MacDonald Final
Soil Re-Use Management Plan
October 13, 2022
Revision 4 (Phase III Filling Program)

Marilyn's Landing Commercial Re-Use Area (MLCRA)
946 Plymouth Street/ Rt. 106 Halifax Town Line
Bridgewater, Massachusetts and;
BFI Halifax Landfill, Halifax, Massachusetts

Revised: October 13, 2022

Prepared for:

Marilyn and David MacDonald
MacDonald Industries Inc.
645 Walnut Street
Bridgewater, Massachusetts 02324

Prepared by:
Richard Stromberg, LSP
Boston Environmental Corp.
338 Howard Street
Brockton, MA 02302

Table of Contents

Figures:

Tables:

Appendices:

1.0 Introduction

1.1 Overview and Site Conditions

The following is a **Fourth Revised "*Soil Re-Use Management Plan*" (SRMP or Plan)** prepared in support of the development of a 7.65+/- -acre parcel of land known as Marilyn's Landing Commercial Re-Use Area (MLCRA) off Plymouth Street in Bridgewater, Massachusetts, and the adjoining 44 +/- acre BFI Halifax Landfill (the "Landfill"), Halifax, Massachusetts for a future solar collector farm (See Appendix A). Collectively, Marilyn's Landing Commercial Re-Use Area and the BFI Halifax Landfill shall be referred as the "Site". MacDonald Industries, Inc. (MacDonald Industries) has been implementing soil fill activities at MLCRA using a phased approach to facilitate development of a future Photovoltaic (PV) Solar Array that would span MLCRA and the adjacent BFI Halifax Landfill (the "Project"). To date, Phase I and Phase II activities have been completed, (except for the roadways), and Phase III activities are ongoing in accordance with the executed Second ACO dated December 15, 2020. Additional soil is being placed under Phase III Activities in an area extending from MLCRA onto the Landfill and including the "swale" on the border of the two properties. Upon completion of soil fill activities a 13.5 acre plateau will be established for the PV array.

This Plan incorporates provisions in a "Post-Closure Use (PCU) – Major (BWP SW36), for the BFI Halifax Landfill, Halifax, Massachusetts" (June 17, 2019) prepared by Civil & Environmental Consultants, Inc. (CEC) submitted to MassDEP which described placement of additional "RCS-1/2" soil on the western slope of the Landfill and the adjoining MLCRA associated with Phase III Activities. It also provides an update to the prior Third Revised SRMP (SRMP Rev-3) prepared on February 2, 2022 by Richard Stromberg, LSP, which addressed the placement of approximately 1.3 million tons of soil under "Phase III" Soil Fill Activities with constituent concentrations which meet the Soil Acceptance Criteria (SAC). On January 20, 2020, MassDEP conditionally approved the Post-Closure Use permit application. The SRMP Rev-3 also includes provisions for management of Street Sweepings (SS) as allowed under the MassDEP "Reuse and Disposal of Street Sweepings" Policy #BAW-18-001provided they are adequately characterized and "Catch Basin Cleanings" (CBC) material under the "Phase III" Soil Fill Activities for soil re-use at MLCRA and a portion of the adjoining Landfill, to a certain design elevation, through use of updated Soil Acceptance Criteria (SAC) and management provisions.

The purpose of this revised SRMP is to provide for the acceptance of soil that is considered remediation waste as defined in the Massachusetts Contingency Plan at 310 CMR 40.0000 (MCP) to mean any uncontainerized waste, contaminated media, and/or contaminated debris that is managed pursuant to 310 CMR 40.0030. Remediation waste does not include containerized waste. Except for selected soil that meets the definition of remediation waste at RCS-1 sites (concentrations of OHM greater that RCS-1 but less that RCS-2), the Owner is not proposing to accept any other remediation waste for reuse at the Site. This soil is hereinafter

referred to as “remediation waste”.

MacDonald Industries has received the approvals from the Towns of Halifax and Bridgewater Town Administrator and Town Manager respectively that are provided in Appendix E.

CEC was consulted to re-evaluate assumptions made by them in the PCU Design submittal for structural slope stability for addition of CBC. The PCU was approved by MassDEP in January 2020. CEC was informed by MacDonald Industries that they plan to accept suburban/rural and some urban CBC from municipalities and catch basins that are not connected to a combined sewer. MacDonald Industries will inspect the CBC at the generating sites after they are drained. After profiling and acceptance by the MLCRA LSP, or another LSP in coordination with MLCRA’s LSP, CBC material will be stockpiled and de-watered further to the extent practical at the Site. The CBC will be blended with incoming soils, similar to SS at a ratio of 3:1 prior to placement as fill.

CEC coordinated with a laboratory to test an example CBC pile at Halifax Department of Public Works (DPW) for modified proctor, direct shear testing and moisture content. CEC indicated in their P.E. stamped letter in Appendix E, dated October 8, 2021, that incorporation of this material in the mix at a conservative estimate of 10-20% of the total expected soil import would not significantly change the assumptions in the slope/structural stability assessment and not result in significant changes to expected settlement. This would equate to approximately 200,000 tons of CBC material in the estimated quantity of 1.3 million tons of soil estimated to be brought in under Phase III. The project will not exceed the maximum elevations referenced in the PCU, associated plans, the Consent Order and the February 2022 ACO Amendment.

As indicated in following sections, the SAC was previously updated to incorporate additional testing guidance for specific parameters including asbestos and per-and polyfluoroalkyl substances, if suspected to be present at the sending Site. The SAC in the SRMP Rev. No. 3 was revised to include testing for fecal coliform in in CBC material.

Placement of CBC material will be conducted in accordance with existing permits and plans (i.e., PCU, Order of Conditions, an updated Project SWPPP), and updated town approvals. No placement of CBC material will occur within 100 feet of a bordering vegetated wetland.

Information with respect to the private drinking well users in the area, and consolidated information for the monitoring well network at the combined Site is also contained in this SRMP. Otherwise, information remains similar to the prior SRMP and previous SAC. The soil import will be managed by MacDonald Industries. This SRMP will be used to guide remaining soil fill activities at the Site under roadways as part of Phase II and Phase III in accordance with the Consent Order No. 00009681 described below and the new ACO Amendment to be executed for this SRMP Revision. Appropriate soil cover and stabilization will be completed under Phase III as guided under the Storm Water Pollution Protection Plan (SWPPP) provided herein.

The location of the MLCRA with respect to surrounding areas is shown on Figure 1. A topographic property boundary map of the MLCRA is shown on Figure 2 which is the "Topographic and Wetland Plan of Land" prepared by Terra Nova Survey Consultants, dated June 2013. Figure 2 also shows the boundaries of jurisdictional land including: identified wetlands, proposed limit of soil placement under this plan in Lot A, and other on-site features (i.e. roadways and monitoring wells). Figure 2A is the current topographic map for the area being filled dated July 2021 prepared by CEC. Since that time flyovers have been completed by Firmatek for Republic Services in May 2022 showing remaining "airspace" for the project. These flyovers will be done quarterly and the latest is provided in the "Quarterly Construction Status Report" filed by BEC for the site for the period of February 15 to May 15, 2022.

Previous plans called for importation and placement of approximately 400,000 tons of soil up to an elevation of approximately 65 feet NAVD, known as Phase I Activities, as shown on Figure 3. Figure 4 shows the mapped wetlands in the area of MLCRA. The SRMP was later modified and finalized (November 17, 2017) as part of the existing Administrative Consent Order No. 00003451 to reflect the importation of an additional 400,000 tons of soil to meet an elevation of 88 feet (NAVD) ("Phase II Activities"). Approximately 670,817tons of soil have been placed at MLCRA under the previous plan and modifications, encompassing Phase I and Phase II. This Phase III program will be implemented to continue soil placement up to 144' maximum elevation on the Bridgewater parcel and 141' on the Halifax parcel, filling the "Swale Area" in between them. Figures 5 and 6 show the current and proposed final elevations. As stated in the PCU Plan by CEC, the anticipated volume of fill to be placed onto the BFI-Halifax Landfill area is approximately 580,800 cubic yards and 252,100 cubic yards on the MLCRA property, totaling 832,900 cubic yards and corresponding to a total tonnage of approximately 1,332,640 tons using a 1.6 multiplier. Based on settling, density of materials, etc. the actual amounts that will be placed at the Site may exceed the estimated tonnage. The total volume of soil, SS, and CBC is controlled by final elevations. Pursuant to the February 2022 ACO amendment, the maximum quantity of catch basin cleanings that can be accepted through project completion is 200,000 tons. The soil placement will meet the requirements set forth in the attached Table 1 (Soil Acceptance Criteria "SAC").

The MLCRA property is owned by MacDonald Industries, Inc. (c/o Mr. David MacDonald, 645 Walnut Street, Bridgewater, MA 02324), ("MacDonald Industries" or "the Applicant"). MLCRA was historically used for sand and gravel mining related to the adjoining Halifax Sanitary Landfill located to the east of the subject property in the Town of Halifax. The Bridgewater Board of Health issued an Amended Site Assignment to MacDonald for MLCRA on November 14, 1988 pursuant to M.G.L. c. 111, § 150A. MLCRA was not used for the landfill and the adjacent Halifax Sanitary Landfill is now closed. There is no evidence of unauthorized dumping, tanks, or other unauthorized use on the Site.

MCLRA is accessed at 946 Plymouth Street, (Rt. 106) at the Bridgewater/Halifax Town Line in Bridgewater, Massachusetts. The municipal boundary between the Town of Bridgewater and the Town of Halifax runs along the eastern property boundary of the MLCRA. MLCRA is zoned "industrial" as shown on the Bridgewater Zoning Map (February 6, 2007).

The surrounding areas are as follows:

North: Undeveloped industrial-zoned land, access road to MLCRA and Rt. 106.
South: Undeveloped industrial-zoned land.
East: Closed Halifax Landfill.
West: Wetlands, A Public Water Supply, "Zone II Aquifer Protection District" area is located about 2,500 feet to the west of MLCRA.

There are no vernal pools or habitats for rare wildlife on MLCRA; however, priority habitats for rare species are located southwest of MLCRA. The uplands are mainly grassed fields or woods. The area of MLCRA contains intermittent drainage but no perennially flowing water bodies.

MacDonald Industries intends to vertically expand the limits of an existing area at the Site as delineated on the attached Existing Conditions Plan and Proposed Grading Plan prepared by CEC in Figures 5 and 6 where soils have been placed and place additional fill will be placed on four (4) existing parcels of vacant land located off Plymouth Street Extension in Bridgewater, Massachusetts identified as assessor's parcel numbers 040-009, 040-010, 040-016 and 040-017 (See Figure 2). An Order of Conditions (MassDEP File No. SE116-1297) was issued by the Town of Bridgewater Conservation Commission (BCC) on December 10, 2013, allowing the construction of the drainage improvements and placement of fill as shown on the Plans in Figure 3 prepared by EBI Consulting dated November 11, 2013. Since the issuance of the Order of Conditions, the placement of soil has commenced and is ongoing. A Letter of Intent to install solar facility is provided in Appendix A. Work is being conducted in accordance with the updated Health & Safety Plan (HASP) prepared by Civil and Environmental Consultants (CEC) in Appendix B.

The Phase III activities include placement of a total of up to 1,332,640 tons of additional material to achieve final elevations. This will also include construction of a gravel access road, earthwork, erosion and sedimentation control, and associated storm water management improvements to support the placement of soil (refer to Grading and Drainage Plans – Figures 5 and 6).

MLCRA Initial Grading Plan ("Phase I") Project NOI and the Order of Conditions was first approved by the Bridgewater Conservation Commission (BCC) in December 2013 for the placement of soil to Elevation 65+/-. Soil was placed in the initial fill area (as shown on Figure 2) outside of any wetland jurisdictional areas. Soils were consistent with the MassDEP "Similar Soils Provision Guidance" (Sept. 2014) and MCP "RCS-1" standards.

Implementation of Phase II Activities included an Order of Conditions for a revised Plan to place soils to Elevation 88+/-was approved by the BCC on July 14, 2015 and found in Appendix C. Figure 3 depicts the proposed grade as it was contemplated at that time on the Revised Plan prepared for the BCC and to delineate the boundaries of the Fill Area and management of adjoining wetland buffer zones to the west of the parcel. A Determination of Applicability for these western wetland buffer zones was submitted in Spring, 2016 to the BCC. In July of 2016, the BCC issued a Negative Determination of Applicability (See Appendix D) which

revised the limits of jurisdiction under the Wetlands Protection Act on MLCRA. This determination effectively allowed for this additional area to be used as part of the fill operation, as it was determined to not be a wetland and beyond the limits of jurisdiction. The 2016 Plan (See Figure 3) proposed placement of < RCS-1 and RCS-2 soil up to elevation 88 feet (NAVD) including the former wetlands on the western side of the parcel to be used in the construction of a solar farm.

The Order of Conditions executed in 2015 is provided in Appendix E. Letters from the Bridgewater Town Manager and Health Agent and Halifax Board of Selectmen submitted to MassDEP and MacDonalds Industries acknowledging the original SRMP and updates to the SAC are also provided in Appendix E.

As part of this expansion, a Storm Water Pollution Prevention Plan (SWPPP) prepared by CEC is attached as Appendix G as required in the PCU document. The SRMP was updated in December 2015, November 2017, September 2020, and May 2022 to reflect the changes approved by the BCC in July 2015. MLCRA conducts weekly SWPPP inspections and reporting, as required for MLCRA. Engineering work and inspections will be provided by respective parties for the MLCRA side and the Halifax Landfill side in accordance with the "Engineering Work" requirements in Item 31 of the current Consent Order No. 00009681 and Item C of the Post Closure Use Permit. Mr. Karlis Skulte. P.E., or an alternative qualified representative of CEC will conduct periodic inspections, as needed, for the overall grading activities, erosion controls, and stormwater management Best Management Practices (BMPs) installed as construction progresses and will prepare reports for each site inspection. The inspections will include a review of the grading activities and work along the existing landfill cap for the Halifax Landfill to document the work is being done in accordance with good engineering practice and is not resulting in damage to the existing landfill cap.

This updated SRMP provides information for the placement of remediation waste (i.e., soil) within the defined boundaries of the Site that meet certain physical and chemical criteria and is consistent with local Towns of Bridgewater and Halifax requirements for placement of this material containing contaminant concentrations that are below RCS-1 and 2 Reportable Concentrations and meet the SAC.

1.2 Reportable Concentrations

Pursuant to the MCP, the soil and groundwater Reportable Concentrations (RCs) applicable to the Site include RCS-2 for soil and RCGW-2 for groundwater. A Release Tracking Number (RTN) 4-26987 has been assigned to MLCRA by MassDEP to allow e-DEP submittals associated with Phase II Activities. A new RTN was established for the combined Site by MassDEP for issuance of reports associated with Phase III Activities (RTN 4-28626).

The determination is supported by the following criteria:

Soil:

- The wetlands to the west include a parcel of land zoned residential that is within 500 feet of the Site. This zoning classification determines that the reporting classification for soil would

be RCS-1 under 310 CMR 40.0360, however no residences are allowed to be built within these wetlands pursuant to the Massachusetts Wetlands Protection Act, M.G.L. c. 131, § 40 ("the Act"), and MacDonald Industries agreed to record a deed restriction in the Plymouth County Registry of Deeds prohibiting residential development. The Notice of Deed Restriction was filed with the Plymouth County Registry of Deeds on December 20, 2017 by MacDonald Industries (Book 49369, Page 164-165), and was included in the "Initial Construction Status Report" submitted to MassDEP on January 2, 2018, as required in Section III.27.S.iii. Due to the legal prohibition to residential development under the Act and MacDonald Industries agreement to record a deed restriction, MassDEP has determined that the applicable reporting category for soil under the MCP is RCS-2.

- There are residential properties > 500 feet and within ½ mile from the Site and all are reportedly connected to the municipal water distribution system.

- There are no private/residential drinking water wells within ½ mile of the Site. Boston Environmental Corp. (BEC) and MacDonald Industries obtained a list of wells in Bridgewater and Halifax recorded with the Water Departments and Board of Health (BOH). BEC provided a "Private Well Use Research" report to MassDEP and the municipal agencies in March 2019 and the results are provided in Appendix I. No known domestic drinking water wells are located within ½ mile of the Site.

- There will be no athletic fields or areas of high intensive activity in the area to be filled under this project, and the intended future use of the Site will include a Solar Farm.

- There are also no planned vegetable or communal vegetable gardens.

- There will also be no installation of additional subsurface utilities, i.e. telephone, cable, electricity, or storm drains, as no buildings are planned during this Phase III.

- Underground electrical lines for electrical transmission lines and minimal lighting may need to be installed when the Solar Farm is constructed, as anticipated during or after Phase III. The construction and operation of the photovoltaic array on the Phase III area will require the submittal of a Post-closure use permit application for MassDEP review.

Groundwater:

Based on a review of the MassGIS Priority Resource Map (Figure 4), the Bridgewater and Halifax Zoning Maps, local file reviews and on conditions observed at the Site, groundwater at the Site meets the criteria of groundwater category RCGW-2.

- RCGW-1 – This criterion does not apply since the Site is not located within the geographic boundaries of a MassDEP Approved Wellhead Protection Area (Zone II), Interim Wellhead Protection Area, Zone A of Class A surface water body used as a public water supply, Potentially Productive Aquifer or an aquifer protection district. Additionally, according to Bridgewater and Halifax officials, there are no private drinking water wells, irrigation wells, cooling water wells, agricultural wells, food processing wells, non-community water supplies or industrial wells within 1,000 feet of the Site. The Site is served by the Halifax

municipal water system. According to the Bridgewater and Halifax Zoning Maps, the Site is not located within an aquifer or groundwater protection district.

- RCGW-2 – This criterion applies since the Site is not located within a current or potential drinking water resource area.

1.3 Names and Addresses of Parties Involved

The Owner of the MLCRA property is: MacDonald Industries Inc., c/o Mr. David MacDonald, 645 Walnut Street, Bridgewater, MA 02324. The Owner of the BFI Halifax Landfill property is: Browning Ferris Industries Inc. (BFI) / Republic Services, c/o Mr. Christopher Ford, 14 Belcher Street, Plainville, MA 02762.

The Operator of the Project is David MacDonald and the Operations Manager for all proposed shipments and pricing is Marilyn MacDonald Phone: (508) -294-0173 e-mail marilyn@macdonald-industries.com.

The On-Site Operations Coordinator for filling operations is David MacDonald Phone: (508) -294-0174.

The Assistant Site and Operations Manager for the onsite scale house is, Michael MacDonald Phone: (508) -245-3745 e-mail michael@macdondald-industries.com. Michael provides daily log sheets and excel spreadsheets can also be provided directly to clients upon their request. Any questions during running hours of the scale can be directed to Michael, the cell phone number for the scale house is (508) – 294 – 1364. Michael also provides support to above Coordinator and Manager positions in either of their absence.

The Weigh Scale for all soil shipments is located at the Site.

The "Site LSP" reviewing candidate soil packages is Mr. Richard G. Stromberg LSP Phone cell: (617) 908-7094 Office: (508) 897- 8051) e-mail: rstromberg@bostonenvcorp.com mailto:
Web-Site is: www.macdonald-industries.com

1.4 Approach and Objectives for Soil Re-use

It has been determined that soil or material of sufficient chemical and physical quality is necessary to be imported for the project to bring certain areas to the required grade for development. This SRMP has been updated to include the acceptance of remediation waste as supplemental fill material. Richard G. Stromberg, LSP in coordination with LSPs/QEPs at Generator sites, is responsible for reviewing soil characterization data so that only soils and other approved materials meeting SAC and approved under this Revised SRMP are brought to the Site.

MLCRA has accepted approximately 670,817 tons of < RCS-1/2 soil in Phases I and II to establish a suitable platform up to elevation 88 feet (NAVD) ("Phase I/II Activities"). The prior

SRMP was used in conjunction with an Administrative Consent Order (ACO) signed by MacDonald Industries and MassDEP in November 2017 for Phase I, Document No. 00003451, ACO Amendments No.1 dated March 4, 2019 for Phase II, and Consent Order No. 00009681, dated December 15, 2020 for Phase III Activities. These successive Consent Orders and associated SRMP revisions ensure these activities pose no significant risk of harm to health, safety, public welfare or the environment and does not create new releases or threats of releases of oil or hazardous materials (OHM).

The following chart depicts the progression of ACOs, Amendments, SRMP Revisions, and Parties:

Item	**Phase II**	**Phase II & III (Current to Project Completion)**	**Notes**
ACO	**Doc#00003451 (11/30/2017)**	**Doc#00009681 (12/15/2020)**	
Amendments	**Amendment 1 (3/4/2019)- Doc#00006711**	***Amendment 1 (Doc No. TBD) ****Amendment 2**	***** Project Change to include Acceptance of CBC**
SRMP	**Original (11/17/2017) & Revision 1 (2/26/2019)**	**Revision 2 (9/14/2020) & *Revision 3 ****Revision 4**	***Project Change to include Acceptance of CBC ****** Project Change to include Acceptance of Remediation Waste**
Parties	**MacDonald Industries**	**MacDonald Industries & BFI**	

Since Phase III now includes acceptance of remediation waste at a capped and closed landfill owned by a BFI/Republic Services, as well as at MacDonald Industries property, Consent Order No. 00009681 shall be amended accordingly to include a second amendment. Once executed, all remaining soil and other material fill activities will be performed in accordance with the Consent Order, First Amendment Enforcement Document No. 00012500, and Second Amendment Enforcement Document No. 00013971 where applicable.

This SRMP addresses Phase III Activities proposed to be conducted to complete soil fill activities not to exceed elevation 144' on the Bridgewater parcel and 141' on the Halifax parcel and addresses acceptance of soil and other approved material that meets the updated SAC as set forth in Table I, attached and incorporated herein. A Grading and Drainage Map has been developed for the Site to illustrate the dimensions of the current conditions and proposed fill area for Phase III Activities (Figures 5 and 6). Upon reaching final grades, a solar farm is proposed across both facilities ("Phase IV Activities").

There is an access road from Plymouth Street leading to a scale and an operations building, as shown on the "Soil Re-use Approval Request" at the end of this SRMP. The Site Operations Coordinator (David MacDonald) has constructed an access road from this platform using imported granular soils. MLCRA continues to be filled from that area toward the re-use area, creating a working base from which to fill to the grades approved by the BCC. An updated trucking route map and directions is provided with the profile at the end of this SRMP.

The BCC Order of Conditions specifies that "clean" fill soil be used. The term used in this context does not include organic matter, large stones, masonry, stumps, asphalt, or waste material, including but not limited to lumber, bricks, plaster, wire, lath, paper, cardboard, pipe, tires, ashes, refrigerators, motor vehicles, or their parts. In addition, any cement, concrete, soil, or other debris deposited or washed into the wetland buffer zone or wetland resource areas shall be removed with minimal disturbance (as specified in the SWPPP). Previously MacDonald Industries notified and discussed with the Towns of Bridgewater and Halifax, its boards and commissions the required import of material to obtain the elevation 65 feet NAVD proposed under Phase I Activities. T h e initial approval letters from the respective towns are provided in Appendix E dated May 3, 2013, June 10, 2013 and October 26, 2011, respectively.

Subsequently, the Bridgewater Council and Board of Health members voted unanimously to approve up to RCS-2 contaminant levels, or as otherwise indicated in the November 2017 SAC Table 1, under Phase II Activities as documented in a Bridgewater Council Letter dated March 31, 2017 letter and Bridgewater Board of Health dated September 1, 2017, attached hereto as Appendix E. Similarly, in an April 5, 2017 letter the Halifax Board of Health approved the RCS-2 proposal, as set forth in the February 6, 2017 correspondence from Marilyn MacDonald, both of which are attached hereto as Appendix E. I CBC material re-use letters were prepared in June 2020, and April and June 2021 and submitted to MassDEP. Lastly, The MassDEP received a letter, dated July 13, 2022, from the Town of Bridgewater Town Manager indicating that a duly public noticed meeting of the Bridgewater Town Council unanimously voting to approve the proposal for acceptance of remediation waste at Marilyn's Landing on July 12, 2022. No comments were provided by the Town of Bridgewater or public on the project. The MassDEP received a letter, dated April 28,, 2022, from the Chair of the Board of Selectmen of the Town of Halifax indicating the Town did not have any concerns with the proposed modifications to the SRMP to accommodate the acceptance of remediation waste, after discussions during a duly noticed Halifax Board of Selectmen meeting on April 26, 2022.

Finally, MassDEP has approved SRMP, so that they are consistent with SAC at other similar re-use sites and account for additional testing guidance mentioned above. Soil, SS, and CBC material accepted at the Site must comply with the SAC set forth in Table 1.

Candidate Soils and SS/CBC Materials

Soil can range from granular to fine grained with occasional cobbles, and it is understood that certain fine-grained silts and clay (such as Boston Blue Clay) and with some small percentage of natural organics can be accepted. Some degree of moisture can be tolerated, as it will be blended with granular soil prior to placement.

MacDonald Industries and Browning Ferris Industries, Inc./Republic Services intends to conduct the soil management operations with approved granular fill, re-worked natural soils and undisturbed (pristine) natural soils from off-site locations that are considered to be the following:

- Naturally occurring, non-impacted soils that do not originate from an MCP site or a site with filling activities and are not otherwise regulated. These soils may not require the amount of testing as soils from MCP Sites or historic fill sites below that require compliance with the MCP "anti-degradation" provisions at 310 CMR 40.0032 and MassDEP's Similar Soils Policy. Testing of natural, non-impacted soils will be conducted at the frequency required in this SRMP.

- Soils from within the Disposal Site Boundaries of Massachusetts Contingency Plan (MCP) regulated Sites that is not "Remediation Waste" as that term is defined under the MCP and have been characterized by an LSP/QEP as meeting the SAC in Table 1 may be accepted. These are typically historic fill sites that are recognized to contain fill materials (reworked natural soil or soil with some small proportion of anthropogenic residual material)

- Clean asphalt, brick, and concrete (ABC) less than 6'' in diameter and comprising <5% of the soils may be accepted. The materials cannot be mixed with or contaminated by any other wastes or debris. (Clean ABC means materials that contains only weathered (cured) asphalt pavement, clay bricks, and attached mortar normally used in construction, or concrete that may contain rebar that is not painted coated or impregnated with any substance.

- SS can also be accepted in accordance with MassDEP Policy # BAW-18-001 once they have been characterized and meet SAC and are approved by the Site LSP.

- Similarly, CBC material will be accepted once they have been inspected and characterized similar to SS and soils, meet SAC, and are approved by the sending LSP and LSPs at MLCRA and Halifax (Republic Services) for blending and placement.

- Soil that is considered Remediation Waste at RCS-1 sites provided constituent concentrations meet the SAC in Table 1 of the SRMP and is shipped under a Bill of Lading in accordance with the MCP. All other remediation waste is prohibited from being accepted at the Site.

- Soils, SS, and CBC may contain only incidental, randomly dispersed, *de minimis* quantities of ash and/or solid waste (e.g., municipal solid waste and/or construction and demolition waste) as defined in 310 CMR 16.000 and 310 CMR 19.000, which collectively shall comprise less than 1% by volume of the soil and materials.

- Soils may contain occasional cobbles. Blasted rock may be accepted. Please note that the acceptance of blasted rock is contingent upon it meeting the Acid Generation Potential criteria in the SAC.

Incoming soils, Street Sweepings, and Catch Basin Cleanings are approved by both the MLCRA and Republic Services LSP.

1.5 Hydrogeologic Conditions

The geological conditions on the Site consist of fine to medium sands identified as pro-glacial outwash deposits to an undetermined depth according to the USGS Surficial Geologic Map for the Bridgewater Quadrangle. The Site and surrounding areas are underlain by stratified deposits of gravel, sand, silt, and clay deposited by glacial melt water along streams and in glacial lakes underlain by glacial till and bedrock. No bedrock outcroppings are shown on the map and none have been observed. Shallow groundwater flow below MLCRA is to the west towards the wetlands that abut the Site. Groundwater flow below the Halifax Landfill is radial around it, as would be expected based on monitoring data provided to BEC by Republic Services Incorporated and groundwater monitoring completed by BEC. A groundwater monitoring network is in place around MLCRA that consists of five wells (MW-1, 2, 3, 4, and 5) as shown in Appendix I. Other wells are located around the Halifax Landfill shown in Appendix I that are being monitored by Republic as part of the long-term 30-year Post-Closure program. The sampling of the MLCRA wells was done in August and December 2018, January and July 2019, January and June 2020, December 2020, July and November 2021, and May 2022 and is being conducted semi-annually, as required in ACO No. 00003451. Wells at MLCRA will also be sampled annually for four years following completion of Phase III.

There are also two (2) other monitoring wells on the periphery of the property used by Republic Services for the Halifax Landfill (MW-107, and 111), and water quality data from these wells is provided in Appendix F. Well MW-107 was abandoned in June 2016 because interfering with MLCRA operations. These wells are part of a network of wells at the BFI Halifax Landfill that is being monitored by Republic Services on behalf of BFI as described further in Section 6 of this plan. Groundwater samples have been collected in April and October of each year since 2008 and analyzed for constituents described in Section 6 of this plan. Aside from low pH at all three wells, plus occasional elevated turbidity, results did not indicate an obvious concern of impacted groundwater. This has been corroborated by the results to date of semi-annual sampling in the monitor wells at MLCRA.

2.0 Site Environmental Conditions

There were a series of analytical tests conducted on naturally occurring surface and other surface soils resulting from sloughing of the adjacent Halifax Landfill cover that affected the eastern part of MLCRA. Samples were collected on MLCRA in September and October 2007 by Precision Environmental Management Corporation (Precision). A total of twelve discrete samples designated as "S-1 through S-12" located throughout the area to be developed were collected by Precision. Analysis included: SVOCs, VOCs, TPH, and RCRA-8 metals plus beryllium, nickel, zinc, and vanadium, PCBs, pH, conductance, and reactivity.

Four additional soil samples designated as "S-1 through S-4" were collected by HML in May 2013 and were analyzed for: MCP 14 metals, SVOCs, VOCs, TPH, PCBs, pH, conductance, and reactivity. In January 2014, BETA collected two additional composite samples for analyses. The

primary purpose was to determine what portion of the total chromium concentration was related to hexavalent chromium. The results indicated that the hexavalent chromium concentrations were both <0.5 mg/kg.

3.0 Screening and Testing Requirements and SAC Derivation

Soil, SS, and CBC material to be placed at the Site will require field screening and analytical testing to conform to the screening criteria and approved SAC shown on Table 1 as described in this SRMP. The characterization of the candidate soil and SS/CBC will be done under supervision of an LSP/QEP considering the MassDEP policies/guidance for characterization including the " Similar Soils Provision Guidance", and other MassDEP "Due Diligence" (HW93-01), and "Landfill Soil Re-use" (COMM-97-001) Policies. Soil sampling will be done in-situ or ex-situ as justified by the QEP/LSP using discrete or composite samples to develop an adequate representation of the soil quality in consideration of soil disposition. The physical suitability will be reviewed and approved by MacDonald Industries. Soil Profile Package information for the approval of candidate soils is provided later in this plan. The Site LSP will review the preliminary application package and provide inquiries to the site of origination (hereinafter, "Source Site") QEP/LSP to address for the final package.

Screening Criteria

All soils, SS, and CBC material proposed for reuse at the Site will be screened in accordance with the following screening criteria. A MacDonald Industries representative at the scale will conduct the field screening at this Receiving Site. The Site LSP may also conduct periodic screening of soils that have been shipped to the Site to make sure soils are as represented. The field screening will be conducted utilizing a Photoionization Detector (PID). The analysis will be funded by the party collecting the samples and the results will be provided to the Site LSP for review.

Candidate Soil, SS, and CBC material must be evaluated by the Generator for the following screening criteria and these results must be addressed in the Soil Reuse Application Package prepared by the Generator's LSP for review by the Site LSP and BFI's LSP. With respect to CBC, the Site LSP, or Source Site LSP may inspect the material at the staging Site and will prepare the accompanying Soil and CBC Reuse Application package for review by BFI's LSP.

Candidate soil, SS, and CBC material being placed in the Site shall not exceed the following field screening/visual criteria:

- MassDEP requires that materials shall be screened per MassDEP Policy #WSC-94-400 at a minimum frequency of 1 field screening test per 50 cubic yards. Materials that exhibit a reading of total organic vapor (TOV) in the jar headspace exceeding of 5 ppm by volume due to volatile constituents shall not be used at the Site. If materials appear to differ olfactory or visually from the original characterization information, that material will either be rejected or set aside and analyzed to determine if it meets the SAC. If screening at the Site results in exceedances of the SAC set forth in Table 1, the load(s) will be rejected.

- Extra diligence will be paid by the MacDonalds Industries representative to inspect the SS and CBC for trash and solid debris to ensure these materials are not present at > 1%.

- Materials received that are odorous and can potentially create off-site odors will be rejected and further deliveries terminated until the Generator at the Source Site can demonstrate that any odor issues have been adequately addressed. Materials with strong natural organic or hydrogen sulfide odors that cannot be managed in a manner to minimize potential off-site odor impacts will not be accepted at the Site.

- The material must not exhibit any visual staining, olfactory odors, or other discolorations indicative of oil and hazardous material (OHM) releases as demonstrated by the representative of the material to be imported.

- Materials shall not contain any free-draining liquids that cannot be managed within with the operating area where they are being placed. Materials may contain naturally deposited silts and clays with minor amounts of naturally occurring organic material and moisture since natural drying of the material can occur while it is being worked and spread. Any material delivered in a tanker or vacuum truck is prohibited. CBC materials shall not contain free draining liquids. CBC may need to be tested by a Paint Liquids Filter Test in accordance with MassDEP's "Management of Catch Basin Cleanings" guidance document to confirm absence of drainable water.

- Soils mixed with *de minimis* amounts of bentonite or other slurry materials (<1% by volume) may be accepted on a case-by-case basis. A description of the process and materials generating soil with slurry and the Safety Data Sheet (SDS) for all slurry and any other additive products must be submitted to the Site LSP for review prior to approval. Soils that exceed *de minimis* amounts of mixed-in slurry will not be accepted.

- Soil, SS, and CBC material approved for use at the Site may contain only incidental, randomly dispersed, *de minimis* quantities of ash and/or Solid Waste (e.g. Municipal Solid Waste and/or Construction and Demolition Waste) as defined in Massachusetts Solid Waste Regulations, 310 CMR 16.000 and 310 CMR 19.000, which collectively shall comprise less than 1% by volume of in either material.

- Soil, SS and CBC material approved for use at the Site shall contain no more than 5% asphalt, brick and concrete (ABC) material. Any such ABC material must measure less than six (6) inches in any dimension. The physical separation of ABC or solid waste from soil to meet SAC is not permitted. Loads received that contain more than the acceptable amount of solid waste debris will be rejected by the MacDonald Industries representative and sent back to the Source Site at the Generator's cost.

- Soils, SS, CBC, and ABC shall not contain visible asbestos, asbestos containing materials (ACM), and asbestos containing waste material (ACWM). Asbestos fibers in any concentration including trace levels shall not be accepted (See SAC below and accompanying Table 1.)

Upon arrival of the trucks at the Site, soils, SS, and CBC material shall be visually inspected and field screened with PID from representative loads by MacDonald Industries. The Site LSP will schedule random Third-Party monthly inspections and to screen discrete soil samples from a designated quarantined pile to prepare a composite sample for confirmatory analysis by the Site LSP. In the event that visual inspection suggests unacceptable material, the load or loads will be rejected.

The physical quality of the soils will be reviewed by the MacDonalds Industries and soil will be placed in accordance with the soil blending plan for final disposition. Under this SRMP, solid waste materials (e.g., dredge spoils, foundry sand, etc.) are not permitted or authorized to be used at the Site unless otherwise approved by MassDEP through a Beneficial Use Determination (BUD) Permit approval or other appropriate approval mechanism.

Development of Soil Acceptance Criteria (SAC)

MacDonald Industries and MassDEP have had extensive discussions regarding appropriate SAC for the Site that took into account the Site's location, access, and site-assigned status. After reviewing and discussing several iterations of the SAC that had been developed by MassDEP and MacDonald Industries, the MassDEP approved the initial SAC on August 18, 2017 which contained elements of both RCS-1 and RCS-2 criteria. This SAC was incorporated into the initial SRMP for Marilyn's Landing Phase II activities that was approved on November 17, 2017. The SAC was subsequently revised and incorporated into the SRMP-Revision 1 on February 26, 2019 as shown in the chart in Section 1.4. The SAC were again revised in the SRMP Revision No. 3 on February 2, 2022. This revision retains the previous SAC and shall apply to all soil, SS and CBC packages for the remainder of all fill activities as of the executed date of the first amendment to existing ACO No. 00009681.

Summary of SAC (See also Table 1 for Complete SAC)

- SVOCs are at <RCS-2 except: acenaphthene, acenaphthylene, 2-Methylnaphthalene, naphthalene and phenanthrene that are at 50% of RCS-2.

- VOCs are at less than 10% of RCS-1. *(Note: Higher Detection limits (i.e., 0.1 to 0.9 mg/kg) that are standard for some Constituents (i.e., uncommon VOCs) may be used provided these constituents are not suspected to be present at the Source Site based on Site history, etc. Otherwise, appropriate MDLs (i.e., 10% of RC) will be used to compare results to SAC*. Please also see Memorandum from MassDEP to W.L. French dated Dec. 2013 in Appendix J.

- MCP 14 Metals are at <RCS-2.

- PCBs are at < 10 % of RCS-1 (0.1 mg/kg) with a minimum Reporting Limit (RL) of 0.1 mg/kg. If there is no evidence of disposal or handling of PCB product or remediation waste at a site of generation, as opined by the Source Site LSP/QEP, a Reporting Limit below 50% of RCS-1 (0.5 mg/kg for each isomer and total PCBs may be used provided it does not violate the analytical method). Note that any historical results > 0.1 ppm in this case

precludes sending soils from 0.1 to < 0.5 ppm.

- TPH is at <RCS-2 (3,000 mg/kg). If Extractable Petroleum Hydrocarbon (EPH) reporting is used in lieu of TPH, (with no technical need of justification for running Volatile Petroleum Hydrocarbons (VPH), then the sum of EPH fractions shall not exceed 3,000 mg/kg.

- Pesticides/Herbicides are at less than 10% of RCS-1
- Flashpoint is soil capable under standard temperature and pressure of catching fire through friction, absorption of moisture or spontaneous chemical changes and, when in contact to an ignition source, burns so vigorously and persistently that it creates a hazard. Soil with Flash Point < 140 degrees shall not be accepted. Soil shall also not be ignitable.

- The pH range is 5-9 pH units.

- Specific conductance must be less than 2,000 umhos/cm.

- If crushed or broken rock is considered, it shall pass the "Acid Base Accounting and Net Acid Generation" test with pH > or equal to 4 if sulfide minerals may be present.

- Perchlorate, if determined to require analysis by the sending LSP/QEP in blasted bedrock shall not exceed 10% of the RCS-1 (0.01 mg/kg).

- Asbestos – Non-Detect: No concentrations of Asbestos fibers allowed including trace levels (i.e., < 1%). Only required to be tested if suspected to present in candidate soils at the sending Site (See Table 1).

- Soils, SS, or CBC material containing liquids may need to be analyzed by the Paint Liquids Filter Test to document no drainable liquids are present.

- Testing for fecal coliform for CBC material is required, with no exceedances of 1,000 MPN/grams dry weight

- CBC material must be de-watered prior to placement.

- CBC material will be temporarily stockpiled and blended at a 3:1 ratio of soil to CBC.

- No placement of CBC material will occur within 100 feet of a bordering vegetated wetland.

Other Constituents– Other parameters not listed above under the standard analyte list that are suspected to be present in candidate soils at a sending site (e.g., per-and polyfluroalkyl substances, dioxins) shall be tested at a minimum method reporting limit of < 10% of applicable RCS-1 or unless otherwise stated in Table 1.

4.0 Material Testing Requirements and Approval Process

The majority of the soil and other SS and CBC material that is scheduled to be placed in the Site is contemplated to originate from construction projects or designated temporary storage yards where the materials have either been pre-characterized during the engineering phase of the development or characterized from stockpiles. All materials to be placed in the Site will be pre-characterized by the Generator (i.e. Source Site LSP or Site LSP) using appropriate characterization guidelines as published by MassDEP. All materials proposed for reuse at the Site shall be tested using U.S. EPA testing methodologies for the analytes included below to demonstrate compliance with the SAC:

- SVOCs-EPA-8270
- VOCs-EPA 8260
- PCBs EPA 8082A
- TPH EPA 8100 modified 8100 (summation of EPH fractions may be substituted)
- MCP 14 Metals or Metals EPA 6010 C-D, EPA 7471B
- TCLP Metals 1311,6010B, 6020, 7000A
- Reactivity Cyanide EPA 9014
- Reactivity Sulfide EPA 9030A
- Flashpoint EPA 1010A
- Conductance EPA SM21-22-2510
- Pesticides EPA 8081A (See Note 1 Below)
- Herbicides EPA 8151A (See Note 1 Below)
- PFAS (See "Fact Sheet – Interim Guidance on Sampling and Analysis for PFAS at Disposal Sites under the MCP" (MassDEP, Revised December 2019)
- Fecal Coliform: SM18-20-9222
- Or any other constituent(s) deemed prudent at sending Site based on Site history evaluation.
  Categories of constituents that shall be tested
- Test to characterize acid generation potential and perchlorate (Applicable to blasted and excavated ledge or bedrock) (See Note 2 Below)
- Quality Assurance/Control field analysis, as needed and Laboratory CAM Narrative Reports

Notes:

1. Pesticides/Herbicides may be excluded from analysis only if the Source Site's LSP/QEP can demonstrate that pesticides/herbicides were not stored, released, or misapplied at the Source Site.

2. 1 test for perchlorate per 500 cubic yards unless Generator demonstrates that no perchlorate blasting agents were used and 1 geochemical characterization profile per 500 cubic yards including Acid-Base Accounting and Net Acid Generation Potential unless Generator demonstrates that the rock is not known or suspected to contain sulfide minerals.

For all source material generating Sites, the samples presented shall be representative of the soils to be delivered to the Site as opined by the LSP/QEP. The sampling frequency for soils and other materials shall be conducted at the following minimum frequency unless the Source Site or Site

LSP determines more frequent sampling is necessary to ensure an adequate representation the soils is made:

Soils

- Naturally Deposited Soils – One sample per 1,000 cy of soil.
- All Other Soils – One sample per 500 cy of soil.

Each sample shall consist of a composite of a minimum of three (3) to five (5) grab samples. In instances where PID screening results exceed 5 ppm, discreet samples shall be collected for VOC analysis. At a minimum, all concentrations of potential contaminants in the soils shall meet the SAC set forth in this plan and the equivalent frequency of testing requirements is appropriate to demonstrate that the samples represent the proposed soils. The maximum concentrations of all constituents shall be used when comparing results to the SAC; averaging of concentrations is not allowed. If sufficient analytical data is not available from the Source Site, the Site LSP will require that the Source Site collect additional samples to ensure the appropriate evaluation of the candidate soil is performed in accordance with this SRMP.

Street Sweepings and Catch Basin Cleanings

For SS, one representative composite sample per 500 cy, as judged by the QEP or LSP doing the sampling is sufficient based on the inherent homogenization during stockpiling. Sampling at lower frequencies will be completed as judged by the QEP/LSP based on inspection and screening of the pile subject to approval by the Site LSP.

For CBC material a minimum of one sample per 100 cy for urban center roads and one sample per 500 cy for non-urban center roads is considered sufficient. A minimum of two composite samples is required per 500 cy urban center roads except for quantities less than 100 cy (one composite sample is adequate). No CBC from Combined Sewer Overflow (CSO) systems will be accepted. Sampling at lower frequencies will be completed as judged by the QEP/LSP based on inspection and screening of the pile and approval by the Site LSP.

Prior to transporting any materials described above, including CBC, all Source Site generators and their QEP/LSP must submit the following information in writing, as part of the formal Soil Re-use Approval Request application Submittal, to MacDonald Industries, the Site LSP, and BFI's LSP for review and approval. For CBC, the Site LSP or Generator's LSP will prepare the application package.

The package shall contain the following in an LSP/QEP Opinion Letter addressing the following:

- The location of the Source Site and contact information for the Source Site owner, the Generator, and LSP.

- Brief description of Source Site history including current and past uses and a description/source of any release(s) that have impacted the soil, including any Release Tracking Number(s) associated with the Source Site.

- Description of the area where soil is being taken from on the Site and pertinent delineations of MCP Disposal Site Boundaries, list of analysis conducted, and excluded including the basis for exclusion, and sampling frequency.

- The package will also contain boring logs and test pit logs or physical description of the material (sand, silt, clay, concrete, asphalt, etc.) with PID values.

- Tables with PID screening results and analytical results compared to SAC found in Table 1.

- Source Site map or sketch showing the location from which the soil will be removed and the location of samples.

- Completed and signed "Soil Re-use Approval Request" for MacDonald Industries. The form is provided in this plan.

- Completed and signed Material Shipping Record (MSR) or Bill of Lading (BOL).

- Analytical laboratory results and certifications for the representative samples of material generated.

MacDonald Industries may consider reusing candidate soils from MCP Disposal Sites provided the candidate soils are not hazardous waste and meet the following criteria as required in the MCP.

Source Soil Disposal Sites That Are Within RCS-1 Areas:

Soil generated from an RCS-1 area that contains OHM at concentrations less than the RCS-1 Reportable Concentrations may be reused at the Site provided the candidate soils are not Remediation Waste and meet the SAC. The transportation of these soils does not require a Bill of Lading (BOL).

Soil generated from an RCS-1 area that has concentrations of OHM greater than the RCS-1 Reportable Concentrations but less than the RCS-2 Reportable Concentrations and meets the SAC may be reused at the Site provided the soil is shipped under a BOL.

Source Soil Disposal Sites That Are Within RCS-2 Areas:

Soil generated from an RCS-2 area that contain OHM at concentrations less than the RCS-2 Reportable Concentrations may be reused at the Site provided the candidate soils are not Remediation Waste and meet the SAC. The transportation of these soils does not require a BOL.

