



July 17, 2019

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

Re: Green Line Extension Project – Newbern Avenue RGP
Notice of Intent for Coverage under the
Remediation General Permit for Massachusetts
Discharge of Treated Groundwater to Mystic River, Somerville, 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 related to an area of petroleum and chlorinated volatile organic compounds found in groundwater near the Broadway bridge. 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.

A Site Plan and a Massachusetts Department of Environmental Protection (MassDEP) Priority Resources Map are provided in Attachment B as Figures 1 and 2, respectively. Excavation dewatering and discharge of treated groundwater are expected to begin in July 2019 and end in July 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 three existing Massachusetts Contingency Plan (MCP; 310 CMR 40.0000) Disposal Sites. Groundwater near Broadway in Somerville has been impacted by polycyclic aromatic hydrocarbons (PAHs), metals, and petroleum related volatile organic compounds (VOCs) [Release Tracking Numbers (RTNs) 3-1322, 3-4551, 3-30624, and 3-35568].

RTN 3-35568 was assigned on May 14, 2019 following the detection of benzene and C₅-C₈ aliphatic hydrocarbons in well GLC-NB-3 above RCGW-2 standards which is a 120-day reporting condition.

RTN 3-30624 is associated with the detection of arsenic, cadmium, and nickel in soil within the MBTA right of way discovered during soil pre-characterization work in 2013. A Permanent Solution Report submitted in 2017 documents that these detections are likely the result of the presence of Historic Fill and historical use of the site as a railroad right of way.

RTN 3-4551 (Former Knox Dodge at 643-645 Broadway in Somerville) was issued for releases of gasoline and diesel from underground storage tanks. 1,400 tons of petroleum-impacted soil was removed from the site between 1997 and 1998. In February 2004, oxygen release compound was injected into the aquifer as a remedial action. The RTN was closed with an A-3 Response Action Outcome in April 2005.

RTN 3-1322 was assigned to the (now former) Shell station at 620 Broadway in Somerville due to the discovery of petroleum-impacted soil during UST removal in June 1987. 1,846 tons of impacted soil was generated under a Release Abatement Measure associated with site redevelopment in January and February of 2002. This work included the removal of gasoline and heating oil USTs, dispensers, and the oil/water separator. A Permanent Solution Statement with Conditions was submitted in August 2014.

Groundwater Characterization

Groundwater samples were collected from monitoring wells GLC-NB-2, GLC-NB-3, GLC-NB-3-1, GLC-NB-3-2, GLC-NB-3-3, and GLC-NB-3-4 in May 2019. 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 within the proposed area of dewatering associated with this project.

A summary of groundwater sampling results is included as Table 1 in Attachment C, and the supporting laboratory analytical report is provided in Attachment D. 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.

Elevated detection limits were encountered in samples GLC-NB-3, GLC-NB-3-1, and GLC-NB-3-2 due to detections of several VOCs (e.g. benzene and methyl tert butyl ether). Because of dilutions needed for the analysis, the elevated detection limits for VOCs caused the detection limits of other VOCs (e.g. 1,4-Dichlorobenzene and methylene chloride) to exceed the RGP minimum recording limits; however, these VOCs (if present) would be removed prior to discharge by the same methods used to remove the benzene.

Constituents of concern identified in the groundwater samples include pH, total suspended solids (TSS), VOCs, polycyclic aromatic hydrocarbons, and iron.

Receiving Water Classification

The Mystic River (ID: MA71-02) is a Massachusetts Class B surface water body and is listed on the Massachusetts 303(d) list for:

- Arsenic
- Chlordane
- Chlorophyll-a
- DDT
- Dissolved Oxygen Saturation
- Escherichia coli
- PCB in Fish Tissue

- Phosphorus (total)
- Secchi disk transparency; and
- Sediment Bioassays -- Chronic Toxicity Freshwater.

On May 17, 2019, TRC personnel collected a surface water sample from the Mystic 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 provided in Attachment C, and the supporting laboratory analytical report is provided in Attachment D.

The 7Q10 low flow rate for the Mystic River is 3.52 cubic feet per second (cfs) [i.e., 2.275 million gallons per day (MGD)] (as determined by a US Geological Survey StreamStats Database – see Attachment E); however, MassDEP has made a determination that the proposed outfall is located in an inlet of this river therefore not eligible for a dilution factor. Documentation of this correspondence is attached 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 18,000-gallon frac tank at head of the system for pH adjustment and chemical-aided settling of TSS prior to treatment to reduce metals and organic compound concentrations. Groundwater analyses indicate that the pH adjustment may be needed to raise the pH of the treated effluent. Dosing will depend on the pH of the influent water, the flow rate, and if the system operates continuously or intermittently. A pH adjustment system that is capable of raising or reducing pH will be implemented if required to meet the permit requirements. The pH system is designed to either raise or reduce pH with acid or caustic and includes an automatic metered acid feed system with a mix tank, feed pumps and setpoint controls that maintain the pH approved by the permit, usually set between 6.5 and 8.0. The pH is continuously monitored and the chemical will only be added if the setpoints are exceeded. Cutsheets of the pH Adjustment system are attached. 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 precise dose to adjust pH is not known; however, a worst case scenario of 48 gallons per day to treat 100 gpm flow rate is 333 parts per million which is under the LC50 for fish. Actual chemical needs are expected to be an order of magnitude lower.

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.

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 Treatment System Sub-Contractor

Owner

GLX Constructors
200 Inner Belt
Somerville, Massachusetts

Treatment System Sub-Contractor

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:

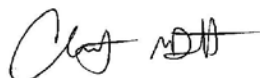
- Review of a Massachusetts Geographic Information Systems MassDEP Priority Resources Map, Figure 2 in Attachment B, shows the Site is not within an ACEC.
- According to the United States Fish and Wildlife Service Information, Planning and Conservation (USFWS) tool, there are no critical habitats at 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 Mystic River Reservation is on the northern bank of the Mystic River but would not be affected by the discharge of treated water.

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@trccompanies.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

Figure 1 – GLX Newbern Ave. RGP (Site map)

Figure 2 - MassDEP Priority Resource Map

Figure 3 - Generalized Treatment System Schematic

Figure 4 - GLX Newbern Ave RGP

Attachment C – Tables

Table 1 - Summary of Newbern Avenue Groundwater Analytical Results

Table 2 - Summary of Surface Water Analytical Results – Mystic River

Attachment D – Laboratory Analytical Reports

Attachment E – Correspondence with MassDEP regarding the Mystic 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
RGP NOI FORM AND CALCULATION
SPREADSHEET

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

A. General site information:

1. Name of site: Green Line Extension Project at Newbern Avenue	Site address: Newbern Avenue Street:		
2. Site owner Massachusetts Bay Transportation Authority 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:	City: Somerville	State: MA	Zip: 02145
3. Site operator, if different than owner Same as owner	Contact Person: Eileen London Telephone: 617-684-3153 Email: Eileen.London@glxconstruct.com Mailing address: 200 Inner Belt Road Street: City: Somerville State: MA Zip: 02143		
4. NPDES permit number assigned by EPA: 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:	5. Other regulatory program(s) to be implemented at site (check all that apply): <input checked="" type="checkbox"/> MA Chapter 21e; list RTN(s) 3-1322, 3-4551, 3-30624, 3-35568. <input type="checkbox"/> NH Groundwater Management Groundwater Release Detection Permit: <input type="checkbox"/> CERCLA <input type="checkbox"/> UIC Program <input type="checkbox"/> POTW Pretreatment <input type="checkbox"/> CWA Section 404		

B. Receiving water information:

1. Name of receiving water(s): Mystic River	Waterbody identification of receiving water(s): MA71-02	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.		3.52 cfs (2.275 MGD)
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: June 4, 2019		
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"/> Potable water; if so, indicate municipality or origin: <input type="checkbox"/> Other; if so, specify:
		<input type="checkbox"/> A surface water other than the receiving water; if so, indicate waterbody:	

2. Source water contaminants: TPH, VOCs, SVOCs, cyanide, low pH, and iron	
a. For source waters that are contaminated groundwater or contaminated surface water, indicate are any contaminants present that are not included in the RGP? (check one): <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): OF-50000 (Mystic River)	Outfall location(s): (Latitude, Longitude) 42.404576 / -71.097035
<p>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:</p> <p>City of Medford Stormwater System</p> <p><input type="checkbox"/> A private storm sewer system <input checked="" type="checkbox"/> A municipal storm sewer system</p> <p>If the discharge enters the receiving water via a private or municipal storm sewer system:</p> <p>Has notification been provided to the owner of this system? (check one): <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>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:</p> <p>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</p>	
Provide the expected start and end dates of discharge(s) (month/year): July 2019 - July 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>a. If Activity Category I or II: (check all that apply)</p> <p><input type="checkbox"/> A. Inorganics</p> <p><input type="checkbox"/> B. Non-Halogenated Volatile Organic Compounds</p> <p><input type="checkbox"/> C. Halogenated Volatile Organic Compounds</p> <p><input type="checkbox"/> D. Non-Halogenated Semi-Volatile Organic Compounds</p> <p><input type="checkbox"/> E. Halogenated Semi-Volatile Organic Compounds</p> <p><input type="checkbox"/> F. Fuels Parameters</p>	
	<p>b. If Activity Category III, IV, V, VI, VII or VIII: (check either G or H)</p>	
	<table border="1"> <tr> <td data-bbox="970 800 1419 873"><input checked="" type="checkbox"/> G. Sites with Known Contamination</td><td data-bbox="1419 800 2003 873"><input type="checkbox"/> H. Sites with Unknown Contamination</td></tr> </table>	<input checked="" type="checkbox"/> G. Sites with Known Contamination
<input checked="" type="checkbox"/> G. Sites with Known Contamination	<input type="checkbox"/> H. Sites with Unknown Contamination	
<table border="1"> <tr> <td data-bbox="970 873 1419 1409"> <p>c. If Category III-G, IV-G, V-G, VI-G, VII-G or VIII-G: (check all that apply)</p> <p><input checked="" type="checkbox"/> A. Inorganics</p> <p><input checked="" type="checkbox"/> B. Non-Halogenated Volatile Organic Compounds</p> <p><input type="checkbox"/> C. Halogenated Volatile Organic Compounds</p> <p><input checked="" type="checkbox"/> D. Non-Halogenated Semi-Volatile Organic Compounds</p> <p><input type="checkbox"/> E. Halogenated Semi-Volatile Organic Compounds</p> <p><input checked="" type="checkbox"/> F. Fuels Parameters</p> </td><td data-bbox="1419 873 2003 1409"> <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> </td></tr> </table>	<p>c. If Category III-G, IV-G, V-G, VI-G, VII-G or VIII-G: (check all that apply)</p> <p><input checked="" type="checkbox"/> A. Inorganics</p> <p><input checked="" type="checkbox"/> B. Non-Halogenated Volatile Organic Compounds</p> <p><input type="checkbox"/> C. Halogenated Volatile Organic Compounds</p> <p><input checked="" type="checkbox"/> D. Non-Halogenated Semi-Volatile Organic Compounds</p> <p><input type="checkbox"/> E. Halogenated Semi-Volatile Organic Compounds</p> <p><input checked="" type="checkbox"/> F. Fuels Parameters</p>	<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>
<p>c. If Category III-G, IV-G, V-G, VI-G, VII-G or VIII-G: (check all that apply)</p> <p><input checked="" type="checkbox"/> A. Inorganics</p> <p><input checked="" type="checkbox"/> B. Non-Halogenated Volatile Organic Compounds</p> <p><input type="checkbox"/> C. Halogenated Volatile Organic Compounds</p> <p><input checked="" type="checkbox"/> D. Non-Halogenated Semi-Volatile Organic Compounds</p> <p><input type="checkbox"/> E. Halogenated Semi-Volatile Organic Compounds</p> <p><input checked="" type="checkbox"/> F. Fuels Parameters</p>	<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

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		✓	6	4500NH3-	375	850	399	Report mg/L	---
Chloride		✓	6	300.0	25000	1,120,000	647,333	Report µg/l	---
Total Residual Chlorine	✓		6	4500CL-D	20	0	0	0.2 mg/L	11
Total Suspended Solids		✓	6	2540D	20,000	16,000	5,503	30 mg/L	30
Antimony	✓		6	200.8	4	0	0	206 µg/L	640
Arsenic		✓	6	200.8	1	21.45	11.7	104 µg/L	10
Cadmium		✓	6	200.8	0.2	2.11	0.6	10.2 µg/L	01.83
Chromium III		✓	6	200.8	10	<2,000	37	323 µg/L	713.1
Chromium VI	✓		6	200.8	10	<2,000	0	323 µg/L	11.4
Copper		✓	6	200.8	1	299.2	94.9	242 µg/L	84.6
Iron		✓	6	200.7	50	174,000	66,190	5,000 µg/L	1000
Lead		✓	6	200.8	1	263.7	105.7	160 µg/L	84.94
Mercury	✓	✓	6	245.1	0.2	0.3	0.05	0.739 µg/L	10.91
Nickel		✓	6	200.8	2	379.3	101.4	1,450 µg/L	462.8
Selenium	✓		6	200.8	5	0	0	235.8 µg/L	5
Silver		✓	6	200.8	0.4	0.91	0.28	35.1 µg/L	320.2
Zinc		✓	6	200.8	10	565.5	225.1	420 µg/L	1066.5
Cyanide		✓	6	4500CN-C	5	67	11.2	178 mg/L	5.2
B. Non-Halogenated VOCs									
Total BTEX		✓	6	8260C	10	2600	710	100 µg/L	---
Benzene		✓	6	8260C	10	2600	613	5.0 µg/L	---
1,4 Dioxane	✓		6	8260CSIM	500	<500	<500	200 µg/L	---
Acetone	✓		6	8260C	100	<100	0	7.97 mg/L	---
Phenol		✓	6	625.1	100	39	6.5	1,080 µg/L	300

* exclusively present in soil

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	✓		6	8260C/624	10	<10	0	4.4 µg/L	1.6
1,2 Dichlorobenzene	✓		6	8260C/624	50	<50	0	600 µg/L	---
1,3 Dichlorobenzene	✓		6	8260C/624	50	<50	0	320 µg/L	---
1,4 Dichlorobenzene	✓		6	8260C/624	50	<50	0	5.0 µg/L	---
Total dichlorobenzene	✓		6	8260C/624	50	<50	0	763 µg/L in NH	---
1,1 Dichloroethane	✓		6	8260C/624	10	<15	0	70 µg/L	---
1,2 Dichloroethane		✓	6	8260C/624	10	21	0	5.0 µg/L	---
1,1 Dichloroethylene	✓		6	8260C/624	15	<10	0	3.2 µg/L	---
Ethylene Dibromide	✓		6	504.1	0.01	<0.01	0	0.05 µg/L	---
Methylene Chloride	✓		6	8260C/624	10	<10	0	4.6 µg/L	---
1,1,1 Trichloroethane	✓		6	8260C/624	20	<20	0	200 µg/L	---
1,1,2 Trichloroethane			6	8260C/624	15	<15	0	5.0 µg/L	---
Trichloroethylene	✓		6	8260C/624	10	<10	0	5.0 µg/L	---
Tetrachloroethylene		✓	6	8260C/624	10	3.3	3.3	5.0 µg/L	3.3
cis-1,2 Dichloroethylene	✓		6	8260C/624	10	<10	0	70 µg/L	---
Vinyl Chloride	✓		6	8260C/624	10	<10	0	2.0 µg/L	---
D. Non-Halogenated SVOCs									
Total Phthalates		✓	6	625/8270D	5	2.6	0.4	190 µg/L	190
Diethylhexyl phthalate		✓	6	625/8270D	2.2	2.6	0.4	101 µg/L	2.2
Total Group I PAHs	✓		6	625/8270D	0.10	1.6	0.285	1.0 µg/L	---
Benzo(a)anthracene		✓	6	625/8270D	0.10	0.27	0.05	As Total PAHs	0.0038
Benzo(a)pyrene		✓	6	625/8270D	0.10	0.26	0.04		0.0038
Benzo(b)fluoranthene		✓	6	625/8270D	0.10	0.45	0.09		0.0038
Benzo(k)fluoranthene		✓	6	625/8270D	0.10	0.18	0.03		0.0038
Chrysene		✓	6	625/8270D	0.10	0.31	0.05		0.0038
Dibenzo(a,h)anthracene	✓		6	625/8270D	0.10	0	0		0.0038
Indeno(1,2,3-cd)pyrene		✓	6	625/8270D	0.10	0.13	0.02		0.0038

* exclusively present in soil

[illegible]

* exclusively present in soil

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, pH adjustment, flocculation/coagulation, bag filtration, 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 checked="" type="checkbox"/> Equalization tank <input type="checkbox"/> Oil/water separator <input type="checkbox"/> Mechanical filter <input checked="" type="checkbox"/> Media filter <input checked="" 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>	<p>100</p>
<p>Provide the proposed maximum effluent flow in gpm.</p>	<p>100</p>
<p>Provide the average effluent flow in gpm.</p>	<p>50</p>
<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"/> Algaecides/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> <p>a. Product name, chemical formula, and manufacturer of the chemical/additive; b. Purpose or use of the chemical/additive or remedial agent; c. Material Safety Data Sheet (MSDS) and Chemical Abstracts Service (CAS) Registry number for each chemical/additive; d. The frequency (hourly, daily, etc.), duration (hours, days), quantity (maximum and average), and method of application for the chemical/additive; e. Any material compatibility risks for storage and/or use including the control measures used to minimize such risks; and f. If available, the vendor's reported aquatic toxicity (NOAEL and/or LC50 in percent for aquatic organism(s)).</p>
<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> <p><input 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”.</p> <p><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</p> <p><input checked="" 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 checked="" type="checkbox"/> the operator <input type="checkbox"/> EPA <input type="checkbox"/> Other; if so, specify:</p>

☒ **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:

Date:

Print Name and Title:

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

↓	
1320	C_d = Enter influent hardness in mg/L CaCO_3
254	C_s = Enter receiving water hardness in mg/L CaCO_3

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

↓	
6.53	pH in Standard Units
11.7	Temperature in °C
1.62	Ammonia in mg/L
254	Hardness in mg/L CaCO_3
	Salinity in ppt
0	Antimony in µg/L
1.42	Arsenic in µg/L
0	Cadmium in µg/L
0	Chromium III in µg/L
0	Chromium VI in µg/L
3.5	Copper in µg/L
2800	Iron in µg/L
1.95	Lead in µg/L
0	Mercury in µg/L
3.28	Nickel in µg/L
0	Selenium in µg/L
0	Silver in µg/L
75.83	Zinc in µg/L

Enter **influent** concentrations in the units specified

↓	
0	TRC in µg/L
0.85	Ammonia in mg/L
0	Antimony in µg/L
21.45	Arsenic in µg/L
2.11	Cadmium in µg/L
222	Chromium III in µg/L
0	Chromium VI in µg/L
299.2	Copper in µg/L
174,000	Iron in µg/L
263.7	Lead in µg/L
0.3	Mercury in µg/L
379.3	Nickel in µg/L
0	Selenium in µg/L
0.91	Silver in µg/L
565.5	Zinc in µg/L
67	Cyanide in µg/L
12	Phenol in µg/L
10	Carbon Tetrachloride in µg/L
10	Tetrachloroethylene in µg/L
2.6	Total Phthalates in µg/L
2.6	Diethylhexylphthalate in µg/L
0.27	Benzo(a)anthracene in µg/L
0.26	Benzo(a)pyrene in µg/L
0.45	Benzo(b)fluoranthene in µg/L
0.18	Benzo(k)fluoranthene in µg/L
0.31	Chrysene in µg/L
0	Dibenzo(a,h)anthracene in µg/L
0.13	Indeno(1,2,3-cd)pyrene in µg/L
4400	Methyl-tert butyl ether in µg/L

Notes:Freshwater: Q_R equal to the 7Q10; enter alternate Q_R if approved by the State; enter 0 if no dilution factor approvedSaltwater (estuarine and marine): enter Q_R if approved by the State; enter 0 if no entry

Discharge flow is equal to the design flow or 1 MGD, whichever is less

Only if approved by State as the entry for Q_R ; leave 0 if no entry

Saltwater (estuarine and marine): only if approved by the State

Leave 0 if no entry

Freshwater only

pH, temperature, and ammonia required for all discharges

Hardness required for freshwater

Salinity required for saltwater (estuarine and marine)

Metals required for all discharges if present and if dilution factor is > 1

Enter 0 if non-detect or testing not required

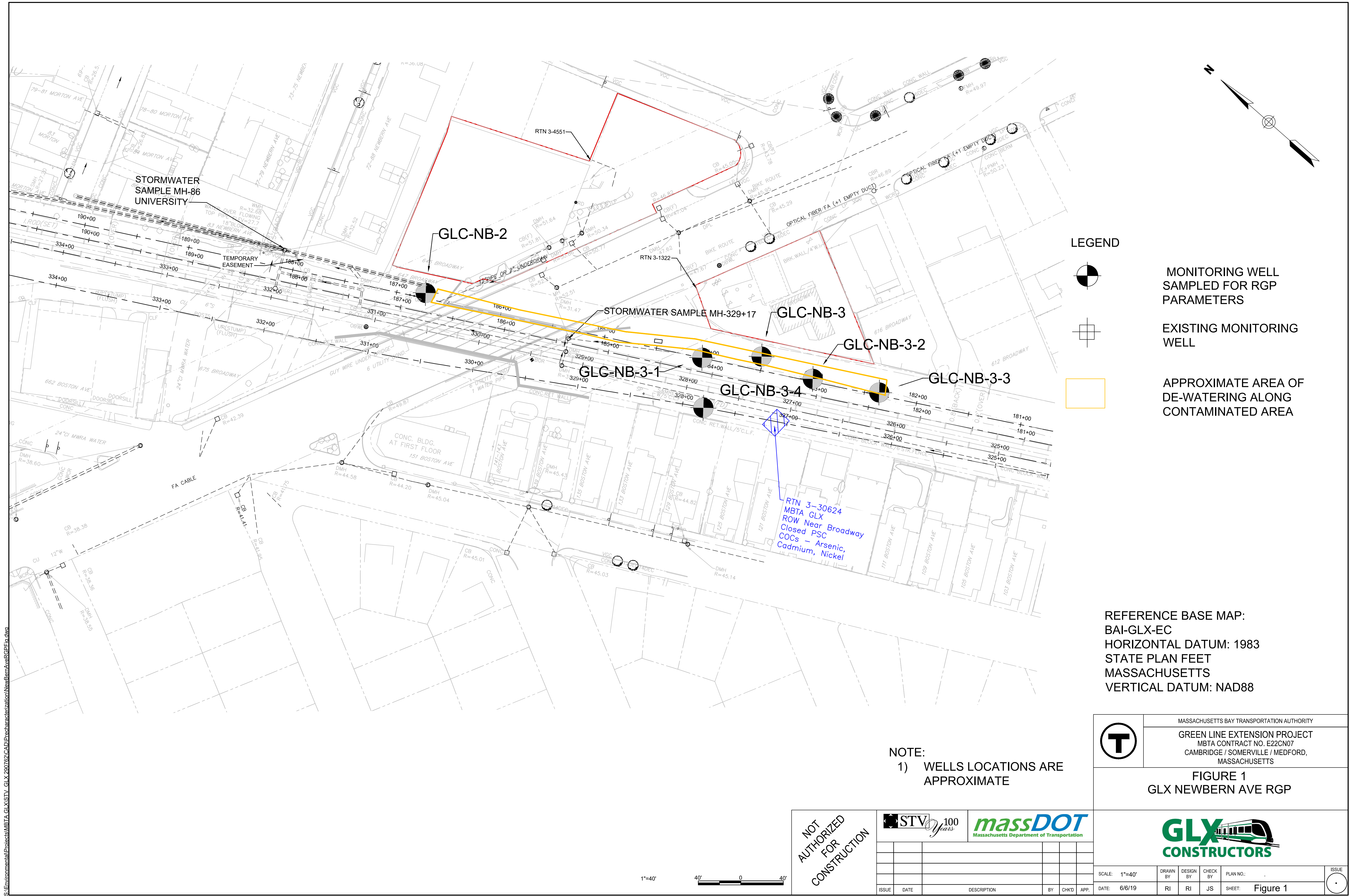
if >1 sample, enter maximum

if >10 samples, may enter 95th percentile

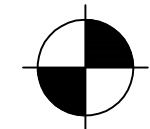
Enter 0 if non-detect or testing not required

Dilution Factor	1.0					
A. Inorganics	TBEL applies if bolded		WQBEL applies if bolded		Compliance Level applies if shown	
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	1.8306	µg/L		
Chromium III	323	µg/L	713.1	µg/L		
Chromium VI	323	µg/L	11.4	µg/L		
Copper	242	µg/L	84.6	µg/L		
Iron	5000	µg/L	1000	µg/L		
Lead	160	µg/L	84.94	µg/L		
Mercury	0.739	µg/L	0.91	µg/L		
Nickel	1450	µg/L	462.8	µg/L		
Selenium	235.8	µg/L	5.0	µg/L		
Silver	35.1	µg/L	320.2	µg/L		
Zinc	420	µg/L	1066.5	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	0.1	µg/L
Benzo(a)pyrene	1.0	µg/L	0.0038	µg/L	0.1	µg/L
Benzo(b)fluoranthene	1.0	µg/L	0.0038	µg/L	0.1	µg/L
Benzo(k)fluoranthene	1.0	µg/L	0.0038	µg/L	0.1	µg/L
Chrysene	1.0	µg/L	0.0038	µg/L	0.1	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	0.1	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	---			

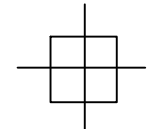
ATTACHMENT B FIGURES



LEGEND



MONITORING WELL
SAMPLED FOR RGP
PARAMETERS



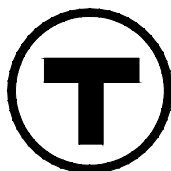
EXISTING MONITORING
WELL



APPROXIMATE AREA OF
DE-WATERING ALONG
CONTAMINATED AREA

REFERENCE BASE MAP:
BAI-GLX-EC
HORIZONTAL DATUM: 1983
STATE PLAN FEET
MASSACHUSETTS
VERTICAL DATUM: NAD88

NOTE:
1) WELLS LOCATIONS ARE
APPROXIMATE



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

FIGURE 1
GLX NEWBERN AVE RGP

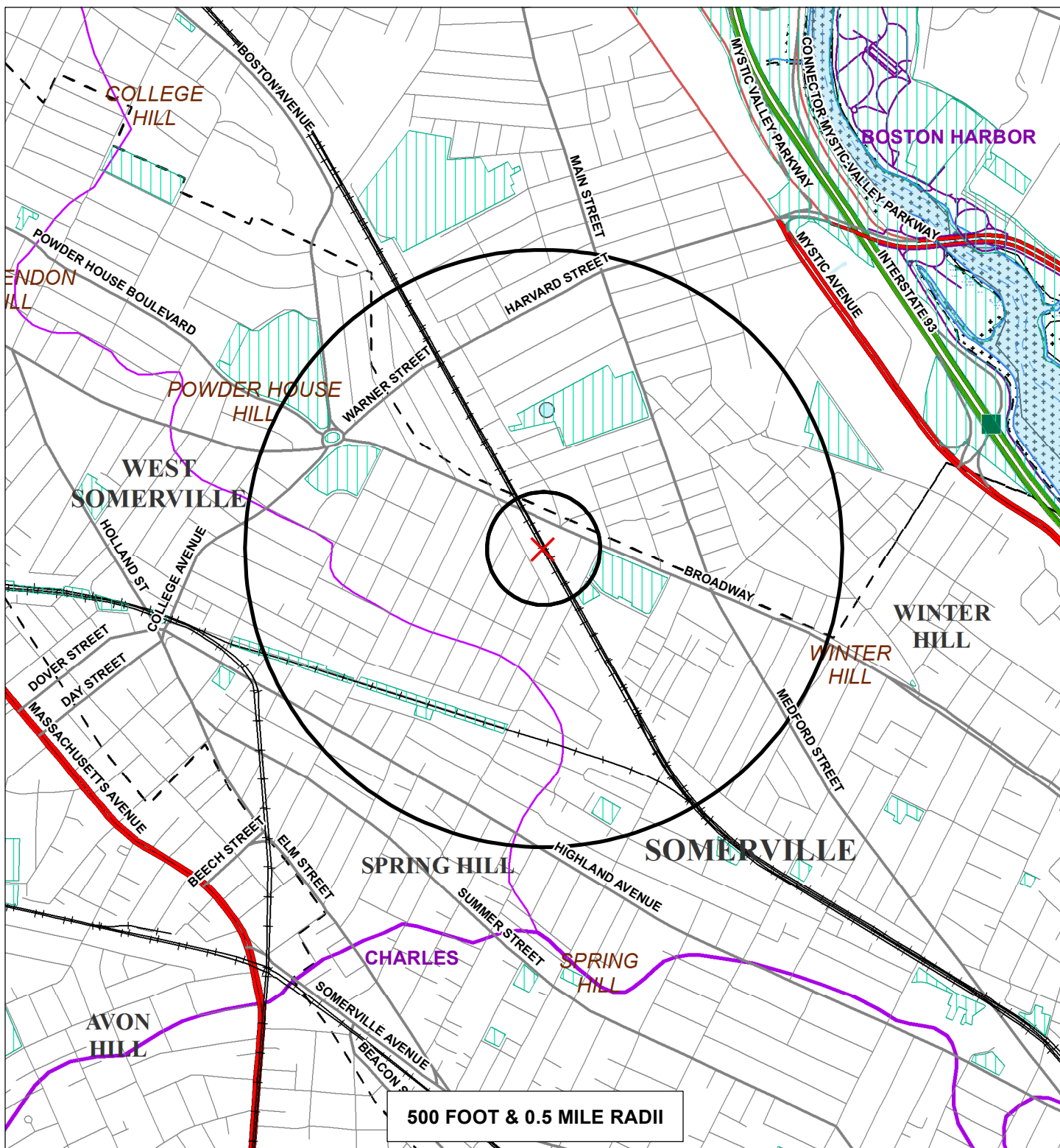


NOT
AUTHORIZED
FOR
CONSTRUCTION



ISSUE	DATE	DESCRIPTION	BY	CHK'D	APP.

SCALE: 1"=40'	DRAWN BY: RI	DESIGN BY: RI	CHECK BY: JS	PLAN NO.: Figure 1	ISSUE: 1
DATE: 6/6/19				SHEET: Figure 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

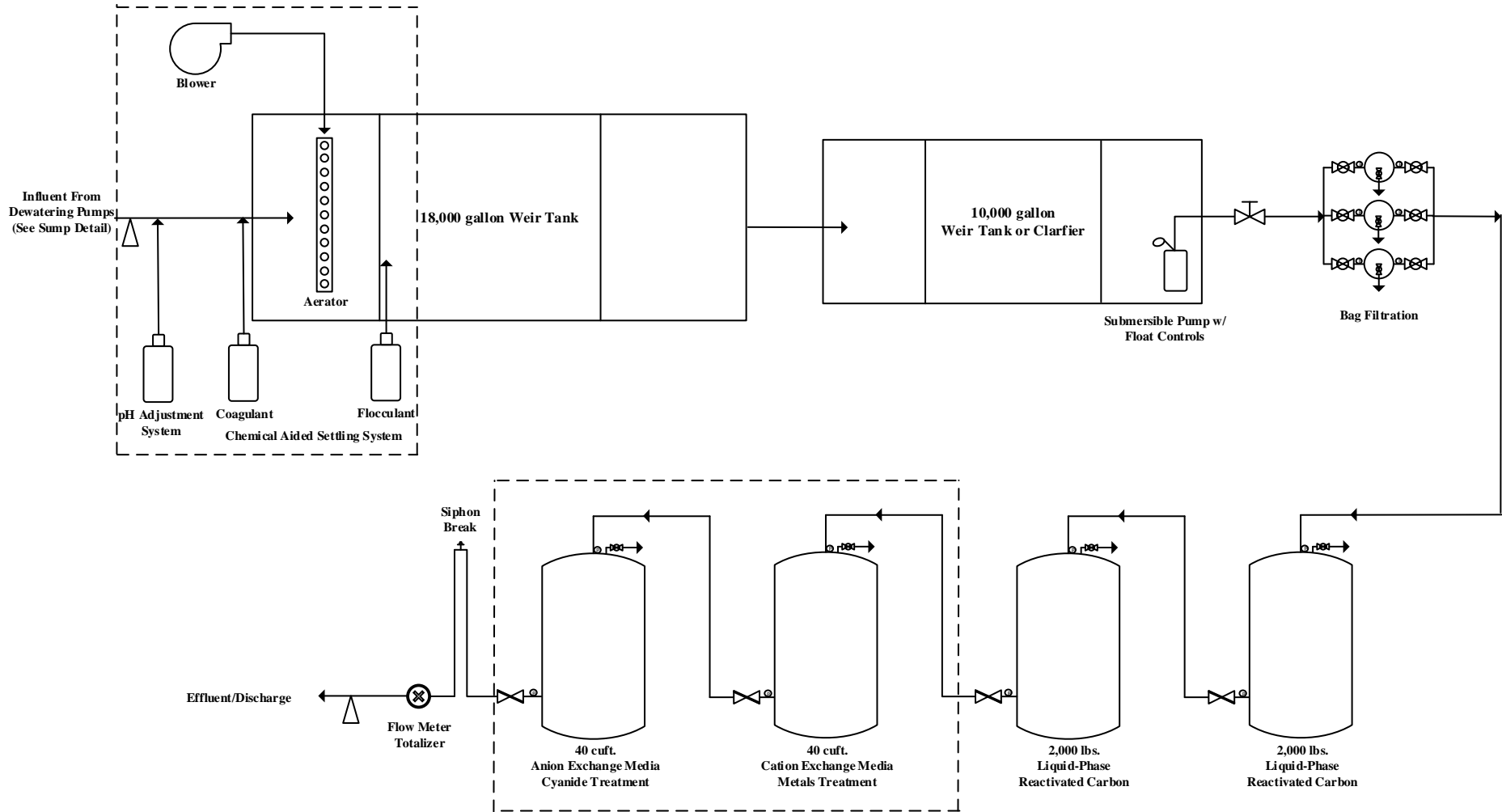


FIGURE 2

MASSDEP PRIORITY RESOURCE MAP
 GLX
 NEWBORN AVENUE RGP
 SOMERVILLE, MA



JUNE
 2019

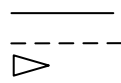


Notes:

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

Key:

Piping/Hose
Contingent
Sample Port



Ball Valve
Butterfly Valve
Gate Valve
Bleed Valve Assembly
Pressure Gauge



Check Valve
Y-Strain/Cleanout
Siphon Break



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

DESIGNED BY: SES/LRT

DRAWN BY: B. Watkins

CHECKED BY: C. Glod

DATE:

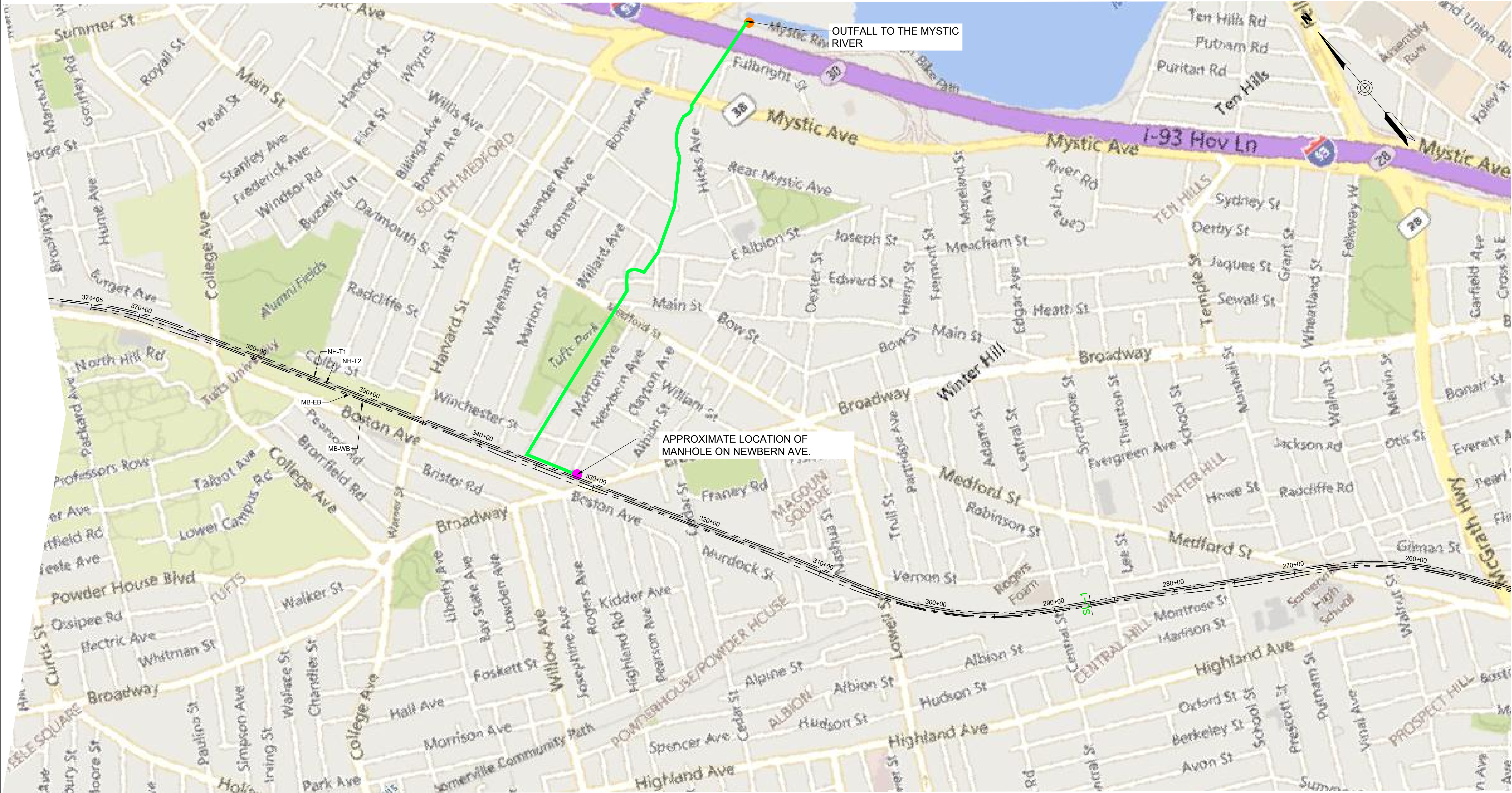
Water Treatment System Schematic Carbon and Metals Treatment System

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

PROJECT No.

FIGURE No.




3



OUTFALL TO THE MYSTIC RIVER

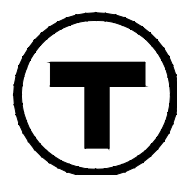
APPROXIMATE LOCATION OF MANHOLE ON NEWBERN AVE.

LEGEND

-  DRAIN LINE
-  DISCHARGE LOCATION
-  OUTFALL LOCATION

1"=400'

400' 0 400'



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

FIGURE 4- GLX
FLOW PATH TO MYSTIC RIVER

NOT
AUTHORIZED
FOR
CONSTRUCTION



ISSUE	DATE	DESCRIPTION	BY	CHK'D	APP.

SCALE: 1" = 400'	DRAWN BY: RI	DESIGN BY: SS	CHECK BY: SS	PLAN NO.:	ISSUE
DATE: 9/12/18				SHEET:	1

ATTACHMENT C TABLES

Table 1
Summary of Newbern Avenue Groundwater Analytical Results
MBTA Green Line Extension Project
Directive Letter 044
May 20-22, 2019

							LOCATION:	GLC-NB-2 ¹	GLC-NB-3 ^{2,9}	GLC-NB-3-1 ^{3,4}	GLC-NB-3-2 ^{3,5,6}	GLC-NB-3-3 ⁸	GLC-NB-3-4 ⁷
							SAMPLING DATE:	5/21/2019	5/20/2019	5/21/2019	5/20/2019	5/20/2019	5/21/2019
							LAB SAMPLE ID:	L1921376-03	L1921130-02	L1921376-01	L1921376-09	L1921130-01	L1921376-02
			RGP for Freshwater ^(a)			EPA	Required Minimum Level ^(d)						
Analysis	Analyte	Units	TBEL	WQBEL ^(b)	Compliance Level ^(c)	MCL							
Volatile Organics													
	Benzene	ug/l	5.0	5.0	N/A	5	5	1 U	980	100	2,600	1 U	1 U
	Toluene	ug/l	N/A	N/A	N/A	1,000	N/A	1 U	130	21	10 U	1 U	1 U
	Ethylbenzene	ug/l	N/A	N/A	N/A	700	N/A	1 U	200	61	10 U	1 U	1 U
	p/m-Xylene	ug/l	N/A	N/A	N/A	10,000	N/A	2 U	100	38	20 U	2 U	2 U
	o-xylene	ug/l	N/A	N/A	N/A	10,000	N/A	1 U	33	10 U	10 U	1 U	1 U
	Total BTEX	ug/l	100	100	N/A	N/A	100	ND	1,443	220	2,600	ND	ND
	1,1-Dichloropropene	ug/l	N/A	N/A	N/A	N/A	N/A	2.5 U	62 U	6.2 U	25 U	2.5 U	2.5 U
	1,2,3-Trichloropropane	ug/l	N/A	N/A	N/A	N/A	N/A	5 U	120 U	12 U	50 U	5 U	5 U
	Bromochloromethane	ug/l	N/A	N/A	N/A	N/A	N/A	2.5 U	62 U	6.2 U	25 U	2.5 U	2.5 U
	Tetrahydrofuran	ug/l	N/A	N/A	N/A	N/A	N/A	5 U	120 U	12 U	50 U	5 U	5 U
	2,2-Dichloropropane	ug/l	N/A	N/A	N/A	N/A	N/A	2.5 U	62 U	6.2 U	25 U	2.5 U	2.5 U
	1,1,1,2-Tetrachloroethane	ug/l	N/A	N/A	N/A	N/A	N/A	0.5 U	12 U	1.2 U	5 U	0.5 U	0.5 U
	Bromobenzene	ug/l	N/A	N/A	N/A	N/A	N/A	2.5 U	62 U	6.2 U	25 U	2.5 U	2.5 U
	n-Butylbenzene	ug/l	N/A	N/A	N/A	N/A	N/A	0.5 U	12 U	2.8	5 U	0.5 U	0.5 U
	sec-Butylbenzene	ug/l	N/A	N/A	N/A	N/A	N/A	0.5 U	12 U	2.1	5 U	0.5 U	0.5 U
	tert-Butylbenzene	ug/l	N/A	N/A	N/A	N/A	N/A	2.5 U	62 U	6.2 U	25 U	2.5 U	2.5 U
	o-Chlorotoluene	ug/l	N/A	N/A	N/A	N/A	N/A	2.5 U	62 U	6.2 U	25 U	2.5 U	2.5 U
	p-Chlorotoluene	ug/l	N/A	N/A	N/A	N/A	N/A	2.5 U	62 U	6.2 U	25 U	2.5 U	2.5 U
	Hexachlorobutadiene	ug/l	N/A	N/A	N/A	N/A	N/A	0.5 U	12 U	1.2 U	5 U	0.5 U	0.5 U
	p-Isopropyltoluene	ug/l	N/A	N/A	N/A	N/A	N/A	0.5 U	12 U	1.2 U	5 U	0.5 U	0.5 U
	Naphthalene	ug/l	20	20	N/A	N/A	20	2.5 U	80	31	25 U^	2.5 U	2.5 U
	n-Propylbenzene	ug/l	N/A	N/A	N/A	N/A	N/A	0.5 U	38	21	5 U	0.5 U	0.5 U
	1,3,5-Trimethylbenzene	ug/l	N/A	N/A	N/A	N/A	N/A	2.5 U	62 U	12	25 U	2.5 U	2.5 U
	1,2,4-Trimethylbenzene	ug/l	N/A	N/A	N/A	N/A	N/A	2.5 U	62 U	20	25 U	2.5 U	2.5 U
	Ethyl ether	ug/l	N/A	N/A	N/A	N/A	N/A	2.5 U	62 U	6.2 U	25 U	2.5 U	2.5 U
	Diisopropyl Ether	ug/l	N/A	N/A	N/A	N/A	N/A	2 U	50 U	5 U	20 U	2 U	2 U
	Ethyl-Tert-Butyl-Ether	ug/l	N/A	N/A	N/A	N/A	N/A	2 U	50 U	5 U	20 U	2 U	2 U
	Methylene chloride	ug/l	4.6	4.6	N/A	5	4.6	1 U	10 U^	10 U^	10 U^	1 U	1 U
	1,1-Dichloroethane	ug/l	70	70	N/A	N/A	70	1.5 U	15 U	15 U	15 U	1.5 U	1.5 U
	Chloroform	ug/l	N/A	N/A	N/A	80	N/A	1 U	10 U	10 U	10 U	1 U	1 U
	Carbon tetrachloride	ug/l	4.4	1.6	N/A	5	1.6	1 U	10 U^	10 U^	10 U^	1 U	1 U
	1,2-Dichloropropane	ug/l	N/A	N/A	N/A	5	N/A	3.5 U	35 U	35 U	35 U	3.5 U	3.5 U
	Dibromochloromethane	ug/l	N/A	N/A	N/A	80	N/A	1 U	10 U	10 U	10 U	1 U	1 U
	1,1,2-Trichloroethane	ug/l	5.0	5.0	N/A	5	5	1.5 U	15 U^	15 U^	15 U^	1.5 U	1.5 U
	2-Chloroethylvinyl ether	ug/l	N/A	N/A	N/A	N/A	N/A	10 U	100 U	100 U	100 U	10 U	10 U
	Tetrachloroethene	ug/l	5.0	3.3	N/A	5	3.3	1 U	10 U^	10 U^	10 U^	1 U	3.3
	Chlorobenzene	ug/l	N/A	N/A	N/A	100	N/A	3.5 U	35 U	35 U	35 U	3.5 U	3.5 U
	Trichlorofluoromethane	ug/l	N/A	N/A	N/A	N/A	N/A	5 U	50 U	50 U	50 U	5 U	5 U
	1,2-Dichloroethane	ug/l	5.0	5.0	N/A	5	5	1.5 U	21	20	15 U^	1.5 U	1.5 U
	1,1,1-Trichloroethane	ug/l	200	200	N/A	200	200	2 U	20 U	20 U	20 U	2 U	2 U
	Bromodichloromethane	ug/l	N/A	N/A	N/A	80	N/A	1 U	10 U	10 U	10 U	1 U	1 U
	trans-1,3-Dichloropropene	ug/l	N/A	N/A	N/A	N/A	N/A	1.5 U	15 U	15 U	15 U	1.5 U	1.5 U
	cis-1,3-Dichloropropene	ug/l	N/A	N/A	N/A	N/A	N/A	1.5 U	15 U	15 U	15 U	1.5 U	1.5 U
	Bromoform	ug/l	N/A	N/A	N/A	80	N/A	1 U	10 U	10 U	10 U	1 U	1 U
	1,1,2,2-Tetrachloroethane	ug/l	N/A	N/A	N/A	N/A	N/A	1 U	10 U	10 U	10 U	1 U	1 U
	Chloromethane	ug/l	N/A	N/A	N/A	N/A	N/A	5 U	50 U	50 U	50 U	5 U	5 U
	Bromomethane	ug/l	N/A	N/A	N/A	N/A	N/A	8.3	50 U	67	90	5 U	8.4
	Vinyl chloride	ug/l	2.0	2.0	N/A	2	2	1 U	10 U^	10 U^	10 U^	1 U	1 U
	Chloroethane	ug/l	N/A	N/A	N/A	N/A	N/A	2 U	20 U	20 U	20 U	2 U	2 U
	1,1-Dichloroethene	ug/l	3.2	3.2	N/A	7	3.2	1 U	10 U^	10 U^	10 U^	1 U	1 U
	trans-1,2-Dichloroethene	ug/l	N/A	N/A	N/A	100	N/A	1.5 U	15 U	15 U	15 U	1.5 U	1.5 U
	cis-1,2-Dichloroethene	ug/l	70	70	N/A	70	70	1 U	10 U	10 U	10 U	1 U	1 U
	Trichloroethene	ug/l	5.0	5.0	N/A	5	5	1 U	10 U^	10 U^	10 U^	1 U	1 U
	1,2-Dichlorobenzene	ug/l	600	600	N/A	600	600	5 U	50 U	50 U	50 U	5 U	5 U
	1,3-Dichlorobenzene	ug/l	320	320	N/A	N/A	320	5 U	50 U	50 U	50 U	5 U	5 U
	1,4-Dichlorobenzene	ug/l	5.0	5.0	N/A	75	5	5 U	50 U^	50 U^	50 U^	5 U	5 U
	Styrene	ug/l	N/A	N/A	N/A	100	N/A	1 U	10 U	10 U	10 U	1 U	1 U
	Acetone	ug/l	7,970	7,970	N/A	N/A	7,970	10 U	100 U	100 U	100 U	10 U	10 U
	Carbon disulfide	ug/l	N/A	N/A	N/A	N/A	N/A	5 U	50 U	50 U	50 U	5 U	5 U

Table 1
Summary of Newbern Avenue Groundwater Analytical Results
MBTA Green Line Extension Project
Directive Letter 044
May 20-22, 2019

							LOCATION:	GLC-NB-2 ¹	GLC-NB-3 ^{2,9}	GLC-NB-3-1 ^{3,4}	GLC-NB-3-2 ^{3,5,6}	GLC-NB-3-3 ⁸	GLC-NB-3-4 ⁷
							SAMPLING DATE:	5/21/2019	5/20/2019	5/21/2019	5/20/2019	5/20/2019	5/21/2019
							LAB SAMPLE ID:	L1921376-03	L1921130-02	L1921376-01	L1921376-09	L1921130-01	L1921376-02
Analysis	Analyte	Units	RGP for Freshwater ^(a)			EPA MCL	Required Minimum Level ^(d)						
			TBEL	WQBEL ^(b)	Compliance Level ^(c)								
	2-Butanone	ug/l	N/A	N/A	N/A	N/A	N/A	10 U	100 U	100 U	100 U	10 U	10 U
	4-Methyl-2-pentanone	ug/l	N/A	N/A	N/A	N/A	N/A	10 U	100 U	100 U	100 U	10 U	10 U
	2-Hexanone	ug/l	N/A	N/A	N/A	N/A	N/A	10 U	100 U	100 U	100 U	10 U	10 U
	Acrolein	ug/l	N/A	N/A	N/A	N/A	N/A	8 U	80 U	80 U	80 U	8 U	8 U
	Acrylonitrile	ug/l	N/A	N/A	N/A	N/A	N/A	10 U	100 U	220	100 U	10 U	10 U
	Methyl tert butyl Ether	ug/l	70	20	N/A	N/A	20	10 U	1,800	4,400	100 U^	10 U	10 U
	Dibromomethane	ug/l	N/A	N/A	N/A	N/A	N/A	1 U	10 U	10 U	10 U	1 U	1 U
	Tert-Butyl Alcohol	ug/l	120	120	N/A	N/A	120	100 U	2,000	1,000 U^	1,000 U^	100 U	100 U
	Tertiary-Amyl Methyl Ether	ug/l	90	90	N/A	N/A	90	20 U	200 U^	200 U^	200 U^	20 U	20 U
	Dichlorodifluoromethane	ug/l	N/A	N/A	N/A	N/A	N/A	1 U	10 U	10 U	10 U	1 U	1 U
	1,2,3-Trichlorobenzene	ug/l	N/A	N/A	N/A	N/A	N/A	1 U	10 U	10 U	10 U	1 U	1 U
	1,2,4-Trichlorobenzene	ug/l	N/A	N/A	N/A	70	N/A	1 U	10 U	10 U	10 U	1 U	1 U
	Isopropylbenzene	ug/l	N/A	N/A	N/A	N/A	N/A	1 U	10 U	10 U	10 U	1 U	1 U
	1,3-Dichloropropane	ug/l	N/A	N/A	N/A	N/A	N/A	1 U	10 U	10 U	10 U	1 U	1 U
	1,2-Dibromo-3-chloropropane	ug/l	N/A	N/A	N/A	0.2	N/A	2 U	20 U	20 U	20 U	2 U	2 U
	1,4-Dioxane	ug/l	200	200	N/A	N/A	50	50 U	500 U^	500 U^	500 U^	50 U	50 U
	1,2-Dibromoethane	ug/l	0.05	0.05	N/A	0.05	0.05	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Volatile Petroleum Hydrocarbons (VPH)													
	C5-C8 Aliphatics	ug/l	N/A	N/A	N/A	N/A	N/A	50 U	NA	4,190	2,650	50 U	50 U
	C9-C12 Aliphatics	ug/l	N/A	N/A	N/A	N/A	N/A	50 U	NA	1,390	500 U	50 U	50 U
	C9-C10 Aromatics	ug/l	N/A	N/A	N/A	N/A	N/A	50 U	NA	526	500 U	50 U	50 U
	C5-C8 Aliphatics, Adjusted	ug/l	N/A	N/A	N/A	N/A	N/A	50 U	NA	2,730	1,100	50 U	50 U
	C9-C12 Aliphatics, Adjusted	ug/l	N/A	N/A	N/A	N/A	N/A	50 U	NA	500 U	500 U	50 U	50 U
	Benzene	ug/l	5.0	5.0	N/A	5	5	2 U	NA	250	1,550	2 U	2 U
	Toluene	ug/l	N/A	N/A	N/A	1,000	NA	2 U	NA	62	20 U	2 U	2 U
	Ethylbenzene	ug/l	N/A	N/A	N/A	700	NA	2 U	NA	413	20 U	2 U	2 U
	p/m-Xylene	ug/l	N/A	N/A	N/A	10,000	NA	2 U	NA	114	20 U	2 U	2 U
	o-Xylene	ug/l	N/A	N/A	N/A	10,000	NA	2 U	NA	20 U	20 U	2 U	2 U
	Total BTEX	ug/l	100	100	N/A	N/A	100	ND	ND	839	1,550	ND	ND
	Methyl tert butyl ether	ug/l	70	20	N/A	N/A	20	3 U	NA	1,140	30 U^	3 U	3 U
	Naphthalene	ug/l	20	20	N/A	N/A	20	4 U	NA	40 U^	40 U^	4 U	4 U
Extractable Petroleum Hydrocarbons (EPH)													
	C9-C18 Aliphatics	ug/l	N/A	N/A	N/A	N/A	N/A	100 U	100 U	100 U	100 U	100 U	100 U
	C19-C36 Aliphatics	ug/l	N/A	N/A	N/A	N/A	N/A	100 U	100 U	100 U	100 U	100 U	100 U
	C11-C22 Aromatics	ug/l	N/A	N/A	N/A	N/A	N/A	100 U	176	115	100 U	100 U	100 U
	C11-C22 Aromatics, Adjusted	ug/l	N/A	N/A	N/A	N/A	N/A	100 U	128	115	100 U	100 U	100 U
Semivolatile Organics by GC/MS													
	Bis(2-ethylhexyl)phthalate	ug/l	101	2.2	N/A	6	2.2	2.6	2.2 U	2.2 U	2.1 U	2.2 U	2.2 U
	Butyl benzyl phthalate	ug/l	N/A	N/A	N/A	N/A	N/A	5 U	5 U	5 U	4.9 U	5 U	5 U
	Di-n-butylphthalate	ug/l	N/A	N/A	N/A	N/A	N/A	5 U	5 U	5 U	4.9 U	5 U	5 U
	Di-n-octylphthalate	ug/l	N/A	N/A	N/A	N/A	N/A	5 U	5 U	5 U	4.9 U	5 U	5 U
	Diethyl phthalate	ug/l	N/A	N/A	N/A	N/A	N/A	5 U	5 U	5 U	4.9 U	5 U	5 U
	Dimethyl phthalate	ug/l	N/A	N/A	N/A	N/A	N/A	5 U	5 U	5 U	4.9 U	5 U	5 U
	Total Phthalates		190	190	N/A	N/A	190	2.60	ND	ND	ND	ND	ND
	Benzidine	ug/l	N/A	N/A	N/A	N/A	N/A	20 U	20 U	20 U	20 U	20 U	20 U
	1,2,4-Trichlorobenzene	ug/l	N/A	N/A	N/A	70	N/A	5 U	5 U	5 U	4.9 U	5 U	5 U
	Bis(2-chloroethyl)ether	ug/l	N/A	N/A	N/A	N/A	N/A	2 U	2 U	2 U	2 U	2 U	2 U
	2-Chloronaphthalene	ug/l	N/A	N/A	N/A	N/A	N/A	2 U	2 U	2 U	2 U	2 U	2 U
	3,3'-Dichlorobenzidine	ug/l	N/A	N/A	N/A	N/A	N/A	5 U	5 U	5 U	4.9 U	5 U	5 U
	2,4-Dinitrotoluene	ug/l	N/A	N/A	N/A	N/A	N/A	5 U	5 U	5 U	4.9 U	5 U	5 U
	2,6-Dinitrotoluene	ug/l	N/A	N/A	N/A	N/A	N/A	5 U	5 U	5 U	4.9 U	5 U	5 U
	Azobenzene	ug/l	N/A	N/A	N/A	N/A	N/A	2 U	2 U	2 U	2 U	2 U	2 U
	4-Bromophenyl phenyl ether	ug/l	N/A	N/A	N/A	N/A	N/A	2 U	2 U	2 U	2 U	2 U	2 U
	Bis(2-chloroisopropyl)ether	ug/l	N/A	N/A	N/A	N/A	N/A	2 U	2 U	2 U	2 U	2 U	2 U
	Bis(2-chloroethoxy)methane	ug/l	N/A	N/A	N/A	N/A	N/A	5 U	5 U	5 U	4.9 U	5 U	5 U
	Hexachlorobutadiene	ug/l	N/A	N/A	N/A	N/A	N/A	2 U	2 U	2 U	2 U	2 U	2 U
	Hexachlorocyclopentadiene	ug/l	N/A	N/A	N/A	50	N/A	10 U	10 U	10 U	9.8 U	10 U	10 U
	Hexachloroethane	ug/l	N/A	N/A	N/A	N/A	N/A	2 U	2 U	2 U	2 U	2 U	2 U
	Isophorone	ug/l	N/A	N/A	N/A	N/A	N/A	5 U	5 U	5 U	4.9 U	5 U	5 U
	Nitrobenzene	ug/l	N/A	N/A	N/A	N/A	N/A	2 U	2 U	2 U	2 U	2 U	2 U

Table 1
Summary of Newbern Avenue Groundwater Analytical Results
MBTA Green Line Extension Project
Directive Letter 044
May 20-22, 2019

							LOCATION: SAMPLING DATE: LAB SAMPLE ID:	GLC-NB-2 ¹ 5/21/2019 L1921376-03	GLC-NB-3 ^{2,9} 5/20/2019 L1921130-02	GLC-NB-3-1 ^{3,4} 5/21/2019 L1921376-01	GLC-NB-3-2 ^{3,5,6} 5/20/2019 L1921376-09	GLC-NB-3-3 ⁸ 5/20/2019 L1921130-01	GLC-NB-3-4 ⁷ 5/21/2019 L1921376-02
Analysis	Analyte	Units	RGP for Freshwater ^(a)			EPA MCL	Required Minimum Level ^(d)						
			TBEL	WQBEL ^(b)	Compliance Level ^(c)								
	NDPA/DPA	ug/l	N/A	N/A	N/A	N/A	N/A	2 U	2 U	2 U	2 U	2 U	2 U
	n-Nitrosodi-n-propylamine	ug/l	N/A	N/A	N/A	N/A	N/A	5 U	5 U	5 U	4.9 U	5 U	5 U
	Aniline	ug/l	N/A	N/A	N/A	N/A	N/A	2 U	2 U	2 U	2 U	2 U	2 U
	4-Chloroaniline	ug/l	N/A	N/A	N/A	N/A	N/A	5 U	5 U	5 U	4.9 U	5 U	5 U
	Dibenzofuran	ug/l	N/A	N/A	N/A	N/A	N/A	2 U	2 U	2 U	2 U	2 U	2 U
	2-Methylnaphthalene	ug/l	N/A	N/A	N/A	N/A	N/A	2 U	10	2 U	2 U	2 U	2 U
	Acetophenone	ug/l	N/A	N/A	N/A	N/A	N/A	5 U	5 U	5 U	4.9 U	5 U	5 U
	n-Nitrosodimethylamine	ug/l	N/A	N/A	N/A	N/A	N/A	2 U	2 U	2 U	2 U	2 U	2 U
	2,4,6-Trichlorophenol	ug/l	N/A	N/A	N/A	N/A	N/A	5 U	5 U	5 U	4.9 U	5 U	5 U
	p-Chloro-m-cresol	ug/l	N/A	N/A	N/A	N/A	N/A	2 U	2 U	2 U	2 U	2 U	2 U
	2-Chlorophenol	ug/l	N/A	N/A	N/A	N/A	N/A	2 U	2 U	2 U	2 U	2 U	2 U
	2,4-Dichlorophenol	ug/l	N/A	N/A	N/A	N/A	N/A	5 U	5 U	5 U	4.9 U	5 U	5 U
	2,4-Dimethylphenol	ug/l	N/A	N/A	N/A	N/A	N/A	5 U	5 U	5 U	4.9 U	5 U	5 U
	2-Nitrophenol	ug/l	N/A	N/A	N/A	N/A	N/A	5 U	5 U	5 U	4.9 U	5 U	5 U
	4-Nitrophenol	ug/l	N/A	N/A	N/A	N/A	N/A	10 U	10 U	10 U	9.8 U	10 U	10 U
	2,4-Dinitrophenol	ug/l	N/A	N/A	N/A	N/A	N/A	20 U	20 U	20 U	20 U	20 U	20 U
	Phenol	ug/l	1,080	300	N/A	N/A	300	5 U	5 U	5 U	12	5 U	5 U
	2-Methylphenol	ug/l	N/A	N/A	N/A	N/A	N/A	5 U	5 U	5 U	4.9 U	5 U	5 U
	3-Methylphenol/4-Methylphenol	ug/l	N/A	N/A	N/A	N/A	N/A	5 U	5 U	5 U	4.9 U	5 U	5 U
	2,4,5-Trichlorophenol	ug/l	N/A	N/A	N/A	N/A	N/A	5 U	5 U	5 U	4.9 U	5 U	5 U
Semivolatile Organics by GC/MS-SIM													
	Benzo(a)anthracene	ug/l	1.0	0.0038	0.1	N/A	0.1	0.1 U	0.1 U	0.1 U	0.27	0.1 U	0.1 U
	Benzo(a)pyrene	ug/l	1.0	0.0038	0.1	0.2	0.1	0.1 U	0.1 U	0.1 U	0.26	0.1 U	0.1 U
	Benzo(b)fluoranthene	ug/l	1.0	0.0038	0.1	N/A	0.1	0.1 U	0.1 U	0.11	0.45	0.1 U	0.1 U
	Benzo(k)fluoranthene	ug/l	1.0	0.0038	0.1	N/A	0.1	0.1 U	0.1 U	0.1 U	0.18	0.1 U	0.1 U
	Chrysene	ug/l	1.0	0.0038	0.1	N/A	0.1	0.1 U	0.1 U	0.1 U	0.31	0.1 U	0.1 U
	Dibenzo(a,h)anthracene	ug/l	1.0	0.0038	N/A	N/A	0.1	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
	Indeno(1,2,3-cd)pyrene	ug/l	1.0	0.0038	0.1	N/A	0.1	0.1 U	0.1 U	0.1 U	0.13	0.1 U	0.1 U
	Total Group I PAHs	ug/l	1.0	1.0	N/A	N/A	1	ND	ND	0.110	1.60	ND	ND
	Acenaphthene	ug/l	N/A	N/A	N/A	N/A	N/A	0.1 U	0.1 U	0.1 U	0.91	0.1 U	0.64
	Fluoranthene	ug/l	N/A	N/A	N/A	N/A	N/A	0.11	0.1 U	0.11	0.6	0.1 U	0.61
	Naphthalene	ug/l	20	20	N/A	N/A	20	0.1 U	48	6.8	2.2	0.1 U	0.1 U
	Acenaphthylene	ug/l	N/A	N/A	N/A	N/A	N/A	0.1 U	0.1 U	0.1 U	0.13	0.1 U	0.1 U
	Anthracene	ug/l	N/A	N/A	N/A	N/A	N/A	0.1 U	0.1 U	0.1 U	0.14	0.1 U	0.1 U
	Benzo(ghi)perylene	ug/l	N/A	N/A	N/A	N/A	N/A	0.1 U	0.1 U	0.1 U	0.11	0.1 U	0.1 U
	Fluorene	ug/l	N/A	N/A	N/A	N/A	N/A	0.1 U	0.1 U	0.1 U	0.47	0.1 U	0.14
	Phenanthrene	ug/l	N/A	N/A	N/A	N/A	N/A	0.11	0.1 U	0.1 U	0.18	0.1 U	0.11
	Pyrene	ug/l	N/A	N/A	N/A	N/A	N/A	0.11	0.1 U	0.1 U	0.58	0.1 U	0.42
	Total Group II PAHs	ug/l	100	100	N/A	N/A	100	0.330	48.0	6.91	5.32	ND	1.92
	Pentachlorophenol	ug/l	1.0	1.0	N/A	1	1	1 U	1 U	1 U	1 U	1 U	1 U
	Hexachlorobenzene	ug/l	N/A	N/A	N/A	1	N/A	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
Organochlorine Pesticides by GC													
	Delta-BHC	ug/l	N/A	N/A	N/A	N/A	N/A	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U
	Lindane	ug/l	N/A	N/A	N/A	0.2	N/A	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U
	Alpha-BHC	ug/l	N/A	N/A	N/A	N/A	N/A	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U
	Beta-BHC	ug/l	N/A	N/A	N/A	N/A	N/A	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U
	Heptachlor	ug/l	N/A	N/A	N/A	0.4	N/A	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U
	Aldrin	ug/l	N/A	N/A	N/A	N/A	N/A	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U
	Heptachlor epoxide	ug/l	N/A	N/A	N/A	0.2	N/A	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U
	Endrin	ug/l	N/A	N/A	N/A	2	N/A	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U
	Endrin aldehyde	ug/l	N/A	N/A	N/A	N/A	N/A	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U
	Endrin ketone	ug/l	N/A	N/A	N/A	N/A	N/A	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U
	Dieldrin	ug/l	N/A	N/A	N/A	N/A	N/A	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U
	4,4'-DDE	ug/l	N/A	N/A	N/A	N/A	N/A	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U
	4,4'-DDD	ug/l	N/A	N/A	N/A	N/A	N/A	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U
	4,4'-DDT	ug/l	N/A	N/A	N/A	N/A	N/A	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U
	Endosulfan I	ug/l	N/A	N/A	N/A	N/A	N/A	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U
	Endosulfan II	ug/l	N/A	N/A	N/A	N/A	N/A	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U
	Endosulfan sulfate	ug/l	N/A	N/A	N/A	N/A	N/A	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U
	Methoxychlor	ug/l	N/A	N/A	N/A	40	N/A	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U

Table 1
Summary of Newbern Avenue Groundwater Analytical Results
MBTA Green Line Extension Project
Directive Letter 044
May 20-22, 2019

							LOCATION:	GLC-NB-2 ¹	GLC-NB-3 ^{2,9}	GLC-NB-3-1 ^{3,4}	GLC-NB-3-2 ^{3,5,6}	GLC-NB-3-3 ⁸	GLC-NB-3-4 ⁷
							SAMPLING DATE:	5/21/2019	5/20/2019	5/21/2019	5/20/2019	5/20/2019	5/21/2019
							LAB SAMPLE ID:	L1921376-03	L1921130-02	L1921376-01	L1921376-09	L1921130-01	L1921376-02
Analysis	Analyte	Units	RGP for Freshwater ^(a)			EPA MCL	Required Minimum Level ^(d)						
			TBEL	WQBEL ^(b)	Compliance Level ^(c)								
	Toxaphene	ug/l	N/A	N/A	N/A	3	N/A	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
	Chlordane	ug/l	N/A	N/A	N/A	2	N/A	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
	cis-Chlordane	ug/l	N/A	N/A	N/A	N/A	N/A	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U
	trans-Chlordane	ug/l	N/A	N/A	N/A	N/A	N/A	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U
Polychlorinated Biphenyls by GC													
	Aroclor 1016	ug/l	N/A	N/A	N/A	N/A	N/A	0.25 U	0.338 U	0.25 U	0.25 U	0.25 U	0.25 U
	Aroclor 1221	ug/l	N/A	N/A	N/A	N/A	N/A	0.25 U	0.338 U	0.25 U	0.25 U	0.25 U	0.25 U
	Aroclor 1232	ug/l	N/A	N/A	N/A	N/A	N/A	0.25 U	0.338 U	0.25 U	0.25 U	0.25 U	0.25 U
	Aroclor 1242	ug/l	N/A	N/A	N/A	N/A	N/A	0.25 U	0.338 U	0.25 U	0.25 U	0.25 U	0.25 U
	Aroclor 1248	ug/l	N/A	N/A	N/A	N/A	N/A	0.25 U	0.338 U	0.25 U	0.25 U	0.25 U	0.25 U
	Aroclor 1254	ug/l	N/A	N/A	N/A	N/A	N/A	0.25 U	0.338 U	0.25 U	0.25 U	0.25 U	0.25 U
	Aroclor 1260	ug/l	N/A	N/A	N/A	N/A	N/A	0.2 U	0.27 U	0.2 U	0.2 U	0.2 U	0.2 U
	Total PCBs	ug/l	0.000064	0.000064	0.5	0.5	0.5	0.25 U	0.338 U	0.25 U	0.25 U	0.25 U	0.25 U
Total Metals													
	Antimony, Total	ug/l	206	640	N/A	6	206	4 U	4 U	4 U	4 U	4 U	4 U
	Arsenic, Total	ug/l	104	10	N/A	10	10	8.2	21.45	16.85	6.45	2.07	15.35
	Cadmium, Total	ug/l	10.2	1.8306	N/A	5	0.25	0.49	0.2 U	2.11	0.2 U	0.2 U	1.03
	Chromium, Total	ug/l	N/A	N/A	N/A	100	N/A	36.41	4.28	304.3	20.3	3.99	221.8
	Copper, Total	ug/l	242	84.6	N/A	1,300	9	49.9	4.68	299.2	24.08	11.78	179.6
	Iron, Total	ug/l	5,000	1,000	N/A	300 ^(e)	1,000	40,700	13,400	174,000	19,500	3,540	146,000
	Lead, Total	ug/l	160	84.94	N/A	15	2.5	142.4	1.81	263.7	39.12	4.51	182.6
	Mercury, Total	ug/l	0.739	0.91	N/A	2	0.77	0.2 U	0.2 U	0.3	0.2 U	0.2 U	0.2 U
	Nickel, Total	ug/l	1,450	462.8	N/A	N/A	52	26.28	5.91	379.3	21.86	6.11	169.2
	Selenium, Total	ug/l	235.8	5.0	N/A	50	5	5 U	5 U	5 U	5 U	5 U	5 U
	Silver, Total	ug/l	35.1	320.2	N/A	100 ^(e)	3.2	0.4 U	0.4 U	0.91	0.4 U	0.4 U	0.79
	Zinc, Total	ug/l	420	1,066.5	N/A	5,000 ^(e)	120	276.7	10 U	565.5	56.97	33.83	407.3
Dissolved Metals													
	Antimony, Dissolved	ug/l	206	640	N/A	6	N/A	4 U	4 U	4 U	4 U	4 U	4 U
	Arsenic, Dissolved	ug/l	104	10	N/A	10	N/A	1 U	26	2.1	7.5	1.2	1 U
	Cadmium, Dissolved	ug/l	10.2	1.8306	N/A	5	N/A	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.3
	Chromium, Dissolved	ug/l	N/A	N/A	N/A	100	N/A	1 U	1 U	6.7	1 U	1 U	1 U
	Copper, Dissolved	ug/l	242	84.6	N/A	1,300	N/A	1 U	1.2	7.2	3.2	7	1 U
	Iron, Dissolved	ug/l	5,000	1,000	N/A	300 ^(e)	N/A	2,190	12,000	5,270	50 U	117	50 U
	Lead, Dissolved	ug/l	160	84.94	N/A	15	N/A	1 U	1 U	3.1	1 U	1 U	1 U
	Mercury, Dissolved	ug/l	0.739	0.91	N/A	2	N/A	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
	Nickel, Dissolved	ug/l	1,450	462.8	N/A	N/A	N/A	2 U	3.8	18.4	6.3	4	7.4
	Selenium, Dissolved	ug/l	235.8	5.0	N/A	50	N/A	5 U	5 U	5 U	5 U	5 U	5 U
	Silver, Dissolved	ug/l	35.1	320.2	N/A	100 ^(e)	N/A	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
	Zinc, Dissolved	ug/l	420	1,066.5	N/A	5,000 ^(e)	N/A	24.7	10 U	12.3	10 U	10 U	10 U
General Chemistry													
	Ethanol	ug/l	N/A	N/A	N/A	N/A	400	2,000 U^	2,000 U^	2,000 U^	2,000 U^	2,000 U^	2,000 U^
	Chloride	ug/l	N/A	N/A	N/A	250,000 ^(e)	230,000	182,000	1,120,000	910,000	182,000	380,000	1,110,000
	Hardness	ug/l	N/A	N/A	N/A	N/A	N/A	196,000	1,100,000	1,320,000	428,000	203,000	891,000
	Chromium, Trivalent (Filtered)	ug/l	323	713.1	N/A	N/A	N/A	10 U	10 U	10 U	10 U	10 U	10 U
	Chromium, Trivalent (Unfiltered)	ug/l	323	713.1	N/A	N/A	74	100 U^	50 U	2,000 U^	200 U^	10 U	222
	Solids, Total Dissolved	ug/l	N/A	N/A	N/A	500,000 ^(e)	N/A	410,000	2,200,000	1,800,000	720,000	840,000	1,900,000
	Solids, Total Suspended	ug/l	30,000	30,000	N/A	N/A	30,000	410,000	98,000	12,000,000	4,500,000	13,000	16,000,000
	Cyanide, Dissolved	ug/l	178	5.2	N/A	N/A	N/A	67	5 U	5 U	5 U	5 U	5 U
	Cyanide, Total	ug/l	178	5.2	N/A	N/A	5.2	5 U	5 U	5 U	5 U	5 U	5 U
	Chlorine, Total Residual	ug/l	200	11	50	N/A	50	20 U	20 U	20 U	20 U	20 U	20 U
	Nitrogen, Ammonia	ug/l	N/A	N/A	N/A	N/A	100	295	96	394	850	224	533
	Total Organic Carbon (TOC)	ug/l	N/A	N/A	N/A	N/A	N/A	2,790	17,100	4,810	NA	6,350	1,520
	Oil & Grease, Hem-Grav	ug/l	5,000	5,000	N/A	N/A	5,000	5,200 U^	4,000 U	4,400 U	5,600 U^	4,000 U	4,800 U
	TPH, SGT-HEM	ug/l	5,000	5,000	N/A	N/A	5,000	5,200 U^	4,000 U	4,400 U	5,600 U^	4,000 U	4,800 U
	Phenolics, Total	ug/l	1,080	300	N/A	N/A	300	30 U	30 U	30 U	39	30 U	30 U
	Chromium, Hexavalent	ug/l	323	11.4	N/A	N/A	N/A	10 U	10 U	10 U	10 U	10 U	10 U
	Chromium, Hexavalent (Unfiltered)	ug/l	323	11.4	N/A	N/A	11	100 U^	50 U^	2,000 U^	200 U^	10 U	100 U^
	pH	su	6.5-8.3	6.5-8.3	N/A	6.5-8.5	N/A	6.22	5.97	6.71	7.16	5.50	6.36
	Temperature	deg. C	N/A	N/A	N/A	N/A	N/A	13	13.09	13.14	16.29	12.69	12.36
Microbiological Analysis													



Table 1
Summary of Newbern Avenue Groundwater Analytical Results
MBTA Green Line Extension Project
Directive Letter 044
May 20-22, 2019

						LOCATION:		GLC-NB-2 ¹	GLC-NB-3 ^{2,9}	GLC-NB-3-1 ^{3,4}	GLC-NB-3-2 ^{3,5,6}	GLC-NB-3-3 ⁸	GLC-NB-3-4 ⁷
						SAMPLING DATE:		5/21/2019	5/20/2019	5/21/2019	5/20/2019	5/20/2019	5/21/2019
						LAB SAMPLE ID:		L1921376-03	L1921130-02	L1921376-01	L1921376-09	L1921130-01	L1921376-02
						RGP for Freshwater ^(a)							
Analysis	Analyte	Units	TBEL	WQBEL ^(b)	Compliance Level ^(c)	EPA	Required						
						MCL	Minimum Level ^(d)						
	E. Coli (MPN)	MPN/100ml	N/A	N/A	N/A	N/A	N/A	NA	NA	115.28	2.02	NA	1

Notes:

ug/L - micrograms per liter.

su - Standard unit.

