1885
CAM.927	Eliot Bridge	Soldier's Field Rd	Cambridge	1950

Inv. No.	Property Name	Street	Town	Year
CAM.1210	Bryan Hall - Harvard University	14-24 South St	Cambridge	1930
CAM.312	Stedman, Samuel House	17 South St	Cambridge	1826
CAM.1185	Harvard Advocate Building	21 South St	Cambridge	1956
CAM.313	Dodge, Edward House	70 Sparks St	Cambridge	1878
CAM.325	Harugari Hall	154 Spring St	Cambridge	1873
CAM.1186		4-6 Story St	Cambridge	1966
CAM.1187		8-12 Story St	Cambridge	1969
CAM.1188		14-16 Story St	Cambridge	1970
CAM.353	Blake and Knowles Core Shop #1	Third St	Cambridge	c 1889
CAM.354	Blake and Knowles Core Shop #2	Third St	Cambridge	c 1890
CAM.505	Lechmere Point Corporation Row House	25 Third St	Cambridge	c 1821
CAM.381	Rollins, John W. Rowhouse	83 Third St	Cambridge	1860
CAM.382	Rollins, John W. Rowhouse	85 Third St	Cambridge	1860
CAM.383	Rollins, John W. Rowhouse	87 Third St	Cambridge	1860
CAM.384	Rollins, John W. Rowhouse	89 Third St	Cambridge	1860
CAM.331	Old Middlesex County Superior Courthouse	90 Third St	Cambridge	1814
CAM.385	Rollins, John W. Rowhouse	91 Third St	Cambridge	1860
CAM.386	Rollins, John W. Rowhouse	93 Third St	Cambridge	1860
CAM.387	Rollins, John W. Rowhouse	95 Third St	Cambridge	1860
CAM.314	Holy Cross Polish National Catholic Church	99 Third St	Cambridge	1827
CAM.315	Bottle House Block	204-214 Third St	Cambridge	1826
CAM.350	Blake and Knowles Machine Shop #1	265 Third St	Cambridge	1889
CAM.351	Blake and Knowles Office Headhouse	265 Third St	Cambridge	1892
CAM.355	Blake and Knowles Smith Shop and Brass Foundry	275 Third St	Cambridge	c 1890
CAM.326	Cambridge Gas Light Company Purifying Plant	354 Third St	Cambridge	1908
CAM.388	Stevens, Atherton H. Rowhouse	59 Thorndike St	Cambridge	1827
CAM.395	Smallidge, Samuel House	66 Thorndike St	Cambridge	1827
CAM.389	Bates, Moses Jr. House	69 Thorndike St	Cambridge	1844
CAM.396	Buck, Silas B. House	70 Thorndike St	Cambridge	1845
CAM.390	Tufts, Sophia Kimball Double House	71-73 Thorndike St	Cambridge	1857
CAM.397	Wellington, Peter House	74 Thorndike St	Cambridge	1843
CAM.391		75 Thorndike St	Cambridge	
CAM.398		76 Thorndike St	Cambridge	
CAM.392		77 Thorndike St	Cambridge	
CAM.399		78 Thorndike St	Cambridge	
CAM.393		79-81 Thorndike St	Cambridge	
CAM.400		80 Thorndike St	Cambridge	

Inv. No.	Property Name	Street	Town	Year
CAM.394		83 Thorndike St	Cambridge	
CAM.402	Stickney, Francis H. - Davies, Benjamin Rowhouse	84 Thorndike St	Cambridge	1867
CAM.417	Clark, Cornelius - Kneeland, W. W. House	85 Thorndike St	Cambridge	1822
CAM.403	Stickney, Francis H. - Davies, Benjamin Rowhouse	86 Thorndike St	Cambridge	1867
CAM.404	Stickney, Francis H. - Davies, Benjamin Rowhouse	88 Thorndike St	Cambridge	1867
CAM.418		89-91 Thorndike St	Cambridge	
CAM.405	Stickney, Francis H. - Davies, Benjamin Rowhouse	90 Thorndike St	Cambridge	1867
CAM.406	Stickney, Francis H. - Davies, Benjamin Rowhouse	92 Thorndike St	Cambridge	1867