Prior to placement of soil at the Site, the Site LSP will review the pre-characterization data packages of all potential candidate soils prior to acceptance of the materials, with the exception of CBC which will be completed by the Site LSP or Generator's LSP. This will be done to demonstrate that the soils from the Generator's property are in compliance with the SAC and

other provisions of this Plan.

The information will be reviewed by MacDonald Industries, the Site LSP, and the BFI LSP and if found acceptable a letter of acknowledgement will be sent to the Generator. The letter will specify an identification number which will be used to track the material from that site, the quantity of material to be accepted, any restrictions and other pertinent information. Once the approval letter is in hand, the Generator must contact the Site Operations Manager, Mrs. Marilyn MacDonald to schedule dates/times to bring in the material.

Test data provided for review and acceptance must be considered current. If aged data (greater than one (1) year old) is to be utilized for acceptance, then a statement from the LSP/QEP professional making the submittal must be provided indicating Source Site conditions have not changed since collection of data and that no documented releases that may impact Source Site conditions have occurred since data was collected.

5.0 Material Placement and Handling

The truck entrance to the Site is within the Towns of Halifax and Bridgewater. The Towns of Halifax and Bridgewater approved a per day truck limit of 200, as set forth in Appendix E. This approval limits material delivery between the hours of 7:00 am and 5:00 pm Monday through Friday, and on weekends with coordination with the Site Operator. Any request to modify the hours of operation for the project should be submitted to the Town of Bridgewater and Halifax for review and approval. All trucks with material approved for re-use at the Site must proceed to the on-site scale to be weighed. At the weighing station, the driver will show the MacDonald Industries representative a copy of the MSR or BOL for log-in and weighing (See Marilyn's Landing Trucking Rules). The MLCRA Acceptance Codes to be placed on MSRs assigned by the Owner's LSP ("ML") shall be prefaced with "SS" for Street Sweepings and "CBC" for Catch Basin Cleanings so that this material can be tracked separately.

The representative will collect the MSR or BOL from the driver, will record the name of the trucking company, will verify the source of the material against the "approved list", and visually inspect and field screen the contents of the trucks for unacceptable fill and debris materials and any visual or olfactory evidence of contamination. If the material does not contain unacceptable material, there is no visual or olfactory evidence of contamination and it meets the field screening criteria outlined in Section 3, it will be directed to the area for off-loading. Otherwise, it will be rejected. The generator of the rejected material will be notified immediately not to ship any additional fill to the Site until the source of the unacceptable fill is identified and corrective action taken to prevent future problems. In addition, the generator must remove the rejected material off-site at the generator's expense.

The SS and CBC will be blended by the operator as previously discussed with incoming soil and then placed in the Phase III Area.

Once the truck has dumped its load, the driver will return to the on-site scale to be weighed prior to leaving. The fill material will be spread in loose lifts and blended, as appropriate, not exceeding 24 inches and compacted by a minimum of 6 passes of a vibratory drum roller with

a minimum drum weight of 10,000 pounds and a minimum dynamic force of 20,000 pounds.

All materials will be spread and compacted daily. MacDonald Industries will maintain a daily log of the following activities:

- Name truck transporting fill material to the Site.
- Weight and source of material for each truck.
- Physical characteristic and results of headspace screening of incoming material if any for each truck.
- Location of the fill placed in the Site as determined by GPS.

6.0 Groundwater Monitoring Program

A "Groundwater Monitoring Plan Update" is provided in Appendix I that summarizes the approved semi-annual programs currently being conducted by BEC at MLCRA and BFI /Republic by Environmental Sampling & Services, Inc. (ES&S). The plan also includes revisions to the currently approved monitoring program at MLCRA and the Halifax Landfill for the Phase III Site to monitor shallow groundwater and surface water runoff that may be affected by placement of materials.

MassDEP is requiring that the groundwater monitoring program in Phase III be adequate to detect potential releases to the environment from the entire Phase III operational area. To meet this objective, MacDonald Industries has included the existing MLCRA shallow groundwater monitor wells and an appropriate set of wells and select previously identified surface water monitoring points around the rest of the BFI landfill as part of the Second Revised SRMP and the First Amendment to ACO No. 00009681. MassDEP requested BEC propose a monitoring network based on the hydrogeological "Conceptual Site Model" (CSM) understanding of the flow system and landfill. BEC evaluated existing data at MLCRA and has collaborated with BFI/Republics consultants during the Phase II program to understand flow conditions. MacDonald Industries has established first receptor monitoring locations outside the landfill portion of Phase III similar to the approach used in selecting locations for Phase II monitoring. As required, a baseline monitoring event has been conducted to capture baseline water quality down-gradient of the Phase III area prior to initiating Phase III activities.

The existing BFI Groundwater Monitoring Network includes shallow wells at the water table and deeper well couplets in nests based on the BFI well construction logs provided to BEC by Republic Services as shown in Appendix I. The shallow BFI wells range from about 5-25' deep and the deeper wells about 30-78'. Wells generally contain 10' well screens to assess shallow and deeper overburden groundwater. The hydrogeologic conditions, as BEC understands them, are that precipitation will percolate through the landfill's vegetative layer and migrate downslope in all directions after encountering the Landfill's 40 mil High Density Polyethylene geomembrane cap. Infiltrated precipitation would then migrate laterally down slope to surface water, existing retention basins and shallow groundwater. As stated in the plan

in Appendix I, the goal of the first phase of monitoring was to complete a "Baseline" in the Summer 2020 to assess conditions in the select existing surface water points being monitored by BFI/Republic Services and four shallow wells located around the BFI landfill (MW-103, 106, 108, and 113) with well screens in the interval of 5-25'. This provided baseline conditions in shallow groundwater and surface water as a first receptor around the landfill prior to Phase III. Baseline information already exists in the MLCRA wells. Sampling of the combined points have then continued in the MLCRA and BFI sampling points as part of the semi-annual monitoring to follow.

It is noted that well MW-4 located in the swale area between the two fill areas is now frequently flooded with runoff and placed soil is encroaching on it. This well no longer constitutes a peripheral "sentinel" well as it is no located in a fill area. Based on this presumption, this well was decommissioned in the summer of 2022 by a MassDEP certified well driller in accordance with MassDEP well decommissioning guidelines. This area will be filled and brought to final grade. Replacement of this well is not considered necessary as it no longer serves its original design intent. The modified network is still adequate to detect potential releases to groundwater from the entire Site and therefore additional wells are therefore not necessary. Additionally, groundwater results around the entire Site, are compliant with applicable standards as described in the quarterly construction status report.

Any exceedances to MCP GW-1 and 3 standards or conditions that may pose a risk to human or ecological receptors is assessed at the time data is collected pursuant to Massachusetts Solid Waste Regulations, 310 CMR 19.000 and the Massachusetts Contingency Plan, 310 CMR 40.00, including the Adequately Regulated provisions at 310 CMR 40.0110 and 310 CMR 40.0114 where applicable.

If deemed necessary by BEC, additional wells may then be included in subsequent rounds to be approved by MassDEP through future amendments to the SRMP. This provision is included in the current and First Amendment to ACO No. 00009681. To date, only a few minor metal exceedances to "GW-3" standards have been found in well MW-5 on the upgradient side of MLCRA network not requiring additional well installations. Groundwater quality in the latest rounds, however, have been compliant.

The following describes the current status of each program and planned revisions:

Current MLCRA Groundwater Monitoring

Under Phase II, MacDonald's Industries Inc. LSP implemented a semi-annual groundwater monitoring program to monitor groundwater quality and assess potential changes to environmental conditions at the MLCRA Site during and after Phase II and III Activities. A "Groundwater Monitoring Plan" was submitted to MassDEP in August 2018 along with semi-annual testing completed since that time. Wells sampled include MW-1, 2, 3, 4, and 5 shallow overburden monitor wells shown on the map in Appendix I. Based on groundwater elevation data obtained by BEC, flow is from the two upgradient wells MW-4 and 5 toward the southwest (MW-1, 2, and 3). The latest round was completed in May 2022 and results have been included in Monthly Status and Quarterly Construction Status Reports.

The current MLCRA monitoring described in Appendix I includes the following:

- Testing to analyze groundwater samples for parameters listed in Table 1 where applicable. The parameters include: MassDEP MCP 14 Dissolved Metals, VOC, SVOC, PCB, Pesticides, Herbicides, pH, Conductance, TPH plus field parameters (Ph, Conductance, Dissolved Oxygen (DO), Oxidation-Reduction Potential (ORP), Temperature, and Turbidity). Testing will be conducted using method Reporting Limits (RLs) consistent with MCP Method 1 GW-1 standards or "Drinking Water Standards" and Compendium of Analytical Methods.

- Monitoring frequency is being conducted semi-annually throughout the duration of Phase III Activities in November and May of each year and annually thereafter for four (4) years after its completion.

- When required by MassDEP and/or determined from monitoring results or other SRMP activity at the project location, MacDonald Industries shall conduct an appropriate risk assessment and associated mitigation, if necessary, when any potential or adverse impact(s) have been identified as a result of project activities. To date, no adverse impacts have been noted to groundwater. Groundwater quality data from semi-annual testing rounds has been uploaded to e-DEP in various report submittals by BEC.

Current BFI Halifax Landfill Monitoring

ES&S, on behalf of BFI has submitted "Semi-annual Water Quality Monitoring Reports" to MassDEP in the Fall and Spring of each year that summarize groundwater and surface water quality testing at approved locations around the landfill. The latest report was submitted in July 2021 and is provided in Appendix I. The sampling is being conducted in accordance with 310 CMR 19.132 "Environmental Monitoring Requirements". Sampling procedures used are generally the same as those employed by BEC.

The program consists of 16 monitor wells (MW-101 through 116) positioned around the Landfill as shown on the map in Appendix I. Surface water locations are SG-1, 2, and 3 as shown on the map. The parameters include: Dissolved 14 Metals (Methods 6010C, 6020A, 7470A), VOC, Chloride, Total Alkalinity, Total Cyanide, Nitrate, Chemical Oxygen Demand (COD), Sulfate, Total Dissolved Solids (TDS), Turbidity, pH, Conductance, plus field parameters (pH, Conductance, Turbidity, DO, and Temperature).

The reports describe the sampling procedures, results, exceedances in narrative discussion and tabular summaries of data. Groundwater results are compared to MassDEP "Drinking Water Standards and Guidelines" (2016), specifically Massachusetts Maximum Contaminant Levels (MMCLs) and "Secondary Maximum Contaminant Levels" (SMCLs). According to ES&S these are designed for water which is delivered to any user of a public water system which are not directly applicable to groundwater or surface water at the Halifax Landfill. Groundwater levels are also collected. The groundwater flow interpreted by ES&S is generally toward the east around that landfill. BEC interprets both data sets to indicate a radial flow pattern around

the Landfill as would be expected.

Combined Phase II and III Program

Under the combined Phase II and III program, the following will be completed:

- Existing monitor wells: MW-1 through 5 at MLCRA except MW-4 which was decommissioned.
- Three surface water sampling locations SG-1, 2, and 3 previously identified by BFI and BFI wells MW-103, 106, 108, and 113.
- The parameters to be sampled include: MassDEP MCP 14 Dissolved Metals, VOC, SVOC, PCB, Pesticides, Herbicides, pH, Conductance, TPH plus field parameters (Ph, Conductance, Dissolved Oxygen (DO), Oxidation-Reduction Potential (ORP), Temperature, and Turbidity). Testing will be conducted using method Reporting Limits (RLs) consistent with MCP Method 1 GW-1 standards or "Drinking Water Standards" and Compendium of Analytical Methods.
- The first Baseline round was conducted in December 2020 and results reported to MassDEP, as required. The rationale for these additions was to assess runoff which is being managed by MacDonald Industries and shallow groundwater conditions around the landfill where the soil is being placed. The data was evaluated by BEC and no new modifications to the current MLCRA wells and the points around the landfill were deemed necessary.
- Additional semi-annual sampling rounds will be conducted in the Fall and Spring of each year as required. Consultants will coordinate sampling efforts so they are done simultaneously.

7.0 Third Party Inspections and Reporting

A monthly randomly-scheduled, unannounced inspection of the operations shall be completed by the Site LSP for MacDonald Industries, Inc. associated with the acceptance of both soil and CBC. Third Party Inspector (in this case the Site LSP), as defined in the First Amendment to ACO 00009681 with MassDEP will conduct the inspections provided soils are being shipped that month. The Third-Party Inspector shall direct a particular load of soils, SS, or CBC to be quarantined in a designated area and collect a confirmatory sample each month during the inspection (assuming soils are being delivered) and submit the sample to a MassDEP-certified analytical laboratory for analysis of all the parameters that are required to be tested as listed in Section 4 of this SRMP. Consideration will be given to CBC if material is being shipped during a given month.

A summary report for each inspection will be submitted to the MassDEP in the applicable Monthly Status Report or Quarterly Construction Status Report in accordance with the First Amendment to ACO00009681.

If a given load is rejected, information shall include:

- The reasons the load was rejected.
- The name and address of the hauler.
- The license plate number of the truck/tractor.
- The name and address of the generator; and
- The corrective actions taken by the MacDonald Industries and the Site LSP and any correspondence from the sending Site LSP/QEP.

The Independent Third - Party Inspection will include the items in III, 27 (S) of the Consent Order and Construction Status Report shall include information in III, 27 (T). The Monthly Status Reports and the Quarterly Construction Status Reports shall be submitted by the 15th of the month following the 15th of the month in which work was completed.

8.0 Environmental Controls and Health and Safety

8.1 Dust and Sediment Control

As described in the Updated SWPPP prepared by CEC in Appendix G, MacDonald Industries will utilize appropriate Best Management Practices (BMPs) to control runoff, fugitive dust, and sediment associated with transporting, spreading and compacting material at the Site. The appropriate stabilization measures and control have been completed in Phase II and will continue in Phase III to allow for work to be continued as described in the ACO No. 00009681 and Amended ACO to be executed.

These measures are generally as follows:

- Re-use operations shall be suspended when winds speeds exceed 40 miles per hour or when wind carries dust beyond the property line despite implementation of dust control measures.
- An operational water truck will be on Site at all times. Water will be applied to control dust as needed to prevent visible dust emissions and offsite dust impacts.
- Truck and trailer dumping of soil and materials will be conducted in a manner to minimize fugitive dust generation.
- Wheel washers may be installed to prevent track-out where project vehicles or equipment exit the site.
- A gravel tracking pad will be constructed as appropriate at equipment/vehicle Site exit

points to remove soil buildup from wheels and tracks and to assist in minimizing track-out onto public ways.

- Roads from the Site will be swept as needed to control fugitive dust and tracking of soil/sediment onto the public way.

- CBC material will be temporarily set aside in a designated area for blending and drying before being placed at the final location with incoming soils.

Erosion controls will be maintained or installed at the 100 - foot wetland buffers. Erosion controls include hay bales, sandbags, crushed stone filter berms and geotextile fabric/silt sacks. The SWPPP to be inspected by CEC's P.E. provides final documentation on wetland buffer zones and runoff protection.

8.2 Health and Safety

A Site-specific Health and Safety Plan (HASP) has been prepared as shown in Appendix B by CEC to specify the types of personal protection, engineering controls, to manage physical hazards associated with soil work.

Soil Re-use Approval Request

Marilyn's Landing Commercial Re-use Area
Off Plymouth Street, Bridgewater, MA 02324
(SOIL RE-USE APPROVAL REQUEST)

Instructions: Complete this form with required attachments and submit to Marilyn MacDonald via email marilynslanding@hotmail.com. At least three (3) business days will be required to review a Soil Re-Use Approval Request once received by the project engineer. Technical questions should be directed to Richard Stromberg, LSP the point of contact.

Technical Point of Contact:

Mr. Richard Stromberg, LSP
Boston Environmental Corporation
338 Howard Street
Brockton, MA 02302
Telephone: 508-897-8051 (cell) 617-908-7094
rstromberg@bostonenvcorp.com

SECTION A:

Project Name:			
Site Location/Address:		**Site or Sub-Area Identifier (if applicable)**	
Site Owner's Name/Address:		**Contact Person for Soils Approval:** **Name:** **Company:** **Address:** **Email:** **Telephone:** **Fax:**	
Estimated Quantity of Soil for Approval:		*Cubic Yards*	*Tons*
Anticipated Shipping Duration:		*Start / / 201*	*End / / 201*
Description of Source, Type of Release, and Contamination			
Current and Former Site Usage:			
Has this soil been impacted by a release from a known specific petroleum source?			
Soil Location at Time of Testing (check one):			
	☐ In-Situ	☐ Stockpiled	
Has the Generator used Due Diligence in Characterizing the Soil (check one):			
	☐ NO	☐ YES	
Is this soil being generated from an MCP Site? (check one):			
	☐ NO	☐ YES	RTN #
Have any other releases or spills occurred in the vicinity of the site which may have affected the site (check one):			
	☐ YES	☐ NO	

SECTION B
Testing Frequency:

The following are Minimum Sampling Frequencies established based on input from MassDEP for soil re-use at the Generator or Candidate Site (i.e. The Sending Site). The sampling frequencies shall be completed from the Candidate Site, prior to shipping to the Receiving Site.

Multi-point composite samples (3-5 grab samples per composite) shall be used for test samples, except use discreet samples for VOC analyses of the highest PID screening result for that test profile. PID results must be less than 5 ppmv. Soil density is to be considered at 1.5 tons per cyd., for a stockpile sample, and less than 1.7 ton per cyd. for in-situ samples from borings or test pits. Technical justification is required for the acceptance of soil with an assumed density greater than 1.7 ton per cyd.

TABLE 1: Testing Frequency

SOIL CATERGORY	GENERAL SOURCE/ORIGIN DESCRIPTION	MINIMUM TEST PROFILE FREQUENCY
1. Nat. Soil	Naturally Deposited Soil: Not from an area of known or suspected high background levels of constituents (i.e., not Worcester County arsenic belt or Boston Blue clay); not proximate to urban fill soil; no MCP disposal sites nearby; and no industrial or manufacturing history.	1 test profile per 1,000 cubic yards (1,500-1,700 tons) for initial review.
2. Nat. Soil	Naturally Deposited Soil: In proximity to urban fill or an MCP disposal site.	1 test profile per 1,000 cubic yards (1,500-1,700 tons) for initial re-view.
3. Nat. Soil	Naturally Deposited Marine Soils and Boston Blue Clay: From areas of known or suspected naturally occurring high background levels of constituents or otherwise regulated soil.	1 test profile per 1,000 cubic yards (1,500-1,700 tons) for initial review. Test Profile must include MCP-14 metals.
4. Fill	Urban Fill Soil/Street Sweepings	1 test profile per 500 cubic yards (750- 850 tons) for initial review. Additional Tests at QEP/LSP Discretion. Test Profile must include MCP-14 metals.
5. Fill	Catch Basin Cleanings	Urban Center Roads: 1 sample per 100/CY* Non-Urban Center Roads: 1 sample per 500/CY *Minimum of 2 samples per 500 cy)

Notes:

1.) Supplemental testing of specific areas for specific contaminants that exceed any Soil Acceptance Criteria (SAC) to define/confirm limits of acceptable soil at 1 test per 100 cyds or as accepted by LSPs.

2.) Soil includes Remediation Waste as defined in the MCP and Non-remediation Waste

SECTION B (cont.)

Laboratory Testing Requirements (Minimum Analytical Data):

The following parameters are to be analyzed at the Sending Site for each sample prior to shipment to the Receiving Site. Attach a legible copy (not a faxed copy) of laboratory analytical data, including all results and QA/QC information, from a Massachusetts Certified laboratory, for the following parameters, as required per the Revised Soil Re-use Management Plan.

- Volatile Organic Compounds (VOCs) by EPA Method 8260;
- Semi-Volatile Organic Compounds (SVOCs) by EPA Method 8270;
- Total MCP-14 by EPA Methods 6010, 7470 (for mercury) and 7010 (for thallium) (refer to Section XIV for analyte list);
- Polychlorinated Biphenyls (PCBs) by EPA Method 8082; (non-soxhlet extraction acceptable)
- Pesticides by EPA Method 8081 (may be excluded or limited based on site history);
- Herbicides by EPA Method 8151 (may be excluded or limited based on site history);
- Total Petroleum Hydrocarbons (TPH) (summation of EPH fractions can be substituted);
- Reactivity (cyanide/sulfide) by EPA Method Ch. 7.3;
- pH/Corrosivity by EPA Method 9045;
- Ignitibility/flashpoint by EPA Method 1010;
- Specific Conductance (Conductivity) by EPA Method SM2510; and
- Any other potential constituents based on location-specific history;
- Analysis for hexavalent chromium will be required on every sample that exceeds RCS-1 for total chromium, and
- TCLP analysis is required of each sample that exceeds potential threshold values.
- Fecal Coliform SM18-20-9222
- Averaging of concentrations is not acceptable!

SECTION C

Site Soil Acceptance Criteria: The MassDEP's derivation of the Soil Acceptance Criteria (SAC) for the Site is summarized below. The complete SAC is provided in Table 1 of the Revised SRMP.

PARAMETER	SOIL ACCEPTANCE CRITERIA
VOCs (EPA 8260)	List analytes individually, with criteria based on < 10% of RCS-1 in Table 1. Lab Report to MDLs to achieve some SAC.
SVOCs (EPA 8270)	List analytes individually. SVOCs < RCS-2 except 5 PAHs 50% of RCS-2 in Table 1.
EPH	Total of carbon ranges < 3,000 ppm (TPH RCS-2 equivalent).
TPH	RCS-2 (i.e., 3,000 mg/kg)
Pesticides (EPA 8081)	List analytes individually, with criteria based on < 10% of RCS-1 in Table 1. Lab Report to MDLs to achieve some SAC.
Herbicides (EPA 8151)	List analytes individually, with criteria based on < 10% of RCS-1 in Table 1. Lab Report to MDLs to achieve some SAC.
PCBs (EPA 8082)	Each PCB isomer at or Below 10% of RCS-1 Value, 0.1 ppm, See note on Table 1.
MCP-14 (with Vanadium)	See SAC on Table 1 of SRMP.
Hexavalent Chromium	See SAC on Table 1 of SRMP.
Specific Conductance (EPA SM2510)	2,000 umhos/cm (1/2 COMM 97-001 limit)
Flashpoint (EPA 1010)	> 140 degrees
pH/Corrosivity (EPA 9045}	5.0-9.0
Reactive Sulfide/Cyanide (EPA Ch. 7.3)	500/250
PID Screening	<5 ppmV
Fecal Coliform	1,000 MPN/Gram Dry Weight

Notes:

1.) See also Table 1 of SRMP.

SECTION D

Was additional analysis required besides those listed in **Minimum Analytical Data (SECTION B)** of this application? (check one)

	☐ YES	☐ NO	

Was there any detection of additional chemicals besides those listed in **Minimum Analytical Data (SECTION B)**? (check one)

	☐ YES (Fill out **SECTION D**)	☐ NO (Skip to **SECTION E**)	

If additional chemicals are detected, the soil shall be deemed acceptable if one or both of the following conditions are met. Please check the applicable condition(s).

☐[1] A) The detected chemicals are solely the result of background conditions and not the result of a release at the site or anthropogenic activities.

☐ B) The concentrations of detected chemicals are less than the applicable RCS-1 reporting concentrations as defined in 310 CMR 40.1600.

[1.] If Box A is checked, please include the additional information in **SECTION F** with the LSP Opinion Letter as detailed below.

SECTION E

LSP Opinion Letter (Required Statements): Attach a letter from a Licensed Site Professional or a Qualified Environmental Professional indicating they have reviewed the analytical data and have formed the opinion that the soil is suitable for use as subgrade fill at the Marilyn's Landing Commercial Re-use Area. At a minimum, the letter MUST contain the following statements:

- *"In my opinion, the analyses performed and submitted for review are sufficient to adequately characterize the identity and concentrations of contaminants in the soil proposed for reuse at the Marilyn's Landing Commercial Re-use Area in Bridgewater, Massachusetts."*

- *"Based on my review of the attached data, it is my opinion as a Licensed Site Professional (or Qualified Environmental Professional) that the soil is appropriate for fill material at the Marilyn's Landing Commercial Re-use Area in Bridgewater, Massachusetts."*

SECTION F

LSP Opinion Letter (Additional Information): Only if BOX A is checked in SECTION D, include the following statement and information in the LSP Opinion Letter:

- *"In my opinion, the chemicals that were detected that are not specifically listed in Table 1 of the Soil Re-use Management Plan for the Marilyn's Landing Commercial Re-use Area in Bridgewater, Massachusetts represent background conditions (naturally occurring) and are not the result of a release or anthropogenic activities and are therefore appropriate for reuse as fill material at the Marilyn's Landing Commercial Re-use Area in Bridgewater, MA."* The letter shall include sufficient information concerning the site of generation, regional background concentrations, and contaminants associated with those releases, and any additional information sufficient to justify this opinion.

SECTION G

Receiving Facility Information: The receiving facility information for use on any shipping documents is as follows:

	Operator/Facility Name:	Marilyn's Landing Commercial Re-use Area, Bridgewater, MA	
	Contact Person:	Ms.Marilyn MacDonald	
	Street:	Off Plymouth Street	
	City/Town:	Bridgewater	
	State and Zip Code:	MA, 02324	
	Phone:	508-294-0173 (508-294-0174 Dave)	

SECTION H

Required Information Checklist (check box if "yes"):

☐	Is there 1 test profile for every 500 cubic yards Fill soil, 1 sample for 100/500 CY Catch Basin Cleanings, or 1 test profile for every 1,000 cubic yards Natural Soil listed on Table 1 in SECTION B of the Soil Re-Use Approval Request Form?
☐	Is there a signed Licensed Site Profession (LSP) or Qualified Engineering Professional (QEP) Opinion letter containing the mandatory statements specified in SECTION E and SECTION F (if applicable) of the Soil Re-Use Approval Request Form?
☐	Does the QEP Opinion letter describe current and former site usage/history justifying the applicable Category?
☐	Does the QEP Opinion letter describe site contaminants?
☐	Is a site sketch included? Does it identify soil source location and sample locations?
☐	Is material free of visual signs of impact or nuisance conditions, such as staining and discoloration?
☐	Is material free of solid wastes?
☐	Is field screening data from the time of sample collection provided?
☐	Is sample data from multi-point composite samples (3-5 grab samples per composite), with the exception of discrete samples for VOC analysis?
☐	Is all of the Minimum Analytical Data Analysis performed as identified in SECTION B of the Soil Re-Use Approval Request Form?
☐	Is there a data table(s) comparing the laboratory analytical results to the applicable Marilyn's Landing SAC on Table 1 of the SRMP (Jan. 2022)?
☐	Are the detection limits for all analysis parameters lower than the maximum acceptable levels listed in Table 1 of the SRMP, or there is a statement in the LSP/QEP opinion letter explaining why this is not the case?
☐	Is material free of visible asbestos?
☐	Are complete copies of the laboratory data, chain(s) of custody, and the QA/QC package for the analysis performed included?
☐	If there is data for any sample(s) that are included with the submitted laboratory reports that are not part of the material package and should be disregarded during our review, are they crossed-out in the submittal and is there a statement in the QEP Opinion letter explaining why the data should not be considered in the review?
☐	Was TCLP testing performed for metals or organic compounds when the total concentrations in the material are above the theoretical 20:1 levels?
☐	Is asphalt, brick, and/or concrete mixed with reclamation materials?
☐	Is there a signed Material Shipping Record? Does the quantity of material requested for acceptance match the quantity listed on the MSR?
☐	Is there a signed Soil Reuse Application Form with all fields completed, including Marilyn's Landing Trucking Rules?

SECTION I

Additional Information / Comments

SECTION J

Generators Signature: The Generator or duly authorized representative of the Generator shall sign and date this soils approval request certifying the following:

"To the best of my knowledge, I certify the information on this form is accurate and complete."	
	Signature Date

Marilyn's Landing Trucking Rules

946 Plymouth Street (Route 106)

Halifax, MA 02338

Call Dave MacDonald (508) 294-0174 for assistance.

1. All Drivers must have a copy of, and follow, the attached Trucking Route Map.
2. The use of residential roads is strictly prohibited.
3. All Drivers must adhere to the posted speed limit.
4. Drivers are to remain in their vehicle while at the scale house. The Scale House Operator will come out to collect the paperwork and provide weight tickets.
5. Use caution when entering and exiting Marilyn's Landing.
6. A signed copy of these rules must accompany every truck on Site.

Any Violation of these rules will result in your truck being shut off for the day and a $100 fine made payable to the Halifax Food Pantry. If multiple violations occur the truck will be permanently banned from Marilyn's Landing.

I (print name)_____Truck Driver for the Truck Company (print company name)_____have read the above Marilyn's Landing Trucking Rules. I understand the Rules, have a printed copy of the Trucking Route Map, and will follow the Trucking Route and Trucking Rules.

Signature_____ Date_____.

Truck Driver Cell Phone Number_____.

Marilyn's Landing Trucking Route Map

For GPS Use: 946 Plymouth Street (Route 106), Halifax, MA 02338

APPROVED TRUCKING ROUTE SHOWN IN RED. USE OF ALL OTHER ROADS IS PROHIBITED.

Trucking Route to Scale House

Scale House Location

Entrance to Marilyn's Landing (View from RT.106 East Bound Lane)

DO NOT ENTER Residential Roads, even to turn around. You will be Fined. Dead end on Laurel Street.

Sandy Pond Cir
Industrial Dr
Furnace St
Elm St
Cranmore Dr
Circuit St
Old Plymou
Plymout
Laurel St
Vinny Cir
East St
Pine St
104
106

N

2000 ft

Google Earth

Project: _____

Project No:_____/MLCRA Approval No:_____

SOIL TRANSPORT SUMMARY and PID SCREENING FOR MARILYN'S LANDING

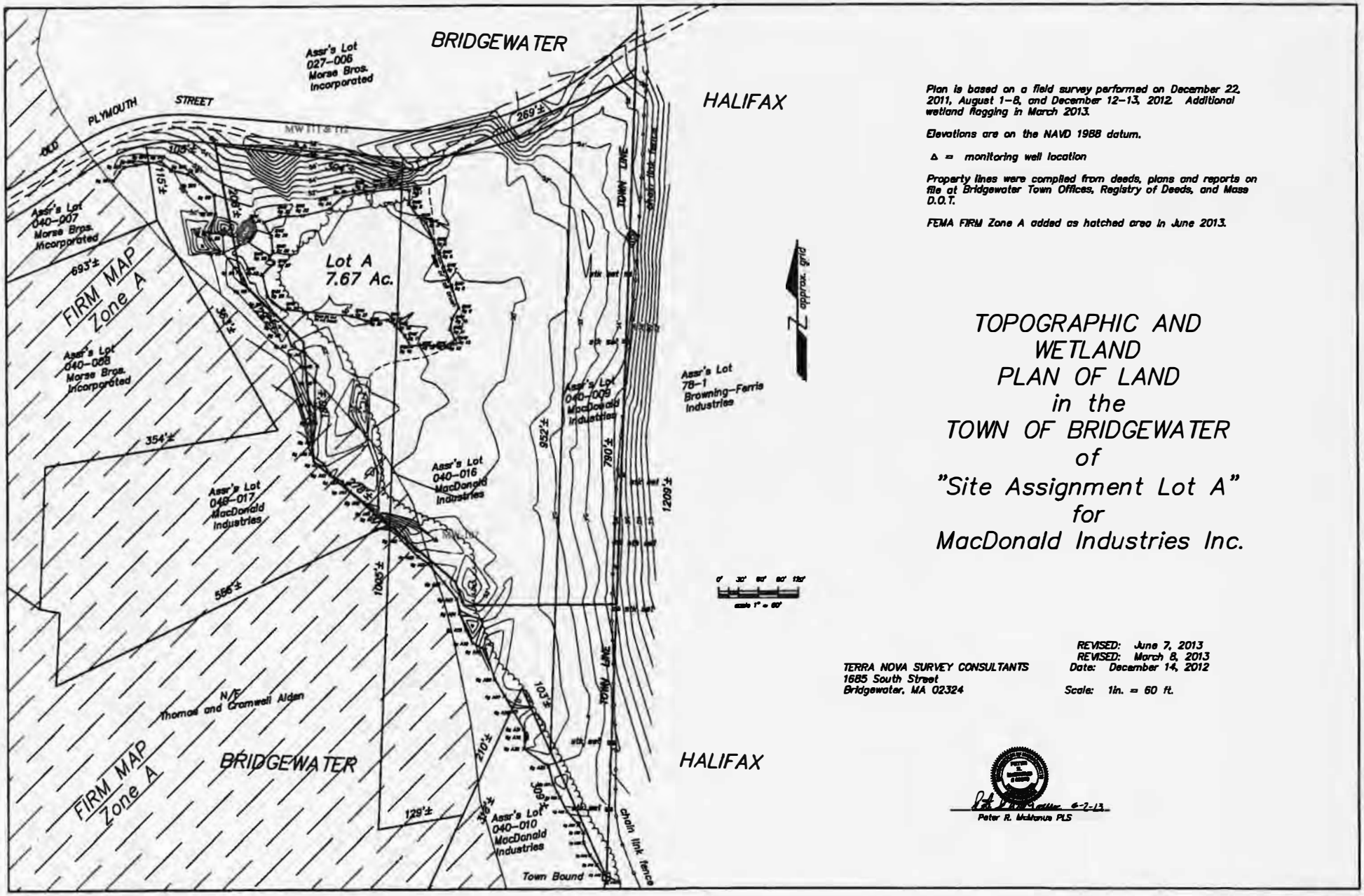
Load Number	Date of Shipment	Truck Reg.	Trailer Reg.	Truck Company	Time of Departure	Time of Return	Load Size (Tons)	Headspace Reading (ppmv)
1								
2								
3								
4								
5								
6								
7								
8								
9								
10								
11								
12								
13								
14								
15								
16								
17								
18								
19								
20								
21								
22								
23								
24								
25								
26								
27								
28								
29								
30								

FIGURES

USGS Topographic Map

SITE LOCUS Marilyn's Landing Off Plymouth Street Bridgewater, Massachusetts	SCALE: Not Shown February 2019 **FIGURE NO. 1**	BOSTON ENVIRONMENTAL CORPORATION

FIGURE 2



Plan is based on a field survey performed on December 22, 2011, August 1–8, and December 12–13, 2012. Additional wetland flagging in March 2013.

Elevations are on the NAVD 1988 datum.

Δ = monitoring well location

Property lines were compiled from deeds, plans and reports on file at Bridgewater Town Offices, Registry of Deeds, and Mass D.O.T.

FEMA FIRM Zone A added as hatched area in June 2013.

TOPOGRAPHIC AND WETLAND PLAN OF LAND in the TOWN OF BRIDGEWATER of "Site Assignment Lot A" for MacDonald Industries Inc.

TERRA NOVA SURVEY CONSULTANTS
1685 South Street
Bridgewater, MA 02324

REVISED: June 7, 2013
REVISED: March 8, 2013
Date: December 14, 2012

Scale: 1in. = 60 ft.

Peter R. McManus PLS 6-7-13

FIGURE 2B

NORTH
NAD83 (2011)

NOTES:

1. EXISTING CONDITIONS INFORMATION WAS COMPILED FROM A LAND SURVEY PERFORMED BY CIVIL & ENVIRONMENTAL CONSULTANTS, INC. ON JULY 29, 2021.
2. ELEVATIONS ARE REFERENCED TO NAVD 1988 DATUM.
3. THIS PLAN AND ANY ACCOMPANYING CERTIFICATIONS DO NOT CONSTITUTE A CERTIFICATION OF TITLE TO THE PROPERTY DISPLAYED HEREON. THE OWNER'S OF LOCUS AND ABUTTING PROPERTIES ARE SHOWN ACCORDING TO CURRENT TOWN ASSESSORS RECORDS.

EXISTING LEGEND:

- EXISTING PROPERTY LINE
- EXISTING ADJACENT PROPERTY LINE
- 870 EXISTING INDEX CONTOUR
- 871 EXISTING INTERMEDIATE CONTOUR
- ×46.8 EXISTING SPOT ELEVATION
- LIMIT PHASE I–III FILL PLACEMENT

MAP 40, LOT 8
N/F
MORSE BROTHERS INC.

WETLAND AREA

MAP 40, LOT 17
N/F
MacDONALD INDUSTRIES

MW–01

MW–111

MW–112

66.6

N/F
THOMAS & CROMWELL ALDEN

WETLANDS LINE

90.1

LIMIT PHASE I–III
FILL PLACEMENT
AS OF JULY 2021

MW–02

101.0

95.9

MAP 40, LOT 16
N/F
MacDONALD INDUSTRIES

MAP 40, LOT 6
N/F
MORSE BROTHERS INC.

OLD PLYMOUTH STREET

WETLAND AREA

MAP 40, LOT 10
N/F
MacDONALD INDUSTRIES

107.0

92.5

59.0

MW–03

95.5

102.0

MAP 40, LOT 9
N/F
MacDONALD INDUSTRIES

MW–05

59.5

57.6

BRIDGEWATER TOWN LINE

MW–04

HALIFAX

LAUREL STREET

MAP 78, LOT 1
N/F
BROWNING–FERRIS INDUSTRIES

SCALE IN FEET
0 40 80

P:\2017\175-313\Survey\Dwg\175313-SV01-MASS83.dwg(PROPOSED) LS(8/4/2021 - jpuccio) - LP, 8/4/2021 2:51 PM

REVISION RECORD

NO	DATE	DESCRIPTION

Civil & Environmental Consultants, Inc.
31 Bellows Road · Raynham, MA 02767
Ph: 774.501.2176 · 866.312.2024 · Fax: 774.501.2669
www.cecinc.com

PLAN OF LAND
"MARILYN'S LANDING"
TOWN OF BRIDGEWATER
MASSACHUSETTS
JULY 31, 2021

PREPARED FOR:
MacDONALD INDUSTRIES, INC.
BRIDGEWATER, MASSACHUSETTS

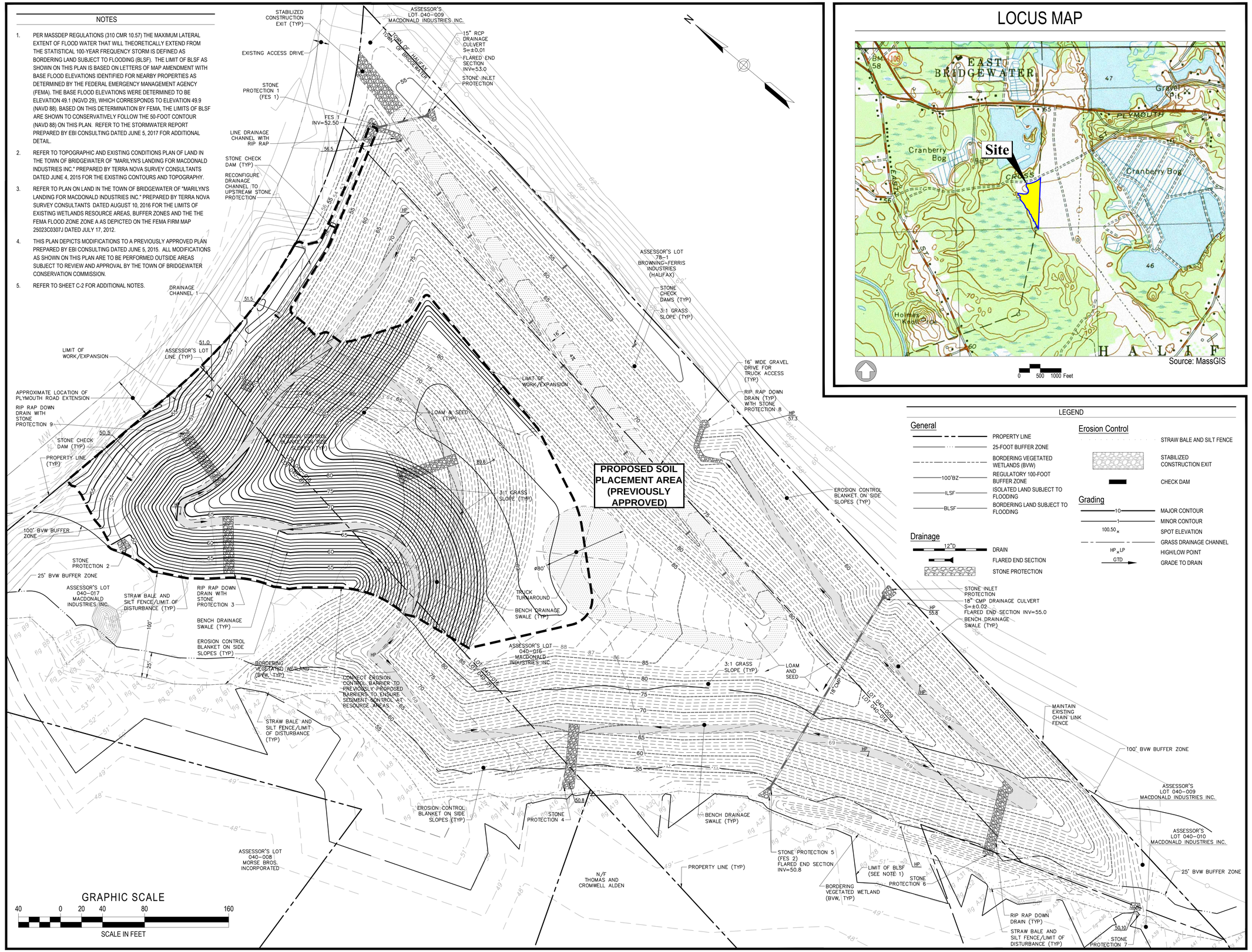
DATE:	JULY 31, 2021
DRAWN BY:	J.PUCCIO
DWG SCALE:	1"=40'
CHECKED BY:	K.SKUTLE
PROJECT NO:	175-313.AW00
APPROVED BY:	DRAFT

DRAWING NO.:
C100
SHEET 1 OF 1

J:\MacDonald Industries\7 Plymouth Street - Bridgewater, MA\CAD\Planset\Additional Fill Area\1616000027 Planset.dwg

NOTES

1. PER MASSDEP REGULATIONS (310 CMR 10.57) THE MAXIMUM LATERAL EXTENT OF FLOOD WATER THAT WILL THEORETICALLY EXTEND FROM THE STATISTICAL 100-YEAR FREQUENCY STORM IS DEFINED AS BORDERING LAND SUBJECT TO FLOODING (BLSF). THE LIMIT OF BLSF AS SHOWN ON THIS PLAN IS BASED ON LETTERS OF MAP AMENDMENT WITH BASE FLOOD ELEVATIONS IDENTIFIED FOR NEARBY PROPERTIES AS DETERMINED BY THE FEDERAL EMERGENCY MANAGEMENT AGENCY (FEMA). THE BASE FLOOD ELEVATIONS WERE DETERMINED TO BE ELEVATION 49.1 (NGVD 29), WHICH CORRESPONDS TO ELEVATION 49.9 (NAVD 88). BASED ON THIS DETERMINATION BY FEMA, THE LIMITS OF BLSF ARE SHOWN TO CONSERVATIVELY FOLLOW THE 50-FOOT CONTOUR (NAVD 88) ON THIS PLAN. REFER TO THE STORMWATER REPORT PREPARED BY EBI CONSULTING DATED JUNE 5, 2017 FOR ADDITIONAL DETAIL.
2. REFER TO TOPOGRAPHIC AND EXISTING CONDITIONS PLAN OF LAND IN THE TOWN OF BRIDGEWATER OF "MARILYN'S LANDING FOR MACDONALD INDUSTRIES INC." PREPARED BY TERRA NOVA SURVEY CONSULTANTS DATED JUNE 4, 2015 FOR THE EXISTING CONTOURS AND TOPOGRAPHY.
3. REFER TO PLAN ON LAND IN THE TOWN OF BRIDGEWATER OF "MARILYN'S LANDING FOR MACDONALD INDUSTRIES INC." PREPARED BY TERRA NOVA SURVEY CONSULTANTS DATED AUGUST 10, 2016 FOR THE LIMITS OF EXISTING WETLANDS RESOURCE AREAS, BUFFER ZONES AND THE THE FEMA FLOOD ZONE ZONE A AS DEPICTED ON THE FEMA FIRM MAP 25023C0307J DATED JULY 17, 2012.
4. THIS PLAN DEPICTS MODIFICATIONS TO A PREVIOUSLY APPROVED PLAN PREPARED BY EBI CONSULTING DATED JUNE 5, 2015. ALL MODIFICATIONS AS SHOWN ON THIS PLAN ARE TO BE PERFORMED OUTSIDE AREAS SUBJECT TO REVIEW AND APPROVAL BY THE TOWN OF BRIDGEWATER CONSERVATION COMMISSION.
5. REFER TO SHEET C-2 FOR ADDITIONAL NOTES.



LOCUS MAP

LEGEND

General
- PROPERTY LINE
- 25-FOOT BUFFER ZONE
- BORDERING VEGETATED WETLANDS (BVW)
- 100'BZ — REGULATORY 100-FOOT BUFFER ZONE
- ILSF — ISOLATED LAND SUBJECT TO FLOODING
- BLSF — BORDERING LAND SUBJECT TO FLOODING

Erosion Control
- STRAW BALE AND SILT FENCE
- STABILIZED CONSTRUCTION EXIT
- CHECK DAM

Grading
- 10 — MAJOR CONTOUR
- 1 — MINOR CONTOUR
- 100.50 × — SPOT ELEVATION
- GRASS DRAINAGE CHANNEL
- HP × LP — HIGH/LOW POINT
- GTD — GRADE TO DRAIN

Drainage
- 12"D — DRAIN
- FLARED END SECTION
- STONE PROTECTION

EBI Consulting
environmental | engineering | due diligence
1400 Hancock Street, 4th Floor
Quincy, MA 02169
Tel: 617.481.5985
www.ebiconsulting.com

FIGURE 3

COMMONWEALTH OF MASSACHUSETTS — CHRISTOPHER M. LAMPRIZZI — CIVIL — No. 41304 — REGISTERED PROFESSIONAL ENGINEER

Christopher M. Lamprizzi, PE
10.24.17

PREPARED FOR:
MacDonald Industries, Inc.