NA - 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.

MCL - Maximum concentration limit, EPA Drinking Water Standards and Health Advisories, March 2018.

MS - Mass Spectrometry.

PAHs - Polynuclear Aromatic Hydrocarbons.

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

SIM - Selected Ion Monitoring.

TBEL - Technology-Based Effluent Limitation.

WQBEL - Water Quality-Based Effluent Limitation.

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

^(a) RGP for Freshwater standards are an average monthly discharge limitation in Massachusetts only.

^(b) No Dilution Factor has been applied based on the flow rate of the Mystic River. The WQBEL standards have been modified by the hardness of the Mystic River and the hardness of the groundwater proposed for treatment and discharge.

^(c) The compliance level is a discharge standard for analytes with detection limits above the RGP discharge standard.

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

^(e) - EPA Secondary Drinking Water Regulations (SDWR), March, 2018.

- 1 - All parameters except those noted below were collected on 5/21/19 and were reported under lab ID L1921376-03.
- TOC and VPH were collected on 5/22/19 and were reported under lab ID L1921376-14.
 - Ethanol was collected on 5/21/19 and was reported under lab ID 490-174548-3.
 - Dissolved Mercury was collected on 5/21/19 and was reported under lab ID 48786-006.
 - Total Mercury was collected on 5/21/19 and was reported under lab ID 48786-003.
- 2 - Results from the undiluted and diluted Semivolatile Organics by GC/MS-SIM analyses have been combined in order to report all results within calibration range. Refer to laboratory report for further detail.
- 3 - Results from the undiluted and diluted Volatile Organics by GC/MS analyses have been combined in order to report all results within calibration range. Refer to laboratory report for further detail.
- 4 - All parameters except those noted below were collected on 5/21/19 and were reported under lab ID L1921376-01.
- E. coli was collected on 5/21/19 and was reported under lab ID L1921376-05.
 - TOC was collected on 5/22/19 and was reported under lab ID L1921376-13.
 - Ethanol was collected on 5/21/19 and was reported under lab ID 490-174548-1.
 - Dissolved Mercury was collected on 5/21/19 and was reported under lab ID 48786-001.
 - Total Mercury was collected on 5/21/19 and was reported under lab ID 48791-001.
- 5 - All parameters except those noted below were collected on 5/20/19 and were reported under lab ID L1921376-09.
- Chloride, Trivalent Chromium (Unfiltered), Total Dissolved Solids, Total Suspended Solids, Total Residual Chlorine, and Hexavalent Chromium (Unfiltered) were collected on 5/21/19 and were reported under lab ID L1921376-11.
 - E. coli was collected on 5/21/19 and was reported under lab ID L1921376-04.
 - Dissolved Metals, Trivalent Chromium (Filtered), Dissolved Cyanide, and Hexavalent Chromium were collected on 5/22/19 and were reported under lab ID L1921376-12.
 - Ethanol was collected on 5/20/19 and was reported under lab ID 490-174548-4.
 - Dissolved Mercury was collected on 5/22/19 and was reported under lab ID 48786-005.
 - Total Mercury was collected on 5/20/19 and was reported under lab ID 48786-004.
- 6 - The laboratory reported two sets of EPH results due to surrogate nonconformances in the original and re-analyses. Results from the original analysis have been tabulated. Refer to laboratory report for further detail.
- 7 - All parameters except those noted below were collected on 5/21/19 and were reported under lab ID L1921376-02.
- E. coli was collected on 5/21/19 and was reported under lab ID L1921376-07.
 - TOC and VPH were collected on 5/22/19 and was reported under lab ID L1921376-15.
 - Ethanol was collected on 5/21/19 and was reported under lab ID 490-174548-2.
 - Dissolved Mercury was collected on 5/21/19 and was reported under lab ID 48791-002.
 - Total Mercury was collected on 5/21/19 and was reported under lab ID 48786-002.
- 8 - All parameters except those noted below were collected on 5/20/19 and were reported under lab ID L1921130-01.
- Ethanol was collected on 5/20/19 and was reported under lab ID 490-174593-1.
- 9 - All parameters except those noted below were collected on 5/20/19 and were reported under lab ID L1921130-02.
- Ethanol was collected on 5/20/19 and was reported under lab ID 490-174593-2.

Table 2
Summary of Surface Water Analytical Results
Mystic River
MBTA Green Line Extension Project
Directive Letter 044
May 20-22, 2019

<div> <div>LOCATION:</div> <div>SAMPLING DATE:</div> <div>LAB SAMPLE ID:</div> </div>			MYSTIC RIVER	
			OUTFALL OF-50000	
			5/17/2019	
			L1920900-01 ¹	
Analysis	Analyte	Units		
Total Metals				
	Antimony, Total	ug/l	4	U
	Arsenic, Total	ug/l	1.42	
	Cadmium, Total	ug/l	0.2	U
	Chromium, Total	ug/l	1	U
	Copper, Total	ug/l	3.5	
	Iron, Total	ug/l	2,800	
	Lead, Total	ug/l	1.95	
	Mercury, Total	ug/l	0.2	U
	Nickel, Total	ug/l	3.28	
	Selenium, Total	ug/l	5	U
	Silver, Total	ug/l	0.4	U
	Zinc, Total	ug/l	75.83	
General Chemistry				
	Nitrogen, Ammonia	ug/l	1,620	
	Chromium, Trivalent	ug/l	10	U
	Chromium, Hexavalent	ug/l	10	U
	Hardness	ug/l	254,000	
	pH	su	6.53	
	Temperature	deg. C	11.7	

Notes:

ug/L - micrograms per liter.

su - Standard unit.

U - Analyte was not detected at specified quantitation limit.

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

¹ All parameters except total mercury analyzed by Alpha Analytical.

Total mercury analyzed by Absolute Resource Associates as Lab Sample ID 48785-001.

ATTACHMENT D

LABORATORY ANALYTICAL REPORTS



ANALYTICAL REPORT

Lab Number:	L1921376
Client:	TRC Environmental Consultants 650 Suffolk Street Lowell, MA 01854
ATTN:	Diane Stallings
Phone:	(978) 970-5600
Project Name:	MBTA GLX NEWBERN AVE II
Project Number:	290762.0016.0000
Report Date:	05/29/19

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





ANALYTICAL REPORT

Lab Number:	L1921130
Client:	TRC Environmental Consultants 650 Suffolk Street Lowell, MA 01854
ATTN:	Diane Stallings
Phone:	(978) 970-5600
Project Name:	MBTA GLX NEWBERN AVE II
Project Number:	290762.0016.0000
Report Date:	05/29/19

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.

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



Project Name: MBTA GLX NEWBERN AVE II
Project Number: 290762.0016.0000

Lab Number: L1921130
Report Date: 05/29/19

Alpha Sample ID	Client ID	Matrix	Sample Location	Collection Date/Time	Receive Date
L1921130-01	GLC-NB-3-3	WATER	SOMERVILLE, MEDFORD, CAMBRIDGE	05/20/19 10:15	05/20/19
L1921130-02	GLC-NB-3	WATER	SOMERVILLE, MEDFORD, CAMBRIDGE	05/20/19 14:23	05/20/19

Project Name: MBTA GLX NEWBERN AVE II

Lab Number: L1921130

Project Number: 290762.0016.0000

Report Date: 05/29/19

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?	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 NEWBERN AVE II
Project Number: 290762.0016.0000

Lab Number: L1921130
Report Date: 05/29/19

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. 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 Outlier Summary Report, located directly after the Case Narrative. QC information is also incorporated in the Data Usability Assessment table (Format 11) of our Data Merger tool, where it can be reviewed in conjunction with the sample result, associated regulatory criteria and any associated data 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.

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 Alpha Project Manager 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 Project Management at 800-624-9220 with any questions.

Project Name: MBTA GLX NEWBERN AVE II
Project Number: 290762.0016.0000

Lab Number: L1921130
Report Date: 05/29/19

Case Narrative (continued)

Report Submission

The analysis of Ethanol was subcontracted. A copy of the laboratory report is included as an addendum.
Please note: This data is only available in PDF format and is not available on Data Merger.

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 and VPH analysis.

Sample Receipt

L1921130-01: The VPH analysis was performed at the client's request.

L1921130-01: Containers for Bacteria analysis were received for the "GLC-NB-3-3" sample, but were not listed on the chain of custody. The analysis was not performed at the client's request.

L1921130-02: Containers for Bacteria analysis were received for the "GLC-NB-3" sample, but were not listed on the chain of custody. The analysis was not performed at the client's request.

EPH

In reference to question I:

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

Non-MCP Related Narratives

Volatile Organics by Method 8260

L1921130-02: The sample has elevated detection limits due to the dilution required by the elevated concentrations of non-target compounds in the sample.

Project Name: MBTA GLX NEWBERN AVE II
Project Number: 290762.0016.0000

Lab Number: L1921130
Report Date: 05/29/19

Case Narrative (continued)

Volatile Organics by Method 624

L1921130-02: The sample has elevated detection limits due to the dilution required by the elevated concentrations of target compounds in the sample.

Volatile Organics by SIM

L1921130-02: The sample has an elevated detection limit for 1,4-Dioxane due to the dilution required by the elevated concentrations of non-target compounds in the sample.

Semivolatile Organics by SIM

L1921130-02: The sample was re-analyzed on dilution in order to quantify the results within the calibration range. The result(s) should be considered estimated, and are qualified with an E flag, for any compound(s) that exceeded the calibration range in the initial analysis. The re-analysis was performed only for the compound(s) that exceeded the calibration range.

PCBs

L1921130-02: The sample has elevated detection limits due to limited sample volume available for analysis.

Chromium, Hexavalent (Unfiltered)

L1921130-02: The sample has an elevated detection limit due to the dilution required by the sample matrix. The WG1239362-4 MS recovery (72%), performed on L1921130-02, is outside the acceptance criteria; however, the associated LCS recovery is within criteria. No further action was taken.

Chlorine, Total Residual

The WG1239298-4 MS recovery (228%), performed on L1921130-02, is outside the acceptance criteria; however, the associated LCS recovery is within criteria. No further action was taken.

Project Name: MBTA GLX NEWBERN AVE II
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Lab Number: L1921130
Report Date: 05/29/19

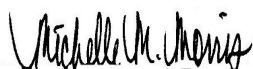
Case Narrative (continued)

Phenolics, Total

The WG1239930-4 MS recovery (54%), performed on L1921130-01, is outside the acceptance criteria; however, the associated LCS recovery is within criteria. No further action was taken.

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: 05/29/19

QC OUTLIER SUMMARY REPORT

Project Name: MBTA GLX NEWBERN AVE II**Lab Number:** L1921130**Project Number:** 290762.0016.0000**Report Date:** 05/29/19

Method	Client ID (Native ID)	Lab ID	Parameter	QC Type	Recovery/RPD (%)	QC Limits (%)	Associated Samples	Data Quality Assessment
General Chemistry - Westborough Lab								
420.1	Batch QC (L1921130-01)	WG1239930-4	Phenolics, Total	MS	54	70-130	01-02	potential low bias
4500CL-D	Batch QC (L1921130-02)	WG1239298-4	Chlorine, Total Residual	MS	228	80-120	01-02	potential high bias
7196A	Batch QC (L1921130-02)	WG1239362-4	Chromium, Hexavalent (Unfiltered)	MS	72	85-115	01-02	potential low bias

ORGANICS

VOLATILES

Project Name: MBTA GLX NEWBERN AVE II
Project Number: 290762.0016.0000

Lab Number: L1921130
Report Date: 05/29/19

SAMPLE RESULTS

Lab ID: L1921130-01
Client ID: GLC-NB-3-3
Sample Location: SOMERVILLE, MEDFORD, CAMBRIDGE

Date Collected: 05/20/19 10:15
Date Received: 05/20/19
Field Prep: Refer to COC

Sample Depth:

Matrix: Water
Analytical Method: 1,8260C
Analytical Date: 05/23/19 17:33
Analyst: PK

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	102		70-130
Toluene-d8	98		70-130
4-Bromofluorobenzene	101		70-130
Dibromofluoromethane	91		70-130

Project Name: MBTA GLX NEWBERN AVE II**Lab Number:** L1921130**Project Number:** 290762.0016.0000**Report Date:** 05/29/19**SAMPLE RESULTS**

Lab ID: L1921130-01
 Client ID: GLC-NB-3-3
 Sample Location: SOMERVILLE, MEDFORD, CAMBRIDGE

Date Collected: 05/20/19 10:15
 Date Received: 05/20/19
 Field Prep: Refer to COC

Sample Depth:

Matrix: Water
 Analytical Method: 128,624.1
 Analytical Date: 05/22/19 17:21
 Analyst: MKS

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 NEWBERN AVE II
Project Number: 290762.0016.0000

Lab Number: L1921130
Report Date: 05/29/19

SAMPLE RESULTS

Lab ID: L1921130-01
Client ID: GLC-NB-3-3
Sample Location: SOMERVILLE, MEDFORD, CAMBRIDGE

Date Collected: 05/20/19 10:15
Date Received: 05/20/19
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	105		60-140
Fluorobenzene	93		60-140
4-Bromofluorobenzene	99		60-140

Project Name: MBTA GLX NEWBERN AVE II
Project Number: 290762.0016.0000

Lab Number: L1921130
Report Date: 05/29/19

SAMPLE RESULTS

Lab ID: L1921130-01
Client ID: GLC-NB-3-3
Sample Location: SOMERVILLE, MEDFORD, CAMBRIDGE

Date Collected: 05/20/19 10:15
Date Received: 05/20/19
Field Prep: Refer to COC

Sample Depth:

Matrix: Water
Analytical Method: 128,624.1-SIM
Analytical Date: 05/21/19 17:53
Analyst: GT

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
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Surrogate	% Recovery	Qualifier	Acceptance Criteria
Fluorobenzene	101		60-140
4-Bromofluorobenzene	110		60-140

Project Name: MBTA GLX NEWBERN AVE II
Project Number: 290762.0016.0000

Lab Number: L1921130
Report Date: 05/29/19

SAMPLE RESULTS

Lab ID: L1921130-01
Client ID: GLC-NB-3-3
Sample Location: SOMERVILLE, MEDFORD, CAMBRIDGE

Date Collected: 05/20/19 10:15
Date Received: 05/20/19
Field Prep: Refer to COC

Sample Depth:

Matrix: Water
Analytical Method: 14,504.1
Analytical Date: 05/22/19 19:00
Analyst: AWS

Extraction Method: EPA 504.1
Extraction Date: 05/22/19 03:35

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 NEWBERN AVE II
Project Number: 290762.0016.0000

Lab Number: L1921130
Report Date: 05/29/19

SAMPLE RESULTS

Lab ID: L1921130-02
Client ID: GLC-NB-3
Sample Location: SOMERVILLE, MEDFORD, CAMBRIDGE

Date Collected: 05/20/19 14:23
Date Received: 05/20/19
Field Prep: Refer to COC

Sample Depth:

Matrix: Water
Analytical Method: 14,504.1
Analytical Date: 05/22/19 19:15
Analyst: AWS

Extraction Method: EPA 504.1
Extraction Date: 05/22/19 03:35

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 NEWBERN AVE II**Lab Number:** L1921130**Project Number:** 290762.0016.0000**Report Date:** 05/29/19**SAMPLE RESULTS**

Lab ID: L1921130-02 D
 Client ID: GLC-NB-3
 Sample Location: SOMERVILLE, MEDFORD, CAMBRIDGE

Date Collected: 05/20/19 14:23
 Date Received: 05/20/19
 Field Prep: Refer to COC

Sample Depth:

Matrix: Water
 Analytical Method: 1,8260C
 Analytical Date: 05/23/19 18:09
 Analyst: PK

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by GC/MS - Westborough Lab						
1,1-Dichloropropene	ND		ug/l	62	--	25
1,2,3-Trichloropropane	ND		ug/l	120	--	25
Bromochloromethane	ND		ug/l	62	--	25
Tetrahydrofuran	ND		ug/l	120	--	25
2,2-Dichloropropane	ND		ug/l	62	--	25
1,1,1,2-Tetrachloroethane	ND		ug/l	12	--	25
Bromobenzene	ND		ug/l	62	--	25
n-Butylbenzene	ND		ug/l	12	--	25
sec-Butylbenzene	ND		ug/l	12	--	25
tert-Butylbenzene	ND		ug/l	62	--	25
o-Chlorotoluene	ND		ug/l	62	--	25
p-Chlorotoluene	ND		ug/l	62	--	25
Hexachlorobutadiene	ND		ug/l	12	--	25
p-Isopropyltoluene	ND		ug/l	12	--	25
Naphthalene	80		ug/l	62	--	25
n-Propylbenzene	38		ug/l	12	--	25
1,3,5-Trimethylbenzene	ND		ug/l	62	--	25
1,2,4-Trimethylbenzene	ND		ug/l	62	--	25
Ethyl ether	ND		ug/l	62	--	25
Diisopropyl Ether	ND		ug/l	50	--	25
Ethyl-Tert-Butyl-Ether	ND		ug/l	50	--	25

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	104		70-130
Toluene-d8	95		70-130
4-Bromofluorobenzene	97		70-130
Dibromofluoromethane	91		70-130

Project Name: MBTA GLX NEWBERN AVE II**Lab Number:** L1921130**Project Number:** 290762.0016.0000**Report Date:** 05/29/19**SAMPLE RESULTS**

Lab ID: L1921130-02 D
 Client ID: GLC-NB-3
 Sample Location: SOMERVILLE, MEDFORD, CAMBRIDGE

Date Collected: 05/20/19 14:23
 Date Received: 05/20/19
 Field Prep: Refer to COC

Sample Depth:

Matrix: Water
 Analytical Method: 128,624.1
 Analytical Date: 05/22/19 17:58
 Analyst: MKS

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by GC/MS - Westborough Lab						
Methylene chloride	ND		ug/l	10	--	10
1,1-Dichloroethane	ND		ug/l	15	--	10
Chloroform	ND		ug/l	10	--	10
Carbon tetrachloride	ND		ug/l	10	--	10
1,2-Dichloropropane	ND		ug/l	35	--	10
Dibromochloromethane	ND		ug/l	10	--	10
1,1,2-Trichloroethane	ND		ug/l	15	--	10
2-Chloroethylvinyl ether	ND		ug/l	100	--	10
Tetrachloroethene	ND		ug/l	10	--	10
Chlorobenzene	ND		ug/l	35	--	10
Trichlorofluoromethane	ND		ug/l	50	--	10
1,2-Dichloroethane	21		ug/l	15	--	10
1,1,1-Trichloroethane	ND		ug/l	20	--	10
Bromodichloromethane	ND		ug/l	10	--	10
trans-1,3-Dichloropropene	ND		ug/l	15	--	10
cis-1,3-Dichloropropene	ND		ug/l	15	--	10
Bromoform	ND		ug/l	10	--	10
1,1,2,2-Tetrachloroethane	ND		ug/l	10	--	10
Benzene	980		ug/l	10	--	10
Toluene	130		ug/l	10	--	10
Ethylbenzene	200		ug/l	10	--	10
Chloromethane	ND		ug/l	50	--	10
Bromomethane	ND		ug/l	50	--	10
Vinyl chloride	ND		ug/l	10	--	10
Chloroethane	ND		ug/l	20	--	10
1,1-Dichloroethene	ND		ug/l	10	--	10
trans-1,2-Dichloroethene	ND		ug/l	15	--	10
cis-1,2-Dichloroethene	ND		ug/l	10	--	10

Project Name: MBTA GLX NEWBERN AVE II
Project Number: 290762.0016.0000

Lab Number: L1921130
Report Date: 05/29/19

SAMPLE RESULTS

Lab ID: L1921130-02 **D**
Client ID: GLC-NB-3
Sample Location: SOMERVILLE, MEDFORD, CAMBRIDGE

Date Collected: 05/20/19 14:23
Date Received: 05/20/19
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	10	--	10
1,2-Dichlorobenzene	ND		ug/l	50	--	10
1,3-Dichlorobenzene	ND		ug/l	50	--	10
1,4-Dichlorobenzene	ND		ug/l	50	--	10
p/m-Xylene	100		ug/l	20	--	10
o-xylene	33		ug/l	10	--	10
Styrene	ND		ug/l	10	--	10
Acetone	ND		ug/l	100	--	10
Carbon disulfide	ND		ug/l	50	--	10
2-Butanone	ND		ug/l	100	--	10
4-Methyl-2-pentanone	ND		ug/l	100	--	10
2-Hexanone	ND		ug/l	100	--	10
Acrolein	ND		ug/l	80	--	10
Acrylonitrile	ND		ug/l	100	--	10
Methyl tert butyl Ether	1800		ug/l	100	--	10
Dibromomethane	ND		ug/l	10	--	10
Tert-Butyl Alcohol	2000		ug/l	1000	--	10
Tertiary-Amyl Methyl Ether	ND		ug/l	200	--	10
Dichlorodifluoromethane ¹	ND		ug/l	10	--	10
1,2,3-Trichlorobenzene	ND		ug/l	10	--	10
1,2,4-Trichlorobenzene	ND		ug/l	10	--	10
Isopropylbenzene	ND		ug/l	10	--	10
1,3-Dichloropropane	ND		ug/l	10	--	10
1,2-Dibromo-3-chloropropane	ND		ug/l	20	--	10

Surrogate	% Recovery	Qualifier	Acceptance Criteria
Pentafluorobenzene	108		60-140
Fluorobenzene	97		60-140
4-Bromofluorobenzene	100		60-140

Project Name: MBTA GLX NEWBERN AVE II
Project Number: 290762.0016.0000

Lab Number: L1921130
Report Date: 05/29/19

SAMPLE RESULTS

Lab ID: L1921130-02 **D**
Client ID: GLC-NB-3
Sample Location: SOMERVILLE, MEDFORD, CAMBRIDGE

Date Collected: 05/20/19 14:23
Date Received: 05/20/19
Field Prep: Refer to COC

Sample Depth:

Matrix: Water
Analytical Method: 128,624.1-SIM
Analytical Date: 05/21/19 18:30
Analyst: GT

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	500	--	10
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Surrogate	% Recovery	Qualifier	Acceptance Criteria
Fluorobenzene	108		60-140
4-Bromofluorobenzene	110		60-140

Project Name: MBTA GLX NEWBERN AVE II
Project Number: 290762.0016.0000

Lab Number: L1921130
Report Date: 05/29/19

Method Blank Analysis
Batch Quality Control

Analytical Method: 128,624.1-SIM
Analytical Date: 05/21/19 15:08
Analyst: GT

Parameter	Result	Qualifier	Units	RL	MDL
Volatile Organics by GC/MS-SIM - Westborough Lab for sample(s): 01-02 Batch: WG1239990-4					
1,4-Dioxane	ND		ug/l	50	--

Surrogate	%Recovery	Qualifier	Acceptance Criteria
Fluorobenzene	98		60-140
4-Bromofluorobenzene	109		60-140

Project Name: MBTA GLX NEWBERN AVE II
Project Number: 290762.0016.0000

Lab Number: L1921130
Report Date: 05/29/19

Method Blank Analysis
Batch Quality Control

Analytical Method: 14,504.1
Analytical Date: 05/22/19 17:15
Analyst: AWS

Extraction Method: EPA 504.1
Extraction Date: 05/22/19 03:35

Parameter	Result	Qualifier	Units	RL	MDL
Microextractables by GC - Westborough Lab for sample(s): 01-02 Batch: WG1240014-1					
1,2-Dibromoethane	ND		ug/l	0.010	-- A

Project Name: MBTA GLX NEWBERN AVE II
Project Number: 290762.0016.0000

Lab Number: L1921130
Report Date: 05/29/19

Method Blank Analysis Batch Quality Control

Analytical Method: 1,8260C
 Analytical Date: 05/23/19 08:32
 Analyst: PD

Parameter	Result	Qualifier	Units	RL	MDL
Volatile Organics by GC/MS - Westborough Lab for sample(s): 01-02 Batch: WG1240495-5					
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	104		70-130
Toluene-d8	99		70-130
4-Bromofluorobenzene	96		70-130
Dibromofluoromethane	100		70-130

Project Name: MBTA GLX NEWBERN AVE II
Project Number: 290762.0016.0000

Lab Number: L1921130
Report Date: 05/29/19

Method Blank Analysis
Batch Quality Control

Analytical Method: 128,624.1
 Analytical Date: 05/22/19 16:08
 Analyst: NLK

Parameter	Result	Qualifier	Units	RL	MDL
Volatile Organics by GC/MS - Westborough Lab for sample(s): 01-02 Batch: WG1240508-4					
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 NEWBERN AVE II
Project Number: 290762.0016.0000

Lab Number: L1921130
Report Date: 05/29/19

Method Blank Analysis Batch Quality Control

Analytical Method: 128,624.1
 Analytical Date: 05/22/19 16:08
 Analyst: NLK

Parameter	Result	Qualifier	Units	RL	MDL
Volatile Organics by GC/MS - Westborough Lab for sample(s): 01-02 Batch: WG1240508-4					
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 NEWBERN AVE II
Project Number: 290762.0016.0000

Lab Number: L1921130
Report Date: 05/29/19

Method Blank Analysis
Batch Quality Control

Analytical Method: 128,624.1
Analytical Date: 05/22/19 16:08
Analyst: NLK

Parameter	Result	Qualifier	Units	RL	MDL
Volatile Organics by GC/MS - Westborough Lab for sample(s): 01-02 Batch: WG1240508-4					

Surrogate	%Recovery	Qualifier	Acceptance Criteria
Pentafluorobenzene	104		60-140
Fluorobenzene	93		60-140
4-Bromofluorobenzene	97		60-140

Lab Control Sample Analysis**Batch Quality Control****Project Name:** MBTA GLX NEWBERN AVE II**Lab Number:** L1921130**Project Number:** 290762.0016.0000**Report Date:** 05/29/19

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: WG1239990-3								
1,4-Dioxane	79		-		60-140	-		20

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
Fluorobenzene	98				60-140
4-Bromofluorobenzene	108				60-140

Lab Control Sample Analysis**Batch Quality Control****Project Name:** MBTA GLX NEWBERN AVE II**Lab Number:** L1921130**Project Number:** 290762.0016.0000**Report Date:** 05/29/19

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: WG1240014-2									
1,2-Dibromoethane	80		-		80-120	-			A

Lab Control Sample Analysis **Batch Quality Control**

Project Name: MBTA GLX NEWBERN AVE II

Lab Number: L1921130

Project Number: 290762.0016.0000

Report Date: 05/29/19

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: WG1240495-3 WG1240495-4								
1,1-Dichloropropene	88		89		70-130	1		20
1,2,3-Trichloropropane	87		88		64-130	1		20
Bromochloromethane	100		95		70-130	5		20
Tetrahydrofuran	87		84		58-130	4		20
2,2-Dichloropropane	100		100		63-133	0		20
1,1,1,2-Tetrachloroethane	94		93		64-130	1		20
Bromobenzene	91		93		70-130	2		20
n-Butylbenzene	93		99		53-136	6		20
sec-Butylbenzene	91		96		70-130	5		20
tert-Butylbenzene	91		93		70-130	2		20
o-Chlorotoluene	92		94		70-130	2		20
p-Chlorotoluene	92		94		70-130	2		20
Hexachlorobutadiene	87		94		63-130	8		20
p-Isopropyltoluene	94		97		70-130	3		20
Naphthalene	87		96		70-130	10		20
n-Propylbenzene	94		98		69-130	4		20
1,3,5-Trimethylbenzene	92		97		64-130	5		20
1,2,4-Trimethylbenzene	95		98		70-130	3		20
Ethyl ether	87		88		59-134	1		20
Diisopropyl Ether	91		90		70-130	1		20
Ethyl-Tert-Butyl-Ether	90		90		70-130	0		20

Lab Control Sample Analysis**Batch Quality Control****Project Name:** MBTA GLX NEWBERN AVE II**Lab Number:** L1921130**Project Number:** 290762.0016.0000**Report Date:** 05/29/19

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: WG1240495-3 WG1240495-4								

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
1,2-Dichloroethane-d4	97		97		70-130
Toluene-d8	98		100		70-130
4-Bromofluorobenzene	95		97		70-130
Dibromofluoromethane	99		96		70-130

Lab Control Sample Analysis Batch Quality Control

Project Name: MBTA GLX NEWBERN AVE II

Project Number: 290762.0016.0000

Lab Number: L1921130

Report Date: 05/29/19

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: WG1240508-3								
Methylene chloride	90		-		60-140	-		28
1,1-Dichloroethane	80		-		50-150	-		49
Chloroform	105		-		70-135	-		54
Carbon tetrachloride	105		-		70-130	-		41
1,2-Dichloropropane	95		-		35-165	-		55
Dibromochloromethane	95		-		70-135	-		50
1,1,2-Trichloroethane	90		-		70-130	-		45
2-Chloroethylvinyl ether	90		-		1-225	-		71
Tetrachloroethene	100		-		70-130	-		39
Chlorobenzene	95		-		65-135	-		53
Trichlorofluoromethane	85		-		50-150	-		84
1,2-Dichloroethane	90		-		70-130	-		49
1,1,1-Trichloroethane	105		-		70-130	-		36
Bromodichloromethane	100		-		65-135	-		56
trans-1,3-Dichloropropene	95		-		50-150	-		86
cis-1,3-Dichloropropene	95		-		25-175	-		58
Bromoform	105		-		70-130	-		42
1,1,2,2-Tetrachloroethane	110		-		60-140	-		61
Benzene	100		-		65-135	-		61
Toluene	100		-		70-130	-		41
Ethylbenzene	105		-		60-140	-		63
Chloromethane	75		-		1-205	-		60
Bromomethane	70		-		15-185	-		61

Lab Control Sample Analysis **Batch Quality Control**

Project Name: MBTA GLX NEWBERN AVE II

Lab Number: L1921130

Project Number: 290762.0016.0000

Report Date: 05/29/19

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: WG1240508-3								
Vinyl chloride	80		-		5-195	-		66
Chloroethane	85		-		40-160	-		78
1,1-Dichloroethene	95		-		50-150	-		32
trans-1,2-Dichloroethene	95		-		70-130	-		45
cis-1,2-Dichloroethene	90		-		60-140	-		30
Trichloroethene	100		-		65-135	-		48
1,2-Dichlorobenzene	100		-		65-135	-		57
1,3-Dichlorobenzene	100		-		70-130	-		43
1,4-Dichlorobenzene	100		-		65-135	-		57
p/m-Xylene	100		-		60-140	-		30
o-xylene	100		-		60-140	-		30
Styrene	100		-		60-140	-		30
Acetone	80		-		40-160	-		30
Carbon disulfide	80		-		60-140	-		30
2-Butanone	84		-		60-140	-		30
4-Methyl-2-pentanone	94		-		60-140	-		30
2-Hexanone	92		-		60-140	-		30
Acrolein	85		-		60-140	-		30
Acrylonitrile	85		-		60-140	-		60
Methyl tert butyl Ether	90		-		60-140	-		30
Dibromomethane	90		-		70-130	-		30
Tert-Butyl Alcohol	75		-		60-140	-		30
Tertiary-Amyl Methyl Ether	85		-		60-140	-		30

Lab Control Sample Analysis

Batch Quality Control

Project Name: MBTA GLX NEWBERN AVE II

Lab Number: L1921130

Project Number: 290762.0016.0000

Report Date: 05/29/19

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: WG1240508-3								
Dichlorodifluoromethane ¹	70		-		70-130	-		30
1,2,3-Trichlorobenzene	105		-		60-140	-		30
1,2,4-Trichlorobenzene	110		-		60-140	-		30
Isopropylbenzene	105		-		60-140	-		30
1,3-Dichloropropane	95		-		60-140	-		30
1,2-Dibromo-3-chloropropane	130		-		60-140	-		30

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
Pentafluorobenzene	104				60-140
Fluorobenzene	93				60-140
4-Bromofluorobenzene	99				60-140

Matrix Spike Analysis **Batch Quality Control**

Project Name: MBTA GLX NEWBERN AVE II

Lab Number: L1921130

Project Number: 290762.0016.0000

Report Date: 05/29/19

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 Sample Associated sample(s): 01-02 QC Batch ID: WG1240014-3 WG1240014-4 QC Sample: L1920453-02 Client ID: MS													
1,2-Dibromoethane	ND	0.25	0.216	86		0.227	90		80-120	5		20	A
1,2-Dibromo-3-chloropropane	ND	0.25	0.238	95		0.248	98		80-120	4		20	A

SEMIVOLATILES

Project Name: MBTA GLX NEWBERN AVE II**Lab Number:** L1921130**Project Number:** 290762.0016.0000**Report Date:** 05/29/19**SAMPLE RESULTS**

Lab ID: L1921130-01
 Client ID: GLC-NB-3-3
 Sample Location: SOMERVILLE, MEDFORD, CAMBRIDGE

Date Collected: 05/20/19 10:15
 Date Received: 05/20/19
 Field Prep: Refer to COC

Sample Depth:

Matrix: Water
 Analytical Method: 129,625.1
 Analytical Date: 05/23/19 05:27
 Analyst: SZ

Extraction Method: EPA 625.1
 Extraction Date: 05/21/19 21:39

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 NEWBERN AVE II
Project Number: 290762.0016.0000

Lab Number: L1921130
Report Date: 05/29/19

SAMPLE RESULTS

Lab ID: L1921130-01
Client ID: GLC-NB-3-3
Sample Location: SOMERVILLE, MEDFORD, CAMBRIDGE

Date Collected: 05/20/19 10:15
Date Received: 05/20/19
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	50		25-87
Phenol-d6	32		16-65
Nitrobenzene-d5	77		42-122
2-Fluorobiphenyl	79		46-121
2,4,6-Tribromophenol	58		45-128
4-Terphenyl-d14	90		47-138

Project Name: MBTA GLX NEWBERN AVE II
Project Number: 290762.0016.0000

Lab Number: L1921130
Report Date: 05/29/19

SAMPLE RESULTS

Lab ID: L1921130-01
Client ID: GLC-NB-3-3
Sample Location: SOMERVILLE, MEDFORD, CAMBRIDGE

Date Collected: 05/20/19 10:15
Date Received: 05/20/19
Field Prep: Refer to COC

Sample Depth:

Matrix: Water
Analytical Method: 129,625.1-SIM
Analytical Date: 05/23/19 20:50
Analyst: DV

Extraction Method: EPA 625.1
Extraction Date: 05/21/19 21:43

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	44		25-87
Phenol-d6	27		16-65
Nitrobenzene-d5	79		42-122
2-Fluorobiphenyl	75		46-121
2,4,6-Tribromophenol	67		45-128
4-Terphenyl-d14	76		47-138

Project Name: MBTA GLX NEWBERN AVE II
Project Number: 290762.0016.0000

Lab Number: L1921130
Report Date: 05/29/19

SAMPLE RESULTS

Lab ID: L1921130-02
Client ID: GLC-NB-3
Sample Location: SOMERVILLE, MEDFORD, CAMBRIDGE

Date Collected: 05/20/19 14:23
Date Received: 05/20/19
Field Prep: Refer to COC

Sample Depth:

Matrix: Water
Analytical Method: 129,625.1
Analytical Date: 05/23/19 05:55
Analyst: SZ

Extraction Method: EPA 625.1
Extraction Date: 05/21/19 21:39

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	10		ug/l	2.0	--	1

Project Name: MBTA GLX NEWBERN AVE II
Project Number: 290762.0016.0000

Lab Number: L1921130
Report Date: 05/29/19

SAMPLE RESULTS

Lab ID: L1921130-02
Client ID: GLC-NB-3
Sample Location: SOMERVILLE, MEDFORD, CAMBRIDGE

Date Collected: 05/20/19 14:23
Date Received: 05/20/19
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	58		25-87
Phenol-d6	35		16-65
Nitrobenzene-d5	82		42-122
2-Fluorobiphenyl	77		46-121
2,4,6-Tribromophenol	60		45-128
4-Terphenyl-d14	83		47-138

Project Name: MBTA GLX NEWBERN AVE II
Project Number: 290762.0016.0000

Lab Number: L1921130
Report Date: 05/29/19

SAMPLE RESULTS

Lab ID: L1921130-02
Client ID: GLC-NB-3
Sample Location: SOMERVILLE, MEDFORD, CAMBRIDGE

Date Collected: 05/20/19 14:23
Date Received: 05/20/19
Field Prep: Refer to COC

Sample Depth:

Matrix: Water
Analytical Method: 129,625.1-SIM
Analytical Date: 05/23/19 21:16
Analyst: DV

Extraction Method: EPA 625.1
Extraction Date: 05/21/19 21:43

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	55	E	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	48		25-87
Phenol-d6	30		16-65
Nitrobenzene-d5	79		42-122
2-Fluorobiphenyl	74		46-121
2,4,6-Tribromophenol	64		45-128
4-Terphenyl-d14	72		47-138

Project Name: MBTA GLX NEWBERN AVE II
Project Number: 290762.0016.0000

Lab Number: L1921130
Report Date: 05/29/19

SAMPLE RESULTS

Lab ID: L1921130-02 D
Client ID: GLC-NB-3
Sample Location: SOMERVILLE, MEDFORD, CAMBRIDGE

Date Collected: 05/20/19 14:23
Date Received: 05/20/19
Field Prep: Refer to COC

Sample Depth:

Matrix: Water
Analytical Method: 129,625.1-SIM
Analytical Date: 05/24/19 19:02
Analyst: DV

Extraction Method: EPA 625.1
Extraction Date: 05/21/19 21:43

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

Naphthalene	48		ug/l	0.50	--	5
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Project Name: MBTA GLX NEWBERN AVE II
Project Number: 290762.0016.0000

Lab Number: L1921130
Report Date: 05/29/19

Method Blank Analysis Batch Quality Control

Analytical Method: 129,625.1
Analytical Date: 05/23/19 05:00
Analyst: SZ

Extraction Method: EPA 625.1
Extraction Date: 05/21/19 21:39

Parameter	Result	Qualifier	Units	RL	MDL
Semivolatile Organics by GC/MS - Westborough Lab for sample(s): 01-02 Batch: WG1239677-1					
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 NEWBERN AVE II
Project Number: 290762.0016.0000

Lab Number: L1921130
Report Date: 05/29/19

Method Blank Analysis Batch Quality Control

Analytical Method: 129,625.1
Analytical Date: 05/23/19 05:00
Analyst: SZ

Extraction Method: EPA 625.1
Extraction Date: 05/21/19 21:39

Parameter	Result	Qualifier	Units	RL	MDL
Semivolatile Organics by GC/MS - Westborough Lab for sample(s): 01-02 Batch: WG1239677-1					
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	32		16-65
Nitrobenzene-d5	79		42-122
2-Fluorobiphenyl	80		46-121
2,4,6-Tribromophenol	50		45-128
4-Terphenyl-d14	86		47-138

Project Name: MBTA GLX NEWBERN AVE II
Project Number: 290762.0016.0000

Lab Number: L1921130
Report Date: 05/29/19

Method Blank Analysis Batch Quality Control

Analytical Method: 129,625.1-SIM
Analytical Date: 05/22/19 18:31
Analyst: DV

Extraction Method: EPA 625.1
Extraction Date: 05/21/19 21:43

Parameter	Result	Qualifier	Units	RL	MDL
Semivolatile Organics by GC/MS-SIM - Westborough Lab for sample(s): 01-02 Batch: WG1239678-1					
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	49		25-87
Phenol-d6	31		16-65
Nitrobenzene-d5	84		42-122
2-Fluorobiphenyl	77		46-121
2,4,6-Tribromophenol	49		45-128
4-Terphenyl-d14	88		47-138

Lab Control Sample Analysis **Batch Quality Control**

Project Name: MBTA GLX NEWBERN AVE II

Project Number: 290762.0016.0000

Lab Number: L1921130

Report Date: 05/29/19

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: WG1239677-2								
Benzidine ¹	6		-		0-70	-		30
1,2,4-Trichlorobenzene	66		-		57-130	-		50
Bis(2-chloroethyl)ether	75		-		43-126	-		108
2-Chloronaphthalene	78		-		65-120	-		24
3,3'-Dichlorobenzidine	37		-		8-213	-		108
2,4-Dinitrotoluene	88		-		48-127	-		42
2,6-Dinitrotoluene	93		-		68-137	-		48
Azobenzene ¹	78		-		44-115	-		23
4-Bromophenyl phenyl ether	74		-		65-120	-		43
Bis(2-chloroisopropyl)ether	68		-		63-139	-		76
Bis(2-chloroethoxy)methane	79		-		49-165	-		54
Hexachlorobutadiene	61		-		38-120	-		62
Hexachlorocyclopentadiene ¹	62		-		7-118	-		35
Hexachloroethane	61		-		55-120	-		52
Isophorone	85		-		47-180	-		93
Nitrobenzene	83		-		54-158	-		62
NDPA/DPA ¹	78		-		45-112	-		36
n-Nitrosodi-n-propylamine	84		-		14-198	-		87
Bis(2-ethylhexyl)phthalate	86		-		29-137	-		82
Butyl benzyl phthalate	99		-		1-140	-		60
Di-n-butylphthalate	96		-		8-120	-		47
Di-n-octylphthalate	95		-		19-132	-		69
Diethyl phthalate	80		-		1-120	-		100

Lab Control Sample Analysis

Batch Quality Control

Project Name: MBTA GLX NEWBERN AVE II

Project Number: 290762.0016.0000

Lab Number: L1921130

Report Date: 05/29/19

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: WG1239677-2								
Dimethyl phthalate	92		-		1-120	-		183
Aniline ¹	46		-		1-75	-		66
4-Chloroaniline ¹	54		-		10-100	-		53
Dibenzofuran ¹	74		-		23-126	-		22
2-Methylnaphthalene ¹	75		-		40-109	-		18
Acetophenone ¹	94		-		46-113	-		28
n-Nitrosodimethylamine ¹	48		-		15-68	-		17
2,4,6-Trichlorophenol	92		-		52-129	-		58
p-Chloro-m-cresol ¹	93		-		68-130	-		73
2-Chlorophenol	78		-		36-120	-		61
2,4-Dichlorophenol	88		-		53-122	-		50
2,4-Dimethylphenol	85		-		42-120	-		58
2-Nitrophenol	89		-		45-167	-		55
4-Nitrophenol	63		-		13-129	-		131
2,4-Dinitrophenol	74		-		1-173	-		132
Phenol	40		-		17-120	-		64
2-Methylphenol ¹	77		-		38-102	-		23
3-Methylphenol/4-Methylphenol ¹	78		-		35-103	-		26
2,4,5-Trichlorophenol ¹	93		-		47-126	-		28

Lab Control Sample Analysis**Batch Quality Control****Project Name:** MBTA GLX NEWBERN AVE II**Lab Number:** L1921130**Project Number:** 290762.0016.0000**Report Date:** 05/29/19

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
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Semivolatile Organics by GC/MS - Westborough Lab Associated sample(s): 01-02 Batch: WG1239677-2

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
2-Fluorophenol	54				25-87
Phenol-d6	36				16-65
Nitrobenzene-d5	83				42-122
2-Fluorobiphenyl	80				46-121
2,4,6-Tribromophenol	60				45-128
4-Terphenyl-d14	84				47-138

Lab Control Sample Analysis Batch Quality Control

Project Name: MBTA GLX NEWBERN AVE II

Project Number: 290762.0016.0000

Lab Number: L1921130

Report Date: 05/29/19

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: WG1239678-2								
Acenaphthene	70		-		60-132	-		30
Fluoranthene	75		-		43-121	-		30
Naphthalene	71		-		36-120	-		30
Benzo(a)anthracene	71		-		42-133	-		30
Benzo(a)pyrene	64		-		32-148	-		30
Benzo(b)fluoranthene	86		-		42-140	-		30
Benzo(k)fluoranthene	88		-		25-146	-		30
Chrysene	67		-		44-140	-		30
Acenaphthylene	76		-		54-126	-		30
Anthracene	71		-		43-120	-		30
Benzo(ghi)perylene	33		-		1-195	-		30
Fluorene	74		-		70-120	-		30
Phenanthrene	70		-		65-120	-		30
Dibenzo(a,h)anthracene	40		-		1-200	-		30
Indeno(1,2,3-cd)pyrene	37		-		1-151	-		30
Pyrene	73		-		70-120	-		30
Pentachlorophenol	41		-		38-152	-		30
Hexachlorobenzene ¹	40		-		8-142	-		30

Lab Control Sample Analysis**Batch Quality Control****Project Name:** MBTA GLX NEWBERN AVE II**Lab Number:** L1921130**Project Number:** 290762.0016.0000**Report Date:** 05/29/19

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
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Semivolatile Organics by GC/MS-SIM - Westborough Lab Associated sample(s): 01-02 Batch: WG1239678-2

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
2-Fluorophenol	48				25-87
Phenol-d6	31				16-65
Nitrobenzene-d5	80				42-122
2-Fluorobiphenyl	75				46-121
2,4,6-Tribromophenol	45				45-128
4-Terphenyl-d14	84				47-138

PETROLEUM HYDROCARBONS

Project Name: MBTA GLX NEWBERN AVE II**Lab Number:** L1921130**Project Number:** 290762.0016.0000**Report Date:** 05/29/19**SAMPLE RESULTS**

Lab ID: L1921130-01
 Client ID: GLC-NB-3-3
 Sample Location: SOMERVILLE, MEDFORD, CAMBRIDGE

Date Collected: 05/20/19 10:15
 Date Received: 05/20/19
 Field Prep: Refer to COC

Sample Depth:
 Matrix: Water
 Analytical Method: 131, VPH-18-2.1
 Analytical Date: 05/22/19 19:39
 Analyst: BAD

Trap: EST, Carboxen 1000&1001**Analytical Column:** Restek, RTX-502.2, 105m, 0.53ID, 3um**Quality Control Information**

Condition of sample received:

Satisfactory

Aqueous Preservative:

Laboratory Provided Preserved
Container

Sample Temperature upon receipt:

Received on Ice

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Petroleum Hydrocarbons - Westborough Lab						
C5-C8 Aliphatics	ND		ug/l	50.0	--	1
C9-C12 Aliphatics	ND		ug/l	50.0	--	1
C9-C10 Aromatics	ND		ug/l	50.0	--	1
C5-C8 Aliphatics, Adjusted	ND		ug/l	50.0	--	1
C9-C12 Aliphatics, Adjusted	ND		ug/l	50.0	--	1
Benzene	ND		ug/l	2.00	--	1
Toluene	ND		ug/l	2.00	--	1
Ethylbenzene	ND		ug/l	2.00	--	1
p/m-Xylene	ND		ug/l	2.00	--	1
o-Xylene	ND		ug/l	2.00	--	1
Methyl tert butyl ether	ND		ug/l	3.00	--	1
Naphthalene	ND		ug/l	4.00	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2,5-Dibromotoluene-PID	93		70-130
2,5-Dibromotoluene-FID	104		70-130

Project Name: MBTA GLX NEWBERN AVE II**Lab Number:** L1921130**Project Number:** 290762.0016.0000**Report Date:** 05/29/19**SAMPLE RESULTS**

Lab ID: L1921130-01
 Client ID: GLC-NB-3-3
 Sample Location: SOMERVILLE, MEDFORD, CAMBRIDGE

Date Collected: 05/20/19 10:15
 Date Received: 05/20/19
 Field Prep: Refer to COC

Sample Depth:
 Matrix: Water
 Analytical Method: 98,EPH-04-1.1
 Analytical Date: 05/22/19 18:13
 Analyst: DG

Extraction Method: EPA 3510C
 Extraction Date: 05/22/19 01:11
 Cleanup Method1: EPH-04-1
 Cleanup Date1: 05/22/19

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	54		40-140
o-Terphenyl	74		40-140
2-Fluorobiphenyl	80		40-140
2-Bromonaphthalene	81		40-140

Project Name: MBTA GLX NEWBERN AVE II**Lab Number:** L1921130**Project Number:** 290762.0016.0000**Report Date:** 05/29/19**SAMPLE RESULTS**

Lab ID: L1921130-02
 Client ID: GLC-NB-3
 Sample Location: SOMERVILLE, MEDFORD, CAMBRIDGE

Date Collected: 05/20/19 14:23
 Date Received: 05/20/19
 Field Prep: Refer to COC

Sample Depth:
 Matrix: Water
 Analytical Method: 98,EPH-04-1.1
 Analytical Date: 05/22/19 18:59
 Analyst: DG

Extraction Method: EPA 3510C
 Extraction Date: 05/22/19 01:11
 Cleanup Method1: EPH-04-1
 Cleanup Date1: 05/22/19

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	176		ug/l	100	--	1
C11-C22 Aromatics, Adjusted	128		ug/l	100	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
Chloro-Octadecane	57		40-140
o-Terphenyl	70		40-140
2-Fluorobiphenyl	80		40-140
2-Bromonaphthalene	81		40-140

Project Name: MBTA GLX NEWBERN AVE II
Project Number: 290762.0016.0000

Lab Number: L1921130
Report Date: 05/29/19

Method Blank Analysis Batch Quality Control

Analytical Method: 98,EPH-04-1.1
 Analytical Date: 05/22/19 16:21
 Analyst: LL

Extraction Method: EPA 3510C
 Extraction Date: 05/21/19 10:26
 Cleanup Method: EPH-04-1
 Cleanup Date: 05/22/19

Parameter	Result	Qualifier	Units	RL	MDL
Extractable Petroleum Hydrocarbons - Westborough Lab for sample(s): 01-02 Batch: WG1239459-1					
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	47		40-140
o-Terphenyl	58		40-140
2-Fluorobiphenyl	99		40-140
2-Bromonaphthalene	97		40-140

Project Name: MBTA GLX NEWBERN AVE II
Project Number: 290762.0016.0000

Lab Number: L1921130
Report Date: 05/29/19

Method Blank Analysis Batch Quality Control

Analytical Method: 131, VPH-18-2.1
 Analytical Date: 05/22/19 10:54
 Analyst: MKS

Parameter	Result	Qualifier	Units	RL	MDL
Volatile Petroleum Hydrocarbons - Westborough Lab for sample(s): 01 Batch: WG1240320-4					
C5-C8 Aliphatics	ND		ug/l	50.0	--
C9-C12 Aliphatics	ND		ug/l	50.0	--
C9-C10 Aromatics	ND		ug/l	50.0	--
C5-C8 Aliphatics, Adjusted	ND		ug/l	50.0	--
C9-C12 Aliphatics, Adjusted	ND		ug/l	50.0	--
Benzene	ND		ug/l	2.00	--
Toluene	ND		ug/l	2.00	--
Ethylbenzene	ND		ug/l	2.00	--
p/m-Xylene	ND		ug/l	2.00	--
o-Xylene	ND		ug/l	2.00	--
Methyl tert butyl ether	ND		ug/l	3.00	--
Naphthalene	ND		ug/l	4.00	--

Surrogate	%Recovery	Qualifier	Acceptance Criteria
2,5-Dibromotoluene-PID	79		70-130
2,5-Dibromotoluene-FID	89		70-130

Lab Control Sample Analysis **Batch Quality Control**

Project Name: MBTA GLX NEWBERN AVE II

Lab Number: L1921130

Project Number: 290762.0016.0000

Report Date: 05/29/19

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Extractable Petroleum Hydrocarbons - Westborough Lab Associated sample(s): 01-02 Batch: WG1239459-2 WG1239459-3								
C9-C18 Aliphatics	50		64		40-140	25		25
C19-C36 Aliphatics	72		76		40-140	5		25
C11-C22 Aromatics	106		107		40-140	1		25
Naphthalene	88		91		40-140	3		25
2-Methylnaphthalene	89		92		40-140	3		25
Acenaphthylene	94		99		40-140	5		25
Acenaphthene	100		106		40-140	6		25
Fluorene	98		102		40-140	4		25
Phenanthrene	102		105		40-140	3		25
Anthracene	107		110		40-140	3		25
Fluoranthene	100		102		40-140	2		25
Pyrene	102		104		40-140	2		25
Benzo(a)anthracene	105		106		40-140	1		25
Chrysene	117		117		40-140	0		25
Benzo(b)fluoranthene	102		103		40-140	1		25
Benzo(k)fluoranthene	109		109		40-140	0		25
Benzo(a)pyrene	103		104		40-140	1		25
Indeno(1,2,3-cd)Pyrene	97		99		40-140	2		25
Dibenzo(a,h)anthracene	107		106		40-140	1		25
Benzo(ghi)perylene	98		98		40-140	0		25
Nonane (C9)	46		52		30-140	12		25
Decane (C10)	52		57		40-140	9		25
Dodecane (C12)	56		61		40-140	9		25

Lab Control Sample Analysis

Batch Quality Control

Project Name: MBTA GLX NEWBERN AVE II

Project Number: 290762.0016.0000

Lab Number: L1921130

Report Date: 05/29/19

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Extractable Petroleum Hydrocarbons - Westborough Lab Associated sample(s): 01-02 Batch: WG1239459-2 WG1239459-3								
Tetradecane (C14)	59		63		40-140	7		25
Hexadecane (C16)	61		64		40-140	5		25
Octadecane (C18)	63		66		40-140	5		25
Nonadecane (C19)	62		66		40-140	6		25
Eicosane (C20)	64		67		40-140	5		25
Docosane (C22)	65		68		40-140	5		25
Tetracosane (C24)	66		69		40-140	4		25
Hexacosane (C26)	69		72		40-140	4		25
Octacosane (C28)	71		74		40-140	4		25
triacontane (C30)	74		77		40-140	4		25
Hexatriacontane (C36)	80		84		40-140	5		25

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
Chloro-Octadecane	67		69		40-140
o-Terphenyl	89		89		40-140
2-Fluorobiphenyl	100		99		40-140
2-Bromonaphthalene	101		100		40-140
% Naphthalene Breakthrough	0		0		
% 2-Methylnaphthalene Breakthrough	0		0		

Lab Control Sample Analysis **Batch Quality Control**

Project Name: MBTA GLX NEWBERN AVE II

Lab Number: L1921130

Project Number: 290762.0016.0000

Report Date: 05/29/19

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Volatile Petroleum Hydrocarbons - Westborough Lab Associated sample(s): 01 Batch: WG1240320-2 WG1240320-3								
C5-C8 Aliphatics	105		99		70-130	6		25
C9-C12 Aliphatics	107		99		70-130	7		25
C9-C10 Aromatics	93		87		70-130	7		25
Benzene	97		91		70-130	6		25
Toluene	97		92		70-130	6		25
Ethylbenzene	100		94		70-130	6		25
p/m-Xylene	97		90		70-130	7		25
o-Xylene	94		88		70-130	6		25
Methyl tert butyl ether	99		97		70-130	1		25
Naphthalene	93		90		70-130	3		25
1,2,4-Trimethylbenzene	93		87		70-130	7		25
Pentane	107		98		70-130	8		25
2-Methylpentane	107		100		70-130	7		25
2,2,4-Trimethylpentane	108		103		70-130	5		25
n-Nonane	111		103		30-130	7		25
n-Decane	99		92		70-130	8		25
n-Butylcyclohexane	112		104		70-130	7		25

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
2,5-Dibromotoluene-PID	95		88		70-130
2,5-Dibromotoluene-FID	105		98		70-130

PCBS

Project Name: MBTA GLX NEWBERN AVE II
Project Number: 290762.0016.0000

Lab Number: L1921130
Report Date: 05/29/19

SAMPLE RESULTS

Lab ID: L1921130-01
Client ID: GLC-NB-3-3
Sample Location: SOMERVILLE, MEDFORD, CAMBRIDGE

Date Collected: 05/20/19 10:15
Date Received: 05/20/19
Field Prep: Refer to COC

Sample Depth:

Matrix: Water
Analytical Method: 127,608.3
Analytical Date: 05/22/19 16:12
Analyst: WR

Extraction Method: EPA 608.3
Extraction Date: 05/22/19 07:53
Cleanup Method: EPA 3665A
Cleanup Date: 05/22/19
Cleanup Method: EPA 3660B
Cleanup Date: 05/22/19

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	81		37-123	B
Decachlorobiphenyl	78		38-114	B
2,4,5,6-Tetrachloro-m-xylene	86		37-123	A
Decachlorobiphenyl	70		38-114	A

Project Name: MBTA GLX NEWBERN AVE II
Project Number: 290762.0016.0000

Lab Number: L1921130
Report Date: 05/29/19

SAMPLE RESULTS

Lab ID: L1921130-02
Client ID: GLC-NB-3
Sample Location: SOMERVILLE, MEDFORD, CAMBRIDGE

Date Collected: 05/20/19 14:23
Date Received: 05/20/19
Field Prep: Refer to COC

Sample Depth:

Matrix: Water
Analytical Method: 127,608.3
Analytical Date: 05/23/19 10:12
Analyst: WR

Extraction Method: EPA 608.3
Extraction Date: 05/22/19 07:53
Cleanup Method: EPA 3665A
Cleanup Date: 05/23/19
Cleanup Method: EPA 3660B
Cleanup Date: 05/23/19

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
Polychlorinated Biphenyls by GC - Westborough Lab							
Aroclor 1016	ND		ug/l	0.338	--	1	A
Aroclor 1221	ND		ug/l	0.338	--	1	A
Aroclor 1232	ND		ug/l	0.338	--	1	A
Aroclor 1242	ND		ug/l	0.338	--	1	A
Aroclor 1248	ND		ug/l	0.338	--	1	A
Aroclor 1254	ND		ug/l	0.338	--	1	A
Aroclor 1260	ND		ug/l	0.270	--	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	55		37-123	B
Decachlorobiphenyl	94		38-114	B
2,4,5,6-Tetrachloro-m-xylene	68		37-123	A
Decachlorobiphenyl	71		38-114	A

Project Name: MBTA GLX NEWBERN AVE II
Project Number: 290762.0016.0000

Lab Number: L1921130
Report Date: 05/29/19

Method Blank Analysis Batch Quality Control

Analytical Method: 127,608.3
 Analytical Date: 05/22/19 12:19
 Analyst: HT

Extraction Method: EPA 608.3
 Extraction Date: 05/22/19 00:55
 Cleanup Method: EPA 3665A
 Cleanup Date: 05/22/19
 Cleanup Method: EPA 3660B
 Cleanup Date: 05/22/19

Parameter	Result	Qualifier	Units	RL	MDL	Column
Polychlorinated Biphenyls by GC - Westborough Lab for sample(s): 01-02 Batch: WG1239707-1						
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	75		37-123	B
Decachlorobiphenyl	101		38-114	B
2,4,5,6-Tetrachloro-m-xylene	81		37-123	A
Decachlorobiphenyl	96		38-114	A

Lab Control Sample Analysis

Batch Quality Control

Project Name: MBTA GLX NEWBERN AVE II

Project Number: 290762.0016.0000

Lab Number: L1921130

Report Date: 05/29/19

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits	Column
Polychlorinated Biphenyls by GC - Westborough Lab Associated sample(s): 01-02 Batch: WG1239707-2									
Aroclor 1016	74		-		50-140	-		36	A
Aroclor 1260	79		-		8-140	-		38	A

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	54				37-123	B
Decachlorobiphenyl	101				38-114	B
2,4,5,6-Tetrachloro-m-xylene	58				37-123	A
Decachlorobiphenyl	94				38-114	A

PESTICIDES

Project Name: MBTA GLX NEWBERN AVE II
Project Number: 290762.0016.0000

Lab Number: L1921130
Report Date: 05/29/19

SAMPLE RESULTS

Lab ID: L1921130-01
Client ID: GLC-NB-3-3
Sample Location: SOMERVILLE, MEDFORD, CAMBRIDGE

Date Collected: 05/20/19 10:15
Date Received: 05/20/19
Field Prep: Refer to COC

Sample Depth:

Matrix: Water
Analytical Method: 127,608.3
Analytical Date: 05/22/19 15:01
Analyst: BM

Extraction Method: EPA 608.3
Extraction Date: 05/22/19 07:52
Cleanup Method: EPA 3620B
Cleanup Date: 05/22/19

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 NEWBERN AVE II**Lab Number:** L1921130**Project Number:** 290762.0016.0000**Report Date:** 05/29/19**SAMPLE RESULTS**

Lab ID: L1921130-01

Date Collected: 05/20/19 10:15

Client ID: GLC-NB-3-3

Date Received: 05/20/19

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	64		47-124	A
Decachlorobiphenyl	55		32-167	A
2,4,5,6-Tetrachloro-m-xylene	69		47-124	B
Decachlorobiphenyl	74		32-167	B

Project Name: MBTA GLX NEWBERN AVE II
Project Number: 290762.0016.0000

Lab Number: L1921130
Report Date: 05/29/19

SAMPLE RESULTS

Lab ID: L1921130-02
Client ID: GLC-NB-3
Sample Location: SOMERVILLE, MEDFORD, CAMBRIDGE

Date Collected: 05/20/19 14:23
Date Received: 05/20/19
Field Prep: Refer to COC

Sample Depth:

Matrix: Water
Analytical Method: 127,608.3
Analytical Date: 05/22/19 15:13
Analyst: BM

Extraction Method: EPA 608.3
Extraction Date: 05/22/19 07:52
Cleanup Method: EPA 3620B
Cleanup Date: 05/22/19

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 NEWBERN AVE II
Project Number: 290762.0016.0000

Lab Number: L1921130
Report Date: 05/29/19

SAMPLE RESULTS

Lab ID: L1921130-02
Client ID: GLC-NB-3
Sample Location: SOMERVILLE, MEDFORD, CAMBRIDGE

Date Collected: 05/20/19 14:23
Date Received: 05/20/19
Field Prep: Refer to COC

Sample Depth:

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

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	63		47-124	A
Decachlorobiphenyl	67		32-167	A
2,4,5,6-Tetrachloro-m-xylene	63		47-124	B
Decachlorobiphenyl	80		32-167	B

Project Name: MBTA GLX NEWBERN AVE II
Project Number: 290762.0016.0000

Lab Number: L1921130
Report Date: 05/29/19

Method Blank Analysis Batch Quality Control

Analytical Method: 127,608.3
 Analytical Date: 05/22/19 10:40
 Analyst: BM

Extraction Method: EPA 608.3
 Extraction Date: 05/21/19 15:24
 Cleanup Method: EPA 3620B
 Cleanup Date: 05/22/19

Parameter	Result	Qualifier	Units	RL	MDL	Column
Organochlorine Pesticides by GC - Westborough Lab for sample(s): 01-02 Batch: WG1239583-1						
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	0.020	--	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 NEWBERN AVE II
Project Number: 290762.0016.0000

Lab Number: L1921130
Report Date: 05/29/19

Method Blank Analysis
Batch Quality Control

Analytical Method: 127,608.3
 Analytical Date: 05/22/19 10:40
 Analyst: BM

Extraction Method: EPA 608.3
 Extraction Date: 05/21/19 15:24
 Cleanup Method: EPA 3620B
 Cleanup Date: 05/22/19

Parameter	Result	Qualifier	Units	RL	MDL	Column
Organochlorine Pesticides by GC - Westborough Lab for sample(s): 01-02 Batch: WG1239583-1						

Surrogate	%Recovery	Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	54		47-124	A
Decachlorobiphenyl	49		32-167	A
2,4,5,6-Tetrachloro-m-xylene	60		47-124	B
Decachlorobiphenyl	85		32-167	B

Lab Control Sample Analysis Batch Quality Control

Project Name: MBTA GLX NEWBERN AVE II

Project Number: 290762.0016.0000

Lab Number: L1921130

Report Date: 05/29/19

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: WG1239583-2									
Delta-BHC	71		-		19-140	-		52	A
Lindane	68		-		32-140	-		39	A
Alpha-BHC	68		-		37-140	-		36	A
Beta-BHC	64		-		17-147	-		44	A
Heptachlor	40		-		34-140	-		43	A
Aldrin	52		-		42-140	-		35	A
Heptachlor epoxide	56		-		37-142	-		26	A
Endrin	67		-		30-147	-		48	A
Endrin aldehyde	60		-		30-150	-		30	A
Endrin ketone ¹	71		-		30-150	-		30	A
Dieldrin	65		-		36-146	-		49	A
4,4'-DDE	57		-		30-145	-		35	A
4,4'-DDD	67		-		31-141	-		39	A
4,4'-DDT	71		-		25-160	-		42	A
Endosulfan I	54		-		45-153	-		28	A
Endosulfan II	65		-		1-202	-		53	A
Endosulfan sulfate	75		-		26-144	-		38	A
Methoxychlor ¹	65		-		30-150	-		30	A
cis-Chlordane ¹	51		-		45-140	-		35	A
trans-Chlordane ¹	66		-		45-140	-		35	A

Lab Control Sample Analysis**Batch Quality Control****Project Name:** MBTA GLX NEWBERN AVE II**Lab Number:** L1921130**Project Number:** 290762.0016.0000**Report Date:** 05/29/19

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: WG1239583-2

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	57				47-124	A
Decachlorobiphenyl	52				32-167	A
2,4,5,6-Tetrachloro-m-xylene	62				47-124	B
Decachlorobiphenyl	88				32-167	B

METALS

Project Name: MBTA GLX NEWBERN AVE II**Lab Number:** L1921130**Project Number:** 290762.0016.0000**Report Date:** 05/29/19**SAMPLE RESULTS**

Lab ID: L1921130-01

Date Collected: 05/20/19 10:15

Client ID: GLC-NB-3-3

Date Received: 05/20/19

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	05/24/19 12:40	05/25/19 12:29	EPA 3005A	3,200.8	MG
Arsenic, Total	0.00207		mg/l	0.00100	--	1	05/24/19 12:40	05/25/19 12:29	EPA 3005A	3,200.8	MG
Cadmium, Total	ND		mg/l	0.00020	--	1	05/24/19 12:40	05/25/19 12:29	EPA 3005A	3,200.8	MG
Chromium, Total	0.00399		mg/l	0.00100	--	1	05/24/19 12:40	05/25/19 12:29	EPA 3005A	3,200.8	MG
Copper, Total	0.01178		mg/l	0.00100	--	1	05/24/19 12:40	05/25/19 12:29	EPA 3005A	3,200.8	MG
Iron, Total	3.54		mg/l	0.050	--	1	05/24/19 12:40	05/25/19 13:59	EPA 3005A	19,200.7	PS
Lead, Total	0.00451		mg/l	0.00100	--	1	05/24/19 12:40	05/25/19 12:29	EPA 3005A	3,200.8	MG
Mercury, Total	ND		mg/l	0.00020	--	1	05/28/19 09:02	05/28/19 11:36	EPA 245.1	3,245.1	GD
Nickel, Total	0.00611		mg/l	0.00200	--	1	05/24/19 12:40	05/25/19 12:29	EPA 3005A	3,200.8	MG
Selenium, Total	ND		mg/l	0.00500	--	1	05/24/19 12:40	05/25/19 12:29	EPA 3005A	3,200.8	MG
Silver, Total	ND		mg/l	0.00040	--	1	05/24/19 12:40	05/25/19 12:29	EPA 3005A	3,200.8	MG
Zinc, Total	0.03383		mg/l	0.01000	--	1	05/24/19 12:40	05/25/19 12:29	EPA 3005A	3,200.8	MG
Total Hardness by SM 2340B - Mansfield Lab											
Hardness	203		mg/l	0.660	NA	1	05/24/19 12:40	05/25/19 13:59	EPA 3005A	19,200.7	PS

General Chemistry - Mansfield Lab

Chromium, Trivalent (Filtered)	ND		mg/l	0.010	--	1		05/25/19 10:20	NA	107,-	
Chromium, Trivalent (Unfiltered)	ND		mg/l	0.010	--	1		05/25/19 12:29	NA	107,-	

Dissolved Metals - Mansfield Lab

Antimony, Dissolved	ND		mg/l	0.0040	--	1	05/24/19 11:41	05/25/19 10:20	EPA 3005A	3,200.8	MG
Arsenic, Dissolved	0.0012		mg/l	0.0010	--	1	05/24/19 11:41	05/25/19 10:20	EPA 3005A	3,200.8	MG
Cadmium, Dissolved	ND		mg/l	0.0002	--	1	05/24/19 11:41	05/25/19 10:20	EPA 3005A	3,200.8	MG
Chromium, Dissolved	ND		mg/l	0.0010	--	1	05/24/19 11:41	05/25/19 10:20	EPA 3005A	3,200.8	MG
Copper, Dissolved	0.0070		mg/l	0.0010	--	1	05/24/19 11:41	05/25/19 10:20	EPA 3005A	3,200.8	MG
Iron, Dissolved	0.117		mg/l	0.050	--	1	05/24/19 11:41	05/25/19 15:23	EPA 3005A	19,200.7	PS
Lead, Dissolved	ND		mg/l	0.0010	--	1	05/24/19 11:41	05/25/19 10:20	EPA 3005A	3,200.8	MG
Mercury, Dissolved	ND		mg/l	0.00020	--	1	05/28/19 09:50	05/28/19 12:56	EPA 245.1	3,245.1	GD



Project Name: MBTA GLX NEWBERN AVE II**Lab Number:** L1921130**Project Number:** 290762.0016.0000**Report Date:** 05/29/19**SAMPLE RESULTS**

Lab ID: L1921130-01

Date Collected: 05/20/19 10:15

Client ID: GLC-NB-3-3

Date Received: 05/20/19

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	0.0040		mg/l	0.0020	--	1	05/24/19 11:41	05/25/19 10:20	EPA 3005A	3,200.8	MG
Selenium, Dissolved	ND		mg/l	0.0050	--	1	05/24/19 11:41	05/25/19 10:20	EPA 3005A	3,200.8	MG
Silver, Dissolved	ND		mg/l	0.0004	--	1	05/24/19 11:41	05/25/19 10:20	EPA 3005A	3,200.8	MG
Zinc, Dissolved	ND		mg/l	0.0100	--	1	05/24/19 11:41	05/25/19 10:20	EPA 3005A	3,200.8	MG



Project Name: MBTA GLX NEWBERN AVE II**Lab Number:** L1921130**Project Number:** 290762.0016.0000**Report Date:** 05/29/19**SAMPLE RESULTS**

Lab ID: L1921130-02

Date Collected: 05/20/19 14:23

Client ID: GLC-NB-3

Date Received: 05/20/19

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	05/24/19 12:40	05/25/19 12:33	EPA 3005A	3,200.8	MG
Arsenic, Total	0.02145		mg/l	0.00100	--	1	05/24/19 12:40	05/25/19 12:33	EPA 3005A	3,200.8	MG
Cadmium, Total	ND		mg/l	0.00020	--	1	05/24/19 12:40	05/25/19 12:33	EPA 3005A	3,200.8	MG
Chromium, Total	0.00428		mg/l	0.00100	--	1	05/24/19 12:40	05/25/19 12:33	EPA 3005A	3,200.8	MG
Copper, Total	0.00468		mg/l	0.00100	--	1	05/24/19 12:40	05/25/19 12:33	EPA 3005A	3,200.8	MG
Iron, Total	13.4		mg/l	0.050	--	1	05/24/19 12:40	05/25/19 14:03	EPA 3005A	19,200.7	PS
Lead, Total	0.00181		mg/l	0.00100	--	1	05/24/19 12:40	05/25/19 12:33	EPA 3005A	3,200.8	MG
Mercury, Total	ND		mg/l	0.00020	--	1	05/28/19 09:02	05/28/19 11:38	EPA 245.1	3,245.1	GD
Nickel, Total	0.00591		mg/l	0.00200	--	1	05/24/19 12:40	05/25/19 12:33	EPA 3005A	3,200.8	MG
Selenium, Total	ND		mg/l	0.00500	--	1	05/24/19 12:40	05/25/19 12:33	EPA 3005A	3,200.8	MG
Silver, Total	ND		mg/l	0.00040	--	1	05/24/19 12:40	05/25/19 12:33	EPA 3005A	3,200.8	MG
Zinc, Total	ND		mg/l	0.01000	--	1	05/24/19 12:40	05/25/19 12:33	EPA 3005A	3,200.8	MG
Total Hardness by SM 2340B - Mansfield Lab											
Hardness	1100		mg/l	0.660	NA	1	05/24/19 12:40	05/25/19 14:03	EPA 3005A	19,200.7	PS

General Chemistry - Mansfield Lab

Chromium, Trivalent (Filtered)	ND		mg/l	0.010	--	1		05/25/19 10:32	NA	107,-	
Chromium, Trivalent (Unfiltered)	ND		mg/l	0.050	--	1		05/25/19 12:33	NA	107,-	

Dissolved Metals - Mansfield Lab

Antimony, Dissolved	ND		mg/l	0.0040	--	1	05/24/19 11:41	05/25/19 10:32	EPA 3005A	3,200.8	MG
Arsenic, Dissolved	0.0260		mg/l	0.0010	--	1	05/24/19 11:41	05/25/19 10:32	EPA 3005A	3,200.8	MG
Cadmium, Dissolved	ND		mg/l	0.0002	--	1	05/24/19 11:41	05/25/19 10:32	EPA 3005A	3,200.8	MG
Chromium, Dissolved	ND		mg/l	0.0010	--	1	05/24/19 11:41	05/25/19 10:32	EPA 3005A	3,200.8	MG
Copper, Dissolved	0.0012		mg/l	0.0010	--	1	05/24/19 11:41	05/25/19 10:32	EPA 3005A	3,200.8	MG
Iron, Dissolved	12.0		mg/l	0.050	--	1	05/24/19 11:41	05/25/19 15:42	EPA 3005A	19,200.7	PS
Lead, Dissolved	ND		mg/l	0.0010	--	1	05/24/19 11:41	05/25/19 10:32	EPA 3005A	3,200.8	MG
Mercury, Dissolved	ND		mg/l	0.00020	--	1	05/28/19 09:50	05/28/19 13:01	EPA 245.1	3,245.1	GD



Project Name: MBTA GLX NEWBERN AVE II**Lab Number:** L1921130**Project Number:** 290762.0016.0000**Report Date:** 05/29/19**SAMPLE RESULTS**

Lab ID: L1921130-02

Date Collected: 05/20/19 14:23

Client ID: GLC-NB-3

Date Received: 05/20/19

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	0.0038		mg/l	0.0020	--	1	05/24/19 11:41	05/25/19 10:32	EPA 3005A	3,200.8	MG
Selenium, Dissolved	ND		mg/l	0.0050	--	1	05/24/19 11:41	05/25/19 10:32	EPA 3005A	3,200.8	MG
Silver, Dissolved	ND		mg/l	0.0004	--	1	05/24/19 11:41	05/25/19 10:32	EPA 3005A	3,200.8	MG
Zinc, Dissolved	ND		mg/l	0.0100	--	1	05/24/19 11:41	05/25/19 10:32	EPA 3005A	3,200.8	MG



Project Name: MBTA GLX NEWBERN AVE II
Project Number: 290762.0016.0000

Lab Number: L1921130
Report Date: 05/29/19

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: WG1240934-1										
Antimony, Dissolved	ND		mg/l	0.0040	--	1	05/24/19 11:41	05/25/19 09:28	3,200.8	MG
Arsenic, Dissolved	ND		mg/l	0.0010	--	1	05/24/19 11:41	05/25/19 09:28	3,200.8	MG
Cadmium, Dissolved	ND		mg/l	0.0002	--	1	05/24/19 11:41	05/25/19 09:28	3,200.8	MG
Chromium, Dissolved	ND		mg/l	0.0010	--	1	05/24/19 11:41	05/25/19 09:28	3,200.8	MG
Copper, Dissolved	ND		mg/l	0.0010	--	1	05/24/19 11:41	05/25/19 09:28	3,200.8	MG
Lead, Dissolved	ND		mg/l	0.0010	--	1	05/24/19 11:41	05/25/19 09:28	3,200.8	MG
Nickel, Dissolved	ND		mg/l	0.0020	--	1	05/24/19 11:41	05/25/19 09:28	3,200.8	MG
Selenium, Dissolved	ND		mg/l	0.0050	--	1	05/24/19 11:41	05/25/19 09:28	3,200.8	MG
Silver, Dissolved	ND		mg/l	0.0004	--	1	05/24/19 11:41	05/25/19 09:28	3,200.8	MG
Zinc, Dissolved	ND		mg/l	0.0100	--	1	05/24/19 11:41	05/25/19 09:28	3,200.8	MG