CAM.419	Whitacre, Celeste I. Rowhouse	93 Thorndike St	Cambridge	1885
CAM.407	Stickney, Francis H. - Davies, Benjamin Rowhouse	94 Thorndike St	Cambridge	1867
CAM.420	Whitacre, Celeste I. Rowhouse	95 Thorndike St	Cambridge	1885
CAM.408	Train, Isaac House	96 Thorndike St	Cambridge	1826
CAM.421	Whitacre, Celeste I. Rowhouse	97 Thorndike St	Cambridge	1885
CAM.422	Davies, Daniel House	97 1/2 Thorndike St	Cambridge	1843
CAM.409		98 Thorndike St	Cambridge	
CAM.423		99 Thorndike St	Cambridge	
CAM.424	Daniels, Granville W. House	101 Thorndike St	Cambridge	1868
CAM.410		102 Thorndike St	Cambridge	
CAM.411	Spare, Elijah Jr. Double House	104-106 Thorndike St	Cambridge	1846
CAM.425	Eaton, Charles House	109 Thorndike St	Cambridge	1857
CAM.412	Quimby, Amos House	110 Thorndike St	Cambridge	1857
CAM.426		111-113 Thorndike St	Cambridge	
CAM.413	Stickney, Francis H. Double House	112-114 Thorndike St	Cambridge	1863
CAM.427		113 1/2 Thorndike St	Cambridge	
CAM.414	Bacon, Henry A. House	116 Thorndike St	Cambridge	1865
CAM.507	Sacred Heart Roman Catholic School and Convent	163 Thorndike St	Cambridge	1902
CAM.316	Craigie Arms	2-6 University Rd	Cambridge	1897
CAM.317	Wyeth, Jacob - Smith, Ebenezer House	152 Vassar Ln	Cambridge	1820
CAM.360	Metropolitan Supply Company Warehouse	269 Vassar St	Cambridge	1948
CAM.361	Hovey, F. A. and Company Warehouse	271-275 Vassar St	Cambridge	c 1940
CAM.362	Metropolitan Supply Company Warehouse	277-287 Vassar St	Cambridge	1939
CAM.363	Metropolitan Supply Company Warehouse	289-293 Vassar St	Cambridge	1939
CAM.989	Walden Street Cattle Pass	Walden St	Cambridge	1857

Inv. No.	Property Name	Street	Town	Year
CAM.1283	Bennink - Douglas Double Cottage	35-37 Walker St	Cambridge	1874
CAM.1284	Bennink - Douglas Double Cottage	39-41 Walker St	Cambridge	1874
CAM.1285	Bennink - Douglas Double Cottage	43-45 Walker St	Cambridge	1874
CAM.1286	Bennink - Douglas Double Cottage	49-51 Walker St	Cambridge	1874
CAM.1034	Sands, Orrin E. House	2 Walnut Ave	Cambridge	1911
CAM.1032		4 Walnut Ave	Cambridge	1878
CAM.1033	Niles, Jacob Harris House	6 Walnut Ave	Cambridge	1884
CAM.1031	Niles, Eugene M. House	9 Walnut Ave	Cambridge	1887
CAM.318	Stanstead, The	19 Ware St	Cambridge	1887
CAM.799	Ritchie, David House	26 Washington Ave	Cambridge	1889
CAM.793	Brown, Laura House	27 Washington Ave	Cambridge	1908
CAM.794	Mellen, James House	33 Washington Ave	Cambridge	1887
CAM.795	Kelley, Stillman F. House	49 Washington Ave	Cambridge	1887
CAM.1000	Boardman, Charles House	58 Washington Ave	Cambridge	1880
CAM.797	Mansfield, Gardiner House	63 Washington Ave	Cambridge	1873
CAM.798	Green, Charles G. House	71 Washington Ave	Cambridge	1877
CAM.1001	Boynton, Morris House	78 Washington Ave	Cambridge	c 1874
CAM.319	Melendy, Henry J. House	81 Washington Ave	Cambridge	1871
CAM.1002		86-88 Washington Ave	Cambridge	1870
CAM.1003		92 Washington Ave	Cambridge	1876