645 Walnut Street
Bridgewater, Massachusetts 02324
Tel: 508.697.5200

SUBMITTALS

NO.	DATE	DESCRIPTION	BY

DATE: March 24, 2017

PROJECT NUMBER: 1616000027

PROJECT TITLE:

Marilyn's Landing Landfill Expansion

Off Plymouth Street Extension
Bridgewater, Massachusetts
Plymouth County

ISSUED FOR:
Client Use
(Not Approved for Construction)

SHEET TITLE:

Grading & Drainage Plan

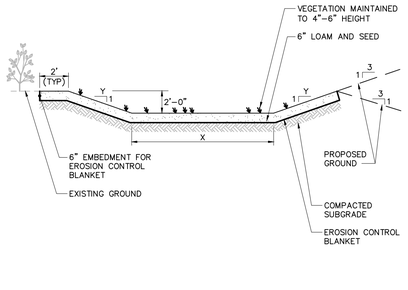
SCALE: 1" = 40'

DESIGNED BY: JVC

CHECKED BY: KPS

SHEET NO: C-1

CHAN. NO.	X (FT)	Y (FT)
1	4	3

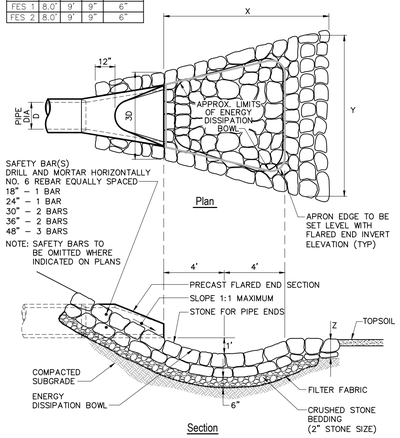


DRAINAGE CHANNEL

SCALE: N.T.S.

C-1

FES NO.	X	Y	Z	STONE DIA. (Dso)
FES 1	8.0'	9'	9"	6"
FES 2	8.0'	9'	9"	6"

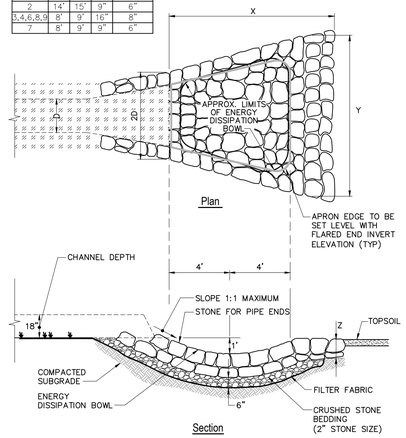


FLARED END SECTION (FES) WITH STONE PROTECTION

SCALE: N.T.S.

C-1

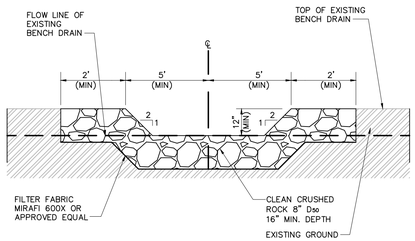
SP NO.	X	Y	Z	STONE DIA. (Dso)
2	14'	15'	9"	6"
3,4,6,8,9	8'	9'	16"	8"
7	8'	9'	9"	6"



STONE PROTECTION

SCALE: N.T.S.

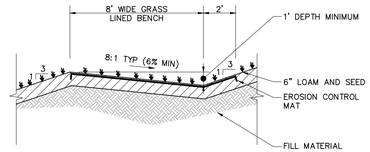
C-1



RIP RAP DOWN DRAIN

SCALE: N.T.S.

C-1



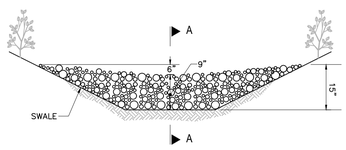
CONSTRUCTION NOTES

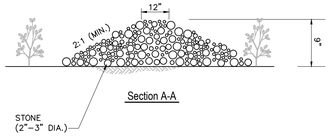
1. LONGITUDINAL SLOPE OF BENCH DRAINAGE SWALE SHALL BE 1% MIN AND 2% MAX.

BENCH DRAINAGE SWALE

SCALE: N.T.S.

C-1





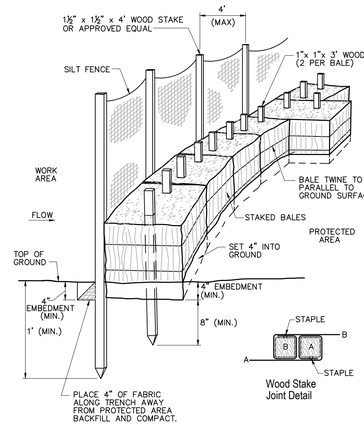
CONSTRUCTION NOTES

1. STONE CHECKDAM TO BE LEFT IN PLACE AFTER CONSTRUCTION.

STONE CHECK DAM

SCALE: N.T.S.

C-1



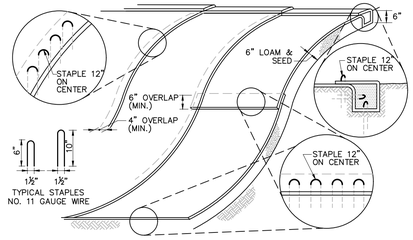
CONSTRUCTION NOTES

1. PLACE ONE STRAW BALE PERPENDICULAR ALONG STRAW BALE BARRIER (100' O.C.)

SILT FENCE / STRAW BALE BARRIER (EMBEDDED)

SCALE: N.T.S.

C-1



CONSTRUCTION NOTES

1. BEGIN AT THE TOP OF BLANKET INSTALLATION AREA BY ANCHORING BLANKET IN A 6" DEEP TRENCH BACKFILL AND COMPACT TRENCH AFTER STAPLING.
2. ROLL THE BLANKET DOWN THE SLOPE IN THE DIRECTION OF THE WATER FLOW.
3. THE EDGES OF BLANKETS MUST BE STAPLED WITH APPROX. 4 INCH OVERLAP WHERE 2 OR MORE STRIP WIDTHS ARE REQUIRED.
4. WHEN BLANKETS MUST BE SPLICED DOWN THE SWALE, PLACE UPPER BLANKET END OVER LOWER END WITH 6 INCH (MIN.) OVERLAP AND STAPLE BOTH TOGETHER.
5. MORE FASTENERS MAY BE REQUIRED DUE TO BLANKET COMPOSITION, SOIL TYPE, SURFACE UNIFORMITY AND SLOPE STEEPNESS. METHOD OF INSTALLATION SHALL BE AS PER MANUFACTURER'S RECOMMENDATIONS.
6. TO BE PLACED ON SLOPES 3:1 OR GREATER, AS SHOWN ON PLANS.

EROSION CONTROL BLANKET PLACEMENT ON SLOPE

SCALE: N.T.S.

C-1

GENERAL NOTES

General Information:

1. CONTRACTOR SHALL BE RESPONSIBLE FOR SITE SECURITY AND JOB SAFETY, CONSTRUCTION ACTIVITIES SHALL BE IN ACCORDANCE WITH OSHA STANDARDS AND LOCAL REQUIREMENTS.
2. AREAS DISTURBED DURING CONSTRUCTION AND NOT RESTORED WITH IMPERVIOUS SURFACES (BUILDINGS, PAVEMENTS, WALKS, ETC.) SHALL RECEIVE 6 INCHES LOAM AND SEED.
3. UPON AWARD OF CONTRACT, CONTRACTOR SHALL MAKE NECESSARY CONSTRUCTION NOTIFICATIONS AND APPLY FOR AND OBTAIN NECESSARY PERMITS, PAY FEES, AND POST BONDS ASSOCIATED WITH THE WORK INDICATED ON THE DRAWINGS, IN THE SPECIFICATIONS, AND IN THE CONTRACT DOCUMENTS. DO NOT CLOSE OR OBSTRUCT ROADWAYS, SIDEWALKS, AND FIRE HYDRANTS, WITHOUT APPROPRIATE PERMITS.
4. AREAS OUTSIDE THE LIMITS OF PROPOSED WORK DISTURBED BY THE CONTRACTOR'S OPERATIONS SHALL BE RESTORED BY THE CONTRACTOR TO THEIR ORIGINAL CONDITION AT THE CONTRACTOR'S EXPENSE.
5. IN THE EVENT THAT SUSPECTED CONTAMINATED SOIL, GROUNDWATER, AND OTHER MEDIA ARE ENCOUNTERED DURING EXCAVATION AND CONSTRUCTION ACTIVITIES BASED ON VISUAL, OLFACTORY, OR OTHER EVIDENCE, THE CONTRACTOR SHALL STOP WORK IN THE VICINITY OF THE SUSPECT MATERIAL TO AVOID FURTHER SPREADING OF THE MATERIAL, AND SHALL NOTIFY THE OWNER IMMEDIATELY SO THAT THE APPROPRIATE TESTING AND SUBSEQUENT ACTION CAN BE TAKEN.
6. CONTRACTOR SHALL PREVENT DUST, SEDIMENT, AND DEBRIS FROM EXITING THE SITE AND SHALL BE RESPONSIBLE FOR CLEANUP, REPAIRS, AND CORRECTIVE ACTION IF SUCH OCCURS.
7. DAMAGE RESULTING FROM CONSTRUCTION LOADS SHALL BE REPAIRED BY THE CONTRACTOR AT NO ADDITIONAL COST TO THE OWNER.
8. CONTRACTOR SHALL CONTROL STORMWATER RUNOFF DURING CONSTRUCTION TO PREVENT ADVERSE IMPACTS TO OFF SITE AREAS, AND SHALL BE RESPONSIBLE TO REPAIR RESULTING DAMAGES, IF ANY, AT NO COST TO OWNER.
9. SOIL PLACEMENT SHALL BE PERFORMED IN ACCORDANCE WITH "THE SOIL REUSE MANAGEMENT PLAN" PREPARED BY CARDNO ATC, DATED SEPTEMBER 2013.

Existing Conditions:

1. THE EXISTING CONDITIONS SHOWN ARE BASED ON THE "TOPOGRAPHIC AND EXISTING CONDITIONS PLAN OF LAND" IN THE TOWN OF BRIDGEWATER OF "MARILYN'S LANDING" PREPARED BY TERRA NOVA SURVEY CONSULTANTS DATED JUNE 4, 2015.
2. WETLAND FLAGGING SHOWN ON THIS PLAN BASED ON INFORMATION PROVIDED ON THE PLAN ON LAND IN THE TOWN OF BRIDGEWATER OF "MARILYN'S LANDING FOR MACDONALD INDUSTRIES INC." PREPARED BY TERRA NOVA SURVEY CONSULTANTS DATED AUGUST 10, 2016.
3. PROJECT DATUM-NAVD 1988.
4. LIMITS OF BORDERING VEGETATED WETLANDS AND BORDERING LAND SUBJECT TO FLOODING DETERMINED BY BRIDGEWATER CONSERVATION COMMISSION THROUGH THE ISSUANCE OF AN ORDER OF CONDITIONS FOR WORK AS SHOWN ON A PLAN PREPARED BY EBI CONSULTING DATED JUNE 5, 2015. ADDITIONALLY, THROUGH A NEGATIVE DETERMINATION OF APPLICABILITY, THE TOWN OF BRIDGEWATER CONSERVATION COMMISSION APPROVED MODIFICATIONS TO THE PREVIOUSLY DELINEATED RESOURCE AREAS. ALL MODIFICATIONS AS SHOWN ON THESE PLANS ARE TO BE PERFORMED OUTSIDE AREAS SUBJECT TO REVIEW AND APPROVAL BY THE TOWN OF BRIDGEWATER CONSERVATION COMMISSION.

GENERAL NOTES

Demolition:

1. CONTRACTOR SHALL DISPOSE OF DEMOLITION DEBRIS IN ACCORDANCE WITH APPLICABLE FEDERAL, STATE AND LOCAL REGULATIONS, ORDINANCES AND STATUES.

Grading & Drainage:

1. STORMWATER MANAGEMENT SYSTEM SHALL BE MAINTAINED IN ACCORDANCE WITH APPROVED OPERATIONS & MANAGEMENT PLAN.
2. PERMISSION AND/OR TEMPORARY CONSTRUCTION EASEMENTS SHALL BE OBTAINED FROM PRIVATE PROPERTY OWNERS PRIOR TO ANY WORK TO BE PERFORMED ON ADJACENT PROPERTIES.

Erosion Control:

1. PRIOR TO STARTING ANY OTHER WORK ON THE SITE, THE CONTRACTOR SHALL NOTIFY APPROPRIATE AGENCIES AND SHALL INSTALL EROSION CONTROL MEASURES AS SHOWN ON THE PLANS AND AS IDENTIFIED IN FEDERAL, STATE, AND LOCAL APPROVAL DOCUMENTS PERTAINING TO THIS PROJECT.
2. CONTRACTOR SHALL INSPECT AND MAINTAIN EROSION CONTROL MEASURES, AND REMOVE SEDIMENT THEREFROM ON A WEEKLY BASIS AND WITHIN TWENTY-FOUR HOURS AFTER EACH STORM EVENT AND DISPOSE OF SEDIMENTS IN AN UPLAND AREA SUCH THAT THEY DO NOT ENCUMBER OTHER DRAINAGE STRUCTURES AND PROTECTED AREAS.
3. CONTRACTOR SHALL BE FULLY RESPONSIBLE TO CONTROL CONSTRUCTION SUCH THAT SEDIMENTATION SHALL NOT AFFECT REGULATORY PROTECTED AREAS, WHETHER SUCH SEDIMENTATION IS CAUSED BY WATER, WIND, OR DIRECT DEPOSIT.
4. CONTRACTOR SHALL PERFORM CONSTRUCTION SEQUENCING SUCH THAT EARTH MATERIALS ARE EXPOSED FOR A MINIMUM OF TIME BEFORE THEY ARE COVERED, SEEDED, OR OTHERWISE STABILIZED TO PREVENT EROSION.
5. UPON COMPLETION OF CONSTRUCTION AND ESTABLISHMENT OF PERMANENT GROUND COVER, CONTRACTOR SHALL REMOVE AND DISPOSE OF EROSION CONTROL MEASURES AND CLEAN SEDIMENT AND DEBRIS FROM ENTIRE DRAINAGE AND SEWER SYSTEMS.
6. WORK SHALL BE COMPLETED IN ACCORDANCE WITH STORMWATER POLLUTION PREVENTION PLAN PREPARED BY EBI CONSULTING, DATED AUGUST 15, 2013.

Layout and Materials:

1. PROPOSED BOUNDS AND ANY EXISTING PROPERTY LINE MONUMENTATION DISTURBED DURING CONSTRUCTION SHALL BE SET OR REST BY A PROFESSIONAL LICENSED SURVEYOR.
2. SYMBOLS AND LEGENDS OF PROJECT FEATURES ARE GRAPHIC REPRESENTATIONS AND ARE NOT NECESSARILY SCALED TO THEIR ACTUAL DIMENSIONS OR LOCATIONS ON THE DRAWINGS, THE CONTRACTOR SHALL REFER TO THE DETAIL SHEET DIMENSIONS, MANUFACTURER'S LITERATURE, SHOP DRAWINGS AND FIELD MEASUREMENTS OF SUPPLIED PRODUCTS FOR LAYOUT OF THE PROJECT FEATURES.
3. CONTRACTOR SHALL NOT RELY SOLELY ON ELECTRONIC VERSIONS OF PLANS, SPECIFICATIONS, AND DATA FILES THAT ARE OBTAINED FROM THE DESIGNERS, BUT SHALL VERIFY LOCATION OF PROJECT FEATURES IN ACCORDANCE WITH THE PAPER COPIES OF THE PLANS AND SPECIFICATIONS THAT ARE SUPPLIED AS PART OF THE CONTRACT DOCUMENTS.

EBI Consulting
environmental | engineering | due diligence
1400 Hancock Street, 4th Floor
Quincy, MA 02169
Tel: 617.481.5985
www.ebiconsulting.com

FIGURE 3 (Details)

COMMONWEALTH OF MASSACHUSETTS
CHRISTOPHER M. LAMUTTI
CIVIL
No. 41304
REGISTERED PROFESSIONAL ENGINEER

Christopher M. Lamutti, PE
10.24.17

PREPARED FOR:
MacDonald Industries, Inc.
645 Walnut Street
Bridgewater, Massachusetts 02324
Tel: 508.697.5200

SUBMITTALS

NO.	DATE	DESCRIPTION	BY

DATE: March 24, 2017

PROJECT NUMBER: 1616000027

PROJECT TITLE:
Marilyn's Landing Landfill Expansion
Off Plymouth Street Extension
Bridgewater, Massachusetts
Plymouth County

ISSUED FOR:
Client Use
(Not Approved for Construction)

SHEET TITLE:
Site Details & General Notes

SCALE: N.T.S.

DESIGNED BY: JVC

CHECKED BY: KPS

SHEET NO: C-2

2 OF 2

MassDEP - Bureau of Waste Site Cleanup

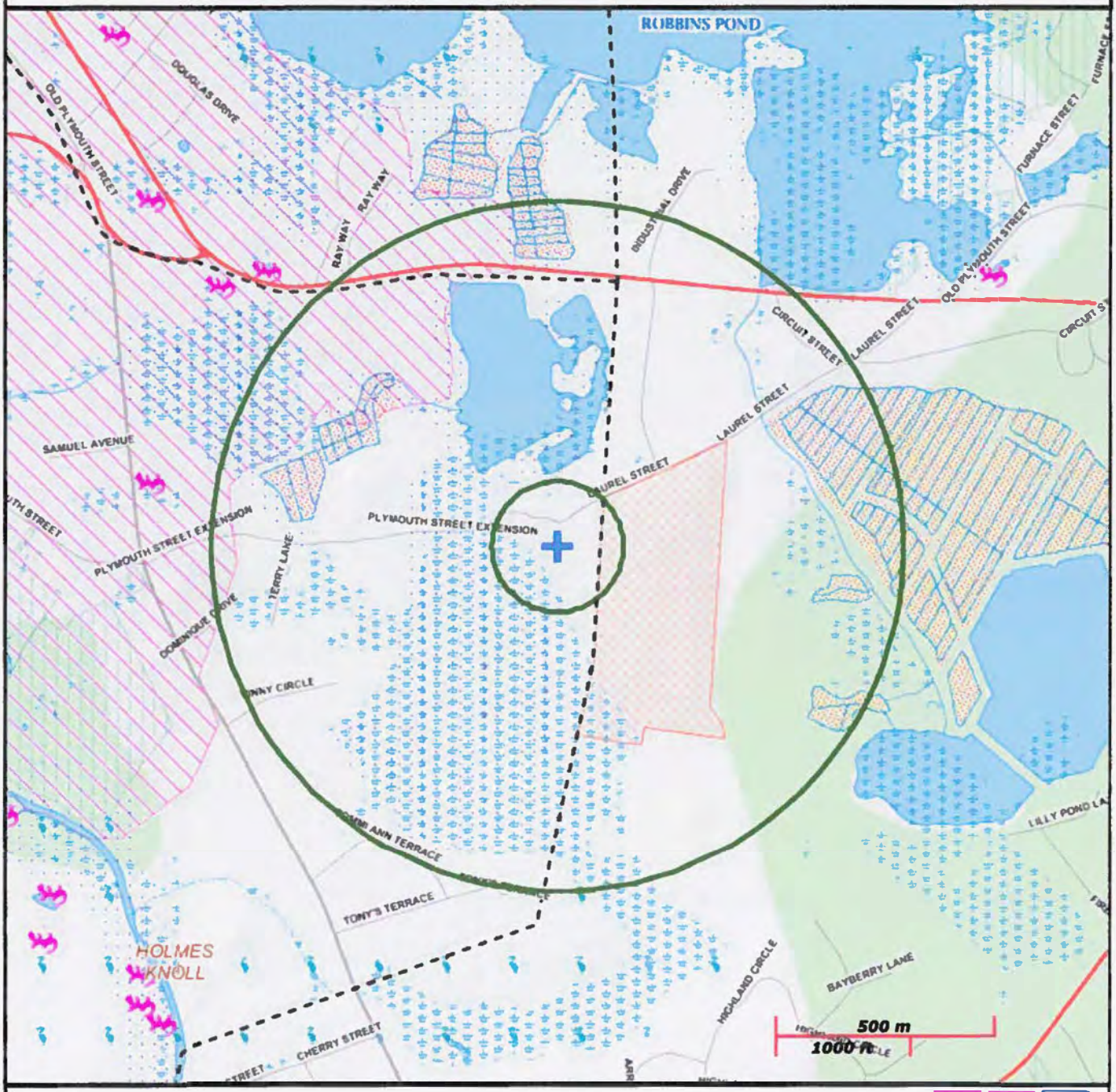
Site Information: MCP Numerical Ranking System Map: 500 feet & 0.5 Mile Radii

2105 PLYMOUTH STREET BRIDGEWATER, MA

NAD83 UTM Meters:
5169588mN , -7692640mE (Zone: 18)
June 12, 2013

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

MassDEP
Commonwealth of Massachusetts
Department of Environmental Protection



Roads: Limited Access, Divided, Other Hwy, Major Road, Minor Road, Track, Trail

Boundaries: Town, County, DEP Region; Train; Powerline; Pipeline; Aqueduct

Basins: Major, PWS; Streams: Perennial, Intermittent, Man Made Shore, Dam

Aquifers: Medium Yield, High Yield, EPA Sole Source.....

Non Potential Drinking Water Source Area: Medium, High (Yield)...

PWS Protection Areas: Zone II, IWPA, Zone A .....

Hydrography: Open Water, PWS Reservoir, Tidal Flat .....

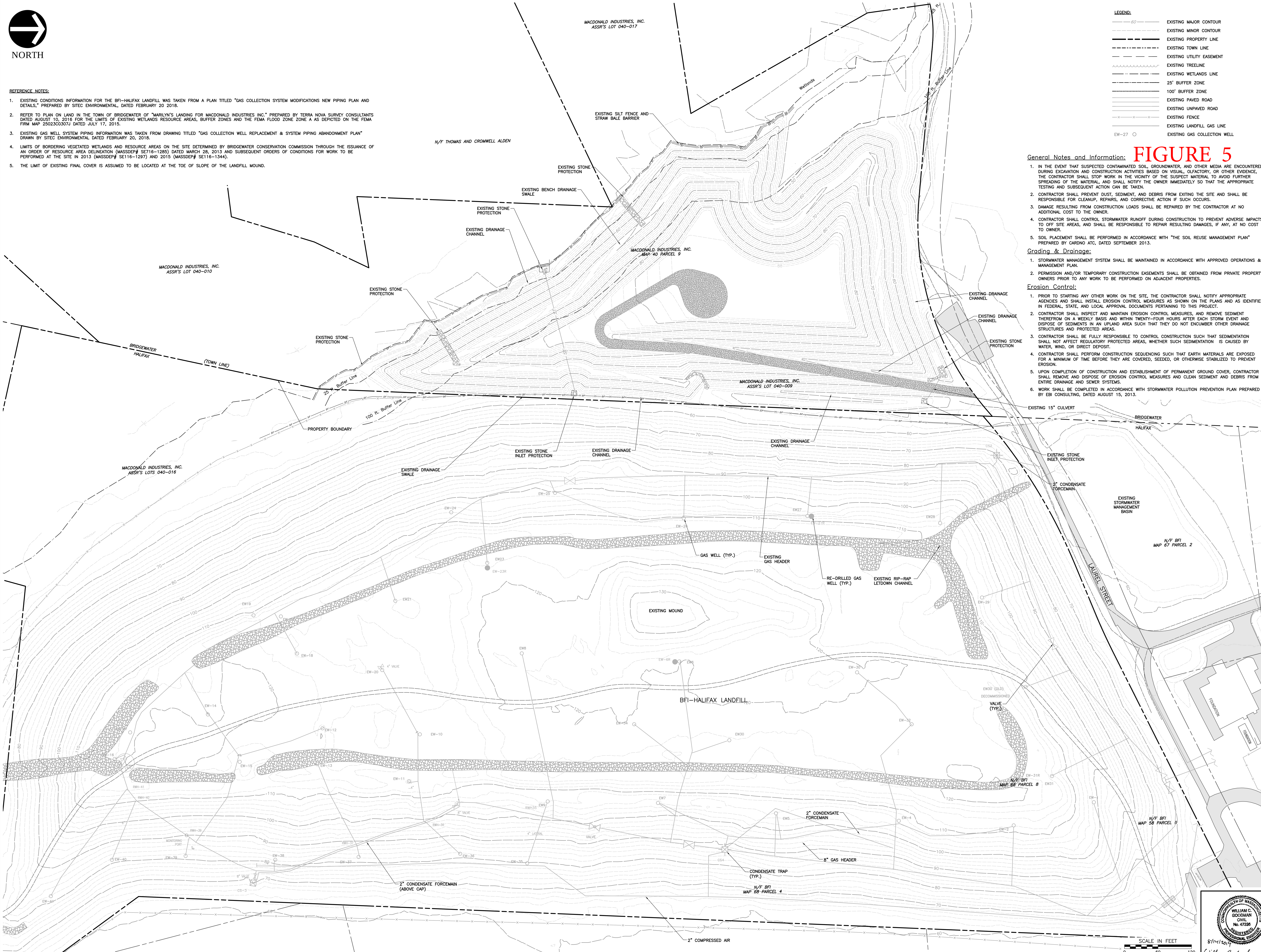
Wetlands: Freshwater, Saltwater, Cranberry Bog .....

FEMA 100yr Floodplain; Protected Open Space, ACEC ....

Est. Rare Wetland Wildlife Hab; Vernal Pool: Cert., Potential

Solid Waste Landfill; PWS: Com.GW,SW, Emerg.,Non-Com.

FIGURE 5



REFERENCE NOTES:

1. EXISTING CONDITIONS INFORMATION FOR THE BFI–HALIFAX LANDFILL WAS TAKEN FROM A PLAN TITLED "GAS COLLECTION SYSTEM MODIFICATIONS NEW PIPING PLAN AND DETAILS," PREPARED BY SITEC ENVIRONMENTAL, DATED FEBRUARY 20 2018.
2. REFER TO PLAN ON LAND IN THE TOWN OF BRIDGEWATER OF "MARILYN'S LANDING FOR MACDONALD INDUSTRIES INC." PREPARED BY TERRA NOVA SURVEY CONSULTANTS DATED AUGUST 10, 2016 FOR THE LIMITS OF EXISTING WETLANDS RESOURCE AREAS, BUFFER ZONES AND THE FEMA FLOOD ZONE ZONE A AS DEPICTED ON THE FEMA FIRM MAP 25023C0307J DATED JULY 17, 2015.
3. EXISTING GAS WELL SYSTEM PIPING INFORMATION WAS TAKEN FROM DRAWING TITLED "GAS COLLECTION WELL REPLACEMENT & SYSTEM PIPING ABANDONMENT PLAN" DRAWN BY SITEC ENVIRONMENTAL DATED FEBRUARY 20, 2018.
4. LIMITS OF BORDERING VEGETATED WETLANDS AND RESOURCE AREAS ON THE SITE DETERMINED BY BRIDGEWATER CONSERVATION COMMISSION THROUGH THE ISSUANCE OF AN ORDER OF RESOURCE AREA DELINEATION (MASSDEP# SE716–1285) DATED MARCH 28, 2013 AND SUBSEQUENT ORDERS OF CONDITIONS FOR WORK TO BE PERFORMED AT THE SITE IN 2013 (MASSDEP# SE116–1297) AND 2015 (MASSDEP# SE116–1344).
5. THE LIMIT OF EXISTING FINAL COVER IS ASSUMED TO BE LOCATED AT THE TOE OF SLOPE OF THE LANDFILL MOUND.

General Notes and Information:

1. IN THE EVENT THAT SUSPECTED CONTAMINATED SOIL, GROUNDWATER, AND OTHER MEDIA ARE ENCOUNTERED DURING EXCAVATION AND CONSTRUCTION ACTIVITIES BASED ON VISUAL, OLFACTORY, OR OTHER EVIDENCE, THE CONTRACTOR SHALL STOP WORK IN THE VICINITY OF THE SUSPECT MATERIAL TO AVOID FURTHER SPREADING OF THE MATERIAL, AND SHALL NOTIFY THE OWNER IMMEDIATELY SO THAT THE APPROPRIATE TESTING AND SUBSEQUENT ACTION CAN BE TAKEN.
2. CONTRACTOR SHALL PREVENT DUST, SEDIMENT, AND DEBRIS FROM EXITING THE SITE AND SHALL BE RESPONSIBLE FOR CLEANUP, REPAIRS, AND CORRECTIVE ACTION IF SUCH OCCURS.
3. DAMAGE RESULTING FROM CONSTRUCTION LOADS SHALL BE REPAIRED BY THE CONTRACTOR AT NO ADDITIONAL COST TO THE OWNER.
4. CONTRACTOR SHALL CONTROL STORMWATER RUNOFF DURING CONSTRUCTION TO PREVENT ADVERSE IMPACTS TO OFF SITE AREAS, AND SHALL BE RESPONSIBLE TO REPAIR RESULTING DAMAGES, IF ANY, AT NO COST TO OWNER.
5. SOIL PLACEMENT SHALL BE PERFORMED IN ACCORDANCE WITH "THE SOIL REUSE MANAGEMENT PLAN" PREPARED BY CARDNO ATC, DATED SEPTEMBER 2013.

Grading & Drainage:

1. STORMWATER MANAGEMENT SYSTEM SHALL BE MAINTAINED IN ACCORDANCE WITH APPROVED OPERATIONS & MANAGEMENT PLAN.
2. PERMISSION AND/OR TEMPORARY CONSTRUCTION EASEMENTS SHALL BE OBTAINED FROM PRIVATE PROPERTY OWNERS PRIOR TO ANY WORK TO BE PERFORMED ON ADJACENT PROPERTIES.

Erosion Control:

1. PRIOR TO STARTING ANY OTHER WORK ON THE SITE, THE CONTRACTOR SHALL NOTIFY APPROPRIATE AGENCIES AND SHALL INSTALL EROSION CONTROL MEASURES AS SHOWN ON THE PLANS AND AS IDENTIFIED IN FEDERAL, STATE, AND LOCAL APPROVAL DOCUMENTS PERTAINING TO THIS PROJECT.
2. CONTRACTOR SHALL INSPECT AND MAINTAIN EROSION CONTROL MEASURES, AND REMOVE SEDIMENT THEREFROM ON A WEEKLY BASIS AND WITHIN TWENTY–FOUR HOURS AFTER EACH STORM EVENT AND DISPOSE OF SEDIMENTS IN AN UPLAND AREA SUCH THAT THEY DO NOT ENCUMBER OTHER DRAINAGE STRUCTURES AND PROTECTED AREAS.
3. CONTRACTOR SHALL BE FULLY RESPONSIBLE TO CONTROL CONSTRUCTION SUCH THAT SEDIMENTATION SHALL NOT AFFECT REGULATORY PROTECTED AREAS, WHETHER SUCH SEDIMENTATION IS CAUSED BY WATER, WIND, OR DIRECT DEPOSIT.
4. CONTRACTOR SHALL PERFORM CONSTRUCTION SEQUENCING SUCH THAT EARTH MATERIALS ARE EXPOSED FOR A MINIMUM OF TIME BEFORE THEY ARE COVERED, SEEDED, OR OTHERWISE STABILIZED TO PREVENT EROSION.
5. UPON COMPLETION OF CONSTRUCTION AND ESTABLISHMENT OF PERMANENT GROUND COVER, CONTRACTOR SHALL REMOVE AND DISPOSE OF EROSION CONTROL MEASURES AND CLEAN SEDIMENT AND DEBRIS FROM ENTIRE DRAINAGE AND SEWER SYSTEMS.
6. WORK SHALL BE COMPLETED IN ACCORDANCE WITH STORMWATER POLLUTION PREVENTION PLAN PREPARED BY EBI CONSULTING, DATED AUGUST 15, 2013.

REVISION RECORD

NO	DATE	DESCRIPTION

Civil & Environmental Consultants, Inc.
31 Bellows Road · Raynham, MA 02767
Ph: 774.501.2176 · 866.312.2024 · Fax: 774.501.2669
www.cecinc.com

MacDONALD INDUSTRIES, INC.
POST CLOSURE USE: MAJOR (BWP-SW36)
SOIL REUSE PLAN
BFI-HALIFAX LANDFILL
HALIFAX, MASSACHUSETTS

EXISTING CONDITIONS PLAN

DATE:	JUNE 2019	DRAWN BY:	EMW
DWG SCALE:	1"=60'	CHECKED BY:	KPS
PROJECT NO:	175-313		
APPROVED BY:	WCG		

COMMONWEALTH OF MASSACHUSETTS
WILLIAM C. GOODMAN
CIVIL
No. 47336
REGISTERED PROFESSIONAL ENGINEER

DRAWING NO.: C101
SHEET 3 OF 10

NORTH

PROPOSED DETENTION BASIN
BOTTOM=50.7
OVERFLOW=53.0
TOP OF BERM=54.0

PROPOSED STRAW BALE AND SILT FENCE (4/10)

PROPOSED STORMWATER OUTLET CONTROL STRUCTURE CULVERTS
(2) 18" CULVERTS
INV. 50.60

8/9 PROPOSED BASIN OVERFLOW (TYP.)

7/10 PROPOSED STORMWATER OUTLET CONTROL STRUCTURE

EXISTING RIPRAP

EXISTING RIPRAP (TYP.)

EXISTING DRAINAGE CHANNEL

EXISTING RIPRAP (TYP.)

EXISTING DRAINAGE CHANNEL

PROPERTY BOUNDARY

BRIDGEWATER
HALIFAX
(TOWN LINE)

1/9 PROPOSED ACCESS ROAD AND SWALE (8% MAX SLOPE)

A/C304

BRIDGEWATER
HALIFAX

LAUREL STREET

EXISTING STORMWATER MANAGEMENT BASIN

11/9 EXTEND EXISTING ACCESS ROAD (8% MAX SLOPE)

TRANSFORMER

WINDMILL

LEGEND:

- EXISTING MAJOR CONTOUR
- EXISTING MINOR CONTOUR
- EXISTING PROPERTY LINE
- EXISTING TOWN LINE
- EXISTING UTILITY EASEMENT
- EXISTING TREELINE
- EXISTING WETLANDS LINE
- 25' BUFFER ZONE
- 100' BUFFER ZONE
- EXISTING PAVED ROAD
- EXISTING UNPAVED ROAD
- EXISTING FENCE
- EXISTING EROSION CONTROL BARRIER
- PROPOSED MAJOR CONTOUR
- PROPOSED MINOR CONTOUR
- PROPOSED ACCESS ROAD
- PROPOSED DRAINAGE SWALE
- PROPOSED EROSION CONTROL BARRIER

FIGURE 6

REFERENCE NOTES:

1. EXISTING CONDITIONS INFORMATION FOR THE BFI–HALIFAX LANDFILL WAS TAKEN FROM A PLAN TITLED "GAS COLLECTION SYSTEM MODIFICATIONS NEW PIPING PLAN AND DETAILS," PREPARED BY SITEC ENVIRONMENTAL, DATED FEBRUARY 20 2018.
2. REFER TO PLAN ON LAND IN THE TOWN OF BRIDGEWATER OF "MARILYN'S LANDING FOR MACDONALD INDUSTRIES INC." PREPARED BY TERRA NOVA SURVEY CONSULTANTS DATED AUGUST 10, 2016 FOR THE LIMITS OF EXISTING WETLANDS RESOURCE AREAS, BUFFER ZONES AND THE FEMA FLOOD ZONE ZONE A AS DEPICTED ON THE FEMA FIRM MAP 25023C0307J DATED JULY 17, 2015.
3. LIMITS OF BORDERING VEGETATED WETLANDS AND RESOURCE AREAS ON THE SITE DETERMINED BY BRIDGEWATER CONSERVATION COMMISSION THROUGH THE ISSUANCE OF AN ORDER OF RESOURCE AREA DELINEATION (MASSDEP# SE116–1285) DATED MARCH 28, 2013 AND SUBSEQUENT ORDERS OF CONDITIONS FOR WORK TO BE PERFORMED AT THE SITE IN 2013 (MASSDEP# SE116–1297) AND 2015 (MASSDEP# SE116–1344).
4. THE LIMIT OF EXISTING FINAL COVER IS ASSUMED TO BE LOCATED AT THE TOE OF SLOPE OF THE LANDFILL MOUND.
5. FINAL CONTOURS REPRESENT TOP OF VEGETATIVE SUPPORT LAYER.

SCALE IN FEET
0 60 120

COMMONWEALTH OF MASSACHUSETTS
WILLIAM C. GOODMAN
CIVIL
No. 47338
REGISTERED PROFESSIONAL ENGINEER
8/14/2019

REVISION RECORD

NO.	DATE	DESCRIPTION
1	8/20/19	REVISED EXISTING CONDITIONS INFORMATION AND LABELS

CEC
Civil & Environmental Consultants, Inc.
31 Bellows Road · Raynham, MA 02767
Ph: 774.501.2176 · 866.312.2024 · Fax: 774.501.2669
www.cecinc.com

MacDONALD INDUSTRIES, INC.
POST CLOSURE USE: MAJOR (BWP-SW36)
SOIL REUSE PLAN
BFI-HALIFAX LANDFILL
HALIFAX, MASSACHUSETTS

PROPOSED GRADING PLAN

DATE:	JUNE 2019
DWG. SCALE:	1"=60'
PROJECT NO:	175-313
DRAWN BY:	EMW
CHECKED BY:	KPS
APPROVED BY:	WCG

DRAWING NO.:
C301

SHEET 5 OF 10

TABLE

(Soil Acceptance Criteria)

CONSTITUENT	TABLE 1 - Soil Acceptance Criteria (SAC) Approved Date Feb. 2, 2022 MARILYN'S LANDING / BFI HALIFAX LANDFILL		
	MCP RCS-1 Standards	MCP RCS-2 Standards	SOIL ACCEPTANCE CRITERIA (SAC)
METALS			
ANTIMONY	20	30	30
ARSENIC	20	20	20
BARIUM	1,000	3,000	3,000
BERYLIUM	90	200	200
CADMIUM	70	100	100
CHROMIUM (TOTAL)	100	200	200
HEXAVALENT CHROMIUM	100	200	200
LEAD	200	600	600
MERCURY	20	30	30
NICKEL	600	1,000	1,000
SELENIUM	400	700	700
SILVER	100	200	200
THALIUM	8	60	60
VANADIUM	400	700	700
ZINC	1,000	3,000	3,000
SEMI-VOLATILE ORGANIC COMPOUNDS (MG/KG)			<RCS-2 EXCEPT FOR 5 ANALYTES ** <50% of RCS-2
ACENAPTHENE	4	3,000	1,500**
ACENAPTHYLENE	1	10	5**
ACETOPHENONE	1,000	10,000	10,000
ANTHRACENE	1,000	3,000	3,000
ANILINE	1,000	10,000	10,000
BENZO(A) ANTHRACENE	7	40	40
BENZO(A) PYRENE	2	7	7
BENZO(B) FLOURANTHENE	7	40	40
BENZO(G,H,I) PERYLENE	1,000	3,000	3,000
BENZO(K) FLOURANTHENE	70	400	400
BIS(2-CHLOROETHOXY)METHANE	500	5,000	5,000
BIS(2-CHLOROETHYL)ETHER	0.7	0.7	0.7
BIS(2-CHLOROISOPROPYL)ETHER	0.7	0.7	0.7
BIS (2- ETHYLHEXYL) PHTHALATE	90	600	600
4-BROMOPHENYL PHENYL ETHER	100	1,000	1,000
BUTYLBENZYLPHTHALATE	100	1,000	1,000
4-CHLOROANILINE	1	3	3
2-CHLORONAPHTHALENE	1,000	10,000	10,000
2-CHLOROPHENOL	0.7	100	100
CHRYSENE	70	400	400
DIBENZO(1,H) ANTHRACENE	0.7	4	4
DIBENZOFURAN	100	1,000	1,000
DI-N-BUTYLPHTHALATE	50	500	500
1,2-DICHLOROBENZENE	9	100	100
1,3-DICHLOROBENZENE	3	200	200
1,4-DICHLOROBENZENE	0.7	1	1
3,3'-DICHLOROBENZIDINE	3	20	20
2,4-DICHLOROPHENOL	0.7	40	40
DIETHYLPHTHALATE	10	200	200
2,4-DIMETHYLPHENOL	0.7	100	100
DIMETHYLPHTHALATE	0.7	50	50
2,4-DINITROPHENOL	3	50	50
2,4-DINITROTOLUENE	0.7	10	10
2,6-DINITROTOLUENE	100	1,000	1,000
DI-N-OCTYLPHTHALATE	1,000	10,000	10,000
1,2-DIPHENYLHYDRAZINE (AZOBENZENE)	50	500	500
FLOURANTHENE	1,000	3,000	3,000
FLOURENE	1,000	3,000	3,000
HEXACHLOROBENZENE	0.7	0.8	0.8
HEXACHLOROBUTADIENE	30	100	100
HEXACHLOROETHANE	0.7	3	3
INDENO(1,2,3 CD) PYRENE	7	40	40
ISOPHORONE	100	1,000	1,000
2-METHYLNAPTHALENE	0.7	80	40**
O-CRESOL	500	5,000	5,000
M/P-CRESOL	500	5,000	5,000
NAPHTHALENE	4	20	10**
NITROBENZENE	500	5,000	5,000
2-NITROPHENOL	100	1,000	1,000
4-NITROPHENOL	100	1,000	1,000
PENTACHLOROPHENOL	3	10	10
PHANANTHRENE	10	1,000	500**
PHENOL	1	20	20
PYRENE	1,000	3,000	3,000
1,2,4-TRICHLOROBENZENE	2	6	6
2,4,5-TRICHLOROPHENOL	4	600	600
2,4,6-TRICHLOROPHENOL	0.7	20	20
VOLATILE ORGANIC COMPOUNDS (MG/KG)[10]			<10% RCS-1
ACETONE	6	50	0.6
TERT-AMYL METHYL ETHER	~	~	~
BENZENE	2	200	0.2
BROMOBENZENE	100	1,000	10
BROMOCHLOROMETHANE	~	~	~

CONSTITUENT	TABLE 1 - Soil Acceptance Criteria (SAC) Approved Date Feb. 2, 2022 MARILYN'S LANDING / BFI HALIFAX LANDFILL		
	MCP RCS-1 Standards	MCP RCS-2 Standards	SOIL ACCEPTANCE CRITERIA (SAC)
BROMODICHLOROMETHANE	0.1	0.1	0.01
BROMOFORM	0.1	1	0.01
BROMOMETHANE	0.5	0.5	0.05
Methyl Ethyl Ketone	4	50	0.4
N-BUTYLBENZENE	~	~	~
SEC-BUTYLBENZENE	~	~	~
TERT-BUTYLBENZENE	100	1,000	10
TERT-BUTYLETHYL ETHER	~	~	~
CARBON DISULFIDE	100	1,000	10
CARBON TETRACHLORIDE	5	5	0.5
CHLOROBENZENE	1	3	0.1
CHLORODIBROMOMETHANE	0.005	0.03	0.0005
CHLOROETHANE	100	1,000	10
CHLOROFORM	0.2	0.2	0.02
CHLOROMETHANE	100	1,000	10
2-CHLOROTOLUENE	100	1,000	10
4-CHLOROTOLUENE	100	1,000	10
1,2-DIBROMO-3-CHLOROPROPANE	10	100	1
1,2-DIBROMOETHANE (EDB)	0.1	0.1	0.01
DIBROMOMETHANE	500	5,000	50
1,2-DICHLOROBENZENE	9	100	0.9
1,3-DICHLOROBENZENE	3	200	0.3
1,4-DICHLOROBENZENE	0.7	1	0.07
DICHLORODIFLUOROMETHANE	1,000	10,000	100
1,1-DICHLOROETHANE	0.4	9	0.04
1,2-DICHLOROETHANE	0.1	0.1	0.01
1,1-DICHLOROETHYLENE	3	40	0.3
CIS-1,2-DICHLOROETHYLENE	0.1	0.1	0.01
TRANS-1,2-DICHLOROETHYLENE	1	1	0.1
1,2-DICHLOROPROPANE	0.1	0.1	0.01
1,3-DICHLOROPROPANE	500	5,000	50
2,2-DICHLOROPROPANE	0.1	0.2	0.01
1,1-DICHLOROPROPENE	0.01	0.1	0.001
CIS-1,3-DICHLOROPROPENE	0.01	0.1	0.001
TRANS-1,3-DICHLOROPROPENE	0.01	0.1	0.001
DIETHYL ETHER	100	1,000	10
DIISOPROPYL ETHER	100	1,000	10
1,4-DIOXANE	0.2	6	0.02
ETHYLBENZENE	40	1,000	4
HEXACHLOROBUTADIENE	30	100	3
2-HEXANONE	100	1,000	10
ISOPROPYLBENZENE	1,000	10,000	100
P-ISOPROPYLTOLUENE	100	1,000	10
METHYL TERT-BUTYL ETHER (MTBE)	0.1	100	0.01
METHYLENE CHLORIDE	0.1	4	0.01
4-METHYL-2-PENTANONE (MIBK)	0.4	50	0.04
NAPHTHALENE	4.0	20	0.4
N-PROPYLBENZENE	100	1,000	10
STYRENE	3.0	4	0.3
1,1,1,2-TETRACHLOROETHANE	0.1	0.1	0.01
1,1,2,2-TETRACHLOROETHANE	0.005	0.02	0.0005
TETRACHLOROETHYLENE	1.0	10	0.1
TETRAHYDROFURAN	500	5,000	50
TOLUENE	30	1,000	3
1,2,3-TRICHLOROBENZENE	~	~	~
1,2,4-TRICHLOROBENZENE	2	6	0.2
1,1,1-TRICHLOROETHANE	30	600	3
1,1,2-TRICHLOROETHANE	0.1	2	0.01
TRICHLOROETHYLENE	0.3	0.3	0.03
TRICHLOROFLUOROMETHANE	1,000	10,000	100
1,2,3-TRICHLOROPROPANE	100	1,000	10
1,2,4-TRIMETHYLBENZENE	1,000	10,000	100
1,3,5-TRIMETHYLBENZENE	10	100	1
VINYL CHLORIDE	0.7	0.7	0.07
M/P-XYLENE	100	100	10
O-XYLENE	100	100	10
PCB'S (MG/KG) [5]			**<10% RCS-1 [5].**
PCBs	1	4	0.1
TOTAL PETROLEUM HYDROCARBONS (MG/KG) [4]			
TPH	1,000	3,000	3,000
TOXICITY CHARACTERISTIC LEACHING PROCEDURE LEAD (MG/KG)			
TCLP LEAD	~	~	Detected concentrations of metals exceeding "20 times rule" require TCLP analysis
GENERAL CHEMISTRY			
pH (S.U)	~	~	5-9
REACTIVE CN (mg/kg)	~	~	NR
REACTIVE SULFIDE (mg/kg)	~	~	NR
SPECIFIC CONDUCTANCE (UMHOS/CM)	~	~	2,000
FLASHPOINT (degree F)	~	~	>140
IGNITABILITY (degree F)	~	~	Not ignitable

CONSTITUENT	TABLE 1 - Soil Acceptance Criteria (SAC) Approved Date Feb. 2, 2022 MARILYN'S LANDING / BFI HALIFAX LANDFILL		
	MCP RCS-1 Standards	MCP RCS-2 Standards	SOIL ACCEPTANCE CRITERIA (SAC)
ASBESTOS	~	~	NON-DETECTED [11]
FECAL COLIFORM[14]	~	~	1,000 MPN/GRAM (DRY WEIGHT)
PERCHLORATE COMPOUNDS	0.1	5	0.01 [12]
PER- AND POLYFLUOROALKYL SUBSTANCE (PFAS) (MG/KG)			10% of RCS-1 [13]
PERFLUORODECANOIC ACID (PFDA)	0.0003	0.4	0.00003
PERFLUOROHEPTANOIC ACID (PFHpA)	0.0005	0.4	0.00005
PERFLUOROHEXAESULFONIC ACID (PFHxS)	0.0003	0.4	0.00003
PERFLUORONONANOIC ACID (PFNA)	0.00032	0.4	0.000032
PERFLUOROROCTANESULFONIC ACID (PFOS)	0.002	0.4	0.0002
PERFLUOROOCTANOIC ACID (PFOA)	0.00072	0.4	0.000072
PESTICIDES (MG/KG)			<10% RCS-1
4,4'-DDD (p,p'-)	8	40	0.8
4,4'-DDE (p,p'-)	6	30	0.6
4,4'-DDT (p,p'-)	6	30	0.6
Aldrin	0.08	0.5	0.008
Alpha-BHC	50	500	5
Beta-BHC	10	100	1
Chlordane	5	30	0.5
Delta-BHC	10	100	1
Dieldrin	0.08	0.5	0.008
Endosulfan I	0.5	1	0.05
Endosulfan II	0.5	1	0.05
Endosulfan sulfate	~	~	~
Endrin	10	20	1
Endrin ketone	~	~	~
Heptachlor	0.3	2	0.03
Heptachlor epoxide	0.1	0.9	0.01
Hexachlorobenzene	0.7	0.8	0.07
Lindane (hexachlorocyclohexane, gamma [gamma-HCH])	0.003	0.5	0.0003
Methoxychlor	200	400	20
HERBICIDES (MG/KG)			<10% RCS-1
2,4,5-T	100	1,000	10
2,4,5-TP (Silvex)	100	1,000	10
2,4-D	100	1,000	10
2,4-DB	100	1,000	10
Dalapon	~	~	~
Dicamba	500	5,000	50
Dichloroprop	~	~	~
Dinoseb	500	5,000	50
MCPA	100	1,000	10
MCPP	~	~	~
ROCK			
BLASTED OR EXCAVATED LEDGE OR BEDROCK			1 test for perchlorate per 500 cubic yards unless the Generator demonstrates that no perchlorate blasting agents were used. 1 geochemical characterization profile per 500 cubic yards including Acid-Base Accounting and Net Acid Generation Potential unless Generator demonstrates that the rock is not known or suspected to contain sulfide minerals

Notes:

1. Current EPA/MassDEP or other approved methods for laboratory. MassDEP CAM utilized where appropriate.

2. Reporting limits of laboratory tests for all constituents must be appropriate and adequate for comparison to SAC, (Method Detection Limits Utilized).