Prep Information

Digestion Method: EPA 3005A

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Metals - Mansfield Lab for sample(s): 01-02 Batch: WG1240968-1										
Antimony, Total	ND		mg/l	0.00400	--	1	05/24/19 12:40	05/25/19 11:40	3,200.8	MG
Arsenic, Total	ND		mg/l	0.00100	--	1	05/24/19 12:40	05/25/19 11:40	3,200.8	MG
Cadmium, Total	ND		mg/l	0.00020	--	1	05/24/19 12:40	05/25/19 11:40	3,200.8	MG
Chromium, Total	ND		mg/l	0.00100	--	1	05/24/19 12:40	05/25/19 11:40	3,200.8	MG
Copper, Total	ND		mg/l	0.00100	--	1	05/24/19 12:40	05/25/19 11:40	3,200.8	MG
Lead, Total	ND		mg/l	0.00100	--	1	05/24/19 12:40	05/25/19 11:40	3,200.8	MG
Nickel, Total	ND		mg/l	0.00200	--	1	05/24/19 12:40	05/25/19 11:40	3,200.8	MG
Selenium, Total	ND		mg/l	0.00500	--	1	05/24/19 12:40	05/25/19 11:40	3,200.8	MG
Silver, Total	ND		mg/l	0.00040	--	1	05/24/19 12:40	05/25/19 11:40	3,200.8	MG
Zinc, Total	ND		mg/l	0.01000	--	1	05/24/19 12:40	05/25/19 11:40	3,200.8	MG

Prep Information

Digestion Method: EPA 3005A



Project Name: MBTA GLX NEWBERN AVE II
Project Number: 290762.0016.0000

Lab Number: L1921130
Report Date: 05/29/19

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: WG1241274-1										
Iron, Dissolved	ND		mg/l	0.050	--	1	05/24/19 11:41	05/25/19 15:14	19,200.7	PS

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: WG1241283-1										
Iron, Total	ND		mg/l	0.050	--	1	05/24/19 12:40	05/26/19 14:51	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: WG1241283-1										
Hardness	ND		mg/l	0.660	NA	1	05/24/19 12:40	05/26/19 14:51	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: WG1241644-1										
Mercury, Total	ND		mg/l	0.00020	--	1	05/28/19 09:02	05/28/19 11:24	3,245.1	GD

Project Name: MBTA GLX NEWBERN AVE II**Lab Number:** L1921130**Project Number:** 290762.0016.0000**Report Date:** 05/29/19

Method Blank Analysis Batch Quality Control

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: WG1241676-1										
Mercury, Dissolved	ND		mg/l	0.00020	--	1	05/28/19 09:50	05/28/19 12:53	3,245.1	GD

Prep Information

Digestion Method: EPA 245.1

Lab Control Sample Analysis

Batch Quality Control

Project Name: MBTA GLX NEWBERN AVE II

Lab Number: L1921130

Project Number: 290762.0016.0000

Report Date: 05/29/19

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Dissolved Metals - Mansfield Lab Associated sample(s): 01-02 Batch: WG1240934-2								
Antimony, Dissolved	98		-		85-115	-		
Arsenic, Dissolved	105		-		85-115	-		
Cadmium, Dissolved	113		-		85-115	-		
Chromium, Dissolved	102		-		85-115	-		
Copper, Dissolved	101		-		85-115	-		
Lead, Dissolved	111		-		85-115	-		
Nickel, Dissolved	102		-		85-115	-		
Selenium, Dissolved	108		-		85-115	-		
Silver, Dissolved	106		-		85-115	-		
Zinc, Dissolved	113		-		85-115	-		

Lab Control Sample Analysis

Batch Quality Control

Project Name: MBTA GLX NEWBERN AVE II

Project Number: 290762.0016.0000

Lab Number: L1921130

Report Date: 05/29/19

Parameter	LCS %Recovery	LCSD %Recovery	%Recovery Limits	RPD	RPD Limits
Total Metals - Mansfield Lab Associated sample(s): 01-02 Batch: WG1240968-2					
Antimony, Total	95	-	85-115	-	
Arsenic, Total	105	-	85-115	-	
Cadmium, Total	114	-	85-115	-	
Chromium, Total	100	-	85-115	-	
Copper, Total	100	-	85-115	-	
Lead, Total	112	-	85-115	-	
Nickel, Total	103	-	85-115	-	
Selenium, Total	114	-	85-115	-	
Silver, Total	108	-	85-115	-	
Zinc, Total	114	-	85-115	-	
Dissolved Metals - Mansfield Lab Associated sample(s): 01-02 Batch: WG1241274-2					
Iron, Dissolved	104	-	85-115	-	
Total Metals - Mansfield Lab Associated sample(s): 01-02 Batch: WG1241283-2					
Iron, Total	106	-	85-115	-	
Total Hardness by SM 2340B - Mansfield Lab Associated sample(s): 01-02 Batch: WG1241283-2					
Hardness	105	-	85-115	-	

Lab Control Sample Analysis

Batch Quality Control

Project Name: MBTA GLX NEWBERN AVE II

Project Number: 290762.0016.0000

Lab Number: L1921130

Report Date: 05/29/19

Parameter	LCS %Recovery	LCSD %Recovery	%Recovery Limits	RPD	RPD Limits
Total Metals - Mansfield Lab Associated sample(s): 01-02 Batch: WG1241644-2					
Mercury, Total	103	-	85-115	-	
Dissolved Metals - Mansfield Lab Associated sample(s): 01-02 Batch: WG1241676-2					
Mercury, Dissolved	98	-	85-115	-	

Matrix Spike Analysis

Batch Quality Control

Project Name: MBTA GLX NEWBERN AVE II
Project Number: 290762.0016.0000

Lab Number: L1921130
Report Date: 05/29/19

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	Qual	MSD Found	MSD %Recovery	Qual	Recovery Limits	RPD	Qual	RPD Limits
Dissolved Metals - Mansfield Lab Associated sample(s): 01-02 QC Batch ID: WG1240934-3 QC Sample: L1921130-01 Client ID: GLC-NB-3-3												
Antimony, Dissolved	ND	0.5	0.6299	126		-	-		70-130	-		20
Arsenic, Dissolved	0.0012	0.12	0.1265	104		-	-		70-130	-		20
Cadmium, Dissolved	ND	0.051	0.0586	115		-	-		70-130	-		20
Chromium, Dissolved	ND	0.2	0.2046	102		-	-		70-130	-		20
Copper, Dissolved	0.0070	0.25	0.2580	100		-	-		70-130	-		20
Lead, Dissolved	ND	0.51	0.5702	112		-	-		70-130	-		20
Nickel, Dissolved	0.0040	0.5	0.5177	103		-	-		70-130	-		20
Selenium, Dissolved	ND	0.12	0.1243	104		-	-		70-130	-		20
Silver, Dissolved	ND	0.05	0.0535	107		-	-		70-130	-		20
Zinc, Dissolved	ND	0.5	0.5655	113		-	-		70-130	-		20

Dissolved Metals - Mansfield Lab Associated sample(s): 01-02 QC Batch ID: WG1240934-5 QC Sample: L1921130-02 Client ID: GLC-NB-3

Antimony, Dissolved	ND	0.5	0.6518	130		-	-		70-130	-		20
Arsenic, Dissolved	0.0260	0.12	0.1548	107		-	-		70-130	-		20
Cadmium, Dissolved	ND	0.051	0.0593	116		-	-		70-130	-		20
Chromium, Dissolved	ND	0.2	0.2098	105		-	-		70-130	-		20
Copper, Dissolved	0.0012	0.25	0.2570	102		-	-		70-130	-		20
Lead, Dissolved	ND	0.51	0.5952	117		-	-		70-130	-		20
Nickel, Dissolved	0.0038	0.5	0.5276	105		-	-		70-130	-		20
Selenium, Dissolved	ND	0.12	0.1302	108		-	-		70-130	-		20
Silver, Dissolved	ND	0.05	0.0551	110		-	-		70-130	-		20
Zinc, Dissolved	ND	0.5	0.5652	113		-	-		70-130	-		20

Matrix Spike Analysis

Batch Quality Control

Project Name: MBTA GLX NEWBERN AVE II

Lab Number: L1921130

Project Number: 290762.0016.0000

Report Date: 05/29/19

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: WG1241274-3 QC Sample: L1921130-01 Client ID: GLC-NB-3-3									
Iron, Dissolved	0.117	1	1.16	104	-	-	75-125	-	20
Dissolved Metals - Mansfield Lab Associated sample(s): 01-02 QC Batch ID: WG1241676-3 QC Sample: L1921130-01 Client ID: GLC-NB-3-3									
Mercury, Dissolved	ND	0.005	0.00426	85	-	-	75-125	-	20

Project Name: MBTA GLX NEWBERN AVE II
Project Number: 290762.0016.0000

Lab Duplicate Analysis
Batch Quality Control

Lab Number: L1921130
Report Date: 05/29/19

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
Dissolved Metals - Mansfield Lab Associated sample(s): 01-02 QC Batch ID: WG1240934-4 QC Sample: L1921130-01 Client ID: GLC-NB-3-3						
Antimony, Dissolved	ND	ND	mg/l	NC		20
Arsenic, Dissolved	0.0012	0.0012	mg/l	1		20
Cadmium, Dissolved	ND	ND	mg/l	NC		20
Chromium, Dissolved	ND	ND	mg/l	NC		20
Copper, Dissolved	0.0070	0.0072	mg/l	3		20
Lead, Dissolved	ND	ND	mg/l	NC		20
Nickel, Dissolved	0.0040	0.0039	mg/l	1		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

Lab Duplicate Analysis *Batch Quality Control*

Project Name: MBTA GLX NEWBERN AVE II
Project Number: 290762.0016.0000

Lab Number: L1921130
Report Date: 05/29/19

Parameter	Native Sample	Duplicate Sample	Units	RPD	RPD Limits
Dissolved Metals - Mansfield Lab Associated sample(s): 01-02 QC Batch ID: WG1240934-6 QC Sample: L1921130-02 Client ID: GLC-NB-3					
Antimony, Dissolved	ND	ND	mg/l	NC	20
Arsenic, Dissolved	0.0260	0.0261	mg/l	0	20
Cadmium, Dissolved	ND	ND	mg/l	NC	20
Chromium, Dissolved	ND	ND	mg/l	NC	20
Copper, Dissolved	0.0012	0.0013	mg/l	8	20
Lead, Dissolved	ND	ND	mg/l	NC	20
Nickel, Dissolved	0.0038	0.0038	mg/l	1	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: WG1241274-4 QC Sample: L1921130-01 Client ID: GLC-NB-3-3					
Iron, Dissolved	0.117	0.118	mg/l	1	20
Dissolved Metals - Mansfield Lab Associated sample(s): 01-02 QC Batch ID: WG1241676-4 QC Sample: L1921130-01 Client ID: GLC-NB-3-3					
Mercury, Dissolved	ND	ND	mg/l	NC	20

INORGANICS & MISCELLANEOUS

Project Name: MBTA GLX NEWBERN AVE II
Project Number: 290762.0016.0000

Lab Number: L1921130
Report Date: 05/29/19

SAMPLE RESULTS

Lab ID: L1921130-01
Client ID: GLC-NB-3-3
Sample Location: SOMERVILLE, MEDFORD, CAMBRIDGE

Date Collected: 05/20/19 10:15
Date Received: 05/20/19
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	840		mg/l	10	--	1	-	05/21/19 09:20	121,2540C	DW
Solids, Total Suspended	13.		mg/l	5.0	NA	1	-	05/21/19 10:50	121,2540D	DR
Cyanide, Dissolved	ND		mg/l	0.005	--	1	05/22/19 10:05	05/22/19 12:51	1,9010C/9012B	LH
Cyanide, Total	ND		mg/l	0.005	--	1	05/21/19 11:15	05/21/19 14:09	121,4500CN-CE	LH
Chlorine, Total Residual	ND		mg/l	0.02	--	1	-	05/21/19 01:42	121,4500CL-D	JW
Nitrogen, Ammonia	0.224		mg/l	0.075	--	1	05/21/19 17:00	05/21/19 23:02	121,4500NH3-BH	AT
Total Organic Carbon	6.35		mg/l	2.00	--	4	-	05/21/19 08:52	121,5310C	AG
Oil & Grease, Hem-Grav	ND		mg/l	4.0	--	1	05/22/19 16:30	05/22/19 17:30	74,1664A	ML
TPH, SGT-HEM	ND		mg/l	4.00	--	1	05/22/19 16:30	05/22/19 22:00	74,1664A	ML
Phenolics, Total	ND		mg/l	0.030	--	1	05/22/19 09:25	05/22/19 13:53	4,420.1	BR
Chromium, Hexavalent	ND		mg/l	0.010	--	1	05/21/19 05:00	05/21/19 06:36	1,7196A	MA
Chromium, Hexavalent (Unfiltered)	ND		mg/l	0.010	--	1	05/21/19 05:00	05/21/19 06:38	1,7196A	MA
Anions by Ion Chromatography - Westborough Lab										
Chloride	380.		mg/l	12.5	--	25	-	05/23/19 22:24	44,300.0	AU



Project Name: MBTA GLX NEWBERN AVE II

Lab Number: L1921130

Project Number: 290762.0016.0000

Report Date: 05/29/19

SAMPLE RESULTS

Lab ID: L1921130-02

Date Collected: 05/20/19 14:23

Client ID: GLC-NB-3

Date Received: 05/20/19

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	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total Dissolved	2200		mg/l	10	--	1	-	05/21/19 09:20	121,2540C	DW
Solids, Total Suspended	98.		mg/l	5.0	NA	1	-	05/21/19 10:50	121,2540D	DR
Cyanide, Dissolved	ND		mg/l	0.005	--	1	05/22/19 10:05	05/22/19 12:52	1,9010C/9012B	LH
Cyanide, Total	ND		mg/l	0.005	--	1	05/21/19 11:15	05/21/19 14:10	121,4500CN-CE	LH
Chlorine, Total Residual	ND		mg/l	0.02	--	1	-	05/21/19 01:42	121,4500CL-D	JW
Nitrogen, Ammonia	0.096		mg/l	0.075	--	1	05/21/19 17:00	05/21/19 23:03	121,4500NH3-BH	AT
Total Organic Carbon	17.1		mg/l	5.00	--	10	-	05/21/19 08:52	121,5310C	AG
Oil & Grease, Hem-Grav	ND		mg/l	4.0	--	1	05/22/19 16:30	05/22/19 17:30	74,1664A	ML
TPH, SGT-HEM	ND		mg/l	4.00	--	1	05/22/19 16:30	05/22/19 22:00	74,1664A	ML
Phenolics, Total	ND		mg/l	0.030	--	1	05/22/19 09:25	05/22/19 13:58	4,420.1	BR
Chromium, Hexavalent	ND		mg/l	0.010	--	1	05/21/19 05:00	05/21/19 06:37	1,7196A	MA
Chromium, Hexavalent (Unfiltered)	ND		mg/l	0.050	--	5	05/21/19 05:00	05/21/19 06:53	1,7196A	MA
Anions by Ion Chromatography - Westborough Lab										
Chloride	1120		mg/l	12.5	--	25	-	05/23/19 22:36	44,300.0	AU



Project Name: MBTA GLX NEWBERN AVE II**Lab Number:** L1921130**Project Number:** 290762.0016.0000**Report Date:** 05/29/19

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: WG1239298-1										
Chlorine, Total Residual	ND		mg/l	0.02	--	1	-	05/21/19 01:42	121,4500CL-D	JW
General Chemistry - Westborough Lab for sample(s): 01-02 Batch: WG1239346-1										
Solids, Total Dissolved	ND		mg/l	10	--	1	-	05/21/19 09:20	121,2540C	DW
General Chemistry - Westborough Lab for sample(s): 01-02 Batch: WG1239351-1										
Total Organic Carbon	ND		mg/l	0.500	--	1	-	05/21/19 08:52	121,5310C	AG
General Chemistry - Westborough Lab for sample(s): 01-02 Batch: WG1239357-1										
Chromium, Hexavalent	ND		mg/l	0.010	--	1	05/21/19 05:00	05/21/19 06:34	1,7196A	MA
General Chemistry - Westborough Lab for sample(s): 01-02 Batch: WG1239362-1										
Chromium, Hexavalent (Unfiltered)	ND		mg/l	0.010	--	1	05/21/19 05:00	05/21/19 06:33	1,7196A	MA
General Chemistry - Westborough Lab for sample(s): 01-02 Batch: WG1239388-1										
Solids, Total Suspended	ND		mg/l	5.0	NA	1	-	05/21/19 10:50	121,2540D	DR
General Chemistry - Westborough Lab for sample(s): 01-02 Batch: WG1239449-1										
Cyanide, Total	ND		mg/l	0.005	--	1	05/21/19 11:15	05/21/19 13:46	121,4500CN-CE	LH
General Chemistry - Westborough Lab for sample(s): 01-02 Batch: WG1239511-1										
Nitrogen, Ammonia	ND		mg/l	0.075	--	1	05/21/19 17:00	05/21/19 22:35	121,4500NH3-BH	AT
General Chemistry - Westborough Lab for sample(s): 01-02 Batch: WG1239855-1										
Cyanide, Dissolved	ND		mg/l	0.005	--	1	05/22/19 10:05	05/22/19 12:43	1,9010C/9012B	LH
General Chemistry - Westborough Lab for sample(s): 01-02 Batch: WG1239930-1										
Phenolics, Total	ND		mg/l	0.030	--	1	05/22/19 09:25	05/22/19 13:51	4,420.1	BR
General Chemistry - Westborough Lab for sample(s): 01-02 Batch: WG1240071-1										
Oil & Grease, Hem-Grav	ND		mg/l	4.0	--	1	05/22/19 16:30	05/22/19 17:30	74,1664A	ML
General Chemistry - Westborough Lab for sample(s): 01-02 Batch: WG1240076-1										
TPH, SGT-HEM	ND		mg/l	4.00	--	1	05/22/19 16:30	05/22/19 22:00	74,1664A	ML
Anions by Ion Chromatography - Westborough Lab for sample(s): 01-02 Batch: WG1240702-1										
Chloride	ND		mg/l	0.500	--	1	-	05/23/19 12:11	44,300.0	AU

Lab Control Sample Analysis

Batch Quality Control

Project Name: MBTA GLX NEWBERN AVE II

Project Number: 290762.0016.0000

Lab Number: L1921130

Report Date: 05/29/19

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01-02 Batch: WG1239298-2								
Chlorine, Total Residual	92		-		90-110	-		
General Chemistry - Westborough Lab Associated sample(s): 01-02 Batch: WG1239346-2								
Solids, Total Dissolved	102		-		80-120	-		
General Chemistry - Westborough Lab Associated sample(s): 01-02 Batch: WG1239351-2								
Total Organic Carbon	103		-		90-110	-		
General Chemistry - Westborough Lab Associated sample(s): 01-02 Batch: WG1239357-2								
Chromium, Hexavalent	96		-		85-115	-		20
General Chemistry - Westborough Lab Associated sample(s): 01-02 Batch: WG1239362-2								
Chromium, Hexavalent (Unfiltered)	96		-		85-115	-		20
General Chemistry - Westborough Lab Associated sample(s): 01-02 Batch: WG1239449-2								
Cyanide, Total	95		-		90-110	-		
General Chemistry - Westborough Lab Associated sample(s): 01-02 Batch: WG1239511-2								
Nitrogen, Ammonia	99		-		80-120	-		20

Lab Control Sample Analysis

Batch Quality Control

Project Name: MBTA GLX NEWBERN AVE II

Project Number: 290762.0016.0000

Lab Number: L1921130

Report Date: 05/29/19

Parameter	LCS %Recovery	LCSD %Recovery	%Recovery Limits	RPD	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01-02 Batch: WG1239855-2 WG1239855-3					
Cyanide, Dissolved	93	94	80-120	1	20
General Chemistry - Westborough Lab Associated sample(s): 01-02 Batch: WG1239930-2					
Phenolics, Total	93	-	70-130	-	
General Chemistry - Westborough Lab Associated sample(s): 01-02 Batch: WG1240071-2					
Oil & Grease, Hem-Grav	94	-	78-114	-	18
General Chemistry - Westborough Lab Associated sample(s): 01-02 Batch: WG1240076-2					
TPH	84	-	64-132	-	34
Anions by Ion Chromatography - Westborough Lab Associated sample(s): 01-02 Batch: WG1240702-2					
Chloride	101	-	90-110	-	

Matrix Spike Analysis

Batch Quality Control

Project Name: MBTA GLX NEWBERN AVE II
Project Number: 290762.0016.0000

Lab Number: L1921130
Report Date: 05/29/19

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	Qual	MSD Found	MSD %Recovery	Qual	Recovery Limits	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01-02 QC Batch ID: WG1239298-4 QC Sample: L1921130-02 Client ID: GLC-NB-3												
Chlorine, Total Residual	ND	0.25	0.57	228	Q	-	-		80-120	-		20
General Chemistry - Westborough Lab Associated sample(s): 01-02 QC Batch ID: WG1239357-4 QC Sample: L1921130-02 Client ID: GLC-NB-3												
Chromium, Hexavalent	ND	0.1	0.097	97		-	-		85-115	-		20
General Chemistry - Westborough Lab Associated sample(s): 01-02 QC Batch ID: WG1239362-4 QC Sample: L1921130-02 Client ID: GLC-NB-3												
Chromium, Hexavalent (Unfiltered)	ND	0.5	0.360	72	Q	-	-		85-115	-		20
General Chemistry - Westborough Lab Associated sample(s): 01-02 QC Batch ID: WG1239930-4 QC Sample: L1921130-01 Client ID: GLC-NB-3-3												
Phenolics, Total	ND	0.4	0.21	54	Q	-	-		70-130	-		20

Project Name: MBTA GLX NEWBERN AVE II
Project Number: 290762.0016.0000

Lab Duplicate Analysis
Batch Quality Control

Lab Number: L1921130
Report Date: 05/29/19

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01-02 QC Batch ID: WG1239346-3 QC Sample: L1921130-01 Client ID: GLC-NB-3-3						
Solids, Total Dissolved	840	860	mg/l	2		10
General Chemistry - Westborough Lab Associated sample(s): 01-02 QC Batch ID: WG1239357-3 QC Sample: L1921130-01 Client ID: GLC-NB-3-3						
Chromium, Hexavalent	ND	ND	mg/l	NC		20
General Chemistry - Westborough Lab Associated sample(s): 01-02 QC Batch ID: WG1239362-3 QC Sample: L1921130-01 Client ID: GLC-NB-3-3						
Chromium, Hexavalent (Unfiltered)	ND	ND	mg/l	NC		20
General Chemistry - Westborough Lab Associated sample(s): 01-02 QC Batch ID: WG1239930-3 QC Sample: L1921130-01 Client ID: GLC-NB-3-3						
Phenolics, Total	ND	ND	mg/l	NC		20

Project Name: MBTA GLX NEWBERN AVE II**Lab Number:** L1921130**Project Number:** 290762.0016.0000**Report Date:** 05/29/19**Sample Receipt and Container Information**

Were project specific reporting limits specified?

YES

Cooler Information**Cooler Custody Seal**

A	Absent
B	Absent
C	Absent
D	Absent

Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L1921130-01A	Vial HCl preserved	A	NA		3.2	Y	Absent		8260(14)
L1921130-01A1	Vial HCl preserved	A	NA		3.2	Y	Absent		VPH-DELUX-18(14)
L1921130-01B	Vial HCl preserved	A	NA		3.2	Y	Absent		8260(14)
L1921130-01B1	Vial HCl preserved	A	NA		3.2	Y	Absent		VPH-DELUX-18(14)
L1921130-01C	Vial HCl preserved	A	NA		3.2	Y	Absent		8260(14)
L1921130-01C1	Vial HCl preserved	A	NA		3.2	Y	Absent		VPH-DELUX-18(14)
L1921130-01C2	Vial HCl preserved	A	NA		3.2	Y	Absent		SUB-ETHANOL(14)
L1921130-01C3	Vial HCl preserved	A	NA		3.2	Y	Absent		SUB-ETHANOL(14)
L1921130-01C4	Vial HCl preserved	A	NA		3.2	Y	Absent		SUB-ETHANOL(14)
L1921130-01C5	Vial H2SO4 preserved	A	NA		3.2	Y	Absent		TOC-5310(28)
L1921130-01C6	Vial H2SO4 preserved	A	NA		3.2	Y	Absent		TOC-5310(28)
L1921130-01D	Vial Na2S2O3 preserved	A	NA		3.2	Y	Absent		624.1-SIM-RGP(7),624.1-RGP(3)
L1921130-01D1	Vial Na2S2O3 preserved	A	NA		3.2	Y	Absent		624.1-SIM-RGP(7),624.1-RGP(3)
L1921130-01E	Vial Na2S2O3 preserved	A	NA		3.2	Y	Absent		624.1-SIM-RGP(7),624.1-RGP(3)
L1921130-01E1	Vial Na2S2O3 preserved	A	NA		3.2	Y	Absent		624.1-SIM-RGP(7),624.1-RGP(3)
L1921130-01F	Vial Na2S2O3 preserved	A	NA		3.2	Y	Absent		624.1-SIM-RGP(7),624.1-RGP(3)
L1921130-01F1	Vial Na2S2O3 preserved	A	NA		3.2	Y	Absent		624.1-SIM-RGP(7),624.1-RGP(3)
L1921130-01G	Vial Na2S2O3 preserved	A	NA		3.2	Y	Absent		504(14)
L1921130-01H	Vial Na2S2O3 preserved	A	NA		3.2	Y	Absent		504(14)
L1921130-01J	Plastic 120ml unpreserved	A	7	7	3.2	Y	Absent		HEXCR-7196(1)

Project Name: MBTA GLX NEWBERN AVE II**Lab Number:** L1921130**Project Number:** 290762.0016.0000**Report Date:** 05/29/19**Container Information**

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L1921130-01K	Plastic 250ml HNO3 preserved	A	<2	<2	3.2	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)
L1921130-01L	Plastic 250ml HNO3 preserved	A	<2	<2	3.2	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)
L1921130-01M	Plastic 250ml NaOH preserved	A	>12	>12	3.2	Y	Absent		SCN-9010(14)
L1921130-01N	Plastic 250ml NaOH preserved	A	>12	>12	3.2	Y	Absent		TCN-4500(14)
L1921130-01P	Plastic 500ml H2SO4 preserved	A	<2	<2	3.2	Y	Absent		NH3-4500(28)
L1921130-01Q	Plastic 950ml unpreserved	A	7	7	3.2	Y	Absent		CL-300(28),HEXCR-7196-UF(1),TRC-4500(1),TDS-2540(7)
L1921130-01R	Plastic 950ml unpreserved	A	7	7	3.2	Y	Absent		TSS-2540(7)
L1921130-01S	Amber 1000ml Na2S2O3	A	7	7	3.2	Y	Absent		625.1-RGP(7),625.1-SIM-RGP(7)
L1921130-01S1	Amber 1000ml Na2S2O3	A	7	7	3.2	Y	Absent		625.1-RGP(7),625.1-SIM-RGP(7)
L1921130-01T	Amber 1000ml Na2S2O3	A	7	7	3.2	Y	Absent		625.1-RGP(7),625.1-SIM-RGP(7)
L1921130-01T1	Amber 1000ml Na2S2O3	A	7	7	3.2	Y	Absent		625.1-RGP(7),625.1-SIM-RGP(7)
L1921130-01U	Amber 1000ml Na2S2O3	A	7	7	3.2	Y	Absent		PCB-608.3(7)
L1921130-01U1	Amber 1000ml Na2S2O3	A	7	7	3.2	Y	Absent		PCB-608.3(7)
L1921130-01V	Amber 1000ml Na2S2O3	A	7	7	3.2	Y	Absent		PESTICIDE-608.3(7)
L1921130-01V1	Amber 1000ml Na2S2O3	A	7	7	3.2	Y	Absent		PESTICIDE-608.3(7)
L1921130-01W	Amber 1000ml H2SO4 preserved	A	<2	<2	3.2	Y	Absent		TPHENOL-420(28)
L1921130-01W1	Amber 1000ml HCl preserved	A	NA		3.2	Y	Absent		TPH-1664(28)
L1921130-01W2	Amber 1000ml HCl preserved	A	NA		3.2	Y	Absent		TPH-1664(28)
L1921130-01W3	Amber 1000ml HCl preserved	A	NA		3.2	Y	Absent		OG-1664(28)
L1921130-01W4	Amber 1000ml HCl preserved	A	NA		3.2	Y	Absent		OG-1664(28)
L1921130-01W5	Amber 1000ml HCl preserved	A	<2	<2	3.2	Y	Absent		EPH-10(14)
L1921130-01W6	Amber 1000ml HCl preserved	A	<2	<2	3.2	Y	Absent		EPH-10(14)
L1921130-01Y	Bacteria Cup Na2S2O3 preserved	A	NA		3.2	Y	Absent		ARCHIVE()
L1921130-01Z	Bacteria Cup Na2S2O3 preserved	A	NA		3.2	Y	Absent		ARCHIVE()

Project Name: MBTA GLX NEWBERN AVE II**Lab Number:** L1921130**Project Number:** 290762.0016.0000**Report Date:** 05/29/19**Container Information**

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L1921130-02A	Vial HCl preserved	A	NA		3.2	Y	Absent		8260(14)
L1921130-02B	Vial HCl preserved	A	NA		3.2	Y	Absent		8260(14)
L1921130-02C	Vial HCl preserved	A	NA		3.2	Y	Absent		SUB-ETHANOL(14)
L1921130-02C1	Vial H2SO4 preserved	A	NA		3.2	Y	Absent		TOC-5310(28)
L1921130-02C2	Vial H2SO4 preserved	A	NA		3.2	Y	Absent		TOC-5310(28)
L1921130-02D	Vial Na2S2O3 preserved	A	NA		3.2	Y	Absent		624.1-SIM-RGP(7),624.1-RGP(3)
L1921130-02D1	Vial Na2S2O3 preserved	A	NA		3.2	Y	Absent		624.1-SIM-RGP(7),624.1-RGP(3)
L1921130-02E	Vial Na2S2O3 preserved	A	NA		3.2	Y	Absent		624.1-SIM-RGP(7),624.1-RGP(3)
L1921130-02E1	Vial Na2S2O3 preserved	A	NA		3.2	Y	Absent		624.1-SIM-RGP(7),624.1-RGP(3)
L1921130-02F	Vial Na2S2O3 preserved	A	NA		3.2	Y	Absent		624.1-SIM-RGP(7),624.1-RGP(3)
L1921130-02F1	Vial Na2S2O3 preserved	A	NA		3.2	Y	Absent		624.1-SIM-RGP(7),624.1-RGP(3)
L1921130-02G	Vial Na2S2O3 preserved	A	NA		3.2	Y	Absent		504(14)
L1921130-02H	Vial Na2S2O3 preserved	A	NA		3.2	Y	Absent		504(14)
L1921130-02J	Plastic 120ml unpreserved	B	7	7	3.5	Y	Absent		HEXCR-7196(1)
L1921130-02K	Plastic 250ml HNO3 preserved	B	<2	<2	3.5	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)
L1921130-02L	Plastic 250ml HNO3 preserved	B	<2	<2	3.5	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)
L1921130-02M	Plastic 250ml NaOH preserved	B	>12	>12	3.5	Y	Absent		SCN-9010(14)
L1921130-02N	Plastic 250ml NaOH preserved	B	>12	>12	3.5	Y	Absent		TCN-4500(14)
L1921130-02P	Plastic 500ml H2SO4 preserved	B	<2	<2	3.5	Y	Absent		NH3-4500(28)
L1921130-02Q	Plastic 950ml unpreserved	C	7	7	2.8	Y	Absent		CL-300(28),HEXCR-7196-UF(1),TRC-4500(1),TDS-2540(7)
L1921130-02R	Plastic 950ml unpreserved	C	7	7	2.8	Y	Absent		TSS-2540(7)
L1921130-02S	Amber 1000ml Na2S2O3	C	7	7	2.8	Y	Absent		625.1-RGP(7),625.1-SIM-RGP(7)
L1921130-02S1	Amber 1000ml Na2S2O3	C	7	7	2.8	Y	Absent		625.1-RGP(7),625.1-SIM-RGP(7)
L1921130-02T	Amber 1000ml Na2S2O3	C	7	7	2.8	Y	Absent		625.1-RGP(7),625.1-SIM-RGP(7)

Project Name: MBTA GLX NEWBERN AVE II
Project Number: 290762.0016.0000

Serial_No:05291919:57
Lab Number: L1921130
Report Date: 05/29/19

Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L1921130-02T1	Amber 1000ml Na2S2O3	C	7	7	2.8	Y	Absent		625.1-RGP(7),625.1-SIM-RGP(7)
L1921130-02U	Amber 1000ml Na2S2O3	C	7	7	2.8	Y	Absent		PCB-608.3(7)
L1921130-02U1	Amber 1000ml Na2S2O3	C	7	7	2.8	Y	Absent		PCB-608.3(7)
L1921130-02V	Amber 1000ml Na2S2O3	C	7	7	2.8	Y	Absent		PESTICIDE-608.3(7)
L1921130-02V1	Amber 1000ml Na2S2O3	C	7	7	2.8	Y	Absent		PESTICIDE-608.3(7)
L1921130-02W	Amber 1000ml H2SO4 preserved	C	<2	<2	2.8	Y	Absent		TPHENOL-420(28)
L1921130-02W1	Amber 1000ml HCl preserved	D	NA		3.4	Y	Absent		TPH-1664(28)
L1921130-02W2	Amber 1000ml HCl preserved	D	NA		3.4	Y	Absent		TPH-1664(28)
L1921130-02W3	Amber 1000ml HCl preserved	D	NA		3.4	Y	Absent		OG-1664(28)
L1921130-02W4	Amber 1000ml HCl preserved	D	NA		3.4	Y	Absent		OG-1664(28)
L1921130-02W5	Amber 1000ml HCl preserved	D	<2	<2	3.4	Y	Absent		EPH-10(14)
L1921130-02W6	Amber 1000ml HCl preserved	D	<2	<2	3.4	Y	Absent		EPH-10(14)
L1921130-02Y	Bacteria Cup Na2S2O3 preserved	D	NA		3.4	Y	Absent		ARCHIVE()
L1921130-02Z	Bacteria Cup Na2S2O3 preserved	D	NA		3.4	Y	Absent		ARCHIVE()

Project Name: MBTA GLX NEWBERN AVE II
Project Number: 290762.0016.0000

Lab Number: L1921130
Report Date: 05/29/19

GLOSSARY

Acronyms

DL	- 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 limit of quantitation (LOQ). The DL includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)
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.
LOD	- Limit of Detection: This value represents the level to which a target analyte can reliably be detected for a specific analyte in a specific matrix by a specific method. The LOD includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)
LOQ	- Limit of Quantitation: The value at which an instrument can accurately measure an analyte at a specific concentration. The LOQ includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)
	Limit of Quantitation: The value at which an instrument can accurately measure an analyte at a specific concentration. The LOQ includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)
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. For Method 332.0, the spike recovery is calculated using the native concentration, including estimated values.
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

Report Format: Data Usability Report



Project Name: MBTA GLX NEWBERN AVE II
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Lab Number: L1921130
Report Date: 05/29/19

- 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.

PFAS Total: With respect to PFAS analyses, the 'PFAS, Total (5)' result is defined as the summation of results for: PFHpA, PFHxS, PFOA, PFNA and PFOS. If a 'Total' result is requested, the results of its individual components will also be reported.

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 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.
- J** - Estimated value. This represents an estimated concentration for Tentatively Identified Compounds (TICs).
- M** - Reporting Limit (RL) exceeds the MCP CAM Reporting Limit for this analyte.
- ND** - Not detected at the reporting limit (RL) for the sample.
- 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.

Report Format: Data Usability Report



Project Name: MBTA GLX NEWBERN AVE II
Project Number: 290762.0016.0000

Lab Number: L1921130
Report Date: 05/29/19

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.



- 131 Method for the Determination of Volatile Petroleum Hydrocarbons (VPH), MassDEP, February 2018, Revision 2.1 with QC Requirements & Performance Standards for the Analysis of VPH under the Massachusetts Contingency Plan, WSC-CAM-IVA, June 1, 2018.

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.



Alpha Analytical, Inc.

ID No.:17873

Facility: **Company-wide**

Revision 12

Department: **Quality Assurance**

Published Date: 10/9/2018 4:58:19 PM

Title: **Certificate/Approval Program Summary**

Page 1 of 1

Certification Information

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

Westborough Facility**EPA 624/624.1:** 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 6860:** SCM: Perchlorate**SM4500:** NPW: Amenable Cyanide; 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, **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 300:** Chloride, Sulfate, Nitrate.**EPA 624.1:** Volatile Halocarbons & Aromatics,**EPA 608.3:** 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 625.1:** SVOC (Acid/Base/Neutral Extractables), **EPA 600/4-81-045:** PCB-Oil.**Microbiology:** **SM9223B-Colilert-QT; Enterolert-QT, SM9221E, EPA 1600, EPA 1603.****Mansfield Facility:****Drinking Water****EPA 200.7:** Al, Ba, Cd, Cr, Cu, Fe, 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, Fe, Pb, Mn, Ni, K, Se, Ag, Na, TL, Zn.**EPA 245.1 Hg.****SM2340B**

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

PAGE OF

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

[illegible]

**IS YOUR PROJECT
MA MCP *or* CT RCP?**

FCRM NO. 31-0519
(rev. 5-JAN-12)

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.

straw hat

#: L1921130

PO #: 135774

Are CT RCP (Reasonable Confidence Protocols) Required?
--

NPDES RGP GW 2017 per quote

Pesticides by 608

EPH (Fractions Only) by MassDEP

Oil and Grease (HEM) by 1654A

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

TOC by 5310

VOCs by 8260C

Sample Specific Comments

TOTAL # BOTTLES

		Subcontract Chain of Custody Test America (Nashville) 2960 Foster Creighton Drive Nashville, TN 37204		Alpha Job Number L1921130	
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 Turnaround & Deliverables Information Due Date: 05/28/19 (RUSH) Deliverables:		State/Federal Program: Regulatory Criteria:	
Project Specific Requirements and/or Report Requirements					
Reference following Alpha Job Number on final report/deliverables: L1921130				Report to include Method Blank, LCS/LCSD:	
Additional Comments: Send all results/reports to subreports@alphalab.com 3 DAY RUSH					
Lab ID	Client ID	Collection Date/Time	Sample Matrix	Analysis	Batch QC
	GLC-NB-3-3 GLC-NB-3	05-20-19 10:15 05-20-19 14:23	WATER WATER	Ethanol by EPA 1671 Revision A Ethanol by EPA 1671 Revision A	
Relinquished By:		Date/Time:	Received By:	Date/Time:	
		5/22/19			
Form No: AL_subcoc					



Environment Testing
TestAmerica

ANALYTICAL REPORT

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

Laboratory Job ID: 490-174593-1

Client Project/Site: L1921130

For:

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

Attn: Reports Dept.

Authorized for release by:
5/29/2019 5:29:33 PM

Ken Hayes, Project Manager II
(615)301-5035

ken.hayes@testamericainc.com

LINKS

Review your project
results through

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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: L1921130

Job ID: 490-174593-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
490-174593-1	GLC-NB-3-3	Water	05/20/19 10:15	05/23/19 09:05	
490-174593-2	GLC-NB-3	Water	05/20/19 14:23	05/23/19 09:05	

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Case Narrative

Client: Alpha Analytical Inc
Project/Site: L1921130

Job ID: 490-174593-1

Job ID: 490-174593-1

Laboratory: Eurofins TestAmerica, Nashville

Narrative

Job Narrative 490-174593-1

Comments

No additional comments.

Receipt

The samples were received on 5/23/2019 9:05 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 4.3° C.

GC Semi VOA

Method 1671A: The RPD of the laboratory control sample (LCS) and laboratory control sample duplicate (LCSD) for batch analytical batch 490-597997 recovered outside control limits for the following analyte: Ethanol.

Method 1671A: The surrogate recovery for the laboratory control sample (LCS) associated with analytical batch 490-597997 was outside the control limits. All associated sample surrogate recoveries were within control limits; therefore, the data has been qualified and reported.

Method 1671A: Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate (MS/MSD) associated with analytical batch 490-597997.

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: L1921130

Job ID: 490-174593-1

Qualifiers

GC VOA

Qualifier	Qualifier Description
*	RPD of the LCS and LCSD exceeds the control limits
X	Surrogate is outside control limits

Glossary

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

Client Sample Results

Client: Alpha Analytical Inc
Project/Site: L1921130

Job ID: 490-174593-1

Client Sample ID: GLC-NB-3-3

Lab Sample ID: 490-174593-1

Date Collected: 05/20/19 10:15

Matrix: Water

Date Received: 05/23/19 09:05

Method: 1671A - Ethanol (GC/FID)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ethanol	ND	*	2000	500	ug/L	-		05/28/19 11:42	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Isopropyl acetate (Surr)	105		70 - 130		05/28/19 11:42	1

Client Sample Results

Client: Alpha Analytical Inc
Project/Site: L1921130

Job ID: 490-174593-1

Client Sample ID: GLC-NB-3

Lab Sample ID: 490-174593-2

Date Collected: 05/20/19 14:23

Matrix: Water

Date Received: 05/23/19 09:05

Method: 1671A - Ethanol (GC/FID)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ethanol	ND	*	2000	500	ug/L	-		05/28/19 11:48	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Isopropyl acetate (Surr)	99		70 - 130		05/28/19 11:48	1

QC Sample Results

Client: Alpha Analytical Inc
Project/Site: L1921130

Job ID: 490-174593-1

Method: 1671A - Ethanol (GC/FID)

Lab Sample ID: MB 490-597997/4

Matrix: Water

Analysis Batch: 597997

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	-		05/28/19 11:17	1
Surrogate	MB %Recovery	MB Qualifier	Limits				Prepared	Analyzed	Dil Fac
Isopropyl acetate (Surr)	91		70 - 130					05/28/19 11:17	1

Lab Sample ID: LCS 490-597997/5

Matrix: Water

Analysis Batch: 597997

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Ethanol			50200	36480		ug/L	-	73	70 - 130
Surrogate	LCS %Recovery	LCS Qualifier	Limits						
Isopropyl acetate (Surr)	65	X	70 - 130						

Lab Sample ID: LCSD 490-597997/6

Matrix: Water

Analysis Batch: 597997

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	44940	*	ug/L	-	89	70 - 130	21	20
Surrogate	LCSD %Recovery	LCSD Qualifier	Limits								
Isopropyl acetate (Surr)	85		70 - 130								

QC Association Summary

Client: Alpha Analytical Inc
Project/Site: L1921130

Job ID: 490-174593-1

GC VOA

Analysis Batch: 597997

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-174593-1	GLC-NB-3-3	Total/NA	Water	1671A	
490-174593-2	GLC-NB-3	Total/NA	Water	1671A	
MB 490-597997/4	Method Blank	Total/NA	Water	1671A	
LCS 490-597997/5	Lab Control Sample	Total/NA	Water	1671A	
LCSD 490-597997/6	Lab Control Sample Dup	Total/NA	Water	1671A	

Lab Chronicle

Client: Alpha Analytical Inc
Project/Site: L1921130

Job ID: 490-174593-1

Client Sample ID: GLC-NB-3-3

Lab Sample ID: 490-174593-1

Date Collected: 05/20/19 10:15

Matrix: Water

Date Received: 05/23/19 09:05

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			597997	05/28/19 11:42	JDJ	TAL NSH

Client Sample ID: GLC-NB-3

Lab Sample ID: 490-174593-2

Date Collected: 05/20/19 14:23

Matrix: Water

Date Received: 05/23/19 09:05

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			597997	05/28/19 11:48	JDJ	TAL NSH

Laboratory References:

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

Method Summary

Client: Alpha Analytical Inc
Project/Site: L1921130

Job ID: 490-174593-1

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

Protocol References:

EPA = US Environmental Protection Agency

Laboratory References:

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

Accreditation/Certification Summary

Client: Alpha Analytical Inc
Project/Site: L1921130

Job ID: 490-174593-1

Laboratory: Eurofins 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	06-30-19

The following analytes are included in this report, but the laboratory is not certified by the governing authority. This list may include analytes for which the agency does not offer certification.

Analysis Method	Prep Method	Matrix	Analyte	
1671A		Water	Ethanol	
Maine	State Program	1	TN00032	11-03-19

The following analytes are included in this report, but the laboratory is not certified by the governing authority. This list may include analytes for which the agency does not offer certification.

Analysis Method	Prep Method	Matrix	Analyte
1671A		Water	Ethanol

TestAmericaTHE LEADER IN ENVIRONMENTAL TESTING
Nashville, TN**COOLER RECEIPT FORM**

490-174593 Chain of Custody

Cooler Received/Opened On 05-23-2019 @ 0905Time Samples Removed From Cooler 14:46 Time Samples Placed In Storage 14:59 (2 Hour Window)1. Tracking # 1Z8306540191747277 (last 4 digits, FedEx) Courier: UPS NDA
IR Gun ID 31470368 pH Strip Lot N/A Chlorine Strip Lot N/A2. Temperature of rep. sample or temp blank when opened: 4.3 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...NAI certify that I opened the cooler and answered questions 1-6 (initial) KA7. Were custody seals on containers: YES NO and IntactYES...NO...NA

Were these signed and dated correctly?

YES...NO...NA8. Packing mat'l used? Bubblewrap Plastic bag Peanuts Vermiculite Foam Insert Paper Other None9. Cooling process: Ice Ice-pack Ice (direct contact) Dry ice Other None

10. Did all containers arrive in good condition (unbroken)?

YES...NO...NA

11. Were all container labels complete (#, date, signed, pres., etc)?

YES...NO...NA

12. Did all container labels and tags agree with custody papers?

YES...NO...NA

13a. Were VOA vials received?

YES...NO...NA

b. Was there any observable headspace present in any VOA vial?

YES...NO...NA

Larger than this.

14. Was there a Trip Blank in this cooler? YES...NO...NA If multiple coolers, sequence # _____I certify that I unloaded the cooler and answered questions 7-14 (initial) KA

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...NAI certify that I checked for chlorine and pH as per SOP and answered questions 15-16 (initial) KA

17. Were custody papers properly filled out (ink, signed, etc)?

YES...NO...NA

18. Did you sign the custody papers in the appropriate place?


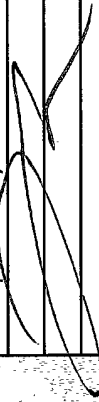
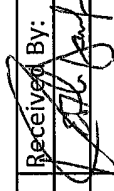
YES...NO...NA

19. Were correct containers used for the analysis requested?

YES...NO...NA

20. Was sufficient amount of sample sent in each container?

YES...NO...NAI certify that I entered this project into LIMS and answered questions 17-20 (initial) KAI certify that I attached a label with the unique LIMS number to each container (initial) KA21. Were there Non-Conformance issues at login? YES...NO...NO Was a NCM generated? YES...NO...NO..# _____

		Subcontract Chain of Custody Test America (Nashville) 2960 Foster Creighton Drive Nashville, TN 37204		Alpha Job Number L1921130	
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: 05/28/19 (RUSH) Deliverables:		Regulatory Requirements/Report Limits State/Federal Program: Regulatory Criteria:	
Project Specific Requirements and/or Report Requirements					
Reference following Alpha Job Number on final report/deliverables: L1921130		Report to include Method Blank, LCS/LCSD:			
Additional Comments: Send all results/reports to subreports@alphalab.com 3 DAY RUSH					
Lab ID	Client ID	Collection Date/Time	Sample Matrix	Analysis	Batch QC
	GLC-NB-3-3 GLC-NB-3	05-20-19 10:15 05-20-19 14:23	WATER WATER	Ethanol by EPA 1671 Revision A Ethanol by EPA 1671 Revision A	
			Loc: 490 174593		
Relinquished By:		Date/Time:	Received By:	Date/Time:	
		5/22/19		05-23-2019 09:05	
Form No: AL_subcoc					

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Project Name: MBTA GLX NEWBERN AVE II
Project Number: 290762.0016.0000

Lab Number: L1921376
Report Date: 05/29/19

Alpha Sample ID	Client ID	Matrix	Sample Location	Collection Date/Time	Receive Date
L1921376-01	GLC-NB-3-1	WATER	SOMERVILLE, MEDFORD, CAMBRIDGE	05/21/19 11:00	05/21/19
L1921376-02	GLC-NB-3-4	WATER	SOMERVILLE, MEDFORD, CAMBRIDGE	05/21/19 12:00	05/21/19
L1921376-03	GLC-NB-2	WATER	SOMERVILLE, MEDFORD, CAMBRIDGE	05/21/19 14:00	05/21/19
L1921376-04	GLC-NB-3-2	WATER	SOMERVILLE, MEDFORD, CAMBRIDGE	05/21/19 15:55	05/21/19
L1921376-05	GLC-NB-3-1	WATER	SOMERVILLE, MEDFORD, CAMBRIDGE	05/21/19 12:50	05/21/19
L1921376-06	GLC-NB-2	WATER	SOMERVILLE, MEDFORD, CAMBRIDGE	05/21/19 14:45	05/21/19
L1921376-07	GLC-NB-3-4	WATER	SOMERVILLE, MEDFORD, CAMBRIDGE	05/21/19 13:30	05/21/19
L1921376-08	GLC-NB-1	WATER	SOMERVILLE, MEDFORD, CAMBRIDGE	05/21/19 15:50	05/21/19
L1921376-09	GLC-NB-3-2	WATER	SOMERVILLE, MEDFORD, CAMBRIDGE	05/20/19 11:00	05/21/19
L1921376-10	TRIP BLANK	WATER	SOMERVILLE, MEDFORD, CAMBRIDGE	05/20/19 00:00	05/21/19
L1921376-11	GLC-NB-3-2	WATER	SOMERVILLE, MEDFORD, CAMBRIDGE	05/21/19 15:00	05/21/19
L1921376-12	GLC-NB-3-2	WATER	SOMERVILLE, MEDFORD, CAMBRIDGE	05/22/19 12:00	05/22/19
L1921376-13	GLC-NB-3-1	WATER	SOMERVILLE, MEDFORD, CAMBRIDGE	05/22/19 12:35	05/22/19
L1921376-14	GLC-NB-2	WATER	SOMERVILLE, MEDFORD, CAMBRIDGE	05/22/19 13:20	05/22/19
L1921376-15	GLC-NB-3-4	WATER	SOMERVILLE, MEDFORD, CAMBRIDGE	05/22/19 14:10	05/22/19
L1921376-16	TRIP BLANK	WATER	SOMERVILLE, MEDFORD, CAMBRIDGE	05/22/19 00:00	05/22/19

Project Name: MBTA GLX NEWBERN AVE II

Lab Number: L1921376

Project Number: 290762.0016.0000

Report Date: 05/29/19

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?	YES
C	Were all required corrective actions and analytical response actions specified in the selected CAM protocol(s) implemented for all identified performance standard non-conformances?	YES
D	Does the laboratory report comply with all the reporting requirements specified in CAM VII A, "Quality Assurance and Quality Control Guidelines for the Acquisition and Reporting of Analytical Data?"	YES
E a.	VPH, EPH, and APH Methods only: Was each method conducted without significant modification(s)? (Refer to the individual method(s) for a list of significant modifications).	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 NEWBERN AVE II
Project Number: 290762.0016.0000

Lab Number: L1921376
Report Date: 05/29/19

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. 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 Outlier Summary Report, located directly after the Case Narrative. QC information is also incorporated in the Data Usability Assessment table (Format 11) of our Data Merger tool, where it can be reviewed in conjunction with the sample result, associated regulatory criteria and any associated data 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.

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 Alpha Project Manager 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 Project Management at 800-624-9220 with any questions.

Project Name: MBTA GLX NEWBERN AVE II
Project Number: 290762.0016.0000

Lab Number: L1921376
Report Date: 05/29/19

Case Narrative (continued)

Report Submission

May 29, 2019: This final report includes the results of all requested analyses.

May 28, 2019: This is a preliminary report.

May 24, 2019: This is a preliminary report.

The analyses of Ethanol, Total Mercury, and Dissolved Mercury were subcontracted. Copies of the laboratory reports are 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

All samples were logged according to the project manager's instruction.

L1921376-10 and -16: A sample identified as "TRIP BLANK" was received but not listed on the Chain of Custody. At the client's request, this sample was analyzed.

In reference to question A:

L1921376-01: An aliquot was taken from an unpreserved container and preserved appropriately with HNO₃ for the subcontracted analysis of Total Mercury.

Volatile Organics

L1921376-01 and -09: The sample has elevated detection limits due to the dilution required by the elevated concentrations of non-target compounds in the sample.

In reference to question G:

L1921376-01 and -09: One or more of the target analytes did not achieve the requested CAM reporting limits.

In reference to question I:

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

VPH

Project Name: MBTA GLX NEWBERN AVE II
Project Number: 290762.0016.0000

Lab Number: L1921376
Report Date: 05/29/19

Case Narrative (continued)

L1921376-01: 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 G:

L1921376-01 and -09: One or more of the target analytes did not achieve the requested CAM reporting limits.

EPH

In reference to question H:

L1921376-09: The surrogate recovery was outside the acceptance criteria for chloro-octadecane (28%); however, re-extraction achieved a similar result: chloro-octadecane (32%). The results of both extractions are reported; however, all associated compounds are considered to have a potential bias.

The WG1240040-2/-3 LCS/LCSD RPDs, associated with L1921376-09, are above the acceptance criteria for c11-c22 aromatics (53%), naphthalene (60%), 2-methylnaphthalene (60%), acenaphthylene (57%), acenaphthene (56%), fluorene (52%), phenanthrene (49%), anthracene (50%), fluoranthene (45%), pyrene (45%), benzo(a)anthracene (46%), chrysene (45%), benzo(b)fluoranthene (48%), benzo(k)fluoranthene (47%), benzo(a)pyrene (48%), indeno(1,2,3-cd)pyrene (55%), dibenzo(a,h)anthracene (51%), and benzo(ghi)perylene (56%).

In reference to question I:

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

Chromium, Hexavalent (Unfiltered)

L1921376-01, -02, -03, and -11: The sample has an elevated detection limit due to the dilution required by the sample matrix.

Cyanide, Dissolved

L1921376-03: The Dissolved Cyanide result is higher than the Total Cyanide result. The sample was re-prepped and re-analyzed for both analyses and the results were confirmed.

Project Name: MBTA GLX NEWBERN AVE II
Project Number: 290762.0016.0000

Lab Number: L1921376
Report Date: 05/29/19

Case Narrative (continued)

Non-MCP Related Narratives

Volatile Organics by Method 624

L1921376-01 and -09: The sample has elevated detection limits due to the dilution required by the elevated concentrations of target compounds in the sample.

L1921376-01 and -09: The sample was re-analyzed on dilution in order to quantify the results within the calibration range. The result(s) should be considered estimated, and are qualified with an E flag, for any compound(s) that exceeded the calibration range in the initial analysis. The re-analysis was performed only for the compound(s) that exceeded the calibration range.

The WG1240431-8 Method Blank, associated with L1921376-01D2 and -09D2, has a concentration above the reporting limit for bromomethane. Since the samples were non-detect to the RL for this analyte, no further actions were taken. The results of the original analysis are reported.

Volatile Organics by SIM

L1921376-01 and -09: The sample has an elevated detection limit due to the dilution required by the elevated concentrations of non-target compounds in the sample.

PCBs

L1921376-09: The surrogate recovery is outside the individual acceptance criteria for decachlorobiphenyl (139%), but within the overall method allowances. The results of the original analysis are reported.

The surrogate recovery for the WG1240233-2 LCS, associated with L1921376-01, is outside the acceptance criteria for decachlorobiphenyl (136%). The LCS spike compounds are within overall method allowances; therefore, no further action was taken.

Pesticides

The surrogate recovery for the WG1239709-2 LCS, associated with L1921376-01, -02, -03, and -09, is outside the acceptance criteria for 2,4,5,6-tetrachloro-m-xylene (45%). The LCS spike compounds are within overall method allowances; therefore, no further action was taken.

Project Name: MBTA GLX NEWBERN AVE II
Project Number: 290762.0016.0000

Lab Number: L1921376
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Case Narrative (continued)

Total Metals

The WG1240560-2 LCS recovery, associated with L1921376-02, -03, -09, and -11, is above the acceptance criteria for selenium (117%); however, the associated samples are non-detect to the RL for this target analyte. The results of the original analysis are reported.

The WG1240624-2 LCS recovery, associated with L1921376-01, is above the acceptance criteria for selenium (120%); however, the associated sample is non-detect to the RL for this target analyte. The results of the original analysis are reported.

The WG1240624-3 MS recoveries for antimony (31%), cadmium (133%), and zinc (147%), performed on L1921376-01, recovered outside the 70-130% acceptance criteria. The results for these analytes are considered suspect due to either the heterogeneous nature of the sample or matrix interference.

The WG1240628-3 MS recovery for iron (1500%), performed on L1921376-01, does not apply because the sample concentration is greater than four times the spike amount added.

Dissolved Metals

The WG1240627-2 LCS recoveries, associated with L1921376-01, -03, and -12, are above the acceptance criteria for selenium (118%) and silver (118%); however, the associated samples are non-detect to the RL for these target analytes. The results of the original analysis are reported.

The WG1240627-3 MS recovery for antimony (136%), performed on L1921376-12, 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.

The WG1240881-3 MS recovery for antimony (140%), performed on L1921376-02, 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.

E. Coli (MPN)

L1921376-05 was analyzed with the method required holding time exceeded.

Project Name: MBTA GLX NEWBERN AVE II
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Case Narrative (continued)

Chlorine, Total Residual

The WG1240029-4 MS recovery (76%), performed on L1921376-11, is outside the acceptance criteria; however, the associated LCS recovery is within criteria. No further action was taken.

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:



Kelly Stenstrom

Title: Technical Director/Representative

Date: 05/29/19

QC OUTLIER SUMMARY REPORT

Project Name: MBTA GLX NEWBERN AVE II

Project Number: 290762.0016.0000

Lab Number: L1921376

Report Date: 05/29/19

Method	Client ID (Native ID)	Lab ID	Parameter	QC Type	Recovery/RPD (%)	QC Limits (%)	Associated Samples	Data Quality Assessment
Extractable Petroleum Hydrocarbons - Westborough Lab								
EPH-04-1.1	GLC-NB-3-2	L1921376-09	Chloro-Octadecane	Surrogate	28	40-140	-	potential low bias
EPH-04-1.1	GLC-NB-3-2	L1921376-09 RE	Chloro-Octadecane	Surrogate	32	40-140	-	potential low bias
EPH-04-1.1	Batch QC	WG1240040-3	C11-C22 Aromatics	LCSD	53	25	09	non-directional bias
EPH-04-1.1	Batch QC	WG1240040-3	Naphthalene	LCSD	60	25	09	non-directional bias
EPH-04-1.1	Batch QC	WG1240040-3	2-Methylnaphthalene	LCSD	60	25	09	non-directional bias
EPH-04-1.1	Batch QC	WG1240040-3	Acenaphthylene	LCSD	57	25	09	non-directional bias
EPH-04-1.1	Batch QC	WG1240040-3	Acenaphthene	LCSD	56	25	09	non-directional bias
EPH-04-1.1	Batch QC	WG1240040-3	Fluorene	LCSD	52	25	09	non-directional bias
EPH-04-1.1	Batch QC	WG1240040-3	Phenanthrene	LCSD	49	25	09	non-directional bias
EPH-04-1.1	Batch QC	WG1240040-3	Anthracene	LCSD	50	25	09	non-directional bias
EPH-04-1.1	Batch QC	WG1240040-3	Fluoranthene	LCSD	45	25	09	non-directional bias
EPH-04-1.1	Batch QC	WG1240040-3	Pyrene	LCSD	45	25	09	non-directional bias
EPH-04-1.1	Batch QC	WG1240040-3	Benzo(a)anthracene	LCSD	46	25	09	non-directional bias
EPH-04-1.1	Batch QC	WG1240040-3	Chrysene	LCSD	45	25	09	non-directional bias
EPH-04-1.1	Batch QC	WG1240040-3	Benzo(b)fluoranthene	LCSD	48	25	09	non-directional bias
EPH-04-1.1	Batch QC	WG1240040-3	Benzo(k)fluoranthene	LCSD	47	25	09	non-directional bias
EPH-04-1.1	Batch QC	WG1240040-3	Benzo(a)pyrene	LCSD	48	25	09	non-directional bias
EPH-04-1.1	Batch QC	WG1240040-3	Indeno(1,2,3-cd)Pyrene	LCSD	55	25	09	non-directional bias
EPH-04-1.1	Batch QC	WG1240040-3	Dibenzo(a,h)anthracene	LCSD	35	40-140	09	potential low bias
EPH-04-1.1	Batch QC	WG1240040-3	Dibenzo(a,h)anthracene	LCSD	51	25	09	non-directional bias
EPH-04-1.1	Batch QC	WG1240040-3	Benzo(ghi)perylene	LCSD	56	25	09	non-directional bias
Polychlorinated Biphenyls by GC - Westborough Lab								
608.3	GLC-NB-3-2	L1921376-09	Decachlorobiphenyl	Surrogate	139	38-114	-	potential high bias
608.3	Batch QC	WG1240233-2	Decachlorobiphenyl	Surrogate	136	38-114	-	potential high bias
Organochlorine Pesticides by GC - Westborough Lab								
608.3	Batch QC	WG1239709-2	2,4,5,6-Tetrachloro-m-xylene	Surrogate	45	47-124	-	potential low bias

QC OUTLIER SUMMARY REPORT

Project Name: MBTA GLX NEWBERN AVE II
Project Number: 290762.0016.0000

Lab Number: L1921376
Report Date: 05/29/19

Method	Client ID (Native ID)	Lab ID	Parameter	QC Type	Recovery/RPD (%)	QC Limits (%)	Associated Samples	Data Quality Assessment
Dissolved Metals - Mansfield Lab								
200.8	Batch QC	WG1240627-2	Selenium, Dissolved	LCS	118	85-115	01,03,12	potential high bias
200.8	Batch QC	WG1240627-2	Silver, Dissolved	LCS	118	85-115	01,03,12	potential high bias
200.8	Batch QC (L1921376-12)	WG1240627-3	Antimony, Dissolved	MS	136	70-130	01,03,12	potential high bias
200.8	Batch QC (L1921376-02)	WG1240881-3	Antimony, Dissolved	MS	140	70-130	02	potential high bias
Total Metals - Mansfield Lab								
200.7	Batch QC (L1921376-01)	WG1240628-3	Iron, Total	MS	1500	75-125	01	potential high bias
200.8	Batch QC	WG1240560-2	Selenium, Total	LCS	117	85-115	02-03,09,11	potential high bias
200.8	Batch QC	WG1240624-2	Selenium, Total	LCS	120	85-115	01	potential high bias
200.8	Batch QC (L1921376-01)	WG1240624-3	Antimony, Total	MS	31	70-130	01	potential low bias
200.8	Batch QC (L1921376-01)	WG1240624-3	Cadmium, Total	MS	133	70-130	01	potential high bias
200.8	Batch QC (L1921376-01)	WG1240624-3	Zinc, Total	MS	147	70-130	01	potential high bias
General Chemistry - Westborough Lab								
4500CL-D	Batch QC (L1921376-11)	WG1240029-4	Chlorine, Total Residual	MS	76	80-120	11	potential low bias

ORGANICS

VOLATILES

Project Name: MBTA GLX NEWBERN AVE II
Project Number: 290762.0016.0000

Lab Number: L1921376
Report Date: 05/29/19

SAMPLE RESULTS

Lab ID: L1921376-01
Client ID: GLC-NB-3-1
Sample Location: SOMERVILLE, MEDFORD, CAMBRIDGE

Date Collected: 05/21/19 11:00
Date Received: 05/21/19
Field Prep: Refer to COC

Sample Depth:

Matrix: Water
Analytical Method: 14,504.1
Analytical Date: 05/23/19 15:32
Analyst: AWS

Extraction Method: EPA 504.1
Extraction Date: 05/23/19 14:40

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 NEWBERN AVE II**Lab Number:** L1921376**Project Number:** 290762.0016.0000**Report Date:** 05/29/19**SAMPLE RESULTS**

Lab ID: L1921376-01 D2
 Client ID: GLC-NB-3-1
 Sample Location: SOMERVILLE, MEDFORD, CAMBRIDGE

Date Collected: 05/21/19 11:00
 Date Received: 05/21/19
 Field Prep: Refer to COC

Sample Depth:

Matrix: Water

Analytical Method: 128,624.1

Analytical Date: 05/23/19 12:16

Analyst: MKS

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

Methyl tert butyl Ether	4400		ug/l	500	--	50
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Surrogate	% Recovery	Qualifier	Acceptance Criteria
Pentafluorobenzene	112		60-140
Fluorobenzene	109		60-140
4-Bromofluorobenzene	109		60-140

Project Name: MBTA GLX NEWBERN AVE II**Lab Number:** L1921376**Project Number:** 290762.0016.0000**Report Date:** 05/29/19**SAMPLE RESULTS**

Lab ID: L1921376-01 D
 Client ID: GLC-NB-3-1
 Sample Location: SOMERVILLE, MEDFORD, CAMBRIDGE

Date Collected: 05/21/19 11:00
 Date Received: 05/21/19
 Field Prep: Refer to COC

Sample Depth:

Matrix: Water
 Analytical Method: 1,8260C
 Analytical Date: 05/22/19 13:10
 Analyst: KJD

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by GC/MS - Westborough Lab						
1,1-Dichloropropene	ND		ug/l	6.2	--	2.5
1,2,3-Trichloropropane	ND		ug/l	12	--	2.5
Bromochloromethane	ND		ug/l	6.2	--	2.5
Tetrahydrofuran	ND		ug/l	12	--	2.5
2,2-Dichloropropane	ND		ug/l	6.2	--	2.5
1,1,1,2-Tetrachloroethane	ND		ug/l	1.2	--	2.5
Bromobenzene	ND		ug/l	6.2	--	2.5
n-Butylbenzene	2.8		ug/l	1.2	--	2.5
sec-Butylbenzene	2.1		ug/l	1.2	--	2.5
tert-Butylbenzene	ND		ug/l	6.2	--	2.5
o-Chlorotoluene	ND		ug/l	6.2	--	2.5
p-Chlorotoluene	ND		ug/l	6.2	--	2.5
Hexachlorobutadiene	ND		ug/l	1.2	--	2.5
p-Isopropyltoluene	ND		ug/l	1.2	--	2.5
Naphthalene	31		ug/l	6.2	--	2.5
n-Propylbenzene	21		ug/l	1.2	--	2.5
1,3,5-Trimethylbenzene	12		ug/l	6.2	--	2.5
1,2,4-Trimethylbenzene	20		ug/l	6.2	--	2.5
Ethyl ether	ND		ug/l	6.2	--	2.5
Diisopropyl Ether	ND		ug/l	5.0	--	2.5
Ethyl-Tert-Butyl-Ether	ND		ug/l	5.0	--	2.5

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	89		70-130
Toluene-d8	100		70-130
4-Bromofluorobenzene	98		70-130
Dibromofluoromethane	84		70-130

Project Name: MBTA GLX NEWBERN AVE II**Lab Number:** L1921376**Project Number:** 290762.0016.0000**Report Date:** 05/29/19**SAMPLE RESULTS**

Lab ID: L1921376-01 D
 Client ID: GLC-NB-3-1
 Sample Location: SOMERVILLE, MEDFORD, CAMBRIDGE

Date Collected: 05/21/19 11:00
 Date Received: 05/21/19
 Field Prep: Refer to COC

Sample Depth:

Matrix: Water
 Analytical Method: 128,624.1
 Analytical Date: 05/22/19 19:07
 Analyst: GT

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by GC/MS - Westborough Lab						
Methylene chloride	ND		ug/l	10	--	10
1,1-Dichloroethane	ND		ug/l	15	--	10
Chloroform	ND		ug/l	10	--	10
Carbon tetrachloride	ND		ug/l	10	--	10
1,2-Dichloropropane	ND		ug/l	35	--	10
Dibromochloromethane	ND		ug/l	10	--	10
1,1,2-Trichloroethane	ND		ug/l	15	--	10
2-Chloroethylvinyl ether	ND		ug/l	100	--	10
Tetrachloroethene	ND		ug/l	10	--	10
Chlorobenzene	ND		ug/l	35	--	10
Trichlorofluoromethane	ND		ug/l	50	--	10
1,2-Dichloroethane	20		ug/l	15	--	10
1,1,1-Trichloroethane	ND		ug/l	20	--	10
Bromodichloromethane	ND		ug/l	10	--	10
trans-1,3-Dichloropropene	ND		ug/l	15	--	10
cis-1,3-Dichloropropene	ND		ug/l	15	--	10
Bromoform	ND		ug/l	10	--	10
1,1,2,2-Tetrachloroethane	ND		ug/l	10	--	10
Benzene	100		ug/l	10	--	10
Toluene	21		ug/l	10	--	10
Ethylbenzene	61		ug/l	10	--	10
Chloromethane	ND		ug/l	50	--	10
Bromomethane	67		ug/l	50	--	10
Vinyl chloride	ND		ug/l	10	--	10
Chloroethane	ND		ug/l	20	--	10
1,1-Dichloroethene	ND		ug/l	10	--	10
trans-1,2-Dichloroethene	ND		ug/l	15	--	10
cis-1,2-Dichloroethene	ND		ug/l	10	--	10

Project Name: MBTA GLX NEWBERN AVE II**Lab Number:** L1921376**Project Number:** 290762.0016.0000**Report Date:** 05/29/19**SAMPLE RESULTS**

Lab ID: L1921376-01 D
 Client ID: GLC-NB-3-1
 Sample Location: SOMERVILLE, MEDFORD, CAMBRIDGE

Date Collected: 05/21/19 11:00
 Date Received: 05/21/19
 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	10	--	10
1,2-Dichlorobenzene	ND		ug/l	50	--	10
1,3-Dichlorobenzene	ND		ug/l	50	--	10
1,4-Dichlorobenzene	ND		ug/l	50	--	10
p/m-Xylene	38		ug/l	20	--	10
o-xylene	ND		ug/l	10	--	10
Styrene	ND		ug/l	10	--	10
Acetone	ND		ug/l	100	--	10
Carbon disulfide	ND		ug/l	50	--	10
2-Butanone	ND		ug/l	100	--	10
4-Methyl-2-pentanone	ND		ug/l	100	--	10
2-Hexanone	ND		ug/l	100	--	10
Acrolein	ND		ug/l	80	--	10
Acrylonitrile	220		ug/l	100	--	10
Methyl tert butyl Ether	3600	E	ug/l	100	--	10
Dibromomethane	ND		ug/l	10	--	10
Tert-Butyl Alcohol	ND		ug/l	1000	--	10
Tertiary-Amyl Methyl Ether	ND		ug/l	200	--	10
Dichlorodifluoromethane ¹	ND		ug/l	10	--	10
1,2,3-Trichlorobenzene	ND		ug/l	10	--	10
1,2,4-Trichlorobenzene	ND		ug/l	10	--	10
Isopropylbenzene	ND		ug/l	10	--	10
1,3-Dichloropropane	ND		ug/l	10	--	10
1,2-Dibromo-3-chloropropane	ND		ug/l	20	--	10

Surrogate	% Recovery	Qualifier	Acceptance Criteria
Pentafluorobenzene	129		60-140
Fluorobenzene	126		60-140
4-Bromofluorobenzene	110		60-140

Project Name: MBTA GLX NEWBERN AVE II
Project Number: 290762.0016.0000

Lab Number: L1921376
Report Date: 05/29/19

SAMPLE RESULTS

Lab ID: L1921376-01 **D**
Client ID: GLC-NB-3-1
Sample Location: SOMERVILLE, MEDFORD, CAMBRIDGE

Date Collected: 05/21/19 11:00
Date Received: 05/21/19
Field Prep: Refer to COC

Sample Depth:

Matrix: Water
Analytical Method: 128,624.1-SIM
Analytical Date: 05/22/19 19:07
Analyst: GT

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
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Volatile Organics by GC/MS-SIM - Westborough Lab						
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1,4-Dioxane	ND		ug/l	500	--	10
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Surrogate	% Recovery	Qualifier	Acceptance Criteria
Fluorobenzene	135		60-140
4-Bromofluorobenzene	108		60-140

Project Name: MBTA GLX NEWBERN AVE II**Lab Number:** L1921376**Project Number:** 290762.0016.0000**Report Date:** 05/29/19**SAMPLE RESULTS**

Lab ID: L1921376-02
 Client ID: GLC-NB-3-4
 Sample Location: SOMERVILLE, MEDFORD, CAMBRIDGE

Date Collected: 05/21/19 12:00
 Date Received: 05/21/19
 Field Prep: Refer to COC

Sample Depth:

Matrix: Water
 Analytical Method: 1,8260C
 Analytical Date: 05/22/19 13:45
 Analyst: KJD

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	97		70-130
4-Bromofluorobenzene	92		70-130
Dibromofluoromethane	94		70-130

Project Name: MBTA GLX NEWBERN AVE II**Lab Number:** L1921376**Project Number:** 290762.0016.0000**Report Date:** 05/29/19**SAMPLE RESULTS**

Lab ID: L1921376-02
 Client ID: GLC-NB-3-4
 Sample Location: SOMERVILLE, MEDFORD, CAMBRIDGE

Date Collected: 05/21/19 12:00
 Date Received: 05/21/19
 Field Prep: Refer to COC

Sample Depth:

Matrix: Water
 Analytical Method: 128,624.1
 Analytical Date: 05/22/19 19:42
 Analyst: GT

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by GC/MS - Westborough Lab						
Methylene chloride	ND		ug/l	1.0	--	1
1,1-Dichloroethane	ND		ug/l	1.5	--	1
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	3.3		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	8.4		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 NEWBERN AVE II**Lab Number:** L1921376**Project Number:** 290762.0016.0000**Report Date:** 05/29/19**SAMPLE RESULTS****Lab ID:** L1921376-02**Date Collected:** 05/21/19 12:00**Client ID:** GLC-NB-3-4**Date Received:** 05/21/19**Sample Location:** SOMERVILLE, MEDFORD, CAMBRIDGE**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	128		60-140
Fluorobenzene	121		60-140
4-Bromofluorobenzene	118		60-140

Project Name: MBTA GLX NEWBERN AVE II
Project Number: 290762.0016.0000

Lab Number: L1921376
Report Date: 05/29/19

SAMPLE RESULTS

Lab ID: L1921376-02
Client ID: GLC-NB-3-4
Sample Location: SOMERVILLE, MEDFORD, CAMBRIDGE

Date Collected: 05/21/19 12:00
Date Received: 05/21/19
Field Prep: Refer to COC

Sample Depth:

Matrix: Water
Analytical Method: 128,624.1-SIM
Analytical Date: 05/22/19 19:42
Analyst: GT

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
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Surrogate	% Recovery	Qualifier	Acceptance Criteria
Fluorobenzene	129		60-140
4-Bromofluorobenzene	120		60-140

Project Name: MBTA GLX NEWBERN AVE II
Project Number: 290762.0016.0000

Lab Number: L1921376
Report Date: 05/29/19

SAMPLE RESULTS

Lab ID: L1921376-02
Client ID: GLC-NB-3-4
Sample Location: SOMERVILLE, MEDFORD, CAMBRIDGE

Date Collected: 05/21/19 12:00
Date Received: 05/21/19
Field Prep: Refer to COC

Sample Depth:

Matrix: Water
Analytical Method: 14,504.1
Analytical Date: 05/23/19 15:47
Analyst: AWS

Extraction Method: EPA 504.1
Extraction Date: 05/23/19 14:40

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 NEWBERN AVE II**Lab Number:** L1921376**Project Number:** 290762.0016.0000**Report Date:** 05/29/19**SAMPLE RESULTS**

Lab ID: L1921376-03
 Client ID: GLC-NB-2
 Sample Location: SOMERVILLE, MEDFORD, CAMBRIDGE

Date Collected: 05/21/19 14:00
 Date Received: 05/21/19
 Field Prep: Refer to COC

Sample Depth:

Matrix: Water
 Analytical Method: 1,8260C
 Analytical Date: 05/23/19 10:55
 Analyst: PD

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	100		70-130
Toluene-d8	96		70-130
4-Bromofluorobenzene	95		70-130
Dibromofluoromethane	99		70-130

Project Name: MBTA GLX NEWBERN AVE II**Lab Number:** L1921376**Project Number:** 290762.0016.0000**Report Date:** 05/29/19**SAMPLE RESULTS**

Lab ID: L1921376-03
 Client ID: GLC-NB-2
 Sample Location: SOMERVILLE, MEDFORD, CAMBRIDGE

Date Collected: 05/21/19 14:00
 Date Received: 05/21/19
 Field Prep: Refer to COC

Sample Depth:

Matrix: Water
 Analytical Method: 128,624.1
 Analytical Date: 05/22/19 20:50
 Analyst: GT

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by GC/MS - Westborough Lab						
Methylene chloride	ND		ug/l	1.0	--	1
1,1-Dichloroethane	ND		ug/l	1.5	--	1
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	8.3		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 NEWBERN AVE II**Lab Number:** L1921376**Project Number:** 290762.0016.0000**Report Date:** 05/29/19**SAMPLE RESULTS****Lab ID:** L1921376-03**Date Collected:** 05/21/19 14:00**Client ID:** GLC-NB-2**Date Received:** 05/21/19**Sample Location:** SOMERVILLE, MEDFORD, CAMBRIDGE**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	117		60-140
Fluorobenzene	111		60-140
4-Bromofluorobenzene	121		60-140