CAM.1004	Hutchins, Elizabeth House	108 Washington Ave	Cambridge	1924
CAM.541	Whittemore, Rev. Thomas Double House	271-273 Washington St	Cambridge	1837
CAM.540	Whittemore, Rev. Thomas Double House	288 Washington St	Cambridge	1837
CAM.539	Paige, Rev. Lucius R. House	296 Washington St	Cambridge	1837
CAM.346		1 Waterhouse St	Cambridge	1916
CAM.320	Vassall - Waterhouse - Ware House	7 Waterhouse St	Cambridge	c 1753
CAM.347		9 Waterhouse St	Cambridge	1887
CAM.335	Christian Science Church	13 Waterhouse St	Cambridge	1923
CAM.988	Fort Washington	95 Waverly St	Cambridge	
CAM.924	Western Avenue Bridge	Western Ave	Cambridge	1924
CAM.638	Cambridge Police Headquarters	5 Western Ave	Cambridge	1933
CAM.948	Central Square Park	22 Western Ave	Cambridge	1987
CAM.321	Read, Cheney House	135 Western Ave	Cambridge	1846
CAM.323	Hasey, Abraham - Wheat, Dr. Samuel House	8 Willard St	Cambridge	c 1730
CAM.514	Hixon, Edward House	3 William St	Cambridge	1857
CAM.1378	Immaculate Conception (Lithuanian) Catholic Church	432 Windsor St	Cambridge	1910
CAM.1379	Immaculate Conception (Lithuanian) Church	432 Windsor St	Cambridge	1972

Inv. No.	Property Name	Street	Town	Year
CAM.1380	Rectory Immaculate Conception Church Rectory Metal Garage	432 Windsor St	Cambridge	1941
CAM.1381	Immaculate Conception Church Rectory Wood Garage	432 Windsor St	Cambridge	1948
CAM.500		19 Winter St	Cambridge	r 1855
CAM.492		21 Winter St	Cambridge	c 1854
CAM.486	Leighton, Thomas H. House	22 Winter St	Cambridge	1833
CAM.491		24 Winter St	Cambridge	c 1854
CAM.493		25 Winter St	Cambridge	c 1854
CAM.494		27 Winter St	Cambridge	c 1854
CAM.496		28-30 Winter St	Cambridge	c 1854
CAM.495		29 Winter St	Cambridge	c 1854
CAM.497		31-33 Winter St	Cambridge	c 1854
CAM.501		34-42 Winter St	Cambridge	r 1875
CAM.498		61 Winter St	Cambridge	c 1854
CAM.499		65 Winter St	Cambridge	c 1854
CAM.489	Stevens, Atherton Haugh House	67 Winter St	Cambridge	1843
CAM.490	Stevens, Atherton Haugh House	71 Winter St	Cambridge	1843
CAM.487	Stevens, Atherton Haugh House	74 Winter St	Cambridge	1838
CAM.1344		75 Winter St	Cambridge	
CAM.1345	Stevens, Atherton Haugh House	77 Winter St	Cambridge	1838
CAM.488	Stevens, Atherton Haugh House	79 Winter St	Cambridge	1838
CAM.1189	Metcalf, Lydia House	41 Winthrop St	Cambridge	1845
CAM.1190		65-67 Winthrop St	Cambridge	1887
CAM.1191	University Lutheran Church	66 Winthrop St	Cambridge	1950
CAM.1192		69 Winthrop St	Cambridge	r 1835
CAM.1193	Pi Eta Club	89 Winthrop St	Cambridge	r 1908
CAM.1194	Pi Eta Hall	95 Winthrop St	Cambridge	r 1896
CAM.1195	Hyde, Isaac - Taylor House	96 Winthrop St	Cambridge	1845
CAM.329	Cox - Hicks House	98 Winthrop St	Cambridge	c 1806
CAM.951	Winthrop Street Retaining Wall	98 Winthrop St	Cambridge	c 1725
CAM.1196	Dame School	106 Winthrop St	Cambridge	c 1800
CAM.909	Yerxa Street Pedestrian Subway	Yerxa St	Cambridge	1904
CAM.1391	Saint Patrick's Roman Catholic Church	40-50 York St	Cambridge	