3. Averaging of concentrations is not allowed. All constitutents must be below their corresponding SAC for acceptance of soil.

4. In addition to, or in lieu of TPH analysis, the summation of the extractable petroleum hydrocarbon (EPH) fractions can be utilized for TPH comparison if VOC/VPH negligible.

5. If there is no evidence of PCB Handling/Disposal at Source Site as opined by LSP, a RL not to exceed 50% of the RCS-1 may be used provided it does not violate the method. Also, in this case there can be no historical evidence of PCBs > 0.1 mg/kg. Otherwise, the RL shall not exceed 10% of the RCS-1 (.1mg/kg).

6. Soil Acceptance Criteria (SAC).
7. These SAC may be amended subject to review and approval by MassDEP.

8. ~ = No RC or Standard Established-Soils with any parameter that does not have a RC Requires MassDEP approval.

9. NR = Non Reactive

10. Higher detection limits (i.e., 0.1 to 0.9 mg.kg) that are standard for certain VOCs (i.e., uncommon VOCs) may be used provided these constituents are not suspected to be present at the Source Site based on Site history, etc.. Otherwise, appropriate MDLs (equal to or less than 10% of RCS-1) will be used to compare results to SAC.

11. No trace levels or abestos fibers detected. Asbestos analysis by Polarized Light Microscopy (PLM) and/or Transmission Electron Microscopy (TEM). To be analyzed if considered a constituent
12. 10% of RCS-1. To be analyzed if considered a constituent of concern (COC) by LSP at generating Site.
13. To be analyzed if considered a constituent of concern (COC) by LSP at generating Site.
14. To be performed for Catch Basin Cleanings

APPENDIX A
SOLAR LETTER OF INTENT

CITIZENS
ENERGY
CORPORATION
a non-profit energy company

February 10, 2012

David MacDonald
MacDonald Industries, Inc.
P.O. Box 431
Bridgewater, MA 02324

Dear Mr. MacDonald:

I am writing to express my company's intent to develop a ground-mounted solar facility on your property located at 1 Plymouth Street, Extension Rear, Bridgewater, MA.

I understand that prior to the installation of a solar facility you plan to fill the site with approximately 300,000 to 350,000 cubic yards of fill. Upon completion of this phase of the project, Citizens Energy intends to reuse the site to develop a solar facility atop, and potentially on the southern slope, of the fill.

Please let me know if you have any questions or would like to discuss this project further. I can be contacted by phone at 617-951-0405 or email at bmorrissey@citizensenergy.com.

Sincerely,

Brian Morrissey
Director of Solar Development

88 Black Falcon Avenue • Center Lobby Suite 342 • Boston, Massachusetts 02210
617.338.6300 FAX 617.542.4467

APPENDIX B
HEALTH AND SAFETY PLAN
(CEC , June 2020)

Site-Specific Health and Safety Plan

Marilyn's Landing/BFI Halifax Landfill
Soil Fill Project

Marilyn's Landing
946 Plymouth Street/Rte. 106
Bridgewater, MA 02324

BFI Halifax Landfill
27 Laurel St.
Halifax, MA 02338

Prepared for:
MacDonald Industries, Inc.
645 Walnut St.
Bridgewater, MA 02324

Browning Ferris Industries, Inc.
27 Laurel St.
Halifax, MA 02338

Prepared by:
Civil & Environmental Consultants, Inc.

May 26, 2020

Sign-off Sheet

Purpose and Approval

Our work can be hazardous, and it is imperative that we never forget that! It is the purpose of this site-specific Health and Safety Plan (HASP) to proactively aid site workers in:

- Identifying and understanding the risks/hazards they are likely to encounter at the site.
- Mitigating those risks/hazards.

It is the policy of MacDonald Industries to complete our work on this site without any type of incident (injury, illness, impact to the environment, impact to property and equipment). In order to achieve this goal, the project team will work together to perform an effective hazard assessment. The team will then establish appropriate precautions and communicate these daily among project staff. Staff will be responsible for communicating changing field conditions to the project management so these conditions and appropriate precautions may be re-evaluated as needed. Staff will implement **STOP WORK AUTHORITY** at any time they believe that conditions may be inherently unsafe or might cause damage to property or harm to the environment. Staff may refuse to participate in work they believe will be unsafe. If such conditions exist, staff will communicate immediately with the Project Manager to resolve the situation. We expect all subcontractors and project personnel to share this goal.

Client: MacDonald Industries **Project Name:** Marilyn's Landing/BFI Halifax Landfill Soil Fill Project **Start Date:** Summer 2020 **Plan Review Date:** 5/27/2020		**Site Name:** Marilyn's Landing / BFI Halifax Landfill **Project Number:** 175-313 **End Date:** Summer 2025
Karlis Skulte Project Manager	Signature: 	Date: 06/23/2020
Site Health and Safety Officer	Signature:	Date:
Karlis Skulte Peer Reviewer	Signature: 	Date: 06/23/2020
Keith Robinson HASP Originator	Signature: Keith D. Robinson	Date: 06/23/2020

The health and safety guidelines in this HASP were prepared exclusively for this site. This HASP will be amended (with changes recorded on the Health and Safety Plan Modification Log) if site conditions, scope of work, training dates, personnel, or other critical items change after the scheduled HASP review date above.

Table of Contents

LIST OF APPENDICES

Health and Safety Plan Modification Log

HASP Section	Description of Revision	Revision Date	Approved By	Acknowledged By

Acknowledgement and Agreement Form

"Zero Tolerance for Incidents of ANY Kind.
Work Together to Ensure A SAFE and High Quality Project"

This HASP has been developed for the purpose of proactively aiding site workers in identifying, understanding, and mitigating the risks and hazards they are likely to encounter at the site. This HASP may also be used as a guidance document by properly trained and experienced subcontractors and clients; is readily available to assist subcontractors in identifying and addressing their employees' risks; however, subcontractors and other contractors at the site must develop their own HASP or other safety planning documents as appropriate to address the hazards faced by their own employees.

All parties conducting site activities are required to coordinate their activities and practices with the Site Health and Safety Officer (SHSO). A copy of this HASP will be provided to contractors in the interest of full disclosure of hazards of which we may be aware and to satisfy responsibilities under the Occupational Safety and Health Administration (OSHA) Hazard Communication standard. Similarly, contractors are required to inform of any hazards of which they are aware or that the contractor's work on site might possibly pose to workers including (but not limited to) the Material Safety Data Sheets for chemicals the contractor may bring on site. This HASP should NOT be understood by contractors to provide information on all of the hazards to which a contractor's employees may be exposed as a result of their work. MacDonald Industries claims no responsibility for use of this HASP by others for purposes unrelated to this project at the site.

Your signature below confirms the following: you have read and understand the hazards and associated mitigation measures discussed in this HASP; you have received training and medical surveillance required by any applicable OSHA standards; you understand that subcontractors and contractors must develop their own HASP for their employees; and you understand that you could be prohibited by the SHSO or other personnel from working on this project at the site for failure to comply with any aspect of this HASP.

(All site workers must sign.)

Name	Signature	Company	Date

Acknowledgement and Agreement Form

Name	Signature	Company	Date

1.0 Emergency Response

1.1 PHONE NUMBERS

The nearest telephone is a personal cell phone carried by the SHSO:

- Michael MacDonald (508) 245-3745.

The site is served by two (2) primary cell phone providers (Sprint and Verizon) as well as one (1) fail safe (AT&T). There are no landlines available at the Site. The nearest landline is located at a restaurant across the Street (Johnny Macaroni's) @ (781) 300-2600.

Emergency Response			
Name & Address		**Telephone**	**Verification**
Hospital	Brockton Hospital 680 Centre Street Brockton, MA 02302	(508) 941-7000	
Sentry-Approved Medical Care			
Ambulance	911	911	
Police	911	911	
Fire Department	911	911	
Spill Response	Boston Environmental Corporation Mr. Richard Stromberg, LSP Environmental Sampling & Services, Inc. Mr. Robert Chiodo Civil & Environmental Consultants, Inc. Karlis Skulte, P.E.	617-908-7094 716-628-7581 508-386-8049	
Environmental Response	National Response Center (24-hour hotline)	(800) 424-8802	NA
Environmental Protection	Massachusetts Department of Environmental Protection	(888) 304-1133	NA
Poison Control	U.S. National Poison Control Center (24-hour hotline)	(800) 222-1222	NA

Agency / Line Locator			
Name		**Telephone**	**Verification**
National Line Locator	National 811 Call-Before-You-Dig Hotline (24-hour hotline)	811	NA

Project Team Phone Numbers			
Name		**Telephone**	**Verification**
Owner #1	MacDonald Industries Marilyn MacDonald	508-294-0143	
Owner #2	Browning Ferris Industries Christopher Ford, EM	508-786-7022	
Project Manager	Marilyn MacDonald	508-294-0143	
Site Health and Safety Officer	Michael MacDonald	508-245-3745	
Project Staff	Environmental Professional Richard Stromberg, LSP, MLCRA, BEC	617-908-7094	
Project Staff	Environmental Professional Robert Chiodo ES&S, Inc.	716-628-7581	
Project Staff	Civil Engineer Karlis Skulte, P.E., CEC, INC.	508-386-8049	
Project Staff	Landfill Gas System Consultant Mathew Ferris, CEC, INC.	774-501-7036	
Project Staff			
Project Staff			
Subcontractor	Dyer Construction	508-697-6050	
Subcontractor	B&M Excavating		
Subcontractor	Civil & Environmental Constants Inc.	774-501-7036	
Subcontractor			

1.2 ORGANIZATION AND RESPONSIBILITIES

An organization chart for project personnel is provided below.

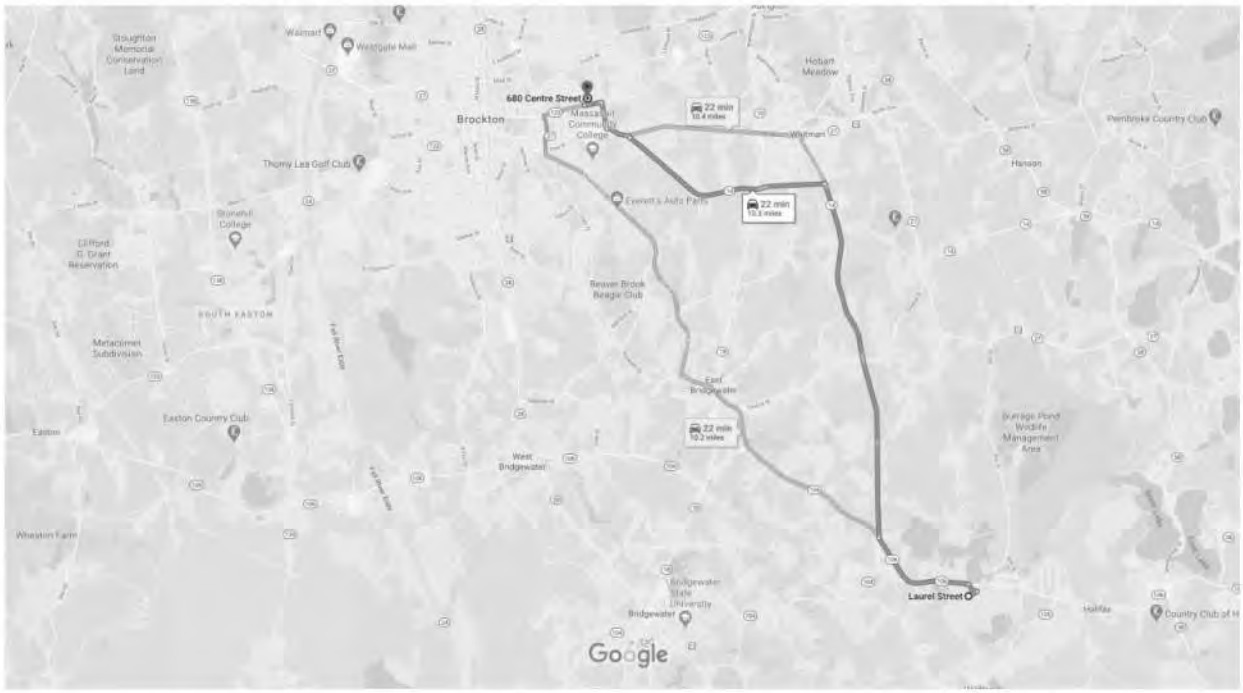
A table summarizing responsibilities for project personnel is provided below.

Project Job Title	General Project Responsibilities
Owner #1	Grading, drainage, soil placement, and erosion control as part of construction activities
Owner #2	MSW landfill-related modifications, including but not limited to gas risers and lateral construction
Project Manager	Overall financial and logistics. Contact client and subcontractors to understand all hazards. Discuss with SHSO. Follow-up all incidents upon notice.
Site Health and Safety Officer	Conduct work in accordance with JSA and this HASP. Report all incidents and near misses immediately to Project Manager.
Project Staff	Oversee / perform work
Dyer Construction	Earthwork, soil placement, and stormwater controls

1.3 DIRECTIONS AND MAP TO THE HOSPITAL - BROCKTON HOSPITAL

The SHSO will verify and validate the route to the hospital by driving it before work begins.

Google Maps Laurel St, Halifax, MA 02338 to 680 Centre Street, Brockton, MA Drive 10.3 miles, 22 min



Map data ©2020 1 mi

Laurel St
Halifax, MA 02338

Take Circuit St to MA-106 W

1 min (0.3 mi)

6/16/2020 Laurel St, Halifax, MA 02338 to 680 Centre Street, Brockton, MA - Google Maps

1. Head northeast on Laurel St toward Circuit St

0.1 mi

2. Sharp left onto Circuit St

0.2 mi

3. Turn left onto MA-106 W

4 min (1.5 mi)

4. Turn right onto Washington St

8 min (4.7 mi)

Continue on MA-14 W to Brockton

5 min (3.7 mi)

5. Turn left onto MA-14 W

2.8 mi

6. Turn left onto Crescent St

0.3 mi

7. Turn right onto Quincy St

0.3 mi

8. Turn left onto Centre St

0.2 mi

Drive to your destination

54 s (0.1 mi)

9. Turn right

275 ft

10. Turn right

Destination will be on the right

246 ft

680 Centre St
Brockton, MA 02302

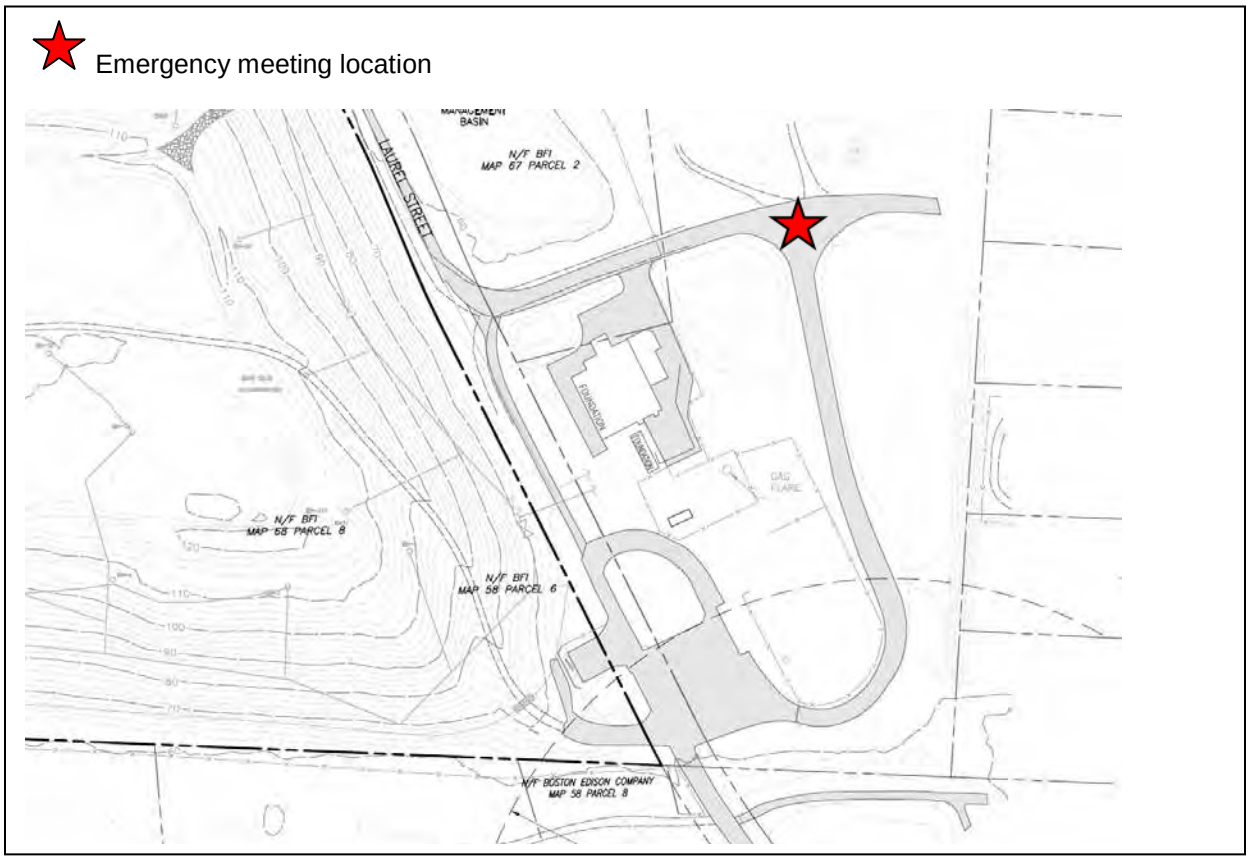
https://www.google.com/maps/dir/Laurel+St,+Halifax,+MA+02338/680+Centre+Street,+Brockton,+MA/@42.0406186,-70.9825025,13z/am=t/data=!3m1!4b1!4m13!4m12!1m5!1m1!1s0x89e4973a770276... 2/3

1.4 EMERGENCY RESPONSE PROCEDURES: EVACUATION

In the event of an on-site or off-site emergency requiring site evacuation (e.g., fire, release, explosion, etc.), the following procedures will be followed:

- Stop Work and notify the SHSO.
- Evacuate the site and go to the emergency meeting location if safe conditions exist. The evacuation point is shown in the sketch below or following this page. If safe conditions prevent evacuation to this location, move upwind, away from the source of the emergency. Maintain a safe distance from the source.
- Check in with the SHSO at the emergency meeting location. The SHSO will take attendance once all personnel have gathered.
- Dial the appropriate emergency response number(s). State the problem clearly and completely and remain on the line until dismissed by the operator.
- Only attempt extinguishing small fires with portable dry chemical equipment on-hand. When in doubt, emergency response personnel shall be notified.
- Do not reenter the emergency site without specific approval from emergency response personnel.

Randomly scheduled evacuation drills may be conducted at any time during field activities.



1.5 EMERGENCY RESPONSE PROCEDURES: INJURY OR ILLNESS

If an injury or illness occurs, take the following action:

- Stop Work, stabilize the situation, and secure the site.
- Administer First Aid for the person immediately using a first aid and blood-borne pathogens kit.
- Determine if emergency response (fire/ambulance) is necessary. If so, call appropriate emergency response numbers on closest available phone. Provide the location of the injured person and other details as requested. Drive the individual to the hospital only if it makes sense.
- If emergency decontamination is required:
    - Immediately remove contaminated personal protective equipment (PPE) or clothing.
    - If possible, wash contaminated area with mild soap and water.
    - Use eyewash station if necessary.
    - Personnel assisting the contaminated individual will don the proper PPE to avoid unnecessary exposures.
- For all injuries or illness, even minor cuts, scratches, and bruises, notify the SHSO immediately. The SHSO is responsible for initiating incident reporting procedures immediately after the victim(s)/site have been stabilized. The SHSO will assume responsibility during a medical emergency until more qualified emergency response personnel arrive at the site as needed.
- As promptly as possible following an injury or illness, ensure appropriate notification has been made to the family of the individual involved.
- Please see Section 1.6 for incident reporting procedures.

1.5.1 Injuries or Illnesses Requiring Hospital Service WITHOUT Ambulance Service

Injuries or illnesses requiring hospital service without ambulance services include significant lacerations, significant sprains, etc. The following procedures will be taken immediately:

- The SHSO will ensure prompt transportation of the injured person to a physician or hospital.
- A representative of the site worker's company will drive the injured employee to the medical facility and remain at the facility until the employee is ready to return.
- If the driver of the vehicle is not familiar with directions to the hospital, a second person shall accompany the driver and the injured employee and navigate the route to the hospital.
- If it is necessary for the SHSO to accompany the injured employee, provisions will be made to have another qualified employee, properly trained and certified in First Aid, to act as the temporary SHSO.
- If the injured employee is able to return to the job site the same day, he/she will bring with him/her a statement from the doctor containing such information as:
    - Date
    - Employee's name
    - Diagnosis
    - Date he/she is able to return to work, regular or light duty
    - Date he/she is to return to doctor for follow-up appointment, if necessary
    - Signature and address of doctor
- As promptly as possible following an injury or illness, ensure appropriate notification has been made to the family of the individual involved.
- Please see Section 1.6 for incident reporting procedures.

If the injured employee is unable to return to the job site the same day, the employee who transported him will bring this information back to the job site and report it to the Project Manager and SHSO.

1.5.2 Injuries or Illnesses Requiring Hospital Service WITH Ambulance Service

Injuries or illnesses requiring hospital service with ambulance services include severe head injuries, amputations, heart attacks, heat stroke, etc. The following procedures will be taken immediately:

- Call for ambulance service and notify the SHSO.
- Administer First Aid until ambulance service arrives.
- While the injured employee is being transported, the SHSO will contact the medical facility to be utilized.
- One designated representative will accompany the injured employee to the medical facility and remain at the facility until final diagnosis and other relevant information is obtained.
- As promptly as possible following an injury or illness, ensure appropriate notification has been made to the family of the individual involved.
- Please see Section 1.6 for incident reporting procedures.

1.6 EMERGENCY RESPONSE PROCEDURES: SPILLS OR CUT LINES

Given the location and nature of the scope of work, it is unlikely that there will be any underground utilities in the work area (e.g. sewer, water, electric, telecommunications etc.) All trenching activities to take place on the landfill footprint are to be above the landfill cap. To prevent problems document the location of underground lines and gas system risers (e.g., Landfill Gas (LFG) headers, supplied air piping

and condensate force mains) before starting site work. There is also a potential for a spill of mechanical fluids from site vehicles or heavy equipment. If a pipe is damaged, or a spill from a vehicle or another leak occurs, document the event as soon as possible using the Incident Investigation Report.

In the event of a spill/release, follow this plan:

- Stop Work, stabilize the situation, and secure the site.
- Call Fire Department immediately if the spill cannot be contained or in case of fire or other emergency.
- Stay upwind of the spill/release.
- Wear appropriate PPE.
- Turn off equipment and other sources of ignition.
- Turn off pumps and shut valves to stop the flow/leak.
- Plug the leak or collect drippings, when possible.
- Use sorbent pads to collect product and impede its flow, if possible.
- Notify the SHSO to begin the incident reporting procedures. All spills/releases will be reported to the client within 24 hours.
- Determine if the client wants to repair the damage or if the client will use an emergency repair contractor.
- Based on agreements, contact emergency spill contractor for containment of free product. The contacts for this project will be the local fire department and/or Boston Environmental Corporation (617) 908-7094 or 911.
- Advise the client of spill discharge notification requirements and determine who will complete and submit forms. (Do not submit or report to agencies without the client's consent.) Document each interaction with the client and regulators and note, in writing; name, title, authorizations, refusals, decisions, and commitments to action.
- Do not transport or approve transportation of contaminated soils or product until proper manifests have been completed and approved. Be aware that soils / product may meet criteria for hazardous waste.
- Do not sign manifests as generator of wastes unless you have been given appropriate training and approval for signing on behalf of the generator; contact Project Manager to discuss waste transportation.
- The Project Manager will involve the Owners and generator in the Incident Investigation process. The Owners / generator are under obligation to report to the proper government agencies per Massachusetts state regulations *310 CMR 40.00* for petroleum and anti-freeze spills in an amount greater than 10 gallons total volume.

1.7 INCIDENT REPORTING PROCEDURES

This section outlines the procedures that will be followed in the event of an incident. A flowchart and a table with necessary contact information (phone numbers, fax numbers, and email addresses) for incident reporting are also provided.

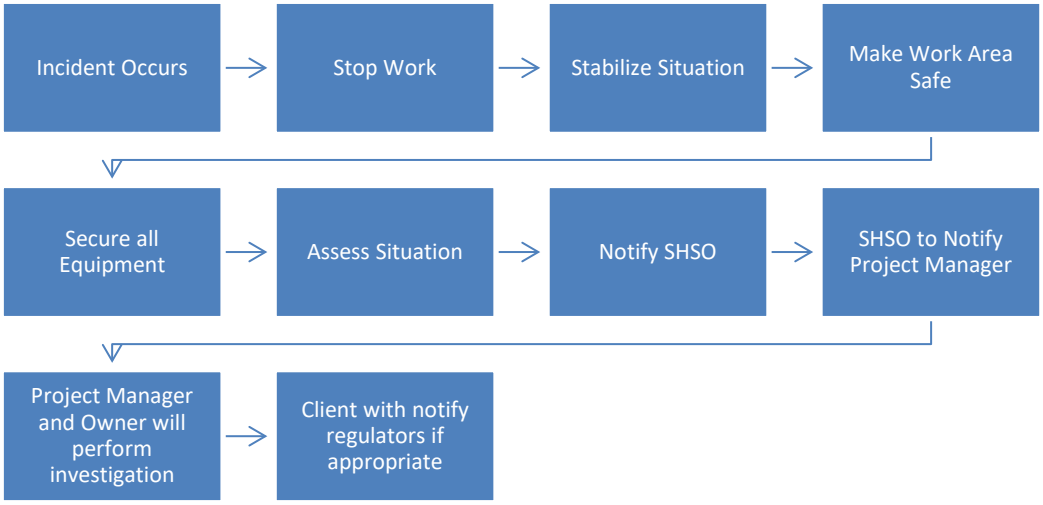
In the event of an incident:

1. Stop Work, stabilize the situation, and secure the site.

2. Report all incidents, injuries, spills, non-conformance events, permit exceedances, and potential incidents (near losses) immediately to the SHSO, who will then notify the Project Manager. If you are unsure whether or not something should be reported, Stop Work and proceed with

notification anyway. **Anyone reporting an event must speak to a live person (SHSO, project manager, etc.) — not voice mail — before the verbal reporting requirement is considered complete.**

3. The Project Manager will notify the Owners. They will also provide a written report.



Incident Type	Definition
Report Only	An employee needs to document a happening that may be relevant in the future. Examples include: witnessing an accident or a non-work-related injury, an incident on a worksite not involving personnel, physical signs and symptoms related to workstation ergonomics and/or materials handling.
Incident	Any unplanned event that adversely affects our employees, our business, its physical assets, the clients we serve, or the environment.
Serious Incident	Any work-related incident where there is property damage greater than $5,000, employee hospitalization, fatality, facility/site shutdown, or involves a third party (public). A near miss with the potential for any of the above consequences would also be considered a serious incident.
Near-Miss	Any event that could adversely affect our employees, our business, its physical assets, the customers we serve, or the environment, given any change in circumstances.
Hazard Identification	The identification of a condition or practice that has the potential for an incident or loss.
Property Damage (Vehicle)	Damage to any vehicle used for business, whether the vehicle is attended or not. This does not include normal wear and tear (e.g. tire damage, minor scratches, stone chips to paint or windshield, mechanical wear).
Property Damage (Other)	Damage to equipment, materials, etc., excluding vehicle damage.
Theft	Theft of any property.
Non-compliance	Where an employee or project is identified as operating outside the parameters of policy and/or legislative requirements.

Incident Type	Definition
***Near Miss - Injury**	An employee reports physical symptoms related to work activities that have not yet resulted in treatment of any type, nor have they impacted the employee's working ability.
First Aid	An injury or illness requires first aid treatment only.
Medical Treatment	Medical treatment above and beyond first aid, without loss of work time beyond the day of injury or illness.
Restricted Work	Change in job duties and/or shortened workday resulting from a work-related injury or illness, affecting the employee's ability to engage in one or more routine work activities (i.e. an activity carried out at least once per week).
Lost Time	Health care professional recommends one or more days away from work due to a work-related injury or illness.
Fatality	Work related fatality.
Motor Vehicle Incident	An incident involving a vehicle driven, whether on or off the road, that has resulted in damage to assets, or the environment, irrespective of cost or responsibility for cause. This does not include damage as a result of normal wear and tear (see Property Damage – Vehicle).
Spill or Release	Discharge of material or substance which is reportable to a third party such as a regulatory agency or a client, or which may expose an employee to a health risk.
Contractor Recordable Injury	Definitions as above, including Medical Aid – No Lost Time, Restricted Work, Lost Time or Fatality) but applied to a subcontractor.
Fire / Explosion / Flood	A natural or man-made hazard including fire, explosion or flood that causes damage or injury.
Violence or Harassment	Any act in which a person is abused, threatened, intimidated or assaulted in the course of their employment.
3rd Party Incident	Incident involves someone who is not party to the work being completed, but may be impacted. Example: Member of the public.
Utility Strike	Compromising or disrupting of service to buried and/or overhead utility service lines, municipal or third party owned utility services, UST system components and other subsurface property service lines or systems.
Work Refusal	An employee has enacted their legislated Right to Refuse dangerous work.
Stop Work Authority	An employee has enacted Stop Work Authority provisions upon observing the presence of unsafe conditions associated with work activities. All employees have the right to stop or refuse work when they perceive an immediate danger to their health and safety or that of their colleagues.
	For Consideration
High Potential Incident	A Near Miss, First Aid injury, Medical Aid injury, Modified Work injury or Lost Time injury can often have the potential to be a fatality or a Significant Injury with disability if the circumstances would have been slightly different. For example, a Lost Time incident due to a back soft tissue injury would only be counted as a Lost Time with low potential for a serious injury, whereas a First Aid incident involving a remotely operated machine striking a worker and imparting a small cut would be counted as a First Aid incident with high potential for a Fatality or a Significant Injury. Any incident with energy exchange that had the potential to be a Fatality or a Significant Injury if the circumstances would have been slightly different should be

Incident Type	Definition
	counted as High Potential; all others should be counted as low potential and reported as normal incidents (see above). In terms of Risk Assessment language when the exposure, probability and consequence of the hazard(s) that created the injury calculate to a High or Extreme Risk Level, the incident should be counted as a High Potential; all others should be counted as low potential.

2.0 Scope of Work

The scope of this project is to:

- Importation, placement, grading and compaction with heavy equipment of fill materials consisting of "< RCS 1 and 2" soils
- Establishment and maintenance of erosion controls
- Modification of above-grade Gas Control and Collection System (GCCS) components to accommodate filling activities
- Improvements to below-grade gas collection headers and laterals including header connections below the landfill cap,
- Construction of stormwater swales, down chutes, etc.

Therefore, this HASP was prepared for the use of personnel while performing the following tasks:

1. Drive to/from the site.

2. Removal of the existing vegetative support soils before the on-site soils are placed above the existing final cover drainage sand.

    - Once the proposed elevations are achieved with the soil placement, the existing vegetative support soils that were removed will be re-installed and seeded.

3. Importation, placement, grading and compaction with heavy equipment of fill materials. (See section 2.1 for additional detail below).

4. Modification to the existing gas control systems to provide adequate collection of landfill gas and accommodate filling activities.

5. Installation of stormwater and sedimentation controls.

2.1 SOIL PLACEMENT AND HANDLING

All trucks with material approved for re-use at the Site will proceed to the scale located on the Marilyn's Landing site to be weighed. At the weighing station, the driver will show the Marilyn's Landing representative a copy of a bill of lading for log-in and weighing. The Site Operator will collect the bill of lading from the driver, will record the name of the trucking company, will verify the source of the material against an "approved list", and visually inspect and field screen the contents of the trucks for unacceptable fill materials and any visual or olfactory evidence of contamination. If the fill does not contain unacceptable material, there is no visual or olfactory evidence of contamination and it meets the field screening criteria outlined in the current Soil Re-Use Management Plan, it will be directed to the area for off-loading. Otherwise, it will be rejected. The generator of the rejected material will be notified immediately not to ship any additional fill to the Site until the source of the unacceptable fill is identified and corrective

action taken to prevent future problems. In addition, the generator must remove the rejected material off-site at the generator's expense.

Once the truck has dumped its load, the driver will return to the on-site scale to be weighed prior to leaving. The fill material will be spread in loose lifts not exceeding 24 inches and compacted by a vibratory drum roller. Materials will be spread and compacted daily. MacDonald Industries will maintain a daily log of the activities.

2.2 GAS SYSTEM MODIFICATIONS

The existing gas control systems will be modified, both during and after filling operations to provide adequate collection of landfill gas. Temporary lateral piping that will be raised as the filling progresses, and final gas system modifications, including laterals, header and valves will be constructed once filling has been completed. During the time of the filling existing vertical gas wells will be raised as needed.

3.0 Site Background and Chemical Hazards

The proposed project will be located on two adjacent properties known as Marilyn's Landing and the BFI Halifax Landfill. Marilyn's Landing is ±19.8-acre property owned by MacDonald Industries, Inc. located off Laurel Street in Bridgewater, Massachusetts that includes soil fill placement on a ±6.8-arcre portion of the property. The BFI Halifax Landfill is a closed, capped municipal waste landfill that directly abuts the Marilyn's Landing property. The BFI Halifax Landfill is located on a ±43.8 acre parcel of land in the Town of Halifax, Massachusetts owned by Browning Ferris Industries, Inc. (BFI).

A Soil Re-Use Management Plan was developed for the Marilyn's Landing site allowing for the importation and placement of soils under an Administrative Consent Order (ACO) issued by the Massachusetts Department of Environmental Protection (MassDEP). Approximately 580,000 tons of soil have been placed at the Marilyn's Landing site under the above-referenced plan, rising to an elevation of generally 95-110 feet (NGVD 88). To date, the proposed soil fill has consisted of less than RCS-1 and RCS-2 soils in accordance with a document entitled, Soil Re-use Management Plan, Revision 1, Marilyn's Landing Commercial Re-use Area Off of Plymouth Street, Bridgewater, Massachusetts, dated February 26, 2019. This Soil Re-use Management Plan (SRMP) was previously submitted to and approved by MassDEP under a First Amendment to the ACO No. 00003451.

The BFI Halifax Landfill is a municipal landfill that has been closed since 1996. The Landfill was capped to an elevation of approximately 141 feet, with a 40-mil textured High Density Polyethylene (HDPE) geomembrane cap, a drainage layer sand and topsoil. The final landfill closure also includes an active landfill gas collection system complete with drilled extraction wells along with lateral and header piping to convey the collected gas to a skid mounted candlestick flare.

This Project includes soil placement up to a maximum elevation of 144 feet (NGVD 88) spanning the BFI Halifax landfill and Marilyn's Landing sites, filling the "swale area" in between the two properties. The anticipated volume of fill to be placed onto the BFI-Halifax Landfill site is approximately 580,800 cubic yards and 252,100 cubic yards on the Marilyn's Landing site, totaling 832,900 cubic yards or approximately 1,250,000 tons of soil. Actual soil volume deposited may exceed this estimate to reach final elevations. The work is limited to a ±27.2-acre area including ±6.8-acres on the Marilyn's Landing property and ±20.4-acres on the BFI Halifax Landfill property.

A revised Soil Re-Use Management Plan (SRMP) is currently being developed by others which will govern the soil placement at the Marilyn's Landing Site. Since this Project includes work on the capped and closed BFI Halifax Landfill owned by a Browning Ferris Industries, Inc. which was not party to the initial ACO or first amendment, a new ACO between MacDonald Industries Inc. and Browning Ferris Industries, Inc. (collectively the "Owners") and MassDEP is required. This ACO is

currently being finalized and will govern the soil placement and other elements of the work being performed for this Project.

The majority of the soil that is scheduled to be placed in the Site is contemplated to originate from construction projects where the soils have either been pre-characterized during the engineering phase of the development or characterized from stockpiled soil at the generation sites. All soils to be placed in the Site will be pre-characterized by the generator using appropriate characterization guidelines as published by MassDEP. All soils proposed for reuse at the Site shall be tested using U.S. EPA testing methodologies for certain analytes to demonstrate compliance with the SAC.

No major chemical hazards are currently identified or anticipated in regard to the incoming soils at the Site. Soils accepted to the facility are <RCS-1 and <RCS2, and as such have demonstrated through laboratory testing not to represent a risk to human health or the environment. As per the Updated Soil Re-Use Management Plan, for each accepted load, Marilyn's Landing staff visually inspects the contents of the trucks for unacceptable fill materials and any visual or olfactory evidence of contamination. In the event that a suspect load is identified, the generator of the rejected material will be notified immediately and the Site LSP will be contacted. The generator will be instructed not to ship any additional fill to the Site until the source of the unacceptable fill is identified and corrective action taken to prevent future problems. In addition, the generator must remove the rejected material off-site at the generator's expense.

Marilyn's landing staff may also screen incoming loads using a photoionization detector (PID) for total organic vapors. In the event that a headspace readings greater than 5.0 ppmv are encountered, the load will be rejected. To prevent contact with potential contaminants of concern (COCs) when handling contaminated soils or samples, nitrile gloves must be worn at all times. Cut and tear resistant gloves should be donned when appropriate. Additional reporting to MassDEP and subsequent actions as directed may be required based on the characteristics of the load in question.

Richard G. Stromberg, LSP in coordination with LSPs/QEPs at Generator sites, is responsible for reviewing soil characterization data so that only soils meeting the Soil Acceptance Criteria are brought to the Site. The SRMP and ACO have been prepared so that these activities pose no significant risk of harm to health, safety, public welfare or the environment and does not create new releases or threats of releases of oil or hazardous materials (OHM).

Per the SRMP, no environmental monitoring will be necessary as soils are < RCS-2 which applies to area use and will not constitute unacceptable exposures to contaminated soil through ingestion, dermal contact and inhalation.

4.0 Potential Airborne Concerns and Air Monitoring Action Levels

Potential Airborne Concerns						
Chemical (Or Class)	**OSHA PEL ACGIH TLV**	**Other Pertinent Limits**	**Warning Properties**	**Routes of Exposure or Irritation**	**Acute Health Effects**	**Chronic Health Effects/Target Organs**
Landfill Gas (LFG) – May contain constituents in the Air Monitoring Action Level table below. Work practice modification shall occur as indicated.	N/A	N/A	• Headache • Shortness of breath • Dizziness • Respiratory Irritation	Inhalation	Respiratory Nervous System	Respiratory Nervous System

Abbreviation	Explanation
PEL	Permissible Exposure Limit set by OSHA (8-hour time-weighted average [TWA])
REL	Recommended Exposure Limit set by NIOSH (8-hour TWA)
C	Ceiling Limit (not to be exceeded for any period of time)
STEL	Short Term Exposure Limit (15-minute average)
IDLH	Immediately Dangerous to Life or Health
TLV	Threshold Limit Value set by the ACGIH (American Conference of Governmental Industrial Hygienists; 8-hour TWA)
AIHA WEEL	Workplace Environmental Exposure Level set by the AIHA (American Industrial Hygiene Association)
SKIN	Skin Absorption is a significant potential contributor to total exposure
NIOSH	National Institute for Occupational Safety and Health
CNS	Central Nervous System
CVS	Cardiovascular System

SITE-SPECIFIC HEALTH AND SAFETY PLAN

Potential Airborne Concerns and Air Monitoring Action Levels

Air Monitoring Action Levels (If appropriate)					
Chemical (or Class)	**Monitoring Equipment**	**Task**	**Monitoring Frequency/ Location**	**Level For Respirator Use**	**Level For Work Stoppage**
Methane (monitored as Lower Explosive Limit) LEL	Personal Multi-Gas meter, Ventis MX4 or equivalent	While onsite where there is a potential for LFG to be present	Air monitoring instrument should be calibrated daily with standard calibration gas prior to use. Sampling will be continuous. Each person onsite will be equipped with a personal Multi-Gas meter.	N/A	Stop work and evacuate the area if at any time any meter reads 25% LEL or higher.
Hydrogen Sulfide	Personal Multi-Gas meter, Ventis MX4 or equivalent	While onsite where there is a potential for LFG to be present	Air monitoring instrument should be calibrated daily with standard calibration gas prior to use. Sampling will be continuous. Each person onsite will be equipped with a personal Multi-Gas meter.	N/A	Stop work and evacuate the area if at any time any meter reads 10 ppm or higher. Note that atmospheres with appreciable amounts (1 ppm or greater) of H2S are potentially indicative of a larger problem. Be proactive and identify sources and contact project managers before larger problems surface.
Oxygen	Personal Multi-Gas meter, Ventis MX4 or equivalent	While onsite where there is a potential for LFG to be present	Air monitoring instrument should be calibrated daily with standard calibration gas prior to use. Sampling will be continuous. Each person onsite will be equipped with a personal Multi-Gas meter.	N/A	Stop work and evacuate the area at if Oxygen is below 19.5% by volume.

Potential Airborne Concerns and Air Monitoring Action Levels

- The Level for Work Stoppage is the concentration at which work on the job will stop. Determine why exposures have reached that concentration and how they can be reduced. Site evacuation is not necessary at this level. Implement engineering controls to reduce the concentration, and then resume work.
- Personal Multi Gas meters are used to monitor the air surrounding a person for very low levels of specific chemicals. The meters for this project should be capable of measuring Methane (LEL) as low as 1%, Hydrogen Sulfide (H2S) as low as 1 parts per million and Oxygen in a range of 15 to 25%/Vol.
- Standard Calibration Gas for a Multi-Gas meter consists of 25 PPM H2S, 0.35% (25% LEL) Pentane and 18% Oxygen.
- The SHSO shall maintain a binder containing all monitoring equipment calibration records to be made available to MacDonald Industries and Browning Ferris Industries, Inc upon request.
- Action levels can be modified with particular knowledge of contaminants and site conditions.
- In the following cases, contact the SHSO for guidance on the air monitoring requirements.
    - When requesting to modify the values above.
    - On sites impacted with chemicals other than petroleum products or Landfill Gas.

4.1 DUST CONTROL

The Owner will utilize several best management practices (BMPs) to control dust associated with transporting, spreading and compacting soil to fill the Site including the following

- Re-use operations shall be suspended when winds speeds exceed 40 miles per hour or when wind carries dust beyond the property line despite implementation of dust control measures.
- An operational water truck will be on Site at all times. Water will be applied to control dust as needed to prevent visible dust emissions and offsite dust impacts.