Project Name: MBTA GLX NEWBERN AVE II
Project Number: 290762.0016.0000

Lab Number: L1921376
Report Date: 05/29/19

SAMPLE RESULTS

Lab ID: L1921376-03
Client ID: GLC-NB-2
Sample Location: SOMERVILLE, MEDFORD, CAMBRIDGE

Date Collected: 05/21/19 14:00
Date Received: 05/21/19
Field Prep: Refer to COC

Sample Depth:

Matrix: Water
Analytical Method: 128,624.1-SIM
Analytical Date: 05/22/19 20:50
Analyst: GT

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
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Surrogate	% Recovery	Qualifier	Acceptance Criteria
Fluorobenzene	121		60-140
4-Bromofluorobenzene	124		60-140

Project Name: MBTA GLX NEWBERN AVE II
Project Number: 290762.0016.0000

Lab Number: L1921376
Report Date: 05/29/19

SAMPLE RESULTS

Lab ID: L1921376-03
Client ID: GLC-NB-2
Sample Location: SOMERVILLE, MEDFORD, CAMBRIDGE

Date Collected: 05/21/19 14:00
Date Received: 05/21/19
Field Prep: Refer to COC

Sample Depth:

Matrix: Water
Analytical Method: 14,504.1
Analytical Date: 05/23/19 16:02
Analyst: AWS

Extraction Method: EPA 504.1
Extraction Date: 05/23/19 14:40

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 NEWBERN AVE II
Project Number: 290762.0016.0000

Lab Number: L1921376
Report Date: 05/29/19

SAMPLE RESULTS

Lab ID: L1921376-09
Client ID: GLC-NB-3-2
Sample Location: SOMERVILLE, MEDFORD, CAMBRIDGE

Date Collected: 05/20/19 11:00
Date Received: 05/21/19
Field Prep: Not Specified

Sample Depth:

Matrix: Water
Analytical Method: 14,504.1
Analytical Date: 05/23/19 16:32
Analyst: AWS

Extraction Method: EPA 504.1
Extraction Date: 05/23/19 14:40

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 NEWBERN AVE II
Project Number: 290762.0016.0000

Lab Number: L1921376
Report Date: 05/29/19

SAMPLE RESULTS

Lab ID: L1921376-09 D2
Client ID: GLC-NB-3-2
Sample Location: SOMERVILLE, MEDFORD, CAMBRIDGE

Date Collected: 05/20/19 11:00
Date Received: 05/21/19
Field Prep: Not Specified

Sample Depth:

Matrix: Water
Analytical Method: 128,624.1
Analytical Date: 05/23/19 12:50
Analyst: MKS

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

Benzene	2600		ug/l	20	--	20
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Surrogate	% Recovery	Qualifier	Acceptance Criteria
Pentafluorobenzene	129		60-140
Fluorobenzene	126		60-140
4-Bromofluorobenzene	126		60-140

Project Name: MBTA GLX NEWBERN AVE II**Lab Number:** L1921376**Project Number:** 290762.0016.0000**Report Date:** 05/29/19**SAMPLE RESULTS**

Lab ID: L1921376-09 D
 Client ID: GLC-NB-3-2
 Sample Location: SOMERVILLE, MEDFORD, CAMBRIDGE

Date Collected: 05/20/19 11:00
 Date Received: 05/21/19
 Field Prep: Not Specified

Sample Depth:

Matrix: Water
 Analytical Method: 1,8260C
 Analytical Date: 05/23/19 11:31
 Analyst: PD

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by GC/MS - Westborough Lab						
1,1-Dichloropropene	ND		ug/l	25	--	10
1,2,3-Trichloropropane	ND		ug/l	50	--	10
Bromochloromethane	ND		ug/l	25	--	10
Tetrahydrofuran	ND		ug/l	50	--	10
2,2-Dichloropropane	ND		ug/l	25	--	10
1,1,1,2-Tetrachloroethane	ND		ug/l	5.0	--	10
Bromobenzene	ND		ug/l	25	--	10
n-Butylbenzene	ND		ug/l	5.0	--	10
sec-Butylbenzene	ND		ug/l	5.0	--	10
tert-Butylbenzene	ND		ug/l	25	--	10
o-Chlorotoluene	ND		ug/l	25	--	10
p-Chlorotoluene	ND		ug/l	25	--	10
Hexachlorobutadiene	ND		ug/l	5.0	--	10
p-Isopropyltoluene	ND		ug/l	5.0	--	10
Naphthalene	ND		ug/l	25	--	10
n-Propylbenzene	ND		ug/l	5.0	--	10
1,3,5-Trimethylbenzene	ND		ug/l	25	--	10
1,2,4-Trimethylbenzene	ND		ug/l	25	--	10
Ethyl ether	ND		ug/l	25	--	10
Diisopropyl Ether	ND		ug/l	20	--	10
Ethyl-Tert-Butyl-Ether	ND		ug/l	20	--	10

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	101		70-130
Toluene-d8	100		70-130
4-Bromofluorobenzene	94		70-130
Dibromofluoromethane	97		70-130

Project Name: MBTA GLX NEWBERN AVE II**Lab Number:** L1921376**Project Number:** 290762.0016.0000**Report Date:** 05/29/19**SAMPLE RESULTS**

Lab ID: L1921376-09 D
 Client ID: GLC-NB-3-2
 Sample Location: SOMERVILLE, MEDFORD, CAMBRIDGE

Date Collected: 05/20/19 11:00
 Date Received: 05/21/19
 Field Prep: Not Specified

Sample Depth:

Matrix: Water
 Analytical Method: 128,624.1
 Analytical Date: 05/22/19 20:16
 Analyst: GT

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by GC/MS - Westborough Lab						
Methylene chloride	ND		ug/l	10	--	10
1,1-Dichloroethane	ND		ug/l	15	--	10
Chloroform	ND		ug/l	10	--	10
Carbon tetrachloride	ND		ug/l	10	--	10
1,2-Dichloropropane	ND		ug/l	35	--	10
Dibromochloromethane	ND		ug/l	10	--	10
1,1,2-Trichloroethane	ND		ug/l	15	--	10
2-Chloroethylvinyl ether	ND		ug/l	100	--	10
Tetrachloroethene	ND		ug/l	10	--	10
Chlorobenzene	ND		ug/l	35	--	10
Trichlorofluoromethane	ND		ug/l	50	--	10
1,2-Dichloroethane	ND		ug/l	15	--	10
1,1,1-Trichloroethane	ND		ug/l	20	--	10
Bromodichloromethane	ND		ug/l	10	--	10
trans-1,3-Dichloropropene	ND		ug/l	15	--	10
cis-1,3-Dichloropropene	ND		ug/l	15	--	10
Bromoform	ND		ug/l	10	--	10
1,1,2,2-Tetrachloroethane	ND		ug/l	10	--	10
Benzene	2600	E	ug/l	10	--	10
Toluene	ND		ug/l	10	--	10
Ethylbenzene	ND		ug/l	10	--	10
Chloromethane	ND		ug/l	50	--	10
Bromomethane	90		ug/l	50	--	10
Vinyl chloride	ND		ug/l	10	--	10
Chloroethane	ND		ug/l	20	--	10
1,1-Dichloroethene	ND		ug/l	10	--	10
trans-1,2-Dichloroethene	ND		ug/l	15	--	10
cis-1,2-Dichloroethene	ND		ug/l	10	--	10

Project Name: MBTA GLX NEWBERN AVE II**Lab Number:** L1921376**Project Number:** 290762.0016.0000**Report Date:** 05/29/19**SAMPLE RESULTS**

Lab ID: L1921376-09 D
 Client ID: GLC-NB-3-2
 Sample Location: SOMERVILLE, MEDFORD, CAMBRIDGE

Date Collected: 05/20/19 11:00
 Date Received: 05/21/19
 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	10	--	10
1,2-Dichlorobenzene	ND		ug/l	50	--	10
1,3-Dichlorobenzene	ND		ug/l	50	--	10
1,4-Dichlorobenzene	ND		ug/l	50	--	10
p/m-Xylene	ND		ug/l	20	--	10
o-xylene	ND		ug/l	10	--	10
Styrene	ND		ug/l	10	--	10
Acetone	ND		ug/l	100	--	10
Carbon disulfide	ND		ug/l	50	--	10
2-Butanone	ND		ug/l	100	--	10
4-Methyl-2-pentanone	ND		ug/l	100	--	10
2-Hexanone	ND		ug/l	100	--	10
Acrolein	ND		ug/l	80	--	10
Acrylonitrile	ND		ug/l	100	--	10
Methyl tert butyl Ether	ND		ug/l	100	--	10
Dibromomethane	ND		ug/l	10	--	10
Tert-Butyl Alcohol	ND		ug/l	1000	--	10
Tertiary-Amyl Methyl Ether	ND		ug/l	200	--	10
Dichlorodifluoromethane ¹	ND		ug/l	10	--	10
1,2,3-Trichlorobenzene	ND		ug/l	10	--	10
1,2,4-Trichlorobenzene	ND		ug/l	10	--	10
Isopropylbenzene	ND		ug/l	10	--	10
1,3-Dichloropropane	ND		ug/l	10	--	10
1,2-Dibromo-3-chloropropane	ND		ug/l	20	--	10

Surrogate	% Recovery	Qualifier	Acceptance Criteria
Pentafluorobenzene	123		60-140
Fluorobenzene	119		60-140
4-Bromofluorobenzene	114		60-140

Project Name: MBTA GLX NEWBERN AVE II
Project Number: 290762.0016.0000

Lab Number: L1921376
Report Date: 05/29/19

SAMPLE RESULTS

Lab ID: L1921376-09 D
Client ID: GLC-NB-3-2
Sample Location: SOMERVILLE, MEDFORD, CAMBRIDGE

Date Collected: 05/20/19 11:00
Date Received: 05/21/19
Field Prep: Not Specified

Sample Depth:

Matrix: Water
Analytical Method: 128,624.1-SIM
Analytical Date: 05/22/19 20:16
Analyst: GT

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
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Volatile Organics by GC/MS-SIM - Westborough Lab						
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1,4-Dioxane	ND		ug/l	500	--	10
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Surrogate	% Recovery	Qualifier	Acceptance Criteria
Fluorobenzene	130		60-140
4-Bromofluorobenzene	122		60-140

Project Name: MBTA GLX NEWBERN AVE II
Project Number: 290762.0016.0000

Lab Number: L1921376
Report Date: 05/29/19

SAMPLE RESULTS

Lab ID: L1921376-10
Client ID: TRIP BLANK
Sample Location: SOMERVILLE, MEDFORD, CAMBRIDGE

Date Collected: 05/20/19 00:00
Date Received: 05/21/19
Field Prep: Not Specified

Sample Depth:

Matrix: Water
Analytical Method: 1,8260C
Analytical Date: 05/24/19 09:45
Analyst: MKS

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	107		70-130
Toluene-d8	98		70-130
4-Bromofluorobenzene	101		70-130
Dibromofluoromethane	108		70-130

Project Name: MBTA GLX NEWBERN AVE II**Lab Number:** L1921376**Project Number:** 290762.0016.0000**Report Date:** 05/29/19**SAMPLE RESULTS**

Lab ID: L1921376-10
 Client ID: TRIP BLANK
 Sample Location: SOMERVILLE, MEDFORD, CAMBRIDGE

Date Collected: 05/20/19 00:00
 Date Received: 05/21/19
 Field Prep: Not Specified

Sample Depth:

Matrix: Water
 Analytical Method: 128,624.1
 Analytical Date: 05/23/19 18:57
 Analyst: MKS

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 NEWBERN AVE II**Lab Number:** L1921376**Project Number:** 290762.0016.0000**Report Date:** 05/29/19**SAMPLE RESULTS****Lab ID:** L1921376-10**Date Collected:** 05/20/19 00:00**Client ID:** TRIP BLANK**Date Received:** 05/21/19**Sample Location:** SOMERVILLE, MEDFORD, CAMBRIDGE**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	107		60-140
Fluorobenzene	94		60-140
4-Bromofluorobenzene	97		60-140

Project Name: MBTA GLX NEWBERN AVE II
Project Number: 290762.0016.0000

Lab Number: L1921376
Report Date: 05/29/19

SAMPLE RESULTS

Lab ID: L1921376-10
Client ID: TRIP BLANK
Sample Location: SOMERVILLE, MEDFORD, CAMBRIDGE

Date Collected: 05/20/19 00:00
Date Received: 05/21/19
Field Prep: Not Specified

Sample Depth:

Matrix: Water
Analytical Method: 128,624.1-SIM
Analytical Date: 05/23/19 18:57
Analyst: MKS

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
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Surrogate	% Recovery	Qualifier	Acceptance Criteria
Fluorobenzene	97		60-140
4-Bromofluorobenzene	110		60-140

Project Name: MBTA GLX NEWBERN AVE II
Project Number: 290762.0016.0000

Lab Number: L1921376
Report Date: 05/29/19

SAMPLE RESULTS

Lab ID: L1921376-10
Client ID: TRIP BLANK
Sample Location: SOMERVILLE, MEDFORD, CAMBRIDGE

Date Collected: 05/20/19 00:00
Date Received: 05/21/19
Field Prep: Not Specified

Sample Depth:

Matrix: Water
Analytical Method: 14,504.1
Analytical Date: 05/23/19 16:47
Analyst: AWS

Extraction Method: EPA 504.1
Extraction Date: 05/23/19 14:40

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 NEWBERN AVE II
Project Number: 290762.0016.0000

Lab Number: L1921376
Report Date: 05/29/19

Method Blank Analysis Batch Quality Control

Analytical Method: 1,8260C
 Analytical Date: 05/22/19 08:55
 Analyst: PD

Parameter	Result	Qualifier	Units	RL	MDL
Volatile Organics by GC/MS - Westborough Lab for sample(s): 01-02 Batch: WG1240176-5					
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	98		70-130
4-Bromofluorobenzene	94		70-130
Dibromofluoromethane	96		70-130

Project Name: MBTA GLX NEWBERN AVE II
Project Number: 290762.0016.0000

Lab Number: L1921376
Report Date: 05/29/19

Method Blank Analysis Batch Quality Control

Analytical Method: 128,624.1
 Analytical Date: 05/22/19 12:25
 Analyst: GT

Parameter	Result	Qualifier	Units	RL	MDL
Volatile Organics by GC/MS - Westborough Lab for sample(s): 01-03,09 Batch: WG1240431-4					
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 NEWBERN AVE II
Project Number: 290762.0016.0000

Lab Number: L1921376
Report Date: 05/29/19

Method Blank Analysis Batch Quality Control

Analytical Method: 128,624.1
 Analytical Date: 05/22/19 12:25
 Analyst: GT

Parameter	Result	Qualifier	Units	RL	MDL
Volatile Organics by GC/MS - Westborough Lab for sample(s): 01-03,09 Batch: WG1240431-4					
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 NEWBERN AVE II
Project Number: 290762.0016.0000

Lab Number: L1921376
Report Date: 05/29/19

Method Blank Analysis
Batch Quality Control

Analytical Method: 128,624.1
Analytical Date: 05/22/19 12:25
Analyst: GT

Parameter	Result	Qualifier	Units	RL	MDL
Volatile Organics by GC/MS - Westborough Lab for sample(s): 01-03,09 Batch: WG1240431-4					

Surrogate	%Recovery	Qualifier	Acceptance Criteria
Pentafluorobenzene	94		60-140
Fluorobenzene	98		60-140
4-Bromofluorobenzene	94		60-140

Project Name: MBTA GLX NEWBERN AVE II
Project Number: 290762.0016.0000

Lab Number: L1921376
Report Date: 05/29/19

Method Blank Analysis
Batch Quality Control

Analytical Method: 128,624.1
 Analytical Date: 05/23/19 10:47
 Analyst: GT

Parameter	Result	Qualifier	Units	RL	MDL
Volatile Organics by GC/MS - Westborough Lab for sample(s): 01,09 Batch: WG1240431-8					
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	9.8		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 NEWBERN AVE II
Project Number: 290762.0016.0000

Lab Number: L1921376
Report Date: 05/29/19

Method Blank Analysis Batch Quality Control

Analytical Method: 128,624.1
 Analytical Date: 05/23/19 10:47
 Analyst: GT

Parameter	Result	Qualifier	Units	RL	MDL
Volatile Organics by GC/MS - Westborough Lab for sample(s): 01,09 Batch: WG1240431-8					
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 NEWBERN AVE II
Project Number: 290762.0016.0000

Lab Number: L1921376
Report Date: 05/29/19

Method Blank Analysis
Batch Quality Control

Analytical Method: 128,624.1
Analytical Date: 05/23/19 10:47
Analyst: GT

Parameter	Result	Qualifier	Units	RL	MDL
Volatile Organics by GC/MS - Westborough Lab for sample(s): 01,09 Batch: WG1240431-8					

Surrogate	%Recovery	Qualifier	Acceptance Criteria
Pentafluorobenzene	119		60-140
Fluorobenzene	114		60-140
4-Bromofluorobenzene	121		60-140

Project Name: MBTA GLX NEWBERN AVE II
Project Number: 290762.0016.0000

Lab Number: L1921376
Report Date: 05/29/19

Method Blank Analysis
Batch Quality Control

Analytical Method: 128,624.1-SIM
Analytical Date: 05/22/19 12:25
Analyst: GT

Parameter	Result	Qualifier	Units	RL	MDL
Volatile Organics by GC/MS-SIM - Westborough Lab for sample(s): 01-03,09 Batch: WG1240444-4					
1,4-Dioxane	ND		ug/l	50	--

Surrogate	%Recovery	Qualifier	Acceptance Criteria
Fluorobenzene	105		60-140
4-Bromofluorobenzene	98		60-140

Project Name: MBTA GLX NEWBERN AVE II
Project Number: 290762.0016.0000

Lab Number: L1921376
Report Date: 05/29/19

Method Blank Analysis Batch Quality Control

Analytical Method: 1,8260C
 Analytical Date: 05/23/19 08:32
 Analyst: PD

Parameter	Result	Qualifier	Units	RL	MDL
Volatile Organics by GC/MS - Westborough Lab for sample(s): 03,09 Batch: WG1240495-5					
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	104		70-130
Toluene-d8	99		70-130
4-Bromofluorobenzene	96		70-130
Dibromofluoromethane	100		70-130

Project Name: MBTA GLX NEWBERN AVE II
Project Number: 290762.0016.0000

Lab Number: L1921376
Report Date: 05/29/19

Method Blank Analysis
Batch Quality Control

Analytical Method: 14,504.1
Analytical Date: 05/23/19 15:17
Analyst: AWS

Extraction Method: EPA 504.1
Extraction Date: 05/23/19 14:40

Parameter	Result	Qualifier	Units	RL	MDL
Microextractables by GC - Westborough Lab for sample(s): 01-03,09-10 Batch: WG1240537-1					
1,2-Dibromoethane	ND		ug/l	0.010	-- A

Project Name: MBTA GLX NEWBERN AVE II
Project Number: 290762.0016.0000

Lab Number: L1921376
Report Date: 05/29/19

Method Blank Analysis Batch Quality Control

Analytical Method: 128,624.1
 Analytical Date: 05/23/19 11:27
 Analyst: GT

Parameter	Result	Qualifier	Units	RL	MDL
Volatile Organics by GC/MS - Westborough Lab for sample(s): 10 Batch: WG1240909-4					
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 NEWBERN AVE II
Project Number: 290762.0016.0000

Lab Number: L1921376
Report Date: 05/29/19

Method Blank Analysis Batch Quality Control

Analytical Method: 128,624.1
 Analytical Date: 05/23/19 11:27
 Analyst: GT

Parameter	Result	Qualifier	Units	RL	MDL
Volatile Organics by GC/MS - Westborough Lab for sample(s): 10 Batch: WG1240909-4					
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 NEWBERN AVE II
Project Number: 290762.0016.0000

Lab Number: L1921376
Report Date: 05/29/19

Method Blank Analysis
Batch Quality Control

Analytical Method: 128,624.1
Analytical Date: 05/23/19 11:27
Analyst: GT

Parameter	Result	Qualifier	Units	RL	MDL
Volatile Organics by GC/MS - Westborough Lab for sample(s): 10 Batch: WG1240909-4					

Surrogate	%Recovery	Qualifier	Acceptance Criteria
Pentafluorobenzene	104		60-140
Fluorobenzene	94		60-140
4-Bromofluorobenzene	99		60-140

Project Name: MBTA GLX NEWBERN AVE II
Project Number: 290762.0016.0000

Lab Number: L1921376
Report Date: 05/29/19

Method Blank Analysis
Batch Quality Control

Analytical Method: 128,624.1-SIM
Analytical Date: 05/23/19 11:27
Analyst: GT

Parameter	Result	Qualifier	Units	RL	MDL
Volatile Organics by GC/MS-SIM - Westborough Lab for sample(s): 10 Batch: WG1240917-4					
1,4-Dioxane	ND		ug/l	50	--

Surrogate	%Recovery	Qualifier	Acceptance Criteria
Fluorobenzene	97		60-140
4-Bromofluorobenzene	111		60-140

Project Name: MBTA GLX NEWBERN AVE II
Project Number: 290762.0016.0000

Lab Number: L1921376
Report Date: 05/29/19

Method Blank Analysis Batch Quality Control

Analytical Method: 1,8260C
 Analytical Date: 05/24/19 09:17
 Analyst: MKS

Parameter	Result	Qualifier	Units	RL	MDL
Volatile Organics by GC/MS - Westborough Lab for sample(s): 10 Batch: WG1240958-5					
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	108		70-130
Toluene-d8	98		70-130
4-Bromofluorobenzene	100		70-130
Dibromofluoromethane	106		70-130

Lab Control Sample Analysis **Batch Quality Control**

Project Name: MBTA GLX NEWBERN AVE II

Lab Number: L1921376

Project Number: 290762.0016.0000

Report Date: 05/29/19

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: WG1240176-3 WG1240176-4								
1,1-Dichloropropene	90		85		70-130	6		20
1,2,3-Trichloropropane	93		88		64-130	6		20
Bromochloromethane	100		96		70-130	4		20
Tetrahydrofuran	88		83		58-130	6		20
2,2-Dichloropropane	100		97		63-133	3		20
1,1,1,2-Tetrachloroethane	98		92		64-130	6		20
Bromobenzene	96		93		70-130	3		20
n-Butylbenzene	100		98		53-136	2		20
sec-Butylbenzene	98		95		70-130	3		20
tert-Butylbenzene	96		93		70-130	3		20
o-Chlorotoluene	98		93		70-130	5		20
p-Chlorotoluene	98		95		70-130	3		20
Hexachlorobutadiene	94		95		63-130	1		20
p-Isopropyltoluene	99		96		70-130	3		20
Naphthalene	94		97		70-130	3		20
n-Propylbenzene	100		97		69-130	3		20
1,3,5-Trimethylbenzene	99		95		64-130	4		20
1,2,4-Trimethylbenzene	100		98		70-130	2		20
Ethyl ether	94		87		59-134	8		20
Diisopropyl Ether	92		87		70-130	6		20
Ethyl-Tert-Butyl-Ether	90		86		70-130	5		20

Lab Control Sample Analysis

Batch Quality Control

Project Name: MBTA GLX NEWBERN AVE II

Lab Number: L1921376

Project Number: 290762.0016.0000

Report Date: 05/29/19

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: WG1240176-3 WG1240176-4								

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
1,2-Dichloroethane-d4	95		92		70-130
Toluene-d8	100		98		70-130
4-Bromofluorobenzene	97		95		70-130
Dibromofluoromethane	96		94		70-130

Lab Control Sample Analysis **Batch Quality Control**

Project Name: MBTA GLX NEWBERN AVE II

Project Number: 290762.0016.0000

Lab Number: L1921376

Report Date: 05/29/19

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Volatile Organics by GC/MS - Westborough Lab Associated sample(s): 01-03,09 Batch: WG1240431-3								
Methylene chloride	105		-		60-140	-		28
1,1-Dichloroethane	95		-		50-150	-		49
Chloroform	105		-		70-135	-		54
Carbon tetrachloride	110		-		70-130	-		41
1,2-Dichloropropane	105		-		35-165	-		55
Dibromochloromethane	100		-		70-135	-		50
1,1,2-Trichloroethane	100		-		70-130	-		45
2-Chloroethylvinyl ether	95		-		1-225	-		71
Tetrachloroethene	110		-		70-130	-		39
Chlorobenzene	95		-		65-135	-		53
Trichlorofluoromethane	110		-		50-150	-		84
1,2-Dichloroethane	110		-		70-130	-		49
1,1,1-Trichloroethane	115		-		70-130	-		36
Bromodichloromethane	110		-		65-135	-		56
trans-1,3-Dichloropropene	100		-		50-150	-		86
cis-1,3-Dichloropropene	105		-		25-175	-		58
Bromoform	95		-		70-130	-		42
1,1,2,2-Tetrachloroethane	100		-		60-140	-		61
Benzene	110		-		65-135	-		61
Toluene	110		-		70-130	-		41
Ethylbenzene	105		-		60-140	-		63
Chloromethane	100		-		1-205	-		60
Bromomethane	85		-		15-185	-		61

Lab Control Sample Analysis **Batch Quality Control**

Project Name: MBTA GLX NEWBERN AVE II

Lab Number: L1921376

Project Number: 290762.0016.0000

Report Date: 05/29/19

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Volatile Organics by GC/MS - Westborough Lab Associated sample(s): 01-03,09 Batch: WG1240431-3								
Vinyl chloride	100		-		5-195	-		66
Chloroethane	105		-		40-160	-		78
1,1-Dichloroethene	120		-		50-150	-		32
trans-1,2-Dichloroethene	110		-		70-130	-		45
cis-1,2-Dichloroethene	105		-		60-140	-		30
Trichloroethene	110		-		65-135	-		48
1,2-Dichlorobenzene	100		-		65-135	-		57
1,3-Dichlorobenzene	100		-		70-130	-		43
1,4-Dichlorobenzene	100		-		65-135	-		57
p/m-Xylene	105		-		60-140	-		30
o-xylene	95		-		60-140	-		30
Styrene	105		-		60-140	-		30
Acetone	100		-		40-160	-		30
Carbon disulfide	100		-		60-140	-		30
2-Butanone	106		-		60-140	-		30
4-Methyl-2-pentanone	106		-		60-140	-		30
2-Hexanone	96		-		60-140	-		30
Acrolein	82		-		60-140	-		30
Acrylonitrile	95		-		60-140	-		60
Methyl tert butyl Ether	100		-		60-140	-		30
Dibromomethane	100		-		70-130	-		30
Tert-Butyl Alcohol	100		-		60-140	-		30
Tertiary-Amyl Methyl Ether	90		-		60-140	-		30

Lab Control Sample Analysis

Batch Quality Control

Project Name: MBTA GLX NEWBERN AVE II

Project Number: 290762.0016.0000

Lab Number: L1921376

Report Date: 05/29/19

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Volatile Organics by GC/MS - Westborough Lab Associated sample(s): 01-03,09 Batch: WG1240431-3								
Dichlorodifluoromethane ¹	100		-		70-130	-		30
1,2,3-Trichlorobenzene	95		-		60-140	-		30
1,2,4-Trichlorobenzene	100		-		60-140	-		30
Isopropylbenzene	110		-		60-140	-		30
1,3-Dichloropropane	105		-		60-140	-		30
1,2-Dibromo-3-chloropropane	90		-		60-140	-		30

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
Pentafluorobenzene	97				60-140
Fluorobenzene	100				60-140
4-Bromofluorobenzene	97				60-140

Lab Control Sample Analysis Batch Quality Control

Project Name: MBTA GLX NEWBERN AVE II

Project Number: 290762.0016.0000

Lab Number: L1921376

Report Date: 05/29/19

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Volatile Organics by GC/MS - Westborough Lab Associated sample(s): 01,09 Batch: WG1240431-7								
Methylene chloride	110		-		60-140	-		28
1,1-Dichloroethane	95		-		50-150	-		49
Chloroform	105		-		70-135	-		54
Carbon tetrachloride	110		-		70-130	-		41
1,2-Dichloropropane	105		-		35-165	-		55
Dibromochloromethane	100		-		70-135	-		50
1,1,2-Trichloroethane	100		-		70-130	-		45
2-Chloroethylvinyl ether	100		-		1-225	-		71
Tetrachloroethene	110		-		70-130	-		39
Chlorobenzene	95		-		65-135	-		53
Trichlorofluoromethane	105		-		50-150	-		84
1,2-Dichloroethane	105		-		70-130	-		49
1,1,1-Trichloroethane	110		-		70-130	-		36
Bromodichloromethane	105		-		65-135	-		56
trans-1,3-Dichloropropene	95		-		50-150	-		86
cis-1,3-Dichloropropene	100		-		25-175	-		58
Bromoform	95		-		70-130	-		42
1,1,2,2-Tetrachloroethane	100		-		60-140	-		61
Benzene	110		-		65-135	-		61
Toluene	105		-		70-130	-		41
Ethylbenzene	100		-		60-140	-		63
Chloromethane	95		-		1-205	-		60
Bromomethane	80		-		15-185	-		61

Lab Control Sample Analysis **Batch Quality Control**

Project Name: MBTA GLX NEWBERN AVE II

Lab Number: L1921376

Project Number: 290762.0016.0000

Report Date: 05/29/19

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Volatile Organics by GC/MS - Westborough Lab Associated sample(s): 01,09 Batch: WG1240431-7								
Vinyl chloride	95		-		5-195	-		66
Chloroethane	100		-		40-160	-		78
1,1-Dichloroethene	115		-		50-150	-		32
trans-1,2-Dichloroethene	115		-		70-130	-		45
cis-1,2-Dichloroethene	100		-		60-140	-		30
Trichloroethene	115		-		65-135	-		48
1,2-Dichlorobenzene	105		-		65-135	-		57
1,3-Dichlorobenzene	100		-		70-130	-		43
1,4-Dichlorobenzene	100		-		65-135	-		57
p/m-Xylene	102		-		60-140	-		30
o-xylene	95		-		60-140	-		30
Styrene	100		-		60-140	-		30
Acetone	100		-		40-160	-		30
Carbon disulfide	100		-		60-140	-		30
2-Butanone	100		-		60-140	-		30
4-Methyl-2-pentanone	108		-		60-140	-		30
2-Hexanone	96		-		60-140	-		30
Acrolein	90		-		60-140	-		30
Acrylonitrile	100		-		60-140	-		60
Methyl tert butyl Ether	105		-		60-140	-		30
Dibromomethane	100		-		70-130	-		30
Tert-Butyl Alcohol	100		-		60-140	-		30
Tertiary-Amyl Methyl Ether	95		-		60-140	-		30

Lab Control Sample Analysis **Batch Quality Control**

Project Name: MBTA GLX NEWBERN AVE II

Lab Number: L1921376

Project Number: 290762.0016.0000

Report Date: 05/29/19

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Volatile Organics by GC/MS - Westborough Lab Associated sample(s): 01,09 Batch: WG1240431-7								
Dichlorodifluoromethane ¹	90		-		70-130	-		30
1,2,3-Trichlorobenzene	95		-		60-140	-		30
1,2,4-Trichlorobenzene	100		-		60-140	-		30
Isopropylbenzene	105		-		60-140	-		30
1,3-Dichloropropane	100		-		60-140	-		30
1,2-Dibromo-3-chloropropane	95		-		60-140	-		30

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
Pentafluorobenzene	105				60-140
Fluorobenzene	101				60-140
4-Bromofluorobenzene	99				60-140

Lab Control Sample Analysis**Batch Quality Control****Project Name:** MBTA GLX NEWBERN AVE II**Lab Number:** L1921376**Project Number:** 290762.0016.0000**Report Date:** 05/29/19

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Volatile Organics by GC/MS-SIM - Westborough Lab Associated sample(s): 01-03,09 Batch: WG1240444-3								
1,4-Dioxane	84		-		60-140	-		20

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
Fluorobenzene	105				60-140
4-Bromofluorobenzene	98				60-140

Lab Control Sample Analysis **Batch Quality Control**

Project Name: MBTA GLX NEWBERN AVE II

Project Number: 290762.0016.0000

Lab Number: L1921376

Report Date: 05/29/19

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Volatile Organics by GC/MS - Westborough Lab Associated sample(s): 03,09 Batch: WG1240495-3 WG1240495-4								
1,1-Dichloropropene	88		89		70-130	1		20
1,2,3-Trichloropropane	87		88		64-130	1		20
Bromochloromethane	100		95		70-130	5		20
Tetrahydrofuran	87		84		58-130	4		20
2,2-Dichloropropane	100		100		63-133	0		20
1,1,1,2-Tetrachloroethane	94		93		64-130	1		20
Bromobenzene	91		93		70-130	2		20
n-Butylbenzene	93		99		53-136	6		20
sec-Butylbenzene	91		96		70-130	5		20
tert-Butylbenzene	91		93		70-130	2		20
o-Chlorotoluene	92		94		70-130	2		20
p-Chlorotoluene	92		94		70-130	2		20
Hexachlorobutadiene	87		94		63-130	8		20
p-Isopropyltoluene	94		97		70-130	3		20
Naphthalene	87		96		70-130	10		20
n-Propylbenzene	94		98		69-130	4		20
1,3,5-Trimethylbenzene	92		97		64-130	5		20
1,2,4-Trimethylbenzene	95		98		70-130	3		20
Ethyl ether	87		88		59-134	1		20
Diisopropyl Ether	91		90		70-130	1		20
Ethyl-Tert-Butyl-Ether	90		90		70-130	0		20

Lab Control Sample Analysis

Batch Quality Control

Project Name: MBTA GLX NEWBERN AVE II

Lab Number: L1921376

Project Number: 290762.0016.0000

Report Date: 05/29/19

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Volatile Organics by GC/MS - Westborough Lab Associated sample(s): 03,09 Batch: WG1240495-3 WG1240495-4								

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
1,2-Dichloroethane-d4	97		97		70-130
Toluene-d8	98		100		70-130
4-Bromofluorobenzene	95		97		70-130
Dibromofluoromethane	99		96		70-130

Lab Control Sample Analysis
Batch Quality Control**Project Name:** MBTA GLX NEWBERN AVE II**Project Number:** 290762.0016.0000**Lab Number:** L1921376**Report Date:** 05/29/19

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits	Column
Microextractables by GC - Westborough Lab Associated sample(s): 01-03,09-10 Batch: WG1240537-2									
1,2-Dibromoethane	80		-		80-120	-			A

Lab Control Sample Analysis **Batch Quality Control**

Project Name: MBTA GLX NEWBERN AVE II

Lab Number: L1921376

Project Number: 290762.0016.0000

Report Date: 05/29/19

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Volatile Organics by GC/MS - Westborough Lab Associated sample(s): 10 Batch: WG1240909-3								
Methylene chloride	95		-		60-140	-		28
1,1-Dichloroethane	85		-		50-150	-		49
Chloroform	100		-		70-135	-		54
Carbon tetrachloride	110		-		70-130	-		41
1,2-Dichloropropane	100		-		35-165	-		55
Dibromochloromethane	100		-		70-135	-		50
1,1,2-Trichloroethane	95		-		70-130	-		45
2-Chloroethylvinyl ether	90		-		1-225	-		71
Tetrachloroethene	105		-		70-130	-		39
Chlorobenzene	105		-		65-135	-		53
Trichlorofluoromethane	90		-		50-150	-		84
1,2-Dichloroethane	95		-		70-130	-		49
1,1,1-Trichloroethane	110		-		70-130	-		36
Bromodichloromethane	105		-		65-135	-		56
trans-1,3-Dichloropropene	95		-		50-150	-		86
cis-1,3-Dichloropropene	105		-		25-175	-		58
Bromoform	105		-		70-130	-		42
1,1,2,2-Tetrachloroethane	105		-		60-140	-		61
Benzene	100		-		65-135	-		61
Toluene	105		-		70-130	-		41
Ethylbenzene	110		-		60-140	-		63
Chloromethane	80		-		1-205	-		60
Bromomethane	70		-		15-185	-		61

Lab Control Sample Analysis Batch Quality Control

Project Name: MBTA GLX NEWBERN AVE II

Lab Number: L1921376

Project Number: 290762.0016.0000

Report Date: 05/29/19

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Volatile Organics by GC/MS - Westborough Lab Associated sample(s): 10 Batch: WG1240909-3								
Vinyl chloride	85		-		5-195	-		66
Chloroethane	90		-		40-160	-		78
1,1-Dichloroethene	100		-		50-150	-		32
trans-1,2-Dichloroethene	100		-		70-130	-		45
cis-1,2-Dichloroethene	95		-		60-140	-		30
Trichloroethene	100		-		65-135	-		48
1,2-Dichlorobenzene	110		-		65-135	-		57
1,3-Dichlorobenzene	105		-		70-130	-		43
1,4-Dichlorobenzene	105		-		65-135	-		57
p/m-Xylene	110		-		60-140	-		30
o-xylene	105		-		60-140	-		30
Styrene	105		-		60-140	-		30
Acetone	76		-		40-160	-		30
Carbon disulfide	90		-		60-140	-		30
2-Butanone	80		-		60-140	-		30
4-Methyl-2-pentanone	90		-		60-140	-		30
2-Hexanone	84		-		60-140	-		30
Acrolein	85		-		60-140	-		30
Acrylonitrile	85		-		60-140	-		60
Methyl tert butyl Ether	85		-		60-140	-		30
Dibromomethane	90		-		70-130	-		30
Tert-Butyl Alcohol	69		-		60-140	-		30
Tertiary-Amyl Methyl Ether	80		-		60-140	-		30

Lab Control Sample Analysis

Batch Quality Control

Project Name: MBTA GLX NEWBERN AVE II

Project Number: 290762.0016.0000

Lab Number: L1921376

Report Date: 05/29/19

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Volatile Organics by GC/MS - Westborough Lab Associated sample(s): 10 Batch: WG1240909-3								
Dichlorodifluoromethane ¹	75		-		70-130	-		30
1,2,3-Trichlorobenzene	105		-		60-140	-		30
1,2,4-Trichlorobenzene	110		-		60-140	-		30
Isopropylbenzene	110		-		60-140	-		30
1,3-Dichloropropane	100		-		60-140	-		30
1,2-Dibromo-3-chloropropane	120		-		60-140	-		30

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
Pentafluorobenzene	105				60-140
Fluorobenzene	94				60-140
4-Bromofluorobenzene	104				60-140

Lab Control Sample Analysis**Batch Quality Control****Project Name:** MBTA GLX NEWBERN AVE II**Lab Number:** L1921376**Project Number:** 290762.0016.0000**Report Date:** 05/29/19

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Volatile Organics by GC/MS-SIM - Westborough Lab Associated sample(s): 10 Batch: WG1240917-3								
1,4-Dioxane	110		-		60-140	-		20

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
Fluorobenzene	97				60-140
4-Bromofluorobenzene	109				60-140

Lab Control Sample Analysis **Batch Quality Control**

Project Name: MBTA GLX NEWBERN AVE II

Lab Number: L1921376

Project Number: 290762.0016.0000

Report Date: 05/29/19

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Volatile Organics by GC/MS - Westborough Lab Associated sample(s): 10 Batch: WG1240958-3 WG1240958-4								
1,1-Dichloropropene	93		97		70-130	4		20
1,2,3-Trichloropropane	100		96		64-130	4		20
Bromochloromethane	110		110		70-130	0		20
Tetrahydrofuran	110		95		58-130	15		20
2,2-Dichloropropane	120		120		63-133	0		20
1,1,1,2-Tetrachloroethane	110		110		64-130	0		20
Bromobenzene	98		100		70-130	2		20
n-Butylbenzene	100		100		53-136	0		20
sec-Butylbenzene	91		95		70-130	4		20
tert-Butylbenzene	99		100		70-130	1		20
o-Chlorotoluene	120		120		70-130	0		20
p-Chlorotoluene	100		100		70-130	0		20
Hexachlorobutadiene	95		98		63-130	3		20
p-Isopropyltoluene	100		110		70-130	10		20
Naphthalene	91		93		70-130	2		20
n-Propylbenzene	98		100		69-130	2		20
1,3,5-Trimethylbenzene	100		100		64-130	0		20
1,2,4-Trimethylbenzene	100		100		70-130	0		20
Ethyl ether	90		88		59-134	2		20
Diisopropyl Ether	92		91		70-130	1		20
Ethyl-Tert-Butyl-Ether	96		94		70-130	2		20

Lab Control Sample Analysis

Batch Quality Control

Project Name: MBTA GLX NEWBERN AVE II

Lab Number: L1921376

Project Number: 290762.0016.0000

Report Date: 05/29/19

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Volatile Organics by GC/MS - Westborough Lab Associated sample(s): 10 Batch: WG1240958-3 WG1240958-4								

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
1,2-Dichloroethane-d4	113		111		70-130
Toluene-d8	98		99		70-130
4-Bromofluorobenzene	98		98		70-130
Dibromofluoromethane	106		104		70-130

Matrix Spike Analysis **Batch Quality Control**

Project Name: MBTA GLX NEWBERN AVE II
Project Number: 290762.0016.0000

Lab Number: L1921376
Report Date: 05/29/19

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): 01-03,09-10 QC Batch ID: WG1240537-3 QC Sample: L1921376-03 Client ID: GLC-NB-2													
1,2-Dibromoethane	ND	0.252	0.223	88		-	-		80-120	-		20	A

SEMIVOLATILES

Project Name: MBTA GLX NEWBERN AVE II**Lab Number:** L1921376**Project Number:** 290762.0016.0000**Report Date:** 05/29/19**SAMPLE RESULTS**

Lab ID: L1921376-01
 Client ID: GLC-NB-3-1
 Sample Location: SOMERVILLE, MEDFORD, CAMBRIDGE

Date Collected: 05/21/19 11:00
 Date Received: 05/21/19
 Field Prep: Refer to COC

Sample Depth:

Matrix: Water
 Analytical Method: 129,625.1
 Analytical Date: 05/23/19 07:17
 Analyst: SZ

Extraction Method: EPA 625.1
 Extraction Date: 05/22/19 01:38

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 NEWBERN AVE II
Project Number: 290762.0016.0000

Lab Number: L1921376
Report Date: 05/29/19

SAMPLE RESULTS

Lab ID: L1921376-01
Client ID: GLC-NB-3-1
Sample Location: SOMERVILLE, MEDFORD, CAMBRIDGE

Date Collected: 05/21/19 11:00
Date Received: 05/21/19
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	60		25-87
Phenol-d6	38		16-65
Nitrobenzene-d5	90		42-122
2-Fluorobiphenyl	87		46-121
2,4,6-Tribromophenol	68		45-128
4-Terphenyl-d14	99		47-138

Project Name: MBTA GLX NEWBERN AVE II
Project Number: 290762.0016.0000

Lab Number: L1921376
Report Date: 05/29/19

SAMPLE RESULTS

Lab ID: L1921376-01
Client ID: GLC-NB-3-1
Sample Location: SOMERVILLE, MEDFORD, CAMBRIDGE

Date Collected: 05/21/19 11:00
Date Received: 05/21/19
Field Prep: Refer to COC

Sample Depth:

Matrix: Water
Analytical Method: 129,625.1-SIM
Analytical Date: 05/22/19 19:53
Analyst: DV

Extraction Method: EPA 625.1
Extraction Date: 05/22/19 01:36

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Semivolatile Organics by GC/MS-SIM - Westborough Lab						
Acenaphthene	ND		ug/l	0.10	--	1
Fluoranthene	0.11		ug/l	0.10	--	1
Naphthalene	6.8		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	0.11		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	56		25-87
Phenol-d6	35		16-65
Nitrobenzene-d5	93		42-122
2-Fluorobiphenyl	87		46-121
2,4,6-Tribromophenol	63		45-128
4-Terphenyl-d14	94		47-138

Project Name: MBTA GLX NEWBERN AVE II**Lab Number:** L1921376**Project Number:** 290762.0016.0000**Report Date:** 05/29/19**SAMPLE RESULTS**

Lab ID: L1921376-02
 Client ID: GLC-NB-3-4
 Sample Location: SOMERVILLE, MEDFORD, CAMBRIDGE

Date Collected: 05/21/19 12:00
 Date Received: 05/21/19
 Field Prep: Refer to COC

Sample Depth:

Matrix: Water
 Analytical Method: 129,625.1
 Analytical Date: 05/23/19 07:45
 Analyst: SZ

Extraction Method: EPA 625.1
 Extraction Date: 05/22/19 01:38

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 NEWBERN AVE II
Project Number: 290762.0016.0000

Lab Number: L1921376
Report Date: 05/29/19

SAMPLE RESULTS

Lab ID: L1921376-02
Client ID: GLC-NB-3-4
Sample Location: SOMERVILLE, MEDFORD, CAMBRIDGE

Date Collected: 05/21/19 12:00
Date Received: 05/21/19
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	54		25-87
Phenol-d6	34		16-65
Nitrobenzene-d5	86		42-122
2-Fluorobiphenyl	86		46-121
2,4,6-Tribromophenol	67		45-128
4-Terphenyl-d14	97		47-138

Project Name: MBTA GLX NEWBERN AVE II
Project Number: 290762.0016.0000

Lab Number: L1921376
Report Date: 05/29/19

SAMPLE RESULTS

Lab ID: L1921376-02
Client ID: GLC-NB-3-4
Sample Location: SOMERVILLE, MEDFORD, CAMBRIDGE

Date Collected: 05/21/19 12:00
Date Received: 05/21/19
Field Prep: Refer to COC

Sample Depth:

Matrix: Water
Analytical Method: 129,625.1-SIM
Analytical Date: 05/23/19 18:37
Analyst: DV

Extraction Method: EPA 625.1
Extraction Date: 05/22/19 01:36

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Semivolatile Organics by GC/MS-SIM - Westborough Lab						
Acenaphthene	0.64		ug/l	0.10	--	1
Fluoranthene	0.61		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	0.14		ug/l	0.10	--	1
Phenanthrene	0.11		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	0.42		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	45		25-87
Phenol-d6	28		16-65
Nitrobenzene-d5	78		42-122
2-Fluorobiphenyl	75		46-121
2,4,6-Tribromophenol	60		45-128
4-Terphenyl-d14	72		47-138

Project Name: MBTA GLX NEWBERN AVE II**Lab Number:** L1921376**Project Number:** 290762.0016.0000**Report Date:** 05/29/19**SAMPLE RESULTS**

Lab ID: L1921376-03
 Client ID: GLC-NB-2
 Sample Location: SOMERVILLE, MEDFORD, CAMBRIDGE

Date Collected: 05/21/19 14:00
 Date Received: 05/21/19
 Field Prep: Refer to COC

Sample Depth:

Matrix: Water
 Analytical Method: 129,625.1
 Analytical Date: 05/23/19 08:13
 Analyst: SZ

Extraction Method: EPA 625.1
 Extraction Date: 05/22/19 01:38

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	2.6		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 NEWBERN AVE II**Lab Number:** L1921376**Project Number:** 290762.0016.0000**Report Date:** 05/29/19**SAMPLE RESULTS****Lab ID:** L1921376-03**Date Collected:** 05/21/19 14:00**Client ID:** GLC-NB-2**Date Received:** 05/21/19**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	60		25-87
Phenol-d6	37		16-65
Nitrobenzene-d5	91		42-122
2-Fluorobiphenyl	89		46-121
2,4,6-Tribromophenol	66		45-128
4-Terphenyl-d14	100		47-138

Project Name: MBTA GLX NEWBERN AVE II
Project Number: 290762.0016.0000

Lab Number: L1921376
Report Date: 05/29/19

SAMPLE RESULTS

Lab ID: L1921376-03
Client ID: GLC-NB-2
Sample Location: SOMERVILLE, MEDFORD, CAMBRIDGE

Date Collected: 05/21/19 14:00
Date Received: 05/21/19
Field Prep: Refer to COC

Sample Depth:

Matrix: Water
Analytical Method: 129,625.1-SIM
Analytical Date: 05/23/19 19:03
Analyst: DV

Extraction Method: EPA 625.1
Extraction Date: 05/22/19 01:36

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Semivolatile Organics by GC/MS-SIM - Westborough Lab						
Acenaphthene	ND		ug/l	0.10	--	1
Fluoranthene	0.11		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	0.11		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	0.11		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	53		25-87
Phenol-d6	33		16-65
Nitrobenzene-d5	89		42-122
2-Fluorobiphenyl	85		46-121
2,4,6-Tribromophenol	60		45-128
4-Terphenyl-d14	79		47-138

Project Name: MBTA GLX NEWBERN AVE II**Lab Number:** L1921376**Project Number:** 290762.0016.0000**Report Date:** 05/29/19**SAMPLE RESULTS**

Lab ID: L1921376-09
 Client ID: GLC-NB-3-2
 Sample Location: SOMERVILLE, MEDFORD, CAMBRIDGE

Date Collected: 05/20/19 11:00
 Date Received: 05/21/19
 Field Prep: Not Specified

Sample Depth:

Matrix: Water
 Analytical Method: 129,625.1
 Analytical Date: 05/27/19 15:59
 Analyst: CB

Extraction Method: EPA 625.1
 Extraction Date: 05/24/19 15:46

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	4.9	--	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	4.9	--	1
2,4-Dinitrotoluene	ND		ug/l	4.9	--	1
2,6-Dinitrotoluene	ND		ug/l	4.9	--	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	4.9	--	1
Hexachlorobutadiene	ND		ug/l	2.0	--	1
Hexachlorocyclopentadiene ¹	ND		ug/l	9.8	--	1
Hexachloroethane	ND		ug/l	2.0	--	1
Isophorone	ND		ug/l	4.9	--	1
Nitrobenzene	ND		ug/l	2.0	--	1
NDPA/DPA ¹	ND		ug/l	2.0	--	1
n-Nitrosodi-n-propylamine	ND		ug/l	4.9	--	1
Bis(2-ethylhexyl)phthalate	ND		ug/l	2.1	--	1
Butyl benzyl phthalate	ND		ug/l	4.9	--	1
Di-n-butylphthalate	ND		ug/l	4.9	--	1
Di-n-octylphthalate	ND		ug/l	4.9	--	1
Diethyl phthalate	ND		ug/l	4.9	--	1
Dimethyl phthalate	ND		ug/l	4.9	--	1
Aniline ¹	ND		ug/l	2.0	--	1
4-Chloroaniline ¹	ND		ug/l	4.9	--	1
Dibenzofuran ¹	ND		ug/l	2.0	--	1
2-Methylnaphthalene ¹	ND		ug/l	2.0	--	1

Project Name: MBTA GLX NEWBERN AVE II
Project Number: 290762.0016.0000

Lab Number: L1921376
Report Date: 05/29/19

SAMPLE RESULTS

Lab ID: L1921376-09
Client ID: GLC-NB-3-2
Sample Location: SOMERVILLE, MEDFORD, CAMBRIDGE

Date Collected: 05/20/19 11:00
Date Received: 05/21/19
Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Semivolatile Organics by GC/MS - Westborough Lab						
Acetophenone ¹	ND		ug/l	4.9	--	1
n-Nitrosodimethylamine ¹	ND		ug/l	2.0	--	1
2,4,6-Trichlorophenol	ND		ug/l	4.9	--	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	4.9	--	1
2,4-Dimethylphenol	ND		ug/l	4.9	--	1
2-Nitrophenol	ND		ug/l	4.9	--	1
4-Nitrophenol	ND		ug/l	9.8	--	1
2,4-Dinitrophenol	ND		ug/l	20	--	1
Phenol	12		ug/l	4.9	--	1
2-Methylphenol ¹	ND		ug/l	4.9	--	1
3-Methylphenol/4-Methylphenol ¹	ND		ug/l	4.9	--	1
2,4,5-Trichlorophenol ¹	ND		ug/l	4.9	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Fluorophenol	34		25-87
Phenol-d6	24		16-65
Nitrobenzene-d5	52		42-122
2-Fluorobiphenyl	60		46-121
2,4,6-Tribromophenol	62		45-128
4-Terphenyl-d14	64		47-138

Project Name: MBTA GLX NEWBERN AVE II
Project Number: 290762.0016.0000

Lab Number: L1921376
Report Date: 05/29/19

SAMPLE RESULTS

Lab ID: L1921376-09
Client ID: GLC-NB-3-2
Sample Location: SOMERVILLE, MEDFORD, CAMBRIDGE

Date Collected: 05/20/19 11:00
Date Received: 05/21/19
Field Prep: Not Specified

Sample Depth:

Matrix: Water
Analytical Method: 129,625.1-SIM
Analytical Date: 05/23/19 18:00
Analyst: DV

Extraction Method: EPA 625.1
Extraction Date: 05/22/19 15:46

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Semivolatile Organics by GC/MS-SIM - Westborough Lab						
Acenaphthene	0.91		ug/l	0.10	--	1
Fluoranthene	0.60		ug/l	0.10	--	1
Naphthalene	2.2		ug/l	0.10	--	1
Benzo(a)anthracene	0.27		ug/l	0.10	--	1
Benzo(a)pyrene	0.26		ug/l	0.10	--	1
Benzo(b)fluoranthene	0.45		ug/l	0.10	--	1
Benzo(k)fluoranthene	0.18		ug/l	0.10	--	1
Chrysene	0.31		ug/l	0.10	--	1
Acenaphthylene	0.13		ug/l	0.10	--	1
Anthracene	0.14		ug/l	0.10	--	1
Benzo(ghi)perylene	0.11		ug/l	0.10	--	1
Fluorene	0.47		ug/l	0.10	--	1
Phenanthrene	0.18		ug/l	0.10	--	1
Dibenzo(a,h)anthracene	ND		ug/l	0.10	--	1
Indeno(1,2,3-cd)pyrene	0.13		ug/l	0.10	--	1
Pyrene	0.58		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	38		25-87
Phenol-d6	27		16-65
Nitrobenzene-d5	83		42-122
2-Fluorobiphenyl	80		46-121
2,4,6-Tribromophenol	49		45-128
4-Terphenyl-d14	78		47-138

Project Name: MBTA GLX NEWBERN AVE II
Project Number: 290762.0016.0000

Lab Number: L1921376
Report Date: 05/29/19

Method Blank Analysis Batch Quality Control

Analytical Method: 129,625.1
 Analytical Date: 05/23/19 05:00
 Analyst: SZ

Extraction Method: EPA 625.1
 Extraction Date: 05/21/19 21:39

Parameter	Result	Qualifier	Units	RL	MDL
Semivolatile Organics by GC/MS - Westborough Lab for sample(s): 01-03 Batch: WG1239677-1					
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 NEWBERN AVE II
Project Number: 290762.0016.0000

Lab Number: L1921376
Report Date: 05/29/19

Method Blank Analysis Batch Quality Control

Analytical Method: 129,625.1
 Analytical Date: 05/23/19 05:00
 Analyst: SZ

Extraction Method: EPA 625.1
 Extraction Date: 05/21/19 21:39

Parameter	Result	Qualifier	Units	RL	MDL
Semivolatile Organics by GC/MS - Westborough Lab for sample(s): 01-03 Batch: WG1239677-1					
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	32		16-65
Nitrobenzene-d5	79		42-122
2-Fluorobiphenyl	80		46-121
2,4,6-Tribromophenol	50		45-128
4-Terphenyl-d14	86		47-138

Project Name: MBTA GLX NEWBERN AVE II
Project Number: 290762.0016.0000

Lab Number: L1921376
Report Date: 05/29/19

Method Blank Analysis Batch Quality Control

Analytical Method: 129,625.1-SIM
Analytical Date: 05/22/19 18:31
Analyst: DV

Extraction Method: EPA 625.1
Extraction Date: 05/21/19 21:43

Parameter	Result	Qualifier	Units	RL	MDL
Semivolatile Organics by GC/MS-SIM - Westborough Lab for sample(s): 01-03,09 Batch: WG1239678-1					
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	49		25-87
Phenol-d6	31		16-65
Nitrobenzene-d5	84		42-122
2-Fluorobiphenyl	77		46-121
2,4,6-Tribromophenol	49		45-128
4-Terphenyl-d14	88		47-138

Project Name: MBTA GLX NEWBERN AVE II
Project Number: 290762.0016.0000

Lab Number: L1921376
Report Date: 05/29/19

Method Blank Analysis
Batch Quality Control

Analytical Method: 129,625.1
Analytical Date: 05/27/19 12:58
Analyst: CB

Extraction Method: EPA 625.1
Extraction Date: 05/24/19 04:11

Parameter	Result	Qualifier	Units	RL	MDL
Semivolatile Organics by GC/MS - Westborough Lab for sample(s): 09 Batch: WG1240770-1					
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 NEWBERN AVE II
Project Number: 290762.0016.0000

Lab Number: L1921376
Report Date: 05/29/19

Method Blank Analysis Batch Quality Control

Analytical Method: 129,625.1
 Analytical Date: 05/27/19 12:58
 Analyst: CB

Extraction Method: EPA 625.1
 Extraction Date: 05/24/19 04:11

Parameter	Result	Qualifier	Units	RL	MDL
Semivolatile Organics by GC/MS - Westborough Lab for sample(s): 09 Batch: WG1240770-1					
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	46		25-87
Phenol-d6	33		16-65
Nitrobenzene-d5	75		42-122
2-Fluorobiphenyl	83		46-121
2,4,6-Tribromophenol	70		45-128
4-Terphenyl-d14	87		47-138

Lab Control Sample Analysis **Batch Quality Control**

Project Name: MBTA GLX NEWBERN AVE II

Lab Number: L1921376

Project Number: 290762.0016.0000

Report Date: 05/29/19

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Semivolatile Organics by GC/MS - Westborough Lab Associated sample(s): 01-03 Batch: WG1239677-2								
Benzidine ¹	6		-		0-70	-		30
1,2,4-Trichlorobenzene	66		-		57-130	-		50
Bis(2-chloroethyl)ether	75		-		43-126	-		108
2-Chloronaphthalene	78		-		65-120	-		24
3,3'-Dichlorobenzidine	37		-		8-213	-		108
2,4-Dinitrotoluene	88		-		48-127	-		42
2,6-Dinitrotoluene	93		-		68-137	-		48
Azobenzene ¹	78		-		44-115	-		23
4-Bromophenyl phenyl ether	74		-		65-120	-		43
Bis(2-chloroisopropyl)ether	68		-		63-139	-		76
Bis(2-chloroethoxy)methane	79		-		49-165	-		54
Hexachlorobutadiene	61		-		38-120	-		62
Hexachlorocyclopentadiene ¹	62		-		7-118	-		35
Hexachloroethane	61		-		55-120	-		52
Isophorone	85		-		47-180	-		93
Nitrobenzene	83		-		54-158	-		62
NDPA/DPA ¹	78		-		45-112	-		36
n-Nitrosodi-n-propylamine	84		-		14-198	-		87
Bis(2-ethylhexyl)phthalate	86		-		29-137	-		82
Butyl benzyl phthalate	99		-		1-140	-		60
Di-n-butylphthalate	96		-		8-120	-		47
Di-n-octylphthalate	95		-		19-132	-		69
Diethyl phthalate	80		-		1-120	-		100

Lab Control Sample Analysis Batch Quality Control

Project Name: MBTA GLX NEWBERN AVE II

Project Number: 290762.0016.0000

Lab Number: L1921376

Report Date: 05/29/19

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Semivolatile Organics by GC/MS - Westborough Lab Associated sample(s): 01-03 Batch: WG1239677-2								
Dimethyl phthalate	92		-		1-120	-		183
Aniline ¹	46		-		1-75	-		66
4-Chloroaniline ¹	54		-		10-100	-		53
Dibenzofuran ¹	74		-		23-126	-		22
2-Methylnaphthalene ¹	75		-		40-109	-		18
Acetophenone ¹	94		-		46-113	-		28
n-Nitrosodimethylamine ¹	48		-		15-68	-		17
2,4,6-Trichlorophenol	92		-		52-129	-		58
p-Chloro-m-cresol ¹	93		-		68-130	-		73
2-Chlorophenol	78		-		36-120	-		61
2,4-Dichlorophenol	88		-		53-122	-		50
2,4-Dimethylphenol	85		-		42-120	-		58
2-Nitrophenol	89		-		45-167	-		55
4-Nitrophenol	63		-		13-129	-		131
2,4-Dinitrophenol	74		-		1-173	-		132
Phenol	40		-		17-120	-		64
2-Methylphenol ¹	77		-		38-102	-		23
3-Methylphenol/4-Methylphenol ¹	78		-		35-103	-		26
2,4,5-Trichlorophenol ¹	93		-		47-126	-		28

Lab Control Sample Analysis

Batch Quality Control

Project Name: MBTA GLX NEWBERN AVE II

Lab Number: L1921376

Project Number: 290762.0016.0000

Report Date: 05/29/19

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Semivolatile Organics by GC/MS - Westborough Lab Associated sample(s): 01-03 Batch: WG1239677-2								

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
2-Fluorophenol	54				25-87
Phenol-d6	36				16-65
Nitrobenzene-d5	83				42-122
2-Fluorobiphenyl	80				46-121
2,4,6-Tribromophenol	60				45-128
4-Terphenyl-d14	84				47-138

Lab Control Sample Analysis Batch Quality Control

Project Name: MBTA GLX NEWBERN AVE II

Project Number: 290762.0016.0000

Lab Number: L1921376

Report Date: 05/29/19

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Semivolatile Organics by GC/MS-SIM - Westborough Lab Associated sample(s): 01-03,09 Batch: WG1239678-2								
Acenaphthene	70		-		60-132	-		30
Fluoranthene	75		-		43-121	-		30
Naphthalene	71		-		36-120	-		30
Benzo(a)anthracene	71		-		42-133	-		30
Benzo(a)pyrene	64		-		32-148	-		30
Benzo(b)fluoranthene	86		-		42-140	-		30
Benzo(k)fluoranthene	88		-		25-146	-		30
Chrysene	67		-		44-140	-		30
Acenaphthylene	76		-		54-126	-		30
Anthracene	71		-		43-120	-		30
Benzo(ghi)perylene	33		-		1-195	-		30
Fluorene	74		-		70-120	-		30
Phenanthrene	70		-		65-120	-		30
Dibenzo(a,h)anthracene	40		-		1-200	-		30
Indeno(1,2,3-cd)pyrene	37		-		1-151	-		30
Pyrene	73		-		70-120	-		30
Pentachlorophenol	41		-		38-152	-		30
Hexachlorobenzene ¹	40		-		8-142	-		30

Lab Control Sample Analysis**Batch Quality Control****Project Name:** MBTA GLX NEWBERN AVE II**Lab Number:** L1921376**Project Number:** 290762.0016.0000**Report Date:** 05/29/19

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Semivolatile Organics by GC/MS-SIM - Westborough Lab Associated sample(s): 01-03,09 Batch: WG1239678-2								

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
2-Fluorophenol	48				25-87
Phenol-d6	31				16-65
Nitrobenzene-d5	80				42-122
2-Fluorobiphenyl	75				46-121
2,4,6-Tribromophenol	45				45-128
4-Terphenyl-d14	84				47-138

Lab Control Sample Analysis **Batch Quality Control**

Project Name: MBTA GLX NEWBERN AVE II

Project Number: 290762.0016.0000

Lab Number: L1921376

Report Date: 05/29/19

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Semivolatile Organics by GC/MS - Westborough Lab Associated sample(s): 09 Batch: WG1240770-3								
Benzidine ¹	0		-		0-70	-		30
1,2,4-Trichlorobenzene	72		-		57-130	-		50
Bis(2-chloroethyl)ether	66		-		43-126	-		108
2-Chloronaphthalene	83		-		65-120	-		24
3,3'-Dichlorobenzidine	32		-		8-213	-		108
2,4-Dinitrotoluene	98		-		48-127	-		42
2,6-Dinitrotoluene	110		-		68-137	-		48
Azobenzene ¹	73		-		44-115	-		23
4-Bromophenyl phenyl ether	80		-		65-120	-		43
Bis(2-chloroisopropyl)ether	63		-		63-139	-		76
Bis(2-chloroethoxy)methane	69		-		49-165	-		54
Hexachlorobutadiene	74		-		38-120	-		62
Hexachlorocyclopentadiene ¹	78		-		7-118	-		35
Hexachloroethane	61		-		55-120	-		52
Isophorone	70		-		47-180	-		93
Nitrobenzene	73		-		54-158	-		62
NDPA/DPA ¹	79		-		45-112	-		36
n-Nitrosodi-n-propylamine	73		-		14-198	-		87
Bis(2-ethylhexyl)phthalate	78		-		29-137	-		82
Butyl benzyl phthalate	80		-		1-140	-		60
Di-n-butylphthalate	80		-		8-120	-		47
Di-n-octylphthalate	74		-		19-132	-		69
Diethyl phthalate	74		-		1-120	-		100

Lab Control Sample Analysis **Batch Quality Control**

Project Name: MBTA GLX NEWBERN AVE II

Project Number: 290762.0016.0000

Lab Number: L1921376

Report Date: 05/29/19

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Semivolatile Organics by GC/MS - Westborough Lab Associated sample(s): 09 Batch: WG1240770-3								
Dimethyl phthalate	88		-		1-120	-		183
Aniline ¹	25		-		1-75	-		66
4-Chloroaniline ¹	48		-		10-100	-		53
Dibenzofuran ¹	77		-		23-126	-		22
2-Methylnaphthalene ¹	78		-		40-109	-		18
Acetophenone ¹	70		-		46-113	-		28
n-Nitrosodimethylamine ¹	41		-		15-68	-		17
2,4,6-Trichlorophenol	91		-		52-129	-		58
p-Chloro-m-cresol ¹	81		-		68-130	-		73
2-Chlorophenol	67		-		36-120	-		61
2,4-Dichlorophenol	81		-		53-122	-		50
2,4-Dimethylphenol	50		-		42-120	-		58
2-Nitrophenol	82		-		45-167	-		55
4-Nitrophenol	56		-		13-129	-		131
2,4-Dinitrophenol	94		-		1-173	-		132
Phenol	39		-		17-120	-		64
2-Methylphenol ¹	61		-		38-102	-		23
3-Methylphenol/4-Methylphenol ¹	62		-		35-103	-		26
2,4,5-Trichlorophenol ¹	95		-		47-126	-		28

Lab Control Sample Analysis**Batch Quality Control****Project Name:** MBTA GLX NEWBERN AVE II**Lab Number:** L1921376**Project Number:** 290762.0016.0000**Report Date:** 05/29/19

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
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Semivolatile Organics by GC/MS - Westborough Lab Associated sample(s): 09 Batch: WG1240770-3

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
2-Fluorophenol	50				25-87
Phenol-d6	37				16-65
Nitrobenzene-d5	79				42-122
2-Fluorobiphenyl	87				46-121
2,4,6-Tribromophenol	88				45-128
4-Terphenyl-d14	91				47-138

PETROLEUM HYDROCARBONS

Project Name: MBTA GLX NEWBERN AVE II**Lab Number:** L1921376**Project Number:** 290762.0016.0000**Report Date:** 05/29/19**SAMPLE RESULTS**

Lab ID: L1921376-01
 Client ID: GLC-NB-3-1
 Sample Location: SOMERVILLE, MEDFORD, CAMBRIDGE

Date Collected: 05/21/19 11:00
 Date Received: 05/21/19
 Field Prep: Refer to COC

Sample Depth:
 Matrix: Water
 Analytical Method: 98,EPH-04-1.1
 Analytical Date: 05/26/19 09:41
 Analyst: LL

Extraction Method: EPA 3510C
 Extraction Date: 05/24/19 16:00
 Cleanup Method1: EPH-04-1
 Cleanup Date1: 05/26/19

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	115		ug/l	100	--	1
C11-C22 Aromatics, Adjusted	115		ug/l	100	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
Chloro-Octadecane	43		40-140
o-Terphenyl	79		40-140
2-Fluorobiphenyl	83		40-140
2-Bromonaphthalene	85		40-140

Project Name: MBTA GLX NEWBERN AVE II**Lab Number:** L1921376**Project Number:** 290762.0016.0000**Report Date:** 05/29/19**SAMPLE RESULTS**

Lab ID: L1921376-01 D
 Client ID: GLC-NB-3-1
 Sample Location: SOMERVILLE, MEDFORD, CAMBRIDGE

Date Collected: 05/21/19 11:00
 Date Received: 05/21/19
 Field Prep: Refer to COC

Sample Depth:
 Matrix: Water
 Analytical Method: 131, VPH-18-2.1
 Analytical Date: 05/23/19 12:25
 Analyst: MKS

Trap: EST, Carboxen B/Carboxen 1000&1001**Analytical Column:** Restek, RTX-502.2, 105m, 0.53ID, 3um**Quality Control Information**

Condition of sample received:

Satisfactory

Aqueous Preservative:

Laboratory Provided Preserved
Container

Sample Temperature upon receipt:

Received on Ice

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Petroleum Hydrocarbons - Westborough Lab						
C5-C8 Aliphatics	4190		ug/l	500	--	10
C9-C12 Aliphatics	1390		ug/l	500	--	10
C9-C10 Aromatics	526		ug/l	500	--	10
C5-C8 Aliphatics, Adjusted	2730		ug/l	500	--	10
C9-C12 Aliphatics, Adjusted	ND		ug/l	500	--	10
Benzene	250		ug/l	20.0	--	10
Toluene	62.0		ug/l	20.0	--	10
Ethylbenzene	413		ug/l	20.0	--	10
p/m-Xylene	114		ug/l	20.0	--	10
o-Xylene	ND		ug/l	20.0	--	10
Methyl tert butyl ether	1140		ug/l	30.0	--	10
Naphthalene	ND		ug/l	40.0	--	10

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2,5-Dibromotoluene-PID	92		70-130
2,5-Dibromotoluene-FID	105		70-130

Project Name: MBTA GLX NEWBERN AVE II**Lab Number:** L1921376**Project Number:** 290762.0016.0000**Report Date:** 05/29/19**SAMPLE RESULTS**

Lab ID: L1921376-02
 Client ID: GLC-NB-3-4
 Sample Location: SOMERVILLE, MEDFORD, CAMBRIDGE

Date Collected: 05/21/19 12:00
 Date Received: 05/21/19
 Field Prep: Refer to COC

Sample Depth:
 Matrix: Water
 Analytical Method: 98,EPH-04-1.1
 Analytical Date: 05/22/19 16:42
 Analyst: DG

Extraction Method: EPA 3510C
 Extraction Date: 05/22/19 03:57
 Cleanup Method1: EPH-04-1
 Cleanup Date1: 05/22/19

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	44		40-140
o-Terphenyl	72		40-140
2-Fluorobiphenyl	83		40-140
2-Bromonaphthalene	84		40-140

Project Name: MBTA GLX NEWBERN AVE II**Lab Number:** L1921376**Project Number:** 290762.0016.0000**Report Date:** 05/29/19**SAMPLE RESULTS**

Lab ID: L1921376-03
 Client ID: GLC-NB-2
 Sample Location: SOMERVILLE, MEDFORD, CAMBRIDGE

Date Collected: 05/21/19 14:00
 Date Received: 05/21/19
 Field Prep: Refer to COC

Sample Depth:
 Matrix: Water
 Analytical Method: 98,EPH-04-1.1
 Analytical Date: 05/22/19 17:27
 Analyst: DG

Extraction Method: EPA 3510C
 Extraction Date: 05/22/19 03:57
 Cleanup Method1: EPH-04-1
 Cleanup Date1: 05/22/19

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	55		40-140
o-Terphenyl	73		40-140
2-Fluorobiphenyl	80		40-140
2-Bromonaphthalene	81		40-140

Project Name: MBTA GLX NEWBERN AVE II**Lab Number:** L1921376**Project Number:** 290762.0016.0000**Report Date:** 05/29/19**SAMPLE RESULTS**

Lab ID: L1921376-09
 Client ID: GLC-NB-3-2
 Sample Location: SOMERVILLE, MEDFORD, CAMBRIDGE

Date Collected: 05/20/19 11:00
 Date Received: 05/21/19
 Field Prep: Not Specified

Sample Depth:
 Matrix: Water
 Analytical Method: 98,EPH-04-1.1
 Analytical Date: 05/23/19 08:49
 Analyst: LL

Extraction Method: EPA 3510C
 Extraction Date: 05/22/19 15:40
 Cleanup Method1: EPH-04-1
 Cleanup Date1: 05/24/19

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	28	Q	40-140
o-Terphenyl	80		40-140
2-Fluorobiphenyl	97		40-140
2-Bromonaphthalene	97		40-140

Project Name: MBTA GLX NEWBERN AVE II**Lab Number:** L1921376**Project Number:** 290762.0016.0000**Report Date:** 05/29/19**SAMPLE RESULTS**

Lab ID: L1921376-09 RE
 Client ID: GLC-NB-3-2
 Sample Location: SOMERVILLE, MEDFORD, CAMBRIDGE

Date Collected: 05/20/19 11:00
 Date Received: 05/21/19
 Field Prep: Not Specified

Sample Depth:
 Matrix: Water
 Analytical Method: 98,EPH-04-1.1
 Analytical Date: 05/24/19 18:00
 Analyst: LL

Extraction Method: EPA 3510C
 Extraction Date: 05/24/19 08:50
 Cleanup Method1: EPH-04-1
 Cleanup Date1: 05/24/19

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	133	--	1
C19-C36 Aliphatics	ND		ug/l	133	--	1
C11-C22 Aromatics	ND		ug/l	133	--	1
C11-C22 Aromatics, Adjusted	ND		ug/l	133	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
Chloro-Octadecane	32	Q	40-140
o-Terphenyl	81		40-140
2-Fluorobiphenyl	97		40-140
2-Bromonaphthalene	97		40-140

Project Name: MBTA GLX NEWBERN AVE II**Lab Number:** L1921376**Project Number:** 290762.0016.0000**Report Date:** 05/29/19**SAMPLE RESULTS**

Lab ID: L1921376-09 D
 Client ID: GLC-NB-3-2
 Sample Location: SOMERVILLE, MEDFORD, CAMBRIDGE

Date Collected: 05/20/19 11:00
 Date Received: 05/21/19
 Field Prep: Not Specified

Sample Depth:
 Matrix: Water
 Analytical Method: 131, VPH-18-2.1
 Analytical Date: 05/23/19 01:01
 Analyst: BAD

Trap: EST, Carboxen B/Carboxen 1000&1001**Analytical Column:** Restek, RTX-502.2, 105m, 0.53ID, 3um**Quality Control Information**

Condition of sample received:

Satisfactory

Aqueous Preservative:

Laboratory Provided Preserved
Container

Sample Temperature upon receipt:

Received on Ice

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Petroleum Hydrocarbons - Westborough Lab						
C5-C8 Aliphatics	2650		ug/l	500	--	10
C9-C12 Aliphatics	ND		ug/l	500	--	10
C9-C10 Aromatics	ND		ug/l	500	--	10
C5-C8 Aliphatics, Adjusted	1100		ug/l	500	--	10
C9-C12 Aliphatics, Adjusted	ND		ug/l	500	--	10
Benzene	1550		ug/l	20.0	--	10
Toluene	ND		ug/l	20.0	--	10
Ethylbenzene	ND		ug/l	20.0	--	10
p/m-Xylene	ND		ug/l	20.0	--	10
o-Xylene	ND		ug/l	20.0	--	10
Methyl tert butyl ether	ND		ug/l	30.0	--	10
Naphthalene	ND		ug/l	40.0	--	10

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2,5-Dibromotoluene-PID	83		70-130
2,5-Dibromotoluene-FID	92		70-130

Project Name: MBTA GLX NEWBERN AVE II**Lab Number:** L1921376**Project Number:** 290762.0016.0000**Report Date:** 05/29/19**SAMPLE RESULTS**

Lab ID: L1921376-10
 Client ID: TRIP BLANK
 Sample Location: SOMERVILLE, MEDFORD, CAMBRIDGE

Date Collected: 05/20/19 00:00
 Date Received: 05/21/19
 Field Prep: Not Specified

Sample Depth:
 Matrix: Water
 Analytical Method: 131, VPH-18-2.1
 Analytical Date: 05/24/19 09:32
 Analyst: MKS

Trap: EST, Carboxen B/Carboxen 1000&1001**Analytical Column:** Restek, RTX-502.2, 105m, 0.53ID, 3um**Quality Control Information**

Condition of sample received:

Satisfactory

Aqueous Preservative:

Laboratory Provided Preserved
Container

Sample Temperature upon receipt:

Received on Ice

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Petroleum Hydrocarbons - Westborough Lab						
C5-C8 Aliphatics	ND		ug/l	50.0	--	1
C9-C12 Aliphatics	ND		ug/l	50.0	--	1
C9-C10 Aromatics	ND		ug/l	50.0	--	1
C5-C8 Aliphatics, Adjusted	ND		ug/l	50.0	--	1
C9-C12 Aliphatics, Adjusted	ND		ug/l	50.0	--	1
Benzene	ND		ug/l	2.00	--	1
Toluene	ND		ug/l	2.00	--	1
Ethylbenzene	ND		ug/l	2.00	--	1
p/m-Xylene	ND		ug/l	2.00	--	1
o-Xylene	ND		ug/l	2.00	--	1
Methyl tert butyl ether	ND		ug/l	3.00	--	1
Naphthalene	ND		ug/l	4.00	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2,5-Dibromotoluene-PID	100		70-130
2,5-Dibromotoluene-FID	107		70-130

Project Name: MBTA GLX NEWBERN AVE II**Lab Number:** L1921376**Project Number:** 290762.0016.0000**Report Date:** 05/29/19**SAMPLE RESULTS**

Lab ID: L1921376-14
 Client ID: GLC-NB-2
 Sample Location: SOMERVILLE, MEDFORD, CAMBRIDGE

Date Collected: 05/22/19 13:20
 Date Received: 05/22/19
 Field Prep: None

Sample Depth:
 Matrix: Water
 Analytical Method: 131, VPH-18-2.1
 Analytical Date: 05/23/19 13:45
 Analyst: MKS

Trap: EST, Carboxen B/Carboxen 1000&1001**Analytical Column:** Restek, RTX-502.2, 105m, 0.53ID, 3um**Quality Control Information**

Condition of sample received:

Satisfactory

Aqueous Preservative:

Laboratory Provided Preserved
Container

Sample Temperature upon receipt:

Received on Ice

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Petroleum Hydrocarbons - Westborough Lab						
C5-C8 Aliphatics	ND		ug/l	50.0	--	1
C9-C12 Aliphatics	ND		ug/l	50.0	--	1
C9-C10 Aromatics	ND		ug/l	50.0	--	1
C5-C8 Aliphatics, Adjusted	ND		ug/l	50.0	--	1
C9-C12 Aliphatics, Adjusted	ND		ug/l	50.0	--	1
Benzene	ND		ug/l	2.00	--	1
Toluene	ND		ug/l	2.00	--	1
Ethylbenzene	ND		ug/l	2.00	--	1
p/m-Xylene	ND		ug/l	2.00	--	1
o-Xylene	ND		ug/l	2.00	--	1
Methyl tert butyl ether	ND		ug/l	3.00	--	1
Naphthalene	ND		ug/l	4.00	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2,5-Dibromotoluene-PID	96		70-130
2,5-Dibromotoluene-FID	109		70-130

Project Name: MBTA GLX NEWBERN AVE II**Lab Number:** L1921376**Project Number:** 290762.0016.0000**Report Date:** 05/29/19**SAMPLE RESULTS**

Lab ID: L1921376-15
 Client ID: GLC-NB-3-4
 Sample Location: SOMERVILLE, MEDFORD, CAMBRIDGE

Date Collected: 05/22/19 14:10
 Date Received: 05/22/19
 Field Prep: Not Specified

Sample Depth:
 Matrix: Water
 Analytical Method: 131, VPH-18-2.1
 Analytical Date: 05/23/19 14:26
 Analyst: MKS

Trap: EST, Carboxen 1000&1001**Analytical Column:** Restek, RTX-502.2, 105m, 0.53ID, 3um**Quality Control Information**

Condition of sample received:

Satisfactory

Aqueous Preservative:

Laboratory Provided Preserved
Container

Sample Temperature upon receipt:

Received on Ice

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Petroleum Hydrocarbons - Westborough Lab						
C5-C8 Aliphatics	ND		ug/l	50.0	--	1
C9-C12 Aliphatics	ND		ug/l	50.0	--	1
C9-C10 Aromatics	ND		ug/l	50.0	--	1
C5-C8 Aliphatics, Adjusted	ND		ug/l	50.0	--	1
C9-C12 Aliphatics, Adjusted	ND		ug/l	50.0	--	1
Benzene	ND		ug/l	2.00	--	1
Toluene	ND		ug/l	2.00	--	1
Ethylbenzene	ND		ug/l	2.00	--	1
p/m-Xylene	ND		ug/l	2.00	--	1
o-Xylene	ND		ug/l	2.00	--	1
Methyl tert butyl ether	ND		ug/l	3.00	--	1
Naphthalene	ND		ug/l	4.00	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2,5-Dibromotoluene-PID	98		70-130
2,5-Dibromotoluene-FID	112		70-130

Project Name: MBTA GLX NEWBERN AVE II**Lab Number:** L1921376**Project Number:** 290762.0016.0000**Report Date:** 05/29/19**SAMPLE RESULTS**

Lab ID: L1921376-16
 Client ID: TRIP BLANK
 Sample Location: SOMERVILLE, MEDFORD, CAMBRIDGE

Date Collected: 05/22/19 00:00
 Date Received: 05/22/19
 Field Prep: Not Specified

Sample Depth:
 Matrix: Water
 Analytical Method: 131, VPH-18-2.1
 Analytical Date: 05/24/19 10:03
 Analyst: MKS

Trap: EST, Carboxen B/Carboxen 1000&1001**Analytical Column:** Restek, RTX-502.2, 105m, 0.53ID, 3um**Quality Control Information**

Condition of sample received:

Satisfactory

Aqueous Preservative:

Laboratory Provided Preserved
Container

Sample Temperature upon receipt:

Received on Ice

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Petroleum Hydrocarbons - Westborough Lab						
C5-C8 Aliphatics	ND		ug/l	50.0	--	1
C9-C12 Aliphatics	ND		ug/l	50.0	--	1
C9-C10 Aromatics	ND		ug/l	50.0	--	1
C5-C8 Aliphatics, Adjusted	ND		ug/l	50.0	--	1
C9-C12 Aliphatics, Adjusted	ND		ug/l	50.0	--	1
Benzene	ND		ug/l	2.00	--	1
Toluene	ND		ug/l	2.00	--	1
Ethylbenzene	ND		ug/l	2.00	--	1
p/m-Xylene	ND		ug/l	2.00	--	1
o-Xylene	ND		ug/l	2.00	--	1
Methyl tert butyl ether	ND		ug/l	3.00	--	1
Naphthalene	ND		ug/l	4.00	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2,5-Dibromotoluene-PID	104		70-130
2,5-Dibromotoluene-FID	112		70-130

Project Name: MBTA GLX NEWBERN AVE II
Project Number: 290762.0016.0000

Lab Number: L1921376
Report Date: 05/29/19

Method Blank Analysis
Batch Quality Control

Analytical Method: 98,EPH-04-1.1
Analytical Date: 05/22/19 16:21
Analyst: LL

Extraction Method: EPA 3510C
Extraction Date: 05/21/19 10:26
Cleanup Method: EPH-04-1
Cleanup Date: 05/22/19

Parameter	Result	Qualifier	Units	RL	MDL
Extractable Petroleum Hydrocarbons - Westborough Lab for sample(s): 02-03 Batch: WG1239459-1					
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	47		40-140
o-Terphenyl	58		40-140
2-Fluorobiphenyl	99		40-140
2-Bromonaphthalene	97		40-140

Project Name: MBTA GLX NEWBERN AVE II
Project Number: 290762.0016.0000

Lab Number: L1921376
Report Date: 05/29/19

Method Blank Analysis
Batch Quality Control

Analytical Method: 98,EPH-04-1.1
 Analytical Date: 05/23/19 08:10
 Analyst: LL

Extraction Method: EPA 3510C
 Extraction Date: 05/22/19 15:40
 Cleanup Method: EPH-04-1
 Cleanup Date: 05/22/19

Parameter	Result	Qualifier	Units	RL	MDL
Extractable Petroleum Hydrocarbons - Westborough Lab for sample(s): 09 Batch: WG1240040-1					
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	73		40-140
o-Terphenyl	94		40-140
2-Fluorobiphenyl	95		40-140
2-Bromonaphthalene	97		40-140

Project Name: MBTA GLX NEWBERN AVE II
Project Number: 290762.0016.0000

Lab Number: L1921376
Report Date: 05/29/19

Method Blank Analysis Batch Quality Control

Analytical Method: 131, VPH-18-2.1
 Analytical Date: 05/22/19 10:54
 Analyst: MKS

Parameter	Result	Qualifier	Units	RL	MDL
Volatile Petroleum Hydrocarbons - Westborough Lab for sample(s): 09 Batch: WG1240320-4					
C5-C8 Aliphatics	ND		ug/l	50.0	--
C9-C12 Aliphatics	ND		ug/l	50.0	--
C9-C10 Aromatics	ND		ug/l	50.0	--
C5-C8 Aliphatics, Adjusted	ND		ug/l	50.0	--
C9-C12 Aliphatics, Adjusted	ND		ug/l	50.0	--
Benzene	ND		ug/l	2.00	--
Toluene	ND		ug/l	2.00	--
Ethylbenzene	ND		ug/l	2.00	--
p/m-Xylene	ND		ug/l	2.00	--
o-Xylene	ND		ug/l	2.00	--
Methyl tert butyl ether	ND		ug/l	3.00	--
Naphthalene	ND		ug/l	4.00	--

Surrogate	%Recovery	Qualifier	Acceptance Criteria
2,5-Dibromotoluene-PID	79		70-130
2,5-Dibromotoluene-FID	89		70-130

Project Name: MBTA GLX NEWBERN AVE II
Project Number: 290762.0016.0000

Lab Number: L1921376
Report Date: 05/29/19

Method Blank Analysis Batch Quality Control

Analytical Method: 131, VPH-18-2.1
 Analytical Date: 05/23/19 11:45
 Analyst: MKS

Parameter	Result	Qualifier	Units	RL	MDL
Volatile Petroleum Hydrocarbons - Westborough Lab for sample(s): 01,14-15 Batch: WG1240834-4					
C5-C8 Aliphatics	ND		ug/l	50.0	--
C9-C12 Aliphatics	ND		ug/l	50.0	--
C9-C10 Aromatics	ND		ug/l	50.0	--
C5-C8 Aliphatics, Adjusted	ND		ug/l	50.0	--
C9-C12 Aliphatics, Adjusted	ND		ug/l	50.0	--
Benzene	ND		ug/l	2.00	--
Toluene	ND		ug/l	2.00	--
Ethylbenzene	ND		ug/l	2.00	--
p/m-Xylene	ND		ug/l	2.00	--
o-Xylene	ND		ug/l	2.00	--
Methyl tert butyl ether	ND		ug/l	3.00	--
Naphthalene	ND		ug/l	4.00	--

Surrogate	%Recovery	Qualifier	Acceptance Criteria
2,5-Dibromotoluene-PID	81		70-130
2,5-Dibromotoluene-FID	90		70-130

Project Name: MBTA GLX NEWBERN AVE II
Project Number: 290762.0016.0000

Lab Number: L1921376
Report Date: 05/29/19

Method Blank Analysis Batch Quality Control

Analytical Method: 131, VPH-18-2.1
 Analytical Date: 05/24/19 09:01
 Analyst: MKS

Parameter	Result	Qualifier	Units	RL	MDL
Volatile Petroleum Hydrocarbons - Westborough Lab for sample(s): 10,16 Batch: WG1240956-4					
C5-C8 Aliphatics	ND		ug/l	50.0	--
C9-C12 Aliphatics	ND		ug/l	50.0	--
C9-C10 Aromatics	ND		ug/l	50.0	--
C5-C8 Aliphatics, Adjusted	ND		ug/l	50.0	--
C9-C12 Aliphatics, Adjusted	ND		ug/l	50.0	--
Benzene	ND		ug/l	2.00	--
Toluene	ND		ug/l	2.00	--
Ethylbenzene	ND		ug/l	2.00	--
p/m-Xylene	ND		ug/l	2.00	--
o-Xylene	ND		ug/l	2.00	--
Methyl tert butyl ether	ND		ug/l	3.00	--
Naphthalene	ND		ug/l	4.00	--

Surrogate	%Recovery	Qualifier	Acceptance Criteria
2,5-Dibromotoluene-PID	88		70-130
2,5-Dibromotoluene-FID	94		70-130

Project Name: MBTA GLX NEWBERN AVE II
Project Number: 290762.0016.0000

Lab Number: L1921376
Report Date: 05/29/19

Method Blank Analysis
Batch Quality Control

Analytical Method: 98,EPH-04-1.1
 Analytical Date: 05/24/19 17:22
 Analyst: LL

Extraction Method: EPA 3510C
 Extraction Date: 05/24/19 08:50
 Cleanup Method: EPH-04-1
 Cleanup Date: 05/24/19

Parameter	Result	Qualifier	Units	RL	MDL
Extractable Petroleum Hydrocarbons - Westborough Lab for sample(s): 09 Batch: WG1240991-1					
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	67		40-140
o-Terphenyl	89		40-140
2-Fluorobiphenyl	94		40-140
2-Bromonaphthalene	95		40-140

Project Name: MBTA GLX NEWBERN AVE II
Project Number: 290762.0016.0000

Lab Number: L1921376
Report Date: 05/29/19

Method Blank Analysis
Batch Quality Control

Analytical Method: 98,EPH-04-1.1
Analytical Date: 05/26/19 09:09
Analyst: LL

Extraction Method: EPA 3510C
Extraction Date: 05/24/19 16:00
Cleanup Method: EPH-04-1
Cleanup Date: 05/26/19

Parameter	Result	Qualifier	Units	RL	MDL
Extractable Petroleum Hydrocarbons - Westborough Lab for sample(s): 01 Batch: WG1241337-1					
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	68		40-140
o-Terphenyl	95		40-140
2-Fluorobiphenyl	106		40-140
2-Bromonaphthalene	107		40-140

Lab Control Sample Analysis **Batch Quality Control**

Project Name: MBTA GLX NEWBERN AVE II

Lab Number: L1921376

Project Number: 290762.0016.0000

Report Date: 05/29/19

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Extractable Petroleum Hydrocarbons - Westborough Lab Associated sample(s): 02-03 Batch: WG1239459-2 WG1239459-3								
C9-C18 Aliphatics	50		64		40-140	25		25
C19-C36 Aliphatics	72		76		40-140	5		25
C11-C22 Aromatics	106		107		40-140	1		25
Naphthalene	88		91		40-140	3		25
2-Methylnaphthalene	89		92		40-140	3		25
Acenaphthylene	94		99		40-140	5		25
Acenaphthene	100		106		40-140	6		25
Fluorene	98		102		40-140	4		25
Phenanthrene	102		105		40-140	3		25
Anthracene	107		110		40-140	3		25
Fluoranthene	100		102		40-140	2		25
Pyrene	102		104		40-140	2		25
Benzo(a)anthracene	105		106		40-140	1		25
Chrysene	117		117		40-140	0		25
Benzo(b)fluoranthene	102		103		40-140	1		25
Benzo(k)fluoranthene	109		109		40-140	0		25
Benzo(a)pyrene	103		104		40-140	1		25
Indeno(1,2,3-cd)Pyrene	97		99		40-140	2		25
Dibenzo(a,h)anthracene	107		106		40-140	1		25
Benzo(ghi)perylene	98		98		40-140	0		25
Nonane (C9)	46		52		30-140	12		25
Decane (C10)	52		57		40-140	9		25
Dodecane (C12)	56		61		40-140	9		25

Lab Control Sample Analysis

Batch Quality Control

Project Name: MBTA GLX NEWBERN AVE II

Project Number: 290762.0016.0000

Lab Number: L1921376

Report Date: 05/29/19

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Extractable Petroleum Hydrocarbons - Westborough Lab Associated sample(s): 02-03 Batch: WG1239459-2 WG1239459-3								
Tetradecane (C14)	59		63		40-140	7		25
Hexadecane (C16)	61		64		40-140	5		25
Octadecane (C18)	63		66		40-140	5		25
Nonadecane (C19)	62		66		40-140	6		25
Eicosane (C20)	64		67		40-140	5		25
Docosane (C22)	65		68		40-140	5		25
Tetracosane (C24)	66		69		40-140	4		25
Hexacosane (C26)	69		72		40-140	4		25
Octacosane (C28)	71		74		40-140	4		25
triacontane (C30)	74		77		40-140	4		25
Hexatriacontane (C36)	80		84		40-140	5		25

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
Chloro-Octadecane	67		69		40-140
o-Terphenyl	89		89		40-140
2-Fluorobiphenyl	100		99		40-140
2-Bromonaphthalene	101		100		40-140
% Naphthalene Breakthrough	0		0		
% 2-Methylnaphthalene Breakthrough	0		0		

Lab Control Sample Analysis **Batch Quality Control**

Project Name: MBTA GLX NEWBERN AVE II

Project Number: 290762.0016.0000

Lab Number: L1921376

Report Date: 05/29/19

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Extractable Petroleum Hydrocarbons - Westborough Lab Associated sample(s): 09 Batch: WG1240040-2 WG1240040-3								
C9-C18 Aliphatics	85		88		40-140	3		25
C19-C36 Aliphatics	112		112		40-140	0		25
C11-C22 Aromatics	117		68		40-140	53	Q	25
Naphthalene	112		60		40-140	60	Q	25
2-Methylnaphthalene	109		59		40-140	60	Q	25
Acenaphthylene	115		64		40-140	57	Q	25
Acenaphthene	121		68		40-140	56	Q	25
Fluorene	119		70		40-140	52	Q	25
Phenanthrene	125		76		40-140	49	Q	25
Anthracene	117		70		40-140	50	Q	25
Fluoranthene	125		79		40-140	45	Q	25
Pyrene	128		81		40-140	45	Q	25
Benzo(a)anthracene	118		74		40-140	46	Q	25
Chrysene	106		67		40-140	45	Q	25
Benzo(b)fluoranthene	122		75		40-140	48	Q	25
Benzo(k)fluoranthene	108		67		40-140	47	Q	25
Benzo(a)pyrene	108		66		40-140	48	Q	25
Indeno(1,2,3-cd)Pyrene	106		60		40-140	55	Q	25
Dibenzo(a,h)anthracene	59		35	Q	40-140	51	Q	25
Benzo(ghi)perylene	91		51		40-140	56	Q	25
Nonane (C9)	60		66		30-140	10		25
Decane (C10)	70		75		40-140	7		25
Dodecane (C12)	75		79		40-140	5		25

Lab Control Sample Analysis

Batch Quality Control

Project Name: MBTA GLX NEWBERN AVE II

Lab Number: L1921376

Project Number: 290762.0016.0000

Report Date: 05/29/19

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Extractable Petroleum Hydrocarbons - Westborough Lab Associated sample(s): 09 Batch: WG1240040-2 WG1240040-3								
Tetradecane (C14)	81		86		40-140	6		25
Hexadecane (C16)	87		93		40-140	7		25
Octadecane (C18)	92		97		40-140	5		25
Nonadecane (C19)	94		98		40-140	4		25
Eicosane (C20)	96		100		40-140	4		25
Docosane (C22)	97		101		40-140	4		25
Tetracosane (C24)	98		103		40-140	5		25
Hexacosane (C26)	103		107		40-140	4		25
Octacosane (C28)	108		112		40-140	4		25
triacontane (C30)	113		117		40-140	3		25
Hexatriacontane (C36)	102		98		40-140	4		25

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
Chloro-Octadecane	80		85		40-140
o-Terphenyl	109		66		40-140
2-Fluorobiphenyl	107		59		40-140
2-Bromonaphthalene	110		61		40-140
% Naphthalene Breakthrough	0		0		
% 2-Methylnaphthalene Breakthrough	0		0		

Lab Control Sample Analysis

Batch Quality Control

Project Name: MBTA GLX NEWBERN AVE II

Project Number: 290762.0016.0000

Lab Number: L1921376

Report Date: 05/29/19

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Volatile Petroleum Hydrocarbons - Westborough Lab Associated sample(s): 09 Batch: WG1240320-2 WG1240320-3								
C5-C8 Aliphatics	105		99		70-130	6		25
C9-C12 Aliphatics	107		99		70-130	7		25
C9-C10 Aromatics	93		87		70-130	7		25
Benzene	97		91		70-130	6		25
Toluene	97		92		70-130	6		25
Ethylbenzene	100		94		70-130	6		25
p/m-Xylene	97		90		70-130	7		25
o-Xylene	94		88		70-130	6		25
Methyl tert butyl ether	99		97		70-130	1		25
Naphthalene	93		90		70-130	3		25
1,2,4-Trimethylbenzene	93		87		70-130	7		25
Pentane	107		98		70-130	8		25
2-Methylpentane	107		100		70-130	7		25
2,2,4-Trimethylpentane	108		103		70-130	5		25
n-Nonane	111		103		30-130	7		25
n-Decane	99		92		70-130	8		25
n-Butylcyclohexane	112		104		70-130	7		25

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
2,5-Dibromotoluene-PID	95		88		70-130
2,5-Dibromotoluene-FID	105		98		70-130

Lab Control Sample Analysis

Batch Quality Control

Project Name: MBTA GLX NEWBERN AVE II

Project Number: 290762.0016.0000

Lab Number: L1921376

Report Date: 05/29/19

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Volatile Petroleum Hydrocarbons - Westborough Lab Associated sample(s): 01,14-15 Batch: WG1240834-2 WG1240834-3								
C5-C8 Aliphatics	99		104		70-130	5		25
C9-C12 Aliphatics	101		105		70-130	4		25
C9-C10 Aromatics	87		90		70-130	3		25
Benzene	91		95		70-130	5		25
Toluene	91		96		70-130	4		25
Ethylbenzene	94		98		70-130	4		25
p/m-Xylene	91		94		70-130	4		25
o-Xylene	88		92		70-130	4		25
Methyl tert butyl ether	92		97		70-130	5		25
Naphthalene	87		91		70-130	5		25
1,2,4-Trimethylbenzene	87		90		70-130	3		25
Pentane	99		105		70-130	5		25
2-Methylpentane	100		106		70-130	6		25
2,2,4-Trimethylpentane	103		108		70-130	5		25
n-Nonane	106		109		30-130	3		25
n-Decane	94		97		70-130	3		25
n-Butylcyclohexane	106		110		70-130	4		25

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
2,5-Dibromotoluene-PID	88		91		70-130
2,5-Dibromotoluene-FID	98		102		70-130

Lab Control Sample Analysis **Batch Quality Control**

Project Name: MBTA GLX NEWBERN AVE II

Lab Number: L1921376

Project Number: 290762.0016.0000

Report Date: 05/29/19

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Volatile Petroleum Hydrocarbons - Westborough Lab Associated sample(s): 10,16 Batch: WG1240956-2 WG1240956-3								
C5-C8 Aliphatics	95		93		70-130	2		25
C9-C12 Aliphatics	100		98		70-130	2		25
C9-C10 Aromatics	94		92		70-130	2		25
Benzene	92		90		70-130	2		25
Toluene	94		92		70-130	2		25
Ethylbenzene	97		94		70-130	2		25
p/m-Xylene	98		96		70-130	2		25
o-Xylene	94		92		70-130	2		25
Methyl tert butyl ether	100		98		70-130	2		25
Naphthalene	98		98		70-130	0		25
1,2,4-Trimethylbenzene	94		92		70-130	2		25
Pentane	92		90		70-130	2		25
2-Methylpentane	97		95		70-130	2		25
2,2,4-Trimethylpentane	94		92		70-130	2		25
n-Nonane	99		98		30-130	2		25
n-Decane	99		97		70-130	3		25
n-Butylcyclohexane	102		100		70-130	2		25

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
2,5-Dibromotoluene-PID	99		98		70-130
2,5-Dibromotoluene-FID	105		103		70-130

Lab Control Sample Analysis **Batch Quality Control**

Project Name: MBTA GLX NEWBERN AVE II

Lab Number: L1921376

Project Number: 290762.0016.0000

Report Date: 05/29/19

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Extractable Petroleum Hydrocarbons - Westborough Lab Associated sample(s): 09 Batch: WG1240991-2 WG1240991-3								
C9-C18 Aliphatics	61		59		40-140	3		25
C19-C36 Aliphatics	76		77		40-140	1		25
C11-C22 Aromatics	109		89		40-140	20		25
Naphthalene	88		70		40-140	23		25
2-Methylnaphthalene	90		73		40-140	21		25
Acenaphthylene	99		81		40-140	20		25
Acenaphthene	104		86		40-140	19		25
Fluorene	104		86		40-140	19		25
Phenanthrene	107		89		40-140	18		25
Anthracene	114		94		40-140	19		25
Fluoranthene	104		87		40-140	18		25
Pyrene	107		89		40-140	18		25
Benzo(a)anthracene	110		90		40-140	20		25
Chrysene	121		98		40-140	21		25
Benzo(b)fluoranthene	107		88		40-140	19		25
Benzo(k)fluoranthene	115		93		40-140	21		25
Benzo(a)pyrene	108		88		40-140	20		25
Indeno(1,2,3-cd)Pyrene	102		83		40-140	21		25
Dibenzo(a,h)anthracene	106		84		40-140	23		25
Benzo(ghi)perylene	95		75		40-140	24		25
Nonane (C9)	44		40		30-140	10		25
Decane (C10)	49		46		40-140	6		25
Dodecane (C12)	59		56		40-140	5		25

Lab Control Sample Analysis

Batch Quality Control

Project Name: MBTA GLX NEWBERN AVE II

Project Number: 290762.0016.0000

Lab Number: L1921376

Report Date: 05/29/19

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Extractable Petroleum Hydrocarbons - Westborough Lab Associated sample(s): 09 Batch: WG1240991-2 WG1240991-3								
Tetradecane (C14)	64		63		40-140	2		25
Hexadecane (C16)	66		66		40-140	0		25
Octadecane (C18)	67		68		40-140	1		25
Nonadecane (C19)	67		68		40-140	1		25
Eicosane (C20)	68		69		40-140	1		25
Docosane (C22)	69		70		40-140	1		25
Tetracosane (C24)	70		71		40-140	1		25
Hexacosane (C26)	73		74		40-140	1		25
Octacosane (C28)	76		76		40-140	0		25
triacontane (C30)	78		79		40-140	1		25
Hexatriacontane (C36)	84		85		40-140	1		25

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
Chloro-Octadecane	69		68		40-140
o-Terphenyl	94		76		40-140
2-Fluorobiphenyl	96		79		40-140
2-Bromonaphthalene	98		80		40-140
% Naphthalene Breakthrough	0		0		
% 2-Methylnaphthalene Breakthrough	0		0		

Lab Control Sample Analysis **Batch Quality Control**

Project Name: MBTA GLX NEWBERN AVE II

Lab Number: L1921376

Project Number: 290762.0016.0000

Report Date: 05/29/19

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Extractable Petroleum Hydrocarbons - Westborough Lab Associated sample(s): 01 Batch: WG1241337-2 WG1241337-3								
C9-C18 Aliphatics	99		92		40-140	7		25
C19-C36 Aliphatics	89		84		40-140	6		25
C11-C22 Aromatics	125		119		40-140	5		25
Naphthalene	102		97		40-140	5		25
2-Methylnaphthalene	101		97		40-140	4		25
Acenaphthylene	110		107		40-140	3		25
Acenaphthene	113		109		40-140	4		25
Fluorene	116		112		40-140	4		25
Phenanthrene	120		117		40-140	3		25
Anthracene	120		117		40-140	3		25
Fluoranthene	124		121		40-140	2		25
Pyrene	129		126		40-140	2		25
Benzo(a)anthracene	123		121		40-140	2		25
Chrysene	126		122		40-140	3		25
Benzo(b)fluoranthene	126		124		40-140	2		25
Benzo(k)fluoranthene	123		119		40-140	3		25
Benzo(a)pyrene	120		118		40-140	2		25
Indeno(1,2,3-cd)Pyrene	122		119		40-140	2		25
Dibenzo(a,h)anthracene	122		119		40-140	2		25
Benzo(ghi)perylene	116		111		40-140	4		25
Nonane (C9)	64		60		30-140	6		25
Decane (C10)	73		68		40-140	7		25
Dodecane (C12)	78		74		40-140	5		25

Lab Control Sample Analysis

Batch Quality Control

Project Name: MBTA GLX NEWBERN AVE II

Project Number: 290762.0016.0000

Lab Number: L1921376

Report Date: 05/29/19

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Extractable Petroleum Hydrocarbons - Westborough Lab Associated sample(s): 01 Batch: WG1241337-2 WG1241337-3								
Tetradecane (C14)	84		80		40-140	5		25
Hexadecane (C16)	90		85		40-140	6		25
Octadecane (C18)	95		90		40-140	5		25
Nonadecane (C19)	96		91		40-140	5		25
Eicosane (C20)	98		92		40-140	6		25
Docosane (C22)	98		93		40-140	5		25
Tetracosane (C24)	97		92		40-140	5		25
Hexacosane (C26)	97		92		40-140	5		25
Octacosane (C28)	96		92		40-140	4		25
triacontane (C30)	96		92		40-140	4		25
Hexatriacontane (C36)	99		95		40-140	4		25

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
Chloro-Octadecane	78		78		40-140
o-Terphenyl	113		104		40-140
2-Fluorobiphenyl	106		110		40-140
2-Bromonaphthalene	106		112		40-140
% Naphthalene Breakthrough	0		0		
% 2-Methylnaphthalene Breakthrough	0		0		

PCBS

Project Name: MBTA GLX NEWBERN AVE II
Project Number: 290762.0016.0000

Lab Number: L1921376
Report Date: 05/29/19

SAMPLE RESULTS

Lab ID: L1921376-01
Client ID: GLC-NB-3-1
Sample Location: SOMERVILLE, MEDFORD, CAMBRIDGE

Date Collected: 05/21/19 11:00
Date Received: 05/21/19
Field Prep: Refer to COC

Sample Depth:

Matrix: Water
Analytical Method: 127,608.3
Analytical Date: 05/23/19 14:05
Analyst: HT

Extraction Method: EPA 608.3
Extraction Date: 05/23/19 03:04
Cleanup Method: EPA 3665A
Cleanup Date: 05/23/19
Cleanup Method: EPA 3660B
Cleanup Date: 05/23/19

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		37-123	B
Decachlorobiphenyl	86		38-114	B
2,4,5,6-Tetrachloro-m-xylene	92		37-123	A
Decachlorobiphenyl	62		38-114	A

Project Name: MBTA GLX NEWBERN AVE II
Project Number: 290762.0016.0000

Lab Number: L1921376
Report Date: 05/29/19

SAMPLE RESULTS

Lab ID: L1921376-02
Client ID: GLC-NB-3-4
Sample Location: SOMERVILLE, MEDFORD, CAMBRIDGE

Date Collected: 05/21/19 12:00
Date Received: 05/21/19
Field Prep: Refer to COC

Sample Depth:

Matrix: Water
Analytical Method: 127,608.3
Analytical Date: 05/22/19 13:36
Analyst: HT

Extraction Method: EPA 608.3
Extraction Date: 05/22/19 04:02
Cleanup Method: EPA 3665A
Cleanup Date: 05/22/19
Cleanup Method: EPA 3660B
Cleanup Date: 05/22/19

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	86		37-123	B
Decachlorobiphenyl	58		38-114	B
2,4,5,6-Tetrachloro-m-xylene	89		37-123	A
Decachlorobiphenyl	52		38-114	A

Project Name: MBTA GLX NEWBERN AVE II
Project Number: 290762.0016.0000

Lab Number: L1921376
Report Date: 05/29/19

SAMPLE RESULTS

Lab ID: L1921376-03
Client ID: GLC-NB-2
Sample Location: SOMERVILLE, MEDFORD, CAMBRIDGE

Date Collected: 05/21/19 14:00
Date Received: 05/21/19
Field Prep: Refer to COC

Sample Depth:

Matrix: Water
Analytical Method: 127,608.3
Analytical Date: 05/22/19 13:49
Analyst: HT

Extraction Method: EPA 608.3
Extraction Date: 05/22/19 04:02
Cleanup Method: EPA 3665A
Cleanup Date: 05/22/19
Cleanup Method: EPA 3660B
Cleanup Date: 05/22/19

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	74		37-123	B
Decachlorobiphenyl	76		38-114	B
2,4,5,6-Tetrachloro-m-xylene	77		37-123	A
Decachlorobiphenyl	70		38-114	A

Project Name: MBTA GLX NEWBERN AVE II
Project Number: 290762.0016.0000

Lab Number: L1921376
Report Date: 05/29/19

SAMPLE RESULTS

Lab ID: L1921376-09
Client ID: GLC-NB-3-2
Sample Location: SOMERVILLE, MEDFORD, CAMBRIDGE

Date Collected: 05/20/19 11:00
Date Received: 05/21/19
Field Prep: Not Specified

Sample Depth:

Matrix: Water
Analytical Method: 127,608.3
Analytical Date: 05/23/19 09:46
Analyst: HT

Extraction Method: EPA 608.3
Extraction Date: 05/22/19 15:47
Cleanup Method: EPA 3665A
Cleanup Date: 05/23/19
Cleanup Method: EPA 3660B
Cleanup Date: 05/23/19

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	72		37-123	B
Decachlorobiphenyl	139	Q	38-114	B
2,4,5,6-Tetrachloro-m-xylene	88		37-123	A
Decachlorobiphenyl	100		38-114	A

Project Name: MBTA GLX NEWBERN AVE II
Project Number: 290762.0016.0000

Lab Number: L1921376
Report Date: 05/29/19

Method Blank Analysis Batch Quality Control

Analytical Method: 127,608.3
 Analytical Date: 05/22/19 12:19
 Analyst: HT

Extraction Method: EPA 608.3
 Extraction Date: 05/22/19 00:55
 Cleanup Method: EPA 3665A
 Cleanup Date: 05/22/19
 Cleanup Method: EPA 3660B
 Cleanup Date: 05/22/19

Parameter	Result	Qualifier	Units	RL	MDL	Column
Polychlorinated Biphenyls by GC - Westborough Lab for sample(s): 02-03,09 Batch: WG1239707-1						
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	75		37-123	B
Decachlorobiphenyl	101		38-114	B
2,4,5,6-Tetrachloro-m-xylene	81		37-123	A
Decachlorobiphenyl	96		38-114	A

Project Name: MBTA GLX NEWBERN AVE II
Project Number: 290762.0016.0000

Lab Number: L1921376
Report Date: 05/29/19

Method Blank Analysis Batch Quality Control

Analytical Method: 127,608.3
 Analytical Date: 05/23/19 13:01
 Analyst: HT

Extraction Method: EPA 608.3
 Extraction Date: 05/23/19 03:04
 Cleanup Method: EPA 3665A
 Cleanup Date: 05/23/19
 Cleanup Method: EPA 3660B
 Cleanup Date: 05/23/19

Parameter	Result	Qualifier	Units	RL	MDL	Column
Polychlorinated Biphenyls by GC - Westborough Lab for sample(s): 01 Batch: WG1240233-1						
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	60		37-123	B
Decachlorobiphenyl	107		38-114	B
2,4,5,6-Tetrachloro-m-xylene	75		37-123	A
Decachlorobiphenyl	80		38-114	A

Lab Control Sample Analysis **Batch Quality Control**

Project Name: MBTA GLX NEWBERN AVE II

Project Number: 290762.0016.0000

Lab Number: L1921376

Report Date: 05/29/19

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits	Column
Polychlorinated Biphenyls by GC - Westborough Lab Associated sample(s): 02-03,09 Batch: WG1239707-2									
Aroclor 1016	74		-		50-140	-		36	A
Aroclor 1260	79		-		8-140	-		38	A

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	54				37-123	B
Decachlorobiphenyl	101				38-114	B
2,4,5,6-Tetrachloro-m-xylene	58				37-123	A
Decachlorobiphenyl	94				38-114	A

Lab Control Sample Analysis**Batch Quality Control****Project Name:** MBTA GLX NEWBERN AVE II**Lab Number:** L1921376**Project Number:** 290762.0016.0000**Report Date:** 05/29/19

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: WG1240233-2									
Aroclor 1016	89		-		50-140	-		36	A
Aroclor 1260	79		-		8-140	-		38	A

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	69				37-123	B
Decachlorobiphenyl	136	Q			38-114	B
2,4,5,6-Tetrachloro-m-xylene	85				37-123	A
Decachlorobiphenyl	100				38-114	A

PESTICIDES

Project Name: MBTA GLX NEWBERN AVE II**Lab Number:** L1921376**Project Number:** 290762.0016.0000**Report Date:** 05/29/19**SAMPLE RESULTS**

Lab ID: L1921376-01
 Client ID: GLC-NB-3-1
 Sample Location: SOMERVILLE, MEDFORD, CAMBRIDGE

Date Collected: 05/21/19 11:00
 Date Received: 05/21/19
 Field Prep: Refer to COC

Sample Depth:

Matrix: Water
 Analytical Method: 127,608.3
 Analytical Date: 05/22/19 15:51
 Analyst: BM

Extraction Method: EPA 608.3
 Extraction Date: 05/22/19 04:05
 Cleanup Method: EPA 3620B
 Cleanup Date: 05/22/19

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

Project Name: MBTA GLX NEWBERN AVE II**Lab Number:** L1921376**Project Number:** 290762.0016.0000**Report Date:** 05/29/19**SAMPLE RESULTS**

Lab ID: L1921376-01

Date Collected: 05/21/19 11:00

Client ID: GLC-NB-3-1

Date Received: 05/21/19

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	60		47-124	A
Decachlorobiphenyl	46		32-167	A
2,4,5,6-Tetrachloro-m-xylene	67		47-124	B
Decachlorobiphenyl	69		32-167	B

Project Name: MBTA GLX NEWBERN AVE II
Project Number: 290762.0016.0000

Lab Number: L1921376
Report Date: 05/29/19

SAMPLE RESULTS

Lab ID: L1921376-02
Client ID: GLC-NB-3-4
Sample Location: SOMERVILLE, MEDFORD, CAMBRIDGE

Date Collected: 05/21/19 12:00
Date Received: 05/21/19
Field Prep: Refer to COC

Sample Depth:

Matrix: Water
Analytical Method: 127,608.3
Analytical Date: 05/22/19 16:04
Analyst: BM

Extraction Method: EPA 608.3
Extraction Date: 05/22/19 04:05
Cleanup Method: EPA 3620B
Cleanup Date: 05/22/19

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

Project Name: MBTA GLX NEWBERN AVE II**Lab Number:** L1921376**Project Number:** 290762.0016.0000**Report Date:** 05/29/19**SAMPLE RESULTS****Lab ID:** L1921376-02**Date Collected:** 05/21/19 12:00**Client ID:** GLC-NB-3-4**Date Received:** 05/21/19**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	66		47-124	A
Decachlorobiphenyl	35		32-167	A
2,4,5,6-Tetrachloro-m-xylene	67		47-124	B
Decachlorobiphenyl	45		32-167	B

Project Name: MBTA GLX NEWBERN AVE II
Project Number: 290762.0016.0000

Lab Number: L1921376
Report Date: 05/29/19

SAMPLE RESULTS

Lab ID: L1921376-03
Client ID: GLC-NB-2
Sample Location: SOMERVILLE, MEDFORD, CAMBRIDGE

Date Collected: 05/21/19 14:00
Date Received: 05/21/19
Field Prep: Refer to COC

Sample Depth:

Matrix: Water
Analytical Method: 127,608.3
Analytical Date: 05/22/19 16:16
Analyst: BM

Extraction Method: EPA 608.3
Extraction Date: 05/22/19 04:05
Cleanup Method: EPA 3620B
Cleanup Date: 05/22/19

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

Project Name: MBTA GLX NEWBERN AVE II**Lab Number:** L1921376**Project Number:** 290762.0016.0000**Report Date:** 05/29/19**SAMPLE RESULTS**

Lab ID: L1921376-03

Date Collected: 05/21/19 14:00

Client ID: GLC-NB-2

Date Received: 05/21/19

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	52		47-124	A
Decachlorobiphenyl	39		32-167	A
2,4,5,6-Tetrachloro-m-xylene	56		47-124	B
Decachlorobiphenyl	52		32-167	B

Project Name: MBTA GLX NEWBERN AVE II
Project Number: 290762.0016.0000

Lab Number: L1921376
Report Date: 05/29/19

SAMPLE RESULTS

Lab ID: L1921376-09
Client ID: GLC-NB-3-2
Sample Location: SOMERVILLE, MEDFORD, CAMBRIDGE

Date Collected: 05/20/19 11:00
Date Received: 05/21/19
Field Prep: Not Specified

Sample Depth:

Matrix: Water
Analytical Method: 127,608.3
Analytical Date: 05/24/19 09:25
Analyst: BM

Extraction Method: EPA 608.3
Extraction Date: 05/22/19 15:47
Cleanup Method: EPA 3620B
Cleanup Date: 05/23/19

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

Project Name: MBTA GLX NEWBERN AVE II**Lab Number:** L1921376**Project Number:** 290762.0016.0000**Report Date:** 05/29/19**SAMPLE RESULTS**

Lab ID: L1921376-09

Date Collected: 05/20/19 11:00

Client ID: GLC-NB-3-2

Date Received: 05/21/19

Sample Location: SOMERVILLE, MEDFORD, CAMBRIDGE

Field Prep: Not Specified

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	70		47-124	A
Decachlorobiphenyl	44		32-167	A
2,4,5,6-Tetrachloro-m-xylene	72		47-124	B
Decachlorobiphenyl	61		32-167	B

Project Name: MBTA GLX NEWBERN AVE II
Project Number: 290762.0016.0000

Lab Number: L1921376
Report Date: 05/29/19

Method Blank Analysis Batch Quality Control

Analytical Method: 127,608.3
 Analytical Date: 05/22/19 15:26
 Analyst: BM

Extraction Method: EPA 608.3
 Extraction Date: 05/22/19 01:06
 Cleanup Method: EPA 3620B
 Cleanup Date: 05/22/19

Parameter	Result	Qualifier	Units	RL	MDL	Column
Organochlorine Pesticides by GC - Westborough Lab for sample(s): 01-03,09 Batch: WG1239709-1						
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

Project Name: MBTA GLX NEWBERN AVE II
Project Number: 290762.0016.0000

Lab Number: L1921376
Report Date: 05/29/19

Method Blank Analysis
Batch Quality Control

Analytical Method: 127,608.3
 Analytical Date: 05/22/19 15:26
 Analyst: BM

Extraction Method: EPA 608.3
 Extraction Date: 05/22/19 01:06
 Cleanup Method: EPA 3620B
 Cleanup Date: 05/22/19

Parameter	Result	Qualifier	Units	RL	MDL	Column
Organochlorine Pesticides by GC - Westborough Lab for sample(s): 01-03,09 Batch: WG1239709-1						

Surrogate	%Recovery	Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	64		47-124	A
Decachlorobiphenyl	58		32-167	A
2,4,5,6-Tetrachloro-m-xylene	70		47-124	B
Decachlorobiphenyl	98		32-167	B

Lab Control Sample Analysis Batch Quality Control

Project Name: MBTA GLX NEWBERN AVE II

Project Number: 290762.0016.0000

Lab Number: L1921376

Report Date: 05/29/19

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits	Column
Organochlorine Pesticides by GC - Westborough Lab Associated sample(s): 01-03,09 Batch: WG1239709-2									
Delta-BHC	63		-		19-140	-		52	B
Lindane	72		-		32-140	-		39	B
Alpha-BHC	72		-		37-140	-		36	B
Beta-BHC	65		-		17-147	-		44	B
Heptachlor	48		-		34-140	-		43	B
Aldrin	45		-		42-140	-		35	B
Heptachlor epoxide	59		-		37-142	-		26	B
Endrin	79		-		30-147	-		48	B
Endrin aldehyde	60		-		30-150	-		30	B
Endrin ketone ¹	69		-		30-150	-		30	B
Dieldrin	76		-		36-146	-		49	B
4,4'-DDE	69		-		30-145	-		35	B
4,4'-DDD	73		-		31-141	-		39	B
4,4'-DDT	80		-		25-160	-		42	B
Endosulfan I	67		-		45-153	-		28	B
Endosulfan II	68		-		1-202	-		53	B
Endosulfan sulfate	60		-		26-144	-		38	B
Methoxychlor ¹	67		-		30-150	-		30	B
cis-Chlordane ¹	63		-		45-140	-		35	B
trans-Chlordane ¹	64		-		45-140	-		35	B

Lab Control Sample Analysis

Batch Quality Control

Project Name: MBTA GLX NEWBERN AVE II

Lab Number: L1921376

Project Number: 290762.0016.0000

Report Date: 05/29/19

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): 01-03,09 Batch: WG1239709-2

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	45	Q			47-124	A
Decachlorobiphenyl	66				32-167	A
2,4,5,6-Tetrachloro-m-xylene	48				47-124	B
Decachlorobiphenyl	100				32-167	B

METALS

Project Name: MBTA GLX NEWBERN AVE II**Lab Number:** L1921376**Project Number:** 290762.0016.0000**Report Date:** 05/29/19**SAMPLE RESULTS**

Lab ID: L1921376-01

Date Collected: 05/21/19 11:00

Client ID: GLC-NB-3-1

Date Received: 05/21/19

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	05/22/19 15:51	05/24/19 03:35	EPA 3005A	3,200.8	AM
Arsenic, Total	0.01685		mg/l	0.00100	--	1	05/22/19 15:51	05/24/19 03:35	EPA 3005A	3,200.8	AM
Cadmium, Total	0.00211		mg/l	0.00020	--	1	05/22/19 15:51	05/24/19 03:35	EPA 3005A	3,200.8	AM
Chromium, Total	0.3043		mg/l	0.00100	--	1	05/22/19 15:51	05/24/19 03:35	EPA 3005A	3,200.8	AM
Copper, Total	0.2992		mg/l	0.00100	--	1	05/22/19 15:51	05/24/19 03:35	EPA 3005A	3,200.8	AM
Iron, Total	174		mg/l	0.050	--	1	05/22/19 15:51	05/24/19 10:36	EPA 3005A	19,200.7	LC
Lead, Total	0.2637		mg/l	0.00100	--	1	05/22/19 15:51	05/24/19 03:35	EPA 3005A	3,200.8	AM
Nickel, Total	0.3793		mg/l	0.00200	--	1	05/22/19 15:51	05/24/19 03:35	EPA 3005A	3,200.8	AM
Selenium, Total	ND		mg/l	0.00500	--	1	05/22/19 15:51	05/24/19 03:35	EPA 3005A	3,200.8	AM
Silver, Total	0.00091		mg/l	0.00040	--	1	05/22/19 15:51	05/24/19 03:35	EPA 3005A	3,200.8	AM
Zinc, Total	0.5655		mg/l	0.01000	--	1	05/22/19 15:51	05/24/19 03:35	EPA 3005A	3,200.8	AM
Total Hardness by SM 2340B - Mansfield Lab											
Hardness	1320		mg/l	0.660	NA	1	05/22/19 15:51	05/24/19 10:36	EPA 3005A	19,200.7	LC
General Chemistry - Mansfield Lab											
Chromium, Trivalent (Filtered)	ND		mg/l	0.010	--	1		05/24/19 02:55	NA	107,-	
Chromium, Trivalent (Unfiltered)	ND		mg/l	2.00	--	1		05/24/19 03:35	NA	107,-	
Dissolved Metals - Mansfield Lab											
Antimony, Dissolved	ND		mg/l	0.0040	--	1	05/23/19 19:32	05/24/19 02:55	EPA 3005A	3,200.8	AM
Arsenic, Dissolved	0.0021		mg/l	0.0010	--	1	05/23/19 19:32	05/24/19 02:55	EPA 3005A	3,200.8	AM
Cadmium, Dissolved	ND		mg/l	0.0002	--	1	05/23/19 19:32	05/24/19 02:55	EPA 3005A	3,200.8	AM
Chromium, Dissolved	0.0067		mg/l	0.0010	--	1	05/23/19 19:32	05/24/19 02:55	EPA 3005A	3,200.8	AM
Copper, Dissolved	0.0072		mg/l	0.0010	--	1	05/23/19 19:32	05/24/19 02:55	EPA 3005A	3,200.8	AM
Iron, Dissolved	5.27		mg/l	0.050	--	1	05/23/19 19:32	05/24/19 09:57	EPA 3005A	19,200.7	LC
Lead, Dissolved	0.0031		mg/l	0.0010	--	1	05/23/19 19:32	05/24/19 02:55	EPA 3005A	3,200.8	AM
Nickel, Dissolved	0.0184		mg/l	0.0020	--	1	05/23/19 19:32	05/24/19 02:55	EPA 3005A	3,200.8	AM
Selenium, Dissolved	ND		mg/l	0.0050	--	1	05/23/19 19:32	05/24/19 02:55	EPA 3005A	3,200.8	AM



Project Name: MBTA GLX NEWBERN AVE II**Lab Number:** L1921376**Project Number:** 290762.0016.0000**Report Date:** 05/29/19**SAMPLE RESULTS**

Lab ID: L1921376-01

Date Collected: 05/21/19 11:00

Client ID: GLC-NB-3-1

Date Received: 05/21/19

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
Silver, Dissolved	ND		mg/l	0.0004	--	1	05/23/19 19:32	05/24/19 02:55	EPA 3005A	3,200.8	AM
Zinc, Dissolved	0.0123		mg/l	0.0100	--	1	05/23/19 19:32	05/24/19 02:55	EPA 3005A	3,200.8	AM



Project Name: MBTA GLX NEWBERN AVE II**Lab Number:** L1921376**Project Number:** 290762.0016.0000**Report Date:** 05/29/19**SAMPLE RESULTS**

Lab ID: L1921376-02

Date Collected: 05/21/19 12:00

Client ID: GLC-NB-3-4

Date Received: 05/21/19

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	05/23/19 20:00	05/24/19 04:32	EPA 3005A	3,200.8	AM
Arsenic, Total	0.01535		mg/l	0.00100	--	1	05/23/19 20:00	05/24/19 04:32	EPA 3005A	3,200.8	AM
Cadmium, Total	0.00103		mg/l	0.00020	--	1	05/23/19 20:00	05/24/19 04:32	EPA 3005A	3,200.8	AM
Chromium, Total	0.2218		mg/l	0.00100	--	1	05/23/19 20:00	05/24/19 04:32	EPA 3005A	3,200.8	AM
Copper, Total	0.1796		mg/l	0.00100	--	1	05/23/19 20:00	05/24/19 04:32	EPA 3005A	3,200.8	AM
Iron, Total	146		mg/l	0.050	--	1	05/23/19 20:00	05/24/19 15:59	EPA 3005A	19,200.7	LC
Lead, Total	0.1826		mg/l	0.00100	--	1	05/23/19 20:00	05/24/19 04:32	EPA 3005A	3,200.8	AM
Nickel, Total	0.1692		mg/l	0.00200	--	1	05/23/19 20:00	05/24/19 04:32	EPA 3005A	3,200.8	AM
Selenium, Total	ND		mg/l	0.00500	--	1	05/23/19 20:00	05/24/19 04:32	EPA 3005A	3,200.8	AM
Silver, Total	0.00079		mg/l	0.00040	--	1	05/23/19 20:00	05/24/19 04:32	EPA 3005A	3,200.8	AM
Zinc, Total	0.4073		mg/l	0.01000	--	1	05/23/19 20:00	05/24/19 04:32	EPA 3005A	3,200.8	AM
Total Hardness by SM 2340B - Mansfield Lab											
Hardness	891		mg/l	0.660	NA	1	05/23/19 20:00	05/24/19 15:59	EPA 3005A	19,200.7	LC
General Chemistry - Mansfield Lab											
Chromium, Trivalent (Filtered)	ND		mg/l	0.010	--	1		05/24/19 14:35	NA	107,-	
Chromium, Trivalent (Unfiltered)	0.222		mg/l	0.100	--	1		05/24/19 04:32	NA	107,-	
Dissolved Metals - Mansfield Lab											
Antimony, Dissolved	ND		mg/l	0.0040	--	1	05/24/19 09:58	05/24/19 14:35	EPA 3005A	3,200.8	AM
Arsenic, Dissolved	ND		mg/l	0.0010	--	1	05/24/19 09:58	05/24/19 14:35	EPA 3005A	3,200.8	AM
Cadmium, Dissolved	0.0003		mg/l	0.0002	--	1	05/24/19 09:58	05/24/19 14:35	EPA 3005A	3,200.8	AM
Chromium, Dissolved	ND		mg/l	0.0010	--	1	05/24/19 09:58	05/24/19 14:35	EPA 3005A	3,200.8	AM
Copper, Dissolved	ND		mg/l	0.0010	--	1	05/24/19 09:58	05/24/19 14:35	EPA 3005A	3,200.8	AM
Iron, Dissolved	ND		mg/l	0.050	--	1	05/24/19 09:58	05/24/19 15:56	EPA 3005A	19,200.7	LC
Lead, Dissolved	ND		mg/l	0.0010	--	1	05/24/19 09:58	05/24/19 14:35	EPA 3005A	3,200.8	AM
Nickel, Dissolved	0.0074		mg/l	0.0020	--	1	05/24/19 09:58	05/24/19 14:35	EPA 3005A	3,200.8	AM
Selenium, Dissolved	ND		mg/l	0.0050	--	1	05/24/19 09:58	05/24/19 14:35	EPA 3005A	3,200.8	AM



Project Name: MBTA GLX NEWBERN AVE II**Lab Number:** L1921376**Project Number:** 290762.0016.0000**Report Date:** 05/29/19**SAMPLE RESULTS**

Lab ID: L1921376-02

Date Collected: 05/21/19 12:00

Client ID: GLC-NB-3-4

Date Received: 05/21/19

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
Silver, Dissolved	ND		mg/l	0.0004	--	1	05/24/19 09:58	05/24/19 14:35	EPA 3005A	3,200.8	AM
Zinc, Dissolved	ND		mg/l	0.0100	--	1	05/24/19 09:58	05/24/19 14:35	EPA 3005A	3,200.8	AM



Project Name: MBTA GLX NEWBERN AVE II**Lab Number:** L1921376**Project Number:** 290762.0016.0000**Report Date:** 05/29/19**SAMPLE RESULTS**

Lab ID: L1921376-03

Date Collected: 05/21/19 14:00

Client ID: GLC-NB-2

Date Received: 05/21/19

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	05/23/19 20:00	05/24/19 04:36	EPA 3005A	3,200.8	AM
Arsenic, Total	0.00820		mg/l	0.00100	--	1	05/23/19 20:00	05/24/19 04:36	EPA 3005A	3,200.8	AM
Cadmium, Total	0.00049		mg/l	0.00020	--	1	05/23/19 20:00	05/24/19 04:36	EPA 3005A	3,200.8	AM
Chromium, Total	0.03641		mg/l	0.00100	--	1	05/23/19 20:00	05/24/19 04:36	EPA 3005A	3,200.8	AM
Copper, Total	0.04990		mg/l	0.00100	--	1	05/23/19 20:00	05/24/19 04:36	EPA 3005A	3,200.8	AM
Iron, Total	40.7		mg/l	0.050	--	1	05/23/19 20:00	05/24/19 16:04	EPA 3005A	19,200.7	LC
Lead, Total	0.1424		mg/l	0.00100	--	1	05/23/19 20:00	05/24/19 04:36	EPA 3005A	3,200.8	AM
Nickel, Total	0.02628		mg/l	0.00200	--	1	05/23/19 20:00	05/24/19 04:36	EPA 3005A	3,200.8	AM
Selenium, Total	ND		mg/l	0.00500	--	1	05/23/19 20:00	05/24/19 04:36	EPA 3005A	3,200.8	AM
Silver, Total	ND		mg/l	0.00040	--	1	05/23/19 20:00	05/24/19 04:36	EPA 3005A	3,200.8	AM
Zinc, Total	0.2767		mg/l	0.01000	--	1	05/23/19 20:00	05/24/19 04:36	EPA 3005A	3,200.8	AM
Total Hardness by SM 2340B - Mansfield Lab											
Hardness	196		mg/l	0.660	NA	1	05/23/19 20:00	05/24/19 16:04	EPA 3005A	19,200.7	LC

General Chemistry - Mansfield Lab

Chromium, Trivalent (Filtered)	ND		mg/l	0.010	--	1		05/24/19 02:59	NA	107,-	
Chromium, Trivalent (Unfiltered)	ND		mg/l	0.100	--	1		05/24/19 04:36	NA	107,-	

Dissolved Metals - Mansfield Lab

Antimony, Dissolved	ND		mg/l	0.0040	--	1	05/23/19 19:32	05/24/19 02:59	EPA 3005A	3,200.8	AM
Arsenic, Dissolved	ND		mg/l	0.0010	--	1	05/23/19 19:32	05/24/19 02:59	EPA 3005A	3,200.8	AM
Cadmium, Dissolved	ND		mg/l	0.0002	--	1	05/23/19 19:32	05/24/19 02:59	EPA 3005A	3,200.8	AM
Chromium, Dissolved	ND		mg/l	0.0010	--	1	05/23/19 19:32	05/24/19 02:59	EPA 3005A	3,200.8	AM
Copper, Dissolved	ND		mg/l	0.0010	--	1	05/23/19 19:32	05/24/19 02:59	EPA 3005A	3,200.8	AM
Iron, Dissolved	2.19		mg/l	0.050	--	1	05/23/19 19:32	05/24/19 10:02	EPA 3005A	19,200.7	LC
Lead, Dissolved	ND		mg/l	0.0010	--	1	05/23/19 19:32	05/24/19 02:59	EPA 3005A	3,200.8	AM
Nickel, Dissolved	ND		mg/l	0.0020	--	1	05/23/19 19:32	05/24/19 02:59	EPA 3005A	3,200.8	AM
Selenium, Dissolved	ND		mg/l	0.0050	--	1	05/23/19 19:32	05/24/19 02:59	EPA 3005A	3,200.8	AM



Project Name: MBTA GLX NEWBERN AVE II**Lab Number:** L1921376**Project Number:** 290762.0016.0000**Report Date:** 05/29/19**SAMPLE RESULTS**

Lab ID: L1921376-03

Date Collected: 05/21/19 14:00

Client ID: GLC-NB-2

Date Received: 05/21/19

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
Silver, Dissolved	ND		mg/l	0.0004	--	1	05/23/19 19:32	05/24/19 02:59	EPA 3005A	3,200.8	AM
Zinc, Dissolved	0.0247		mg/l	0.0100	--	1	05/23/19 19:32	05/24/19 02:59	EPA 3005A	3,200.8	AM



Project Name: MBTA GLX NEWBERN AVE II**Lab Number:** L1921376**Project Number:** 290762.0016.0000**Report Date:** 05/29/19**SAMPLE RESULTS**

Lab ID: L1921376-09

Date Collected: 05/20/19 11:00

Client ID: GLC-NB-3-2

Date Received: 05/21/19

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	05/23/19 20:00	05/24/19 05:00	EPA 3005A	3,200.8	AM
Arsenic, Total	0.00645		mg/l	0.00100	--	1	05/23/19 20:00	05/24/19 05:00	EPA 3005A	3,200.8	AM
Cadmium, Total	ND		mg/l	0.00020	--	1	05/23/19 20:00	05/24/19 05:00	EPA 3005A	3,200.8	AM
Chromium, Total	0.02030		mg/l	0.00100	--	1	05/23/19 20:00	05/24/19 05:00	EPA 3005A	3,200.8	AM
Copper, Total	0.02408		mg/l	0.00100	--	1	05/23/19 20:00	05/24/19 05:00	EPA 3005A	3,200.8	AM
Iron, Total	19.5		mg/l	0.050	--	1	05/23/19 20:00	05/24/19 16:09	EPA 3005A	19,200.7	LC
Lead, Total	0.03912		mg/l	0.00100	--	1	05/23/19 20:00	05/24/19 05:00	EPA 3005A	3,200.8	AM
Nickel, Total	0.02186		mg/l	0.00200	--	1	05/23/19 20:00	05/24/19 05:00	EPA 3005A	3,200.8	AM
Selenium, Total	ND		mg/l	0.00500	--	1	05/23/19 20:00	05/24/19 05:00	EPA 3005A	3,200.8	AM
Silver, Total	ND		mg/l	0.00040	--	1	05/23/19 20:00	05/24/19 05:00	EPA 3005A	3,200.8	AM
Zinc, Total	0.05697		mg/l	0.01000	--	1	05/23/19 20:00	05/24/19 05:00	EPA 3005A	3,200.8	AM
Total Hardness by SM 2340B - Mansfield Lab											
Hardness	428		mg/l	0.660	NA	1	05/23/19 20:00	05/24/19 16:09	EPA 3005A	19,200.7	LC



Project Name: MBTA GLX NEWBERN AVE II**Lab Number:** L1921376**Project Number:** 290762.0016.0000**Report Date:** 05/29/19**SAMPLE RESULTS**

Lab ID: L1921376-11

Date Collected: 05/21/19 15:00

Client ID: GLC-NB-3-2

Date Received: 05/21/19

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
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Total Metals - Mansfield Lab

Chromium, Total	0.02030		mg/l	0.00100	--	1	05/23/19 20:00	05/24/19 05:00	EPA 3005A	3,200.8	AM
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General Chemistry - Mansfield Lab

Chromium, Trivalent (Unfiltered)	ND		mg/l	0.200	--	1		05/24/19 05:00	NA	107,-	
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Project Name: MBTA GLX NEWBERN AVE II**Lab Number:** L1921376**Project Number:** 290762.0016.0000**Report Date:** 05/29/19**SAMPLE RESULTS**

Lab ID: L1921376-12

Date Collected: 05/22/19 12:00

Client ID: GLC-NB-3-2

Date Received: 05/22/19

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
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General Chemistry - Mansfield Lab

Chromium, Trivalent (Filtered)	ND		mg/l	0.010	--	1		05/24/19 01:47	NA	107,-	
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Dissolved Metals - Mansfield Lab

Antimony, Dissolved	ND		mg/l	0.0040	--	1	05/23/19 19:32	05/24/19 01:47	EPA 3005A	3,200.8	AM
Arsenic, Dissolved	0.0075		mg/l	0.0010	--	1	05/23/19 19:32	05/24/19 01:47	EPA 3005A	3,200.8	AM
Cadmium, Dissolved	ND		mg/l	0.0002	--	1	05/23/19 19:32	05/24/19 01:47	EPA 3005A	3,200.8	AM
Chromium, Dissolved	ND		mg/l	0.0010	--	1	05/23/19 19:32	05/24/19 01:47	EPA 3005A	3,200.8	AM
Copper, Dissolved	0.0032		mg/l	0.0010	--	1	05/23/19 19:32	05/24/19 01:47	EPA 3005A	3,200.8	AM
Iron, Dissolved	ND		mg/l	0.050	--	1	05/23/19 19:32	05/24/19 09:38	EPA 3005A	19,200.7	LC
Lead, Dissolved	ND		mg/l	0.0010	--	1	05/23/19 19:32	05/24/19 01:47	EPA 3005A	3,200.8	AM
Nickel, Dissolved	0.0063		mg/l	0.0020	--	1	05/23/19 19:32	05/24/19 01:47	EPA 3005A	3,200.8	AM
Selenium, Dissolved	ND		mg/l	0.0050	--	1	05/23/19 19:32	05/24/19 01:47	EPA 3005A	3,200.8	AM
Silver, Dissolved	ND		mg/l	0.0004	--	1	05/23/19 19:32	05/24/19 01:47	EPA 3005A	3,200.8	AM
Zinc, Dissolved	ND		mg/l	0.0100	--	1	05/23/19 19:32	05/24/19 01:47	EPA 3005A	3,200.8	AM



Project Name: MBTA GLX NEWBERN AVE II

Lab Number: L1921376

Project Number: 290762.0016.0000

Report Date: 05/29/19

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): 02-03,09 Batch: WG1240555-1										
Iron, Total	ND		mg/l	0.050	--	1	05/23/19 20:00	05/24/19 15:32	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): 02-03,09 Batch: WG1240555-1										
Hardness	ND		mg/l	0.660	NA	1	05/23/19 20:00	05/24/19 15:32	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): 02-03,09,11 Batch: WG1240560-1										
Antimony, Total	ND		mg/l	0.00400	--	1	05/23/19 20:00	05/24/19 03:11	3,200.8	AM
Arsenic, Total	ND		mg/l	0.00100	--	1	05/23/19 20:00	05/24/19 03:11	3,200.8	AM
Cadmium, Total	ND		mg/l	0.00020	--	1	05/23/19 20:00	05/24/19 03:11	3,200.8	AM
Chromium, Total	ND		mg/l	0.00100	--	1	05/23/19 20:00	05/24/19 03:11	3,200.8	AM
Copper, Total	ND		mg/l	0.00100	--	1	05/23/19 20:00	05/24/19 03:11	3,200.8	AM
Lead, Total	ND		mg/l	0.00100	--	1	05/23/19 20:00	05/24/19 03:11	3,200.8	AM
Nickel, Total	ND		mg/l	0.00200	--	1	05/23/19 20:00	05/24/19 03:11	3,200.8	AM
Selenium, Total	ND		mg/l	0.00500	--	1	05/23/19 20:00	05/24/19 03:11	3,200.8	AM
Silver, Total	ND		mg/l	0.00040	--	1	05/23/19 20:00	05/24/19 03:11	3,200.8	AM
Zinc, Total	ND		mg/l	0.01000	--	1	05/23/19 20:00	05/24/19 03:11	3,200.8	AM

Prep Information

Digestion Method: EPA 3005A



Project Name: MBTA GLX NEWBERN AVE II

Lab Number: L1921376

Project Number: 290762.0016.0000

Report Date: 05/29/19

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: WG1240624-1										
Antimony, Total	ND		mg/l	0.00400	--	1	05/22/19 15:51	05/24/19 02:26	3,200.8	AM
Arsenic, Total	ND		mg/l	0.00100	--	1	05/22/19 15:51	05/24/19 02:26	3,200.8	AM
Cadmium, Total	ND		mg/l	0.00020	--	1	05/22/19 15:51	05/24/19 02:26	3,200.8	AM
Chromium, Total	ND		mg/l	0.00100	--	1	05/22/19 15:51	05/24/19 02:26	3,200.8	AM
Copper, Total	ND		mg/l	0.00100	--	1	05/22/19 15:51	05/24/19 02:26	3,200.8	AM
Lead, Total	ND		mg/l	0.00100	--	1	05/22/19 15:51	05/24/19 02:26	3,200.8	AM
Nickel, Total	ND		mg/l	0.00200	--	1	05/22/19 15:51	05/24/19 02:26	3,200.8	AM
Selenium, Total	ND		mg/l	0.00500	--	1	05/22/19 15:51	05/24/19 02:26	3,200.8	AM
Silver, Total	ND		mg/l	0.00040	--	1	05/22/19 15:51	05/24/19 02:26	3,200.8	AM
Zinc, Total	ND		mg/l	0.01000	--	1	05/22/19 15:51	05/24/19 02:26	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): 01,03,12 Batch: WG1240627-1										
Antimony, Dissolved	ND		mg/l	0.0040	--	1	05/23/19 19:32	05/24/19 01:31	3,200.8	AM
Arsenic, Dissolved	ND		mg/l	0.0010	--	1	05/23/19 19:32	05/24/19 01:31	3,200.8	AM
Cadmium, Dissolved	ND		mg/l	0.0002	--	1	05/23/19 19:32	05/24/19 01:31	3,200.8	AM
Chromium, Dissolved	ND		mg/l	0.0010	--	1	05/23/19 19:32	05/24/19 01:31	3,200.8	AM
Copper, Dissolved	ND		mg/l	0.0010	--	1	05/23/19 19:32	05/24/19 01:31	3,200.8	AM
Lead, Dissolved	ND		mg/l	0.0010	--	1	05/23/19 19:32	05/24/19 01:31	3,200.8	AM
Nickel, Dissolved	ND		mg/l	0.0020	--	1	05/23/19 19:32	05/24/19 01:31	3,200.8	AM
Selenium, Dissolved	ND		mg/l	0.0050	--	1	05/23/19 19:32	05/24/19 01:31	3,200.8	AM
Silver, Dissolved	ND		mg/l	0.0004	--	1	05/23/19 19:32	05/24/19 01:31	3,200.8	AM
Zinc, Dissolved	ND		mg/l	0.0100	--	1	05/23/19 19:32	05/24/19 01:31	3,200.8	AM

Prep Information

Digestion Method: EPA 3005A



Project Name: MBTA GLX NEWBERN AVE II
Project Number: 290762.0016.0000

Lab Number: L1921376
Report Date: 05/29/19

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: WG1240628-1										
Iron, Total	ND		mg/l	0.050	--	1	05/22/19 15:51	05/24/19 10:21	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 Batch: WG1240628-1										
Hardness	ND		mg/l	0.660	NA	1	05/22/19 15:51	05/24/19 10:21	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
Dissolved Metals - Mansfield Lab for sample(s): 01,03,12 Batch: WG1240629-1										
Iron, Dissolved	ND		mg/l	0.050	--	1	05/23/19 19:32	05/24/19 09:29	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
Dissolved Metals - Mansfield Lab for sample(s): 02 Batch: WG1240881-1										
Antimony, Dissolved	ND		mg/l	0.0040	--	1	05/24/19 09:58	05/24/19 14:08	3,200.8	AM
Arsenic, Dissolved	ND		mg/l	0.0010	--	1	05/24/19 09:58	05/24/19 14:08	3,200.8	AM
Cadmium, Dissolved	ND		mg/l	0.0002	--	1	05/24/19 09:58	05/24/19 14:08	3,200.8	AM
Chromium, Dissolved	ND		mg/l	0.0010	--	1	05/24/19 09:58	05/24/19 14:08	3,200.8	AM
Copper, Dissolved	ND		mg/l	0.0010	--	1	05/24/19 09:58	05/24/19 14:08	3,200.8	AM



Project Name: MBTA GLX NEWBERN AVE II**Lab Number:** L1921376**Project Number:** 290762.0016.0000**Report Date:** 05/29/19

Method Blank Analysis Batch Quality Control

Lead, Dissolved	ND	mg/l	0.0010	--	1	05/24/19 09:58	05/24/19 14:08	3,200.8	AM
Nickel, Dissolved	ND	mg/l	0.0020	--	1	05/24/19 09:58	05/24/19 14:08	3,200.8	AM
Selenium, Dissolved	ND	mg/l	0.0050	--	1	05/24/19 09:58	05/24/19 14:08	3,200.8	AM
Silver, Dissolved	ND	mg/l	0.0004	--	1	05/24/19 09:58	05/24/19 14:08	3,200.8	AM
Zinc, Dissolved	ND	mg/l	0.0100	--	1	05/24/19 09:58	05/24/19 14:08	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): 02 Batch: WG1240882-1										
Iron, Dissolved	ND		mg/l	0.050	--	1	05/24/19 09:58	05/24/19 16:01	19,200.7	LC

Prep Information

Digestion Method: EPA 3005A

Lab Control Sample Analysis

Batch Quality Control

Project Name: MBTA GLX NEWBERN AVE II

Project Number: 290762.0016.0000

Lab Number: L1921376

Report Date: 05/29/19

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Total Metals - Mansfield Lab Associated sample(s): 02-03,09 Batch: WG1240555-2								
Iron, Total	106		-		85-115	-		
Total Hardness by SM 2340B - Mansfield Lab Associated sample(s): 02-03,09 Batch: WG1240555-2								
Hardness	106		-		85-115	-		
Total Metals - Mansfield Lab Associated sample(s): 02-03,09,11 Batch: WG1240560-2								
Antimony, Total	96		-		85-115	-		
Arsenic, Total	110		-		85-115	-		
Cadmium, Total	114		-		85-115	-		
Chromium, Total	105		-		85-115	-		
Copper, Total	103		-		85-115	-		
Lead, Total	107		-		85-115	-		
Nickel, Total	106		-		85-115	-		
Selenium, Total	117	Q	-		85-115	-		
Silver, Total	114		-		85-115	-		
Zinc, Total	115		-		85-115	-		

Lab Control Sample Analysis

Batch Quality Control

Project Name: MBTA GLX NEWBERN AVE II

Lab Number: L1921376

Project Number: 290762.0016.0000

Report Date: 05/29/19

Parameter	LCS %Recovery	LCSD %Recovery	%Recovery Limits	RPD	RPD Limits
Total Metals - Mansfield Lab Associated sample(s): 01 Batch: WG1240624-2					
Antimony, Total	102	-	85-115	-	
Arsenic, Total	109	-	85-115	-	
Cadmium, Total	111	-	85-115	-	
Chromium, Total	106	-	85-115	-	
Copper, Total	105	-	85-115	-	
Lead, Total	115	-	85-115	-	
Nickel, Total	106	-	85-115	-	
Selenium, Total	120	Q	85-115	-	
Silver, Total	114	-	85-115	-	
Zinc, Total	107	-	85-115	-	

Lab Control Sample Analysis

Batch Quality Control

Project Name: MBTA GLX NEWBERN AVE II

Project Number: 290762.0016.0000

Lab Number: L1921376

Report Date: 05/29/19

Parameter	LCS %Recovery	LCSD %Recovery	%Recovery Limits	RPD	RPD Limits
Dissolved Metals - Mansfield Lab Associated sample(s): 01,03,12 Batch: WG1240627-2					
Antimony, Dissolved	95	-	85-115	-	
Arsenic, Dissolved	104	-	85-115	-	
Cadmium, Dissolved	108	-	85-115	-	
Chromium, Dissolved	108	-	85-115	-	
Copper, Dissolved	105	-	85-115	-	
Lead, Dissolved	114	-	85-115	-	
Nickel, Dissolved	107	-	85-115	-	
Selenium, Dissolved	118	Q	85-115	-	
Silver, Dissolved	118	Q	85-115	-	
Zinc, Dissolved	115	-	85-115	-	
Total Metals - Mansfield Lab Associated sample(s): 01 Batch: WG1240628-2					
Iron, Total	113	-	85-115	-	
Total Hardness by SM 2340B - Mansfield Lab Associated sample(s): 01 Batch: WG1240628-2					
Hardness	109	-	85-115	-	
Dissolved Metals - Mansfield Lab Associated sample(s): 01,03,12 Batch: WG1240629-2					
Iron, Dissolved	108	-	85-115	-	

Lab Control Sample Analysis

Batch Quality Control

Project Name: MBTA GLX NEWBERN AVE II

Project Number: 290762.0016.0000

Lab Number: L1921376

Report Date: 05/29/19

Parameter	LCS %Recovery	LCSD %Recovery	%Recovery Limits	RPD	RPD Limits
Dissolved Metals - Mansfield Lab Associated sample(s): 02 Batch: WG1240881-2					
Antimony, Dissolved	85	-	85-115	-	
Arsenic, Dissolved	96	-	85-115	-	
Cadmium, Dissolved	102	-	85-115	-	
Chromium, Dissolved	95	-	85-115	-	
Copper, Dissolved	93	-	85-115	-	
Lead, Dissolved	110	-	85-115	-	
Nickel, Dissolved	97	-	85-115	-	
Selenium, Dissolved	86	-	85-115	-	
Silver, Dissolved	100	-	85-115	-	
Zinc, Dissolved	97	-	85-115	-	
Dissolved Metals - Mansfield Lab Associated sample(s): 02 Batch: WG1240882-2					
Iron, Dissolved	108	-	85-115	-	

Matrix Spike Analysis

Batch Quality Control

Project Name: MBTA GLX NEWBERN AVE II
Project Number: 290762.0016.0000

Lab Number: L1921376
Report Date: 05/29/19

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 QC Batch ID: WG1240624-3 QC Sample: L1921376-01 Client ID: GLC-NB-3-1												
Antimony, Total	ND	0.5	0.1542	31	Q	-	-		70-130	-		20
Arsenic, Total	0.01685	0.12	0.1028	72		-	-		70-130	-		20
Cadmium, Total	0.00211	0.051	0.06992	133	Q	-	-		70-130	-		20
Chromium, Total	0.3043	0.2	0.5366	116		-	-		70-130	-		20
Copper, Total	0.2992	0.25	0.6026	121		-	-		70-130	-		20
Lead, Total	0.2637	0.51	0.9280	130		-	-		70-130	-		20
Nickel, Total	0.3793	0.5	0.9630	117		-	-		70-130	-		20
Selenium, Total	ND	0.12	0.08554	71		-	-		70-130	-		20
Silver, Total	0.00091	0.05	0.05888	116		-	-		70-130	-		20
Zinc, Total	0.5655	0.5	1.301	147	Q	-	-		70-130	-		20
Dissolved Metals - Mansfield Lab Associated sample(s): 01,03,12 QC Batch ID: WG1240627-3 QC Sample: L1921376-12 Client ID: GLC-NB-3-2												
Antimony, Dissolved	ND	0.5	0.6775	136	Q	-	-		70-130	-		20
Arsenic, Dissolved	0.0075	0.12	0.1358	107		-	-		70-130	-		20
Cadmium, Dissolved	ND	0.051	0.0618	121		-	-		70-130	-		20
Chromium, Dissolved	ND	0.2	0.2097	105		-	-		70-130	-		20
Copper, Dissolved	0.0032	0.25	0.2611	103		-	-		70-130	-		20
Lead, Dissolved	ND	0.51	0.5755	113		-	-		70-130	-		20
Nickel, Dissolved	0.0063	0.5	0.5372	106		-	-		70-130	-		20
Selenium, Dissolved	ND	0.12	0.1330	111		-	-		70-130	-		20
Silver, Dissolved	ND	0.05	0.0574	115		-	-		70-130	-		20
Zinc, Dissolved	ND	0.5	0.5658	113		-	-		70-130	-		20