5.0 Other Site Hazards

5.1 PHYSICAL HAZARDS

Physical hazards may include uneven terrain, sharp debris, holes, noise, etc.

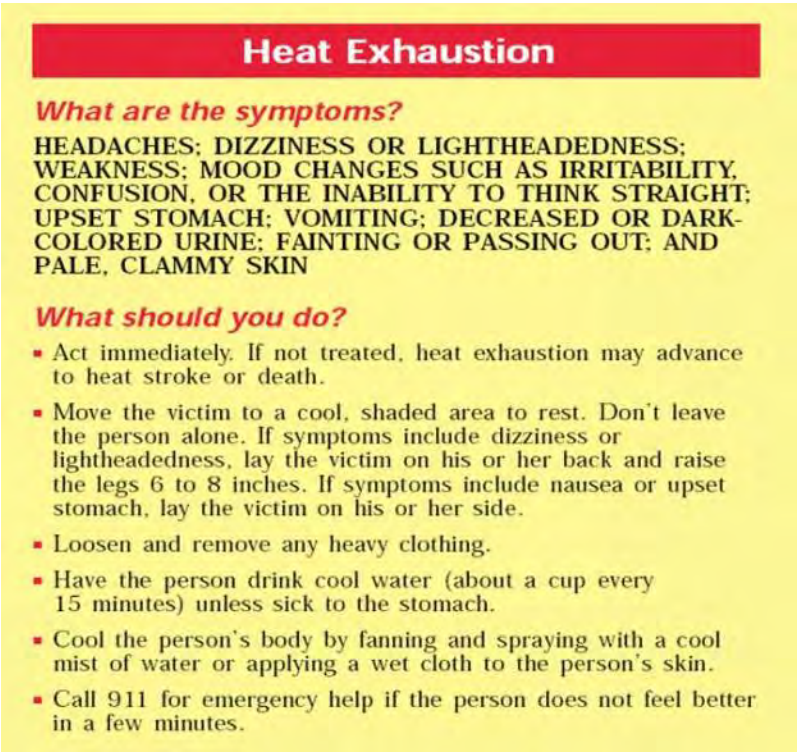
All of these physical hazards will be present. To protect yourself, look before you step and wear proper PPE for the task being performed, including steel-toe boots, hearing protection, hard hat, high-visibility safety vest, and appropriate eye protection.

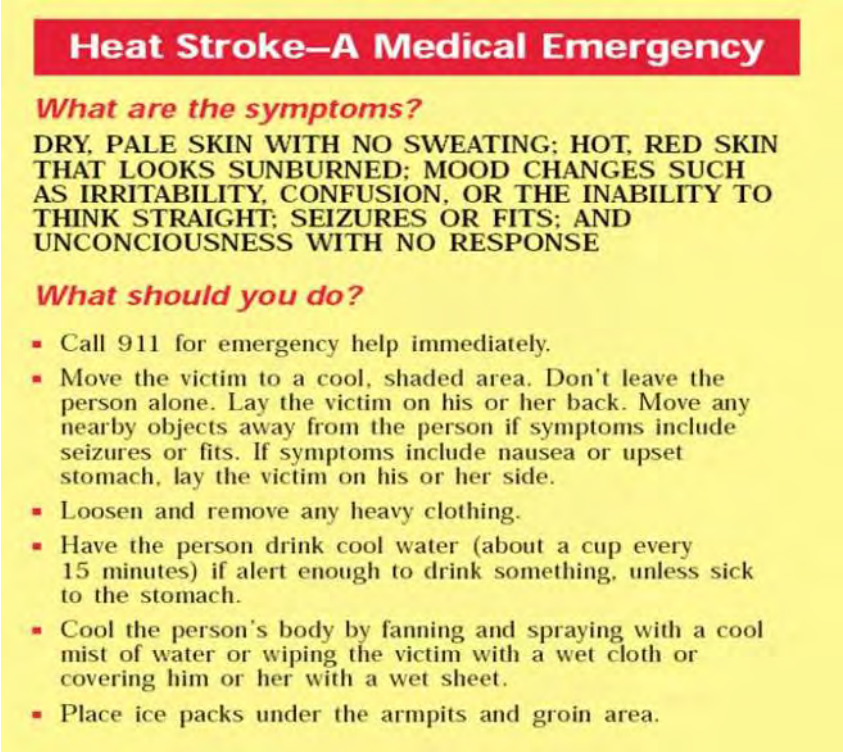
5.2 WEATHER AND NATURAL DISASTERS

Hazards associated with weather and natural disasters may include, but are not limited to, effects of extreme heat (heat exhaustion, heat stroke), effects of extreme cold (hypothermia, frostbite), high winds, heavy rain, lightening, heavy snow, ice, earthquakes, landslides, flooding, etc.

The most likely hazards at the site are effects of extreme heat (heat exhaustion, heat stroke).

To protect yourself from heat, perform the heaviest work at the coolest part of the day; drink plenty of cool water; wear light, loose-fitting, breathable clothing; and take frequent, short breaks in the shade. Certain medications, having a previous heat-related illness, and wearing PPE such as a respirator or protective suit can put you at increased risk.





Heat Stroke–A Medical Emergency

What are the symptoms?

DRY, PALE SKIN WITH NO SWEATING; HOT, RED SKIN THAT LOOKS SUNBURNED; MOOD CHANGES SUCH AS IRRITABILITY, CONFUSION, OR THE INABILITY TO THINK STRAIGHT; SEIZURES OR FITS; AND UNCONCIOUSNESS WITH NO RESPONSE

What should you do?

- Call 911 for emergency help immediately.
- Move the victim to a cool, shaded area. Don't leave the person alone. Lay the victim on his or her back. Move any nearby objects away from the person if symptoms include seizures or fits. If symptoms include nausea or upset stomach, lay the victim on his or her side.
- Loosen and remove any heavy clothing.
- Have the person drink cool water (about a cup every 15 minutes) if alert enough to drink something, unless sick to the stomach.
- Cool the person's body by fanning and spraying with a cool mist of water or wiping the victim with a wet cloth or covering him or her with a wet sheet.
- Place ice packs under the armpits and groin area.

5.3 BIOLOGICAL HAZARDS

Biological hazards may include, but are not limited to, bees/wasps, spiders, snakes, stray dogs, poisonous/allergenic plants and other wildlife.

1. Bees, wasps, and spiders may be encountered during a number of tasks including: opening well vault covers; opening core or sample boxes; working in tall grass, weeds, or brush; cleaning or moving materials; performing site assessment, etc.

   To mitigate hazards associated with bees, wasps or spiders:

   - Avoid known locations of bees, wasps and spiders.
   - Keep your eyes and ears open for swarms.
   - Be cautious moving logs, rocks, or other debris that may hide spiders from view.
   - Look for insects flying in and out of openings such as a crack in the wall, an open pipe end, or a well vault lid.
   - Be cautious of tall grass as some bees build their hives at ground level.
   - Be cautious of pointed structures, especially in barns, storage sheds, and outbuildings as bees often build hives in those structures, and spiders build their webs.
   - Avoid wearing citrus or floral aftershaves or perfumes, as bees/wasps may be attracted to these odors.
   - Wear light colored clothing as insects are generally attracted to dark colors.

- Fill in cracks or crevices and close open ends of pipes when bees, wasps, and spiders are not around.
- Leave the area as quickly as possible if a nest has been disturbed. Do not retrieve nearby belongings. Do not stand still. Do not try to fight them.

If stung by a bee or wasp, wash the area with soap and water, and may use Benadryl from the First Aid kit. If you have been stung over 15 times or are having symptoms other than pain and swelling, seek emergency medical assistance immediately. Staff that know they are allergic to insect stings should discuss their allergic reactions and controls (e.g., EpiPen®) with the Project Manager or SHSO.

2. To protect against snakebites, the following guidelines should be followed:

- Employees shall wear work boots, long pants and long sleeved shirts when going into wooded areas and habitats conducive to snakes.
- In areas known to be the habitat of venomous snakes, snake chaps, legging or other appropriate PPE shall be worn.
- Employees working in vegetative areas where snakes are likely should be equipped with a bush axe or other brush cutter to clear underbrush and for protection. A machete is inappropriate, since it would put the employee too close to the snake.
- Employees should avoid reaching or stepping into and over hidden and obscured areas.
- Employees should make as much noise as possible when approaching a potential snake area. This alerts the snake to your presence and offers the snake time to leave.
- To reduce the risk of snakebite, avoid touching any snake. Instead, back away slowly. Most snakes avoid people if possible and bite only when threatened, surprised, or handled.
- According to the Mayo Clinic, if a snakebite occurs, the employee should:
    - Move beyond the snake's striking distance.
    - Remain still and calm to help slow the spread of venom.
    - Remove jewelry before you start to swell.
    - Position yourself, if possible, so that the bite is at or below the level of your heart.
    - Cleanse the wound, but don't flush it with water, and cover it with a clean, dry dressing.
    - Apply a splint to reduce movement of the affected area, but keep it loose enough so as not to restrict blood flow.
    - Don't use a tourniquet or apply ice.
    - Don't cut the wound or attempt to remove the venom.
    - Don't drink caffeine or alcohol, which could speed your body's absorption of venom.
    - Don't try to capture the snake. Try to remember its color and shape so that you can describe it, which will help in your treatment. If you have a

smartphone with you and it won't delay your getting help, take a picture of the snake from a safe distance to help with identification.

- Call 911 or seek immediate medical attention, especially if the area changes color, begins to swell or is painful.

3. Exposure to poison ivy, poison oak, and poison sumac, can be miserable. Reactions range from mild (very little or none) to severe (rash and blisters). To prevent a rash, stay away from the plants. If this is not possible, be sure to follow these tips:

   - Use a barrier cream that helps prevent the skin from absorbing the oil (urushiol) that causes the rash.
   - Those with known sensitivity to poisonous plants must apply these barrier creams or a pre-contact spray to all body parts susceptible to exposure. Re-apply at least every four (4) hours.
   - Wear long pants, long sleeves, boots, and gloves when around these plants. Even when you apply a product that contains bentoquatam, you should protect your skin with clothing.
   - If you do touch one of these plants, you may prevent a rash by:
   - Apply an Ivy-Wash product that is designed to remove the urushiol from the skin. Those with known sensitivity must have this product available for all fieldwork, and must use it during breaks and after fieldwork concludes each day.
   - Washing your skin well. Use lukewarm water and soap as soon as you think you've touched a plant.
   - Washing all clothing and everything else that may have the oil on it. Urushiol (you-ROO-shee-all) can cause a rash even when it is not on the plant. It remains active for a long time.

4. To avoid accident or injuries associated with stray dogs, rodents or other animals observe the following guidelines:

   - Be aware of your surroundings and note any wild or suspicious acting animals in your work area. If necessary, seek safe shelter from these animals.
   - Avoid reaching or stepping into or over hidden areas that may contain such animals.
   - When working with soil, be aware of signs that indicate above or below ground animal nests and take appropriate action to prevent contamination by dust or injury from bites.
   - If working around animal carcasses, spray them with a disinfectant (Lysol) prior to removal and wear rubber gloves to remove animal carcasses. Dispose of dead animals in compliance with applicable city or county health guidelines. Wash exposed skin with an antibacterial or disinfectant soap (e.g., Dial or Dermascrub) after removal and disposal of the animal.
   - If an animal bite occurs, clean the wound with soap and water, and follow appropriate first aid procedures. Immediately report the incident to your supervisor.
   - Transport any bite victim to the hospital shown in section 1.3 of this document.

- If exposure to airborne particles and dust from a nest does occur, immediately report the incident to the SHSO. (If possible, and without further exposure to you, mark the site without disturbing it so trained personnel can collect samples to determine if any disease causing agents are present.)
- Avoid direct contact with bird, bat and other animal droppings. Areas where birds and bats roost should be avoided or appropriate respiratory protection shall be used when working in such an area.
- Avoid direct contact with animal blood. Wear rubber gloves if contact with animal blood cannot be prevented. Dispose of rubber gloves properly. Wash hands thoroughly with an antibacterial soap after disposal of rubber gloves and before eating, drinking or smoking.
- When working near farm animals, note their positions, numbers and demeanor.

5.4 HEAVY EQUIPMENT HAZARDS

This should be a continuously active construction site with heavy equipment traffic. It is important to use all of your senses to identify and avoid hazards. You must STOP, LOOK, LISTEN, and use your sense of SMELL constantly. Use of cell phones while driving, talking, walking, or while discussing observations will divert your attention from observing potential hazards. While the use of cell phones may be unavoidable, one identified member of the group should serve as a safety lookout when cell calls are made.

5.5 NOISE HAZARDS

Workers may be exposed to sound levels of 85 dbA or greater. If they are, then they:

- Must wear hearing protection appropriate to mitigate the noise level to which they are exposed.

If the exposure is over an 8-hour period or longer, then the employee:

- Must be included in their employer's Hearing Conservation Program;
- Must be trained annually in their employer's Hearing Conservation Program and any updated changes in PPE requirements associated with applicable work practices.

5.6 HAND AND PORTABLE POWER TOOL HAZARDS

Workers may utilize a variety of hand and/or power tools in the performance of services. The following safe equipment operating procedures are designed to reduce the potential for injury during the use of hand or power tools:

- Workers shall perform a preoperational check of their equipment. Be familiar with the operator's manual. Tools shall be maintained in a safe condition or be immediately taken out of service by tagging or locking out the controls. Report needed repairs promptly. Do not use any equipment that is unsafe.

- Wear safety glasses and other appropriate personal protective equipment (such as gloves and hearing protection) consistent with the hazard associated with the tool.
- Only use tools in the manner for which they are designed to avoid tool damage and personal injury.
- Visually inspect all tools prior to use and remove damaged tools from service.
- Ensure that tool handles are free from cracks, splits and splinters prior to use.
- Ensure that impact tools are free from "mushroomed" heads.
- Keep work area clean to avoid slipping, tripping or falling.
- Avoid using dull power tools or hand tools. Power saws, chain saws and drills that have dull blades or bits can cause binding or kickback which can result in cuts, bruises and loss of fingers or limbs to the operator and others.
- Ensure proper grounding for power tools.
- Be aware of safety devices on tools; check regularly and use only tools with all safety devices properly operating. Do not use electric power tools with damaged cords or switches.
- Place tools in safe position when not in use so that sharp points are not exposed. Carry all sharp tools in a sheath or holster.
- When using knives, shears or other cutting tools, cut in a direction away from your body.
- Store tools in an appropriate manner, such as storage cabinets and wall storage units.
- All personnel shall utilize non- sparking equipment and tools while performing work on the GCCS.

5.7 LIFTING HAZARDS

Before lifting any load, think of alternate means of moving it (push, pull, roll, pour or pump). Complete an assessment of the potential hazards associated with manual lifting. Consider the weight of the material(s) to be lifted, the duration and or frequency of lifting that needs to occur. Practicing proper lifting techniques. Work within your own strength parameters. A good rule of thumb is that any single item weighing more than 40 pounds presents an increased risk of injury when being lifted or lowered. Ask for help and/or use two man lifts when necessary or in the event that mechanical lifting or other lifting devices are available for use. Use mechanical lifting means wherever it is available. .

5.8 COVID-19 PROTOCOLS

1. If you are feeling ill or are exhibiting symptoms (fever, cough, and/or shortness of breath), you will not be permitted to visit the site.
2. Secure appropriate personal protective equipment for the project including hand sanitizers, disinfectant wipes, gloves, etc.
3. No ride sharing. Ride in the vehicle you came in. Take appropriate measures to disinfect contact surfaces of any vehicles before beginning your drive.
4. Maintain a safe “social distance – 6 feet”, between field event participants at all times. Only essential personnel should be participating in the field events.

5. Practice good hygiene at all times. Frequently use the hand sanitizers after contact with surfaces, sharing tools/equipment, and before and after eating.
6. For all incoming soil deliveries, operators will remain inside their trucks while on the scale and a runner will pick up and deliver weight tickets until further notice.

6.0 Site Control and Safety Procedures

Procedures described in this section are intended to aid site personnel in mitigating site risks/hazards. Also, refer to Appendix A for client-specific safety requirements.

The proposed construction shall proceed in compliance with MassDEP regulations, requirements, MassDEP's Landfill Technical Guidance Manual, revised May 1997, or as required by permit approvals.

Cameras

Prior to using a camera or other electronic recording devices on this site, all on-site personnel and/or visitors will obtain approval from the Project Manager and/or Client.

Daily Production Health and Safety Briefings

A safety meeting will be conducted prior to initiating site activity, and other appropriate times (each morning and change or addition of work) at the site to discuss the health and safety issues for the activities to be conducted that day. The topics of the meeting will include, at a minimum, general health and safety procedures, reviewing health and safety policies and reviewing the job hazard analyses for the tasks to be conducted. Additional safety meetings may be conducted if the scope of work changes during the day, or if other health and safety issues are identified. The Daily Tailgate form will be used to document daily health and safety briefings. Blank forms and example meeting topics are included in **Appendix B**.

Driving

Inspect vehicles at least once a day for each vehicle driven for business to identify potential vehicle issues/hazards. Vehicles must be labeled to clearly identify company affiliation.

Smoking

All smoking, including electronic vapor devices is prohibited on site.

HASP Inspections

The site-specific HASP should be inspected in the field by the SHSO or other personnel to determine the effectiveness of the plan. Deficiencies should be corrected and changes will be recorded on the HASP Modification Log.

Material Safety Data Sheets

Material Safety Data Sheets (MSDSs) are included in **Appendix C** for all chemicals that may be found on site (including chemicals that will be brought on site by on-site personnel and/or visitors).

Permits

This HASP will serve as the general permit to work for this site. Client specific work permits, if required, will be available in the field.

Personal Protective Equipment (PPE)

PPE is identified in JSAs. PPE listed in each JSA is specific to the task outlined in the JSA. PPE is to be used in accordance with manufacturers' recommendations. Minimum PPE at the site includes steel toe/steel shank boots, work gloves, high-visibility safety vest, long sleeve shirt, pants, safety glasses with side shields, and a hard hat.

Pre-entry Briefing

All on-site workers and visitors will receive a pre-entry briefing prior to accessing work areas of the site. The briefing will include reviewing contents of the HASP and signing the Acknowledgement and Agreement Form. The briefing for visitors may be abbreviated to be fit-for-purpose based on the intent of the visit.

Public Questions and Press

Questions about the site posed by neighbors, the press, or other interested parties will be directed to the Client.

Job Safety Analysis (JSA)

JSA's must be developed for each respective task by the on-site supervisor performing the work prior to commencement of work. Applicable JSAs will be reviewed in detail on a daily basis by all affected on-site workers and/or visitors. Revisions to the JSAs will be hand-written into the JSAs, forwarded to the Project Manager and SHSO and communicated during Daily Production Health and Safety Briefings. Templates for creating JSAs associated with the site/project are located in **Appendix D.**

Site Access and Layout

There is a paved access road to the site from the main road, with gravel access roads to the top of landfill. There is perimeter fencing around most of the area.

Site Security

Security of our staff, subcontractors, equipment, and the public is of paramount importance. Employees are trained in hazard recognition and will follow standard policies and procedures to report and mitigate site security issues/hazards if identified. Note that security consideration is different than traffic guidance and control, which also impacts security to some extent. Security refers to personal safety and freedom from theft or violence. The following items will be evaluated when considering security measures at the site:

- Daytime activities at the site;
- Recent criminal activity at nearby areas;
- Work hours (security concerns may be different depending on the time of day); and
- Lighting at the site (thieves are generally dissuaded from stealing on well-lit sites).

Standard security measures will be implemented on site to minimize the potential for loss at the site. Standard security measures include properly maintained lighting, functioning locks for windows/doors/equipment storage areas, and maintaining control of tools and equipment when not in use. Security may be implemented in a variety of ways:

- Orange construction fence (minimal security);
- Chain link fencing;
- Extra lighting;
- Specialized locks; and/or
- Contract security.

Traffic Guidance and Control

Where determined by risk analysis, the SHSO and project staff will develop a Traffic Guidance and Control Plan and disseminate this information to all site personnel. This plan will consider the amount of traffic at a site and provide for the safety of all workers. Equipment and resources to be considered as part of traffic guidance and control include:

- Vehicle hazard lights (tail and headlights)
- Delineators and orange construction fencing
- Placement of vehicles as barriers between workers and traffic
- Rotating amber hazard lights that can be placed on top of vehicles
- Professionally trained flaggers

Other considerations for the Traffic Guidance and Control Plan include:

- Requiring personal vehicles (that aren't being used as barriers) to park as far away from potential traffic as possible.
- Cordoning off as much space as is necessary to ensure our safety. This will be discussed with property owners and tenants, as it may mean closing down additional gasoline pumps, etc.
- Identifying traffic flow routes and parking areas for heavy equipment (e.g., vacuum trucks, drill rigs, etc.) and establishing site speed limits.
- Reviewing local regulations for: formally developed traffic guidance and control plans signed by licensed individuals, police details, flagmen, hours of activity, closure of streets, etc.

Work Hours

Work on this project will be conducted during the hours of 7:00 AM to 5:00 PM, Monday through Friday, excluding holidays.

7.0 Project Team Information

7.1 TRAINING

Site personnel will have completed the trainings below:

- OSHA 10-Hour OSHA Construction Training;
- First Aid/CPR Training;
- Supervisory 8-hour Training [29 CFR 1910.120(e)(4)] for the Site Manager/SHSO; and
- Optional training specific to the job being performed (e.g., Fall Protection, Lock Out/Tag Out, Hot Work, Confined Space, OSHA HAZWOPER etc.).

Health and Safety Requirements:
In addition to the above-mentioned trainings, personnel are required to have training in the hazards associated with landfill gasses.

Client-Specific Safety Procedures:
The Client's Standard Operating Procedures (SOP) governing LFG services is included in Appendix A for reference. No additional Client-Specific safety procedures have been included to date. If provided at a later date, additional Client-Specific Safety Procedures shall be included in Appendix A.

Appendix A

Client-Specific Safety Documents

SECTION 2
GENERAL INFORMATION

2.1 FORMAT OF SOP

Imperative and abbreviated language is used in the SOP that is directed at the party performing the OM&M services unless specifically noted otherwise. Note that whether stated imperatively or otherwise, all requirements must be met unless an approved variance is granted.

For incomplete sentences, the reader should insert "shall", "OM&M Provider shall", or similar mandatory phrases by inference.

2.2 RESOURCES/CONTACTS

The following Republic Corporate and Region resources (or those of similar title) are available to assist with issues related to OM&M of LFG management systems:

- Manager, Landfill Gas Operations (Corporate)
- Manager, Air Compliance (Corporate)
- Director, Engineering (Corporate)
- Director, Engineering and Environmental Management (Region)
- Region Engineer (Region)

2.3 HEALTH AND SAFETY

All Republic personnel performing work on LFG management systems shall abide by Republic corporate health and safety policies and shall participate in Republic's general safety training and supplemental training specifically related to landfill gas and leachate management.

Contractors shall have in place and abide by their corporate and site-specific health and safety plans (HASP). Contractor shall provide Republic a copy of the site-specific HASP prior to the commencement of work at any site, and shall submit an electronic copy of the firm's corporate health and safety plan. If requested, Contractor also shall submit to the EM or the Landfill Operations Manager, on a daily basis, copies of Contractor's daily tailgate meeting sign-off logs, personal protective monitor calibration logs, and other pertinent HASP related documentation.

All work by either Republic or Contractor personnel shall be conducted in a safe and professional manner using best industry practices. All OM&M personnel shall utilize non-sparking equipment, flame and spark arrestors, and appropriate personal and handheld gas meters in order to maintain the safety of on-site personnel. Personnel shall not permit open flames or smoking anywhere or at any time while working at a Republic facility. Personnel shall also immediately employ any and all safety measures deemed reasonable and appropriate by the EM or Landfill Operations Manager.

Other minimum health and safety requirements are:

A. **High Visibility Clothing:** High-visibility clothing shall be worn when on site. Clothing must comply with ANSI/ISEA 107-2010: American National Standard for High-Visibility Safety Apparel and Headwear, OSHA, and DOT standards, as applicable. Examples of high visibility clothing include fluorescent green shirts and reflective vests. Personnel who are found not adhering to the high-visibility policy will be required to stop work until they obtain acceptable clothing.

B. **Personal Protective Equipment (PPE):** Appropriate site-specific PPE shall be worn by all OM&M personnel, including managers and other support personnel who may periodically visit the worksite. Examples include: hardhats, steel toe boots, coveralls, gloves, eye protection, hearing protection, etc. The EM and Landfill Operations Manager may provide a list of site-specific PPE to be worn by OM&M personnel.

C. **Four-Gas Meter:** Properly operating and calibrated 4-gas monitors (O_2, CO, H_2S, LEL) shall be worn by all personnel performing monitoring and maintenance activities related to the GCCS or leachate management system, including at the blower/flare station. Monitors must be affixed to the technician's outer clothing and at an appropriate height.

D. **Non-Sparking Equipment:** Appropriate non-sparking (intrinsically safe) equipment shall be used for relevant tasks.

E. **Smoking:** Open flames or smoking are not permitted anywhere on or adjacent to the landfill and GCCS equipment. Smoking is only allowed in designated areas, as determined by the Landfill Operations Manager.

F. **Vehicles:** Access vehicles, including four-wheel drive or other all-terrain vehicles, may be used during completion of the work at the discretion of Landfill Operations Manager. All OM&M personnel shall ensure that damage to both vegetated and non-vegetated areas of the landfill does not occur as a result of vehicle use, which may preclude use of these vehicles at certain times of the year. Vehicles must be labeled to clearly identify company affiliation and should be outfitted with high visibility buggy whips or orange strobe lights.

   Personnel using all-terrain vehicles shall be trained by their employer and be able to demonstrate participation in training for the proper use of all-terrain vehicles on landfills. Refresher training is required annually. Any abuse (horseplay, speeding, unsafe operation, etc.) will result in revocation of this privilege. If OM&M Provider is banned from use of these vehicles, Republic **will not** renegotiate the service contract to address additional Contractor time constraints to complete the required Scope of Work (SOW).

2.3.1 Minimum Health and Safety Training Requirements

All OM&M technicians (Republic and Contractors) shall have OSHA 29 CFR 1910.120 40-hour HAZWOPER training and be up-to-date on 8-hour annual refresher training prior to beginning work on any Republic site, unless Republic approves alternate extensive safety training specific to landfills and of similar rigor to the HAZWOPER certification and 8-hour refresher courses in the future.

Contractors' personnel must also be trained and certified in Competent Person Awareness for Trench and Excavation Safety in accordance with OSHA Excavation Standards. If requested, Contractors shall supply proof of all relevant training within two days of request by Republic's EM or Area, Region, or Corporate staff.

2.3.2 Personal Protective Equipment (PPE)

In addition to site-specific health and safety requirements that may be in place at the facility, appropriate PPE, including high visibility clothing and hardhats, shall be worn by all workers when near the working face or by heavy equipment. Work will be performed in OSHA Level D Personal Protective Equipment (PPE) unless other levels of PPE are deemed appropriate by the OM&M Provider. The O&M Provider shall coordinate with the EM or Landfill Operations Manager to obtain site-specific requirements that must be followed.

2.3.3 Confined Space Work

No Republic employee performing GCCS OM&M or repairing GCCS components may perform confined space work.

2.4 CONTRACTS

To ensure that contracted work is properly detailed and scoped, insurance coverage is in place, and schedules and budgets are clear, OM&M Providers shall comply with the following:

A. Work shall not be performed without an executed Republic contract and Purchase Order. The executed contract must contain a detailed SOW for the required services. An example SOW for OM&M services can be found in Attachment B. Republic is under no obligation to pay for work performed without an approved contract or purchase order.

B. The SOW and associated contract shall clearly define tasks that the OM&M Provider considers in-scope (routine) work. Work items that fall outside of the routine scope of services, including emergency services, will be considered non-routine. It is the OM&M Provider's responsibility to ensure that the SOW is clear and all parties agree on the routine vs. non-routine aspects of the project.

C. Non-routine work items shall not be performed until verbal or written authorization from Republic has been granted.

Appendix B

Daily Tailgate Forms

TAILGATE SAFETY MEETING FORM

Location of Work:_____

_____

Date:_____

SCOPE OF WORK	HAZARDS PRESENT	CONTROL MEASURES

Daily Safety Topic:_____

_____

_____

_____

_____

ATTENDEES NAMES	
PRINT	SIGNATURE

Appendix C

Safety Data Sheets (SDS)

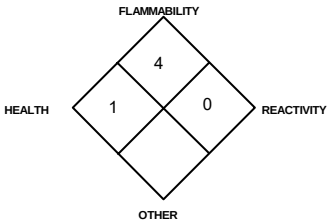
- **Methane**
- **Hydrogen Sulfide**
- **Carbon Dioxide**
- **Oxygen**
- **Diesel Fuel**
- **Oil**

MATERIAL SAFETY DATA SHEET

Prepared to U.S. OSHA, CMA, ANSI and Canadian WHMIS Standards

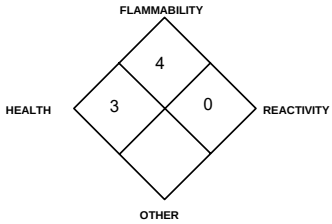
METHANE GAS

NFPA RATING



LIQUID METHANE

NFPA RATING



PART I *What is the material and what do I need to know in an emergency?*

1. PRODUCT IDENTIFICATION

CHEMICAL NAME; CLASS: **METHANE - CH_4, Gaseous**
METHANE - CH_4, Liquefied (Cryogenic)
Document Number: 001033

PRODUCT USE: Fuel and for general analytic/synthetic chemical uses.

SUPPLIER/MANUFACTURER'S NAME: AIRGAS INC.
ADDRESS: 259 N. Radnor-Chester Road
Suite 100
Radnor, PA 19087-5283

BUSINESS PHONE: 1-610-687-5253
EMERGENCY PHONE: 1-800-949-7937
International: 423-479-0293

DATE OF PREPARATION: May 12, 1996
REVISION DATE: January 3, 2001

2. COMPOSITION and INFORMATION ON INGREDIENTS

CHEMICAL NAME	CAS #	mole %	EXPOSURE LIMITS IN AIR					
			ACGIH		OSHA			
			TLV ppm	STEL ppm	PEL ppm	STEL ppm	IDLH ppm	OTHER
Methane	74-82-8	> 99%	There are no specific exposure limits for Methane. Methane is a simple asphyxiant (SA). Oxygen levels should be maintained above 19.5%.					
Maximum Impurities		< 1%	None of the trace impurities in this product contribute significantly to the hazards associated with the product. All hazard information pertinent to this product has been provided in this Material Safety Data Sheet, per the requirements of the OSHA Hazard Communication Standard (29 CFR 1910.1200) and State equivalent standards.					

NE = Not Established C = Ceiling Limit See Section 16 for Definitions of Terms Used

NOTE: All WHMIS required information is included. It is located in appropriate sections based on the ANSI Z400.1-1993 format.

3. HAZARD IDENTIFICATION

EMERGENCY OVERVIEW: Methane is an odorless, colorless gas, or a colorless, odorless liquid in its cryogenic form. Both the liquid and the gas pose a serious fire hazard when accidentally released. The liquid will rapidly boil to the gas at standard temperatures and pressures. As a gas, it will act as a simple asphyxiant and present a significant health hazard by displacing the oxygen in the atmosphere. The gas is lighter than air and may spread long distances. Distant ignition and flashback are possible. The liquefied gas can cause frostbite to any contaminated tissue. Flame or high temperature impinging on a localized area of the cylinder of Methane can cause the cylinder to rupture without activating the cylinder's relief devices. Provide adequate fire protection during emergency response situations. Allow the released gas to dissipate in the atmosphere.

SYMPTOMS OF OVEREXPOSURE BY ROUTE OF EXPOSURE: The most significant route of overexposure for this gas is by inhalation. The following paragraphs describe symptoms of exposure by route of exposure.

INHALATION: High concentrations of this gas can cause an oxygen-deficient environment. Individuals breathing such an atmosphere may experience symptoms which include headaches, ringing in ears, dizziness, drowsiness, unconsciousness, nausea, vomiting, and depression of all the senses. Under some circumstances of overexposure, death may occur. The effects associated with various levels of oxygen are as follows:

CONCENTRATION	**SYMPTOMS OF EXPOSURE**
12-16% Oxygen:	Breathing and pulse rate increased, muscular coordination slightly disturbed.
10-14% Oxygen:	Emotional upset, abnormal fatigue, disturbed respiration.
6-10% Oxygen:	Nausea and vomiting, collapse or loss of consciousness.
Below 6%:	Convulsive movements, possible respiratory collapse, and death.

OTHER POTENTIAL HEALTH EFFECTS: Contact with cryogenic liquid or rapidly expanding gases (which are released under high pressure) may cause frostbite. Symptoms of frostbite include change in skin color to white or grayish-yellow. The pain after contact with the liquid can quickly subside.

HAZARDOUS MATERIAL INFORMATION SYSTEM

HEALTH	(BLUE)	1
FLAMMABILITY	(RED)	4
REACTIVITY	(YELLOW)	0
PROTECTIVE EQUIPMENT		B

EYES	RESPIRATORY	HANDS	BODY
	See Section 8		See Section 8

For routine industrial applications

See Section 16 for Definition of Ratings

HEALTH EFFECTS OR RISKS FROM EXPOSURE: An Explanation in **Lay Terms**. Overexposure to Methane may cause the following health effects:

ACUTE: The most significant hazard associated with this gas is inhalation of oxygen-deficient atmospheres. Symptoms of oxygen deficiency include respiratory difficulty, headache, dizziness, and nausea. At high concentrations, unconsciousness or death may occur. Contact with cryogenic liquid or rapidly expanding gases may cause frostbite.

CHRONIC: There are currently no known adverse health effects associated with chronic exposure to Methane.

TARGET ORGANS: Respiratory system.

PART II *What should I do if a hazardous situation occurs?*

4. FIRST-AID MEASURES

RESCUERS SHOULD NOT ATTEMPT TO RETRIEVE VICTIMS OF EXPOSURE TO METHANE WITHOUT ADEQUATE PERSONAL PROTECTIVE EQUIPMENT. At a minimum, Self-Contained Breathing Apparatus and Fire-Retardant Personal Protective equipment should be worn. Adequate fire protection must be provided during rescue situations.

4. FIRST-AID MEASURES (Continued)

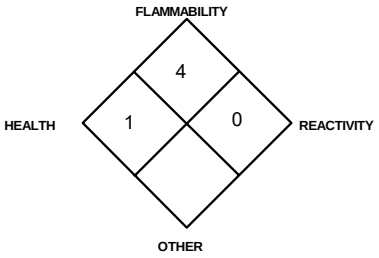
Remove victim(s) to fresh air as quickly as possible. Trained personnel should administer supplemental oxygen and/or cardio-pulmonary resuscitation, if necessary. Only trained personnel should administer supplemental oxygen.

In case of frostbite, place the frostbitten part in warm water. DO NOT USE HOT WATER. If warm water is not available, or is impractical to use, wrap the affected parts gently in blankets. Alternatively, if the fingers or hands are frostbitten, place the affected area in the armpit, Encourage victim to gently exercise the affected part while being warmed. Seek immediate medical attention. Victim(s) must be taken for medical attention. Rescuers should be taken for medical attention, if necessary. Take copy of label and MSDS to physician or other health professional with victim(s).

5. FIRE-FIGHTING MEASURES

METHANE GAS

NFPA RATING



FLASH POINT (Closed Cup):
-187°C (-306°F)

AUTOIGNITION TEMPERATURE:
537°C (999°F)

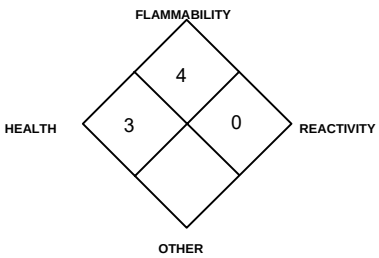
FLAMMABLE LIMITS (in air by volume, %):

Lower (LEL): 5.0%
Upper (UEL): 15.0%

See Section 16 for Definition of Ratings

LIQUID METHANE

NFPA RATING



FIRE EXTINGUISHING MATERIALS: Extinguish fires of this gas by shutting off the source of the gas. Use water spray to cool fire-exposed containers, structures, and equipment.

UNUSUAL FIRE AND EXPLOSION HAZARDS: When involved in a fire, this gas will ignite and produce toxic gases including carbon monoxide and carbon dioxide. An extreme explosion hazard exists in areas in which the gas has been released, but the material has not yet ignited.

DANGER! Fires impinging (direct flame) on the outside surface of unprotected pressure storage vessels of Methane can be very dangerous and lead to container failure. The resulting fire and explosion can result in severe equipment damage and personnel injury or death over a large area around the vessel. For massive fires in large areas, use unmanned hose holder or monitor nozzles; if this is not possible, withdraw from area and allow fire to burn.

RESPONSE TO FIRE INVOLVING CRYOGEN: Cryogenic liquids can be particularly dangerous during fires because of their potential to rapidly freeze water. Careless use of water may cause heavy icing. Furthermore, relatively warm water greatly increases the evaporation rate of Methane. If large concentrations of Methane gas are present, the water vapor in the surrounding air will condense, creating a dense fog that may make it difficult to find fire exits or equipment. Liquid Methane, when exposed to the atmosphere, will produce a cloud of ice/fog in the air upon its release. A flammable mixture will exist within the vapor cloud and it is advisable that personnel keep well outside the area of visible moisture.

Explosion Sensitivity to Mechanical Impact: Not sensitive.
Explosion Sensitivity to Static Discharge: Static discharge may cause Methane to ignite explosively.

SPECIAL FIRE-FIGHTING PROCEDURES: Structural fire-fighters must wear Self-Contained Breathing Apparatus and full protective equipment. The best fire-fighting technique may be simply to let the burning gas escape from the pressurized cylinder, tank car, or pipeline. Stop the leak before extinguishing fire. If the fire is extinguished before the leak is sealed, the still-leaking gas could explosively re-ignite without warning and cause extensive damage, injury, or fatality. In this case, increase ventilation (in enclosed areas) to prevent flammable or explosive mixture formation. For large releases, consider evacuation. Refer to the North American Emergency Response Guidebook for additional information.

6. ACCIDENTAL RELEASE MEASURES

SPILL AND LEAK RESPONSE: Uncontrolled releases should be responded to by trained personnel using pre-planned procedures. Proper protective equipment should be used. In case of a release, clear the affected area, protect people, and respond with trained personnel. Adequate fire protection must be provided. Minimum Personal Protective Equipment should be **Level B: fire-retardant protective clothing, gloves resistant to tears, and Self-Contained Breathing Apparatus.**

Use only non-sparking tools and equipment. Locate and seal the source of the leaking gas. Protect personnel attempting the shut-off with water-spray. Allow the gas, which is lighter than air, to dissipate. Liquid Methane, when exposed to the atmosphere, will produce a cloud of ice/fog in the air upon its release. A flammable mixture will exist within the vapor cloud, and it is advisable that personnel keep well outside the area of visible moisture. If cryogenic liquid is released, keep area clear and allow the liquid to evaporate. The gas that is then formed should be allowed to dissipate.

Monitor the surrounding area for combustible gas levels and oxygen. The atmosphere must have at least 19.5 percent oxygen before personnel can be allowed in the area without Self-Contained Breathing Apparatus. Combustible gas concentration must be below 10% of the LEL (LEL = 5.0%) prior to entry. Attempt to close the main source valve prior to entering the area. If this does not stop the release (or if it is not possible to reach the valve), allow the gas to release in-place or remove it to a safe area and allow the gas to be released there.

RESPONSE TO CRYOGENIC RELEASE: Clear the affected area and allow the liquid to evaporate and the gas to dissipate. After the gas is formed, follow the instructions provided in the previous paragraphs. If the area must be entered by emergency personnel, SCBA, Kevlar gloves, and appropriate foot and leg protection must be worn.

THIS IS AN EXTREMELY FLAMMABLE GAS. Protection of all personnel and the area must be maintained.

PART III *How can I prevent hazardous situations from occurring?*

7. HANDLING and STORAGE

WORK PRACTICES AND HYGIENE PRACTICES: As with all chemicals, avoid getting Methane IN YOU. Do not eat or drink while handling chemicals. Be aware of any signs of dizziness or fatigue; exposures to fatal concentrations of Methane could occur without any significant warning symptoms.

STORAGE AND HANDLING PRACTICES: Cylinders should be stored in dry, well-ventilated areas away from sources of heat. Compressed gases can present significant safety hazards. Store containers away from heavily trafficked areas and emergency exits. Post “No Smoking or Open Flames” signs in storage or use areas.

SPECIAL PRECAUTIONS FOR HANDLING GAS CYLINDERS: Protect cylinders against physical damage. Store in cool, dry, well-ventilated area, away from sources of heat, ignition and direct sunlight. Do not allow area where cylinders are stored to exceed 52°C (125°F). Isolate from oxidizers such as oxygen, chlorine, or fluorine. Use a check valve or trap in the discharge line to prevent hazardous backflow. Post “No Smoking or Open Flame” signs in storage and use areas. Cylinders should be stored upright and be firmly secured to prevent falling or being knocked over. Cylinders can be stored in the open, but in such cases, should be protected against extremes of weather and from the dampness of the ground to prevent rusting. Never tamper with pressure relief devices in valves and cylinders. Electrical equipment should be non-sparking or explosion proof. The following rules are applicable to work situations in which cylinders are being used:

Before Use: Move cylinders with a suitable hand truck. Do not drag, slide, or roll cylinders. Do not drop cylinders or permit them to strike each other. Secure cylinders firmly. Leave the valve protection cap, if provided, in place until cylinder is ready for use.

During Use: Use designated CGA fittings and other support equipment. Do not use adapters. Do not heat cylinder by any means to increase the discharge rate of the product from the cylinder. Use check valve or trap in discharge line to prevent hazardous backflow into the cylinder. Do not use oils or grease on gas-handling fittings or equipment.

After Use: Close main cylinder valve. Replace valve protection cap, if provided. Mark empty cylinders “EMPTY”.

NOTE: Use only DOT or ASME code containers. Earth-ground and bond all lines and equipment associated with Methane. Close valve after each use and when empty. Cylinders must not be recharged except by or with the consent of owner. For additional information refer to the Compressed Gas Association Pamphlet P-1, *Safe Handling of Compressed Gases in Containers*. Additionally, refer to CGA Bulletin SB-2 “*Oxygen Deficient Atmospheres*”.

PROTECTIVE PRACTICES DURING MAINTENANCE OF CONTAMINATED EQUIPMENT: Follow practices indicated in Section 6 (Accidental Release Measures). Make certain that application equipment is locked and tagged-out safely. Purge gas handling equipment with inert gas (e.g., nitrogen) before attempting repairs.

8. EXPOSURE CONTROLS - PERSONAL PROTECTION

VENTILATION AND ENGINEERING CONTROLS: Use with adequate ventilation. Local exhaust ventilation is preferred, because it prevents Methane dispersion into the work place by eliminating it at its source. If appropriate, install automatic monitoring equipment to detect the presence of potentially explosive air-gas mixtures and the level of oxygen. Monitoring devices should be installed near the ceiling.

RESPIRATORY PROTECTION: Maintain oxygen levels above 19.5% in the workplace. Use supplied air respiratory protection if oxygen levels are below 19.5% or during emergency response to a release of Methane. If respiratory protection is required, follow the requirements of the Federal OSHA Respiratory Protection Standard (29 CFR 1910.134) or equivalent State standards.

EYE PROTECTION: Splash goggles or safety glasses, for protection from rapidly expanding gases and splashes of liquid Methane.

HAND PROTECTION: Wear gloves resistant to tears when handling cylinders of Methane. Use low-temperature protective gloves when working with containers of liquid Methane.

BODY PROTECTION: Use body protection appropriate for task. Transfer of large quantities under pressure may require protective equipment appropriate to protect employees from splashes of liquefied product, as well as fire retardant items.

9. PHYSICAL and CHEMICAL PROPERTIES

VAPOR DENSITY: 0.6784 kg/m^3 (0.042 35 lb/ft^3)
SPECIFIC GRAVITY (air = 1): 0.555
SOLUBILITY IN WATER: Very slight.
EXPANSION RATIO: 626 (cryogenic liquid)
ODOR THRESHOLD: Not applicable. Odorless.
COEFFICIENT WATER/OIL DISTRIBUTION: Not applicable.
SPECIFIC VOLUME: 23.7
FREEZING POINT: -182.2°C (-296°F)
BOILING POINT @ 1 atm: -161°C (-258.7°F)
EVAPORATION RATE (n-BuAc): Not applicable.
VAPOR PRESSURE (psia): Not applicable.
pH: Not applicable.

APPEARANCE AND COLOR: Colorless, odorless gas, or colorless, odorless, cryogenic liquid.
HOW TO DETECT THIS SUBSTANCE (warning properties): There are no distinct warning properties. In terms of leak detection, fittings and joints can be painted with a soap solution to detect leaks, which will be indicated by a bubble formation.
NOTE: This gas is lighter than air and must not be allowed to accumulate in elevated locations.

10. STABILITY and REACTIVITY

STABILITY: Stable.

DECOMPOSITION PRODUCTS: When ignited in the presence of oxygen, this gas will burn to produce carbon monoxide, carbon dioxide.

MATERIALS WITH WHICH SUBSTANCE IS INCOMPATIBLE: Strong oxidizers (e.g., chlorine, bromine pentafluoride, oxygen, oxygen difluoride, and nitrogen trifluoride).

HAZARDOUS POLYMERIZATION: Will not occur.

CONDITIONS TO AVOID: Contact with incompatible materials and exposure to heat, sparks, and other sources of ignition. Cylinders exposed to high temperatures or direct flame can rupture or burst.

PART IV *Is there any other useful information about this material?*

11. TOXICOLOGICAL INFORMATION

TOXICITY DATA: There are no specific toxicology data for Methane. Methane is a simple asphyxiant, which acts to displace oxygen in the environment.

SUSPECTED CANCER AGENT: Methane is not found on the following lists: FEDERAL OSHA Z LIST, NTP, IARC, CAL/OSHA, and therefore, is neither considered to be nor suspected to be a cancer-causing agent by these agencies.