Matrix Spike Analysis

Batch Quality Control

Project Name: MBTA GLX NEWBERN AVE II
Project Number: 290762.0016.0000

Lab Number: L1921376
Report Date: 05/29/19

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	MSD Found	MSD %Recovery	Recovery Limits	RPD	RPD Limits
Total Metals - Mansfield Lab Associated sample(s): 01 QC Batch ID: WG1240628-3 QC Sample: L1921376-01 Client ID: GLC-NB-3-1									
Iron, Total	174	1	189	1500	Q	-	75-125	-	20
Total Hardness by SM 2340B - Mansfield Lab Associated sample(s): 01 QC Batch ID: WG1240628-3 QC Sample: L1921376-01 Client ID: GLC-NB-3-1									
Hardness	1320	66.2	1370	76	-	-	75-125	-	20
Dissolved Metals - Mansfield Lab Associated sample(s): 01,03,12 QC Batch ID: WG1240629-3 QC Sample: L1921376-12 Client ID: GLC-NB-3-2									
Iron, Dissolved	ND	1	1.15	115	-	-	75-125	-	20
Dissolved Metals - Mansfield Lab Associated sample(s): 02 QC Batch ID: WG1240881-3 QC Sample: L1921376-02 Client ID: GLC-NB-3-4									
Antimony, Dissolved	ND	1	1.400	140	Q	-	70-130	-	20
Arsenic, Dissolved	ND	0.24	0.2618	109	-	-	70-130	-	20
Cadmium, Dissolved	0.0003	0.102	0.1199	117	-	-	70-130	-	20
Chromium, Dissolved	ND	0.4	0.4251	106	-	-	70-130	-	20
Copper, Dissolved	ND	0.5	0.5329	106	-	-	70-130	-	20
Lead, Dissolved	ND	1.02	1.150	113	-	-	70-130	-	20
Nickel, Dissolved	0.0074	1	1.074	107	-	-	70-130	-	20
Selenium, Dissolved	ND	0.24	0.2641	110	-	-	70-130	-	20
Silver, Dissolved	ND	0.1	0.1144	114	-	-	70-130	-	20
Zinc, Dissolved	ND	1	1.127	113	-	-	70-130	-	20
Dissolved Metals - Mansfield Lab Associated sample(s): 02 QC Batch ID: WG1240882-3 QC Sample: L1921376-02 Client ID: GLC-NB-3-4									
Iron, Dissolved	ND	2	2.17	108	-	-	75-125	-	20

Project Name: MBTA GLX NEWBERN AVE II
Project Number: 290762.0016.0000

Lab Duplicate Analysis
Batch Quality Control

Lab Number: L1921376
Report Date: 05/29/19

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
Total Metals - Mansfield Lab Associated sample(s): 01 QC Batch ID: WG1240624-4 QC Sample: L1921376-01 Client ID: GLC-NB-3-1						
Antimony, Total	ND	ND	mg/l	NC		20
Arsenic, Total	0.01685	0.01682	mg/l	0		20
Cadmium, Total	0.00211	0.00217	mg/l	3		20
Chromium, Total	0.3043	0.3154	mg/l	4		20
Copper, Total	0.2992	0.3188	mg/l	6		20
Lead, Total	0.2637	0.2867	mg/l	8		20
Nickel, Total	0.3793	0.3915	mg/l	3		20
Selenium, Total	ND	ND	mg/l	NC		20
Silver, Total	0.00091	0.00109	mg/l	18		20
Zinc, Total	0.5655	0.5940	mg/l	5		20

Lab Duplicate Analysis *Batch Quality Control*

Project Name: MBTA GLX NEWBERN AVE II
Project Number: 290762.0016.0000

Lab Number: L1921376
Report Date: 05/29/19

Parameter	Native Sample	Duplicate Sample	Units	RPD	RPD Limits
Dissolved Metals - Mansfield Lab Associated sample(s): 01,03,12 QC Batch ID: WG1240627-4 QC Sample: L1921376-12 Client ID: GLC-NB-3-2					
Antimony, Dissolved	ND	ND	mg/l	NC	20
Arsenic, Dissolved	0.0075	0.0078	mg/l	4	20
Cadmium, Dissolved	ND	ND	mg/l	NC	20
Chromium, Dissolved	ND	ND	mg/l	NC	20
Copper, Dissolved	0.0032	0.0032	mg/l	0	20
Lead, Dissolved	ND	ND	mg/l	NC	20
Nickel, Dissolved	0.0063	0.0062	mg/l	1	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
Total Metals - Mansfield Lab Associated sample(s): 01 QC Batch ID: WG1240628-4 QC Sample: L1921376-01 Client ID: GLC-NB-3-1					
Iron, Total	174	177	mg/l	2	20
Total Hardness by SM 2340B - Mansfield Lab Associated sample(s): 01 QC Batch ID: WG1240628-4 QC Sample: L1921376-01 Client ID: GLC-NB-3-1					
Hardness	1320	1330	mg/l	1	20
Dissolved Metals - Mansfield Lab Associated sample(s): 01,03,12 QC Batch ID: WG1240629-4 QC Sample: L1921376-12 Client ID: GLC-NB-3-2					
Iron, Dissolved	ND	ND	mg/l	NC	20

Lab Duplicate Analysis *Batch Quality Control*

Project Name: MBTA GLX NEWBERN AVE II
Project Number: 290762.0016.0000

Lab Number: L1921376
Report Date: 05/29/19

Parameter	Native Sample	Duplicate Sample	Units	RPD	RPD Limits
Dissolved Metals - Mansfield Lab Associated sample(s): 02 QC Batch ID: WG1240881-4 QC Sample: L1921376-02 Client ID: GLC-NB-3-4					
Antimony, Dissolved	ND	ND	mg/l	NC	20
Arsenic, Dissolved	ND	ND	mg/l	NC	20
Cadmium, Dissolved	0.0003	0.0003	mg/l	5	20
Chromium, Dissolved	ND	ND	mg/l	NC	20
Copper, Dissolved	ND	ND	mg/l	NC	20
Lead, Dissolved	ND	ND	mg/l	NC	20
Nickel, Dissolved	0.0074	0.0067	mg/l	9	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): 02 QC Batch ID: WG1240882-4 QC Sample: L1921376-02 Client ID: GLC-NB-3-4					
Iron, Dissolved	ND	ND	mg/l	NC	20

INORGANICS & MISCELLANEOUS

Project Name: MBTA GLX NEWBERN AVE II

Lab Number: L1921376

Project Number: 290762.0016.0000

Report Date: 05/29/19

SAMPLE RESULTS

Lab ID: L1921376-01

Date Collected: 05/21/19 11:00

Client ID: GLC-NB-3-1

Date Received: 05/21/19

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	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total Dissolved	1800		mg/l	10	--	1	-	05/22/19 08:10	121,2540C	DW
Solids, Total Suspended	12000		mg/l	500	NA	100	-	05/22/19 14:45	121,2540D	DR
Cyanide, Dissolved	ND		mg/l	0.005	--	1	05/22/19 10:05	05/22/19 12:53	1,9010C/9012B	LH
Cyanide, Total	ND		mg/l	0.005	--	1	05/22/19 05:30	05/22/19 14:22	121,4500CN-CE	LH
Chlorine, Total Residual	ND		mg/l	0.02	--	1	-	05/22/19 03:09	121,4500CL-D	JW
Nitrogen, Ammonia	0.394		mg/l	0.375	--	5	05/22/19 16:21	05/22/19 21:41	121,4500NH3-BH	AT
Oil & Grease, Hem-Grav	ND		mg/l	4.4	--	1.1	05/22/19 16:30	05/22/19 17:30	74,1664A	ML
TPH, SGT-HEM	ND		mg/l	4.40	--	1.1	05/22/19 16:30	05/22/19 22:00	74,1664A	ML
Phenolics, Total	ND		mg/l	0.030	--	1	05/22/19 09:25	05/22/19 13:58	4,420.1	BR
Chromium, Hexavalent	ND		mg/l	0.010	--	1	05/22/19 03:30	05/22/19 04:00	1,7196A	EJ
Chromium, Hexavalent (Unfiltered)	ND		mg/l	2.00	--	200	05/22/19 05:45	05/22/19 06:35	1,7196A	MA
Anions by Ion Chromatography - Westborough Lab										
Chloride	910.		mg/l	25.0	--	50	-	05/23/19 00:03	44,300.0	JT



Project Name: MBTA GLX NEWBERN AVE II

Lab Number: L1921376

Project Number: 290762.0016.0000

Report Date: 05/29/19

SAMPLE RESULTS

Lab ID: L1921376-02

Date Collected: 05/21/19 12:00

Client ID: GLC-NB-3-4

Date Received: 05/21/19

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	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total Dissolved	1900		mg/l	10	--	1	-	05/22/19 08:10	121,2540C	DW
Solids, Total Suspended	16000		mg/l	500	NA	100	-	05/22/19 14:45	121,2540D	DR
Cyanide, Dissolved	ND		mg/l	0.005	--	1	05/22/19 10:05	05/22/19 12:56	1,9010C/9012B	LH
Cyanide, Total	ND		mg/l	0.005	--	1	05/22/19 05:30	05/22/19 14:23	121,4500CN-CE	LH
Chlorine, Total Residual	ND		mg/l	0.02	--	1	-	05/22/19 03:09	121,4500CL-D	JW
Nitrogen, Ammonia	0.533		mg/l	0.375	--	5	05/22/19 16:21	05/22/19 21:15	121,4500NH3-BH	AT
Oil & Grease, Hem-Grav	ND		mg/l	4.8	--	1.2	05/22/19 16:30	05/22/19 17:30	74,1664A	ML
TPH, SGT-HEM	ND		mg/l	4.80	--	1.2	05/22/19 16:30	05/22/19 22:00	74,1664A	ML
Phenolics, Total	ND		mg/l	0.030	--	1	05/22/19 09:25	05/22/19 13:59	4,420.1	BR
Chromium, Hexavalent	ND		mg/l	0.010	--	1	05/22/19 03:30	05/22/19 04:03	1,7196A	EJ
Chromium, Hexavalent (Unfiltered)	ND		mg/l	0.100	--	10	05/22/19 05:45	05/22/19 06:36	1,7196A	MA
Anions by Ion Chromatography - Westborough Lab										
Chloride	1110		mg/l	25.0	--	50	-	05/23/19 00:15	44,300.0	JT



Project Name: MBTA GLX NEWBERN AVE II

Lab Number: L1921376

Project Number: 290762.0016.0000

Report Date: 05/29/19

SAMPLE RESULTS

Lab ID: L1921376-03

Date Collected: 05/21/19 14:00

Client ID: GLC-NB-2

Date Received: 05/21/19

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	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total Dissolved	410		mg/l	10	--	1	-	05/22/19 08:10	121,2540C	DW
Solids, Total Suspended	410		mg/l	25	NA	5	-	05/22/19 14:45	121,2540D	DR
Cyanide, Dissolved	0.067		mg/l	0.005	--	1	05/22/19 10:05	05/22/19 12:57	1,9010C/9012B	LH
Cyanide, Total	ND		mg/l	0.005	--	1	05/22/19 05:30	05/22/19 14:24	121,4500CN-CE	LH
Chlorine, Total Residual	ND		mg/l	0.02	--	1	-	05/22/19 03:09	121,4500CL-D	JW
Nitrogen, Ammonia	0.295		mg/l	0.075	--	1	05/22/19 16:21	05/22/19 21:16	121,4500NH3-BH	AT
Oil & Grease, Hem-Grav	ND		mg/l	5.2	--	1.3	05/22/19 16:30	05/22/19 17:30	74,1664A	ML
TPH, SGT-HEM	ND		mg/l	5.20	--	1.3	05/22/19 16:30	05/22/19 22:00	74,1664A	ML
Phenolics, Total	ND		mg/l	0.030	--	1	05/23/19 06:27	05/23/19 09:47	4,420.1	BR
Chromium, Hexavalent	ND		mg/l	0.010	--	1	05/22/19 03:30	05/22/19 04:04	1,7196A	EJ
Chromium, Hexavalent (Unfiltered)	ND		mg/l	0.100	--	10	05/22/19 05:45	05/22/19 06:54	1,7196A	MA
Anions by Ion Chromatography - Westborough Lab										
Chloride	182.		mg/l	5.00	--	10	-	05/22/19 22:03	44,300.0	JT



Project Name: MBTA GLX NEWBERN AVE II**Project Number:** 290762.0016.0000**Lab Number:** L1921376**Report Date:** 05/29/19**SAMPLE RESULTS****Lab ID:** L1921376-04**Client ID:** GLC-NB-3-2**Sample Location:** SOMERVILLE, MEDFORD, CAMBRIDGE**Date Collected:** 05/21/19 15:55**Date Received:** 05/21/19**Field Prep:** None**Sample Depth:****Matrix:** Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Microbiological Analysis - Westborough Lab										
E. Coli (MPN)	2.02		MPN/100ml	1	NA	1	-	05/21/19 21:10	121,9223B	AJ



Project Name: MBTA GLX NEWBERN AVE II**Project Number:** 290762.0016.0000**Lab Number:** L1921376**Report Date:** 05/29/19**SAMPLE RESULTS****Lab ID:** L1921376-05**Client ID:** GLC-NB-3-1**Sample Location:** SOMERVILLE, MEDFORD, CAMBRIDGE**Date Collected:** 05/21/19 12:50**Date Received:** 05/21/19**Field Prep:** Not Specified**Sample Depth:****Matrix:** Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Microbiological Analysis - Westborough Lab										
E. Coli (MPN)	115.28		MPN/100ml	1	NA	1	-	05/21/19 21:10	121,9223B	AJ



Project Name: MBTA GLX NEWBERN AVE II**Project Number:** 290762.0016.0000**Lab Number:** L1921376**Report Date:** 05/29/19**SAMPLE RESULTS****Lab ID:** L1921376-07**Client ID:** GLC-NB-3-4**Sample Location:** SOMERVILLE, MEDFORD, CAMBRIDGE**Date Collected:** 05/21/19 13:30**Date Received:** 05/21/19**Field Prep:** Not Specified**Sample Depth:****Matrix:** Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Microbiological Analysis - Westborough Lab										
E. Coli (MPN)	1		MPN/100ml	1	NA	1	-	05/21/19 21:10	121,9223B	AJ



Project Name: MBTA GLX NEWBERN AVE II**Project Number:** 290762.0016.0000**Lab Number:** L1921376**Report Date:** 05/29/19**SAMPLE RESULTS****Lab ID:** L1921376-08**Client ID:** GLC-NB-1**Sample Location:** SOMERVILLE, MEDFORD, CAMBRIDGE**Date Collected:** 05/21/19 15:50**Date Received:** 05/21/19**Field Prep:** Not Specified**Sample Depth:****Matrix:** Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Microbiological Analysis - Westborough Lab										
E. Coli (MPN)	<1		MPN/100ml	1	NA	1	-	05/21/19 21:10	121,9223B	AJ



Project Name: MBTA GLX NEWBERN AVE II
Project Number: 290762.0016.0000

Lab Number: L1921376
Report Date: 05/29/19

SAMPLE RESULTS

Lab ID: L1921376-09
Client ID: GLC-NB-3-2
Sample Location: SOMERVILLE, MEDFORD, CAMBRIDGE

Date Collected: 05/20/19 11:00
Date Received: 05/21/19
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										
Cyanide, Total	ND		mg/l	0.005	--	1	05/22/19 16:45	05/23/19 12:45	121,4500CN-CE	LH
Nitrogen, Ammonia	0.850		mg/l	0.075	--	1	05/22/19 21:15	05/22/19 23:54	121,4500NH3-BH	AT
Oil & Grease, Hem-Grav	ND		mg/l	5.6	--	1.4	05/22/19 16:30	05/22/19 17:30	74,1664A	ML
TPH, SGT-HEM	ND		mg/l	5.60	--	1.4	05/22/19 16:30	05/22/19 22:00	74,1664A	ML
Phenolics, Total	0.039		mg/l	0.030	--	1	05/23/19 06:27	05/23/19 09:52	4,420.1	BR



Project Name: MBTA GLX NEWBERN AVE II**Project Number:** 290762.0016.0000**Lab Number:** L1921376**Report Date:** 05/29/19**SAMPLE RESULTS****Lab ID:** L1921376-11**Client ID:** GLC-NB-3-2**Sample Location:** SOMERVILLE, MEDFORD, CAMBRIDGE**Date Collected:** 05/21/19 15:00**Date Received:** 05/21/19**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 Dissolved	720		mg/l	10	--	1	-	05/23/19 09:00	121,2540C	DW
Solids, Total Suspended	4500		mg/l	170	NA	33.3	-	05/23/19 11:00	121,2540D	DR
Chlorine, Total Residual	ND		mg/l	0.02	--	1	-	05/22/19 14:30	121,4500CL-D	JO
Chromium, Hexavalent (Unfiltered)	ND		mg/l	0.200	--	20	05/22/19 14:35	05/22/19 14:57	1,7196A	LH
Anions by Ion Chromatography - Westborough Lab										
Chloride	182.		mg/l	5.00	--	10	-	05/22/19 22:15	44,300.0	JT



Project Name: MBTA GLX NEWBERN AVE II**Lab Number:** L1921376**Project Number:** 290762.0016.0000**Report Date:** 05/29/19**SAMPLE RESULTS****Lab ID:** L1921376-12**Date Collected:** 05/22/19 12:00**Client ID:** GLC-NB-3-2**Date Received:** 05/22/19**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	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Cyanide, Dissolved	ND		mg/l	0.005	--	1	05/23/19 12:10	05/23/19 14:59	1,9010C/9012B	LH
Chromium, Hexavalent	ND		mg/l	0.010	--	1	05/23/19 00:01	05/23/19 00:34	1,7196A	JW



Project Name: MBTA GLX NEWBERN AVE II**Project Number:** 290762.0016.0000**Lab Number:** L1921376**Report Date:** 05/29/19**SAMPLE RESULTS****Lab ID:** L1921376-13**Client ID:** GLC-NB-3-1**Sample Location:** SOMERVILLE, MEDFORD, CAMBRIDGE**Date Collected:** 05/22/19 12:35**Date Received:** 05/22/19**Field Prep:** None**Sample Depth:****Matrix:** Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Total Organic Carbon	4.81		mg/l	0.500	--	1	-	05/23/19 08:49	121,5310C	DW



Project Name: MBTA GLX NEWBERN AVE II**Project Number:** 290762.0016.0000**Lab Number:** L1921376**Report Date:** 05/29/19**SAMPLE RESULTS****Lab ID:** L1921376-14**Client ID:** GLC-NB-2**Sample Location:** SOMERVILLE, MEDFORD, CAMBRIDGE**Date Collected:** 05/22/19 13:20**Date Received:** 05/22/19**Field Prep:** None**Sample Depth:****Matrix:** Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Total Organic Carbon	2.79		mg/l	0.500	--	1	-	05/23/19 08:49	121,5310C	DW



Project Name: MBTA GLX NEWBERN AVE II**Project Number:** 290762.0016.0000**Lab Number:** L1921376**Report Date:** 05/29/19**SAMPLE RESULTS****Lab ID:** L1921376-15**Client ID:** GLC-NB-3-4**Sample Location:** SOMERVILLE, MEDFORD, CAMBRIDGE**Date Collected:** 05/22/19 14:10**Date Received:** 05/22/19**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										
Total Organic Carbon	1.52		mg/l	0.500	--	1	-	05/23/19 08:49	121,5310C	DW



Project Name: MBTA GLX NEWBERN AVE II
Project Number: 290762.0016.0000

Lab Number: L1921376
Report Date: 05/29/19

Method Blank Analysis
Batch Quality Control

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Microbiological Analysis - Westborough Lab for sample(s): 04-05,07-08 Batch: WG1239683-2										
E. Coli (MPN)	<1		MPN/100ml	1	NA	1	-	05/21/19 21:10	121,9223B	AJ
General Chemistry - Westborough Lab for sample(s): 01-03 Batch: WG1239737-1										
Chlorine, Total Residual	ND		mg/l	0.02	--	1	-	05/22/19 03:09	121,4500CL-D	JW
General Chemistry - Westborough Lab for sample(s): 01-03 Batch: WG1239739-1										
Chromium, Hexavalent	ND		mg/l	0.010	--	1	05/22/19 03:30	05/22/19 03:58	1,7196A	EJ
General Chemistry - Westborough Lab for sample(s): 01-03 Batch: WG1239759-1										
Solids, Total Dissolved	ND		mg/l	10	--	1	-	05/22/19 08:10	121,2540C	DW
General Chemistry - Westborough Lab for sample(s): 01-03 Batch: WG1239761-1										
Cyanide, Total	ND		mg/l	0.005	--	1	05/22/19 05:30	05/22/19 14:14	121,4500CN-CE	LH
General Chemistry - Westborough Lab for sample(s): 01-03 Batch: WG1239770-1										
Chromium, Hexavalent (Unfiltered)	ND		mg/l	0.010	--	1	05/22/19 05:45	05/22/19 06:34	1,7196A	MA
General Chemistry - Westborough Lab for sample(s): 01-03 Batch: WG1239825-1										
Solids, Total Suspended	ND		mg/l	5.0	NA	1	-	05/22/19 14:45	121,2540D	DR
General Chemistry - Westborough Lab for sample(s): 01-03 Batch: WG1239855-1										
Cyanide, Dissolved	ND		mg/l	0.005	--	1	05/22/19 10:05	05/22/19 12:43	1,9010C/9012B	LH
General Chemistry - Westborough Lab for sample(s): 01-02 Batch: WG1239930-1										
Phenolics, Total	ND		mg/l	0.030	--	1	05/22/19 09:25	05/22/19 13:51	4,420.1	BR
General Chemistry - Westborough Lab for sample(s): 01-03 Batch: WG1239939-1										
Nitrogen, Ammonia	ND		mg/l	0.075	--	1	05/22/19 16:21	05/22/19 21:10	121,4500NH3-BH	AT
General Chemistry - Westborough Lab for sample(s): 11 Batch: WG1240006-1										
Chromium, Hexavalent (Unfiltered)	ND		mg/l	0.010	--	1	05/22/19 14:35	05/22/19 14:50	1,7196A	LH
General Chemistry - Westborough Lab for sample(s): 11 Batch: WG1240029-1										
Chlorine, Total Residual	ND		mg/l	0.02	--	1	-	05/22/19 14:30	121,4500CL-D	JO
General Chemistry - Westborough Lab for sample(s): 01-03,09 Batch: WG1240071-1										
Oil & Grease, Hem-Grav	ND		mg/l	4.0	--	1	05/22/19 16:30	05/22/19 17:30	74,1664A	ML
General Chemistry - Westborough Lab for sample(s): 01-03,09 Batch: WG1240076-1										
TPH, SGT-HEM	ND		mg/l	4.00	--	1	05/22/19 16:30	05/22/19 22:00	74,1664A	ML



Project Name: MBTA GLX NEWBERN AVE II**Lab Number:** L1921376**Project Number:** 290762.0016.0000**Report Date:** 05/29/19

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): 09 Batch: WG1240170-1										
Nitrogen, Ammonia	ND		mg/l	0.075	--	1	05/22/19 21:15	05/22/19 23:51	121,4500NH3-BH	AT
General Chemistry - Westborough Lab for sample(s): 12 Batch: WG1240203-1										
Chromium, Hexavalent	ND		mg/l	0.010	--	1	05/23/19 00:01	05/23/19 00:33	1,7196A	JW
Anions by Ion Chromatography - Westborough Lab for sample(s): 01-03,11 Batch: WG1240263-1										
Chloride	ND		mg/l	0.500	--	1	-	05/22/19 16:50	44,300.0	JT
General Chemistry - Westborough Lab for sample(s): 11 Batch: WG1240275-1										
Solids, Total Dissolved	ND		mg/l	10	--	1	-	05/23/19 09:00	121,2540C	DW
General Chemistry - Westborough Lab for sample(s): 13-15 Batch: WG1240277-1										
Total Organic Carbon	ND		mg/l	0.500	--	1	-	05/23/19 08:49	121,5310C	DW
General Chemistry - Westborough Lab for sample(s): 03,09 Batch: WG1240310-1										
Phenolics, Total	ND		mg/l	0.030	--	1	05/23/19 06:27	05/23/19 09:46	4,420.1	BR
General Chemistry - Westborough Lab for sample(s): 11 Batch: WG1240340-1										
Solids, Total Suspended	ND		mg/l	5.0	NA	1	-	05/23/19 11:00	121,2540D	DR
General Chemistry - Westborough Lab for sample(s): 12 Batch: WG1240474-1										
Cyanide, Dissolved	ND		mg/l	0.005	--	1	05/23/19 12:10	05/23/19 14:48	1,9010C/9012B	LH
General Chemistry - Westborough Lab for sample(s): 09 Batch: WG1240984-1										
Cyanide, Total	ND		mg/l	0.005	--	1	05/22/19 16:45	05/23/19 12:31	121,4500CN-CE	LH

Lab Control Sample Analysis **Batch Quality Control**

Project Name: MBTA GLX NEWBERN AVE II

Project Number: 290762.0016.0000

Lab Number: L1921376

Report Date: 05/29/19

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01-03 Batch: WG1239737-2								
Chlorine, Total Residual	92		-		90-110	-		
General Chemistry - Westborough Lab Associated sample(s): 01-03 Batch: WG1239739-2								
Chromium, Hexavalent	101		-		85-115	-		20
General Chemistry - Westborough Lab Associated sample(s): 01-03 Batch: WG1239759-2								
Solids, Total Dissolved	100		-		80-120	-		
General Chemistry - Westborough Lab Associated sample(s): 01-03 Batch: WG1239761-2								
Cyanide, Total	100		-		90-110	-		
General Chemistry - Westborough Lab Associated sample(s): 01-03 Batch: WG1239770-2								
Chromium, Hexavalent (Unfiltered)	100		-		85-115	-		20
General Chemistry - Westborough Lab Associated sample(s): 01-03 Batch: WG1239855-2 WG1239855-3								
Cyanide, Dissolved	93		94		80-120	1		20
General Chemistry - Westborough Lab Associated sample(s): 01-02 Batch: WG1239930-2								
Phenolics, Total	93		-		70-130	-		

Lab Control Sample Analysis

Batch Quality Control

Project Name: MBTA GLX NEWBERN AVE II

Project Number: 290762.0016.0000

Lab Number: L1921376

Report Date: 05/29/19

Parameter	LCS %Recovery	LCSD %Recovery	%Recovery Limits	RPD	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01-03 Batch: WG1239939-2					
Nitrogen, Ammonia	100	-	80-120	-	20
General Chemistry - Westborough Lab Associated sample(s): 11 Batch: WG1240006-2					
Chromium, Hexavalent (Unfiltered)	98	-	85-115	-	20
General Chemistry - Westborough Lab Associated sample(s): 11 Batch: WG1240029-2					
Chlorine, Total Residual	96	-	90-110	-	
General Chemistry - Westborough Lab Associated sample(s): 01-03,09 Batch: WG1240071-2					
Oil & Grease, Hem-Grav	94	-	78-114	-	18
General Chemistry - Westborough Lab Associated sample(s): 01-03,09 Batch: WG1240076-2					
TPH	84	-	64-132	-	34
General Chemistry - Westborough Lab Associated sample(s): 09 Batch: WG1240170-2					
Nitrogen, Ammonia	97	-	80-120	-	20
General Chemistry - Westborough Lab Associated sample(s): 12 Batch: WG1240203-2					
Chromium, Hexavalent	102	-	85-115	-	20

Lab Control Sample Analysis**Batch Quality Control****Project Name:** MBTA GLX NEWBERN AVE II**Project Number:** 290762.0016.0000**Lab Number:** L1921376**Report Date:** 05/29/19

Parameter	LCS %Recovery	LCSD %Recovery	%Recovery Limits	RPD	RPD Limits
Anions by Ion Chromatography - Westborough Lab Associated sample(s): 01-03,11 Batch: WG1240263-2					
Chloride	100	-	90-110	-	
General Chemistry - Westborough Lab Associated sample(s): 11 Batch: WG1240275-2					
Solids, Total Dissolved	85	-	80-120	-	
General Chemistry - Westborough Lab Associated sample(s): 13-15 Batch: WG1240277-2					
Total Organic Carbon	105	-	90-110	-	
General Chemistry - Westborough Lab Associated sample(s): 03,09 Batch: WG1240310-2					
Phenolics, Total	82	-	70-130	-	
General Chemistry - Westborough Lab Associated sample(s): 12 Batch: WG1240474-2 WG1240474-3					
Cyanide, Dissolved	88	98	80-120	11	20
General Chemistry - Westborough Lab Associated sample(s): 09 Batch: WG1240984-2 WG1240984-3					
Cyanide, Total	95	96	90-110	1	

Matrix Spike Analysis

Batch Quality Control

Project Name: MBTA GLX NEWBERN AVE II
Project Number: 290762.0016.0000

Lab Number: L1921376
Report Date: 05/29/19

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	Qual	MSD Found	MSD %Recovery	Qual	Recovery Limits	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01-03 QC Batch ID: WG1239737-4 QC Sample: L1921376-03 Client ID: GLC-NB-2												
Chlorine, Total Residual	ND	0.25	0.24	96		-	-		80-120	-		20
General Chemistry - Westborough Lab Associated sample(s): 01-03 QC Batch ID: WG1239739-4 QC Sample: L1921376-01 Client ID: GLC-NB-3-1												
Chromium, Hexavalent	ND	0.1	0.099	99		-	-		85-115	-		20
General Chemistry - Westborough Lab Associated sample(s): 01-03 QC Batch ID: WG1239770-4 QC Sample: L1921376-03 Client ID: GLC-NB-2												
Chromium, Hexavalent (Unfiltered)	ND	1	0.903	90		-	-		85-115	-		20
General Chemistry - Westborough Lab Associated sample(s): 01-03 QC Batch ID: WG1239855-4 WG1239855-5 QC Sample: L1921376-01 Client ID: GLC-NB-3-1												
Cyanide, Dissolved	ND	0.2	0.199	100		0.197	98		80-120	1		20
General Chemistry - Westborough Lab Associated sample(s): 11 QC Batch ID: WG1240006-4 QC Sample: L1921376-11 Client ID: GLC-NB-3-2												
Chromium, Hexavalent (Unfiltered)	ND	2	1.70	85		-	-		85-115	-		20
General Chemistry - Westborough Lab Associated sample(s): 11 QC Batch ID: WG1240029-4 QC Sample: L1921376-11 Client ID: GLC-NB-3-2												
Chlorine, Total Residual	ND	0.25	0.19	76	Q	-	-		80-120	-		20
General Chemistry - Westborough Lab Associated sample(s): 01-03,09 QC Batch ID: WG1240071-4 QC Sample: L1921376-03 Client ID: GLC-NB-2												
Oil & Grease, Hem-Grav	ND	50	40	81		-	-		78-114	-		18
General Chemistry - Westborough Lab Associated sample(s): 01-03,09 QC Batch ID: WG1240076-4 QC Sample: L1921376-03 Client ID: GLC-NB-2												
TPH	ND	25	19.2	77		-	-		64-132	-		34
General Chemistry - Westborough Lab Associated sample(s): 09 QC Batch ID: WG1240170-4 QC Sample: L1921376-09 Client ID: GLC-NB-3-2												
Nitrogen, Ammonia	0.850	4	5.04	105		-	-		80-120	-		20

Matrix Spike Analysis

Batch Quality Control

Project Name: MBTA GLX NEWBERN AVE II
Project Number: 290762.0016.0000

Lab Number: L1921376
Report Date: 05/29/19

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	MSD Found	MSD %Recovery	Recovery Limits	RPD	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 12 QC Batch ID: WG1240203-4 QC Sample: L1921376-12 Client ID: GLC-NB-3-2									
Chromium, Hexavalent	ND	0.1	0.101	101	-	-	85-115	-	20
General Chemistry - Westborough Lab Associated sample(s): 03,09 QC Batch ID: WG1240310-4 QC Sample: L1921376-03 Client ID: GLC-NB-2									
Phenolics, Total	ND	0.4	0.31	77	-	-	70-130	-	20
General Chemistry - Westborough Lab Associated sample(s): 12 QC Batch ID: WG1240474-4 WG1240474-5 QC Sample: L1921376-12 Client ID: GLC-NB-3-2									
Cyanide, Dissolved	ND	0.2	0.193	96	0.198	99	80-120	3	20

Lab Duplicate Analysis

Batch Quality Control

Project Name: MBTA GLX NEWBERN AVE II
Project Number: 290762.0016.0000

Lab Number: L1921376
Report Date: 05/29/19

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab	Associated sample(s): 01-03	QC Batch ID: WG1239737-3	QC Sample: L1921376-01	Client ID: GLC-NB-3-1		
Chlorine, Total Residual	ND	ND	mg/l	NC		20
General Chemistry - Westborough Lab	Associated sample(s): 01-03	QC Batch ID: WG1239739-3	QC Sample: L1921376-02	Client ID: GLC-NB-3-4		
Chromium, Hexavalent	ND	ND	mg/l	NC		20
General Chemistry - Westborough Lab	Associated sample(s): 01-03	QC Batch ID: WG1239759-3	QC Sample: L1921376-01	Client ID: GLC-NB-3-1		
Solids, Total Dissolved	1800	1800	mg/l	0		10
General Chemistry - Westborough Lab	Associated sample(s): 01-03	QC Batch ID: WG1239770-3	QC Sample: L1921376-02	Client ID: GLC-NB-3-4		
Chromium, Hexavalent (Unfiltered)	ND	ND	mg/l	NC		20
General Chemistry - Westborough Lab	Associated sample(s): 11	QC Batch ID: WG1240006-3	QC Sample: L1921376-11	Client ID: GLC-NB-3-2		
Chromium, Hexavalent (Unfiltered)	ND	ND	mg/l	NC		20
General Chemistry - Westborough Lab	Associated sample(s): 11	QC Batch ID: WG1240029-3	QC Sample: L1921376-11	Client ID: GLC-NB-3-2		
Chlorine, Total Residual	ND	ND	mg/l	NC		20
General Chemistry - Westborough Lab	Associated sample(s): 01-03,09	QC Batch ID: WG1240071-3	QC Sample: L1921376-03	Client ID: GLC-NB-2		
Oil & Grease, Hem-Grav	ND	ND	mg/l	NC		18
General Chemistry - Westborough Lab	Associated sample(s): 01-03,09	QC Batch ID: WG1240076-3	QC Sample: L1921376-03	Client ID: GLC-NB-2		
TPH, SGT-HEM	ND	ND	mg/l	NC		34
General Chemistry - Westborough Lab	Associated sample(s): 09	QC Batch ID: WG1240170-3	QC Sample: L1921376-09	Client ID: GLC-NB-3-2		
Nitrogen, Ammonia	0.850	0.856	mg/l	1		20

Project Name: MBTA GLX NEWBERN AVE II
Project Number: 290762.0016.0000

Lab Duplicate Analysis

Batch Quality Control

Lab Number: L1921376
Report Date: 05/29/19

Parameter	Native Sample	Duplicate Sample	Units	RPD	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 12 QC Batch ID: WG1240203-3 QC Sample: L1921376-12 Client ID: GLC-NB-3-2					
Chromium, Hexavalent	ND	ND	mg/l	NC	20
General Chemistry - Westborough Lab Associated sample(s): 11 QC Batch ID: WG1240275-3 QC Sample: L1921376-11 Client ID: GLC-NB-3-2					
Solids, Total Dissolved	720	730	mg/l	1	10
General Chemistry - Westborough Lab Associated sample(s): 03,09 QC Batch ID: WG1240310-3 QC Sample: L1921376-03 Client ID: GLC-NB-2					
Phenolics, Total	ND	ND	mg/l	NC	20

Project Name: MBTA GLX NEWBERN AVE II**Lab Number:** L1921376**Project Number:** 290762.0016.0000**Report Date:** 05/29/19**Sample Receipt and Container Information**

Were project specific reporting limits specified?

YES

Cooler Information**Cooler Custody Seal**

A	Absent
A1	Absent
B	Absent
B1	Absent
C	Absent
D	Absent
E	Absent
F	Absent
G	Absent
H	Absent

Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L1921376-01A	Vial HCl preserved	B	NA		2.9	Y	Absent		SUB-ETHANOL(14)
L1921376-01B	Vial HCl preserved	B	NA		2.9	Y	Absent		SUB-ETHANOL(14)
L1921376-01C	Vial HCl preserved	B	NA		2.9	Y	Absent		SUB-ETHANOL(14)
L1921376-01D	Vial HCl preserved	B	NA		2.9	Y	Absent		8260(14)
L1921376-01E	Vial HCl preserved	B	NA		2.9	Y	Absent		8260(14)
L1921376-01F	Vial HCl preserved	B	NA		2.9	Y	Absent		8260(14)
L1921376-01G	Vial HCl preserved	B	NA		2.9	Y	Absent		VPH-DELUX-18(14)
L1921376-01H	Vial HCl preserved	B	NA		2.9	Y	Absent		VPH-DELUX-18(14)
L1921376-01I	Vial HCl preserved	B	NA		2.9	Y	Absent		VPH-DELUX-18(14)
L1921376-01J	Vial Na2S2O3 preserved	C	NA		3.5	Y	Absent		504(14)
L1921376-01K	Vial Na2S2O3 preserved	C	NA		3.5	Y	Absent		504(14)
L1921376-01L	Vial Na2S2O3 preserved	C	NA		3.5	Y	Absent		504(14)
L1921376-01M	Vial Na2S2O3 preserved	C	NA		3.5	Y	Absent		624.1-SIM-RGP(7),624.1-RGP(3)

Project Name: MBTA GLX NEWBERN AVE II
Project Number: 290762.0016.0000

Serial_No: 05291917:01
Lab Number: L1921376
Report Date: 05/29/19

Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L1921376-01N	Vial Na2S2O3 preserved	C	NA		3.5	Y	Absent		624.1-SIM-RGP(7),624.1-RGP(3)
L1921376-01O	Vial Na2S2O3 preserved	C	NA		3.5	Y	Absent		624.1-SIM-RGP(7),624.1-RGP(3)
L1921376-01P	Vial Na2S2O3 preserved	C	NA		3.5	Y	Absent		624.1-SIM-RGP(7),624.1-RGP(3)
L1921376-01Q	Vial Na2S2O3 preserved	C	NA		3.5	Y	Absent		624.1-SIM-RGP(7),624.1-RGP(3)
L1921376-01R	Plastic 250ml HNO3 preserved	F	<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),SE-2008T(180),CR-2008T(180),PB-2008T(180),SB-2008T(180)
L1921376-01S	Plastic 250ml HNO3 preserved	F	<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)
L1921376-01S1	Plastic 120ml HNO3 preserved split	F	NA		3.1	Y	Absent		SUB-HG-245S()
L1921376-01T	Plastic 250ml NaOH preserved	G	>12	>12	5.1	Y	Absent		SCN-9010(14)
L1921376-01U	Plastic 250ml NaOH preserved	B	>12	>12	2.9	Y	Absent		TCN-4500(14)
L1921376-01V	Plastic 120ml unpreserved	D	7	7	5.2	Y	Absent		HEXCR-7196(1)
L1921376-01V1	Plastic 120ml HNO3 preserved split	E	7	<2	4.0	N	Absent		SUB-HG-245T()
L1921376-01W	Plastic 950ml unpreserved	E	7	7	4.0	Y	Absent		CL-300(28),HEXCR-7196-UF(1),TRC-4500(1),TDS-2540(7)
L1921376-01W1	Plastic 950ml unpreserved	E	7	7	4.0	Y	Absent		TSS-2540(7)
L1921376-01W2	Plastic 500ml H2SO4 preserved	G	<2	<2	5.1	Y	Absent		NH3-4500(28)
L1921376-01W3	Amber 1000ml H2SO4 preserved	F	<2	<2	3.1	Y	Absent		TPHENOL-420(28)
L1921376-01Y1	Amber 1000ml Na2S2O3	B	7	7	2.9	Y	Absent		PESTICIDE-608.3(7),PCB-608.3(7)
L1921376-01Y2	Amber 1000ml Na2S2O3	A	7	7	3.6	Y	Absent		PESTICIDE-608.3(7),PCB-608.3(7)
L1921376-01Y3	Amber 1000ml Na2S2O3	A	7	7	3.6	Y	Absent		PESTICIDE-608.3(7),PCB-608.3(7)
L1921376-01Y4	Amber 1000ml Na2S2O3	A	7	7	3.6	Y	Absent		PESTICIDE-608.3(7),PCB-608.3(7)
L1921376-01Y6	Amber 1000ml Na2S2O3	G	7	7	5.1	Y	Absent		625.1-RGP(7),625.1-SIM-RGP(7)
L1921376-01Y7	Amber 1000ml Na2S2O3	G	7	7	5.1	Y	Absent		625.1-RGP(7),625.1-SIM-RGP(7)
L1921376-01Y8	Amber 1000ml Na2S2O3	G	7	7	5.1	Y	Absent		625.1-RGP(7),625.1-SIM-RGP(7)
L1921376-01Y9	Amber 1000ml Na2S2O3	G	7	7	5.1	Y	Absent		625.1-RGP(7),625.1-SIM-RGP(7)
L1921376-01Z1	Amber 1000ml HCl preserved	F	<2	<2	3.1	Y	Absent		EPH-10(14)
L1921376-01Z2	Amber 1000ml HCl preserved	B	<2	<2	2.9	Y	Absent		EPH-10(14)

Project Name: MBTA GLX NEWBERN AVE II**Lab Number:** L1921376**Project Number:** 290762.0016.0000**Report Date:** 05/29/19**Container Information**

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L1921376-01Z3	Amber 1000ml HCl preserved	B	<2	<2	2.9	Y	Absent		EPH-10(14)
L1921376-01Z4	Amber 1000ml HCl preserved	B	<2	<2	2.9	Y	Absent		EPH-10(14)
L1921376-01Z5	Amber 1000ml HCl preserved	D	NA		5.2	Y	Absent		OG-1664(28),TPH-1664(28)
L1921376-01Z6	Amber 1000ml HCl preserved	D	NA		5.2	Y	Absent		OG-1664(28),TPH-1664(28)
L1921376-02A1	Vial Na2S2O3 preserved	C	NA		3.5	Y	Absent		504(14)
L1921376-02A2	Vial Na2S2O3 preserved	C	NA		3.5	Y	Absent		504(14)
L1921376-02A3	Vial Na2S2O3 preserved	C	NA		3.5	Y	Absent		504(14)
L1921376-02A4	Vial Na2S2O3 preserved	C	NA		3.5	Y	Absent		504(14)
L1921376-02A5	Vial Na2S2O3 preserved	C	NA		3.5	Y	Absent		624.1-SIM-RGP(7),624.1-RGP(3)
L1921376-02A6	Vial Na2S2O3 preserved	C	NA		3.5	Y	Absent		624.1-SIM-RGP(7),624.1-RGP(3)
L1921376-02A7	Vial Na2S2O3 preserved	C	NA		3.5	Y	Absent		624.1-SIM-RGP(7),624.1-RGP(3)
L1921376-02A8	Vial Na2S2O3 preserved	C	NA		3.5	Y	Absent		624.1-SIM-RGP(7),624.1-RGP(3)
L1921376-02B1	Vial HCl preserved	C	NA		3.5	Y	Absent		8260(14)
L1921376-02B2	Vial HCl preserved	C	NA		3.5	Y	Absent		8260(14)
L1921376-02B3	Vial HCl preserved	C	NA		3.5	Y	Absent		SUB-ETHANOL(14)
L1921376-02C	Plastic 950ml unpreserved	E	7	7	4.0	Y	Absent		TSS-2540(7)
L1921376-02D	Plastic 950ml unpreserved	E	7	7	4.0	Y	Absent		CL-300(28),HEXCR-7196-UF(1),TRC-4500(1),TDS-2540(7)
L1921376-02E	Plastic 120ml unpreserved	D	7	7	5.2	Y	Absent		HEXCR-7196(1)
L1921376-02F1	Plastic 250ml NaOH preserved	B	>12	>12	2.9	Y	Absent		TCN-4500(14)
L1921376-02F2	Plastic 250ml NaOH preserved	G	>12	>12	5.1	Y	Absent		SCN-9010(14)
L1921376-02G	Plastic 500ml H2SO4 preserved	G	<2	<2	5.1	Y	Absent		NH3-4500(28)
L1921376-02H	Plastic 250ml HNO3 preserved	G	<2	<2	5.1	Y	Absent		ARCHIVE()
L1921376-02I	Plastic 250ml HNO3 preserved	G	<2	<2	5.1	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),SE-2008T(180),CR-2008T(180),PB-2008T(180),SB-2008T(180)
L1921376-02I1	Plastic 120ml HNO3 preserved split	G	NA		5.1	Y	Absent		SUB-HG-245T()
L1921376-02J	Amber 1000ml H2SO4 preserved	F	<2	<2	3.1	Y	Absent		TPHENOL-420(28)
L1921376-02K1	Amber 1000ml HCl preserved	D	NA		5.2	Y	Absent		OG-1664(28),TPH-1664(28)

Project Name: MBTA GLX NEWBERN AVE II**Lab Number:** L1921376**Project Number:** 290762.0016.0000**Report Date:** 05/29/19**Container Information**

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L1921376-02K2	Amber 1000ml HCl preserved	D	NA		5.2	Y	Absent		OG-1664(28),TPH-1664(28)
L1921376-02K3	Amber 1000ml HCl preserved	D	<2	<2	5.2	Y	Absent		EPH-10(14)
L1921376-02K4	Amber 1000ml HCl preserved	D	<2	<2	5.2	Y	Absent		EPH-10(14)
L1921376-02K5	Amber 1000ml HCl preserved	D	<2	<2	5.2	Y	Absent		EPH-10(14)
L1921376-02K6	Amber 1000ml HCl preserved	A	<2	<2	3.6	Y	Absent		EPH-10(14)
L1921376-02K7	Amber 1000ml HCl preserved	A	NA		3.6	Y	Absent		OG-1664(28),TPH-1664(28)
L1921376-02K8	Amber 1000ml HCl preserved	A	NA		3.6	Y	Absent		OG-1664(28),TPH-1664(28)
L1921376-02L	Amber 1000ml Na2S2O3	H	7	7	2.8	Y	Absent		PESTICIDE-608.3(7),PCB-608.3(7)
L1921376-02M	Amber 1000ml Na2S2O3	H	7	7	2.8	Y	Absent		PESTICIDE-608.3(7),PCB-608.3(7)
L1921376-02N	Amber 1000ml Na2S2O3	H	7	7	2.8	Y	Absent		PESTICIDE-608.3(7),PCB-608.3(7)
L1921376-02O	Amber 1000ml Na2S2O3	G	7	7	5.1	Y	Absent		PESTICIDE-608.3(7),PCB-608.3(7)
L1921376-02P	Amber 1000ml Na2S2O3	G	7	7	5.1	Y	Absent		625.1-RGP(7),625.1-SIM-RGP(7)
L1921376-02P1	Plastic 120ml HNO3 preserved split	E	NA		4.0	Y	Absent		SUB-HG-245S()
L1921376-02P2	Plastic 120ml HNO3 preserved split	E	NA		4.0	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)
L1921376-02Q	Amber 1000ml Na2S2O3	H	7	7	2.8	Y	Absent		625.1-RGP(7),625.1-SIM-RGP(7)
L1921376-02R	Amber 1000ml Na2S2O3	H	7	7	2.8	Y	Absent		625.1-RGP(7),625.1-SIM-RGP(7)
L1921376-02S	Amber 1000ml Na2S2O3	H	7	7	2.8	Y	Absent		625.1-RGP(7),625.1-SIM-RGP(7)
L1921376-02V	Plastic 120ml unpreserved split	E	7	7	4.0	Y	Absent		-
L1921376-02V1	Plastic 120ml unpreserved split	E	7	7	4.0	Y	Absent		SUB-HG-245S()
L1921376-03A	Plastic 120ml unpreserved	E	7	7	4.0	Y	Absent		HEXCR-7196(1)
L1921376-03A1	Vial HCl preserved	A1	NA		3.0	Y	Absent		8260(14)
L1921376-03B	Plastic 950ml unpreserved	E	7	7	4.0	Y	Absent		CL-300(28),HEXCR-7196-UF(1),TRC-4500(1),TDS-2540(7)
L1921376-03B1	Vial HCl preserved	A1	NA		3.0	Y	Absent		8260(14)
L1921376-03C	Plastic 950ml unpreserved	E	7	7	4.0	Y	Absent		TSS-2540(7)
L1921376-03C1	Vial HCl preserved	A1	NA		3.0	Y	Absent		SUB-ETHANOL(14)
L1921376-03D	Plastic 250ml NaOH preserved	B	>12	>12	2.9	Y	Absent		SCN-9010(14),504(14)
L1921376-03D1	Vial Na2S2O3 preserved	A1	NA		3.0	Y	Absent		504(14)

Project Name: MBTA GLX NEWBERN AVE II**Lab Number:** L1921376**Project Number:** 290762.0016.0000**Report Date:** 05/29/19**Container Information**

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L1921376-03D2	Vial Na2S2O3 preserved	A1	NA		3.0	Y	Absent		504(14)
L1921376-03D3	Vial Na2S2O3 preserved	A1	NA		3.0	Y	Absent		504(14)
L1921376-03D4	Vial Na2S2O3 preserved	A1	NA		3.0	Y	Absent		504(14)
L1921376-03E	Amber 1000ml Na2S2O3	H	7	7	2.8	Y	Absent		PESTICIDE-608.3(7),624.1-SIM-RGP(7),624.1-RGP(3),PCB-608.3(7)
L1921376-03E1	Vial Na2S2O3 preserved	A1	NA		3.0	Y	Absent		624.1-SIM-RGP(7),624.1-RGP(3)
L1921376-03E2	Vial Na2S2O3 preserved	A1	NA		3.0	Y	Absent		624.1-SIM-RGP(7),624.1-RGP(3)
L1921376-03E3	Vial Na2S2O3 preserved	A1	NA		3.0	Y	Absent		624.1-SIM-RGP(7),624.1-RGP(3)
L1921376-03E4	Vial Na2S2O3 preserved	A1	NA		3.0	Y	Absent		624.1-SIM-RGP(7),624.1-RGP(3)
L1921376-03E5	Vial Na2S2O3 preserved	A1	NA		3.0	Y	Absent		624.1-RGP(3)
L1921376-03E6	Vial Na2S2O3 preserved	A1	NA		3.0	Y	Absent		624.1-RGP(3)
L1921376-03E7	Vial Na2S2O3 preserved	A1	NA		3.0	Y	Absent		624.1-RGP(3)
L1921376-03F	Amber 1000ml Na2S2O3	H	7	7	2.8	Y	Absent		PESTICIDE-608.3(7),PCB-608.3(7)
L1921376-03F1	Amber 950ml H2SO4 preserved	A1	<2	<2	3.0	Y	Absent		TPHENOL-420(28)
L1921376-03G	Amber 1000ml Na2S2O3	H	7	7	2.8	Y	Absent		PESTICIDE-608.3(7),PCB-608.3(7)
L1921376-03H	Amber 1000ml Na2S2O3	B	7	7	2.9	Y	Absent		625.1-RGP(7),625.1-SIM-RGP(7)
L1921376-03I	Amber 1000ml Na2S2O3	B	7	7	2.9	Y	Absent		625.1-RGP(7),625.1-SIM-RGP(7)
L1921376-03J	Amber 1000ml Na2S2O3	B	7	7	2.9	Y	Absent		625.1-RGP(7),625.1-SIM-RGP(7)
L1921376-03K1	Amber 1000ml HCl preserved	C	NA		3.5	Y	Absent		OG-1664(28),TPH-1664(28)
L1921376-03K2	Amber 1000ml HCl preserved	B	<2	<2	2.9	Y	Absent		OG-1664(28),TPH-1664(28)
L1921376-03K3	Amber 1000ml HCl preserved	B	<2	<2	2.9	Y	Absent		EPH-10(14)
L1921376-03K4	Amber 1000ml HCl preserved	A	<2	<2	3.6	Y	Absent		EPH-10(14)
L1921376-03K5	Amber 1000ml HCl preserved	A	<2	<2	3.6	Y	Absent		EPH-10(14)
L1921376-03K8	Amber 1000ml Na2S2O3	A1	7	7	3.0	Y	Absent		625.1-RGP(7),625.1-SIM-RGP(7)
L1921376-03K9	Amber 1000ml Na2S2O3	A1	7	7	3.0	Y	Absent		625.1-RGP(7),625.1-SIM-RGP(7)
L1921376-03L	Plastic 250ml unpreserved split	B	7	7	2.9	Y	Absent		ARCHIVE()
L1921376-03M	Plastic 250ml HNO3 preserved split	B	7	<2	2.9	N	Absent		ARCHIVE()
L1921376-03N	Plastic 250ml NaOH preserved split	B	7	>12	2.9	N	Absent		ARCHIVE()
L1921376-03O	Plastic 250ml H2SO4 preserved split	E	7	<2	4.0	N	Absent		ARCHIVE()

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Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L1921376-03P	Plastic 250ml HNO3 preserved	A1	<2	<2	3.0	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)
L1921376-03P1	Plastic 120ml HNO3 preserved split	A1	<2	<2	3.0	Y	Absent		SUB-HG-245S()
L1921376-03Q	Plastic 250ml HNO3 preserved	A1	<2	<2	3.0	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),SE-2008T(180),CR-2008T(180),PB-2008T(180),SB-2008T(180)
L1921376-03Q1	Plastic 120ml HNO3 preserved split	A1	<2	<2	3.0	Y	Absent		SUB-HG-245T()
L1921376-03R	Plastic 500ml H2SO4 preserved	A1	<2	<2	3.0	Y	Absent		NH3-4500(28)
L1921376-03S	Plastic 250ml NaOH preserved	A1	>12	>12	3.0	Y	Absent		TCN-4500(14)
L1921376-03X	Plastic 120ml HNO3 preserved Filtrates	E	<2	<2	4.0	Y	Absent		ARCHIVE()
L1921376-04A	Bacteria Cup Na2S2O3 preserved	B	NA		2.9	Y	Absent		E-COLI-QT(.33)
L1921376-04B	Bacteria Cup Na2S2O3 preserved	D	NA		5.2	Y	Absent		E-COLI-QT(.33)
L1921376-05A	Bacteria Cup Na2S2O3 preserved	D	NA		5.2	Y	Absent		E-COLI-QT(.33)
L1921376-05B	Bacteria Cup Na2S2O3 preserved	D	NA		5.2	Y	Absent		E-COLI-QT(.33)
L1921376-06A	Bacteria Cup Na2S2O3 preserved	D	NA		5.2	Y	Absent		HOLD(14)
L1921376-06B	Bacteria Cup Na2S2O3 preserved	D	NA		5.2	Y	Absent		HOLD(14)
L1921376-07A	Bacteria Cup Na2S2O3 preserved	D	NA		5.2	Y	Absent		E-COLI-QT(.33)
L1921376-07B	Bacteria Cup Na2S2O3 preserved	D	NA		5.2	Y	Absent		E-COLI-QT(.33)
L1921376-08A	Bacteria Cup Na2S2O3 preserved	D	NA		5.2	Y	Absent		E-COLI-QT(.33)
L1921376-08B	Bacteria Cup Na2S2O3 preserved	D	NA		5.2	Y	Absent		E-COLI-QT(.33)
L1921376-09A	Vial HCl preserved	C	NA		3.5	Y	Absent		8260(14)
L1921376-09A1	Amber 1000ml HCl preserved	B1	<2	<2	2.7	Y	Absent		EPH-10(14)
L1921376-09A2	Amber 1000ml HCl preserved	B1	<2	<2	2.7	Y	Absent		EPH-10(14)
L1921376-09B	Vial HCl preserved	C	NA		3.5	Y	Absent		8260(14)
L1921376-09B1	Amber 1000ml HCl preserved	B1	NA		2.7	Y	Absent		OG-1664(28),TPH-1664(28)
L1921376-09B2	Amber 1000ml HCl preserved	B1	NA		2.7	Y	Absent		OG-1664(28),TPH-1664(28)
L1921376-09C	Vial HCl preserved	C	NA		3.5	Y	Absent		8260(14)
L1921376-09D	Vial HCl preserved	C	NA		3.5	Y	Absent		VPH-DELUX-18(14)

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Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L1921376-09D1	Amber 950ml H2SO4 preserved	B1	<2	<2	2.7	Y	Absent		TPHENOL-420(28)
L1921376-09E	Vial HCl preserved	C	NA		3.5	Y	Absent		VPH-DELUX-18(14)
L1921376-09E1	Amber 1000ml Na2S2O3	B1	7	7	2.7	Y	Absent		PESTICIDE-608.3(7)
L1921376-09E2	Amber 1000ml Na2S2O3	B1	7	7	2.7	Y	Absent		PESTICIDE-608.3(7)
L1921376-09E3	Amber 1000ml Na2S2O3	B1	7	7	2.7	Y	Absent		PESTICIDE-608.3(7)
L1921376-09E4	Amber 1000ml HCl preserved	B1	NA		2.7	Y	Absent		TPH-1664(28)
L1921376-09E5	Amber 1000ml Na2S2O3	B1	7	7	2.7	Y	Absent		PCB-608.3(7)
L1921376-09E6	Amber 1000ml Na2S2O3	B1	7	7	2.7	Y	Absent		PCB-608.3(7)
L1921376-09E7	Amber 1000ml Na2S2O3	B1	7	7	2.7	Y	Absent		PCB-608.3(7)
L1921376-09F	Vial HCl preserved	C	NA		3.5	Y	Absent		VPH-DELUX-18(14)
L1921376-09G	Vial HCl preserved	C	NA		3.5	Y	Absent		SUB-ETHANOL(14)
L1921376-09H	Vial HCl preserved	B	NA		2.9	Y	Absent		SUB-ETHANOL(14)
L1921376-09I	Vial Na2S2O3 preserved	C	NA		3.5	Y	Absent		624.1-RGP(3)
L1921376-09J	Vial Na2S2O3 preserved	C	NA		3.5	Y	Absent		624.1-RGP(3)
L1921376-09K	Vial Na2S2O3 preserved	C	NA		3.5	Y	Absent		624.1-RGP(3)
L1921376-09L	Vial Na2S2O3 preserved	C	NA		3.5	Y	Absent		624.1-SIM-RGP(7)
L1921376-09M	Vial Na2S2O3 preserved	C	NA		3.5	Y	Absent		624.1-SIM-RGP(7)
L1921376-09N	Vial Na2S2O3 preserved	C	NA		3.5	Y	Absent		624.1-SIM-RGP(7)
L1921376-09O	Vial Na2S2O3 preserved	C	NA		3.5	Y	Absent		504(14)
L1921376-09P	Vial Na2S2O3 preserved	C	NA		3.5	Y	Absent		504(14)
L1921376-09Q	Vial H2SO4 preserved	C	NA		3.5	Y	Absent		ARCHIVE()
L1921376-09R	Vial H2SO4 preserved	C	NA		3.5	Y	Absent		ARCHIVE()
L1921376-09S	Plastic 250ml NaOH preserved	B	>12	>12	2.9	Y	Absent		TCN-4500(14),ARCHIVE()
L1921376-09T	Plastic 250ml HNO3 preserved	F	<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),SE-2008T(180),ARCHIVE(),CR-2008T(180),PB-2008T(180),SB-2008T(180)
L1921376-09T1	Plastic 120ml HNO3 preserved split	F	<2	<2	3.1	Y	Absent		SUB-HG-245T()
L1921376-09U	Plastic 500ml H2SO4 preserved	G	<2	<2	5.1	Y	Absent		NH3-4500(28)

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Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L1921376-09V	Amber 1000ml Na2S2O3	F	7	7	3.1	Y	Absent		625.1-RGP(7),625.1-SIM-RGP(7)
L1921376-10A	Vial Na2S2O3 preserved	C	NA		3.5	Y	Absent		624.1-SIM-RGP(7),624.1-RGP(3)
L1921376-10B	Vial Na2S2O3 preserved	C	NA		3.5	Y	Absent		624.1-SIM-RGP(7),624.1-RGP(3)
L1921376-10C	Vial Na2S2O3 preserved	C	NA		3.5	Y	Absent		624.1-SIM-RGP(7),624.1-RGP(3)
L1921376-10D	Vial Na2S2O3 preserved	C	NA		3.5	Y	Absent		504(14)
L1921376-10E	Vial Na2S2O3 preserved	C	NA		3.5	Y	Absent		504(14)
L1921376-10F	Vial Na2S2O3 preserved	C	NA		3.5	Y	Absent		504(14)
L1921376-10G	Vial HCl preserved	B	NA		2.9	Y	Absent		VPH-DELUX-18(14)
L1921376-10H	Vial HCl preserved	B	NA		2.9	Y	Absent		8260(14)
L1921376-11A	Plastic 950ml unpreserved	B1	7	7	2.7	Y	Absent		CL-300(28),HEXCR-7196-UF(1),TRC-4500(1),TDS-2540(7)
L1921376-11B	Plastic 250ml unpreserved	B1	7	7	2.7	Y	Absent		TSS-2540(7)
L1921376-12A	Plastic 120ml unpreserved	A	7	7	3.6	Y	Absent		HEXCR-7196(1)
L1921376-12B	Plastic 250ml NaOH preserved Filtrates	A	>12	>12	3.6	Y	Absent		SCN-9010(14)
L1921376-12C	Plastic 250ml HNO3 preserved Filtrates	A	<2	<2	3.6	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)
L1921376-12C1	Plastic 120ml HNO3 preserved split	A	<2	<2	3.6	Y	Absent		SUB-HG-245S()
L1921376-12D	Amber 1000ml HCl preserved	A	<2	<2	3.6	Y	Absent		ARCHIVE()
L1921376-13A	Vial H2SO4 preserved	A	NA		3.6	Y	Absent		TOC-5310(28)
L1921376-13B	Vial H2SO4 preserved	A	NA		3.6	Y	Absent		TOC-5310(28)
L1921376-14A	Vial H2SO4 preserved	A	NA		3.6	Y	Absent		TOC-5310(28)
L1921376-14B	Vial H2SO4 preserved	A	NA		3.6	Y	Absent		TOC-5310(28)
L1921376-14C	Vial H2SO4 preserved	A	NA		3.6	Y	Absent		TOC-5310(28)
L1921376-14D	Vial HCl preserved	A	NA		3.6	Y	Absent		VPH-DELUX-18(14)
L1921376-14E	Vial HCl preserved	A	NA		3.6	Y	Absent		VPH-DELUX-18(14)
L1921376-14F	Vial HCl preserved	A	NA		3.6	Y	Absent		-
L1921376-15A	Vial H2SO4 preserved	A	NA		3.6	Y	Absent		TOC-5310(28)
L1921376-15B	Vial H2SO4 preserved	A	NA		3.6	Y	Absent		TOC-5310(28)
L1921376-15C	Vial H2SO4 preserved	A	NA		3.6	Y	Absent		TOC-5310(28)

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Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L1921376-15D	Vial HCl preserved	A	NA		3.6	Y	Absent		VPH-DELUX-18(14)
L1921376-15E	Vial HCl preserved	A	NA		3.6	Y	Absent		VPH-DELUX-18(14)
L1921376-15F	Vial HCl preserved	A	NA		3.6	Y	Absent		-
L1921376-16A	Vial HCl preserved	A	NA		3.6	Y	Absent		VPH-DELUX-18(14)
L1921376-16B	Vial HCl preserved	A	NA		3.6	Y	Absent		VPH-DELUX-18(14)

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GLOSSARY

Acronyms

DL	- 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 limit of quantitation (LOQ). The DL includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)
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.
LOD	- Limit of Detection: This value represents the level to which a target analyte can reliably be detected for a specific analyte in a specific matrix by a specific method. The LOD includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)
LOQ	- Limit of Quantitation: The value at which an instrument can accurately measure an analyte at a specific concentration. The LOQ includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)
	Limit of Quantitation: The value at which an instrument can accurately measure an analyte at a specific concentration. The LOQ includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)
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. For Method 332.0, the spike recovery is calculated using the native concentration, including estimated values.
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

Report Format: Data Usability Report



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- 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.

PFAS Total: With respect to PFAS analyses, the 'PFAS, Total (5)' result is defined as the summation of results for: PFHpA, PFHxS, PFOA, PFNA and PFOS. If a 'Total' result is requested, the results of its individual components will also be reported.

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 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.
- J** - Estimated value. This represents an estimated concentration for Tentatively Identified Compounds (TICs).
- M** - Reporting Limit (RL) exceeds the MCP CAM Reporting Limit for this analyte.
- ND** - Not detected at the reporting limit (RL) for the sample.
- 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.

Report Format: Data Usability Report



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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.
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- 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.



- 131 Method for the Determination of Volatile Petroleum Hydrocarbons (VPH), MassDEP, February 2018, Revision 2.1 with QC Requirements & Performance Standards for the Analysis of VPH under the Massachusetts Contingency Plan, WSC-CAM-IVA, June 1, 2018.

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.



Alpha Analytical, Inc.Facility: **Company-wide**Department: **Quality Assurance**Title: **Certificate/Approval Program Summary**ID No.: **17873**Revision **12**

Published Date: 10/9/2018 4:58:19 PM

Page 1 of 1

Certification Information

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

Westborough Facility**EPA 624/624.1:** 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 6860:** SCM: Perchlorate**SM4500:** NPW: Amenable Cyanide; 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, **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 300:** Chloride, Sulfate, Nitrate.**EPA 624.1:** Volatile Halocarbons & Aromatics,**EPA 608.3:** 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 625.1:** SVOC (Acid/Base/Neutral Extractables), **EPA 600/4-81-045:** PCB-Oil.**Microbiology:** **SM9223B-Colilert-QT; Enterolert-QT, SM9221E, EPA 1600, EPA 1603.****Mansfield Facility:****Drinking Water****EPA 200.7:** Al, Ba, Cd, Cr, Cu, Fe, 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, Fe, Pb, Mn, Ni, K, Se, Ag, Na, TL, Zn.**EPA 245.1 Hg.****SM2340B**

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

PAGE 1 OF 2

Project Name: MBTA GLX Newbern Ave II

Project Location: Somerville, Medford, Cambridge

Project #: 290762.0016.0000

Project Manager: Diane Stallings

ALPHA Quote #: 7918

Turn-Around Time

☒ Standard ☒ Rush (ONLY IF PRE-APPROVED)

(K*) 2 DAY

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: DStallings@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 email: KMorin@trcsolutions.com, Riyer@trccompanies.com

bayres@trccompanies

[illegible]

PLEASE ANSWER QUESTIONS ABOVE!

Container Type

Preservative

Relinquished By:

Date/Time

Received By:

Date/Time


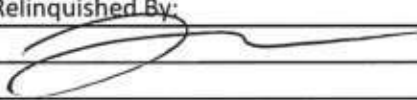
IS YOUR PROJECT MA MCP *or* CT RCP?

FORM NO. 01-0109
REV. 5-1974-129

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.

PAGE 2 OF 2

Page 214 of 249

		Subcontract Chain of Custody Test America (Nashville) 2960 Foster Creighton Drive Nashville, TN 37204		Alpha Job Number L1921376	
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 Turnaround & Deliverables Information Due Date: 05/24/19 Deliverables:		State/Federal Program: Regulatory Criteria:	
Project Specific Requirements and/or Report Requirements					
Reference following Alpha Job Number on final report/deliverables: L1921376				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
	GLC-NB-3-1 GLC-NB-3-4 GLC-NB-2 GLC-NB-3-2	05-21-19 11:00 05-21-19 12:00 05-21-19 14:00 05-20-19 11:00	WATER WATER WATER WATER	Ethanol by EPA 1671 Revision A Ethanol by EPA 1671 Revision A Ethanol by EPA 1671 Revision A Ethanol by EPA 1671 Revision A	
Relinquished By:		Date/Time:		Received By:	Date/Time:
		5/22/19			
Form No: AL_subcoc					



Environment Testing
TestAmerica

ANALYTICAL REPORT

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

Laboratory Job ID: 490-174548-1
Client Project/Site: L1921376

For:

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

Attn: Reports Dept.

Authorized for release by:
5/23/2019 5:39:25 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: L1921376

Job ID: 490-174548-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
490-174548-1	GLC-NB-3-1	Water	05/21/19 11:00	05/23/19 09:05	
490-174548-2	GLC-NB-3-4	Water	05/21/19 12:00	05/23/19 09:05	
490-174548-3	GLC-NB-2	Water	05/21/19 14:00	05/23/19 09:05	
490-174548-4	GLC-NB-3-2	Water	05/20/19 11:00	05/23/19 09:05	

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Case Narrative

Client: Alpha Analytical Inc
Project/Site: L1921376

Job ID: 490-174548-1

Job ID: 490-174548-1

Laboratory: Eurofins TestAmerica, Nashville

Narrative

Job Narrative 490-174548-1

Comments

No additional comments.

Receipt

The samples were received on 5/23/2019 9:05 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 5.7° C.

GC Semi VOA

Method 1671A: Surrogate recovery was outside acceptance limits for the following matrix spike (MS) sample: (490-174494-A-2 MS). The parent sample's surrogate recovery was within limits. The MS sample has been qualified and reported.

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: L1921376

Job ID: 490-174548-1

Qualifiers

GC VOA

Qualifier	Qualifier Description
X	Surrogate is outside control limits

Glossary

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

Client Sample Results

Client: Alpha Analytical Inc
Project/Site: L1921376

Job ID: 490-174548-1

Client Sample ID: GLC-NB-3-1

Lab Sample ID: 490-174548-1

Date Collected: 05/21/19 11:00

Matrix: Water

Date Received: 05/23/19 09:05

Method: 1671A - Ethanol (GC/FID)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ethanol	ND		2000	500	ug/L	-		05/23/19 12:22	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Isopropyl acetate (Surr)	101		70 - 130		05/23/19 12:22	1

Client Sample Results

Client: Alpha Analytical Inc
Project/Site: L1921376

Job ID: 490-174548-1

Client Sample ID: GLC-NB-3-4

Lab Sample ID: 490-174548-2

Date Collected: 05/21/19 12:00

Matrix: Water

Date Received: 05/23/19 09:05

Method: 1671A - Ethanol (GC/FID)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ethanol	ND		2000	500	ug/L	-		05/23/19 12:28	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Isopropyl acetate (Surr)	95		70 - 130		05/23/19 12:28	1

Client Sample Results

Client: Alpha Analytical Inc
Project/Site: L1921376

Job ID: 490-174548-1

Client Sample ID: GLC-NB-2

Lab Sample ID: 490-174548-3

Date Collected: 05/21/19 14:00

Matrix: Water

Date Received: 05/23/19 09:05

Method: 1671A - Ethanol (GC/FID)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ethanol	ND		2000	500	ug/L	-		05/23/19 12:34	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Isopropyl acetate (Surr)	97		70 - 130		05/23/19 12:34	1

Client Sample Results

Client: Alpha Analytical Inc
Project/Site: L1921376

Job ID: 490-174548-1

Client Sample ID: GLC-NB-3-2

Lab Sample ID: 490-174548-4

Date Collected: 05/20/19 11:00

Matrix: Water

Date Received: 05/23/19 09:05

Method: 1671A - Ethanol (GC/FID)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ethanol	ND		2000	500	ug/L	-		05/23/19 12:40	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Isopropyl acetate (Surr)	90		70 - 130		05/23/19 12:40	1

QC Sample Results

Client: Alpha Analytical Inc
Project/Site: L1921376

Job ID: 490-174548-1

Method: 1671A - Ethanol (GC/FID)

Lab Sample ID: MB 490-597177/4

Matrix: Water

Analysis Batch: 597177

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	-		05/23/19 11:27	1
Surrogate	MB %Recovery	MB Qualifier	Limits				Prepared	Analyzed	Dil Fac
Isopropyl acetate (Surr)	97		70 - 130					05/23/19 11:27	1

Lab Sample ID: LCS 490-597177/5

Matrix: Water

Analysis Batch: 597177

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Ethanol			50200	43570		ug/L	-	87	70 - 130
Surrogate	LCS %Recovery	LCS Qualifier	Limits						
Isopropyl acetate (Surr)	101		70 - 130						

Lab Sample ID: LCSD 490-597177/6

Matrix: Water

Analysis Batch: 597177

Client Sample ID: Lab Control Sample Dup

Prep Type: Total/NA

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	Limit
Ethanol			50200	43280		ug/L	-	86	70 - 130	1	20
Surrogate	LCSD %Recovery	LCSD Qualifier	Limits								
Isopropyl acetate (Surr)	103		70 - 130								

Lab Sample ID: 490-174494-A-2 MS

Matrix: Water

Analysis Batch: 597177

Client Sample ID: Matrix Spike

Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Ethanol	ND		50200	38370		ug/L	-	76	70 - 130
Surrogate	MS %Recovery	MS Qualifier	Limits						
Isopropyl acetate (Surr)	67	X	70 - 130						

Lab Sample ID: 490-174494-A-2 MSD

Matrix: Water

Analysis Batch: 597177

Client Sample ID: Matrix Spike Duplicate

Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	Limit
Ethanol	ND		50200	43440		ug/L	-	86	70 - 130	12	20
Surrogate	MSD %Recovery	MSD Qualifier	Limits								
Isopropyl acetate (Surr)	101		70 - 130								

Eurofins TestAmerica, Nashville

QC Association Summary

Client: Alpha Analytical Inc
Project/Site: L1921376

Job ID: 490-174548-1

GC VOA

Analysis Batch: 597177

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-174548-1	GLC-NB-3-1	Total/NA	Water	1671A	
490-174548-2	GLC-NB-3-4	Total/NA	Water	1671A	
490-174548-3	GLC-NB-2	Total/NA	Water	1671A	
490-174548-4	GLC-NB-3-2	Total/NA	Water	1671A	
MB 490-597177/4	Method Blank	Total/NA	Water	1671A	
LCS 490-597177/5	Lab Control Sample	Total/NA	Water	1671A	
LCSD 490-597177/6	Lab Control Sample Dup	Total/NA	Water	1671A	
490-174494-A-2 MS	Matrix Spike	Total/NA	Water	1671A	
490-174494-A-2 MSD	Matrix Spike Duplicate	Total/NA	Water	1671A	

Lab Chronicle

Client: Alpha Analytical Inc
Project/Site: L1921376

Job ID: 490-174548-1

Client Sample ID: GLC-NB-3-1

Lab Sample ID: 490-174548-1

Date Collected: 05/21/19 11:00

Matrix: Water

Date Received: 05/23/19 09:05

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			597177	05/23/19 12:22	ZXS	TAL NSH

Client Sample ID: GLC-NB-3-4

Lab Sample ID: 490-174548-2

Date Collected: 05/21/19 12:00

Matrix: Water

Date Received: 05/23/19 09:05

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			597177	05/23/19 12:28	ZXS	TAL NSH

Client Sample ID: GLC-NB-2

Lab Sample ID: 490-174548-3

Date Collected: 05/21/19 14:00

Matrix: Water

Date Received: 05/23/19 09:05

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			597177	05/23/19 12:34	ZXS	TAL NSH

Client Sample ID: GLC-NB-3-2

Lab Sample ID: 490-174548-4

Date Collected: 05/20/19 11:00

Matrix: Water

Date Received: 05/23/19 09:05

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			597177	05/23/19 12:40	ZXS	TAL NSH

Laboratory References:

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

Method Summary

Client: Alpha Analytical Inc
Project/Site: L1921376

Job ID: 490-174548-1

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

Protocol References:

EPA = US Environmental Protection Agency

Laboratory References:

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

Accreditation/Certification Summary

Client: Alpha Analytical Inc
Project/Site: L1921376

Job ID: 490-174548-1

Laboratory: Eurofins 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
Massachusetts	State Program	1	M-TN032	06-30-19

The following analytes are included in this report, but the laboratory is not certified by the governing authority. This list may include analytes for which the agency does not offer certification.