IRRITANCY OF PRODUCT: Methane is not irritating; however, contact with rapidly expanding gases can cause frostbite to exposed tissue.

SENSITIZATION TO THE PRODUCT: Methane does not cause sensitization with prolonged or repeated contact.

11. TOXICOLOGICAL INFORMATION (Continued)

REPRODUCTIVE TOXICITY INFORMATION: Listed below is information concerning the effects of Methane on the human reproductive system.

Mutagenicity: No mutagenicity effects have been described for Methane.
Embryotoxicity: No embryotoxic effects have been described for Methane.
Teratogenicity: No teratogenicity effects have been described for Methane.
Reproductive Toxicity: No reproductive toxicity effects have been described for Methane.

A mutagen is a chemical which causes permanent changes to genetic material (DNA) such that the changes will propagate through generational lines. An embryotoxin is a chemical which causes damage to a developing embryo (i.e., within the first eight weeks of pregnancy in humans), but the damage does not propagate across generational lines. A teratogen is a chemical which causes damage to a developing fetus, but the damage does not propagate across generational lines. A reproductive toxin is any substance which interferes in any way with the reproductive process.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: Acute or chronic respiratory conditions may be aggravated by overexposure to the components of Methane.

RECOMMENDATIONS TO PHYSICIANS: Administer oxygen if necessary. Treat symptoms and eliminate exposure.

BIOLOGICAL EXPOSURE INDICES (BEIs): Currently, Biological Exposure Indices (BEIs) are not applicable for Methane.

12. ECOLOGICAL INFORMATION

ENVIRONMENTAL STABILITY: Methane occurs naturally in the atmosphere. This gas will be dissipated rapidly in well-ventilated areas.
EFFECT OF MATERIAL ON PLANTS or ANIMALS: Any adverse effect on animals would be related to oxygen-deficient environments. No adverse effect is anticipated to occur to plant-life, except for frost produced in the presence of rapidly expanding gases.
EFFECT OF CHEMICAL ON AQUATIC LIFE: No evidence is currently available on the effects of Methane on aquatic life.

13. DISPOSAL CONSIDERATIONS

PREPARING WASTES FOR DISPOSAL: Product removed from the cylinder must be disposed of in accordance with appropriate Federal, State, and local regulations. Return cylinders with residual product to Airgas. Do not dispose locally.

14. TRANSPORTATION INFORMATION

THIS MATERIAL IS HAZARDOUS AS DEFINED BY 49 CFR 172.101 BY THE U.S. DEPARTMENT OF TRANSPORTATION.

For Methane Gas:

PROPER SHIPPING NAME:	Methane, compressed
HAZARD CLASS NUMBER and DESCRIPTION:	2.1 (Flammable Gas)
UN IDENTIFICATION NUMBER:	UN 1971
PACKING GROUP:	Not Applicable
DOT LABEL(S) REQUIRED:	Flammable Gas

NORTH AMERICAN EMERGENCY RESPONSE GUIDEBOOK NUMBER (2000): 115

For Liquefied Methane:

PROPER SHIPPING NAME:	Methane, refrigerated liquid
HAZARD CLASS NUMBER and DESCRIPTION:	2.1 (Flammable Gas)
UN IDENTIFICATION NUMBER:	UN 1972
PACKING GROUP:	Not Applicable
DOT LABEL(S) REQUIRED:	Flammable Gas

NORTH AMERICAN EMERGENCY RESPONSE GUIDEBOOK NUMBER (2000): 115

MARINE POLLUTANT: Methane is not classified by the DOT as a Marine Pollutant (as defined by 49 CFR 172.101, Appendix B).

15. REGULATORY INFORMATION

U.S. SARA REPORTING REQUIREMENTS: Methane is not subject to the reporting requirements of Sections 302, 304, and 313 of Title III of the Superfund Amendments and Reauthorization Act.

U.S. SARA THRESHOLD PLANNING QUANTITY: Not applicable.

U.S. CERCLA REPORTABLE QUANTITY (RQ): Not applicable.

CANADIAN DSL/NDSL INVENTORY STATUS: Methane is on the DSL Inventory.

U.S. TSCA INVENTORY STATUS: Methane is listed on the TSCA Inventory.

OTHER U.S. FEDERAL REGULATIONS: Methane is subject to the reporting requirements of Section 112(r) of the Clean Air Act. The Threshold Quantity for this gas is 10,000 lb. Depending on specific operations involving the use of Isobutylene, the regulations of the Process Safety Management of Highly Hazardous Chemicals may be applicable (29 CFR 1910.119). Under this regulation Methane is not listed in Appendix A; however, any process that involves a flammable gas on-site, in one location, in quantities of 10,000 lb (4,553 kg) or greater is covered under this regulation unless it is used as a fuel.

U.S. STATE REGULATORY INFORMATION: Methane is covered under specific State regulations, as denoted below:

Alaska - Designated Toxic and Hazardous Substances: Methane.
California - Permissible Exposure Limits for Chemical Contaminants: Methane.
Florida - Substance List: No.
Illinois - Toxic Substance List: Methane.
Kansas - Section 302/313 List: No.
Massachusetts - Substance List: Methane.
Michigan - Critical Materials Register: No.
Minnesota - List of Hazardous Substances: Methane.
Missouri - Employer Information/Toxic Substance List: Methane.
New Jersey - Right to Know Hazardous Substance List: Methane.
North Dakota - List of Hazardous Chemicals, Reportable Quantities: No.
Pennsylvania - Hazardous Substance List: Methane.
Rhode Island - Hazardous Substance List: Methane.
Texas - Hazardous Substance List: No.
West Virginia - Hazardous Substance List: No.
Wisconsin - Toxic and Hazardous Substances: No.

CALIFORNIA SAFE DRINKING WATER AND TOXIC ENFORCEMENT ACT (PROPOSITION 65): Methane is not on the California Proposition 65 lists.

LABELING:

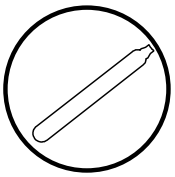
DANGER: FLAMMABLE HIGH PRESSURE GAS.
CAN FORM EXPLOSIVE MIXTURES WITH AIR.

Keep away from heat, flames, and sparks.
Store and use width adequate ventilation.
Use equipment rated for cylinder pressure.
Close valve after each use and when empty.
Use in accordance with the Material Safety Data Sheet.

DO NOT REMOVE THIS PRODUCT LABEL

CANADIAN WHMIS SYMBOLS:

Class A: Compressed Gas
Class B1: Flammable Gas



16. OTHER INFORMATION

PREPARED BY: **Airgas - SAFECOR**

The information contained herein is based on data considered accurate. However, no warranty is expressed or implied regarding the accuracy of these data or the results to be obtained from the use thereof. AIRGAS, Inc. assumes no responsibility for injury to the vendee or third persons proximately caused by the material if reasonable safety procedures are not adhered to as stipulated in the data sheet. Additionally, AIRGAS, Inc. assumes no responsibility for injury to vendee or third persons proximately caused by abnormal use of the material even if reasonable safety procedures are followed. Furthermore, vendee assumes the risk in his use of the material.

DEFINITIONS OF TERMS

A large number of abbreviations and acronyms appear on a MSDS. Some of these which are commonly used include the following:

CAS #: This is the Chemical Abstract Service Number which uniquely identifies each constituent. It is used for computer-related searching.

EXPOSURE LIMITS IN AIR:

ACGIH - American Conference of Governmental Industrial Hygienists, a professional association which establishes exposure limits. **TLV -** Threshold Limit Value - an airborne concentration of a substance which represents conditions under which it is generally believed that nearly all workers may be repeatedly exposed without adverse effect. The duration must be considered, including the 8-hour Time Weighted Average **(TWA)**, the 15-minute Short Term Exposure Limit, and the instantaneous Ceiling Level **(C)**. Skin absorption effects must also be considered.

OSHA - U.S. Occupational Safety and Health Administration. **PEL -** Permissible Exposure Limit - This exposure value means exactly the same as a TLV, except that it is enforceable by OSHA. The OSHA Permissible Exposure Limits are based in the 1989 PELs and the June, 1993 Air Contaminants Rule (Federal Register: 58: 35338-35351 and 58: 40191). Both the current PELs and the vacated PELs are indicated. The phrase, "Vacated 1989 PEL," is placed next to the PEL which was vacated by Court Order.

IDLH - Immediately Dangerous to Life and Health **-** This level represents a concentration from which one can escape within 30-minutes without suffering escape-preventing or permanent injury. **The DFG - MAK** is the Republic of Germany's Maximum Exposure Level, similar to the U.S. PEL. **NIOSH** is the National Institute of Occupational Safety and Health, which is the research arm of the U.S. **O**ccupational **S**afety and **H**ealth **A**dministration (**OSHA**). NIOSH issues exposure guidelines called **R**ecommended **E**xposure **L**evels (**REL**s). When no exposure guidelines are established, an entry of **NE** is made for reference.

HAZARD RATINGS:

HAZARDOUS MATERIALS IDENTIFICATION SYSTEM: Health Hazard: **0** (minimal acute or chronic exposure hazard); **1** (slight acute or chronic exposure hazard); **2** (moderate acute or significant chronic exposure hazard); **3** (severe acute exposure hazard; onetime overexposure can result in permanent injury and may be fatal); **4** (extreme acute exposure hazard; onetime overexposure can be fatal). Flammability Hazard: **0** (minimal hazard); **1** (materials that require substantial pre-heating before burning); **2** (combustible liquid or solids; liquids with a flash point of 38-93°C [100-200°F]); **3** (Class IB and IC flammable liquids with flash points below 38°C [100°F]); **4** (Class IA flammable liquids with flash points below 23°C [73°F] and boiling points below 38°C [100°F]. Reactivity Hazard: **0** (normally stable); 1 (material that can become unstable at elevated temperatures or which can react slightly with water); **2** (materials that are unstable but do not detonate or which can react violently with water); **3** (materials that can detonate when initiated or which can react explosively with water); **4** (materials that can detonate at normal temperatures or pressures).

NATIONAL FIRE PROTECTION ASSOCIATION: Health Hazard: **0** (material that on exposure under fire conditions would offer no hazard beyond that of ordinary combustible materials); **1** (materials that on exposure under fire conditions could cause irritation or minor residual injury); **2** (materials that on intense or continued exposure under fire conditions could cause temporary incapacitation or possible residual injury); **3** (materials that can on short exposure could cause serious temporary or residual injury); **4** (materials that under very short exposure causes death or major residual injury).

NATIONAL FIRE PROTECTION ASSOCIATION (Continued): Flammability Hazard and Reactivity Hazard: Refer to definitions for "Hazardous Materials Identification System".

FLAMMABILITY LIMITS IN AIR:

Much of the information related to fire and explosion is derived from the National Fire Protection Association (**NFPA**). Flash Point - Minimum temperature at which a liquid gives off sufficient vapors to form an ignitable mixture with air. Autoignition Temperature: The minimum temperature required to initiate combustion in air with no other source of ignition. LEL - the lowest percent of vapor in air, by volume, that will explode or ignite in the presence of an ignition source. UEL - the highest percent of vapor in air, by volume, that will explode or ignite in the presence of an ignition source.

TOXICOLOGICAL INFORMATION:

Possible health hazards as derived from human data, animal studies, or from the results of studies with similar compounds are presented. Definitions of some terms used in this section are: **LD_{50}** - Lethal Dose (solids & liquids) which kills 50% of the exposed animals; **LC_{50}** - Lethal Concentration (gases) which kills 50% of the exposed animals; **ppm** concentration expressed in parts of material per million parts of air or water; **mg/m^3** concentration expressed in weight of substance per volume of air; **mg/kg** quantity of material, by weight, administered to a test subject, based on their body weight in kg. Data from several sources are used to evaluate the cancer-causing potential of the material. The sources are: **IARC** - the International Agency for Research on Cancer; **NTP** - the National Toxicology Program, **RTECS** - the Registry of Toxic Effects of Chemical Substances, **OSHA** and **CAL/OSHA**. IARC and NTP rate chemicals on a scale of decreasing potential to cause human cancer with rankings from 1 to 4. Subrankings (2A, 2B, etc.) are also used. Other measures of toxicity include **TDLo**, the lowest dose to cause a symptom and **TCLo** the lowest concentration to cause a symptom; **TDo**, **LDLo**, and **LDo**, or **TC**, **TCo**, **LCLo**, and **LCo**, the lowest dose (or concentration) to cause lethal or toxic effects. **BEI** - Biological Exposure Indices, represent the levels of determinants which are most likely to be observed in specimens collected from a healthy worker who has been exposed to chemicals to the same extent as a worker with inhalation exposure to the TLV. Ecological Information: EC is the effect concentration in water.

REGULATORY INFORMATION:

This section explains the impact of various laws and regulations on the material. **EPA** is the U.S. Environmental Protection Agency. **WHMIS** is the Canadian Workplace Hazardous Materials Information System. **DOT** and **TC** are the U.S. Department of Transportation and the Transport Canada, respectively. Superfund Amendments and Reauthorization Act **(SARA)**; the Canadian Domestic/Non-Domestic Substances List **(DSL/NDSL)**; the U.S. Toxic Substance Control Act **(TSCA)**; Marine Pollutant status according to the **DOT**; the Comprehensive Environmental Response, Compensation, and Liability Act **(CERCLA or Superfund)**; and various state regulations.

SAFETY DATA SHEET

Hydrogen Sulfide

Section 1. Identification

GHS product identifier : Hydrogen Sulfide

Chemical name : hydrogen sulfide

Other means of identification : Hydrogen sulfide; Hydrogen sulfide (H2S); Sulfuretted hydrogen; Sewer gas; Hydrosulfuric acid; dihydrogen sulfide

Product type : Gas.

Product use : Synthetic/Analytical chemistry.

Synonym : Hydrogen sulfide; Hydrogen sulfide (H2S); Sulfuretted hydrogen; Sewer gas; Hydrosulfuric acid; dihydrogen sulfide

SDS # : 001029

Supplier's details : Airgas USA, LLC and its affiliates
259 North Radnor-Chester Road
Suite 100
Radnor, PA 19087-5283
1-610-687-5253

24-hour telephone : 1-866-734-3438

Section 2. Hazards identification

OSHA/HCS status : This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).

Classification of the substance or mixture : FLAMMABLE GASES - Category 1
GASES UNDER PRESSURE - Liquefied gas
ACUTE TOXICITY (inhalation) - Category 2
SPECIFIC TARGET ORGAN TOXICITY (SINGLE EXPOSURE) (Respiratory tract irritation) - Category 3
AQUATIC HAZARD (ACUTE) - Category 1

GHS label elements

Hazard pictograms :

Signal word : Danger

Hazard statements : Extremely flammable gas.
May form explosive mixtures with air.
Contains gas under pressure; may explode if heated.
Fatal if inhaled.
May cause respiratory irritation.
Very toxic to aquatic life.
Extended exposure to gas reduces the ability to smell sulfides.

Precautionary statements

General : Read and follow all Safety Data Sheets (SDS'S) before use. Read label before use. Keep out of reach of children. If medical advice is needed, have product container or label at hand. Close valve after each use and when empty. Use equipment rated for cylinder pressure. Do not open valve until connected to equipment prepared for use. Use a back flow preventative device in the piping. Use only equipment of compatible materials of construction. Always keep container in upright position. Do not depend on odor to detect presence of gas. Approach suspected leak area with caution.

Prevention : Wear respiratory protection. Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. Use only outdoors or in a well-ventilated area. Avoid release to the environment. Do not breathe gas.

Section 2. Hazards identification

Response : Collect spillage. IF INHALED: Remove person to fresh air and keep comfortable for breathing. Immediately call a POISON CENTER or physician. Leaking gas fire: Do not extinguish, unless leak can be stopped safely. Eliminate all ignition sources if safe to do so.

Storage : Store locked up. Protect from sunlight. Store in a well-ventilated place.

Disposal : Dispose of contents and container in accordance with all local, regional, national and international regulations.

Hazards not otherwise classified : In addition to any other important health or physical hazards, this product may displace oxygen and cause rapid suffocation.

Section 3. Composition/information on ingredients

Substance/mixture : Substance

Chemical name : hydrogen sulfide

Other means of identification : Hydrogen sulfide; Hydrogen sulfide (H2S); Sulfuretted hydrogen; Sewer gas; Hydrosulfuric acid; dihydrogen sulfide

Product code : 001029

CAS number/other identifiers

CAS number : 7783-06-4

Ingredient name	%	CAS number
hydrogen sulfide	100	7783-06-4

Any concentration shown as a range is to protect confidentiality or is due to batch variation.

There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment and hence require reporting in this section.

Occupational exposure limits, if available, are listed in Section 8.

Section 4. First aid measures

Description of necessary first aid measures

Eye contact : Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Continue to rinse for at least 10 minutes. Get medical attention if irritation occurs.

Inhalation : Get medical attention immediately. Call a poison center or physician. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.

Skin contact : Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. To avoid the risk of static discharges and gas ignition, soak contaminated clothing thoroughly with water before removing it. Get medical attention if symptoms occur. Wash clothing before reuse. Clean shoes thoroughly before reuse.

Ingestion : As this product is a gas, refer to the inhalation section.

Most important symptoms/effects, acute and delayed

Potential acute health effects

Eye contact : No known significant effects or critical hazards.

Inhalation : Fatal if inhaled. May cause respiratory irritation.

Skin contact : No known significant effects or critical hazards.

Frostbite : Try to warm up the frozen tissues and seek medical attention.

Ingestion : As this product is a gas, refer to the inhalation section.

Section 4. First aid measures

Over-exposure signs/symptoms

Eye contact : No specific data.

Inhalation : Adverse symptoms may include the following:, respiratory tract irritation, coughing

Skin contact : No specific data.

Ingestion : No specific data.

Indication of immediate medical attention and special treatment needed, if necessary

Notes to physician : Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.

Specific treatments : No specific treatment.

Protection of first-aiders : No action shall be taken involving any personal risk or without suitable training. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation.

See toxicological information (Section 11)

Section 5. Fire-fighting measures

Extinguishing media

Suitable extinguishing media : Use an extinguishing agent suitable for the surrounding fire.

Unsuitable extinguishing media : None known.

Specific hazards arising from the chemical : Contains gas under pressure. Extremely flammable gas. In a fire or if heated, a pressure increase will occur and the container may burst, with the risk of a subsequent explosion. This material is very toxic to aquatic life. Fire water contaminated with this material must be contained and prevented from being discharged to any waterway, sewer or drain.

Hazardous thermal decomposition products : Decomposition products may include the following materials:
sulfur oxides

Special protective actions for fire-fighters : Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training. Contact supplier immediately for specialist advice. Move containers from fire area if this can be done without risk. Use water spray to keep fire-exposed containers cool. If involved in fire, shut off flow immediately if it can be done without risk. If this is impossible, withdraw from area and allow fire to burn. Fight fire from protected location or maximum possible distance. Eliminate all ignition sources if safe to do so.

Special protective equipment for fire-fighters : Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

Section 6. Accidental release measures

Personal precautions, protective equipment and emergency procedures

For non-emergency personnel : Accidental releases pose a serious fire or explosion hazard. No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Shut off all ignition sources. No flares, smoking or flames in hazard area. Do not breathe gas. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.

For emergency responders : If specialized clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".

Section 6. Accidental release measures

Environmental precautions : Ensure emergency procedures to deal with accidental gas releases are in place to avoid contamination of the environment. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air). Water polluting material. May be harmful to the environment if released in large quantities. Collect spillage.

Methods and materials for containment and cleaning up

Small spill : Immediately contact emergency personnel. Stop leak if without risk. Use spark-proof tools and explosion-proof equipment.

Large spill : Immediately contact emergency personnel. Stop leak if without risk. Use spark-proof tools and explosion-proof equipment. Note: see Section 1 for emergency contact information and Section 13 for waste disposal.

Section 7. Handling and storage

Precautions for safe handling

Protective measures : Put on appropriate personal protective equipment (see Section 8). Contains gas under pressure. Do not get in eyes or on skin or clothing. Use only with adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Do not enter storage areas and confined spaces unless adequately ventilated. Do not puncture or incinerate container. Use equipment rated for cylinder pressure. Close valve after each use and when empty. Protect cylinders from physical damage; do not drag, roll, slide, or drop. Use a suitable hand truck for cylinder movement.

Use only non-sparking tools. Avoid release to the environment. Empty containers retain product residue and can be hazardous. Store and use away from heat, sparks, open flame or any other ignition source. Use explosion-proof electrical (ventilating, lighting and material handling) equipment. Do not breathe gas.

Advice on general occupational hygiene : Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.

Conditions for safe storage, including any incompatibilities : Store in accordance with local regulations. Store in a segregated and approved area. Store away from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10). Eliminate all ignition sources. Cylinders should be stored upright, with valve protection cap in place, and firmly secured to prevent falling or being knocked over. Cylinder temperatures should not exceed 52 °C (125 °F). Store locked up. Keep container tightly closed and sealed until ready for use. See Section 10 for incompatible materials before handling or use.

Section 8. Exposure controls/personal protection

Control parameters

Occupational exposure limits

Ingredient name	Exposure limits
hydrogen sulfide	**ACGIH TLV (United States, 3/2017).** STEL: 5 ppm 15 minutes. TWA: 1 ppm 8 hours. **NIOSH REL (United States, 10/2016).** CEIL: 15 mg/m³ 10 minutes. CEIL: 10 ppm 10 minutes. **OSHA PEL 1989 (United States, 3/1989).** STEL: 21 mg/m³ 15 minutes. STEL: 15 ppm 15 minutes. TWA: 14 mg/m³ 8 hours. TWA: 10 ppm 8 hours. **OSHA PEL Z2 (United States, 2/2013).** AMP: 50 ppm 10 minutes. CEIL: 20 ppm

Section 8. Exposure controls/personal protection

Appropriate engineering controls : Use only with adequate ventilation. Use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits. The engineering controls also need to keep gas, vapor or dust concentrations below any lower explosive limits. Use explosion-proof ventilation equipment.

Environmental exposure controls : Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

Individual protection measures

Hygiene measures : Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

Eye/face protection : Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists, gases or dusts. If contact is possible, the following protection should be worn, unless the assessment indicates a higher degree of protection: safety glasses with side-shields.

Skin protection

Hand protection : Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary. Considering the parameters specified by the glove manufacturer, check during use that the gloves are still retaining their protective properties. It should be noted that the time to breakthrough for any glove material may be different for different glove manufacturers. In the case of mixtures, consisting of several substances, the protection time of the gloves cannot be accurately estimated.

Body protection : Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product. When there is a risk of ignition from static electricity, wear anti-static protective clothing. For the greatest protection from static discharges, clothing should include anti-static overalls, boots and gloves.

Other skin protection : Appropriate footwear and any additional skin protection measures should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

Respiratory protection : Based on the hazard and potential for exposure, select a respirator that meets the appropriate standard or certification. Respirators must be used according to a respiratory protection program to ensure proper fitting, training, and other important aspects of use. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.

Section 9. Physical and chemical properties

Appearance

Physical state : Gas. [Compressed gas.]

Color : Colorless.

Odor : Rotten eggs.

Odor threshold : Not available.

pH : Not available.

Melting point : -82°C (-115.6°F)

Boiling point : -60°C (-76°F)

Critical temperature : 100.5°C (212.9°F)

Flash point : Not available.

Evaporation rate : Not available.

Section 9. Physical and chemical properties

Flammability (solid, gas) : Not available.

Lower and upper explosive (flammable) limits : Lower: 4.3%
Upper: 45%

Vapor pressure : 252 (psig)

Vapor density : 1.19 (Air = 1)

Specific Volume (ft^3/lb) : 11.236

Gas Density (lb/ft^3) : 0.089

Relative density : Not applicable.

Solubility : Not available.

Solubility in water : 5 g/l

Partition coefficient: n-octanol/water : Not available.

Auto-ignition temperature : 270°C (518°F)

Decomposition temperature : Not available.

Viscosity : Not applicable.

Flow time (ISO 2431) : Not available.

Molecular weight : 34.08 g/mole

Section 10. Stability and reactivity

Reactivity : No specific test data related to reactivity available for this product or its ingredients.

Chemical stability : The product is stable.

Possibility of hazardous reactions : Under normal conditions of storage and use, hazardous reactions will not occur.

Conditions to avoid : Avoid all possible sources of ignition (spark or flame). Do not pressurize, cut, weld, braze, solder, drill, grind or expose containers to heat or sources of ignition.

Incompatible materials : Oxidizers

Hazardous decomposition products : Under normal conditions of storage and use, hazardous decomposition products should not be produced.

Hazardous polymerization : Under normal conditions of storage and use, hazardous polymerization will not occur.

Section 11. Toxicological information

Information on toxicological effects

Acute toxicity

Product/ingredient name	Result	Species	Dose	Exposure
hydrogen sulfide	LC50 Inhalation Gas.	Rat	712 ppm	1 hours

Irritation/Corrosion

Not available.

Sensitization

Not available.

Mutagenicity

Not available.

Section 11. Toxicological information

Carcinogenicity

Not available.

Reproductive toxicity

Not available.

Teratogenicity

Not available.

Specific target organ toxicity (single exposure)

Name	Category	Route of exposure	Target organs
hydrogen sulfide	Category 3	Not applicable.	Respiratory tract irritation

Specific target organ toxicity (repeated exposure)

Not available.

Aspiration hazard

Not available.

Information on the likely routes of exposure : Not available.

Potential acute health effects

Eye contact : No known significant effects or critical hazards.

Inhalation : Fatal if inhaled. May cause respiratory irritation.

Skin contact : No known significant effects or critical hazards.

Ingestion : As this product is a gas, refer to the inhalation section.

Symptoms related to the physical, chemical and toxicological characteristics

Eye contact : No specific data.

Inhalation : Adverse symptoms may include the following:, respiratory tract irritation, coughing

Skin contact : No specific data.

Ingestion : No specific data.

Delayed and immediate effects and also chronic effects from short and long term exposure

Short term exposure

Potential immediate effects : Not available.

Potential delayed effects : Not available.

Long term exposure

Potential immediate effects : Not available.

Potential delayed effects : Not available.

Potential chronic health effects

Not available.

General : No known significant effects or critical hazards.

Carcinogenicity : No known significant effects or critical hazards.

Mutagenicity : No known significant effects or critical hazards.

Teratogenicity : No known significant effects or critical hazards.

Developmental effects : No known significant effects or critical hazards.

Fertility effects : No known significant effects or critical hazards.

Section 11. Toxicological information

Numerical measures of toxicity

Acute toxicity estimates

Not available.

Other information : IDLH : 100 ppm

Section 12. Ecological information

Toxicity

Product/ingredient name	Result	Species	Exposure
hydrogen sulfide	Acute EC50 62 µg/l Fresh water Acute LC50 2 µg/l Fresh water	Crustaceans - Gammarus pseudolimnaeus Fish - Coregonus clupeaformis - Yolk-sac fry	2 days 96 hours

Persistence and degradability

Not available.

Bioaccumulative potential

Not available.

Mobility in soil

Soil/water partition coefficient (K_{OC}) : Not available.

Other adverse effects : No known significant effects or critical hazards.

Section 13. Disposal considerations

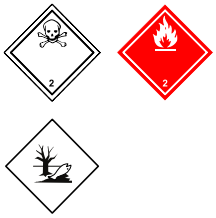
Disposal methods : The generation of waste should be avoided or minimized wherever possible. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Waste should not be disposed of untreated to the sewer unless fully compliant with the requirements of all authorities with jurisdiction. Empty Airgas-owned pressure vessels should be returned to Airgas. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible. This material and its container must be disposed of in a safe way. Empty containers or liners may retain some product residues. Do not puncture or incinerate container.

United States - RCRA Toxic hazardous waste "U" List

Ingredient	CAS #	Status	Reference number
Hydrogen sulfide; Hydrogen sulfide H2S	7783-06-4	Listed	U135

Section 14. Transport information

Section 14. Transport information

	DOT	TDG	Mexico	IMDG	IATA
UN number	UN1053	UN1053	UN1053	UN1053	UN1053
UN proper shipping name	HYDROGEN SULFIDE	HYDROGEN SULFIDE; OR HYDROGEN SULPHIDE	HYDROGEN SULFIDE	HYDROGEN SULPHIDE	HYDROGEN SULPHIDE
Transport hazard class(es)	2.3 (2.1) 	2.3 (2.1) 	2.3 (2.1) 	2.3 (2.1) 	2.3 (2.1) 
Packing group	-	-	-	-	-
Environmental hazards	No.	Yes.	Yes. The environmentally hazardous substance mark is not required.	Yes.	Yes. The environmentally hazardous substance mark is not required.

"Refer to CFR 49 (or authority having jurisdiction) to determine the information required for shipment of the product."

Additional information

DOT Classification : Toxic - Inhalation hazard Zone B
Reportable quantity 100 lbs / 45.4 kg. Package sizes shipped in quantities less than the product reportable quantity are not subject to the RQ (reportable quantity) transportation requirements.
Limited quantity Yes.
Quantity limitation Passenger aircraft/rail: Forbidden. Cargo aircraft: Forbidden.
Special provisions 2, B9, B14

TDG Classification : Product classified as per the following sections of the Transportation of Dangerous Goods Regulations: 2.13-2.17 (Class 2), 2.13-2.17 (Class 2), 2.7 (Marine pollutant mark).
The marine pollutant mark is not required when transported by road or rail.
Explosive Limit and Limited Quantity Index 0
ERAP Index 0
Passenger Carrying Ship Index Forbidden
Passenger Carrying Road or Rail Index Forbidden

IMDG : The marine pollutant mark is not required when transported in sizes of ≤5 L or ≤5 kg.

IATA : The environmentally hazardous substance mark may appear if required by other transportation regulations.
Quantity limitation Passenger and Cargo Aircraft: Forbidden. Cargo Aircraft Only: Forbidden.

Special precautions for user : **Transport within user's premises:** always transport in closed containers that are upright and secure. Ensure that persons transporting the product know what to do in the event of an accident or spillage.

Transport in bulk according to Annex II of MARPOL and the IBC Code : Not available.

Section 15. Regulatory information

U.S. Federal regulations : **TSCA 8(a) CDR Exempt/Partial exemption**: Not determined

Clean Water Act (CWA) 311: hydrogen sulfide

Clean Air Act (CAA) 112 regulated toxic substances: hydrogen sulfide

Clean Air Act Section 112 (b) Hazardous Air Pollutants (HAPs) : Listed

Clean Air Act Section 602 Class I Substances : Not listed

Clean Air Act Section 602 Class II Substances : Not listed

DEA List I Chemicals (Precursor Chemicals) : Not listed

DEA List II Chemicals (Essential Chemicals) : Not listed

SARA 302/304

Composition/information on ingredients

Name	%	EHS	SARA 302 TPQ		SARA 304 RQ	
			(lbs)	(gallons)	(lbs)	(gallons)
hydrogen sulfide	100	Yes.	500	-	100	-

SARA 304 RQ : 100 lbs / 45.4 kg

SARA 311/312

Classification : Refer to Section 2: Hazards Identification of this SDS for classification of substance.

SARA 313

	Product name	CAS number	%
Form R - Reporting requirements	hydrogen sulfide	7783-06-4	100
Supplier notification	hydrogen sulfide	7783-06-4	100

SARA 313 notifications must not be detached from the SDS and any copying and redistribution of the SDS shall include copying and redistribution of the notice attached to copies of the SDS subsequently redistributed.

State regulations

Massachusetts : This material is listed.

New York : This material is listed.

New Jersey : This material is listed.

Pennsylvania : This material is listed.

International regulations

Chemical Weapon Convention List Schedules I, II & III Chemicals

Not listed.

Montreal Protocol (Annexes A, B, C, E)

Not listed.

Stockholm Convention on Persistent Organic Pollutants

Not listed.

Rotterdam Convention on Prior Informed Consent (PIC)

Not listed.

UNECE Aarhus Protocol on POPs and Heavy Metals

Not listed.

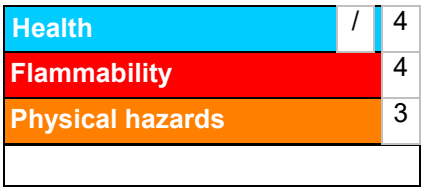
Section 15. Regulatory information

Inventory list

Australia	:	This material is listed or exempted.
Canada	:	This material is listed or exempted.
China	:	This material is listed or exempted.
Europe	:	This material is listed or exempted.
Japan	:	**Japan inventory (ENCS)**: This material is listed or exempted. **Japan inventory (ISHL)**: Not determined.
Malaysia	:	Not determined.
New Zealand	:	This material is listed or exempted.
Philippines	:	This material is listed or exempted.
Republic of Korea	:	This material is listed or exempted.
Taiwan	:	This material is listed or exempted.
Thailand	:	Not determined.
Turkey	:	Not determined.
United States	:	This material is listed or exempted.
Viet Nam	:	Not determined.

Section 16. Other information

Hazardous Material Information System (U.S.A.)



Caution: HMIS® ratings are based on a 0-4 rating scale, with 0 representing minimal hazards or risks, and 4 representing significant hazards or risks. Although HMIS® ratings and the associated label are not required on SDSs or products leaving a facility under 29 CFR 1910.1200, the preparer may choose to provide them. HMIS® ratings are to be used with a fully implemented HMIS® program. HMIS® is a registered trademark and service mark of the American Coatings Association, Inc.

The customer is responsible for determining the PPE code for this material. For more information on HMIS® Personal Protective Equipment (PPE) codes, consult the HMIS® Implementation Manual.

National Fire Protection Association (U.S.A.)

Reprinted with permission from NFPA 704-2001, Identification of the Hazards of Materials for Emergency Response Copyright ©1997, National Fire Protection Association, Quincy, MA 02269. This reprinted material is not the complete and official position of the National Fire Protection Association, on the referenced subject which is represented only by the standard in its entirety.

Copyright ©2001, National Fire Protection Association, Quincy, MA 02269. This warning system is intended to be interpreted and applied only by properly trained individuals to identify fire, health and reactivity hazards of chemicals. The user is referred to certain limited number of chemicals with recommended classifications in NFPA 49 and NFPA 325, which would be used as a guideline only. Whether the chemicals are classified by NFPA or not, anyone using the 704 systems to classify chemicals does so at their own risk.

Procedure used to derive the classification

Section 16. Other information

Classification	Justification
FLAMMABLE GASES - Category 1	Expert judgment
GASES UNDER PRESSURE - Liquefied gas	Expert judgment
ACUTE TOXICITY (inhalation) - Category 2	On basis of test data
SPECIFIC TARGET ORGAN TOXICITY (SINGLE EXPOSURE) (Respiratory tract irritation) - Category 3	Expert judgment
AQUATIC HAZARD (ACUTE) - Category 1	Expert judgment

History

Date of printing : 11/30/2017

Date of issue/Date of revision : 11/30/2017

Date of previous issue : 3/23/2017

Version : 1

Key to abbreviations : ATE = Acute Toxicity Estimate
BCF = Bioconcentration Factor
GHS = Globally Harmonized System of Classification and Labelling of Chemicals
IATA = International Air Transport Association
IBC = Intermediate Bulk Container
IMDG = International Maritime Dangerous Goods
LogPow = logarithm of the octanol/water partition coefficient
MARPOL = International Convention for the Prevention of Pollution From Ships, 1973 as modified by the Protocol of 1978. ("Marpol" = marine pollution)
UN = United Nations

References : Not available.

Indicates information that has changed from previously issued version.

Notice to reader

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.

SAFETY DATA SHEET

Carbon Dioxide

Section 1. Identification

GHS product identifier : Carbon Dioxide

Chemical name : Carbon dioxide, gas

Other means of identification : Carbonic, Carbon Dioxide, Carbonic Anhydride, R744, Carbon Dioxide USP

Product type : Gas.

Product use : Synthetic/Analytical chemistry and Medical use.

Synonym : Carbonic, Carbon Dioxide, Carbonic Anhydride, R744, Carbon Dioxide USP

SDS # : 001013

Supplier's details : Airgas USA, LLC and its affiliates
259 North Radnor-Chester Road
Suite 100
Radnor, PA 19087-5283
1-610-687-5253

24-hour telephone : 1-866-734-3438

Section 2. Hazards identification

OSHA/HCS status : This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).

Classification of the substance or mixture : GASES UNDER PRESSURE - Liquefied gas
Simple asphyxiant.

GHS label elements

Hazard pictograms :

Signal word : Warning

Hazard statements : Contains gas under pressure; may explode if heated.
May displace oxygen and cause rapid suffocation.
May increase respiration and heart rate.

Precautionary statements

General : Read and follow all Safety Data Sheets (SDS'S) before use. Read label before use. Keep out of reach of children. If medical advice is needed, have product container or label at hand. Close valve after each use and when empty. Use equipment rated for cylinder pressure. Do not open valve until connected to equipment prepared for use. Use a back flow preventative device in the piping. Use only equipment of compatible materials of construction. Always keep container in upright position.

Prevention : Use and store only outdoors or in a well ventilated place.

Response : Not applicable.

Storage : Protect from sunlight. Store in a well-ventilated place.

Disposal : Not applicable.

Hazards not otherwise classified : In addition to any other important health or physical hazards, this product may displace oxygen and cause rapid suffocation.
May cause frostbite.

Section 3. Composition/information on ingredients

Substance/mixture : Substance

Chemical name : Carbon dioxide, gas

Other means of identification : Carbonic, Carbon Dioxide, Carbonic Anhydride, R744, Carbon Dioxide USP

Product code : 001013

CAS number/other identifiers

CAS number : 124-38-9

Ingredient name	%	CAS number
Carbon Dioxide	100	124-38-9

Any concentration shown as a range is to protect confidentiality or is due to batch variation.

There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment and hence require reporting in this section.

Occupational exposure limits, if available, are listed in Section 8.

Section 4. First aid measures

Description of necessary first aid measures

Eye contact : Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Continue to rinse for at least 10 minutes. Get medical attention if irritation occurs.

Inhalation : Remove victim to fresh air and keep at rest in a position comfortable for breathing. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Get medical attention if adverse health effects persist or are severe. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.

Skin contact : Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Get medical attention if symptoms occur. Wash clothing before reuse. Clean shoes thoroughly before reuse.

Ingestion : As this product is a gas, refer to the inhalation section.

Most important symptoms/effects, acute and delayed

Potential acute health effects

Eye contact : No known significant effects or critical hazards.

Inhalation : No known significant effects or critical hazards.

Skin contact : No known significant effects or critical hazards.

Frostbite : Try to warm up the frozen tissues and seek medical attention.

Ingestion : As this product is a gas, refer to the inhalation section.

Over-exposure signs/symptoms

Eye contact : No specific data.

Inhalation : No specific data.

Skin contact : No specific data.

Ingestion : No specific data.

Indication of immediate medical attention and special treatment needed, if necessary

Notes to physician : Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.

Specific treatments : No specific treatment.

Section 4. First aid measures

Protection of first-aiders : No action shall be taken involving any personal risk or without suitable training. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation.

See toxicological information (Section 11)

Section 5. Fire-fighting measures

Extinguishing media

Suitable extinguishing media : Use an extinguishing agent suitable for the surrounding fire.

Unsuitable extinguishing media : None known.

Specific hazards arising from the chemical : Contains gas under pressure. In a fire or if heated, a pressure increase will occur and the container may burst or explode.

Hazardous thermal decomposition products : Decomposition products may include the following materials:
carbon dioxide
carbon monoxide

Special protective actions for fire-fighters : Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training. Contact supplier immediately for specialist advice. Move containers from fire area if this can be done without risk. Use water spray to keep fire-exposed containers cool.

Special protective equipment for fire-fighters : Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

Section 6. Accidental release measures

Personal precautions, protective equipment and emergency procedures

For non-emergency personnel : No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Avoid breathing gas. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.

For emergency responders : If specialized clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".

Environmental precautions : Ensure emergency procedures to deal with accidental gas releases are in place to avoid contamination of the environment. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).

Methods and materials for containment and cleaning up

Small spill : Immediately contact emergency personnel. Stop leak if without risk.

Large spill : Immediately contact emergency personnel. Stop leak if without risk. Note: see Section 1 for emergency contact information and Section 13 for waste disposal.

Section 7. Handling and storage

Precautions for safe handling

Protective measures : Put on appropriate personal protective equipment (see Section 8). Contains gas under pressure. Avoid breathing gas. Do not puncture or incinerate container. Use equipment rated for cylinder pressure. Close valve after each use and when empty. Protect cylinders from physical damage; do not drag, roll, slide, or drop. Use a suitable hand truck for cylinder movement.
Avoid contact with eyes, skin and clothing. Empty containers retain product residue and can be hazardous.

Section 7. Handling and storage

Advice on general occupational hygiene : Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.

Conditions for safe storage, including any incompatibilities : Store in accordance with local regulations. Store in a segregated and approved area. Store away from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10). Cylinders should be stored upright, with valve protection cap in place, and firmly secured to prevent falling or being knocked over. Cylinder temperatures should not exceed 52 °C (125 °F). Keep container tightly closed and sealed until ready for use. See Section 10 for incompatible materials before handling or use.

Section 8. Exposure controls/personal protection

Control parameters

Occupational exposure limits

Ingredient name	Exposure limits
Carbon Dioxide	**ACGIH TLV (United States, 3/2017). Oxygen Depletion [Asphyxiant].** STEL: 54000 mg/m³ 15 minutes. STEL: 30000 ppm 15 minutes. TWA: 9000 mg/m³ 8 hours. TWA: 5000 ppm 8 hours. **NIOSH REL (United States, 10/2016).** STEL: 54000 mg/m³ 15 minutes. STEL: 30000 ppm 15 minutes. TWA: 9000 mg/m³ 10 hours. TWA: 5000 ppm 10 hours. **OSHA PEL (United States, 6/2016).** TWA: 9000 mg/m³ 8 hours. TWA: 5000 ppm 8 hours. **OSHA PEL 1989 (United States, 3/1989).** STEL: 54000 mg/m³ 15 minutes. STEL: 30000 ppm 15 minutes. TWA: 18000 mg/m³ 8 hours. TWA: 10000 ppm 8 hours.

Appropriate engineering controls : Good general ventilation should be sufficient to control worker exposure to airborne contaminants.

Environmental exposure controls : Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

Individual protection measures

Hygiene measures : Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

Eye/face protection : Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists, gases or dusts. If contact is possible, the following protection should be worn, unless the assessment indicates a higher degree of protection: safety glasses with side-shields.

Skin protection

Section 8. Exposure controls/personal protection

Hand protection : Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary. Considering the parameters specified by the glove manufacturer, check during use that the gloves are still retaining their protective properties. It should be noted that the time to breakthrough for any glove material may be different for different glove manufacturers. In the case of mixtures, consisting of several substances, the protection time of the gloves cannot be accurately estimated.

Body protection : Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

Other skin protection : Appropriate footwear and any additional skin protection measures should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

Respiratory protection : Based on the hazard and potential for exposure, select a respirator that meets the appropriate standard or certification. Respirators must be used according to a respiratory protection program to ensure proper fitting, training, and other important aspects of use. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.

Section 9. Physical and chemical properties

Appearance

Physical state : Gas. [Compressed gas.]

Color : Colorless.

Odor : Odorless.

Odor threshold : Not available.

pH : Not available.

Melting point : Sublimation temperature: -79°C (-110.2 to °F)

Boiling point : Not available.

Critical temperature : 30.85°C (87.5°F)

Flash point : [Product does not sustain combustion.]

Evaporation rate : Not available.

Flammability (solid, gas) : Not available.

Lower and upper explosive (flammable) limits : Not available.

Vapor pressure : 830 (psig)

Vapor density : 1.53 (Air = 1) Liquid Density@BP: Solid density = 97.5 lb/ft3 (1562 kg/m3)

Specific Volume (ft^3/lb) : 8.7719

Gas Density (lb/ft^3) : 0.114

Relative density : Not applicable.

Solubility : Not available.

Solubility in water : Not available.

Partition coefficient: n-octanol/water : 0.83

Auto-ignition temperature : Not available.

Decomposition temperature : Not available.

Viscosity : Not applicable.

Flow time (ISO 2431) : Not available.

Molecular weight : 44.01 g/mole

Section 10. Stability and reactivity

Reactivity : No specific test data related to reactivity available for this product or its ingredients.

Chemical stability : The product is stable.

Possibility of hazardous reactions : Under normal conditions of storage and use, hazardous reactions will not occur.

Conditions to avoid : No specific data.

Incompatible materials : No specific data.

Hazardous decomposition products : Under normal conditions of storage and use, hazardous decomposition products should not be produced.

Hazardous polymerization : Under normal conditions of storage and use, hazardous polymerization will not occur.

Section 11. Toxicological information

Information on toxicological effects

Acute toxicity

Not available.

Irritation/Corrosion

Not available.

Sensitization

Not available.

Mutagenicity

Not available.

Carcinogenicity

Not available.

Reproductive toxicity

Not available.

Teratogenicity

Not available.

Specific target organ toxicity (single exposure)

Not available.

Specific target organ toxicity (repeated exposure)

Not available.

Aspiration hazard

Not available.

Information on the likely routes of exposure : Not available.

Potential acute health effects

Eye contact : No known significant effects or critical hazards.

Inhalation : No known significant effects or critical hazards.

Skin contact : No known significant effects or critical hazards.

Section 11. Toxicological information

Ingestion : As this product is a gas, refer to the inhalation section.

Symptoms related to the physical, chemical and toxicological characteristics

Eye contact : No specific data.

Inhalation : No specific data.

Skin contact : No specific data.

Ingestion : No specific data.

Delayed and immediate effects and also chronic effects from short and long term exposure

Short term exposure

Potential immediate effects : Not available.

Potential delayed effects : Not available.

Long term exposure

Potential immediate effects : Not available.

Potential delayed effects : Not available.

Potential chronic health effects

Not available.

General : No known significant effects or critical hazards.

Carcinogenicity : No known significant effects or critical hazards.

Mutagenicity : No known significant effects or critical hazards.

Teratogenicity : No known significant effects or critical hazards.

Developmental effects : No known significant effects or critical hazards.

Fertility effects : No known significant effects or critical hazards.

Numerical measures of toxicity

Acute toxicity estimates

Not available.

Section 12. Ecological information

Toxicity

Not available.

Persistence and degradability

Not available.

Bioaccumulative potential

Product/ingredient name	$LogP_{ow}$	BCF	Potential
Carbon Dioxide	0.83	-	low

Mobility in soil

Soil/water partition coefficient (K_{OC}) : Not available.

Other adverse effects : No known significant effects or critical hazards.

Section 13. Disposal considerations

Disposal methods : The generation of waste should be avoided or minimized wherever possible. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Waste should not be disposed of untreated to the sewer unless fully compliant with the requirements of all authorities with jurisdiction. Empty Airgas-owned pressure vessels should be returned to Airgas. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible. This material and its container must be disposed of in a safe way. Empty containers or liners may retain some product residues. Do not puncture or incinerate container.

Section 14. Transport information

	DOT	TDG	Mexico	IMDG	IATA
UN number	UN1013	UN1013	UN1013	UN1013	UN1013
UN proper shipping name	CARBON DIOXIDE	CARBON DIOXIDE	CARBON DIOXIDE	CARBON DIOXIDE	CARBON DIOXIDE
Transport hazard class(es)	2.2 	2.2 	2.2 	2.2 	2.2 
Packing group	-	-	-	-	-
Environmental hazards	No.	No.	No.	No.	No.

"Refer to CFR 49 (or authority having jurisdiction) to determine the information required for shipment of the product."

Additional information

DOT Classification : **Limited quantity** Yes.
Quantity limitation Passenger aircraft/rail: 75 kg. Cargo aircraft: 150 kg.

TDG Classification : Product classified as per the following sections of the Transportation of Dangerous Goods Regulations: 2.13-2.17 (Class 2).
Explosive Limit and Limited Quantity Index 0.125
Passenger Carrying Road or Rail Index 75

IATA : **Quantity limitation** Passenger and Cargo Aircraft: 75 kg. Cargo Aircraft Only: 150 kg.

Special precautions for user : **Transport within user's premises:** always transport in closed containers that are upright and secure. Ensure that persons transporting the product know what to do in the event of an accident or spillage.

Transport in bulk according to Annex II of MARPOL and the IBC Code : Not available.

Section 15. Regulatory information

U.S. Federal regulations : **TSCA 8(a) CDR Exempt/Partial exemption**: This material is listed or exempted.

Clean Air Act Section 112 (b) Hazardous Air Pollutants (HAPs) : Not listed

Section 15. Regulatory information

Clean Air Act Section 602 Class I Substances : Not listed

Clean Air Act Section 602 Class II Substances : Not listed

DEA List I Chemicals (Precursor Chemicals) : Not listed

DEA List II Chemicals (Essential Chemicals) : Not listed

SARA 302/304

Composition/information on ingredients

No products were found.

SARA 304 RQ : Not applicable.

SARA 311/312

Classification : Refer to Section 2: Hazards Identification of this SDS for classification of substance.

State regulations

Massachusetts : This material is listed.

New York : This material is not listed.

New Jersey : This material is listed.

Pennsylvania : This material is listed.

International regulations

Chemical Weapon Convention List Schedules I, II & III Chemicals

Not listed.

Montreal Protocol (Annexes A, B, C, E)

Not listed.

Stockholm Convention on Persistent Organic Pollutants

Not listed.

Rotterdam Convention on Prior Informed Consent (PIC)

Not listed.

UNECE Aarhus Protocol on POPs and Heavy Metals

Not listed.

Inventory list

Australia : This material is listed or exempted.

Canada : This material is listed or exempted.

China : This material is listed or exempted.

Europe : This material is listed or exempted.

Japan : **Japan inventory (ENCS)**: This material is listed or exempted.
Japan inventory (ISHL): This material is listed or exempted.

Malaysia : Not determined.

New Zealand : This material is listed or exempted.

Philippines : This material is listed or exempted.

Republic of Korea : This material is listed or exempted.

Taiwan : This material is listed or exempted.

Thailand : Not determined.

Turkey : This material is listed or exempted.

United States : This material is listed or exempted.

Viet Nam : Not determined.

Section 16. Other information

Hazardous Material Information System (U.S.A.)

Health	/	1
Flammability		0
Physical hazards		3

Caution: HMIS® ratings are based on a 0-4 rating scale, with 0 representing minimal hazards or risks, and 4 representing significant hazards or risks. Although HMIS® ratings and the associated label are not required on SDSs or products leaving a facility under 29 CFR 1910.1200, the preparer may choose to provide them. HMIS® ratings are to be used with a fully implemented HMIS® program. HMIS® is a registered trademark and service mark of the American Coatings Association, Inc.

The customer is responsible for determining the PPE code for this material. For more information on HMIS® Personal Protective Equipment (PPE) codes, consult the HMIS® Implementation Manual.

National Fire Protection Association (U.S.A.)

Reprinted with permission from NFPA 704-2001, Identification of the Hazards of Materials for Emergency Response Copyright ©1997, National Fire Protection Association, Quincy, MA 02269. This reprinted material is not the complete and official position of the National Fire Protection Association, on the referenced subject which is represented only by the standard in its entirety.

Copyright ©2001, National Fire Protection Association, Quincy, MA 02269. This warning system is intended to be interpreted and applied only by properly trained individuals to identify fire, health and reactivity hazards of chemicals. The user is referred to certain limited number of chemicals with recommended classifications in NFPA 49 and NFPA 325, which would be used as a guideline only. Whether the chemicals are classified by NFPA or not, anyone using the 704 systems to classify chemicals does so at their own risk.

Procedure used to derive the classification

Classification	Justification
GASES UNDER PRESSURE - Liquefied gas	Expert judgment

History

Date of printing : 2/12/2018

Date of issue/Date of revision : 2/12/2018

Date of previous issue : 4/25/2017

Version : 0.03

Key to abbreviations : ATE = Acute Toxicity Estimate
BCF = Bioconcentration Factor
GHS = Globally Harmonized System of Classification and Labelling of Chemicals
IATA = International Air Transport Association
IBC = Intermediate Bulk Container
IMDG = International Maritime Dangerous Goods
LogPow = logarithm of the octanol/water partition coefficient
MARPOL = International Convention for the Prevention of Pollution From Ships, 1973 as modified by the Protocol of 1978. ("Marpol" = marine pollution)
UN = United Nations

References : Not available.

Notice to reader

Section 16. Other information

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.

SAFETY DATA SHEET

Oxygen

Section 1. Identification

GHS product identifier : Oxygen

Chemical name : oxygen

Other means of identification : Molecular oxygen; Oxygen molecule; Pure oxygen; O2; UN 1072; Dioxygen; Oxygen USP, Aviator's Breathing Oxygen (ABO)

Product type : Gas.

Product use : Synthetic/Analytical chemistry.

Synonym : Molecular oxygen; Oxygen molecule; Pure oxygen; O2; UN 1072; Dioxygen; Oxygen USP, Aviator's Breathing Oxygen (ABO)

SDS # : 001043

Supplier's details : Airgas USA, LLC and its affiliates
259 North Radnor-Chester Road
Suite 100
Radnor, PA 19087-5283
1-610-687-5253

24-hour telephone : 1-866-734-3438

Section 2. Hazards identification

OSHA/HCS status : This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).

Classification of the substance or mixture : OXIDIZING GASES - Category 1
GASES UNDER PRESSURE - Compressed gas

GHS label elements

Hazard pictograms :

Signal word : Danger

Hazard statements : May cause or intensify fire; oxidizer.
Contains gas under pressure; may explode if heated.

Precautionary statements

General : Read and follow all Safety Data Sheets (SDS'S) before use. Read label before use. Keep out of reach of children. If medical advice is needed, have product container or label at hand. Close valve after each use and when empty. Use equipment rated for cylinder pressure. Do not open valve until connected to equipment prepared for use. Use a back flow preventative device in the piping. Use only equipment of compatible materials of construction. Open valve slowly. Use only with equipment cleaned for Oxygen service.

Prevention : Keep away from clothing, incompatible materials and combustible materials. Keep reduction valves, valves and fittings free from oil and grease.

Response : In case of fire: Stop leak if safe to do so.

Storage : Protect from sunlight. Store in a well-ventilated place.

Disposal : Not applicable.

Hazards not otherwise classified : None known.

Section 3. Composition/information on ingredients

Substance/mixture : Substance

Chemical name : oxygen

Other means of identification : Molecular oxygen; Oxygen molecule; Pure oxygen; O2; UN 1072; Dioxygen; Oxygen USP, Aviator's Breathing Oxygen (ABO)

Product code : 001043

CAS number/other identifiers

CAS number : 7782-44-7

Ingredient name	%	CAS number
oxygen	100	7782-44-7

Any concentration shown as a range is to protect confidentiality or is due to batch variation.

There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment and hence require reporting in this section.

Occupational exposure limits, if available, are listed in Section 8.

Section 4. First aid measures

Description of necessary first aid measures

Eye contact : Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Continue to rinse for at least 10 minutes. Get medical attention.

Inhalation : Remove victim to fresh air and keep at rest in a position comfortable for breathing. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Get medical attention if adverse health effects persist or are severe. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.

Skin contact : Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Get medical attention if symptoms occur. Wash clothing before reuse. Clean shoes thoroughly before reuse.

Ingestion : As this product is a gas, refer to the inhalation section.

Most important symptoms/effects, acute and delayed

Potential acute health effects

Eye contact : Contact with rapidly expanding gas may cause burns or frostbite.

Inhalation : No known significant effects or critical hazards.

Skin contact : Contact with rapidly expanding gas may cause burns or frostbite.

Frostbite : Try to warm up the frozen tissues and seek medical attention.

Ingestion : As this product is a gas, refer to the inhalation section.

Over-exposure signs/symptoms

Eye contact : No specific data.

Inhalation : No specific data.

Skin contact : No specific data.

Ingestion : No specific data.

Indication of immediate medical attention and special treatment needed, if necessary

Notes to physician : Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.

Specific treatments : No specific treatment.

Section 4. First aid measures

Protection of first-aiders : No action shall be taken involving any personal risk or without suitable training. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation.

See toxicological information (Section 11)

Section 5. Fire-fighting measures

Extinguishing media

Suitable extinguishing media : Use an extinguishing agent suitable for the surrounding fire.

Unsuitable extinguishing media : None known.

Specific hazards arising from the chemical : Contains gas under pressure. Oxidizing material. This material increases the risk of fire and may aid combustion. Contact with combustible material may cause fire. In a fire or if heated, a pressure increase will occur and the container may burst or explode.

Hazardous thermal decomposition products : No specific data.

Special protective actions for fire-fighters : Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training. Contact supplier immediately for specialist advice. Move containers from fire area if this can be done without risk. Use water spray to keep fire-exposed containers cool. If involved in fire, shut off flow immediately if it can be done without risk.

Special protective equipment for fire-fighters : Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

Section 6. Accidental release measures

Personal precautions, protective equipment and emergency procedures

For non-emergency personnel : No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Shut off all ignition sources. No flares, smoking or flames in hazard area. Avoid breathing gas. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.

For emergency responders : If specialized clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".

Environmental precautions : Ensure emergency procedures to deal with accidental gas releases are in place to avoid contamination of the environment. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).

Methods and materials for containment and cleaning up

Small spill : Immediately contact emergency personnel. Stop leak if without risk. Use spark-proof tools and explosion-proof equipment.

Large spill : Immediately contact emergency personnel. Stop leak if without risk. Use spark-proof tools and explosion-proof equipment. Note: see Section 1 for emergency contact information and Section 13 for waste disposal.

Section 7. Handling and storage

Precautions for safe handling

Section 7. Handling and storage

Protective measures : Put on appropriate personal protective equipment (see Section 8). Contains gas under pressure. Avoid breathing gas. Do not puncture or incinerate container. Use equipment rated for cylinder pressure. Close valve after each use and when empty. Protect cylinders from physical damage; do not drag, roll, slide, or drop. Use a suitable hand truck for cylinder movement.

Avoid contact with eyes, skin and clothing. Empty containers retain product residue and can be hazardous. Keep away from clothing, incompatible materials and combustible materials. Keep reduction valves free from grease and oil.

Advice on general occupational hygiene : Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.

Conditions for safe storage, including any incompatibilities : Store in accordance with local regulations. Store in a segregated and approved area. Store away from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10). Cylinders should be stored upright, with valve protection cap in place, and firmly secured to prevent falling or being knocked over. Cylinder temperatures should not exceed 52 °C (125 °F). Separate from reducing agents and combustible materials. Store away from grease and oil. Keep container tightly closed and sealed until ready for use. See Section 10 for incompatible materials before handling or use.

Section 8. Exposure controls/personal protection

Control parameters

Occupational exposure limits

Ingredient name	Exposure limits
oxygen	None.

Appropriate engineering controls : Good general ventilation should be sufficient to control worker exposure to airborne contaminants.

Environmental exposure controls : Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

Individual protection measures

Hygiene measures : Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

Eye/face protection : Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists, gases or dusts. If contact is possible, the following protection should be worn, unless the assessment indicates a higher degree of protection: safety glasses with side-shields.

Skin protection

Hand protection : Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary. Considering the parameters specified by the glove manufacturer, check during use that the gloves are still retaining their protective properties. It should be noted that the time to breakthrough for any glove material may be different for different glove manufacturers. In the case of mixtures, consisting of several substances, the protection time of the gloves cannot be accurately estimated.

Section 8. Exposure controls/personal protection

Body protection : Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

Other skin protection : Appropriate footwear and any additional skin protection measures should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

Respiratory protection : Based on the hazard and potential for exposure, select a respirator that meets the appropriate standard or certification. Respirators must be used according to a respiratory protection program to ensure proper fitting, training, and other important aspects of use. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.

Section 9. Physical and chemical properties

Appearance

Physical state : Gas. [Compressed gas.]

Color : Colorless. Blue.

Odor : Odorless.

Odor threshold : Not available.

pH : Not available.

Melting point : -218.4°C (-361.1°F)

Boiling point : -183°C (-297.4°F)

Critical temperature : -118.15°C (-180.7°F)

Flash point : [Product does not sustain combustion.]

Evaporation rate : Not available.

Flammability (solid, gas) : Extremely flammable in the presence of the following materials or conditions: reducing materials, combustible materials and organic materials.

Lower and upper explosive (flammable) limits : Not available.

Vapor pressure : Not available.

Vapor density : 1.1 (Air = 1)

Specific Volume (ft ^{3}/lb) : 12.0482

Gas Density (lb/ft ^{3}) : 0.083

Relative density : Not applicable.

Solubility : Not available.

Solubility in water : Not available.

Partition coefficient: n-octanol/water : 0.65

Auto-ignition temperature : Not available.

Decomposition temperature : Not available.

Viscosity : Not applicable.

Flow time (ISO 2431) : Not available.

Molecular weight : 32 g/mole

Section 10. Stability and reactivity

Reactivity : No specific test data related to reactivity available for this product or its ingredients.

Chemical stability : The product is stable.

Possibility of hazardous reactions : Hazardous reactions or instability may occur under certain conditions of storage or use.
Conditions may include the following:
contact with combustible materials
Reactions may include the following:
risk of causing fire

Section 10. Stability and reactivity

Conditions to avoid : No specific data.

Incompatible materials : Highly reactive or incompatible with the following materials:
combustible materials
reducing materials
grease
oil

Hazardous decomposition products : Under normal conditions of storage and use, hazardous decomposition products should not be produced.

Hazardous polymerization : Under normal conditions of storage and use, hazardous polymerization will not occur.

Section 11. Toxicological information

Information on toxicological effects

Acute toxicity
Not available.

Irritation/Corrosion
Not available.

Sensitization
Not available.

Mutagenicity
Not available.

Carcinogenicity
Not available.

Reproductive toxicity
Not available.

Teratogenicity
Not available.

Specific target organ toxicity (single exposure)
Not available.

Specific target organ toxicity (repeated exposure)
Not available.

Aspiration hazard
Not available.

Information on the likely routes of exposure : Not available.

Potential acute health effects

Eye contact : Contact with rapidly expanding gas may cause burns or frostbite.

Inhalation : No known significant effects or critical hazards.

Skin contact : Contact with rapidly expanding gas may cause burns or frostbite.

Ingestion : As this product is a gas, refer to the inhalation section.

Symptoms related to the physical, chemical and toxicological characteristics

Section 11. Toxicological information

Eye contact : No specific data.

Inhalation : No specific data.

Skin contact : No specific data.

Ingestion : No specific data.

Delayed and immediate effects and also chronic effects from short and long term exposure

Short term exposure

Potential immediate effects : Not available.

Potential delayed effects : Not available.

Long term exposure

Potential immediate effects : Not available.

Potential delayed effects : Not available.

Potential chronic health effects

Not available.

General : No known significant effects or critical hazards.

Carcinogenicity : No known significant effects or critical hazards.

Mutagenicity : No known significant effects or critical hazards.

Teratogenicity : No known significant effects or critical hazards.

Developmental effects : No known significant effects or critical hazards.

Fertility effects : No known significant effects or critical hazards.

Numerical measures of toxicity

Acute toxicity estimates

Not available.

Section 12. Ecological information

Toxicity

Not available.

Persistence and degradability

Not available.

Bioaccumulative potential

Product/ingredient name	$LogP_{ow}$	BCF	Potential
oxygen	0.65	-	low

Mobility in soil

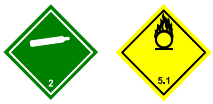
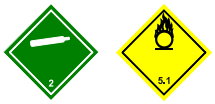
Soil/water partition coefficient (K_{OC}) : Not available.

Other adverse effects : No known significant effects or critical hazards.

Section 13. Disposal considerations

Disposal methods : The generation of waste should be avoided or minimized wherever possible. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Waste should not be disposed of untreated to the sewer unless fully compliant with the requirements of all authorities with jurisdiction. Empty Airgas-owned pressure vessels should be returned to Airgas. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible. This material and its container must be disposed of in a safe way. Empty containers or liners may retain some product residues. Do not puncture or incinerate container.

Section 14. Transport information

	DOT	TDG	Mexico	IMDG	IATA
UN number	UN1072	UN1072	UN1072	UN1072	UN1072
UN proper shipping name	OXYGEN, COMPRESSED	OXYGEN, COMPRESSED	OXYGEN, COMPRESSED	OXYGEN, COMPRESSED	OXYGEN, COMPRESSED
Transport hazard class(es)	2.2 (5.1) 	2.2 	2.2 (5.1) 	2.2 (5.1) 	2.2 (5.1) 
Packing group	-	-	-	-	-
Environmental hazards	No.	No.	No.	No.	No.

"Refer to CFR 49 (or authority having jurisdiction) to determine the information required for shipment of the product."

Additional information

DOT Classification : **Limited quantity** Yes.
Quantity limitation Passenger aircraft/rail: 75 kg. Cargo aircraft: 150 kg.
Special provisions A52

TDG Classification : Product classified as per the following sections of the Transportation of Dangerous Goods Regulations: 2.13-2.17 (Class 2), 2.23-2.25 (Class 5).
Explosive Limit and Limited Quantity Index 0.125
ERAP Index 3000
Passenger Carrying Ship Index 50
Passenger Carrying Road or Rail Index 75
Special provisions 42

IATA : **Quantity limitation** Passenger and Cargo Aircraft: 75 kg. Cargo Aircraft Only: 150 kg.

Special precautions for user : **Transport within user's premises:** always transport in closed containers that are upright and secure. Ensure that persons transporting the product know what to do in the event of an accident or spillage.

Transport in bulk according to Annex II of MARPOL and the IBC Code : Not available.

Section 15. Regulatory information

U.S. Federal regulations : **TSCA 8(a) CDR Exempt/Partial exemption**: This material is listed or exempted.

Clean Air Act Section 112 (b) Hazardous Air Pollutants (HAPs) : Not listed

Clean Air Act Section 602 Class I Substances : Not listed

Clean Air Act Section 602 Class II Substances : Not listed

DEA List I Chemicals (Precursor Chemicals) : Not listed

DEA List II Chemicals (Essential Chemicals) : Not listed

SARA 302/304

Composition/information on ingredients

No products were found.

SARA 304 RQ : Not applicable.

SARA 311/312

Classification : Refer to Section 2: Hazards Identification of this SDS for classification of substance.

State regulations

Massachusetts : This material is listed.

New York : This material is not listed.

New Jersey : This material is listed.

Pennsylvania : This material is listed.

International regulations

Chemical Weapon Convention List Schedules I, II & III Chemicals

Not listed.

Montreal Protocol (Annexes A, B, C, E)

Not listed.

Stockholm Convention on Persistent Organic Pollutants

Not listed.

Rotterdam Convention on Prior Informed Consent (PIC)

Not listed.

UNECE Aarhus Protocol on POPs and Heavy Metals

Not listed.

Inventory list

Australia : This material is listed or exempted.

Canada : This material is listed or exempted.

China : This material is listed or exempted.

Europe : This material is listed or exempted.

Japan : **Japan inventory (ENCS)**: Not determined.
Japan inventory (ISHL): Not determined.

Malaysia : Not determined.

New Zealand : This material is listed or exempted.

Philippines : This material is listed or exempted.

Republic of Korea : This material is listed or exempted.

Section 15. Regulatory information

Taiwan : This material is listed or exempted.

Thailand : Not determined.

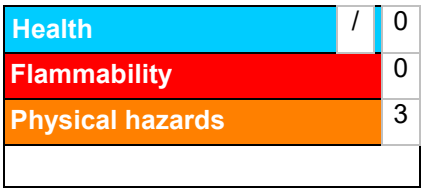
Turkey : Not determined.

United States : This material is listed or exempted.

Viet Nam : Not determined.

Section 16. Other information

Hazardous Material Information System (U.S.A.)



Caution: HMIS® ratings are based on a 0-4 rating scale, with 0 representing minimal hazards or risks, and 4 representing significant hazards or risks. Although HMIS® ratings and the associated label are not required on SDSs or products leaving a facility under 29 CFR 1910.1200, the preparer may choose to provide them. HMIS® ratings are to be used with a fully implemented HMIS® program. HMIS® is a registered trademark and service mark of the American Coatings Association, Inc.

The customer is responsible for determining the PPE code for this material. For more information on HMIS® Personal Protective Equipment (PPE) codes, consult the HMIS® Implementation Manual.

National Fire Protection Association (U.S.A.)

Reprinted with permission from NFPA 704-2001, Identification of the Hazards of Materials for Emergency Response Copyright ©1997, National Fire Protection Association, Quincy, MA 02269. This reprinted material is not the complete and official position of the National Fire Protection Association, on the referenced subject which is represented only by the standard in its entirety.

Copyright ©2001, National Fire Protection Association, Quincy, MA 02269. This warning system is intended to be interpreted and applied only by properly trained individuals to identify fire, health and reactivity hazards of chemicals. The user is referred to certain limited number of chemicals with recommended classifications in NFPA 49 and NFPA 325, which would be used as a guideline only. Whether the chemicals are classified by NFPA or not, anyone using the 704 systems to classify chemicals does so at their own risk.

Procedure used to derive the classification

Classification	Justification
OXIDIZING GASES - Category 1 GASES UNDER PRESSURE - Compressed gas	Expert judgment According to package

History

Date of printing : 2/3/2018

Date of issue/Date of revision : 2/3/2018

Date of previous issue : 1/27/2017

Version : 0.03

Key to abbreviations : ATE = Acute Toxicity Estimate
BCF = Bioconcentration Factor
GHS = Globally Harmonized System of Classification and Labelling of Chemicals
IATA = International Air Transport Association
IBC = Intermediate Bulk Container
IMDG = International Maritime Dangerous Goods
LogPow = logarithm of the octanol/water partition coefficient
MARPOL = International Convention for the Prevention of Pollution From Ships, 1973

Section 16. Other information

as modified by the Protocol of 1978. ("Marpol" = marine pollution)
UN = United Nations

References : Not available.

Indicates information that has changed from previously issued version.

Notice to reader

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.

MSDS SUMMARY SHEET

Manufacturer:
Name: PHILLIPS PETROLEUM COMPANY
Address 1:
Address 2:
Address 3:
CSZ: BARTLESVILLE **State:** OK **Zipcode:** 74004
Emergency phone: (800) 424-9300
Business phone: 800-762-0942

Product:

Ferndale MSDS#: 1354 **Version # :** 6
Manufacturer MSDS#: 0041
Current? : 2002
Name:

NO. 2 DIESEL FUEL

Synonyms:

CARB **Diesel** TF3
CARB **Diesel**
CARB **Diesel** 10%
Diesel Fuel Oil
EPA Low Sulfur **Diesel** Fuel
EPA Low Sulfur **Diesel** Fuel – Dyed
EPA Off Road High Sulfur **Diesel –** Dyed
Fuel Oil No. 2 – CAS # 68476-30-2
No. 2 **Diesel** Fuel Oil
No. 2 Fuel Oil – Non Hiway – Dyed
No. 2 High Sulfur **Diesel** – Dyed
No. 2 Low Sulfur **Diesel** - Dyed
No. 2 Low Sulfur **Diesel** - Undyed
Crude column 3rd IR
Crude column 3rd side cut
Atmospheric tower 3rd side cut
Ultra Low Sulfur **Diesel** No. 2
Finished **Diesel**
DHT Reactor Feed
Straight Run **Diesel**
Diesel
Middle Distillate

Product/Catalog Numbers:
MSDS Date: 01/01/2002 **(received:** 01/14/2002**)**

NFPA codes:
Health: 0 **Flammability:** 2 **Reactivity:** 0

MATERIAL SAFETY DATA SHEET
No. 2 Diesel Fuel

1. PRODUCT AND COMPANY IDENTIFICATION

Product Name: No. 2 Diesel Fuel
Product Code: Multiple
SAP Code:
Synonyms: 1354
CARB Diesel TF3
CARB Diesel
CARB Diesel 10%
Diesel Fuel Oil
EPA Low Sulfur Diesel Fuel
EPA Low Sulfur Diesel Fuel – Dyed
EPA Off Road High Sulfur Diesel – Dyed
Fuel Oil No. 2 – CAS # 68476-30-2
No. 2 Diesel Fuel Oil
No. 2 Fuel Oil – Non Hiway – Dyed
No. 2 High Sulfur Diesel – Dyed
No. 2 Low Sulfur Diesel - Dyed
No. 2 Low Sulfur Diesel – Undyed
No. 2 Ultra Low Sulfur Diesel – Dyed
No. 2 Ultra Low Sulfur Diesel - Undyed
Intended Use: Fuel
Chemical Family:
Responsible Party: Phillip's Petroleum Company
Bartlesville, Oklahoma 74004
For Additional MSDSs: 800-762-0942
Technical Information:

The intended use of this product is indicated above. If any additional use is known, please contact us at the Technical Information number listed.

EMERGENCY OVERVIEW

24 Hour Emergency Telephone Numbers:
Spill, Leak, Fire or Accident
Call CHEMTREC
North America: (800) 424-9300
Others: (703) 527-3887 (collect)

California Poison Control System: 800-356-3120

Health Hazards/Precautionary Measures: Causes severe skin irritation. Aspiration hazard if swallowed. Can enter lungs and cause damage. Use with adequate ventilation. Avoid contact with eyes, skin and clothing. Do not taste or swallow. Wash thoroughly after handling.

Physical Hazards/Precautionary Measures: Flammable liquid and vapor. Keep away from heat, sparks, flames, static electricity or other sources of ignition.

Appearance: Straw-colored to dyed red
Physical Form: Liquid
Odor: Characteristic petroleum

HFPA Hazard Class:
Health: 0 (Least)
Flammability: 2 (Moderate)
Reactivity: 0 (Least)

HMIS Hazard Class
Not Evaluated

2. COMPOSITION/INFORMATION ON INGREDIENTS

HAZARDOUS COMPONENTS	% VOLUME	EXPOSURE GUIDELINE		
		Limits	Agency	Type
Diesel Fuel No. 2 CAS# 68476-34-6	100	100* mg/m3	ACGIH	TWA-SKIN
Naphthalene CAS# 91-20-3	<1	10ppm	ACGIH	TWA
		15ppm	ACGIH	STEL
		10ppm	OSHA	TWA
		250ppm	NIOSH	IDLH

All components are listed on the TSCA inventory

Tosco Low Sulfur No. 2 Diesel meets the specifications of 40 CFR 60.41 for low sulfur diesel fuel.

Note: State, local or other agencies or advisory groups may have established more stringent limits. Consult an industrial hygienist or similar professional, or your local agencies, for further information.

*Proposed ACGIH (1999)

3. HAZARDS IDENTIFICATION

Potential Health Effects:

Eye: Contact may cause mild eye irritation including stinging, watering, and redness.

Skin: Severe skin irritant. Contact may cause redness, itching, burning, and severe skin damage. Prolonged or repeated contact can worsen irritation by causing drying and cracking of the skin, leading to dermatitis (inflammation). Not actually toxic by skin absorption, but prolonged or repeated skin contact may be harmful (see Section 11).

Inhalation (Breathing): No information available. Studies by other exposure routes suggest a low degree of toxicity by inhalation.

Ingestion (Swallowing): Low degree of toxicity by ingestion. ASPIRATION HAZARD – This material can enter lungs during swallowing or vomiting and cause lung inflammation and damage.

Signs and Symptoms: Effects of overexposure may include irritation of the nose and throat, irritation of the digestive tract, nausea, diarrhea and transient excitation followed by signs of nervous system depression (e.g., headache, drowsiness, dizziness, loss of coordination, disorientation and fatigue).

Cancer: Possible skin cancer hazard (see Sections 11 and 14).

Target Organs: There is limited evidence from animal studies that overexposure may cause injury to the kidney (see Section 11).

Developmental: Inadequate data available for this material.

Pre-Existing Medical Conditions: Conditions aggravated by exposure may include skin disorders and kidney disorders.

4. FIRST AID MEASURES

Eye: If irritation or redness develops, move victim away from exposure and into fresh air. Flush eyes with clean water. If symptoms persist, seek medical attention.

Skin: Immediately remove contaminated shoes, clothing, and constrictive jewelry and flush affected area(s) with large amounts of water. If skin surface is damaged, apply a clean dressing and seek immediate medical attention. If skin surface is not damaged, cleanse affected area(s) thoroughly by washing with mild soap and water. If irritation or redness develops, seek immediate medical attention.

Inhalation (Breathing): If respiratory symptoms develop, move victim away from source of exposure and into fresh air. If symptoms persist, seek medical attention. If victim is not breathing, clear airway and immediately begin artificial respiration. If breathing difficulties develop, oxygen should be administered by qualified personnel. Seek immediate medical attention.

Ingestion (Swallowing): Aspiration hazard; Do not induce vomiting or give anything by mouth because this material can enter the lungs and cause severe lung damage. If victim is drowsy or unconscious and vomiting, place on the left side with the head down. If possible, do not leave victim unattended and observe closely for adequacy of breathing. Seek medical attention.

5. FIRE FIGHTING MEASURES

Flammable Properties:

Flash Point: >125°F/>52°
OSHA Flammability Class: Combustible liquid
LEL %: 0.3 / UEL %; 10.0
Autoignition Temperature: 500°F/260°C

Unusual Fire & Explosion Hazards: This material is flammable and can be ignited by heat, sparks, flames, or other sources of ignition (e.g., static electricity, pilot lights, or mechanical/electrical equipment, and electronic devices such as cell phones, computers, calculators, and pagers which have not been certified as intrinsically safe). Vapors may travel considerable distances to a source of ignition where they can ignite, flash back, or explode. May create vapor/air explosion hazard indoors, in confined spaces, outdoors, or in sewers. Vapors are heavier than air and can accumulate in low areas. If container is not properly cooled, it can rupture in the heat of a fire.

Extinguishing Media: Dry chemical, carbon dioxide, or foam is recommended. Water spray is recommended to cool or protect exposed materials or structures. Carbon dioxide can displace oxygen. Use caution when applying carbon dioxide in confined spaces. Water may be ineffective for extinguishment, unless used under favorable conditions by experienced fire fighters.

Fire Fighting Instructions: For fires beyond the incipient stage, emergency responders in the immediate hazard area should wear bunker gear. When the potential chemical hazard is unknown, in enclosed or confined spaces, or when explicitly required by DOT, a self contained breathing apparatus should be worn. In addition, wear other appropriate protective equipment as conditions warrant (see Section 8).

Isolate immediate hazard area, keep unauthorized personnel out. Stop spill/release if it can be done with minimal risk. Move undamaged containers from immediate hazard area if it can be done with minimal risk.

Water spray may be useful in minimizing or dispersing vapors and to protect personnel. Cool equipment exposed to fire with water, if it can be done with minimal risk. Avoid spreading burning liquid with water used for cooling purposes.

6. ACCIDENTAL RELEASE MEASURES

Flammable. Keep all sources of ignition and hot metal surfaces away from spill/release. The use of explosion-proof equipment is recommended.

Stay upwind and away from spill/release. Notify persons down wind of the spill/release, isolate immediate hazard area and keep unauthorized personnel out. Stop spill/release if it can be done with minimal risk. Wear appropriate protective equipment including respiratory protection as conditions warrant (see Section 8).

Prevent spilled material from entering sewers, storm drains, other unauthorized drainage systems, and natural waterways. Dike far ahead of spill for later recovery or disposal. Use foam on spills to minimize vapors (see Section 5). Spilled material may be absorbed into an appropriate material.

Notify fire authorities and appropriate federal, state, and local agencies. Immediate cleanup of any spill is recommended. If spill of any amount is made into or upon navigable waters, the contiguous zone, or adjoining shorelines, notify the National Response Center (phone number 800-424-8802).

7. HANDLING AND STORAGE

Handling: Open container slowly to relieve any pressure. Bond and ground all equipment when transferring from one vessel to another. Can accumulate static charge by flow or agitation. Can be ignited by static discharged. The use of explosion-proof equipment is recommended and may be required (see appropriate fire codes). Refer to NFPA-704 and/or API RP 2003 for specific bonding/grounding requirements.

Do not enter confined spaces such as tanks or pits without following proper entry procedures such ASTM D-4276 and 29CFR 1910.146. The use of appropriate respiratory protection is advised when concentrations exceed any established exposure limits (see Sections 2 and 8).

Do not wear contaminated clothing or shoes. Keep contaminated clothing away from sources of ignition such as sparks or open flames. Use good personal hygiene practices.

High pressure injection of hydrocarbon fuels, hydraulic oils or greases under the skin may have serious consequences even though no symptoms or injury may be apparent. This can happen accidentally when using high pressure equipment such as high pressure grease guns, fuel injection apparatus or from pinhole leaks in tubing or high pressure hydraulic oil equipment.

“Empty” containers retain residue and may be dangerous. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose such containers to heat, flame, sparks, or other sources of ignition. They may explode and cause injury or death. “Empty” drums should be completely drained, properly bunged, and promptly shipped to the supplier or a drum reconditioner. All containers should be disposed of in an environmentally safe manner and in accordance with governmental regulations.

Before working on or in tanks which contain or have contained this material, refer to OSHA regulations, ANSIZ49.1 and other references pertaining to cleaning, repairing, welding, or other contemplated operations.

Storage: Keep container(s) tightly closed. Use and store this material in cool, dry, well-ventilated areas away from heat, direct sunlight, hot metal surfaces, and all sources of ignition. Post area “No Smoking or Open Flame.” Store only in approved containers. Keep away from incompatible material (see Section 10). Protect container(s) against physical damage. Outdoor or detached storage is preferred. Indoor storage should meet OSHA standards and appropriate fire codes.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Engineering controls: If current ventilation practices are not adequate to maintain airborne concentration below the established exposure limits (see Section 2), additional ventilation or exhaust systems may be required. Where explosive mixtures may be present, electrical systems safe for such locations must be used (see appropriate electrical codes).

Personal Protective Equipment (PPE):

Respiratory: A NIOSH certified air purifying respirator with an organic vapor cartridge maybe used under conditions where airborne concentrations are expected to exceed exposure limits (see Section 2).

Protection provided by air purifying respirators is limited (see manufacturer's respirator selection guide). Use a positive pressure air supplied respirator if there is a potential for an uncontrolled release, exposure levels are not known, or any other circumstances where air purifying respirators may not provide adequate protection.

A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements must be followed whenever workplace conditions warrants a respirator's use.

Skin: The use of gloves impervious to the specific material handled is advised to prevent skin contact, possible irritation and skin damage (see glove manufacturer literature for information on permeability). Depending on conditions of use, apron and/or arm covers may be necessary.

Eyes/Face: Approved eye protection to safeguard against potential eye contact, irritation, or injury is recommended. Depending on conditions of use, a face shield may be necessary.

Other Protective Equipment: Eye wash and quick-drench shower facilities should be available in the work area. Thoroughly clean shoes and wash contaminated clothing before reuse. It is recommended that impervious clothing be worn when skin contact is possible.

9. PHYSICAL AND CHEMICAL PROPERTIES

Note: Unless otherwise stated, values are determined at 20°C (68°F) and 760 mm Hg (1atm).

Appearance: Straw-colored to dyed red
Physical State: Liquid
Odor: Characteristic petroleum
pH: unavailable
Vapor Pressure (mm Hg): 0.40
Vapor Densisty (air=1):>3
Boiling Point/Range: 320-700°F /160-371°C
Freezing/Melting Point: No Data
Solubility in Water: Negligible
Specific Gravity: 0.81-0.88 @ 60°F
Percent Volatile: Negligible
Evaporation Rate (nBuAc=1): <1
Viscosity: 32.6-40.0 SUS @ 100°F
Bulk Density: 7.08 lbs/gal
Flash Point: >125°F / >52°C
Flammable/Expolsive Limits (%): LEL: 0.3 / UEL: 10.0

10. STABILITY AND REACTIVITY

Stability: Stable under normal ambient and anticipated storage and handling conditions of temperature and pressure. Flammable liquid and vapor. Vapor can cause flash fire.

Conditions To Avoid: Avoid all possible sources of ignition (see Sections 5 and 7).

Materials to Avoid (Incompatible Materials): Avoid contact with strong oxidants such as liquid chlorine, concentrated oxygen, sodium hypochlorite, calcium hypochlorite, etc.

Hazardous Decomposition Products: The use of hydrocarbon fuels in an area without adequate ventilation may result in hazardous levels of combustion products (e.g., oxides of carbon, sulfur and nitrogen, benzene and other hydrocarbons) and/or dangerously low oxygen levels. ACGIH has included a TLV of 0.05 mg/m3 TWA for diesel exhaust particulate on its 1999 Notice of Intended Changes. See Section 11 for additional information on hazards of engine exhaust.

Hazardous Polymerization: Will not occur.

11. TOXICOLOGICAL INFORMATION

Diesel Fuel No. 2 (CAS# 68476-34-6)

Carcinogenicity: Chronic dermal application of certain middle distillate streams contained in diesel fuel No. 2 resulted in an increased incidence of skin tumors in mice. This material has not been identified as carcinogen by NTP, IARC, or OSHA. Diesel exhaust is a probable cancer hazard based on tests with laboratory animals.

Target Organ(s): Limited evidence of renal impairment has been noted from a few case reports involving excessive exposure to diesel fuel No. 2.

Naphthalene (CAS# 91-20-3)

Carcinogenicity: Naphthalene has been evaluated in two year inhalation studies in both rats and mice. The National Toxicology Program (NTP) concluded that there is clear evidence of carcinogenicity in male and female rats based on increased incidences of respiratory epithelial adenomas and olfactory epithelial neuroblastomas of the nose. NTP found some evidence of carcinogenicity in female mice (alveolar adenomas) and no evidence of carcinogenicity in male mice. Naphthalene has not been identified as a carcinogen by IARC or OSHA.

12. ECOLOGICAL INFORMATION

Not evaluated at this time

13. DISPOSAL CONSIDERATIONS

This material, if discarded as produced, would be a RCRA “characteristic” hazardous waste due to the characteristic(s) of ignitability (D001) and benzene (D018). If the material is spilled to soil or water, characteristic testing of the contaminated materials is recommended. Further, this material, once it becomes a waste, is subject to the land disposal restrictions in 40 CFR 268.40 and may require treatment prior to disposal to meet specific standards. Consult state and local regulations to determine whether they are more stringent then the federal requirements.

Container contents should be completely used and containers should be emptied prior to discard. Container ?insate? could be considered a RCRA hazardous waste and must be disposed of with care and in compliance with federal, state and local regulations. Large empty containers, such as drums, should be returned to the distributor or to a drum reconditioner. To assure proper disposal of smaller containers, consult with state and local regulations and disposal authorities.

14. TRANSPORT INFORMATION

DOT Shipping Description: Diesel Fuel, NA1983
Non-Bulk Package Marking: Diesel Fuel, 3, NA 1993, III

15. REGULATORY INFORMATION

EPA SARA 311/312 (Title III Hazard Categories):

Acute Health:	Yes
Chronic Health:	Yes
Fire Hazard:	Yes
Pressure Hazard:	No
Reactive Hazard:	No

SARA 313 and 40 CFR 372:

This material contains the following chemicals subject to the reporting requirements of SARA 313 and 40 CFR 372:

Component	CAS Number	Weight %
-- None known --		

California Proposition 65:

Warning: This material contains the following chemicals which are known to the state of California to cause cancer, birth defects or other reproductive harm, and are subject to the requirements of California Proposition 65 (CA Health & Safety Code Section 25249.5):

Component	Effect
Benzene	Cancer, Developmental and Reproductive Toxicant
Toluene	Developmental Toxicant

Diesel engine exhaust, while not a component of this material, is on the Proposition 65 list of chemicals known to the State of California to cause cancer.

Carcinogen Identification:

This material has not been identified as a carcinogen by NTP, IARC, or OSHA. See Section 11 for carcinogenicity information of individual components, if any. Diesel exhaust is a probable cancer hazard based on tests in laboratory animals. It has been identified as carcinogen by IARC.

EPA (CERCLA Reportable Quantity: None

16. OTHER INFORMATION

Issue Date: 01/01/02
Previous Issue Date: 05/15/01
Product Code: Multiple
Revised Sections: None
Previous Product Code: Multiple
MSDS Number: 0041

Disclaimer of Expressed and Implied Warranties:

The information presented in this Material Data Safety Sheet is based on data believed to be accurate as of the date this Material Data Sheet was prepared. HOWEVER, NO WARRANTY OF MERCHANTABILITY, FITNESS FOR ANY PARTICULAR PURPOSE, OR ANY OTHER WARRANTY IS EXPRESSED OR IS TO BE IMPLIED REGARDING THE ACCURACY OR COMPLETENESS OF THE INFORMATION PROVIDED ABOVE, THE RESULTS TO BE OBTAINED FROM THE USE OF THIS INFORMATION OR THE PRODUCT, THE SAFETY OF THE PRODUCT, OR THE HAZARDS RELATED TO ITS USE. No responsibility is assumed for any damage or injury resulting from abnormal use or from any failure to adhere to recommended practices. The information provided above, and the product, are furnished on the condition that the person receiving them shall make their own determination as to the suitability of the product for their particular purpose and on the condition that they assume the risk of their use. In addition, no authorization is given nor implied to practice any patented invention without a license.

Tosco Refining Company ***Ferndale Refinery***

UltraLow Sulfur Diesel Product Specification

Ferndale Product Code:34380xx (5) Product Code: ULSD2

(COMETS)

Specification	Unit	Limit	Test Procedure	Typical
Appearance				
Water & Sediment	Vol %	0.05 Max	D 2709	
Color	Number	3.0 Max	D 1500	
Haze Rating	Rating	2 Max	D 4176	
Composition				
Carbon Residue (Ramsbottom)	Wt %	0.35 Max	D 524, D 189	
Volatility				
90% Recovered	Deg; F	540 Min	D 86	
	Deg; F	640 Min	D 86	
Flash Point	Deg; F	125 Min (1)	D 93	130 F
Gravity	API	30 Min	D 287, D4052	
Fluidity				
Pour Point	Deg; F	See Season Table (6)	D 97	
Cloud Point	Deg; F	See Season Table (6)	D 2500	10 F
Viscosity @ 104F	cSt	1.9 Min	D 445	
	cSt	4.1 Max	D 445	
Lubricity, SLBOCLE	grams	3100 Min	D 6078	3300gm
Lubricity, HFRR	mm	.45	D 6079	
Combustion				
Cetane Index or Cetane Number (3,4)	Number	40.0 Min	D 976, D613	47.0
Corrosion				
Copper Strip, 3hr @ 50 deg C	Number	3 Max (2)	D 130	
Aromatics (4)	Vol %	35 Max	D 1319	25 %
Contaminants				
Total Sulfur	PPM	30 Max	D 2622, D4294	15-20ppm
Water & Sediment	Vol %	0.05 Max	D 1796	
Ash	Wt %	0.01 Max	D 482	
Additives				
Cetane Improver	Lb/MBbl	675 Max		
Dye		Undyed		

1. Minimum release specification is 125 deg. F. The refinery should target 135 deg. F.
2. Test result reported as a number and letter (e.g. 1a). Any letter is allowable as long as the number meets the spec shown.
3. Either specification must be met.
4. Either cetane index minimum or aromatics maximum must be met.
5. Winter cloud and pour specifications may be relaxed to the summer specifications by agreement with the customer.
6. Season Table

Month	Product Code	Pour Point	Cloud Point
Jan, Feb, Nov, Dec	WI	0 max (5)	14 max (5)
Mar - Oct	SU	15 max	24 max

Material Safety Data Sheet

SECTION 1 PRODUCT AND COMPANY IDENTIFICATION

Chevron Hydraulic Oil AW

Product Number(s): CPS255673, CPS255674, CPS255675
Synonyms: Chevron Hydraulic Oil AW ISO 32, Chevron Hydraulic Oil AW ISO 46, Chevron Hydraulic Oil AW ISO 68
Company Identification
ChevronTexaco Global Lubricants
6001 Bollinger Canyon Rd.
San Ramon, CA 94583
United States of America
www.chevron-lubricants.com

Transportation Emergency Response
CHEMTREC: (800) 424-9300 or (703) 527-3887
Health Emergency
ChevronTexaco Emergency Information Center: Located in the USA. International collect calls accepted. (800) 231-0623 or (510) 231-0623
Product Information
email : lubemsds@chevrontexaco.com
Product Information: (800) LUBE TEK
MSDS Requests: (800) 414-6737

SECTION 2 COMPOSITION/ INFORMATION ON INGREDIENTS

COMPONENTS	CAS NUMBER	AMOUNT
Non-hazardous additive blend in refined oil	Mixture	100 %weight

SECTION 3 HAZARDS IDENTIFICATION

IMMEDIATE HEALTH EFFECTS
Eye: Not expected to cause prolonged or significant eye irritation.
Skin: Contact with the skin is not expected to cause prolonged or significant irritation. Not expected to be harmful to internal organs if absorbed through the skin. High-Pressure Equipment Information: Accidental high-velocity injection under the skin of materials of this type may result in serious injury. Seek medical attention at once should an accident like this occur. The initial wound at the injection site may not appear to be serious at first; but, if left untreated, could result in disfigurement or amputation of the affected part.