Analysis Method	Prep Method	Matrix	Analyte
1671A		Water	Ethanol

TestAmericaTHE LEADER IN ENVIRONMENTAL TESTING
Nashville, TN**COOLER RECEIPT FORM**

490-174548 Chain of Custody




Cooler Received/Opened On 05-23-2019 @ 09:05
Time Samples Removed From Cooler 09:24 Time Samples Placed In Storage 09:30 (2 Hour Window)1. Tracking # 1ZE306540191530081 (last 4 digits, FedEx) Courier: UPS NDA
IR Gun ID 31470368 pH Strip Lot N/A Chlorine Strip Lot N/A
2. Temperature of rep. sample or temp blank when opened: 5.7 Degrees Celsius3. If Item #2 temperature is 0°C or less, was the representative sample or temp blank frozen? YES NO...NA4. 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...NA6. Were custody papers inside cooler? YES...NO...NAI certify that I opened the cooler and answered questions 1-6 (initial) ED7. Were custody seals on containers: YES NO and Intact YES...NO...NAWere these signed and dated correctly? YES...NO...NA8. Packing mat'l used? Bubblewrap Plastic bag Peanuts Vermiculite Foam Insert Paper Other None9. Cooling process: Ice Ice-pack Ice (direct contact) Dry ice Other None10. Did all containers arrive in good condition (unbroken)? YES...NO...NA11. Were all container labels complete (#, date, signed, pres., etc)? YES...NO...NA12. Did all container labels and tags agree with custody papers? YES...NO...NA13a. Were VOA vials received? YES...NO...NAb. Was there any observable headspace present in any VOA vial? YES...NO...NA

Larger than this.

14. Was there a Trip Blank in this cooler? YES...NO...NA If multiple coolers, sequence # 1I certify that I unloaded the cooler and answered questions 7-14 (initial) ED15a. On pres'd bottles, did pH test strips suggest preservation reached the correct pH level? YES...NO...NAb. Did the bottle labels indicate that the correct preservatives were used YES...NO...NA16. Was residual chlorine present? YES...NO...NAI certify that I checked for chlorine and pH as per SOP and answered questions 15-16 (initial) ED17. Were custody papers properly filled out (ink, signed, etc)? YES...NO...NA18. Did you sign the custody papers in the appropriate place? YES...NO...NA19. Were correct containers used for the analysis requested? YES...NO...NA20. Was sufficient amount of sample sent in each container? YES...NO...NAI certify that I entered this project into LIMS and answered questions 17-20 (initial) EDI certify that I attached a label with the unique LIMS number to each container (initial) ED21. Were there Non-Conformance issues at login? YES...NO... Was a NCM generated? YES...NO...# _____

		Subcontract Chain of Custody Test America (Nashville) 2960 Foster Creighton Drive Nashville, TN 37204		Alpha Job Number L1921376	
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: 05/24/19 Deliverables:		Regulatory Requirements/Report Limits State/Federal Program: Regulatory Criteria:	
Project Specific Requirements and/or Report Requirements					
Reference following Alpha Job Number on final report/deliverables: L1921376		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
GLC-NB-3-1 GLC-NB-3-4 GLC-NB-2 GLC-NB-3-2		05-21-19 11:00 05-21-19 12:00 05-21-19 14:00 05-20-19 11:00	WATER WATER WATER WATER	Ethanol by EPA 1671 Revision A Ethanol by EPA 1671 Revision A Ethanol by EPA 1671 Revision A Ethanol by EPA 1671 Revision A	Loc: 490 174548
Relinquished By: 		Date/Time: 5/22/19		Received By:  J. Kane	Date/Time: 05-23-2019 09:05
Form No: AL_subcoc					

S.7

Laboratory Report

**Absolute Resource** *associates*

124 Heritage Avenue Portsmouth NH 03801

Ashaley Kane
Alpha Analytical Laboratories
8 Walkup Drive
Westborough, MA 01581

PO Number: None
Job ID: 48786
Date Received: 5/23/19

Project: L1921376

Attached please find results for the analysis of the samples received on the date referenced above.

Unless otherwise noted in the attached report, the analyses performed met the requirements of Absolute Resource Associates' Quality Assurance Plan. The Standard Operating Procedures are based upon USEPA SW-846, USEPA Methods for Chemical Analysis of Water and Wastewater, Standard Methods for the Examination of Water and Wastewater and other recognized methodologies. The results contained in this report pertain only to the samples as indicated on the chain of custody.

Absolute Resource Associates maintains certification with the agencies listed below.

We appreciate the opportunity to provide laboratory services. If you have any questions regarding the enclosed report, please contact the laboratory and we will be glad to assist you.

Sincerely,
Absolute Resource Associates

 (for)

Jennifer Lowe
Laboratory Manager

Date of Approval: 5/24/2019
Total number of pages: 8

Absolute Resource Associates Certifications

New Hampshire 1732
Maine NH903

Massachusetts M-NH902

Project ID: L1921376

Sample Association Table

Field ID	Matrix	Date-Time Sampled	Lab#	Analysis
GLC-NB-3-1	Water	5/21/2019 11:00	48786-001	Mercury in water by 245.1 Rush TAT Surcharge (200%)
GLC-NB-3-4	Water	5/21/2019 12:00	48786-002	Mercury in water by 245.1
GLC-NB-2	Water	5/21/2019 14:00	48786-003	Mercury in water by 245.1
GLC-NB-3-2	Water	5/20/2019 11:00	48786-004	Mercury in water by 245.1
GLC-NB-3-2	Water	5/22/2019 12:00	48786-005	Mercury in water by 245.1
GLC-NB-2-DISS	Water	5/21/2019 14:00	48786-006	Mercury in water by 245.1

Project ID: L1921376**Job ID:** 48786**Sample#:** 48786-001**Sample ID:** GLC-NB-3-1**Matrix:** Water**Sampled:** 5/21/19 11:00

Parameter	Result	Reporting Limit	Units	Instr Dil'n Factor	Analyst	Prep Date	Batch	Analysis Date	Time	Reference
Mercury	< 0.0002	0.0002	mg/L	1	AGN	5/24/19	11708	5/24/19	15:59	E245.1

Sample#: 48786-002**Sample ID:** GLC-NB-3-4**Matrix:** Water**Sampled:** 5/21/19 12:00

Parameter	Result	Reporting Limit	Units	Instr Dil'n Factor	Analyst	Prep Date	Batch	Analysis Date	Time	Reference
Mercury	< 0.0002	0.0002	mg/L	1	AGN	5/24/19	11708	5/24/19	16:01	E245.1

Sample#: 48786-003**Sample ID:** GLC-NB-2**Matrix:** Water**Sampled:** 5/21/19 14:00

Parameter	Result	Reporting Limit	Units	Instr Dil'n Factor	Analyst	Prep Date	Batch	Analysis Date	Time	Reference
Mercury	< 0.0002	0.0002	mg/L	1	AGN	5/24/19	11708	5/24/19	16:03	E245.1

Sample#: 48786-004**Sample ID:** GLC-NB-3-2**Matrix:** Water**Sampled:** 5/20/19 11:00

Parameter	Result	Reporting Limit	Units	Instr Dil'n Factor	Analyst	Prep Date	Batch	Analysis Date	Time	Reference
Mercury	< 0.0002	0.0002	mg/L	1	AGN	5/24/19	11708	5/24/19	16:05	E245.1

Sample#: 48786-005**Sample ID:** GLC-NB-3-2**Matrix:** Water**Sampled:** 5/22/19 12:00

Parameter	Result	Reporting Limit	Units	Instr Dil'n Factor	Analyst	Prep Date	Batch	Analysis Date	Time	Reference
Mercury	< 0.0002	0.0002	mg/L	1	AGN	5/24/19	11708	5/24/19	16:06	E245.1

Sample#: 48786-006**Sample ID:** GLC-NB-2-DISS**Matrix:** Water**Sampled:** 5/21/19 14:00

Parameter	Result	Reporting Limit	Units	Instr Dil'n Factor	Analyst	Prep Date	Batch	Analysis Date	Time	Reference
Mercury	< 0.0002	0.0002	mg/L	1	AGN	5/24/19	11708	5/24/19	16:08	E245.1

Quality Control Report



124 Heritage Avenue Unit 16
Portsmouth, NH 03801

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Case Narrative

Lab # 48786

Sample Receiving and Chain of Custody Discrepancies

Samples were received in acceptable condition, at 2 degrees C, on ice, and in accordance with sample handling, preservation and integrity guidelines.

Calibration

No exceptions noted.

Method Blank

No exceptions noted.

Surrogate Recoveries

Not applicable.

Laboratory Control Sample Results

No exceptions noted.

Matrix Spike/Matrix Spike Duplicate/Duplicate Results

Not requested for this project.

Other

Reporting Limits: Dilutions performed during the analysis are noted on the result pages.

No other exceptions noted.

GLOSSARY

%R	Percent Recovery
BLK	Blank (Method Blank, Preparation Blank)
CCB	Continuing Calibration Blank
CCV	Continuing Calibration Verification
Dil'n	Dilution
DL	Detection Limit
DUP	Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
LOD	Limit of Detection
LOQ	Limit of Quantitation
MB	Methanol Blank (associated with solid VOC samples)
MLCS	Methanol Laboratory Control Sample (associated with solid VOC samples)
MLCSD	Methanol Laboratory Control Sample Duplicate (associated with solid VOC samples)
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PB	Preparation Blank
QC	Quality Control
RL	Reporting Limit
RPD	Relative Percent Difference
SUR	Surrogate


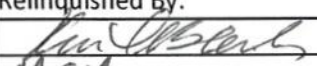
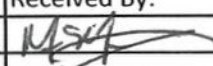

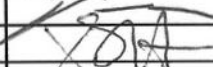




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- QC Report -

Method	QC ID	Parameter	Associated Sample	Result	Units	Amt Added	%R	Limits	RPD	RPD Limit
E245.1	BLK11708	Mercury		< 0.0002	mg/L					
E245.1	DUP11708	Mercury	48719-001	< 0.0002	mg/L					20
E245.1	LCS11708	Mercury		0.0022	mg/L	0.002	110	85 115		
E245.1	LCSD11708	Mercury		0.0022	mg/L	0.002	108	85 115	2	20
E245.1	MS11708	Mercury	48719-001	0.0021	mg/L	0.002	104	85 115		
E245.1	MS11708	Mercury	48739-007	0.0021	mg/L	0.002	105	85 115		

 ALPHA ANALYTICAL <small>World Class Chemistry</small>		Subcontract Chain of Custody		48786		Alpha Job Number L1921376	
		Absolute Resource Associates 124 Heriatge Avenue Portsmouth, NH 03801					
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:			
		Turnaround & Deliverables Information Due Date: 05/24/19 (RUSH) Deliverables:					
Project Specific Requirements and/or Report Requirements							
Reference following Alpha Job Number on final report/deliverables: L1921376				Report to include Method Blank, LCS/LCSD:			
Additional Comments: Send all results/reports to subreports@alphalab.com 24 Hr Rush for Total & Dissolved Hg by 245.1. Dissolved samples Field Filtered.							
Lab ID	Client ID	Collection Date/Time	Sample Matrix	Analysis			Batch QC
48786 Dissolve → 01 02 03 04 05	GLC-NB-3-1 GLC-NB-3-4 GLC-NB-2 GLC-NB-3-2 GLC-NB-3-2	05-21-19 11:00 05-21-19 12:00 05-21-19 14:00 05-20-19 11:00 05-22-19 12:00	WATER WATER WATER WATER WATER	Dissolvedl Mercury by 245.1 Total Mercury by 245.1 Dissolvedl Mercury by 245.1; Total Mercury by 245.1 Total Mercury by 245.1 Dissolvedl Mercury by 245.1			
		Relinquished By:	Date/Time:	Received By:	Date/Time:		
			5/23/19 11:13		5/23/19 11:13		
			5/23/19 1:20		5/23/19 1:20		
			5/23/19 1702		5/23/19 1702		
Form No: AL_subcoc							

on file e jpc

Laboratory Report

**Absolute Resource** *associates*

124 Heritage Avenue Portsmouth NH 03801

Ashaley Kane
Alpha Analytical Laboratories
8 Walkup Drive
Westborough, MA 01581

PO Number: None
Job ID: 48791
Date Received: 5/28/19

Project: L1921376

Attached please find results for the analysis of the samples received on the date referenced above.

Unless otherwise noted in the attached report, the analyses performed met the requirements of Absolute Resource Associates' Quality Assurance Plan. The Standard Operating Procedures are based upon USEPA SW-846, USEPA Methods for Chemical Analysis of Water and Wastewater, Standard Methods for the Examination of Water and Wastewater and other recognized methodologies. The results contained in this report pertain only to the samples as indicated on the chain of custody.

Absolute Resource Associates maintains certification with the agencies listed below.

We appreciate the opportunity to provide laboratory services. If you have any questions regarding the enclosed report, please contact the laboratory and we will be glad to assist you.

Sincerely,
Absolute Resource Associates

A handwritten signature in cursive script that reads "Jennifer Lowe".

Jennifer Lowe
Laboratory Manager

Date of Approval: 5/29/2019
Total number of pages: 8

Absolute Resource Associates Certifications

New Hampshire 1732
Maine NH903

Massachusetts M-NH902

Project ID: L1921376

Sample Association Table

Field ID	Matrix	Date-Time Sampled	Lab#	Analysis
GLC-NB-3-1	Water	5/21/2019 11:00	48791-001	Mercury in water by 245.1 Rush TAT Surcharge (100%)
GLC-NB-3-4	Water	5/21/2019 12:00	48791-002	Mercury in water by 245.1

Project ID: L1921376**Job ID:** 48791**Sample#:** 48791-001**Sample ID:** GLC-NB-3-1**Matrix:** Water**Sampled:** 5/21/19 11:00

Parameter	Result	Reporting Limit	Units	Instr Dil'n Factor	Analyst	Prep Date	Batch	Analysis Date	Time	Reference
Mercury	0.0003	0.0002	mg/L	1	AGN	5/29/19	11715	5/29/19	15:41	E245.1

Sample#: 48791-002**Sample ID:** GLC-NB-3-4**Matrix:** Water**Sampled:** 5/21/19 12:00

Parameter	Result	Reporting Limit	Units	Instr Dil'n Factor	Analyst	Prep Date	Batch	Analysis Date	Time	Reference
Mercury	< 0.0002	0.0002	mg/L	1	AGN	5/29/19	11715	5/29/19	15:43	E245.1

Quality Control Report



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Case Narrative

Lab # 48791

Sample Receiving and Chain of Custody Discrepancies

Samples were received in acceptable condition, at 2 degrees C, on ice, and in accordance with sample handling, preservation and integrity guidelines.

Calibration

No exceptions noted.

Method Blank

No exceptions noted.

Surrogate Recoveries

Not applicable.

Laboratory Control Sample Results

No exceptions noted.

Matrix Spike/Matrix Spike Duplicate/Duplicate Results

Not requested for this project.

Other

Reporting Limits: Dilutions performed during the analysis are noted on the result pages.

No other exceptions noted.

GLOSSARY

%R	Percent Recovery
BLK	Blank (Method Blank, Preparation Blank)
CCB	Continuing Calibration Blank
CCV	Continuing Calibration Verification
Dil'n	Dilution
DL	Detection Limit
DUP	Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
LOD	Limit of Detection
LOQ	Limit of Quantitation
MB	Methanol Blank (associated with solid VOC samples)
MLCS	Methanol Laboratory Control Sample (associated with solid VOC samples)
MLCSD	Methanol Laboratory Control Sample Duplicate (associated with solid VOC samples)
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PB	Preparation Blank
QC	Quality Control
RL	Reporting Limit
RPD	Relative Percent Difference
SUR	Surrogate



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Portsmouth, NH 03801

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- QC Report -

Method	QC ID	Parameter	Associated Sample	Result	Units	Amt Added	%R	Limits	RPD	RPD Limit
E245.1	BLK11715	Mercury		< 0.0002	mg/L					
E245.1	DUP11715	Mercury	48762-001	< 0.0002	mg/L					20
E245.1	LCS11715	Mercury		0.0022	mg/L	0.002	111	80 120		
E245.1	LCSD11715	Mercury		0.0020	mg/L	0.002	100	80 120	10	20
E245.1	MS11715	Mercury	48762-001	0.0020	mg/L	0.002	102	80 120		

Client Information		Project Information		Regulatory Requirements/Report Limits	
Alpha Analytical World Class Chemistry		Subcontract Chain of Custody Absolute Resource Associates 124 Heriatge Avenue Portsmouth, NH 03801		48791 Alpha Job Number L1921376	
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 Turnaround & Deliverables Information Due Date: 05/24/19 (RUSH) Deliverables:		State/Federal Program: Regulatory Criteria:	
Project Specific Requirements and/or Report Requirements					
Reference following Alpha Job Number on final report/deliverables: L1921376				Report to include Method Blank, LCS/LCSD:	
Additional Comments: Send all results/reports to subreports@alphalab.com 24 Hr Rush for Total & Dissolved Hg by 245.1. Dissolved samples Field Filtered.					
Lab ID	Client ID	Collection Date/Time	Sample Matrix	Analysis	Batch QC
48791-01 1-02	GLC-NB-3-1 GLC-NB-3-4 GLC-NB-2 GLC-NB-3-2 GLC-NB-3-2	05-21-19 11:00 05-21-19 12:00 05-21-19 14:00 05-20-19 11:00 05-22-19 12:00	WATER WATER WATER WATER WATER	Dissolved Mercury by 245.1; Total Mercury by 245.1 Dissolved Mercury by 245.1; Total Mercury by 245.1 Dissolved Mercury by 245.1; Total Mercury by 245.1 Total Mercury by 245.1 Dissolved Mercury by 245.1 EXTRACTION SOL 5-23-19 16:31 WATER DNA per A. Kane 5/24/19	
Relinquished By: <i>Paul Masopella</i>		Date/Time: 5/24/19 03:25		Received By: <i>Paul Masopella</i> 5/23/19 2125	
Form No: AL_subcoc		Date/Time: 5/24/19 1425		Date/Time: 5/24/19 0700	
Date/Time: 5/24/19 1542		Date/Time: 5/24/19 2137		Date/Time: 5/24/19 1640	



ANALYTICAL REPORT

Lab Number:	L1920900
Client:	TRC Environmental Consultants 650 Suffolk Street Lowell, MA 01854
ATTN:	Diane Stallings
Phone:	(978) 970-5600
Project Name:	MBTA GLX NEWBERN AVE II
Project Number:	290762.0016.0000
Report Date:	05/24/19

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 NEWBERN AVE II
Project Number: 290762.0016.0000

Lab Number: L1920900
Report Date: 05/24/19

Alpha Sample ID	Client ID	Matrix	Sample Location	Collection Date/Time	Receive Date
L1920900-01	MYSTIC RIVER OUTFALL OF- 50000	WATER	SOMERVILLE, MA	05/17/19 09:20	05/17/19

Project Name: MBTA GLX NEWBERN AVE II
Project Number: 290762.0016.0000

Lab Number: L1920900
Report Date: 05/24/19

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. 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 Outlier Summary Report, located directly after the Case Narrative. QC information is also incorporated in the Data Usability Assessment table (Format 11) of our Data Merger tool, where it can be reviewed in conjunction with the sample result, associated regulatory criteria and any associated data 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.

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 Alpha Project Manager 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 Project Management at 800-624-9220 with any questions.

Project Name: MBTA GLX NEWBERN AVE II
Project Number: 290762.0016.0000

Lab Number: L1920900
Report Date: 05/24/19

Case Narrative (continued)

Report Submission

May 24, 2019: This final report includes the results of all requested analyses.

May 21, 2019: This is a preliminary report.

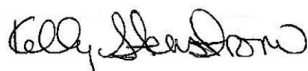
The analysis of Total Mercury was subcontracted. A copy of the laboratory report is included as an addendum.
Please note: This data is only available in PDF format and is not available on Data Merger.

Total Metals

The WG1238678-2 LCS recovery, associated with L1920900-01, is above the acceptance criteria for selenium (122%); however, the associated sample is non-detect for this target analyte. The results of the original analysis are reported.

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:

 Kelly Stenstrom

Title: Technical Director/Representative

Date: 05/24/19

METALS

Project Name: MBTA GLX NEWBERN AVE II**Lab Number:** L1920900**Project Number:** 290762.0016.0000**Report Date:** 05/24/19**SAMPLE RESULTS**

Lab ID: L1920900-01

Date Collected: 05/17/19 09:20

Client ID: MYSTIC RIVER OUTFALL OF-50000

Date Received: 05/17/19

Sample Location: SOMERVILLE, MA

Field Prep: Not Specified

Sample Depth:

Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Antimony, Total	ND		mg/l	0.00400	--	1	05/18/19 13:27	05/18/19 18:46	EPA 3005A	3,200.8	MG
Arsenic, Total	0.00142		mg/l	0.00100	--	1	05/18/19 13:27	05/18/19 18:46	EPA 3005A	3,200.8	MG
Cadmium, Total	ND		mg/l	0.00020	--	1	05/18/19 13:27	05/18/19 18:46	EPA 3005A	3,200.8	MG
Chromium, Total	ND		mg/l	0.00100	--	1	05/18/19 13:27	05/18/19 18:46	EPA 3005A	3,200.8	MG
Copper, Total	0.00350		mg/l	0.00100	--	1	05/18/19 13:27	05/18/19 18:46	EPA 3005A	3,200.8	MG
Iron, Total	2.80		mg/l	0.050	--	1	05/18/19 13:27	05/20/19 13:39	EPA 3005A	19,200.7	LC
Lead, Total	0.00195		mg/l	0.00100	--	1	05/18/19 13:27	05/18/19 18:46	EPA 3005A	3,200.8	MG
Nickel, Total	0.00328		mg/l	0.00200	--	1	05/18/19 13:27	05/18/19 18:46	EPA 3005A	3,200.8	MG
Selenium, Total	ND		mg/l	0.00500	--	1	05/18/19 13:27	05/18/19 18:46	EPA 3005A	3,200.8	MG
Silver, Total	ND		mg/l	0.00040	--	1	05/18/19 13:27	05/18/19 18:46	EPA 3005A	3,200.8	MG
Zinc, Total	0.07583		mg/l	0.01000	--	1	05/18/19 13:27	05/18/19 18:46	EPA 3005A	3,200.8	MG
Total Hardness by SM 2340B - Mansfield Lab											
Hardness	254		mg/l	0.660	NA	1	05/18/19 13:27	05/20/19 13:39	EPA 3005A	19,200.7	LC
General Chemistry - Mansfield Lab											
Chromium, Trivalent	ND		mg/l	0.010	--	1		05/18/19 18:46	NA	107,-	



Project Name: MBTA GLX NEWBERN AVE II
Project Number: 290762.0016.0000

Lab Number: L1920900
Report Date: 05/24/19

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: WG1238678-1										
Iron, Total	ND		mg/l	0.050	--	1	05/18/19 13:27	05/20/19 10:07	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 Batch: WG1238678-1										
Hardness	ND		mg/l	0.660	NA	1	05/18/19 13:27	05/20/19 10:07	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 Batch: WG1238680-1										
Antimony, Total	ND		mg/l	0.00400	--	1	05/18/19 13:27	05/18/19 18:14	3,200.8	MG
Arsenic, Total	ND		mg/l	0.00100	--	1	05/18/19 13:27	05/18/19 18:14	3,200.8	MG
Cadmium, Total	ND		mg/l	0.00020	--	1	05/18/19 13:27	05/18/19 18:14	3,200.8	MG
Chromium, Total	ND		mg/l	0.00100	--	1	05/18/19 13:27	05/18/19 18:14	3,200.8	MG
Copper, Total	ND		mg/l	0.00100	--	1	05/18/19 13:27	05/18/19 18:14	3,200.8	MG
Lead, Total	ND		mg/l	0.00100	--	1	05/18/19 13:27	05/18/19 18:14	3,200.8	MG
Nickel, Total	ND		mg/l	0.00200	--	1	05/18/19 13:27	05/18/19 18:14	3,200.8	MG
Selenium, Total	ND		mg/l	0.00500	--	1	05/18/19 13:27	05/18/19 18:14	3,200.8	MG
Silver, Total	ND		mg/l	0.00040	--	1	05/18/19 13:27	05/18/19 18:14	3,200.8	MG
Zinc, Total	ND		mg/l	0.01000	--	1	05/18/19 13:27	05/18/19 18:14	3,200.8	MG

Prep Information

Digestion Method: EPA 3005A



Lab Control Sample Analysis

Batch Quality Control

Project Name: MBTA GLX NEWBERN AVE II

Project Number: 290762.0016.0000

Lab Number: L1920900

Report Date: 05/24/19

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Total Metals - Mansfield Lab Associated sample(s): 01 Batch: WG1238678-2								
Iron, Total	115		-		85-115	-		
Total Hardness by SM 2340B - Mansfield Lab Associated sample(s): 01 Batch: WG1238678-2								
Hardness	113		-		85-115	-		
Total Metals - Mansfield Lab Associated sample(s): 01 Batch: WG1238680-2								
Antimony, Total	99		-		85-115	-		
Arsenic, Total	106		-		85-115	-		
Cadmium, Total	112		-		85-115	-		
Chromium, Total	102		-		85-115	-		
Copper, Total	102		-		85-115	-		
Lead, Total	113		-		85-115	-		
Nickel, Total	103		-		85-115	-		
Selenium, Total	112		-		85-115	-		
Silver, Total	108		-		85-115	-		
Zinc, Total	115		-		85-115	-		

Matrix Spike Analysis

Batch Quality Control

Project Name: MBTA GLX NEWBERN AVE II
Project Number: 290762.0016.0000

Lab Number: L1920900
Report Date: 05/24/19

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 QC Batch ID: WG1238678-3 QC Sample: L1920160-01 Client ID: MS Sample												
Iron, Total	ND	1	1.27	127	Q	-	-		75-125	-		20
Total Hardness by SM 2340B - Mansfield Lab Associated sample(s): 01 QC Batch ID: WG1238678-3 QC Sample: L1920160-01 Client ID: MS Sample												
Hardness	269	66.2	332	95		-	-		75-125	-		20
Total Metals - Mansfield Lab Associated sample(s): 01 QC Batch ID: WG1238678-7 QC Sample: L1919010-01 Client ID: MS Sample												
Iron, Total	20.4	1	21.0	60	Q	-	-		75-125	-		20
Total Hardness by SM 2340B - Mansfield Lab Associated sample(s): 01 QC Batch ID: WG1238678-7 QC Sample: L1919010-01 Client ID: MS Sample												
Hardness	361	66.2	439	118		-	-		75-125	-		20
Total Metals - Mansfield Lab Associated sample(s): 01 QC Batch ID: WG1238680-3 QC Sample: L1920160-01 Client ID: MS Sample												
Antimony, Total	ND	0.5	0.6450	129		-	-		70-130	-		20
Arsenic, Total	0.00120	0.12	0.1356	112		-	-		70-130	-		20
Cadmium, Total	ND	0.051	0.06162	121		-	-		70-130	-		20
Chromium, Total	ND	0.2	0.2251	112		-	-		70-130	-		20
Copper, Total	0.00477	0.25	0.2789	110		-	-		70-130	-		20
Lead, Total	ND	0.51	0.5886	115		-	-		70-130	-		20
Nickel, Total	ND	0.5	0.5628	112		-	-		70-130	-		20
Selenium, Total	ND	0.12	0.1450	121		-	-		70-130	-		20
Silver, Total	ND	0.05	0.05799	116		-	-		70-130	-		20
Zinc, Total	ND	0.5	0.6031	121		-	-		70-130	-		20

Lab Duplicate Analysis

Batch Quality Control

Project Name: MBTA GLX NEWBERN AVE II

Project Number: 290762.0016.0000

Lab Number: L1920900

Report Date: 05/24/19

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
Total Metals - Mansfield Lab Associated sample(s): 01 QC Batch ID: WG1238678-4 QC Sample: L1920160-01 Client ID: DUP Sample						
Iron, Total	ND	ND	mg/l	NC		20
Total Hardness by SM 2340B - Mansfield Lab Associated sample(s): 01 QC Batch ID: WG1238678-4 QC Sample: L1920160-01 Client ID: DUP Sample						
Hardness	269	265	mg/l	1		20
Total Metals - Mansfield Lab Associated sample(s): 01 QC Batch ID: WG1238680-4 QC Sample: L1920160-01 Client ID: DUP Sample						
Antimony, Total	ND	ND	mg/l	NC		20
Arsenic, Total	0.00120	ND	mg/l	NC		20
Cadmium, Total	ND	ND	mg/l	NC		20
Chromium, Total	ND	ND	mg/l	NC		20
Copper, Total	0.00477	0.00473	mg/l	1		20
Lead, Total	ND	ND	mg/l	NC		20
Nickel, Total	ND	ND	mg/l	NC		20
Selenium, Total	ND	ND	mg/l	NC		20
Silver, Total	ND	ND	mg/l	NC		20
Zinc, Total	ND	ND	mg/l	NC		20

INORGANICS & MISCELLANEOUS

Project Name: MBTA GLX NEWBERN AVE II**Lab Number:** L1920900**Project Number:** 290762.0016.0000**Report Date:** 05/24/19**SAMPLE RESULTS****Lab ID:** L1920900-01**Date Collected:** 05/17/19 09:20**Client ID:** MYSTIC RIVER OUTFALL OF-50000**Date Received:** 05/17/19**Sample Location:** SOMERVILLE, MA**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	1.62		mg/l	0.075	--	1	05/20/19 13:28	05/20/19 17:57	121,4500NH3-BH	ML
Chromium, Hexavalent	ND		mg/l	0.010	--	1	05/18/19 07:55	05/18/19 08:22	1,7196A	JT



Project Name: MBTA GLX NEWBERN AVE II
Project Number: 290762.0016.0000

Lab Number: L1920900
Report Date: 05/24/19

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: WG1238582-1										
Chromium, Hexavalent	ND		mg/l	0.010	--	1	05/18/19 07:55	05/18/19 08:20	1,7196A	JT
General Chemistry - Westborough Lab for sample(s): 01 Batch: WG1239003-1										
Nitrogen, Ammonia	ND		mg/l	0.075	--	1	05/20/19 13:28	05/20/19 17:28	121,4500NH3-BH	ML

Lab Control Sample Analysis

Batch Quality Control

Project Name: MBTA GLX NEWBERN AVE II

Project Number: 290762.0016.0000

Lab Number: L1920900

Report Date: 05/24/19

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01 Batch: WG1238582-2								
Chromium, Hexavalent	102		-		85-115	-		20
General Chemistry - Westborough Lab Associated sample(s): 01 Batch: WG1239003-2								
Nitrogen, Ammonia	94		-		80-120	-		20

Matrix Spike Analysis Batch Quality Control

Project Name: MBTA GLX NEWBERN AVE II

Lab Number: L1920900

Project Number: 290762.0016.0000

Report Date: 05/24/19

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	Qual	MSD Found	MSD %Recovery	Qual	Recovery Limits	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1238582-4 QC Sample: L1920900-01 Client ID: MYSTIC RIVER OUTFALL OF-50000												
Chromium, Hexavalent	ND	0.1	0.098	98		-	-		85-115	-		20
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1239003-4 QC Sample: L1920844-01 Client ID: MS Sample												
Nitrogen, Ammonia	0.284	4	4.17	97		-	-		80-120	-		20

Lab Duplicate Analysis

Batch Quality Control

Project Name: MBTA GLX NEWBERN AVE II
Project Number: 290762.0016.0000

Lab Number: L1920900
Report Date: 05/24/19

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1238582-3 QC Sample: L1920900-01 Client ID: MYSTIC RIVER OUTFALL OF-50000						
Chromium, Hexavalent	ND	ND	mg/l	NC		20
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1239003-3 QC Sample: L1920844-01 Client ID: DUP Sample						
Nitrogen, Ammonia	0.284	0.241	mg/l	16		20

Project Name: MBTA GLX NEWBERN AVE II**Lab Number:** L1920900**Project Number:** 290762.0016.0000**Report Date:** 05/24/19**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(*)
L1920900-01A	Plastic 250ml unpreserved	A	7	7	2.5	Y	Absent		HEXCR-7196(1)
L1920900-01B	Plastic 250ml HNO3 preserved	A	<2	<2	2.5	Y	Absent		CD-2008T(180),NI-2008T(180),SUB-HG-245T(),ZN-2008T(180),CU-2008T(180),FE-UI(180),HARDU(180),AG-2008T(180),AS-2008T(180),SE-2008T(180),CR-2008T(180),PB-2008T(180),SB-2008T(180)
L1920900-01C	Plastic 500ml H2SO4 preserved	A	<2	<2	2.5	Y	Absent		NH3-4500(28)

Project Name: MBTA GLX NEWBERN AVE II
Project Number: 290762.0016.0000

Lab Number: L1920900
Report Date: 05/24/19

GLOSSARY

Acronyms

DL	- 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 limit of quantitation (LOQ). The DL includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)
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.
LOD	- Limit of Detection: This value represents the level to which a target analyte can reliably be detected for a specific analyte in a specific matrix by a specific method. The LOD includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)
LOQ	- Limit of Quantitation: The value at which an instrument can accurately measure an analyte at a specific concentration. The LOQ includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)
	Limit of Quantitation: The value at which an instrument can accurately measure an analyte at a specific concentration. The LOQ includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)
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. For Method 332.0, the spike recovery is calculated using the native concentration, including estimated values.
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

Report Format: Data Usability Report



Project Name: MBTA GLX NEWBERN AVE II
Project Number: 290762.0016.0000

Lab Number: L1920900
Report Date: 05/24/19

- 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.

PFAS Total: With respect to PFAS analyses, the 'PFAS, Total (5)' result is defined as the summation of results for: PFHpA, PFHxS, PFOA, PFNA and PFOS. If a 'Total' result is requested, the results of its individual components will also be reported.

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 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.
- J** - Estimated value. This represents an estimated concentration for Tentatively Identified Compounds (TICs).
- M** - Reporting Limit (RL) exceeds the MCP CAM Reporting Limit for this analyte.
- ND** - Not detected at the reporting limit (RL) for the sample.
- 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.

Report Format: Data Usability Report



Project Name: MBTA GLX NEWBERN AVE II
Project Number: 290762.0016.0000

Lab Number: L1920900
Report Date: 05/24/19

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.



Alpha Analytical, Inc.Facility: **Company-wide**Department: **Quality Assurance**Title: **Certificate/Approval Program Summary**ID No.: **17873**Revision **12**

Published Date: 10/9/2018 4:58:19 PM

Page 1 of 1

Certification Information

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

Westborough Facility**EPA 624/624.1:** 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 6860:** SCM: Perchlorate**SM4500:** NPW: Amenable Cyanide; 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, **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 300:** Chloride, Sulfate, Nitrate. **EPA 624.1:** Volatile Halocarbons & Aromatics,**EPA 608.3:** 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 625.1:** SVOC (Acid/Base/Neutral Extractables), **EPA 600/4-81-045:** PCB-Oil.**Microbiology:** **SM9223B-Colilert-QT; Enterolert-QT, SM9221E, EPA 1600, EPA 1603.****Mansfield Facility:****Drinking Water****EPA 200.7:** Al, Ba, Cd, Cr, Cu, Fe, 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, Fe, Pb, Mn, Ni, K, Se, Ag, Na, TL, Zn.**EPA 245.1 Hg.****SM2340B**

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

[illegible]

Laboratory Report

**Absolute Resource** *associates*

124 Heritage Avenue Portsmouth NH 03801

Ashaley Kane
Alpha Analytical Laboratories
8 Walkup Drive
Westborough, MA 01581

PO Number: None
Job ID: 48785
Date Received: 5/23/19

Project: L1920900

Attached please find results for the analysis of the samples received on the date referenced above.

Unless otherwise noted in the attached report, the analyses performed met the requirements of Absolute Resource Associates' Quality Assurance Plan. The Standard Operating Procedures are based upon USEPA SW-846, USEPA Methods for Chemical Analysis of Water and Wastewater, Standard Methods for the Examination of Water and Wastewater and other recognized methodologies. The results contained in this report pertain only to the samples as indicated on the chain of custody.

Absolute Resource Associates maintains certification with the agencies listed below.

We appreciate the opportunity to provide laboratory services. If you have any questions regarding the enclosed report, please contact the laboratory and we will be glad to assist you.

Sincerely,
Absolute Resource Associates

A handwritten signature in black ink, appearing to read 'JLowe' followed by '(for)' in parentheses.

Jennifer Lowe
Laboratory Manager

Date of Approval: 5/24/2019
Total number of pages: 8

Absolute Resource Associates Certifications

New Hampshire 1732
Maine NH903

Massachusetts M-NH902

Project ID: L1920900

Sample Association Table

Field ID	Matrix	Date-Time Sampled	Lab#	Analysis
MYSTIC RIVER OUTFALL OF-50000	Water	5/17/2019 9:20	48785-001	Mercury in water by 245.1 Rush TAT Surcharge (200%)

Project ID: L1920900**Job ID:** 48785**Sample#:** 48785-001**Sample ID:** MYSTIC RIVER OUTFALL OF-50000**Matrix:** Water**Sampled:** 5/17/19 9:20

Parameter	Reporting		Units	Instr Dil'n	Factor	Analyst	Prep Date	Analysis			Reference
	Result	Limit						Batch	Date	Time	
Mercury	< 0.0002	0.0002	mg/L		1	AGN	5/24/19	11708	5/24/19	15:57	E245.1

Quality Control Report



124 Heritage Avenue Unit 16
Portsmouth, NH 03801

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Absolute Resource

associates

Case Narrative

Lab # 48785

Sample Receiving and Chain of Custody Discrepancies

Samples were received in acceptable condition, at 2 degrees C, on ice, and in accordance with sample handling, preservation and integrity guidelines.

Calibration

No exceptions noted.

Method Blank

No exceptions noted.

Surrogate Recoveries

Not applicable.

Laboratory Control Sample Results

No exceptions noted.

Matrix Spike/Matrix Spike Duplicate/Duplicate Results

Not requested for this project.

Other

Reporting Limits: Dilutions performed during the analysis are noted on the result pages.

No other exceptions noted.

GLOSSARY

%R	Percent Recovery
BLK	Blank (Method Blank, Preparation Blank)
CCB	Continuing Calibration Blank
CCV	Continuing Calibration Verification
Dil'n	Dilution
DL	Detection Limit
DUP	Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
LOD	Limit of Detection
LOQ	Limit of Quantitation
MB	Methanol Blank (associated with solid VOC samples)
MLCS	Methanol Laboratory Control Sample (associated with solid VOC samples)
MLCSD	Methanol Laboratory Control Sample Duplicate (associated with solid VOC samples)
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PB	Preparation Blank
QC	Quality Control
RL	Reporting Limit
RPD	Relative Percent Difference
SUR	Surrogate




124 Heritage Avenue Unit 16
Portsmouth, NH 03801

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- QC Report -

Method	QC ID	Parameter	Associated Sample	Result	Units	Amt Added	%R	Limits	RPD	RPD Limit
E245.1	BLK11708	Mercury		< 0.0002	mg/L					
E245.1	DUP11708	Mercury	48719-001	< 0.0002	mg/L					20
E245.1	LCS11708	Mercury		0.0022	mg/L	0.002	110	85 115		
E245.1	LCSD11708	Mercury		0.0022	mg/L	0.002	108	85 115	2	20
E245.1	MS11708	Mercury	48719-001	0.0021	mg/L	0.002	104	85 115		
E245.1	MS11708	Mercury	48739-007	0.0021	mg/L	0.002	105	85 115		

		Subcontract Chain of Custody Absolute Resource Associates 124 Heriatge Avenue Portsmouth, NH 03801		48785		Alpha Job Number L1920900	
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:			
		Turnaround & Deliverables Information					
		Due Date: 05/24/19 (RUSH) Deliverables:					
Project Specific Requirements and/or Report Requirements							
Reference following Alpha Job Number on final report/deliverables: L1920900				Report to include Method Blank, LCS/LCSD:			
Additional Comments: Send all results/reports to subreports@alphalab.com 24 hr rush							
Lab ID	Client ID	Collection Date/Time	Sample Matrix	Analysis			Batch QC
4878501	MYSTIC RIVER OUTFALL OF-50000	05-17-19 09:20	WATER	Total Mercury by 245.1			
		Relinquished By:	Date/Time:	Received By:	Date/Time:		
		<i>[Signature]</i>	5/23/19 11:13	<i>[Signature]</i>	5/23/19 11:13		
		<i>[Signature]</i>	5/23/19 1220	<i>[Signature]</i>	5/23/19 1345		
		<i>[Signature]</i>	5/23/19 1702	<i>[Signature]</i>	5/23/19 1702		
Form No: AL_subcoc							

Mike C200

ATTACHMENT E
CORRESPONDENCE WITH MASSDEP
REGARDING MYSTIC RIVER

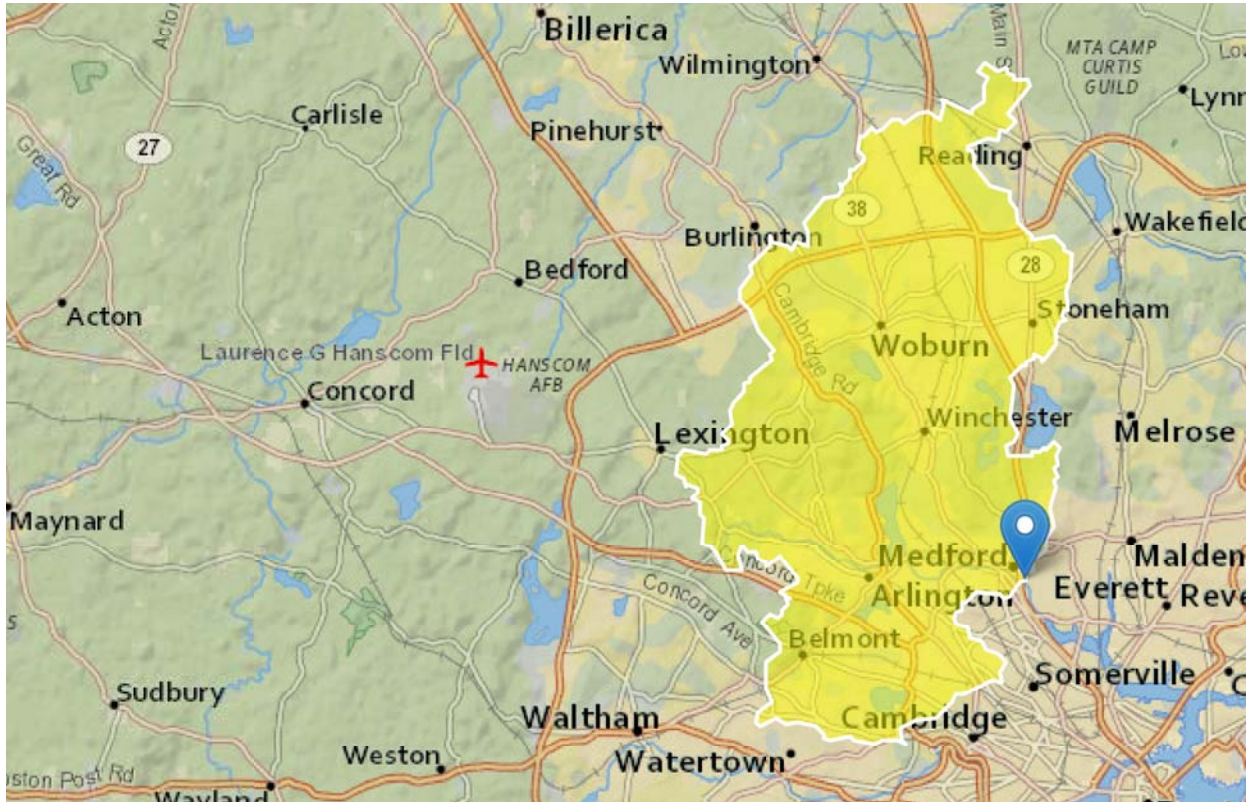
StreamStats Report

Region ID: MA

Workspace ID: MA20190531135109822000

Clicked Point (Latitude, Longitude): 42.41469, -71.10306

Time: 2019-05-31 09:51:26 -0400



Mystic River

Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
DRNAREA	Area that drains to a point on a stream	48.2	square miles
BSLDEM250	Mean basin slope computed from 1:250K DEM	2.429	percent
DRFTPERSTR	Area of stratified drift per unit of stream length	0.26	square mile per mile

Parameter Code	Parameter Description	Value	Unit
MAREGION	Region of Massachusetts 0 for Eastern 1 for Western	0	dimensionless

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

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	48.2	square miles	1.61	149
BSLDEM250	Mean Basin Slope from 250K DEM	2.429	percent	0.32	24.6
DRFTPERSTR	Stratified Drift per Stream Length	0.26	square mile per mile	0	1.29
MAREGION	Massachusetts Region	0	dimensionless	0	1

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

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

Statistic	Value	Unit	PII	Plu	SE	SEp
7 Day 2 Year Low Flow	7.31	ft ³ /s	2.2	23.4	49.5	49.5
7 Day 10 Year Low Flow	3.52	ft ³ /s	0.867	13.3	70.8	70.8

Low-Flow Statistics Citations

Ries, K.G., III, 2000, Methods for estimating low-flow statistics for Massachusetts streams: U.S. Geological Survey Water Resources Investigations Report 00-4135, 81 p. (<http://pubs.usgs.gov/wri/wri004135/>)

USGS Data Disclaimer: Unless otherwise stated, all data, metadata and related materials are considered to satisfy the quality standards relative to the purpose for which the data were collected. Although these data and associated metadata have been reviewed for accuracy and completeness and approved for release by the U.S. Geological Survey (USGS), no warranty expressed or implied is made regarding the display or utility of the data for other purposes, nor on all computer systems, nor shall the act of distribution constitute any such warranty.

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

Application Version: 4.3.1

From: [Vakalopoulos, Catherine \(DEP\)](#)
To: [Stapleton, Jamie](#)
Cc: [Ruan, Xiaodan \(DEP\)](#)
Subject: RE: 7Q10 & DF Confirmation Request: Mystic River
Date: Tuesday, June 4, 2019 5:45:44 PM
Attachments: [image001.png](#)

Hi Jamie,

It seems there is a glitch in StreamStats that classifies the Mystic where the proposed discharge will be as marine. The segment of the Mystic above the Amelia Earhart dam is classified as B (freshwater Class B) and downstream of the dam is classified as SB (marine Class B). I tried calculating the 7Q10 using gage data from 01103040 (Rt. 16 bridge, Medford) but couldn't get a result, perhaps because it was only in service from 2015 to 2017. I think your approach to look upstream where you can get StreamStats to work closest to the proposed discharge is the best you could have done considering the glitch in StreamStats.

Regardless, the proposed discharge will be to an inlet of the Mystic River, not to the mainstem Mystic River. As with other RGP discharges to the Lechmere Canal on the Charles, a dilution factor can't be granted in this inlet in the Mystic due to its shallow and narrow characteristics. If the location of the proposed discharge is moved to the mainstem of the Mystic then I can check your calculation below.

To help you with the NOI, this segment of the Mystic River is identified as MA71-02, is classified (as mentioned above) as Class B, and not an Outstanding Resource Water. There are no approved TMDLs for this segment. To see the list of impairments, go to: https://www.mass.gov/files/documents/2016/08/sa/14list2_0.pdf and search for "MA71-02".

I've probably told you this before but if the site of the proposed project is not a *current* MCP site then you will also have to apply with MassDEP (<https://www.mass.gov/how-to/wm-15-npdes-general-permit-notice-of-intent>) and there is a \$500 fee unless fee exempt (e.g. a municipality).

Please let me know if you have any questions.

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@trccompanies.com]
Sent: Monday, June 03, 2019 8:33 AM
To: Vakalopoulos, Catherine (DEP)
Cc: Ruan, Xiaodan (DEP)
Subject: 7Q10 & DF Confirmation Request: Mystic River

Hi Cathy,

I am requesting confirmation of the below 7Q10 info and dilution factors for a construction dewatering project in Somerville which is proposed to discharge treated groundwater through the municipal stormwater system to the Mystic River. StreamStats does not map to this exact location so the streamstats mapping point (see attachment) is just east of the Route 93 bridge over the Mystic which is almost a mile upstream of the outfall proposed (see attached map) to be used. If you have 7Q10 data for the vicinity of the proposed outfall I can redo the DF calculation.

Discharge Location	Receiving Waterbody	Lat	Long	7Q10 (cfs)			StreamStats Output Link for 7Q10 Entered Into Column F	Treatment Discharge Rate			Dilution Factor
				cfs	gpm	MGD		cfs	gpm	MGD	
Mystic River Near 93 & Mystic Valley Parkway Bridge	Mystic River	42.404576	-71.097035	3.5	1579.9	2.275	See email attachment	0.22	100.0	0.144	16.8

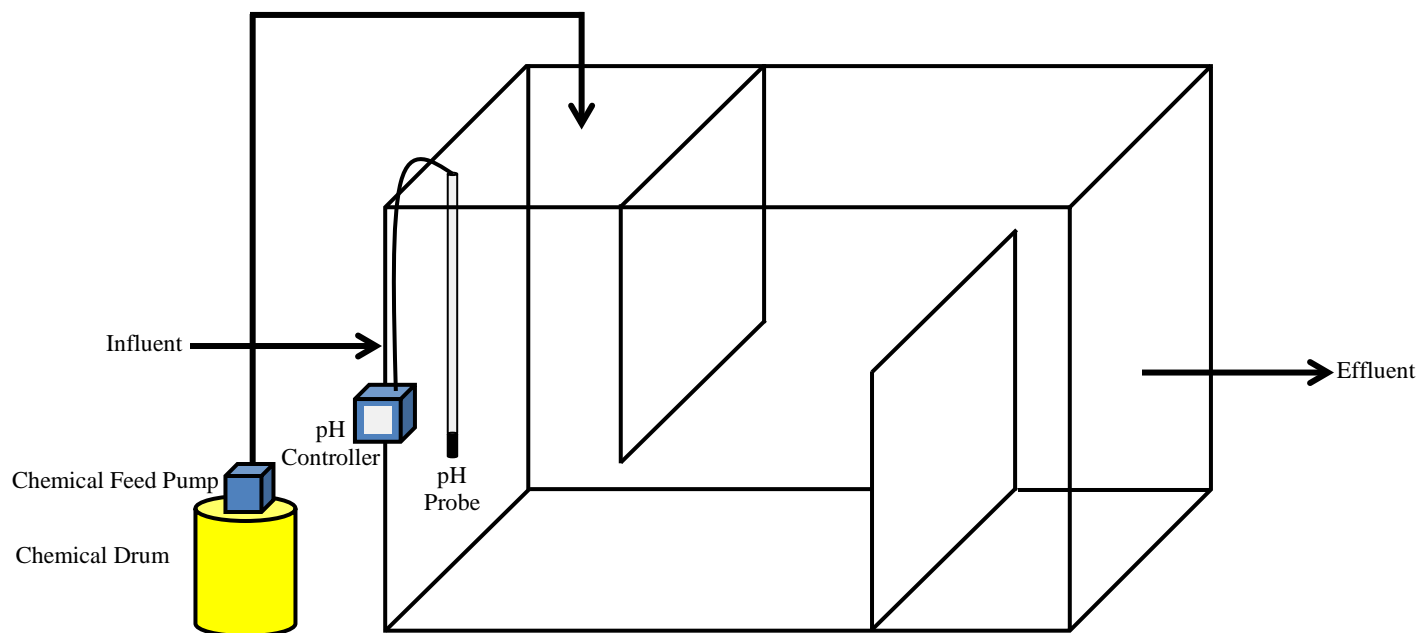
Thank you. -Jamie

Jamie Stapleton
Project Manager / Senior Geologist



670 N. Commercial St, Suite 203, Manchester, NH 03101
C 603-325-5480 | E jstapleton@trccompanies.com
[LinkedIn](#) | [Twitter](#) | [Blog](#) | [TRCcompanies.com](#)

Attachment F – SDS and pH Adjustment Equipment Specifications



Notes:

- 1.) Figure is not to scale.
- 2.) System layout can vary with site conditions.



89 Crawford Street
Leominster, Massachusetts 01453
Tel: 774.450.7177
Fax: 888.835.0617
www.lrt-llc.net

Configuration of pH Adjustment System

SAFETY DATA SHEET

M32415 - ANSI - EN



Occidental Chemical Corporation

A subsidiary of Occidental Petroleum Corporation



CAUSTIC SODA LIQUID (ALL GRADES)

SDS No.: M32415

SDS Revision Date: 13-Jan-2016

SECTION 1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Company Identification:	Occidental Chemical Corporation 5005 LBJ Freeway P.O. Box 809050 Dallas, TX 75380-9050 1-800-752-5151
24 Hour Emergency Telephone Number:	1-800-733-3665 or 1-972-404-3228 (USA); CANUTEC (Canada): 1-613-996-6666; CHEMTREC (within USA and Canada): 1-800-424-9300; CHEMTREC (outside USA and Canada): +1 703-527-3887; CHEMTREC Contract No: CCN16186
To Request an SDS:	MSDS@oxy.com or 1-972-404-3245
Customer Service:	1-800-752-5151 or 1-972-404-3700 (55) 55959542 (Mexico)
Product Identifier:	CAUSTIC SODA LIQUID (ALL GRADES)
Trade Name:	Caustic Soda Diaphragm Grade 10%, 15%, 18%, 20%, 25%, 30%, 35%, 40%, 50%, Caustic Soda Membrane 6%, 18%, 20%, 25%, 30%, 48%, 50%, 50% Caustic Soda Membrane OS, 50% Caustic Soda Diaphragm OS, Caustic Soda Low Salt 50%, Membrane Blended, 50% Caustic Soda Diaphragm (West Coast), Membrane Cell Liquor
Synonyms:	Sodium hydroxide solution, Liquid Caustic, Lye Solution, Caustic, Lye, Soda Lye, Secondary Caustic Soda Liquids
Product Use:	Metal finishing, Cleaner, Process chemical, Petroleum Industry
Uses Advised Against:	None identified

CAUSTIC SODA LIQUID (ALL GRADES)

SDS No.: M32415

SDS Revision Date: 13-Jan-2016

SECTION 2. HAZARDS IDENTIFICATION

OSHA REGULATORY STATUS: This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).

EMERGENCY OVERVIEW:

Color: Colorless to slightly colored
Physical State: Liquid
Appearance: Clear to opaque
Odor: Odorless

Signal Word: **DANGER**

MAJOR HEALTH HAZARDS: CORROSIVE. CAUSES SERIOUS EYE DAMAGE. CAUSES SEVERE SKIN BURNS AND EYE DAMAGE. MAY CAUSE RESPIRATORY IRRITATION. EFFECTS OF CONTACT OR INHALATION MAY BE DELAYED.

PHYSICAL HAZARDS: MAY BE CORROSIVE TO METALS. Mixing with water, acid or incompatible materials may cause splattering and release of heat. Do not store in aluminum container or use aluminum fittings or transfer lines, as flammable hydrogen gas may be generated.

ECOLOGICAL HAZARDS: This material has exhibited moderate toxicity to aquatic organisms. Keep out of water supplies and sewers. This material is alkaline and may raise the pH of surface waters.

PRECAUTIONARY STATEMENTS: Do not get in eyes, on skin, or on clothing. Wear eye protection, face protection, protective gloves. Do not breathe mist, vapors, or spray. Do not ingest. Do not eat, drink or smoke when using this product. Use only outdoors or in a well-ventilated area. Wash thoroughly after handling- exposure can cause burns which are not immediately painful or visible.

ADDITIONAL HAZARD INFORMATION: This material is corrosive. It may cause severe burns and permanent damage to any tissue with which it comes into contact. Toxicity may be delayed, and may not be readily visible. To treat contacted tissue, flush with water to dilute. There is no specific antidote. Significant exposures must be referred for medical attention immediately.

GHS CLASSIFICATION:

GHS: PHYSICAL HAZARDS:	Corrosive to Metals Mixing with water may cause splattering and release of heat
GHS: CONTACT HAZARD - SKIN:	Category 1B - Causes severe skin burns and eye damage.
GHS: CONTACT HAZARD - EYE:	Category 1 - Causes serious eye damage

CAUSTIC SODA LIQUID (ALL GRADES)**SDS No.:** M32415**SDS Revision Date:** 13-Jan-2016

GHS: TARGET ORGAN TOXICITY (SINGLE EXPOSURE):	Category 3 - May cause respiratory irritation
GHS: CARCINOGENICITY:	Not classified as a carcinogen per GHS criteria. This product is not classified as a carcinogen by NTP, IARC or OSHA.
GHS: HAZARDOUS TO AQUATIC ENVIRONMENT - ACUTE HAZARD:	Category 3 - Harmful to aquatic life

UNKNOWN ACUTE TOXICITY: 100% of the mixture consists of ingredient(s) of unknown toxicity. There is no acute toxicity data available for this product.

GHS SYMBOL: Corrosive**GHS SIGNAL WORD:** **DANGER****GHS HAZARD STATEMENTS:****GHS - Physical Hazard Statement(s)**

- May be corrosive to metals

GHS - Health Hazard Statement(s)

- Causes serious eye damage
- Causes severe skin burns and eye damage
- May cause respiratory irritation

GHS - Precautionary Statement(s) - Prevention

- Do not breathe mist, vapors, or spray
- Wear protective gloves, protective clothing, eye, and face protection
- Wash thoroughly after handling
- Keep only in original container
- Use only outdoors or in a well-ventilated area

GHS - Precautionary Statement(s) - Response

- IF ON SKIN (or hair): Remove/Take off Immediately all contaminated clothing. Rinse SKIN with water/shower
- Wash contaminated clothing before reuse
- IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing
- Immediately call a POISON CENTER or doctor/physician
- IF INHALED: Remove person to fresh air and keep comfortable for breathing
- Immediately call a POISON CENTER or doctor/physician
- IF SWALLOWED: Rinse mouth. Do NOT induce vomiting
- IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician
- Specific treatment (see First Aid information on product label and/or Section 4 of the SDS)
- Absorb spillage to prevent material damage

CAUSTIC SODA LIQUID (ALL GRADES)

SDS No.: M32415

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GHS - Precautionary Statement(s) - Storage

- Store locked up
- Store in a well-ventilated place. Keep container tightly closed
- Store in corrosive resistant and NON-ALUMINUM container with a resistant inner liner (NOTE: flammable hydrogen gas may be generated if aluminum container and/or aluminum fittings are used)

GHS - Precautionary Statement(s) - Disposal

- Dispose of contents and container in accordance with applicable local, regional, national, and/or international regulations

Hazards Not Otherwise Classified (HNOC)

Mixing with water may cause splattering and release of heat

Additional Hazard Information

Mixing with water may cause splattering and release of heat.

See Section 11: TOXICOLOGICAL INFORMATION

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Synonyms: Sodium hydroxide solution, Liquid Caustic, Lye Solution, Caustic, Lye, Soda Lye, Secondary Caustic Soda Liquids

Component	Percent [%]	CAS Number
Water	48.5 - 94.5	7732-18-5
Sodium Hydroxide	5.5 - 51.5	1310-73-2
Sodium Chloride	0 - 35	7647-14-5

Notes: All hazardous and non-hazardous components of product composition are listed.

SECTION 4. FIRST AID MEASURES

INHALATION: If inhalation of mists, vapors, or spray occurs and adverse effects result, remove to uncontaminated area. Evaluate ABC's (is Airway constricted, is Breathing occurring, and is blood Circulating) and treat symptomatically. GET MEDICAL ATTENTION IMMEDIATELY. There is no specific antidote, treat symptomatically.

SKIN CONTACT: Immediately flush contaminated areas with water. Remove contaminated clothing, jewelry, and shoes immediately. Wash contaminated areas with large amounts of water. GET MEDICAL ATTENTION IMMEDIATELY. Thoroughly clean and dry contaminated clothing before reuse. Discard contaminated leather goods.

EYE CONTACT: Immediately flush contaminated eyes with a directed stream of water for as long as possible. Remove contact lenses, if present and easy to do. Continue rinsing. GET MEDICAL ATTENTION IMMEDIATELY. Washing eyes within several seconds is essential to achieve maximum effectiveness.

CAUSTIC SODA LIQUID (ALL GRADES)

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INGESTION: If swallowed, do not induce vomiting. For definite or probable ingestion, do not administer oral fluids. If vomiting occurs spontaneously, keep airway clear. Monitor airway. Volume resuscitation (IV fluids) and circulatory support (CPR) may be required. Never give anything by mouth to an unconscious or convulsive person. GET MEDICAL ATTENTION IMMEDIATELY.

Most Important Symptoms/Effects (Acute and Delayed) Corrosive. This material may be corrosive to any tissue it comes in contact with. It can cause serious burns and extensive tissue destruction resulting in: liquefaction, necrosis, and/or perforation.

Acute Symptoms/Effects: Listed below.

Inhalation (Breathing): Respiratory System Effects: Exposure to airborne material may cause irritation, redness of upper and lower airways, coughing, laryngospasm, shortness of breath, bronchoconstriction, and possible pulmonary edema. Severe and permanent scarring may occur. Pulmonary edema may develop several hours after a severe acute exposure. Aspiration of this material may cause the same conditions.

Skin: Skin Corrosion. Exposure to skin may cause redness, itching, irritation, swelling, burns (first, second, or third degree), liquefaction of skin, and damage to underlying tissues (deep and painful wounds).

Eye: Serious Eye Damage. Eye exposures may cause eye lid burns, conjunctivitis, corneal edema, corneal burn, corneal perforation, damage to internal contents of the eye, permanent visual defects, and blindness and/or loss of the eye.

Ingestion (Swallowing): Gastrointestinal System Effects: Exposure by ingestion may cause irritation, swelling, and perforation of upper and lower gastrointestinal tissues. Permanent scarring may occur.

Delayed Symptoms/Effects:

- Skin: Repeated and prolonged skin contact may cause a chronic dermatitis

Interaction with Other Chemicals Which Enhance Toxicity: None known.

Medical Conditions Aggravated by Exposure: May aggravate preexisting conditions such as: eye disorders that decrease tear production or have reduced integrity of the eye; skin disorders that compromise the integrity of the skin; and respiratory conditions including asthma and other breathing disorders.

Protection of First-Aiders: Protect yourself by avoiding contact with this material. Avoid contact with skin and eyes. Do not breathe vapors or spray mist. Do not ingest. Use personal protective equipment. Refer to Section 8 for specific personal protective equipment recommendations. At minimum, treating personnel should utilize PPE sufficient for prevention of bloodborne pathogen transmission.

Notes to Physician: Medical observation and assessment is recommended for all ingestions, all eye exposures, and symptomatic inhalation and dermal exposures. For symptomatic ingestion, do not administer oral fluids and consider investigation by endoscopy, X-ray, or CT scan. Esophageal perforation, airway compromise, hypotension, and shock are possible. For prolonged exposures and significant exposures, consider delayed injury to exposed tissues. There is no antidote. Treatment is supportive care. Follow normal parameters for airway, breathing, and circulation. Surgical intervention may be required.

SECTION 5. FIRE-FIGHTING MEASURES

CAUSTIC SODA LIQUID (ALL GRADES)

SDS No.: M32415

SDS Revision Date: 13-Jan-2016

Fire Hazard: Non-combustible, substance itself does not burn but may decompose upon heating to produce corrosive and/or toxic fumes. May react with chemically reactive metals such as aluminum, zinc, magnesium, copper, etc. to release hydrogen gas which can form explosive mixtures in air.

Extinguishing Media: Use extinguishing agents appropriate for surrounding fire.

Fire Fighting: Move container from fire area if it can be done without risk. Cool containers with water. Do not apply water directly on this product. Heat is generated when mixed with water. Wear NIOSH approved positive-pressure self-contained breathing apparatus operated in pressure demand mode. Avoid contact with skin.

Component	Immediately Dangerous to Life/ Health (IDLH)
Sodium Hydroxide 1310-73-2	10 mg/m ³ IDLH

Hazardous Combustion Products: Sodium hydroxide fumes can be generated by thermal decomposition at elevated temperatures

Sensitivity to Mechanical Impact: Not sensitive.

Sensitivity to Static Discharge: Not sensitive.

Lower Flammability Level (air): Not flammable

Upper Flammability Level (air): Not flammable

Flash point: Not flammable

Auto-ignition Temperature: Not applicable

GHS: PHYSICAL HAZARDS:

- Corrosive to Metals
- Mixing with water may cause splattering and release of heat

SECTION 6. ACCIDENTAL RELEASE MEASURES**Personal Precautions:**

Do not get in eyes, on skin or on clothing. Avoid breathing mist, vapor, or spray. Do not ingest. Wear appropriate personal protective equipment recommended in Section 8 of the SDS.

Methods and Materials for Containment and Cleaning Up:

In case of spill or leak, stop the leak as soon as possible, if safe to do so. Completely contain spilled materials with dikes, sandbags, etc. Shovel dry material into suitable container. Liquid material may be removed with a vacuum truck. Remaining material may be diluted with water and neutralized with dilute acid, then absorbed and collected. Flush spill area with water, if appropriate.

Environmental Precautions:

Keep out of water supplies and sewers. Do not flush into surface water or sanitary sewer system. This material is alkaline and may raise the pH of surface waters with low buffering capacity. Releases should be reported, if required, to appropriate agencies.

CAUSTIC SODA LIQUID (ALL GRADES)

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SECTION 7. HANDLING AND STORAGE**Precautions for Safe Handling:**

Avoid breathing vapor or mist. Do not get in eyes, on skin, or on clothing. Wash thoroughly after handling. Do not ingest. Do not eat, drink or smoke in areas where this material is used. Wear personal protective equipment as described in Exposure Controls/Personal Protection (Section 8) of the SDS. NEVER add water to product. When mixing, slowly add to water to minimize heat generation and spattering.

Safe Storage Conditions:

Store and handle in accordance with all current regulations and standards. Keep container tightly closed and properly labeled. Do not store in aluminum container or use aluminum fittings or transfer lines, as flammable hydrogen gas may be generated. Keep separated from incompatible substances (see below or Section 10 of the Safety Data Sheet).

Incompatibilities/ Materials to Avoid:

Acids and halogenated compounds, Prolonged contact with aluminum, brass, bronze, copper, lead, tin, zinc or other alkali sensitive metals or alloys, Releases heat when diluted in water

GHS: PHYSICAL HAZARDS:

- Corrosive to Metals
- Mixing with water may cause splattering and release of heat

SECTION 8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Regulatory Exposure Limit(s): Listed below for the product components that have regulatory occupational exposure limits (OEL's).

Component	OSHA Final PEL TWA	OSHA Final PEL STEL	OSHA Final PEL Ceiling
Sodium Hydroxide 1310-73-2	2 mg/m ³	-----	-----

OEL: Occupational Exposure Limit; OSHA: United States Occupational Safety and Health Administration; PEL: Permissible Exposure Limit; TWA: Time Weighted Average; STEL: Short Term Exposure Limit

NON-REGULATORY EXPOSURE LIMIT(S): Listed below for the product components that have non-regulatory occupational exposure limits (OEL's).

Component	ACGIH TWA	ACGIH STEL	ACGIH Ceiling	OSHA TWA (Vacated)	OSHA STEL (Vacated)	OSHA Ceiling (Vacated)
Sodium Hydroxide	-----	-----	2 mg/m ³	-----	-----	2 mg/m ³

- The Non-Regulatory United States Occupational Safety and Health Administration (OSHA) limits, if shown, are the Vacated 1989 PEL's (vacated by 58 FR 35338, June 30, 1993).

CAUSTIC SODA LIQUID (ALL GRADES)**SDS No.:** M32415**SDS Revision Date:** 13-Jan-2016

- The American Conference of Governmental Industrial Hygienists (ACGIH) is a voluntary organization of professional industrial hygiene personnel in government or educational institutions in the United States. The ACGIH develops and publishes recommended occupational exposure limits each year called Threshold Limit Values (TLVs) for hundreds of chemicals, physical agents, and biological exposure indices.

Component	OXY REL 8 hr TWA	OXY REL STEL	OXY REL Ceiling
Sodium Chloride 7647-14-5 (0 - 35)	-----	-----	-----

ENGINEERING CONTROLS: Provide local exhaust ventilation where dust or mist may be generated. Ensure compliance with applicable exposure limits.

PERSONAL PROTECTIVE EQUIPMENT:

Eye Protection: Wear chemical safety goggles with a face-shield to protect against eye and skin contact when appropriate. Provide an emergency eye wash fountain and quick drench shower in the immediate work area.

Skin and Body Protection: Wear protective clothing to minimize skin contact. Wear chemical resistant clothing and rubber boots when potential for contact with the material exists. Always place pants legs over boots. Contaminated clothing should be removed, then discarded or laundered. Discard contaminated leather goods.

Hand Protection: Wear appropriate chemical resistant gloves. Consult a glove supplier for assistance in selecting an appropriate chemical resistant glove.

Protective Material Types:

- Natural rubber
- Neoprene
- Nitrile
- Polyvinyl chloride (PVC)
- Tyvek®
- Tychem®

Respiratory Protection: A NIOSH approved respirator with N95 (dust, fume, mist) cartridges may be permissible under certain circumstances where airborne concentrations are expected to exceed exposure limits, or when symptoms have been observed that are indicative of overexposure. If eye irritation occurs, a full face style mask should be used. A respiratory protection program that meets 29 CFR 1910.134 must be followed whenever workplace conditions warrant use of a respirator.

Component	Immediately Dangerous to Life/ Health (IDLH)
Sodium Hydroxide 1310-73-2	10 mg/m ³ IDLH

HYGIENE MEASURES: Handle in accordance with good industrial hygiene and safety practices. Wash hands and affected skin immediately after handling, before breaks, and at the end of the workday. When using do not eat or drink. When using do not smoke.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

CAUSTIC SODA LIQUID (ALL GRADES)

SDS No.: M32415

SDS Revision Date: 13-Jan-2016

Physical State:	Liquid
Appearance:	Clear to opaque
Color:	Colorless to slightly colored
Odor:	Odorless
Odor Threshold [ppm]:	No data available.
Molecular Weight:	40.01
Molecular Formula:	NaOH
Decomposition Temperature:	No data available
Boiling Point/Range:	215 - 291°F (102 - 144°C)
Freezing Point/Range:	-26 to 59°F (-32 to 15 °C).
Vapor Pressure:	13 - 135 mmHg @ 60 °C
Vapor Density (air=1):	No data available
Relative Density/Specific Gravity (water=1):	1.05 – 1.56 @ 15.6 °C
Density:	8.8 - 13.0 lbs/gal @ 15.6 °C
Water Solubility:	100%
pH:	14.0 (theoretical value of 7.5% solution)
Volatility:	No data available
Evaporation Rate (ether=1):	No data available
Partition Coefficient (n-octanol/water):	No data available
Flash point:	Not flammable
Flammability (solid, gas):	Not flammable
Lower Flammability Level (air):	Not flammable
Upper Flammability Level (air):	Not flammable
Auto-ignition Temperature:	Not applicable
Viscosity:	About 24cp for 50% solution at 40 °C (104 °F)

SECTION 10. STABILITY AND REACTIVITY

Reactivity: Soluble in water, releasing heat sufficient to ignite combustibles. Reacts with metals, and may form hydrogen gas.

Chemical Stability: Stable at normal temperatures and pressures.

Possibility of Hazardous Reactions:

Mixing with water, acid, or incompatible materials may cause splattering and release of large amounts of heat. Will react with some metals forming flammable hydrogen gas. Carbon monoxide gas may form upon contact with reducing sugars, food and beverage products in enclosed spaces.

Conditions to Avoid: (e.g., static discharge, shock, or vibration) -. None known.

Incompatibilities/ Materials to Avoid: Acids and halogenated compounds. Prolonged contact with aluminum, brass, bronze, copper, lead, tin, zinc or other alkali sensitive metals or alloys. Releases heat when diluted in water.

Hazardous Decomposition Products: Toxic fumes of sodium oxide

Hazardous Polymerization: Will not occur.

CAUSTIC SODA LIQUID (ALL GRADES)

SDS No.: M32415

SDS Revision Date: 13-Jan-2016

SECTION 11. TOXICOLOGICAL INFORMATION

IRRITATION DATA: PRIMARY SKIN IRRITATION: Severe Irritation, Corrosive (rabbit, 24 hr)
PRIMARY EYE IRRITATION: Severe Irritation, Corrosive (rabbit, 24 hr)

TOXICITY DATA:**PRODUCT TOXICITY DATA: CAUSTIC SODA LIQUID (ALL GRADES)**

<u>LD50 Oral:</u> No reliable data available	<u>LD50 Dermal:</u> No reliable data available	<u>LC50 Inhalation:</u> No data available
--	--	---

COMPONENT TOXICITY DATA:

Note: The component toxicity data is populated by the LOLI database and may differ from the product toxicity data given.

Component	LD50 Oral:	LD50 Dermal:	LC50 Inhalation:
Water 7732-18-5	90 mL/kg (Rat)	-----	-----
Sodium Hydroxide 1310-73-2	140-3400 mg/kg	1350 mg/kg (Rabbit)	-----
Sodium Chloride 7647-14-5	3 g/kg (Rat)	-----	42 g/m ³ (1 hr-Rat)

POTENTIAL HEALTH EFFECTS:

- Eye contact:** Corrosive. Causes serious eye damage which can result in: severe irritation, pain and burns, and permanent damage including blindness.
- Skin contact:** Corrosive. Causes severe skin burns. Prolonged or repeat skin exposures can result in dermatitis.
- Inhalation:** Corrosive. Inhalation injury may result from ingestion and/or aspiration of this material. May cause severe irritation of the respiratory tract with potential airway compromise, coughing, choking, pain, and burns of the mucous membrane and respiratory system. This material can be extremely destructive to the tissue of the mucus membranes and respiratory system. Aspiration may cause chemical pneumonitis, pulmonary edema, damage to lung tissue, death.
- Ingestion:** Corrosive. If swallowed, may cause severe oral and esophageal, mucus membrane, and gastrointestinal burns and possible perforation. If swallowed, may pose a lung aspiration hazard during vomiting.
- Chronic Effects:** Repeated or prolonged skin contact may result in dermatitis.

CAUSTIC SODA LIQUID (ALL GRADES)

SDS No.: M32415

SDS Revision Date: 13-Jan-2016

SIGNS AND SYMPTOMS OF EXPOSURE:

This material may cause severe burns and permanent damage to any tissue with which it comes into contact. It can cause serious burns and extensive tissue destruction resulting in liquefaction, necrosis and/or perforation. Signs and symptoms of exposure vary, and are dependent on the route of exposure, degree of exposure, and duration of exposure.

Inhalation (Breathing): Respiratory System Effects: Exposure to airborne material may cause irritation, redness of upper and lower airways, coughing, laryngeospasm, shortness of breath, bronchoconstriction, and possible pulmonary edema. Severe and permanent scarring may occur. Pulmonary edema may develop several hours after a severe acute exposure. Aspiration of this material may cause the same conditions.

Skin: Skin Corrosion. Exposure to skin may cause redness, itching, irritation, swelling, burns (first, second, or third degree), liquefaction of skin, and damage to underlying tissues (deep and painful wounds).

Eye: Serious Eye Damage. Eye exposures may cause eye lid burns, conjunctivitis, corneal edema, corneal burn, corneal perforation, damage to internal contents of the eye, permanent visual defects, and blindness and/or loss of the eye.

Ingestion (Swallowing): Gastrointestinal System Effects: Exposure by ingestion may cause irritation, swelling, and perforation of upper and lower gastrointestinal tissues. Permanent scarring may occur.

TOXICITY:

When in solution, this material will affect all tissues with which it comes in contact. The severity of the tissue damage is a function of its concentration, the length of tissue contact time, and local tissue conditions. After exposure there may be a time delay before irritation and other effects occur. This material is a strong irritant and is corrosive to the skin, eyes, and mucus membranes. This material may cause severe burns and permanent damage to any tissue with which it comes into contact.

Interaction with Other Chemicals Which Enhance Toxicity: None known.

GHS HEALTH HAZARDS:

GHS: CONTACT HAZARD - EYE: Category 1 - Causes serious eye damage

GHS: CONTACT HAZARD - SKIN: Category 1B - Causes severe skin burns and eye damage

Skin Absorbent / Dermal Route? No.

GHS: CARCINOGENICITY:

Not classified as a carcinogen per GHS criteria. This product is not classified as a carcinogen by NTP, IARC or OSHA.

SPECIFIC TARGET ORGAN TOXICITY (Single Exposure):

Category 3 - Respiratory Irritation

SECTION 12. ECOLOGICAL INFORMATION

ECOTOXICITY DATA:

CAUSTIC SODA LIQUID (ALL GRADES)

SDS No.: M32415

SDS Revision Date: 13-Jan-2016

Aquatic Toxicity:

This material has exhibited moderate toxicity to aquatic organisms. Data provided are for sodium hydroxide

<u>Component</u>	<u>Freshwater Fish</u>	<u>Invertebrate Toxicity:</u>	<u>Algae Toxicity:</u>	<u>Other Toxicity:</u>
Sodium Chloride 7647-14-5 (0 - 35)		340.7 - 469.2 mg/L EC50 = 1000 mg/L EC50	-----	

FATE AND TRANSPORT:

BIODEGRADATION: This material is inorganic and not subject to biodegradation

PERSISTENCE: This material is alkaline and may raise the pH of surface waters with low buffering capacity
This material is believed to exist in the disassociated state in the environment

BIOCONCENTRATION: This material is not expected to bioconcentrate in organisms.

BIOACCUMULATIVE POTENTIAL: Does not bioaccumulate.

MOBILITY IN SOIL: No data available.

ADDITIONAL ECOLOGICAL INFORMATION: This material has exhibited slight toxicity to terrestrial organisms. This material has exhibited moderate toxicity to aquatic organisms.

SECTION 13. DISPOSAL CONSIDERATIONS**Waste from material:**

Reuse or reprocess, if possible. May be subject to disposal regulations. Dispose in accordance with all applicable regulations.

Container Management:

Dispose of container in accordance with applicable local, regional, national, and/or international regulations. Container rinsate must be disposed of in compliance with applicable regulations.

SECTION 14. TRANSPORT INFORMATION**LAND TRANSPORT**

U.S. DOT 49 CFR 172.101:

UN NUMBER: UN1824
PROPER SHIPPING NAME: Sodium Hydroxide Solution
HAZARD CLASS/ DIVISION: 8

CAUSTIC SODA LIQUID (ALL GRADES)

SDS No.: M32415

SDS Revision Date: 13-Jan-2016

PACKING GROUP: II
LABELING REQUIREMENTS: 8
RQ (lbs): RQ 1000 lbs. (Sodium Hydroxide)

CANADIAN TRANSPORTATION OF DANGEROUS GOODS:

UN NUMBER: UN1824
SHIPPING NAME: Sodium hydroxide solution
CLASS OR DIVISION: 8
PACKING/RISK GROUP: II
LABELING REQUIREMENTS: 8

MARITIME TRANSPORT (IMO / IMDG) :

UN NUMBER: UN1824
PROPER SHIPPING NAME: Sodium hydroxide solution
HAZARD CLASS / DIVISION: 8
Packing Group: II
LABELING REQUIREMENTS: 8

SECTION 15. REGULATORY INFORMATION**U.S. REGULATIONS****OSHA REGULATORY STATUS:**

This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200)

CERCLA SECTIONS 102a/103 HAZARDOUS SUBSTANCES (40 CFR 302.4):

If a release is reportable under CERCLA section 103, notify the state emergency response commission and local emergency planning committee. In addition, notify the National Response Center at (800) 424-8802 or (202) 426-2675.

Component	CERCLA Reportable Quantities:
Sodium Hydroxide	1000 lb (final RQ)

SARA EHS Chemical (40 CFR 355.30)

No components are listed

EPCRA SECTIONS 311/312 HAZARD CATEGORIES (40 CFR 370.10):

Acute Health Hazard

EPCRA SECTION 313 (40 CFR 372.65):

No components are listed

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DEPARTMENT OF HOMELAND SECURITY (DHS)- Chemical Facility Anti-Terrorism Standards (6 CFR 27):

No components in this material are regulated under DHS

OSHA PROCESS SAFETY (PSM) (29 CFR 1910.119):

Not regulated

FDA: This material has Generally Recognized as Safe (GRAS) status under specific FDA regulations. Additional information is available from the Code of Federal Regulations which is accessible on the FDA's website. This product is not produced under all current Good Manufacturing Practices (cGMP) requirements as defined by the Food and Drug Administration (FDA).

NATIONAL INVENTORY STATUS**U.S. INVENTORY STATUS: Toxic Substance Control Act (TSCA):** All components are listed or exempt

<u>Component</u>	<u>U.S. INVENTORY STATUS: Toxic Substance Control Act (TSCA):</u>
Water 7732-18-5 (48.5 - 94.5)	Listed
Sodium Hydroxide 1310-73-2 (5.5 - 51.5)	Listed
Sodium Chloride 7647-14-5 (0 - 35)	Listed

TSCA 12(b): This product is not subject to export notification.**Canadian Chemical Inventory:** All components of this product are listed on either the DSL or the NDSL.**STATE REGULATIONS****California Proposition 65:**

This product and its ingredients are not listed, but it may contain impurities/trace elements known to the State of California to cause cancer or reproductive toxicity as listed under Proposition 65 State Drinking Water and Toxic Enforcement Act. For additional information, contact OxyChem Technical Services at 1-800-733-1165.

Component	California Proposition 65 Cancer WARNING:	California Proposition 65 CRT List - Male reproductive toxin:	California Proposition 65 CRT List - Female reproductive toxin:	Massachusetts Right to Know Hazardous Substance List	New Jersey Right to Know Hazardous Substance List	New Jersey Special Health Hazards Substance List
Sodium Hydroxide 1310-73-2	Not Listed	Not Listed	Not Listed	Listed	1706	corrosive

Component	New Jersey - Environmental Hazardous Substance List	Pennsylvania Right to Know Hazardous Substance List	Pennsylvania Right to Know Special Hazardous Substances	Pennsylvania Right to Know Environmental Hazard List	Rhode Island Right to Know Hazardous Substance List
Water 7732-18-5	Not Listed	Listed	Not Listed	Not Listed	Not Listed
Sodium Hydroxide 1310-73-2	Not Listed	Listed	Not Listed	Present	Listed

CANADIAN REGULATIONS

CAUSTIC SODA LIQUID (ALL GRADES)**SDS No.:** M32415**SDS Revision Date:** 13-Jan-2016

• This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the SDS contains all the information required by the Controlled Products Regulations

Component	Water
WHMIS - Classifications of Substances: Uncontrolled product according to WHMIS classification criteria	
Component	Sodium Hydroxide
WHMIS - Classifications of Substances: E	
Component	Sodium Chloride
WHMIS - Classifications of Substances: Uncontrolled product according to WHMIS classification criteria	

SECTION 16. OTHER INFORMATION

Prepared by: OxyChem Corporate HESS - Product Stewardship

Rev. Date: 13-Jan-2016

Other information:

The Safety Data Sheet for Caustic Soda Liquid (ALL Grades) can be used for hazard communication purposes for off-specification, secondary caustic soda liquids generated when cleaning caustic soda storage tanks, including the general disclaimer found in section 16 of the Safety Data Sheet

HMIS: (SCALE 0-4) (Rated using National Paint & Coatings Association HMIS: Rating Instructions, 2nd Edition)

Health Rating: 3**Flammability Rating:** 0**Reactivity Rating:** 1

NFPA 704 - Hazard Identification Ratings (SCALE 0-4) : Listed below.

Health Rating: 3**Flammability:** 0**Reactivity Rating:** 1**Reason for Revision:**

- Changed GHS Classification: SEE SECTION 2
- Toxicological Information has been revised: SEE SECTION 11

CAUSTIC SODA LIQUID (ALL GRADES)

SDS No.: M32415

SDS Revision Date: 13-Jan-2016

IMPORTANT:

The information presented herein, while not guaranteed, was prepared by technical personnel and is true and accurate to the best of our knowledge. NO WARRANTY OF MERCHANTABILITY OR OF FITNESS FOR A PARTICULAR PURPOSE, OR WARRANTY OR GUARANTY OF ANY OTHER KIND, EXPRESSED OR IMPLIED, IS MADE REGARDING PERFORMANCE, SAFETY, SUITABILITY, STABILITY OR OTHERWISE. This information is not intended to be all-inclusive as to the manner and conditions of use, handling, storage, disposal and other factors that may involve other or additional legal, environmental, safety or performance considerations, and OxyChem assumes no liability whatsoever for the use of or reliance upon this information. While our technical personnel will be happy to respond to questions, safe handling and use of the product remains the responsibility of the customer. No suggestions for use are intended as, and nothing herein shall be construed as, a recommendation to infringe any existing patents or to violate any Federal, State, local or foreign laws

OSHA Standard 29 CFR 1910.1200 requires that information be provided to employees regarding the hazards of chemicals by means of a hazard communication program including labeling, safety data sheets, training and access to written records. We request that you, and it is your legal duty to, make all information in this Safety Data Sheet available to your employees

End of Safety Data Sheet

Sulfuric Acid, 70-100%

Safety Data Sheet

According to U.S. Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules And Regulations and according to Canada's Hazardous Products Regulation, February 11, 2015.

Revision Date: 05/07/2018

Date of Issue: 05/31/2016

Version: 4.0

SECTION 1: IDENTIFICATION

Product Identifier

Product Form: Mixture

Product Name: Sulfuric Acid, 70-100%

Formula: H₂-O₄-S

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

INTERNATIONAL: +1-703-741-5970

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 Classification

Met. Corr. 1 H290

Skin Corr. 1A H314

Eye Dam. 1 H318

Carc. 1A H350

Aquatic Acute 3 H402

Full text of hazard classes and H-statements : see section 16

Label Elements

GHS Labeling

Hazard Pictograms



Signal Word

: Danger

Hazard Statements

: H290 - May be corrosive to metals.

H314 - Causes severe skin burns and eye damage.

H318 - Causes serious eye damage.

H350 - May cause cancer (Inhalation).

H402 - Harmful to aquatic life.

Precautionary Statements

: P201 - Obtain special instructions before use.

P202 - Do not handle until all safety precautions have been read and understood.

P234 - Keep only in original container.

P260 - Do not breathe vapors, mist, or spray.

P264 - Wash hands, forearms, and other exposed areas thoroughly after handling.

P273 - Avoid release to the environment.

P280 - Wear protective gloves, protective clothing, and eye protection.

P301+P330+P331 - IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.

Sulfuric Acid, 70-100%

Safety Data Sheet

According to U.S. Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules And Regulations and according to Canada's Hazardous Products Regulation, February 11, 2015.

P303+P361+P353 - IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water.
P304+P340 - IF INHALED: Remove person to fresh air and keep 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.
P308+P313 - If exposed or concerned: Get medical advice/attention.
P310 - Immediately call a POISON CENTER or doctor.
P321 - Specific treatment (see section 4 on this SDS).
P363 - Wash contaminated clothing before reuse.
P390 - Absorb spillage to prevent material damage.
P405 - Store locked up.
P406 - Store in corrosive resistant container with a resistant inner liner.
P501 - Dispose of contents/container in accordance with local, regional, national, territorial, provincial, and international regulations.

Other Hazards

Exposure may aggravate pre-existing eye, skin, or respiratory conditions.

Unknown acute toxicity

No data available

SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

Mixture

Name	Product Identifier	%*	GHS Ingredient Classification
Sulfuric acid**	(CAS-No.) 7664-93-9	70 - 100	Met. Corr. 1, H290 Skin Corr. 1A, H314 Eye Dam. 1, H318 Carc. 1A, H350 Aquatic Acute 3, H402
Water	(CAS-No.) 7732-18-5	0.1 - 30	Not classified

Full text of H-phrases: see section 16

*Percentages are listed in weight by weight percentage (w/w%) for liquid and solid ingredients. Gas ingredients are listed in volume by volume percentage (v/v%).

**Strong inorganic acid aerosols/mists containing this substance are carcinogenic to humans via inhalation. Under normal conditions of use this route of exposure is not expected.

SECTION 4: FIRST AID MEASURES

Description of First-aid Measures

General: Never give anything by mouth to an unconscious person. If you feel unwell, seek medical advice (show the label where possible).

Inhalation: When symptoms occur: go into open air and ventilate suspected area. Obtain medical attention if breathing difficulty persists.

Skin Contact: Remove contaminated clothing. Immediately flush skin with plenty of water for at least 30 minutes. Get immediate medical advice/attention. Wash contaminated clothing before reuse.

Eye Contact: Rinse cautiously with water for at least 30 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Get immediate medical advice/attention.

Ingestion: Rinse mouth. Do NOT induce vomiting. Obtain medical attention.

Most Important Symptoms and Effects Both Acute and Delayed

General: Corrosive to eyes, respiratory system and skin. May cause cancer.

Inhalation: May be corrosive to the respiratory tract.

Skin Contact: Causes severe irritation which will progress to chemical burns.

Eye Contact: Causes permanent damage to the cornea, iris, or conjunctiva.

Ingestion: May cause burns or irritation of the linings of the mouth, throat, and gastrointestinal tract.

Sulfuric Acid, 70-100%

Safety Data Sheet

According to U.S. Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules And Regulations and according to Canada's Hazardous Products Regulation, February 11, 2015.

Chronic Symptoms: Strong inorganic acid mists containing sulfuric acid are carcinogenic to humans. Prolonged inhalation of fumes or mists may cause erosion of the teeth.

Indication of Any Immediate Medical Attention and Special Treatment Needed

If exposed or concerned, get medical advice and attention. If medical advice is needed, have product container or label at hand.

SECTION 5: FIRE-FIGHTING MEASURES

Extinguishing Media

Suitable Extinguishing Media: Foam, carbon dioxide, dry chemical.

Unsuitable Extinguishing Media: Do not use water. Do not get water inside containers. Do not apply water stream directly at source of leak.

Special Hazards Arising From the Substance or Mixture

Fire Hazard: Not flammable.

Explosion Hazard: Product is not explosive.

Reactivity: May be corrosive to metals. Contact with metals may evolve flammable hydrogen gas. May react exothermically with water releasing heat. Adding an acid to a base or base to an acid may cause a violent reaction. This product may act as an oxidizer.

Advice for Firefighters

Precautionary Measures Fire: Exercise caution when fighting any chemical fire.

Firefighting Instructions: Use water spray or fog for cooling exposed containers.

Protection During Firefighting: Do not enter fire area without proper protective equipment, including respiratory protection.

Hazardous Combustion Products: Toxic fumes are released.

Other Information: Do not allow run-off from fire fighting to enter drains or water courses.

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 get in eyes, on skin, or on clothing. Do not breathe vapor, mist or spray. Do not handle until all safety precautions have been read and understood.

For Non-Emergency Personnel

Protective Equipment: Use appropriate personal protective equipment (PPE).

Emergency Procedures: Evacuate unnecessary personnel.

For Emergency Personnel

Protective Equipment: Equip cleanup crew with proper protection.

Emergency Procedures: Upon arrival at the scene, a first responder is expected to recognize the presence of dangerous goods, protect oneself and the public, secure the area, and call for the assistance of trained personnel as soon as conditions permit. Ventilate area.

Environmental Precautions

Prevent entry to sewers and public waters. Avoid release to the environment.

Methods and Materials for Containment and Cleaning Up

For Containment: Contain any spills with dikes or absorbents to prevent migration and entry into sewers or streams. As an immediate precautionary measure, isolate spill or leak area in all directions.

Methods for Cleaning Up: Clean up spills immediately and dispose of waste safely. Absorb spillage to prevent material damage. Cautiously neutralize spilled liquid. Transfer spilled material to a suitable container for disposal. Contact competent authorities after a spill.

Reference to Other Sections

See Section 8 for exposure controls and personal protection and Section 13 for disposal considerations.

SECTION 7: HANDLING AND STORAGE

Precautions for Safe Handling

Wash hands and other exposed areas with mild soap and water before eating, drinking or smoking and when leaving work. Handle empty containers with care because they may still present a hazard. Do not get in eyes, on skin, or on clothing. Do not breathe vapors, mist, spray. Obtain special instructions before use. Do not handle until all safety precautions have been read and understood.

Additional Hazards When Processed: May be corrosive to metals. May release corrosive vapors. NEVER pour water into this substance; when dissolving or diluting always add it slowly to the water.

Sulfuric Acid, 70-100%

Safety Data Sheet

According to U.S. Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules And Regulations and according to Canada's Hazardous Products Regulation, February 11, 2015.

Hygiene Measures: Handle in accordance with good industrial hygiene and safety procedures.

Conditions for Safe Storage, Including Any Incompatibilities

Technical Measures: Comply with applicable regulations.

Storage Conditions: Keep container closed when not in use. Store in a dry, cool place. Keep/Store away from extremely high or low temperatures and incompatible materials. Store in original container or corrosive resistant and/or lined container.

Incompatible Materials: Combustible materials. Reducing agents. Strong oxidizers. Strong bases. Metals. Water.

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 particulate matter)
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 particulate matter)
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 particulate matter)
Nova Scotia	OEL TWA (mg/m ³)	0.2 mg/m ³ (thoracic particulate matter)
Nunavut	OEL STEL (mg/m ³)	0.6 mg/m ³ (thoracic fraction)
Nunavut	OEL TWA (mg/m ³)	0.2 mg/m ³ (thoracic fraction)
Northwest Territories	OEL STEL (mg/m ³)	0.6 mg/m ³ (thoracic fraction, strong acid mists only)
Northwest Territories	OEL TWA (mg/m ³)	0.2 mg/m ³ (thoracic fraction, strong acid mists only)
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 particulate matter)
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: Emergency eye wash fountains and safety showers should be available in the immediate vicinity of any potential exposure. Ensure adequate ventilation, especially in confined areas. Ensure all national/local regulations are observed.

Personal Protective Equipment: Gloves. Protective clothing. Protective goggles. Face shield. Insufficient ventilation: wear respiratory protection.



Sulfuric Acid, 70-100%

Safety Data Sheet

According to U.S. Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules And Regulations and according to Canada's Hazardous Products Regulation, February 11, 2015.

Materials for Protective Clothing: Acid-resistant clothing.

Hand Protection: Wear protective gloves.

Eye Protection: Chemical safety goggles and face shield.

Skin and Body Protection: Wear suitable protective clothing.

Respiratory Protection: If exposure limits are exceeded or irritation is experienced, approved respiratory protection should be worn. In case of inadequate ventilation, oxygen deficient atmosphere, or where exposure levels are not known wear approved respiratory protection.

Other Information: When using, do not eat, drink or smoke.

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
Evaporation Rate	: Not available
Melting Point	: 10.56 °C (51.01 °F)
Freezing Point	: Not available
Boiling Point	: 290 °C (554 °F)
Flash Point	: Not applicable
Auto-ignition Temperature	: Not applicable
Decomposition Temperature	: Not available
Flammability (solid, gas)	: Not applicable
Lower Flammable Limit	: Not applicable
Upper Flammable Limit	: Not applicable
Vapor Pressure	: 0.00027 - 0.16 kPa at 25 °C (77 °F)
Relative Vapor Density at 20°C	: 3.4 (air = 1)
Relative Density	: Not available
Specific Gravity	: 1.84 g/l
Solubility	: Water: Miscible
Partition Coefficient: N-Octanol/Water	: Not available
Viscosity	: Not available

SECTION 10: STABILITY AND REACTIVITY

Reactivity: May be corrosive to metals. Contact with metals may evolve flammable hydrogen gas. May react exothermically with water releasing heat. Adding an acid to a base or base to an acid may cause a violent reaction. This product may act as an oxidizer.

Chemical Stability: Stable under recommended handling and storage conditions (see section 7).

Possibility of Hazardous Reactions: Hazardous polymerization will not occur.

Conditions to Avoid: Extremely high or low temperatures and incompatible materials.

Incompatible Materials: Combustible materials. Reducing agents. Strong bases. Strong oxidizers. Metals. Water.

Hazardous Decomposition Products: Thermal decomposition generates: Corrosive vapors.

SECTION 11: TOXICOLOGICAL INFORMATION

Information on Toxicological Effects - Product

Acute Toxicity (Oral): Not classified

Acute Toxicity (Dermal): Not classified

Acute Toxicity (Inhalation): Not classified

LD50 and LC50 Data: Not available

Skin Corrosion/Irritation: Causes severe skin burns and eye damage.

pH: 0.3

Eye Damage/Irritation: Causes serious eye damage.

Sulfuric Acid, 70-100%

Safety Data Sheet

According to U.S. Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules And Regulations and according to Canada's Hazardous Products Regulation, February 11, 2015.

pH: 0.3

Respiratory or Skin Sensitization: Not classified

Germ Cell Mutagenicity: Not classified

Carcinogenicity: May cause cancer (Inhalation).

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/Effects After Inhalation: May be corrosive to the respiratory tract.

Symptoms/Effects After Skin Contact: Causes severe irritation which will progress to chemical burns.

Symptoms/Effects After Eye Contact: Causes permanent damage to the cornea, iris, or conjunctiva.

Symptoms/Effects After Ingestion: May cause burns or irritation of the linings of the mouth, throat, and gastrointestinal tract.

Chronic Symptoms: Strong inorganic acid mists containing sulfuric acid are carcinogenic to humans. Prolonged inhalation of fumes or mists may cause erosion of the teeth.

Information on Toxicological Effects - Ingredient(s)

LD50 and LC50 Data:

Water (7732-18-5)	
LD50 Oral Rat	> 90000 mg/kg
Sulfuric acid (7664-93-9)	
LD50 Oral Rat	2140 mg/kg
LC50 Inhalation Rat	510 mg/m ³ (Exposure time: 2 h)
Sulfuric acid (7664-93-9)	
IARC Group	1
OSHA Hazard Communication Carcinogen List	In OSHA Hazard Communication Carcinogen list.
Strong inorganic acid mists containing sulfuric acid	
National Toxicology Program (NTP) Status	Known Human Carcinogens.

SECTION 12: ECOLOGICAL INFORMATION

Toxicity

Ecology - General: Harmful to aquatic life.

Sulfuric acid (7664-93-9)	
LC50 Fish 1	500 mg/l (Exposure time: 96 h - Species: Brachydanio rerio [static])
LC50 Fish 2	42 mg/l (Exposure time: 96 h - Species: Gambusia affinis [static])

Persistence and Degradability

Sulfuric Acid, 70-100%	
Persistence and Degradability	Not established.

Bioaccumulative Potential

Sulfuric Acid, 70-100%	
Bioaccumulative Potential	Not established.
Sulfuric acid (7664-93-9)	
BCF Fish 1	(no bioaccumulation)

Mobility in Soil Not available

Other Adverse Effects

Other Information: Avoid release to the environment.

SECTION 13: DISPOSAL CONSIDERATIONS

Waste Disposal Recommendations: Dispose of contents/container in accordance with local, regional, national, territorial, provincial, and international regulations.

Additional Information: Container may remain hazardous when empty. Continue to observe all precautions.

Ecology - Waste Materials: Avoid release to the environment. This material is hazardous to the aquatic environment. Keep out of sewers and waterways.





Sulfuric Acid, 70-100%

Safety Data Sheet

According to U.S. Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules And Regulations and according to Canada's Hazardous Products Regulation, February 11, 2015.

SECTION 14: TRANSPORT INFORMATION

The shipping description(s) stated herein were prepared in accordance with certain assumptions at the time the SDS was authored, and can vary based on a number of variables that may or may not have been known at the time the SDS was issued.

TRANSPORTATION CLASSIFICATION	DOT	TDG	IMDG	IATA
Identification Number	UN1830	UN1830	UN1830	UN1830
Proper Shipping Name	SULFURIC ACID	SULFURIC ACID	SULPHURIC ACID	SULPHURIC ACID
Transport Hazard Class(es)	8	8	8	8
				
Packing Group	II	II	II	II
Environmental Hazards	Marine Pollutant : No	Marine Pollutant : No	Marine Pollutant : No	Marine Pollutant: N/A
Emergency Response	ERG Number : 137	ERAP Index: 3 000	EMS: F-A, S-B	ERG code (IATA): 8L
Additional Information	Not applicable	Not applicable	Not applicable	Not applicable

SECTION 15: REGULATORY INFORMATION

US Federal Regulations

Chemical Name (CAS No.)	CERCLA RQ	EPCRA 304 RQ	SARA 302 TPQ	SARA 313
Sulfuric acid (7664-93-9)	1000 lb	1000 lb	1000 lb	Yes

SARA 311/312

Sulfuric Acid, 70-100%
Immediate (acute) health hazard. Delayed (chronic) health hazard. Reactive hazard

US TSCA Flags Not present

US State Regulations

California Proposition 65

Chemical Name (CAS No.)	Carcinogenicity	Developmental Toxicity	Female Reproductive Toxicity	Male Reproductive Toxicity
Sulfuric acid (7664-93-9)	Yes	No	No	No
Strong inorganic acid mists containing sulfuric acid	Yes	No	No	No

State Right-To-Know Lists

Sulfuric acid (7664-93-9)
U.S. - Massachusetts - Right To Know List - Yes
U.S. - New Jersey - Right to Know Hazardous Substance List - Yes
U.S. - Pennsylvania - RTK (Right to Know) - Environmental Hazard List - Yes
U.S. - Pennsylvania - RTK (Right to Know) - Special Hazardous Substances - No
U.S. - Pennsylvania - RTK (Right to Know) List - Yes

Canadian Regulations

Sulfuric acid (7664-93-9)
Listed on the Canadian DSL (Domestic Substances List)
Not listed on the Canadian NDSL (Non-Domestic Substances List)

International Inventories/Lists

Chemical Name (CAS No.)	Australia AICS	Turkey CICR	Korea ECL	EU EINECS	EU ELINCS	EU SVHC	EU NLP	Mexico INSQ
Sulfuric acid (7664-93-9)	Yes	No	Yes	Yes	No	No	No	No

Sulfuric Acid, 70-100%

Safety Data Sheet

According to U.S. Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules And Regulations and according to Canada's Hazardous Products Regulation, February 11, 2015.

Chemical Name (CAS No.)	China IECSC	Japan ENCS	Japan ISHL	Japan PDSC	Japan PRTR	Philippines PICCS	New Zealand NZIOC	US TSCA
Sulfuric acid (7664-93-9)	Yes	Yes	No	Yes	No	Yes	Yes	Yes

SECTION 16: OTHER INFORMATION, INCLUDING DATE OF PREPARATION OR LAST REVISION

Date of Preparation or Latest Revision : 05/07/2018

Revision Summary

Section	Change	Date Changed
16	Data modified	05/07/2018

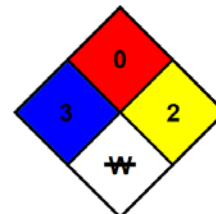
Other Information : This document has been prepared in accordance with the SDS requirements of the OSHA Hazard Communication Standard 29 CFR 1910.1200 and Canada's Hazardous Products Regulations (HPR).

GHS Full Text Phrases:

Aquatic Acute 3	Hazardous to the aquatic environment - Acute Hazard Category 3
Carc. 1A	Carcinogenicity Category 1A
Eye Dam. 1	Serious eye damage/eye irritation Category 1
Met. Corr. 1	Corrosive to metals Category 1
Skin Corr. 1A	Skin corrosion/irritation Category 1A
H290	May be corrosive to metals
H314	Causes severe skin burns and eye damage
H318	Causes serious eye damage
H350	May cause cancer
H402	Harmful to aquatic life

NFPA 704

NFPA Health Hazard : 3
NFPA Fire Hazard : 0
NFPA Reactivity Hazard : 2
NFPA Specific Hazards : W



HMIS Rating

Health : 3
Flammability : 0
Physical : 2
PPE See Section 8

Abbreviations and Acronyms

AICS – Australian Inventory of Chemical Substances
ACGIH – American Conference of Governmental Industrial Hygienists
AIHA – American Industrial Hygiene Association
ATE - Acute Toxicity Estimate
BCF - Bioconcentration factor
BEI - Biological Exposure Indices (BEI)
CAS No. - Chemical Abstracts Service number
CERCLA RQ - Comprehensive Environmental Response, Compensation, and Liability Act - Reportable Quantity
CICR - Turkish Inventory and Control of Chemicals
DOT – 49 CFR – US Department of Transportation – Code of Federal Regulations Title 49 – Transportation.
EC50 - Median effective concentration
ECL - Korea Existing Chemicals List
EINECS - European Inventory of Existing Commercial Chemical Substances
ELINCS - European List of Notified Chemical Substances
EmS - IMDG Emergency Schedule Fire & Spillage
ENCS - Japanese Existing and New Chemical Substances Inventory

LC50 - Median Lethal Concentration
LD50 - Median Lethal Dose
LOAEL - Lowest Observed Adverse Effect Level
LOEC - Lowest-observed-effect Concentration
Log Pow - Octanol/water Partition Coefficient
NFPA 704 – National Fire Protection Association - Standard System for the Identification of the Hazards of Materials for Emergency Response
NIOSH - National Institute for Occupational Safety and Health
NLP - Europe No Longer Polymers List
NOAEL - No-Observed Adverse Effect Level
NOEC - No-Observed Effect Concentration
NZIOC - New Zealand Inventory of Chemicals
OEL - Occupational Exposure Limits
OSHA – Occupational Safety and Health Administration
PEL - Permissible Exposure Limits
PICCS - Philippine Inventory of Chemicals and Chemical Substances
PDSC - Japan Poisonous and Deleterious Substances Control Law
PPE – Personal Protective Equipment

Sulfuric Acid, 70-100%

Safety Data Sheet

According to U.S. Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules And Regulations and according to Canada's Hazardous Products Regulation, February 11, 2015.

EPA – Environmental Protection Agency	PRTR - Japan Pollutant Release and Transfer Register
EPCRA 304 RQ – EPCRA 304 Extremely Hazardous Substance Emergency	REL - Recommended Exposure Limit
Planning and Community Right-to-Know-Act – Reportable Quantity	SADT - Self Accelerating Decomposition Temperature
ERAP Index – Emergency Response Assistance Plan Quantity Limit	SARA - Superfund Amendments and Reauthorization Act
ErC50 - EC50 in Terms of Reduction Growth Rate	SARA 302 - Section 302, 40 CFR Part 355
ERG code (IATA) - Emergency Response Drill Code as found in the International	SARA 311/312 - Sections 311 and 312, 40 CFR Part 370 Hazard Categories
Civil Aviation Organization (ICAO)	SARA 313 - Section 313, 40 CFR Part 372
ERG No. - Emergency Response Guide Number	SRCL - Specifically Regulated Carcinogen List
HCCL - Hazard Communication Carcinogen List	STEL - Short Term Exposure Limit
HMIS – Hazardous Materials Information System	SVHC – European Candidate List of Substance of Very High Concern
IARC - International Agency for Research on Cancer	TDG – Transport Canada Transport of Dangerous Goods Regulations
IATA - International Air Transport Association – Dangerous Goods Regulations	TLM - Median Tolerance Limit
IDLH - Immediately Dangerous to Life or Health	TLV - Threshold Limit Value
IECSC - Inventory of Existing Chemical Substances Produced or Imported in	TPQ - Threshold Planning Quantity
China	TSCA – United States Toxic Substances Control Act
IMDG - International Maritime Dangerous Goods Code	TWA - Time Weighted Average
INSQ - Mexican National Inventory of Chemical Substances	WEEL - Workplace Environmental Exposure Levels
ISHL - Japan Industrial Safety and Health Law	

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 2015



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

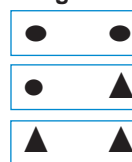
Choose from Hach's Broad Range of Digital and Analog Sensors

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	▲

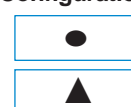
● = Digital ▲ = Analog

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*

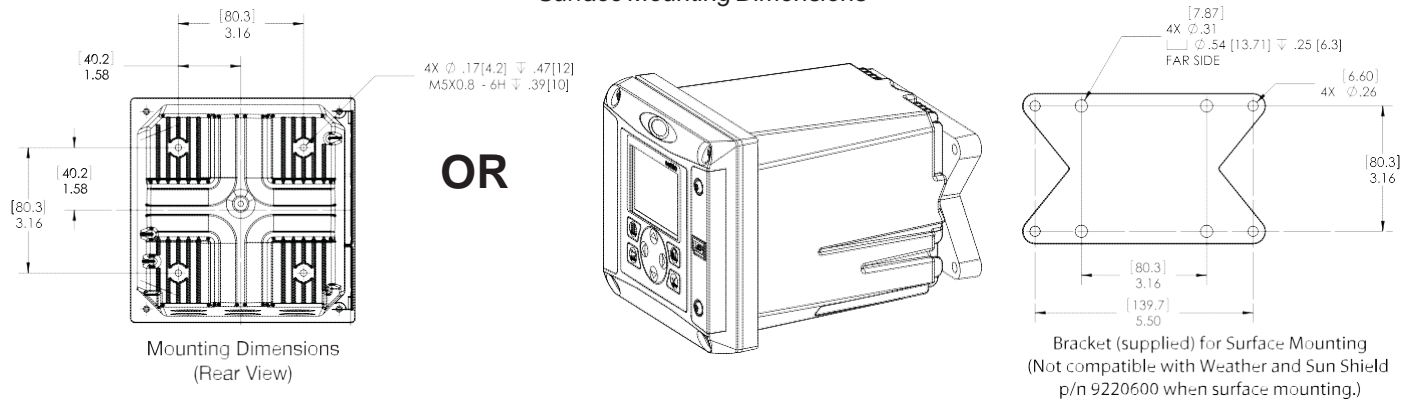
Dimensions (H x W x D)	5.7 in x 5.7 in x 7.1 in (144 mm x 144 mm x 181 mm)
Display	Graphic dot matrix LCD with LED backlighting, transreflective
Display Size	1.9 x 2.7 in. (48 mm x 68 mm)
Display Resolution	240 x 160 pixels
Weight	3.75 lbs. (1.70 kg)
Power Requirements (Voltage)	100 - 240 V AC, 24 V 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
Analog Output Functional Mode	Operational Mode: measurement or calculated value 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, PROFIBUS DPV1, 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

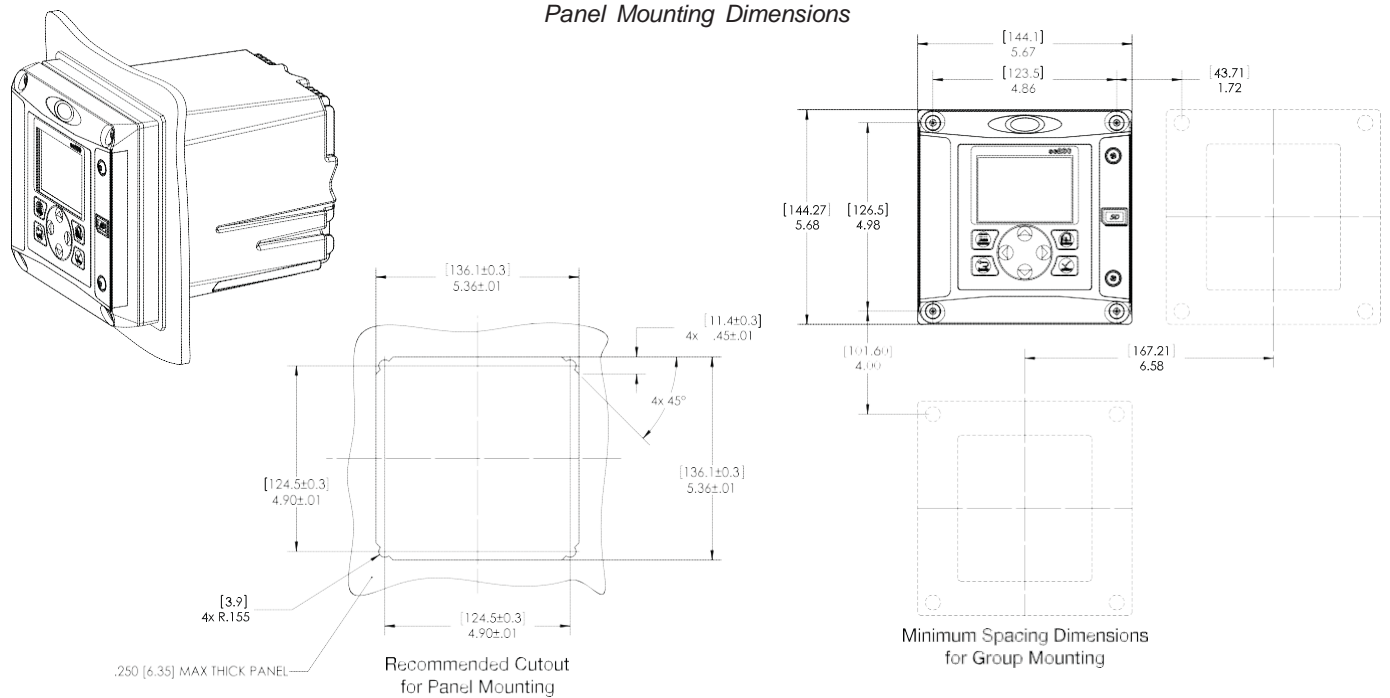
**Subject to change without notice.*

Dimensions

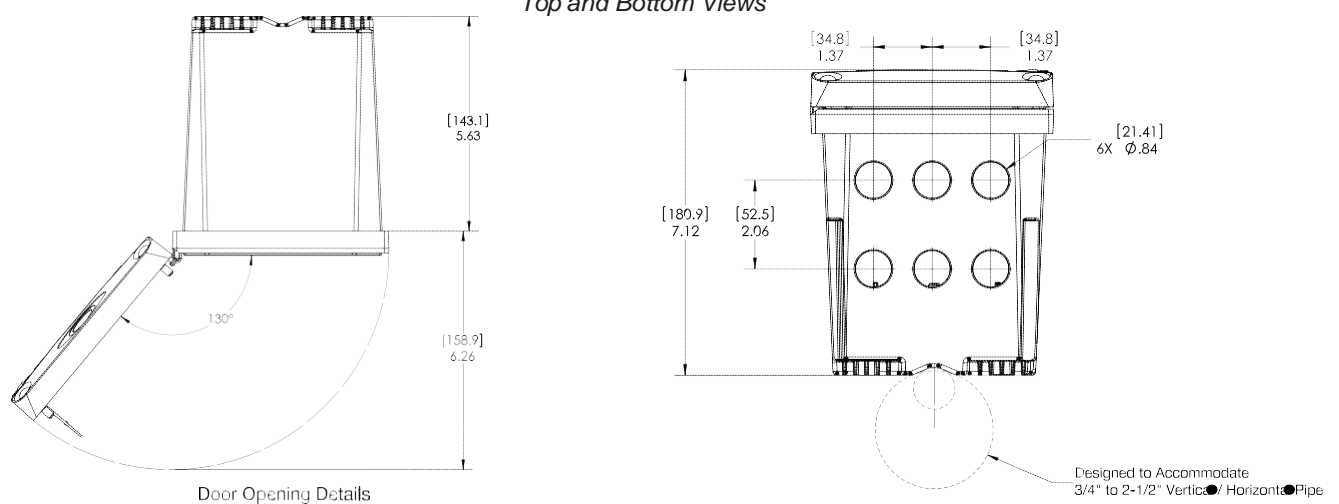
Surface Mounting Dimensions



Panel Mounting Dimensions



Top and Bottom Views



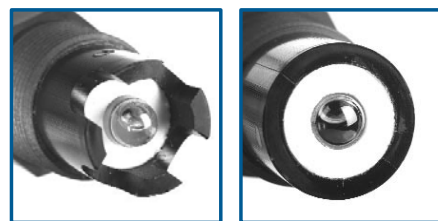


3/4-inch Combination pH and ORP Sensor Kits

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

1. The pH sensor shall be available in convertible, insertion or sanitary styles. The ORP sensor shall be available in only convertible or insertion styles.
2. 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.
3. 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.
4. The sensor shall communicate via MODBUS® RS-485 to a Hach sc Digital Controller.
5. 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

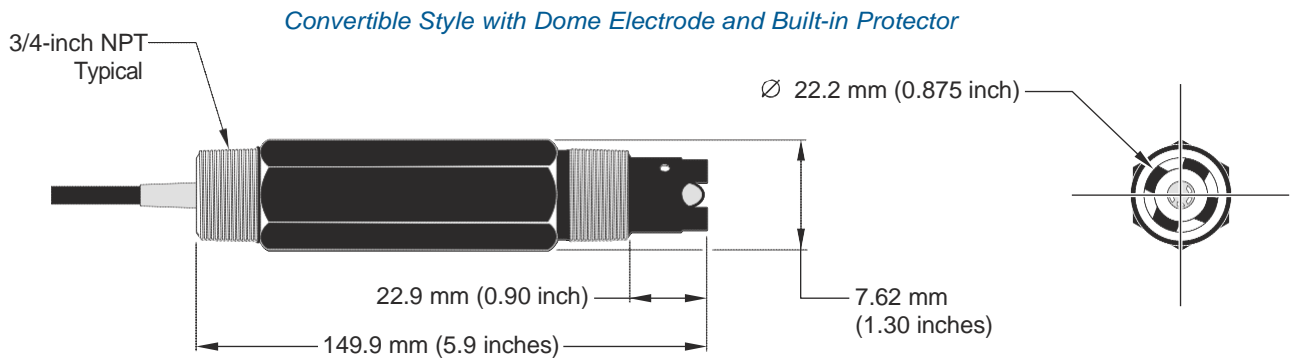
The convertible style sensor has a Ryton® body that features 3/4-inch NPT threads on both ends. The sensor can be directly mounted into a standard 3/4-inch pipe tee for flow-through mounting or fastened onto the end of a pipe for immersion mounting. The convertible style sensor enables inventory consolidation, thereby reducing associated costs. Mounting tees and immersion mounting hardware are offered in a variety of materials to suit application requirements.

Insertion Style Sensor

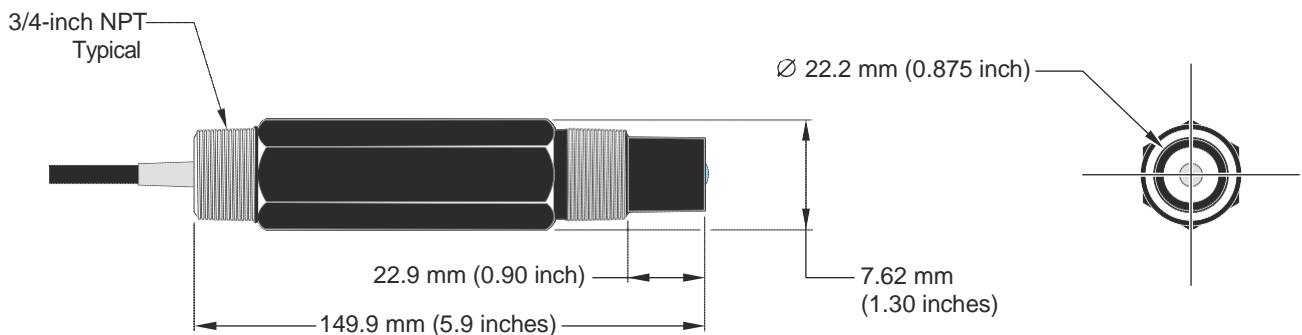
Insertion style sensors feature a longer, non-threaded PVDF body with two Viton® O-rings, providing a seal when used with the optional Hach insertion mount hardware assembly. This ball valve hardware enables sensor insertion and retraction from a pipe or vessel without having to stop the process flow.

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 /
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	025	025	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:		Tubing	1 1/4" ID X 3/8" OD						3/8" ID X 1/2" OD	1 1/4" ID X 3/8" OD		
		Porting							1 1/4" 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:

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 Input Power:

130 Watts

Average Input Power @ Max SPM:

50 Watts

Custom Engineered Designs - Pre-Engineered Systems



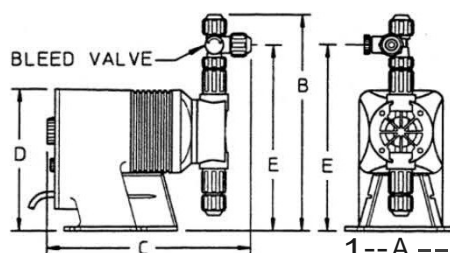
Pre-Engineered Systems

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 25.4 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





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."





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 | • Tanks |
| • Gauges | • Pre-Engineered Systems |
| • Dampeners | • Process Controllers |
| • Pressure Relief Valves | (PULSAbblue, 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
	LPH	1.9	3.8	7.6	15.1	37.9
Pressure (max.)	PSIG	150	150	110	110	80
	BAR	10	10	7	7	5.6
Connections:		(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)				
Tubing						



Engineering Data

Pump Head Materials Available: GFPPPL
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:

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 - GFPPPL=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



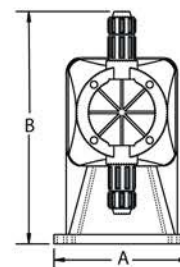
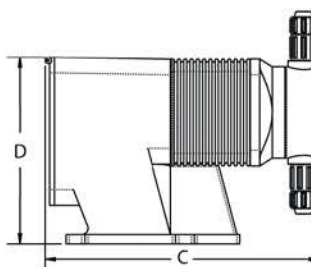
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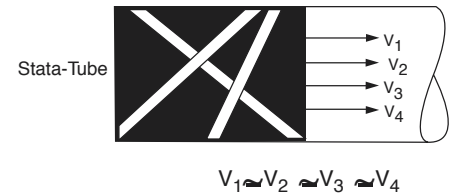
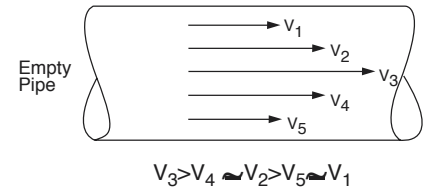
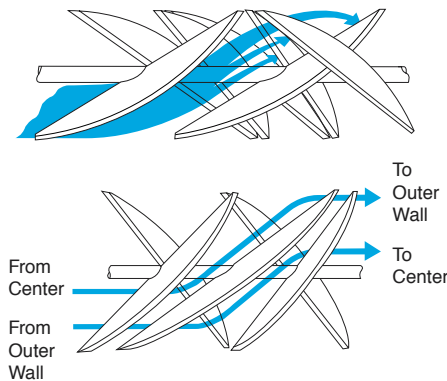
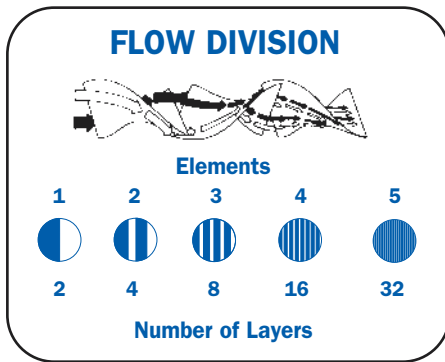
Dimensions

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



$$\text{Blending} = f \left\{ \text{Re}, \mu, \frac{\mu_1}{\mu_2}, \frac{p_1}{p_2}, \frac{V_1}{V_2}, v, n, \frac{L}{D}, \text{Inj} \right\}$$

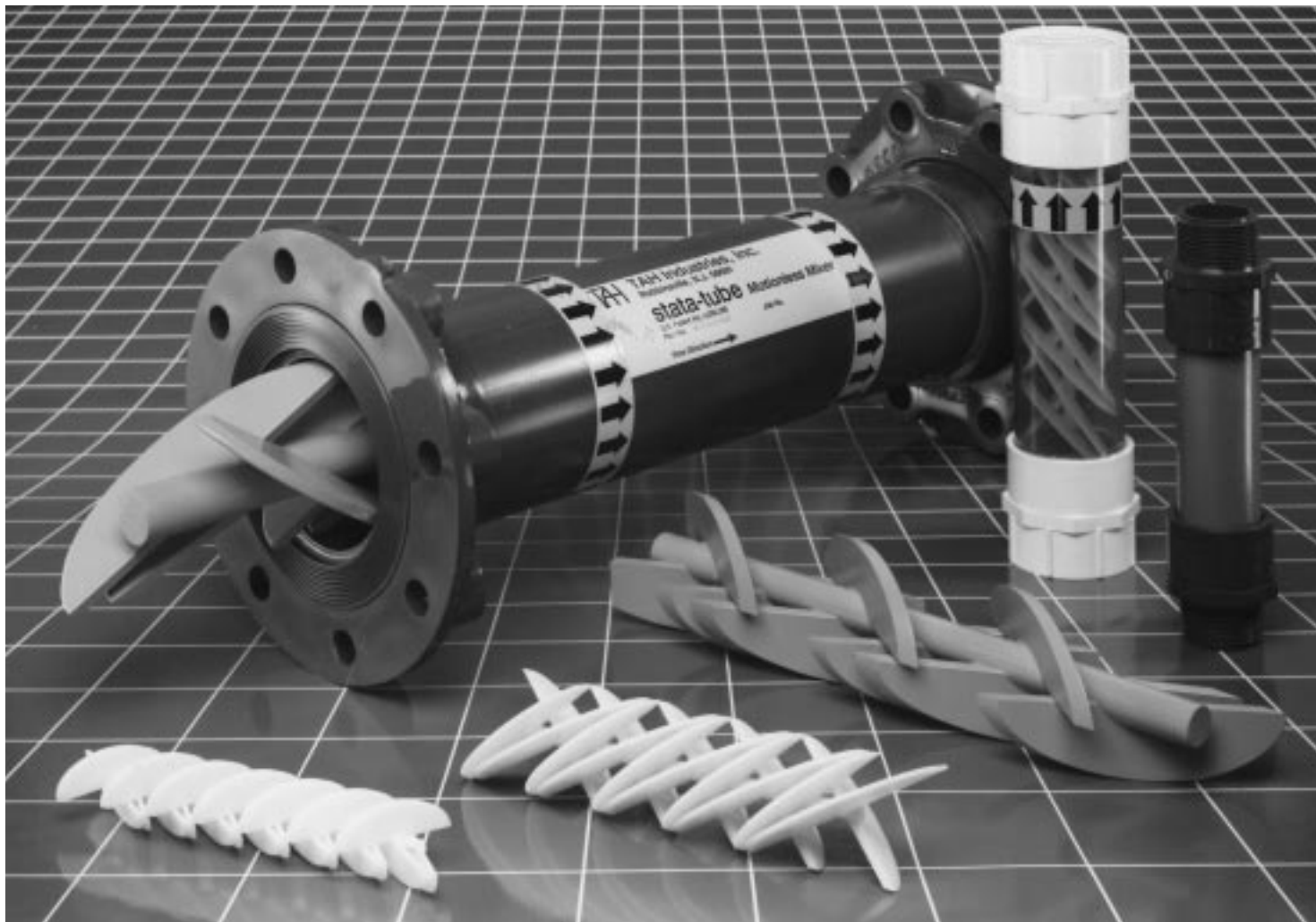
- Where Re = Reynolds Number
 μ = Absolute viscosity
 μ_1/μ_2 = Viscosity ration of unmixed streams
 p_1/p_2 = Density ratio of unmixed streams
 V_1/V_2 = Volumetric ratio of unmixed streams
 v = Shear rate
 n = Number of elements
 L/D = Element length to diameter ratio
 Inj = Injection method of additive 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

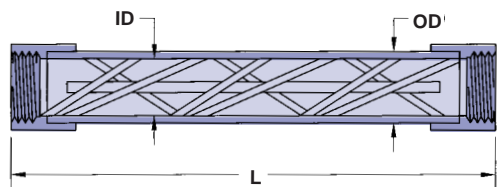
Stata-tube™ PVC Mixer



*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"



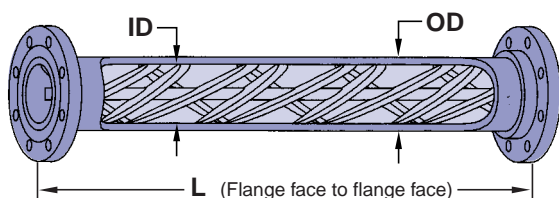
Elements: Polypropylene, Non Removable

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:



Revision date 2019-15-4

SAFETY DATA SHEET

Revision number 1

SECTION 1) CHEMICAL PRODUCT AND SUPPLIER'S IDENTIFICATION

Product Name: Redux E50
Product Use: Water and Wastewater Treatment Coagulant/Flocculant

Revision Date: Apr 15, 2019
Supersedes Date: Mar 5, 2015

Manufacturer's Name: Azure Water Services
Address: 280 Callegari Dr. West Haven CT, 06516
Emergency Phone: Chemtrec, (1) 800-424-9300, in US and Canada only

SECTION 2) HAZARDS IDENTIFICATION

Classification

Corrosive to metals - Category 1
Eye Irritation - Category 2
Skin Irritation - Category 2

Pictograms



Signal Word

Warning

Hazardous Statements - Health

Causes serious eye irritation
Causes skin irritation

Hazardous Statements - Physical

May be corrosive to metals

Precautionary Statements - General

If medical advice is needed, have product container or label at hand.
Keep out of reach of children.
Read label before use.

Precautionary Statements - Prevention

Keep only in original packaging.
Wash thoroughly after handling.
Wear protective gloves/protective clothing/eye protection/face protection.

Precautionary Statements - Response

Absorb spillage to prevent material damage.

IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

If eye irritation persists: Get medical advice/attention.

IF ON SKIN: Wash with plenty of water.

Specific treatment (see first-aid on this SDS).

If skin irritation occurs: Get medical advice/attention.

Take off contaminated clothing. And wash it before reuse.

Precautionary Statements - Storage

Store in a corrosive resistant container with a resistant inner liner.

Precautionary Statements - Disposal

No precautionary statement available.

Hazards Not Otherwise Classified (HNOC)

None.

SECTION 3) COMPOSITION / INFORMATION ON INGREDIENTS

CAS	Chemical Name	% By Weight
PROPRIETARY	Trade Secret Ingredient	45 - 55%

Specific chemical identity and/or exact percentage (concentration) of the composition has been withheld to protect confidentiality.

SECTION 4) FIRST-AID MEASURES

Inhalation

Remove source of exposure or move person to fresh air and keep comfortable for breathing. Immediately call a POISON CENTER/doctor/. If breathing has stopped, trained personnel should begin rescue breathing or, if the heart has stopped, immediately start cardiopulmonary resuscitation (CPR) or automated external defibrillation (AED).

Eye Contact

Remove source of exposure or move person to fresh air. Rinse eyes cautiously with lukewarm, gently flowing water for several minutes, while holding the eyelids open. Remove contact lenses, if present and easy to do. Continue rinsing for a flushing duration of 30 minutes. Take care not to rinse contaminated water into the unaffected eye or onto the face. Immediately call a POISON CENTER/doctor.

Skin Contact

Take off immediately all contaminated clothing, shoes and leather goods (e.g. watchbands, belts). Rinse skin with lukewarm, gently flowing water/shower for a duration of 30 minutes or until medical aid is available. Immediately call a POISON CENTER/doctor. Wash contaminated clothing before re-use or discard.

Ingestion

Rinse mouth with water. Do NOT induce vomiting. Give 1 to 2 cups of milk or water to drink. Never give anything by mouth to an unconscious person. If vomiting occurs naturally, lie on your side, in the recovery position. Immediately call a POISON CENTER/doctor.

Most Important Symptoms and Effects, Both acute and Delayed

No data available.

Indication of Any Immediate Medical Attention and Special Treatment Needed

No data available.

SECTION 5) FIRE-FIGHTING MEASURES

Suitable Extinguishing Media

Dry chemical, foam, carbon dioxide. Sand or earth may be used for small fires only.

Use extinguishing agent suitable for type of surrounding fire.

Unsuitable Extinguishing Media

Do not use direct water stream since this may cause fire to spread.

Specific Hazards in Case of Fire

In case of fire, hazardous decomposition products may include sulphur oxides.

Fire-Fighting Procedures

Isolate immediate hazard area and keep unauthorized personnel out. Stop spill/release if it can be done safely. Move undamaged containers from immediate hazard area if it can be done safely. Water spray may be useful in minimizing or dispersing vapors and to protect personnel. Water may be ineffective but can be used to cool containers exposed to heat or flame. Caution should be exercised when using water or foam as frothing may occur, especially if sprayed into containers of hot, burning liquid. Dispose of fire debris and contaminated extinguishing water in accordance with official regulations.

Special Protective Actions

Wear protective pressure self-contained breathing apparatus (SCBA) and full turnout gear.

SECTION 6) ACCIDENTAL RELEASE MEASURES

Emergency Procedure

Isolate hazard area and keep unnecessary people away. Remove all possible sources of ignition in the surrounding area. Notify authorities if any exposure to the general public or the environment occurs or is likely to occur.

Absorb spill with absorbent material or vacuum spill into polyethylene lined steel or plastic drums.

Do not touch or walk through spilled material.

If spilled material is cleaned up using a regulated solvent, the resulting waste mixture may be regulated.

Recommended Equipment

Positive pressure, full-facepiece self-contained breathing apparatus (SCBA), or positive pressure supplied air respirator with escape SCBA (NIOSH approved).

Personal Precautions

Avoid breathing vapor or mist. Avoid contact with skin, eye or clothing. Ensure adequate ventilation. Do not touch damaged containers or spilled materials unless wearing appropriate protective clothing.

Environmental Precautions

Stop spill/release if it can be done safely. Prevent spilled material from entering sewers, storm drains, other unauthorized drainage systems and natural waterways by using sand, earth, or other appropriate barriers.

Methods and Materials for Containment and Cleaning Up

Contain and collect spillage with non-combustible, absorbent material e.g. sand, earth, vermiculite or diatomaceous earth and place in container for disposal according to local regulations. Contaminated absorbent material may pose the same hazard as the spilled product.

SECTION 7) HANDLING AND STORAGE

General

Wash hands after use.

Do not get in eyes, on skin or on clothing.

Do not breathe vapors or mists.

Use good personal hygiene practices.

Eating, drinking and smoking in work areas is prohibited.

Remove contaminated clothing and protective equipment before entering eating areas.

Eyewash stations and showers should be available in areas where this material is used and stored.

Ventilation Requirements

Use only with adequate ventilation to control air contaminants to their exposure limits. The use of local ventilation is recommended to control emissions near the source.

Storage Room Requirements

Keep container(s) tightly closed and properly labeled. Store in cool, dry, well-ventilated areas away from heat, direct sunlight and strong oxidizers. Store in approved containers and protect against physical damage. Keep containers securely sealed when not in use. Indoor storage should meet OSHA standards and appropriate fire codes. Containers that have been opened must be carefully resealed to prevent leakage. Empty containers retain residue and may be dangerous.

Use non-sparking ventilation systems, approved explosion-proof equipment and intrinsically safe electrical systems in areas where this product is used and stored.

SECTION 8) EXPOSURE CONTROLS, PERSONAL PROTECTION

Eye Protection

Wear eye protection with side shields or goggles. Wear indirect-vent, impact and splash resistant goggles when working with liquids. If additional protection is needed for entire face, use in combination with a face shield.

Skin Protection

Use of gloves approved to relevant standards made from the following materials may provide suitable chemical protection: PVC, neoprene or nitrile rubber gloves. Suitability and durability of a glove is dependent on usage, e.g. frequency and duration of contact, chemical resistance of glove material, glove thickness, dexterity. Always seek advice from glove suppliers. Contaminated gloves should be replaced. Use of an apron and over-boots of chemically impervious materials such as neoprene or nitrile rubber is recommended to avoid skin sensitization. The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace. Launder soiled clothes or properly disposed of contaminated material, which cannot be decontaminated.

Respiratory Protection

If engineering controls do not maintain airborne concentrations to a level which is adequate to protect worker, a respiratory protection program that meets or is equivalent to OSHA 29 CFR 1910.134 and ANSI Z88.2 should be followed. Check with respiratory protective equipment suppliers.

Appropriate Engineering Controls

Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value.

SECTION 9) PHYSICAL AND CHEMICAL PROPERTIES

Physical and Chemical Properties

Density	11.10 lb/gal
Specific Gravity	1.33 - 1.35
Appearance	Colorless to yellow liquid
pH	3 - 4
Odor Threshold	N/A
Odor Description	N/A
Water Solubility	complete
Viscosity	< 100cps @20C
Vapor Pressure	Similar to water
Vapor Density	N/A
Freezing Point	<19 °F
Boiling Point	>212 °F
Evaporation Rate	N/A
Flammability	Will not burn

SECTION 10) STABILITY AND REACTIVITY

Stability

Stable under normal storage and handling conditions.

Conditions To Avoid

Avoid heat, sparks, flame, high temperature and contact with incompatible materials.

Hazardous Reactions/Polymerization

Hazardous polymerization will not occur.

Incompatible Materials

Strong bases, acids, oxidizing and reducing agents.

Hazardous Decomposition Products

May produce carbon monoxide, carbon dioxide.

SECTION 11) TOXICOLOGICAL INFORMATION

Likely Routes of Exposure

Inhalation LC50 : Not Available

Oral LD50 : Not Available

Dermal LD50 : Not Available

Acute Toxicity

Component	weight-%	Oral LD50	Dermal LD50	Inhalation LC50
Trade Secret Ingredient	45 - 55%	= 9187 mg/kg (Rat)	> 2000 mg/k (Rat)	--

Aspiration Hazard

No Data Available

Respiratory/Skin Sensitization

No Data Available

Serious Eye Damage/Irritation

Causes serious eye irritation

Skin Corrosion/Irritation

Causes skin irritation

Specific Target Organ Toxicity - Repeated Exposure

No Data Available

Specific Target Organ Toxicity - Single Exposure

No Data Available

SECTION 12) ECOLOGICAL INFORMATION

Ecotoxicity

Acute aquatic toxicity - Product Information

Fish	LC 50 (96 hour, static) 776.4 mg/L <i>Pimephales promelas</i> (Fathead Minnow) ¹ EC 50 (96 hour, static) 265.5 mg/L <i>Pimephales promelas</i> (Fathead Minnow) ¹
Crustacea	LC 50 (48 hour, static) 803.8 mg/L <i>Ceriodaphnia dubia</i> (Water Flea) ¹ EC 50 (48 hour, static) 33.2 mg/L <i>Ceriodaphnia dubia</i> (Water Flea) ¹
Algae/aquatic plants	No information available

Acute aquatic toxicity - Component Information

Component	weight-%	Algae/aquatic plants	Fish	Toxicity to daphnia and other aquatic invertebrates
Trade Secret Ingredient	45 - 55%	--	LC50 (96 h static) 100 - 500 mg/L (Brachydanio rerio)	--

Mobility in Soil

No data available.

Bio-accumulative Potential

No data available.

Persistence and Degradability

No data available.

Other Adverse Effect

No data available.

SECTION 13) DISPOSAL CONSIDERATIONS

Waste Disposal

Under RCRA it is the responsibility of the user of the product to determine at the time of disposal whether the product meets RCRA criteria for hazardous waste. Waste management should be in full compliance with federal, state and local laws.
Empty Containers retain product residue which may exhibit hazards of material, therefore do not pressurize, cut, glaze, weld or use for any other purposes. Return drums to reclamation centers for proper cleaning and reuse.

SECTION 14) TRANSPORT INFORMATION

U.S. DOT Information

NOT REGULATED FOR TRANSPORTATION

This product is excepted from DOT regulations under 49 CFR 173.154(d) when shipped by road or railway. The product exception is referenced in 49 CFR 172.101 Table. Packaging material must not be aluminum, steel or be degraded by this product

SECTION 15) REGULATORY INFORMATION

CAS	Chemical Name	% By Weight	Regulation List
No applicable CAS	No applicable chemical	-	-

SECTION 16) OTHER INFORMATION

Glossary

ACGIH- American Conference of Governmental Industrial Hygienists; ANSI- American National Standards Institute; Canadian TDG-Canadian Transportation of Dangerous Goods; CAS- Chemical Abstract Service; Chemtrec- Chemical Transportation Emergency Center(US); CHIP- Chemical Hazard Information and Packaging; DSL- Domestic Substances List; EC- Equivalent Concentration; EH40 (UK)- HSE Guidance Note EH40 Occupational Exposure Limits; EPCRA- Emergency Planning and Community Right-To-Know Act; ESL Effects screening levels; HMIS- Hazardous Material Information Service; LC- Lethal Concentration; LD- Lethal Dose; NFPA- National Fire Protection Association; OEL- Occupational Exposure Limits; OSHA- Occupational Safety and Health Administration, US Department of Labor; PEL- Permissible Exposure Limit; SARA (Title III)- Superfund Amendments and Reauthorization Act; SARA 313- Superfund Amendments and Reauthorization Act, Section 313; SCBA- Self Contained Breathing Apparatus; STEL-Short Term Exposure Limit; TCEQ Texas Commission on Environmental Quality; TLV- Threshold Limit Value; TSCA- Toxic Substances Control Act Public Law 94-469; TWA Time Weighted Value; US DOT- US Department of Transportation; WHMIS- Workplace Hazardous Materials Information System.

Additional Information

Any concentration shown as a range is to protect confidentiality or is due to batch variation.

Version 1.0:

Revision Date: Apr 15,2019

First Edition.

DISCLAIMER

To the best of our knowledge, the information contained herein is accurate. However, neither the above named supplier nor any of its subsidiaries assumes any liability whatsoever for the accuracy or completeness of the information contained herein. Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist. The above information pertains to this product as currently formulated, and is based on the information available at this time. Addition of reducers or other additives to this product may substantially alter the composition and hazards of the product. Since conditions of use are outside our control, we make no warranties, express or implied, and assume no liability in connection with any use of this information.



Revision date 2019-15-4

SAFETY DATA SHEET

Revision number 1

SECTION 1) CHEMICAL PRODUCT AND SUPPLIER'S IDENTIFICATION

Product ID: Redux-823
Product Name: Processing aid for industrial applications

Revision Date: Apr 15, 2019
Supersedes Date: Jan 25, 2018

Manufacturer's Name: Azure Water Services
Address: 280 Callegari Drive West Haven, CT, US, 06516
Emergency Phone: Chemtrec 800-424-9300, in US and Canada only

SECTION 2) HAZARDS IDENTIFICATION

Classification of the substance or mixture

Not a hazardous substance or mixture according to United States Occupational Safety and Health Administration (OSHA) Hazard Communication Standard (29 CFR 1910.1200).

Hazards Not Otherwise Classified (HNOC)

None.

SECTION 3) COMPOSITION / INFORMATION ON INGREDIENTS

None of the chemicals in this product are hazardous according to the GHS.

SECTION 4) FIRST-AID MEASURES

Inhalation

Remove source of exposure or move person to fresh air and keep comfortable for breathing. Immediately call a POISON CENTER/doctor/. If breathing has stopped, trained personnel should begin rescue breathing or, if the heart has stopped, immediately start cardiopulmonary resuscitation (CPR) or automated external defibrillation (AED).

Eye Contact

Remove source of exposure or move person to fresh air. Rinse eyes cautiously with lukewarm, gently flowing water for several minutes, while holding the eyelids open. Remove contact lenses, if present and easy to do. Continue rinsing for a flushing duration of 30 minutes. Take care not to rinse contaminated water into the unaffected eye or onto the face. Immediately call a POISON CENTER/doctor.

Skin Contact

Take off immediately all contaminated clothing, shoes and leather goods (e.g. watchbands, belts). Rinse skin with lukewarm, gently flowing water/shower for a duration of 30 minutes or until medical aid is available. Immediately call a POISON CENTER/doctor. Wash contaminated clothing before re-use or discard.

Ingestion

Rinse mouth with water. Do NOT induce vomiting. Give 1 to 2 cups of milk or water to drink. Never give anything by mouth to an unconscious person. If vomiting occurs naturally, lie on your side, in the recovery position. Immediately call a POISON CENTER/doctor.

Most Important Symptoms and Effects, Both acute and Delayed

No data available.

Indication of Any Immediate Medical Attention and Special Treatment Needed

No data available.

SECTION 5) FIRE-FIGHTING MEASURES

Suitable Extinguishing Media

Dry chemical, foam, carbon dioxide. Sand or earth may be used for small fires only.

Use extinguishing agent suitable for type of surrounding fire.

Unsuitable Extinguishing Media

Do not use direct water stream since this may cause fire to spread.

Specific Hazards in Case of Fire

In case of fire, hazardous decomposition products may include sulphur oxides.

Fire-Fighting Procedures

Isolate immediate hazard area and keep unauthorized personnel out. Stop spill/release if it can be done safely. Move undamaged containers from immediate hazard area if it can be done safely. Water spray may be useful in minimizing or dispersing vapors and to protect personnel. Water may be ineffective but can be used to cool containers exposed to heat or flame. Caution should be exercised when using water or foam as frothing may occur, especially if sprayed into containers of hot, burning liquid. Dispose of fire debris and contaminated extinguishing water in accordance with official regulations.

Special Protective Actions

Wear protective pressure self-contained breathing apparatus (SCBA) and full turnout gear.

SECTION 6) ACCIDENTAL RELEASE MEASURES

Emergency Procedure

Isolate hazard area and keep unnecessary people away. Remove all possible sources of ignition in the surrounding area. Notify authorities if any exposure to the general public or the environment occurs or is likely to occur.

Absorb spill with absorbent material or vacuum spill into polyethylene lined steel or plastic drums.

Do not touch or walk through spilled material.

If spilled material is cleaned up using a regulated solvent, the resulting waste mixture may be regulated.

Recommended Equipment

Positive pressure, full-facepiece self-contained breathing apparatus (SCBA), or positive pressure supplied air respirator with escape SCBA (NIOSH approved).

Personal Precautions

Avoid breathing vapor or mist. Avoid contact with skin, eye or clothing. Ensure adequate ventilation. Do not touch damaged containers or spilled materials unless wearing appropriate protective clothing.

Environmental Precautions

Stop spill/release if it can be done safely. Prevent spilled material from entering sewers, storm drains, other unauthorized drainage systems and natural waterways by using sand, earth, or other appropriate barriers.

Methods and Materials for Containment and Cleaning Up

Contain and collect spillage with non-combustible, absorbent material e.g. sand, earth, vermiculite or diatomaceous earth and place in container for disposal according to local regulations. Contaminated absorbent material may pose the same hazard as the spilled product.

SECTION 7) HANDLING AND STORAGE

General

Wash hands after use.

Do not get in eyes, on skin or on clothing.

Do not breathe vapors or mists.

Use good personal hygiene practices.

Eating, drinking and smoking in work areas is prohibited.

Remove contaminated clothing and protective equipment before entering eating areas.

Eyewash stations and showers should be available in areas where this material is used and stored.

Ventilation Requirements

Use only with adequate ventilation to control air contaminants to their exposure limits. The use of local ventilation is recommended to control emissions near the source.

Storage Room Requirements

Keep container(s) tightly closed and properly labeled. Store in cool, dry, well-ventilated areas away from heat, direct sunlight and strong oxidizers. Store in approved containers and protect against physical damage. Keep containers securely sealed when not in use. Indoor storage should meet OSHA standards and appropriate fire codes. Containers that have been opened must be carefully resealed to prevent leakage. Empty containers retain residue and may be dangerous.

Use non-sparking ventilation systems, approved explosion-proof equipment and intrinsically safe electrical systems in areas where this product is used and stored.

SECTION 8) EXPOSURE CONTROLS, PERSONAL PROTECTION

Eye Protection

Wear eye protection with side shields or goggles. Wear indirect-vent, impact and splash resistant goggles when working with liquids. If additional protection is needed for entire face, use in combination with a face shield.

Skin Protection

Use of gloves approved to relevant standards made from the following materials may provide suitable chemical protection: PVC, neoprene or nitrile rubber gloves. Suitability and durability of a glove is dependent on usage, e.g. frequency and duration of contact, chemical resistance of glove material, glove thickness, dexterity. Always seek advice from glove suppliers. Contaminated gloves should be replaced. Use of an apron and over-boots of chemically impervious materials such as neoprene or nitrile rubber is recommended to avoid skin sensitization. The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace. Launder soiled clothes or properly disposed of contaminated material, which cannot be decontaminated.

Respiratory Protection

If engineering controls do not maintain airborne concentrations to a level which is adequate to protect worker, a respiratory protection program that meets or is equivalent to OSHA 29 CFR 1910.134 and ANSI Z88.2 should be followed. Check with respiratory protective equipment suppliers.

Appropriate Engineering Controls

Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value.

SECTION 9) PHYSICAL AND CHEMICAL PROPERTIES

Physical and Chemical Properties

Density	6.26 lb/gal
Specific Gravity	0.6 - 0.9
Appearance	granular, white solid
pH	5 - 9 @ 5 g/L
Odor Threshold	N/A
Odor Description	N/A
Water Solubility	Complete
Viscosity	N/A
Vapor Pressure	Similar to water
Vapor Density	N/A
Freezing Point	<32 °F
Boiling Point	>212 °F
Evaporation Rate	N/A
Flammability	Will not burn

SECTION 10) STABILITY AND REACTIVITY

Stability

Stable under normal storage and handling conditions.

Conditions To Avoid

Avoid heat, sparks, flame, high temperature and contact with incompatible materials.

Hazardous Reactions/Polymerization

Hazardous polymerization will not occur.

Incompatible Materials

Strong bases, acids, oxidizing and reducing agents.

Hazardous Decomposition Products

May produce carbon monoxide, carbon dioxide.

SECTION 11) TOXICOLOGICAL INFORMATION

Likely Routes of Exposure

No Data Available

Acute Toxicity

Inhalation, Testing: Not expected to be toxic by inhalation.

Ingestion, Testing: LD50, Rat > 5,00 mg/kg

Dermal, Testing: LD50, Rat > 5,000 mg/kg

Respiratory/Skin Sensitization

No Data Available

Serious Eye Damage/Irritation

No Data Available

Skin Corrosion/Irritation

No Data Available

Specific Target Organ Toxicity - Repeated Exposure

No Data Available

Specific Target Organ Toxicity - Single Exposure

No Data Available

SECTION 12) ECOLOGICAL INFORMATION

Acute Ecotoxicity

Danio Rerio: 96 hr LC50 >100 mg/l (OECD 203)

Fathead Minnow (pimephales promelas): 96hr LC50 >100 mg/l (OECD 203)

Daphnia Magna: 48hr EC50 >100 mg/l (OECD 202)

Scenedesmus Subspicatus: 72hr IC50 >100 mg/l (OECD 201)

Mobility in Soil

No data available.

Bio-accumulative Potential

Not bioaccumulating.

Persistence and Degradability

Not readily biodegradable.

Other Adverse Effect

No data available.

SECTION 13) DISPOSAL CONSIDERATIONS

Waste Disposal

Under RCRA it is the responsibility of the user of the product to determine at the time of disposal whether the product meets RCRA criteria for hazardous waste. Waste management should be in full compliance with federal, state and local laws. Empty Containers retain product residue which may exhibit hazards of material, therefore do not pressurize, cut, glaze, weld or use for any other purposes. Return drums to reclamation centers for proper cleaning and reuse.

SECTION 14) TRANSPORT INFORMATION

U.S. DOT 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

SECTION 15) REGULATORY INFORMATION

CAS	Chemical Name	% By Weight	Regulation List
No applicable CAS	No applicable chemical	-	-

SECTION 16) OTHER INFORMATION

Glossary

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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:

June 03, 2019

Consultation Code: 05E1NE00-2019-SLI-1868

Event Code: 05E1NE00-2019-E-04611

Project Name: GLX Project

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: 05E1NE00-2019-SLI-1868

Event Code: 05E1NE00-2019-E-04611

Project Name: GLX Project

Project Type: TRANSPORTATION

Project Description: Temporary discharge of treated water

Project Location:

Approximate location of the project can be viewed in Google Maps: <https://www.google.com/maps/place/42.405181877871556N71.09768741262369W>



Counties: Middlesex, MA

Endangered Species Act Species

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

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

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA 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.

Mammals

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

Critical habitats

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

ATTACHMENT H

**MASSACHUSETTS CULTURAL
RESOURCES DATABASE SEARCH
RESULTS**

Massachusetts Cultural Resource Information System

MACRIS

MACRIS Search Results

Search Criteria: Town(s): Medford; Street Name: Mystic Ave; Resource Type(s): Area, Burial Ground, Building, Object, Structure;

Inv. No.	Property Name	Street	Town	Year
MDF.1541	Blanchard, Eben - Bates, Walter Tenant House	11-13 Mystic Ave	Medford	r 1865
MDF.571		29 Mystic Ave	Medford	c 1965
MDF.34	Hall, Benjamin - Swan, Dr. Daniel House	41 Mystic Ave	Medford	1752
MDF.578		45 Mystic Ave	Medford	c 1900
MDF.584		67 Mystic Ave	Medford	c 1958
MDF.585		71 Mystic Ave	Medford	c 1900
MDF.587		73 Mystic Ave	Medford	c 1945
MDF.588		81 Mystic Ave	Medford	c 1945
MDF.590		93 Mystic Ave	Medford	c 1955
MDF.591		101 Mystic Ave	Medford	c 1953

Massachusetts Cultural Resource Information System

MACRIS

MACRIS Search Results

Search Criteria: Town(s): Medford; Street Name: Mystic Valley;

Inv. No.	Property Name	Street	Town	Year
MDF.938	Mystic Valley Parkway - Nelson Circle	High St	Medford	r 1920
MDF.902	Lawrence, Gen. Bridge	Mystic Valley Pkwy	Medford	1933
MDF.920	Mystic Valley Parkway Bridge over Route 38	Mystic Valley Pkwy	Medford	1961
MDF.923	Mystic Valley Parkway - Armory Bridge	Mystic Valley Pkwy	Medford	1906
MDF.937	Mystic Valley Parkway - Mystic Lakes Segment	Mystic Valley Pkwy	Medford	1896
MDF.939	Mystic Valley Parkway Bridge over Mystic River	Mystic Valley Pkwy	Medford	1936
MDF.940	Mystic Valley Parkway - Central Segment	Mystic Valley Pkwy	Medford	c 1905
MDF.941	Mystic Valley Parkway Tree Canopy	Mystic Valley Pkwy	Medford	r 1920
MDF.408		1416 Mystic Valley Pkwy	Medford	c 1910
MDF.1155	Craddock Cove Condominiums	2500 Mystic Valley Pkwy	Medford	1980