Ingestion: Not expected to be harmful if swallowed.
Inhalation: Not expected to be harmful if inhaled. Contains a petroleum-based mineral oil. May cause respiratory irritation or other pulmonary effects following prolonged or repeated inhalation of oil mist at airborne levels above the recommended mineral oil mist exposure limit. Symptoms of respiratory irritation may include coughing and difficulty breathing.

SECTION 4 FIRST AID MEASURES

Eye: No specific first aid measures are required. As a precaution, remove contact lenses, if worn, and flush eyes with water.
Skin: No specific first aid measures are required. As a precaution, remove clothing and shoes if contaminated. To remove the material from skin, use soap and water. Discard contaminated clothing and shoes or thoroughly clean before reuse.

Ingestion: No specific first aid measures are required. Do not induce vomiting. As a precaution, get medical advice.
Inhalation: No specific first aid measures are required. If exposed to excessive levels of material in the air, move the exposed person to fresh air. Get medical attention if coughing or respiratory discomfort occurs.
Note to Physicians: In an accident involving high-pressure equipment, this product may be injected under the skin. Such an accident may result in a small, sometimes bloodless, puncture wound. However, because of its driving force, material injected into a fingertip can be deposited into the palm of the hand. Within 24 hours, there is usually a great deal of swelling, discoloration, and intense throbbing pain. Immediate treatment at a surgical emergency center is recommended.

SECTION 5 FIRE FIGHTING MEASURES

Leaks/ruptures in high pressure system using materials of this type can create a fire hazard when in the vicinity of ignition sources (eg. open flame, pilot lights, sparks, or electric arcs).

FIRE CLASSIFICATION:
OSHA Classification (29 CFR 1910.1200): Not classified by OSHA as flammable or combustible.

NFPA RATINGS: Health: 0 Flammability: 1 Reactivity: 0

FLAMMABLE PROPERTIES:
Flashpoint: (Cleveland Open Cup) 170 °C (338 °F) (Min)
Autoignition: No Data Available
Flammability (Explosive) Limits (% by volume in air): Lower: Not Applicable Upper: Not Applicable

EXTINGUISHING MEDIA: Use water fog, foam, dry chemical or carbon dioxide (CO2) to extinguish flames.

PROTECTION OF FIRE FIGHTERS:
Fire Fighting Instructions: This material will burn although it is not easily ignited. For fires involving this material, do not enter any enclosed or confined fire space without proper protective equipment, including self-contained breathing apparatus.
Combustion Products: Highly dependent on combustion conditions. A complex mixture of airborne solids, liquids, and gases including carbon monoxide, carbon dioxide, and unidentified organic compounds will be evolved when this material undergoes combustion.

SECTION 6 ACCIDENTAL RELEASE MEASURES

Protective Measures: Eliminate all sources of ignition in vicinity of spilled material.
Spill Management: Stop the source of the release if you can do it without risk. Contain release to prevent further contamination of soil, surface water or groundwater. Clean up spill as soon as

possible, observing precautions in Exposure Controls/Personal Protection. Use appropriate techniques such as applying non-combustible absorbent materials or pumping. Where feasible and appropriate, remove contaminated soil. Place contaminated materials in disposable containers and dispose of in a manner consistent with applicable regulations.
Reporting: Report spills to local authorities and/or the U.S. Coast Guard's National Response Center at (800) 424-8802 as appropriate or required.

SECTION 7 HANDLING AND STORAGE

Precautionary Measures: DO NOT USE IN HIGH PRESSURE SYSTEMS in the vicinity of flames, sparks and hot surfaces. Use only in well ventilated areas. Keep container closed.

General Handling Information: Avoid contaminating soil or releasing this material into sewage and drainage systems and bodies of water.
Static Hazard: Electrostatic charge may accumulate and create a hazardous condition when handling this material. To minimize this hazard, bonding and grounding may be necessary but may not, by themselves, be sufficient. Review all operations which have the potential of generating and accumulating an electrostatic charge and/or a flammable atmosphere (including tank and container filling, splash filling, tank cleaning, sampling, gauging, switch loading, filtering, mixing, agitation, and vacuum truck operations) and use appropriate mitigating procedures. For more information, refer to OSHA Standard 29 CFR 1910.106, 'Flammable and Combustible Liquids', National Fire Protection Association (NFPA 77, 'Recommended Practice on Static Electricity', and/or the American Petroleum Institute (API) Recommended Practice 2003, 'Protection Against Ignitions Arising Out of Static, Lightning, and Stray Currents'.
Container Warnings: Container is not designed to contain pressure. Do not use pressure to empty container or it may rupture with explosive force. Empty containers retain product residue (solid, liquid, and/or vapor) and can be dangerous. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose such containers to heat, flame, sparks, static electricity, or other sources of ignition. They may explode and cause injury or death. Empty containers should be completely drained, properly closed, and promptly returned to a drum reconditioner or disposed of properly.

SECTION 8 EXPOSURE CONTROLS/PERSONAL PROTECTION

GENERAL CONSIDERATIONS:
Consider the potential hazards of this material (see Section 3), applicable exposure limits, job activities, and other substances in the work place when designing engineering controls and selecting personal protective equipment. If engineering controls or work practices are not adequate to prevent exposure to harmful levels of this material, the personal protective equipment listed below is recommended. The user should read and understand all instructions and limitations supplied with the equipment since protection is usually provided for a limited time or under certain circumstances.

ENGINEERING CONTROLS:
Use in a well-ventilated area.

PERSONAL PROTECTIVE EQUIPMENT
Eye/Face Protection: No special eye protection is normally required. Where splashing is possible, wear safety glasses with side shields as a good safety practice.
Skin Protection: No special protective clothing is normally required. Where splashing is possible, select protective clothing depending on operations conducted, physical requirements and other substances in the workplace. Suggested materials for protective gloves include: 4H (PE/EVAL), Nitrile Rubber, Silver Shield, Viton.
Respiratory Protection: No respiratory protection is normally required.
If user operations generate an oil mist, determine if airborne concentrations are below the occupational exposure limit for mineral oil mist. If not, wear an approved respirator that provides adequate protection from the measured concentrations of this material. For air-purifying respirators use a particulate cartridge.
Use a positive pressure air-supplying respirator in circumstances where air-purifying respirators

may not provide adequate protection.

Occupational Exposure Limits:

Component	Agency	TWA	STEL	Ceiling	Notation
Non-hazardous additive blend in refined oil	ACGIH	5 mg/m3	10 mg/m3	--	--
Non-hazardous additive blend in refined oil	OSHA Z-1	5 mg/m3	--	--	--

SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES

Attention: the data below are typical values and do not constitute a specification.

Color: Yellow
Physical State: Liquid
Odor: Petroleum odor
pH: Not Applicable
Vapor Pressure: <0.01 mmHg @ 37.8 °C (100 °F)
Vapor Density (Air = 1): >1
Boiling Point: >315.6°C (600°F)
Solubility: Soluble in hydrocarbon solvents; insoluble in water.
Freezing Point: Not Applicable
Melting Point: Not Applicable
Specific Gravity: 0.86 - 0.9 @ 15.6°C (60.1°F) / 15.6°C (60.1°F)
Density: 0.86 kg/l - 0.9 kg/l @ 15°C (59°F)
Viscosity: 28.8 cSt - 61.2 cSt @ 40°C (104°F) (Min)

SECTION 10 STABILITY AND REACTIVITY

Chemical Stability: This material is considered stable under normal ambient and anticipated storage and handling conditions of temperature and pressure.
Incompatibility With Other Materials: May react with strong acids or strong oxidizing agents, such as chlorates, nitrates, peroxides, etc.
Hazardous Decomposition Products: None known (None expected)
Hazardous Polymerization: Hazardous polymerization will not occur.

SECTION 11 TOXICOLOGICAL INFORMATION

IMMEDIATE HEALTH EFFECTS
Eye Irritation: The eye irritation hazard is based on evaluation of data for similar materials or product components.
Skin Irritation: The skin irritation hazard is based on evaluation of data for similar materials or product components.
Skin Sensitization: No product toxicology data available.
Acute Dermal Toxicity: The acute dermal toxicity hazard is based on evaluation of data for similar materials or product components.
Acute Oral Toxicity: The acute oral toxicity hazard is based on evaluation of data for similar materials or product components.
Acute Inhalation Toxicity: The acute inhalation toxicity hazard is based on evaluation of data for similar materials or product components.

ADDITIONAL TOXICOLOGY INFORMATION:
This product contains petroleum base oils which may be refined by various processes including severe solvent extraction, severe hydrocracking, or severe hydrotreating. None of the oils

requires a cancer warning under the OSHA Hazard Communication Standard (29 CFR 1910.1200). These oils have not been listed in the National Toxicology Program (NTP) Annual Report nor have they been classified by the International Agency for Research on Cancer (IARC) as; carcinogenic to humans (Group 1), probably carcinogenic to humans (Group 2A), or possibly carcinogenic to humans (Group 2B). These oils have not been classified by the American Conference of Governmental Industrial Hygienists (ACGIH) as: confirmed human carcinogen (A1), suspected human carcinogen (A2), or confirmed animal carcinogen with unknown relevance to humans (A3).

SECTION 12 ECOLOGICAL INFORMATION

ECOTOXICITY
96 hour(s) LC50: >1000 mg/l (Oncorhynchus mykiss)
48 hour(s) EC50: >1000 mg/l (Daphnia magna)
This material is not expected to be harmful to aquatic organisms.

ENVIRONMENTAL FATE
This material is not expected to be readily biodegradable.

SECTION 13 DISPOSAL CONSIDERATIONS

Use material for its intended purpose or recycle if possible. Oil collection services are available for used oil recycling or disposal. Place contaminated materials in containers and dispose of in a manner consistent with applicable regulations. Contact your sales representative or local environmental or health authorities for approved disposal or recycling methods.

SECTION 14 TRANSPORT INFORMATION

The description shown may not apply to all shipping situations. Consult 49CFR, or appropriate Dangerous Goods Regulations, for additional description requirements (e.g., technical name) and mode-specific or quantity-specific shipping requirements.

DOT Shipping Description: PETROLEUM LUBRICATING OIL

IMO/IMDG Shipping Description: PETROLEUM LUBRICATING OIL

SECTION 15 REGULATORY INFORMATION

EPCRA 311/312 CATEGORIES: 1. Immediate (Acute) Health Effects: NO
2. Delayed (Chronic) Health Effects: NO
3. Fire Hazard: NO
4. Sudden Release of Pressure Hazard: NO
5. Reactivity Hazard: NO

REGULATORY LISTS SEARCHED:

01-1=IARC Group 1	03=EPCRA 313
01-2A=IARC Group 2A	04=CA Proposition 65
01-2B=IARC Group 2B	05=MA RTK

02=NTP Carcinogen 06=NJ RTK
07=PA RTK

No components of this material were found on the regulatory lists above.

CHEMICAL INVENTORIES:
All components comply with the following chemical inventory requirements: AICS (Australia), EINECS (European Union), ENCS (Japan), KECI (Korea), PICCS (Philippines), TSCA (United States).

One or more components does not comply with the following chemical inventory requirements: DSL (Canada).

NEW JERSEY RTK CLASSIFICATION:
Under the New Jersey Right-to-Know Act L. 1983 Chapter 315 N.J.S.A. 34:5A-1 et. seq., the product is to be identified as follows: PETROLEUM OIL (Hydraulic oil)

WHMIS CLASSIFICATION:
This product is not considered a controlled product according to the criteria of the Canadian Controlled Products Regulations.

SECTION 16 OTHER INFORMATION

NFPA RATINGS: Health: 0 Flammability: 1 Reactivity: 0

HMIS RATINGS: Health: 1 Flammability: 1 Reactivity: 0
(0-Least, 1-Slight, 2-Moderate, 3-High, 4-Extreme, PPE:- Personal Protection Equipment Index recommendation, *- Chronic Effect Indicator). These values are obtained using the guidelines or published evaluations prepared by the National Fire Protection Association (NFPA) or the National Paint and Coating Association (for HMIS ratings).

REVISION STATEMENT: This revision updates the following sections of this Material Safety Data Sheet: 1, 8, 11, 14, 15
Revision Date: 02/19/2004

ABBREVIATIONS THAT MAY HAVE BEEN USED IN THIS DOCUMENT:

TLV - Threshold Limit Value	TWA - Time Weighted Average
STEL - Short-term Exposure Limit	PEL - Permissible Exposure Limit
	CAS - Chemical Abstract Service Number
ACGIH - American Conference of Government Industrial Hygienists	IMO/IMDG - International Maritime Dangerous Goods Code
API - American Petroleum Institute	MSDS - Material Safety Data Sheet
CVX - ChevronTexaco	NFPA - National Fire Protection Association (USA)
DOT - Department of Transportation (USA)	NTP - National Toxicology Program (USA)
IARC - International Agency for Research on Cancer	OSHA - Occupational Safety and Health Administration

Prepared according to the OSHA Hazard Communication Standard (29 CFR 1910.1200) and the

ANSI MSDS Standard (Z400.1) by the ChevronTexaco Energy Research & Technology Company, 100 Chevron Way, Richmond, California 94802.

The above information is based on the data of which we are aware and is believed to be correct as of the date hereof. Since this information may be applied under conditions beyond our control and with which we may be unfamiliar and since data made available subsequent to the date hereof may suggest modifications of the information, we do not assume any responsibility for the results of its use. This information is furnished upon condition that the person receiving it shall make his own determination of the suitability of the material for his particular purpose.

Appendix D

Job Safety Analysis Forms

JOB SAFETY ANALYSIS FORM

Job/Task:	**Date:**
Location:	☐ **New** ☐ **Revised**
Author:	**JSA #:**

REQUIRED PERSONAL PROTECTICE EQUIPMENT	**TOOLS REQUIRED**

SEQUENCE OF JOB STEPS	**POTENTIAL HAZARDS**	**RECOMMENDED CONTROLS**

REVIEWING EMPLOYEE NAME	**SIGNATURE**	**DATE**

APPENDIX C
ORDER OF CONDITIONS

Mail 1
Marilyn MacDonald
645 Walnut St
Bridgewater MA 02324

2015 00062015
Bk: 45878 Pg: 47 Page: 1 of 14
Recorded: 08/03/2015 10:50 AM
ATTEST: John R. Buckley, Jr. Register
Plymouth County Registry of Deeds

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands

WPA Form 5 – Order of Conditions

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Provided by MassDEP:
SE116-1344
MassDEP File #

eDEP Transaction #

Bridgewater
City/Town

A. General Information

Please note: this form has been modified with added space to accommodate the Registry of Deeds Requirements

Important: When filling out forms on the computer, use only the tab key to move your cursor - do not use the return key.

1. From: Town of Bridgewater Conservation Commission
Conservation Commission

2. This issuance is for (check one): a. ☐ Order of Conditions b. ☐ Amended Order of Conditions

3. To: Applicant:

David and Marilyn — a. First Name
MacDonald — b. Last Name
Marilyn's Landing — c. Organization
P.O. Box 431, 645 Walnut Street — d. Mailing Address
Bridgewater — e. City/Town
MA — f. State
02324 — g. Zip Code

4. Property Owner (if different from applicant):

a. First Name
b. Last Name
c. Organization
d. Mailing Address
e. City/Town
f. State
g. Zip Code

5. Project Location:

off Plymouth Street — a. Street Address
Bridgewater — b. City/Town
40 — c. Assessors Map/Plat Number
9, 16, and 17 — d. Parcel/Lot Number

Latitude and Longitude, if known: d m s — d. Latitude; d m s — e. Longitude

A. General Information (cont.)

6. Property recorded at the Registry of Deeds for (attach additional information if more than one parcel):

Plymouth
a. County

b. Certificate Number (if registered land)

7400
c. Book

319-2
d. Page

7. Dates: June 9, 2015 (a. Date Notice of Intent Filed) July 14, 2015 (b. Date Public Hearing Closed) July 14, 2015 (c. Date of Issuance)

8. Final Approved Plans and Other Documents (attach additional plan or document references as needed):
Marilyn's Landing - Sheet C1 "Grading and Drainage Plan" and Sheet C2 "Site Details and General Notes"

EBI Consulting
b. Prepared By

Karlis Skulte, P.E., #47703
c. Signed and Stamped by

June 5, 2015
d. Final Revision Date

1"=40"
e. Scale

f. Additional Plan or Document Title

g. Date

B. Findings

1. Findings pursuant to the Massachusetts Wetlands Protection Act:

Following the review of the above-referenced Notice of Intent and based on the information provided in this application and presented at the public hearing, this Commission finds that the areas in which work is proposed is significant to the following interests of the Wetlands Protection Act (the Act). Check all that apply:

a. ☐ Public Water Supply b. ☐ Land Containing Shellfish c. ☒ Prevention of Pollution
d. ☐ Private Water Supply e. ☒ Fisheries f. ☒ Protection of Wildlife Habitat
g. ☒ Groundwater Supply h. ☒ Storm Damage Prevention i. ☒ Flood Control

2. This Commission hereby finds the project, as proposed, is: (check one of the following boxes)

Approved subject to:

a. ☒ the following conditions which are necessary in accordance with the performance standards set forth in the wetlands regulations. This Commission orders that all work shall be performed in accordance with the Notice of Intent referenced above, the following General Conditions, and any other special conditions attached to this Order. To the extent that the following conditions modify or differ from the plans, specifications, or other proposals submitted with the Notice of Intent, these conditions shall control.

B. Findings (cont.)

Denied because:

b. ☐ the proposed work cannot be conditioned to meet the performance standards set forth in the wetland regulations. Therefore, work on this project may not go forward unless and until a new Notice of Intent is submitted which provides measures which are adequate to protect the interests of the Act, and a final Order of Conditions is issued. **A description of the performance standards which the proposed work cannot meet is attached to this Order.**

c. ☐ the information submitted by the applicant is not sufficient to describe the site, the work, or the effect of the work on the interests identified in the Wetlands Protection Act. Therefore, work on this project may not go forward unless and until a revised Notice of Intent is submitted which provides sufficient information and includes measures which are adequate to protect the Act's interests, and a final Order of Conditions is issued. **A description of the specific information which is lacking and why it is necessary is attached to this Order as per 310 CMR 10.05(6)(c).**

3. ☐ Buffer Zone Impacts: Shortest distance between limit of project disturbance and the wetland resource area specified in 310 CMR 10.02(1)(a) _____ a. linear feet

Inland Resource Area Impacts: Check all that apply below. (For Approvals Only)

Resource Area	Proposed Alteration	Permitted Alteration	Proposed Replacement	Permitted Replacement
4. ☐ Bank	a. linear feet	b. linear feet	c. linear feet	d. linear feet
5. ☐ Bordering Vegetated Wetland	a. square feet	b. square feet	c. square feet	d. square feet
6. ☐ Land Under Waterbodies and Waterways	a. square feet	b. square feet	c. square feet	d. square feet
	e. c/y dredged	f. c/y dredged		
7. ☐ Bordering Land Subject to Flooding	a. square feet	b. square feet	c. square feet	d. square feet
Cubic Feet Flood Storage	e. cubic feet	f. cubic feet	g. cubic feet	h. cubic feet
8. ☐ Isolated Land Subject to Flooding	a. square feet	b. square feet		
Cubic Feet Flood Storage	c. cubic feet	d. cubic feet	e. cubic feet	f. cubic feet
9. ☐ Riverfront Area	a. total sq. feet	b. total sq. feet		
Sq ft within 100 ft	c. square feet	d. square feet	e. square feet	f. square feet
Sq ft between 100-200 ft	g. square feet	h. square feet	i. square feet	j. square feet

B. Findings (cont.)

Coastal Resource Area Impacts: Check all that apply below. (For Approvals Only)

	Proposed Alteration	Permitted Alteration	Proposed Replacement	Permitted Replacement
10. ☐ Designated Port Areas	Indicate size under Land Under the Ocean, below			
11. ☐ Land Under the Ocean	a. square feet	b. square feet		
	c. c/y dredged	d. c/y dredged		
12. ☐ Barrier Beaches	Indicate size under Coastal Beaches and/or Coastal Dunes below			
13. ☐ Coastal Beaches	a. square feet	b. square feet	c. nourishment (cu yd)	d. nourishment (cu yd)
14. ☐ Coastal Dunes	a. square feet	b. square feet	c. nourishment (cu yd)	d. nourishment (cu yd)
15. ☐ Coastal Banks	a. linear feet	b. linear feet		
16. ☐ Rocky Intertidal Shores	a. square feet	b. square feet		
17. ☐ Salt Marshes	a. square feet	b. square feet	c. square feet	d. square feet
18. ☐ Land Under Salt Ponds	a. square feet	b. square feet		
	c. c/y dredged	d. c/y dredged		
19. ☐ Land Containing Shellfish	a. square feet	b. square feet	c. square feet	d. square feet
20. ☐ Fish Runs	Indicate size under Coastal Banks, Inland Bank, Land Under the Ocean, and/or inland Land Under Waterbodies and Waterways, above			
	a. c/y dredged	b. c/y dredged		
21. ☐ Land Subject to Coastal Storm Flowage	a. square feet	b. square feet		

B. Findings (cont.)

*** #22.** If the project is for the purpose of restoring or enhancing a wetland resource area in addition to the square footage that has been entered in Section B.5.c (BVW) or B.17.c (Salt Marsh) above, please enter the additional amount here.

22. ☐ Restoration/Enhancement *:

a. square feet of BVW | b. square feet of salt marsh

23. ☐ Stream Crossing(s):

a. number of new stream crossings | b. number of replacement stream crossings

C. General Conditions Under Massachusetts Wetlands Protection Act

The following conditions are only applicable to Approved projects.

1. Failure to comply with all conditions stated herein, and with all related statutes and other regulatory measures, shall be deemed cause to revoke or modify this Order.
2. The Order does not grant any property rights or any exclusive privileges; it does not authorize any injury to private property or invasion of private rights.
3. This Order does not relieve the permittee or any other person of the necessity of complying with all other applicable federal, state, or local statutes, ordinances, bylaws, or regulations.
4. The work authorized hereunder shall be completed within three years from the date of this Order unless either of the following apply:
   a. the work is a maintenance dredging project as provided for in the Act; or
   b. the time for completion has been extended to a specified date more than three years, but less than five years, from the date of issuance. If this Order is intended to be valid for more than three years, the extension date and the special circumstances warranting the extended time period are set forth as a special condition in this Order.
5. This Order may be extended by the issuing authority for one or more periods of up to three years each upon application to the issuing authority at least 30 days prior to the expiration date of the Order.
6. If this Order constitutes an Amended Order of Conditions, this Amended Order of Conditions does not extend the issuance date of the original Final Order of Conditions and the Order will expire on unless extended in writing by the Department.
7. Any fill used in connection with this project shall be clean fill. Any fill shall contain no trash, refuse, rubbish, or debris, including but not limited to lumber, bricks, plaster, wire, lath, paper, cardboard, pipe, tires, ashes, refrigerators, motor vehicles, or parts of any of the foregoing.
8. This Order is not final until all administrative appeal periods from this Order have elapsed, or if such an appeal has been taken, until all proceedings before the Department have been completed.

C. General Conditions Under Massachusetts Wetlands Protection Act (cont.)

9. No work shall be undertaken until the Order has become final and then has been recorded in the Registry of Deeds or the Land Court for the district in which the land is located, within the chain of title of the affected property. In the case of recorded land, the Final Order shall also be noted in the Registry's Grantor Index under the name of the owner of the land upon which the proposed work is to be done. In the case of the registered land, the Final Order shall also be noted on the Land Court Certificate of Title of the owner of the land upon which the proposed work is done. The recording information shall be submitted to the Conservation Commission on the form at the end of this Order, which form must be stamped by the Registry of Deeds, prior to the commencement of work.

10. A sign shall be displayed at the site not less then two square feet or more than three square feet in size bearing the words,

    "Massachusetts Department of Environmental Protection" [or, "MassDEP"]

    "File Number SE116-1344 "

11. Where the Department of Environmental Protection is requested to issue a Superseding Order, the Conservation Commission shall be a party to all agency proceedings and hearings before MassDEP.

12. Upon completion of the work described herein, the applicant shall submit a Request for Certificate of Compliance (WPA Form 8A) to the Conservation Commission.

13. The work shall conform to the plans and special conditions referenced in this order.

14. Any change to the plans identified in Condition #13 above shall require the applicant to inquire of the Conservation Commission in writing whether the change is significant enough to require the filing of a new Notice of Intent.

15. The Agent or members of the Conservation Commission and the Department of Environmental Protection shall have the right to enter and inspect the area subject to this Order at reasonable hours to evaluate compliance with the conditions stated in this Order, and may require the submittal of any data deemed necessary by the Conservation Commission or Department for that evaluation.

16. This Order of Conditions shall apply to any successor in interest or successor in control of the property subject to this Order and to any contractor or other person performing work conditioned by this Order.

17. Prior to the start of work, and if the project involves work adjacent to a Bordering Vegetated Wetland, the boundary of the wetland in the vicinity of the proposed work area shall be marked by wooden stakes or flagging. Once in place, the wetland boundary markers shall be maintained until a Certificate of Compliance has been issued by the Conservation Commission.

C. General Conditions Under Massachusetts Wetlands Protection Act (cont.)

18. All sedimentation barriers shall be maintained in good repair until all disturbed areas have been fully stabilized with vegetation or other means. At no time shall sediments be deposited in a wetland or water body. During construction, the applicant or his/her designee shall inspect the erosion controls on a daily basis and shall remove accumulated sediments as needed. The applicant shall immediately control any erosion problems that occur at the site and shall also immediately notify the Conservation Commission, which reserves the right to require additional erosion and/or damage prevention controls it may deem necessary. Sedimentation barriers shall serve as the limit of work unless another limit of work line has been approved by this Order.

NOTICE OF STORMWATER CONTROL AND MAINTENANCE REQUIREMENTS

19. **The work associated with this Order (the "Project") is** (1) ☒ **is not** (2) ☐ **subject to the Massachusetts Stormwater Standards. If the work is subject to the Stormwater Standards, then the project is subject to the following conditions:**

a) All work, including site preparation, land disturbance, construction and redevelopment, shall be implemented in accordance with the construction period pollution prevention and erosion and sedimentation control plan and, if applicable, the Stormwater Pollution Prevention Plan required by the National Pollution Discharge Elimination System Construction General Permit as required by Stormwater Condition 8. Construction period erosion, sedimentation and pollution control measures and best management practices (BMPs) shall remain in place until the site is fully stabilized.

b) No stormwater runoff may be discharged to the post-construction stormwater BMPs unless and until a Registered Professional Engineer provides a Certification that:
i. all construction period BMPs have been removed or will be removed by a date certain specified in the Certification. For any construction period BMPs intended to be converted to post construction operation for stormwater attenuation, recharge, and/or treatment, the conversion is allowed by the MassDEP Stormwater Handbook BMP specifications and that the BMP has been properly cleaned or prepared for post construction operation, including removal of all construction period sediment trapped in inlet and outlet control structures;
ii. as-built final construction BMP plans are included, signed and stamped by a Registered Professional Engineer, certifying the site is fully stabilized;
iii. any illicit discharges to the stormwater management system have been removed, as per the requirements of Stormwater Standard 10;
iv. all post-construction stormwater BMPs are installed in accordance with the plans (including all planting plans) approved by the issuing authority, and have been inspected to ensure that they are not damaged and that they are in proper working condition;
v. any vegetation associated with post-construction BMPs is suitably established to withstand erosion.

C. General Conditions Under Massachusetts Wetlands Protection Act (cont.)

c) The landowner is responsible for BMP maintenance until the issuing authority is notified that another party has legally assumed responsibility for BMP maintenance. Prior to requesting a Certificate of Compliance, or Partial Certificate of Compliance, the responsible party (defined in General Condition 18(e)) shall execute and submit to the issuing authority an Operation and Maintenance Compliance Statement ("O&M Statement) for the Stormwater BMPs identifying the party responsible for implementing the stormwater BMP Operation and Maintenance Plan ("O&M Plan") and certifying the following: *i.*) the O&M Plan is complete and will be implemented upon receipt of the Certificate of Compliance, and *ii.*) the future responsible parties shall be notified in writing of their ongoing legal responsibility to operate and maintain the stormwater management BMPs and implement the Stormwater Pollution Prevention Plan.

d) Post-construction pollution prevention and source control shall be implemented in accordance with the long-term pollution prevention plan section of the approved Stormwater Report and, if applicable, the Stormwater Pollution Prevention Plan required by the National Pollution Discharge Elimination System Multi-Sector General Permit.

e) Unless and until another party accepts responsibility, the landowner, or owner of any drainage easement, assumes responsibility for maintaining each BMP. To overcome this presumption, the landowner of the property must submit to the issuing authority a legally binding agreement of record, acceptable to the issuing authority, evidencing that another entity has accepted responsibility for maintaining the BMP, and that the proposed responsible party shall be treated as a permittee for purposes of implementing the requirements of Conditions 18(f) through 18(k) with respect to that BMP. Any failure of the proposed responsible party to implement the requirements of Conditions 18(f) through 18(k) with respect to that BMP shall be a violation of the Order of Conditions or Certificate of Compliance. In the case of stormwater BMPs that are serving more than one lot, the legally binding agreement shall also identify the lots that will be serviced by the stormwater BMPs. A plan and easement deed that grants the responsible party access to perform the required operation and maintenance must be submitted along with the legally binding agreement.

f) The responsible party shall operate and maintain all stormwater BMPs in accordance with the design plans, the O&M Plan, and the requirements of the Massachusetts Stormwater Handbook.

C. General Conditions Under Massachusetts Wetlands Protection Act (cont.)

g) The responsible party shall:
1. Maintain an operation and maintenance log for the last three (3) consecutive calendar years of inspections, repairs, maintenance and/or replacement of the stormwater management system or any part thereof, and disposal (for disposal the log shall indicate the type of material and the disposal location);
2. Make the maintenance log available to MassDEP and the Conservation Commission ("Commission") upon request; and
3. Allow members and agents of the MassDEP and the Commission to enter and inspect the site to evaluate and ensure that the responsible party is in compliance with the requirements for each BMP established in the O&M Plan approved by the issuing authority.

h) All sediment or other contaminants removed from stormwater BMPs shall be disposed of in accordance with all applicable federal, state, and local laws and regulations.

i) Illicit discharges to the stormwater management system as defined in 310 CMR 10.04 are prohibited.

j) The stormwater management system approved in the Order of Conditions shall not be changed without the prior written approval of the issuing authority.

k) Areas designated as qualifying pervious areas for the purpose of the Low Impact Site Design Credit (as defined in the MassDEP Stormwater Handbook, Volume 3, Chapter 1, Low Impact Development Site Design Credits) shall not be altered without the prior written approval of the issuing authority.

l) Access for maintenance, repair, and/or replacement of BMPs shall not be withheld. Any fencing constructed around stormwater BMPs shall include access gates and shall be at least six inches above grade to allow for wildlife passage.

Special Conditions (if you need more space for additional conditions, please attach a text document):

C. General Conditions (continued)

20. **Upon completion of the work described herein, the applicant shall submit a Request for Certificate of Compliance (WPA Form 8) to the Conservation Commission. This request shall include a letter to the BCC with an original signature from a registered professional engineer certifying that the work is in compliance with the plans and conditions thereof. The request for Certificate of Compliance shall be submitted along with two copies of an as-built site plan certified by a registered professional land surveyor.**

21. The provision of the Order of Conditions shall apply to and be binding upon its applicant, its employees, and any successor in interest or successor in control of the property subject to this Order and to any contractor or other person performing work conditioned by this Order.

22. Prior to the start of work, and if the project involves work adjacent to a Bordering Vegetated Wetland, the boundary of the wetland in the vicinity of the proposed work area shall be marked by wooden stakes or flagging. The applicant's attention is called to condition #21 herein.

23. In advance of any work on the project the applicant shall notify the Bridgewater Conservation Commission (BCC), and at the request of the BCC, shall arrange an on-site conference among the BCC, the contractor and the applicant to ensure that the conditions of this Order are understood. This Order also shall also be made a part of the contractor's written contract.

24. The applicant or its successors, shall notify the BCC in writing of the identity of the on-site construction supervisor hired to coordinate construction during the work on the site and to ensure compliance with this Order.

25. Prior to construction, permanent 3-foot schedule PVC pipes will be driven into the ground at 30 foot intervals along the wetlands line as indicated on the plan. The pipes will remain exposed 1 foot above the ground and the tops shall be capped and spray painted green for future reference.

26. Any replication area is to be prepared prior to the destruction of the resource area being replicated.

27. All detention basins and/or retention areas are to be completed before installation of any impervious material or structures discharging surface water runoff.

28. There shall be no stockpiling of soil or other materials within 25 feet of the resource area.

29. Upon completion of construction and grading, all disturbed areas located outside the resource areas shall be stabilized permanently against erosion. This shall be done either by sodding or by loaming, seeding and mulching according to Soil Conservation Standards. If the latter is chosen, stabilization will be considered once the surface shows complete vegetative cover has been achieved.

30. After proper grading, all disturbed areas located within a resource area, except those areas designated as compensatory wetlands, shall be loamed and seeded with not less than four (4) inches of good quality loam and a vegetated cover established.

31. No earthen embankment in the Buffer Zone shall have a slope steeper than 2:1.

32. All facilities and equipment used within or as part of this project will be continually maintained and operated so as to comply with this Order and the Wetlands Protection Act.

33. Any errors found in the plans or information submitted by the applicant shall be considered as changes, and the aforementioned procedures outlined for changes shall be followed.

34. The Conservation Commission shall be notified in writing of any lot line or lot number changes with a copy of the plan showing these changes prior to any work on these lots.

35. All conditions are ongoing and do not expire at the end of three years or with the issuance of a Certificate of Compliance.

36. In the opinion of the Bridgewater Conservation Commission, the information submitted with the Notice of Intent for this project along with the results of field inspections and evaluation of the site by members of the Commission and/or its agent(s) justify issuance of this Order of Conditions. The Bridgewater Conservation Commission does, however, reserve the right to raise additional issues and present further evidence as may be appropriate should there be further proceedings pertaining to the Notice of Intent filing for which the Commission has issued this Order of Conditions.

37. Noncompliance with or violation of this Order of Conditions or any part thereof may be deemed reasonable cause by the Bridgewater Conservation Commission to issue a Notice of Noncompliance and/or an Enforcement Order to the applicant/owner. Continued violation of, or noncompliance with the Order of Conditions shall constitute adequate basis for the imposition of the maximum penalty allowed under the law and the Bridgewater Conservation Commission may take any other actions necessary to ensure compliance with the Order of Conditions by the applicant.

38. Special conditions (if any, please See Attachment A).

D. Findings Under Municipal Wetlands Bylaw or Ordinance

1. Is a municipal wetlands bylaw or ordinance applicable? ☒ Yes ☐ No

2. The _____ hereby finds (check one that applies):
   Conservation Commission

   a. ☐ that the proposed work cannot be conditioned to meet the standards set forth in a municipal ordinance or bylaw, specifically:

   _____ _____
   1. Municipal Ordinance or Bylaw 2. Citation

   Therefore, work on this project may not go forward unless and until a revised Notice of Intent is submitted which provides measures which are adequate to meet these standards, and a final Order of Conditions is issued.

   b. ☐ that the following additional conditions are necessary to comply with a municipal ordinance or bylaw:

   _____ _____
   1. Municipal Ordinance or Bylaw 2. Citation

3. The Commission orders that all work shall be performed in accordance with the following conditions and with the Notice of Intent referenced above. To the extent that the following conditions modify or differ from the plans, specifications, or other proposals submitted with the Notice of Intent, the conditions shall control.
   The special conditions relating to municipal ordinance or bylaw are as follows (if you need more space for additional conditions, attach a text document):

E. Signatures

This Order is valid for three years, unless otherwise specified as a special condition pursuant to General Conditions #4, from the date of issuance.

07/14/2015
1. Date of Issuance

Please indicate the number of members who will sign this form.
This Order must be signed by a majority of the Conservation Commission.

2. Number of Signers

The Order must be mailed by certified mail (return receipt requested) or hand delivered to the applicant. A copy also must be mailed or hand delivered at the same time to the appropriate Department of Environmental Protection Regional Office, if not filing electronically, and the property owner, if different from applicant.

Signatures:

☐ by hand delivery on

Date

☐ by certified mail, return receipt requested, on

Date

F. Appeals

The applicant, the owner, any person aggrieved by this Order, any owner of land abutting the land subject to this Order, or any ten residents of the city or town in which such land is located, are hereby notified of their right to request the appropriate MassDEP Regional Office to issue a Superseding Order of Conditions. The request must be made by certified mail or hand delivery to the Department, with the appropriate filing fee and a completed Request of Departmental Action Fee Transmittal Form, as provided in 310 CMR 10.03(7) within ten business days from the date of issuance of this Order. A copy of the request shall at the same time be sent by certified mail or hand delivery to the Conservation Commission and to the applicant, if he/she is not the appellant.

Any appellants seeking to appeal the Department's Superseding Order associated with this appeal will be required to demonstrate prior participation in the review of this project. Previous participation in the permit proceeding means the submission of written information to the Conservation Commission prior to the close of the public hearing, requesting a Superseding Order, or providing written information to the Department prior to issuance of a Superseding Order.

The request shall state clearly and concisely the objections to the Order which is being appealed and how the Order does not contribute to the protection of the interests identified in the Massachusetts Wetlands Protection Act (M.G.L. c. 131, § 40), and is inconsistent with the wetlands regulations (310 CMR 10.00). To the extent that the Order is based on a municipal ordinance or bylaw, and not on the Massachusetts Wetlands Protection Act or regulations, the Department has no appellate jurisdiction.

G. Recording Information

Prior to commencement of work, this Order of Conditions must be recorded in the Registry of Deeds or the Land Court for the district in which the land is located, within the chain of title of the affected property. In the case of recorded land, the Final Order shall also be noted in the Registry's Grantor Index under the name of the owner of the land subject to the Order. In the case of registered land, this Order shall also be noted on the Land Court Certificate of Title of the owner of the land subject to the Order of Conditions. The recording information on this page shall be submitted to the Conservation Commission listed below.

Town of Bridgewater Conservation Commission
Conservation Commission

Detach on dotted line, have stamped by the Registry of Deeds and submit to the Conservation Commission.

To:

Bridgewater Conservation Commission
Conservation Commission

Please be advised that the Order of Conditions for the Project at:

off Plymouth St, Map 40, Parcel 9, 16 & 17
Project Location

SE116-1344
MassDEP File Number

Has been recorded at the Registry of Deeds of:

County | Book | Page

for:
Property Owner

and has been noted in the chain of title of the affected property in:

Book | Page

In accordance with the Order of Conditions issued on:

Date

If recorded land, the instrument number identifying this transaction is:

Instrument Number

If registered land, the document number identifying this transaction is:

Document Number

Signature of Applicant

2018 Extension

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands

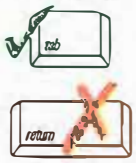
WPA Form 7 – Extension Permit for Orders of Conditions

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

DEP File Number: SE116-1297 Provided by DEP

2018 00053306
Bk: 50010 Pg: 330 Page: 1 of 2
Recorded: 07/05/2018 02:21 PM
ATTEST: John R. Buckley, Jr. Register
Plymouth County Registry of Deeds

Important: When filling out forms on the computer, use only the tab key to move your cursor - do not use the return key.



A. General Information

1. Applicant:

David and Marilyn MacDonald, Marilyn's Landing
Name

PO Box 431, 645 Walnut Street
Mailing Address

Bridgewater | MA | 02324
City/Town | State | Zip Code

2. Property Owner (if different):

Name

Mailing Address

City/Town | State | Zip Code

B. Authorization

The Order of Conditions (or Extension Permit) issued to the applicant or property owner listed above on:

July 14, 2015 (Date) Issued by: Town of Bridgewater Conservation Commission

for work at: Off Plymouth Street (Street Address) | 40 (Assessor's Map/Plat Number) | 9, 16, and 17 (Parcel/Lot Number)

recorded at the Registry of Deeds for:

Plymouth (County) | 44008 (Book) | 300 (Page)

Certificate (if registered land)

is hereby extended until: July 14, 2021 (Date)

Date the Order was last extended (if applicable)

This date can be no more than 3 years from the expiration date of the Order of Conditions or the latest extension. Only unexpired Orders of Conditions or Extension may be extended.

This Extension Permit must be signed by a majority of the Conservation Commission and a copy sent to the applicant and the appropriate DEP Regional Office (http://www.mass.gov/eea/agencies/massdep/about/contacts/find-the-massdep-regional-office-for-your-city-or-town.html).

Signatures: June 28, 2018 (Date)

David & Marilyn MacDonald
645 Walnut St
Bridgewater MA 02324

C. Recording Confirmation

The applicant shall record this document in accordance with General Condition 8 of the Order of Conditions (see below), complete the form attached to this Extension Permit, have it stamped by the Registry of Deeds, and return it to the Conservation Commission.

Note: General Condition 8 of the Order of Conditions requires the applicant, prior to commencement of work, to record the final Order (or in this case, the Extension Permit for the Order of Conditions) in the Registry of Deeds or the Land Court for the district in which the land is located, within the chain of title of the affected property. In the case of recorded land, it shall be noted in the Registry's Granter Index under the name of the owner of the land upon which the proposed work is to be done. In the case of registered land, it shall also be noted on the Land Court Certificate of Title of the owner of the land upon which the proposed work is done.

Detach this page and submit it to the Conservation Commission prior to the expiration of the Order of Conditions subject to this Extension Permit.

To:

Town of Bridgewater
Conservation Commission

Please be advised that the Extension Permit to the Order of Conditions for the project at:

Off Plymouth Street, Map 40, Parcel 9, 16, and 17 — Project Location
SE116-1297 — DEP File Number

has been recorded at the Registry of Deeds of:

County

for:

Property Owner

and has been noted in the chain of title of the affected property in accordance with General Condition 8 of the original Order of Conditions on:

Date | Book | Page

If recorded land the instrument number which identifies this transaction is:

Instrument Number

If registered land, the document number which identifies this transaction is:

Document Number

Signature of Applicant

APPENDIX D
NEGATIVE DETERMINATION OF APPLICABILITY

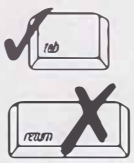
Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands

WPA Form 2 – Determination of Applicability

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

A. General Information

Important:
When filling out forms on the computer, use only the tab key to move your cursor - do not use the return key.



From:

Bridgewater Conservation Commission
Conservation Commission

To: Applicant

Marilyn's Landing
Name

645 Walnut Street
Mailing Address

Bridgewater | MA | 02324
City/Town | State | Zip Code

Property Owner (if different from applicant):

Name

Mailing Address

City/Town | State | Zip Code

1. Title and Date (or Revised Date if applicable) of Final Plans and Other Documents:

ILSF Volume Computation by Peter McManus, PLS of Terra Nova Survey Consultants — 10/08/2013

Title — Date

Title — Date

2. Date Request Filed:

June 29, 2016

B. Determination

Pursuant to the authority of M.G.L. c. 131, § 40, the Conservation Commission considered your Request for Determination of Applicability, with its supporting documentation, and made the following Determination.

Project Description (if applicable):

n/a - No work is proposed

Project Location:

Off Plymouth Street
Street Address

Bridgwater, MA
City/Town

40
Assessors Map/Plat Number

16 and 17
Parcel/Lot Number

B. Determination (cont.)

The following Determination(s) is/are applicable to the proposed site and/or project relative to the Wetlands Protection Act and regulations:

Positive Determination
Note: No work within the jurisdiction of the Wetlands Protection Act may proceed until a final Order of Conditions (issued following submittal of a Notice of Intent or Abbreviated Notice of Intent) or Order of Resource Area Delineation (issued following submittal of Simplified Review ANRAD) has been received from the issuing authority (i.e., Conservation Commission or the Department of Environmental Protection).

☐ 1. The area described on the referenced plan(s) is an area subject to protection under the Act. Removing, filling, dredging, or altering of the area requires the filing of a Notice of Intent.

☒ 2a. The boundary delineations of the following resource areas described on the referenced plan(s) are confirmed as accurate. Therefore, the resource area boundaries confirmed in this Determination are binding as to all decisions rendered pursuant to the Wetlands Protection Act and its regulations regarding such boundaries for as long as this Determination is valid.

The bordering vegetated wetlands delineation as previously approved by the Commission remains valid.

☐ 2b. The boundaries of resource areas listed below are not confirmed by this Determination, regardless of whether such boundaries are contained on the plans attached to this Determination or to the Request for Determination.

☐ 3. The work described on referenced plan(s) and document(s) is within an area subject to protection under the Act and will remove, fill, dredge, or alter that area. Therefore, said work requires the filing of a Notice of Intent.

☐ 4. The work described on referenced plan(s) and document(s) is within the Buffer Zone and will alter an Area subject to protection under the Act. Therefore, said work requires the filing of a Notice of Intent or ANRAD Simplified Review (if work is limited to the Buffer Zone).

☐ 5. The area and/or work described on referenced plan(s) and document(s) is subject to review and approval by:

Name of Municipality

Pursuant to the following municipal wetland ordinance or bylaw:

Name | Ordinance or Bylaw Citation

B. Determination (cont.)

☐ 6. The following area and/or work, if any, is subject to a municipal ordinance or bylaw but not subject to the Massachusetts Wetlands Protection Act:

☐ 7. If a Notice of Intent is filed for the work in the Riverfront Area described on referenced plan(s) and document(s), which includes all or part of the work described in the Request, the applicant must consider the following alternatives. (Refer to the wetland regulations at 10.58(4)c. for more information about the scope of alternatives requirements):

- ☐ Alternatives limited to the lot on which the project is located.
- ☐ Alternatives limited to the lot on which the project is located, the subdivided lots, and any adjacent lots formerly or presently owned by the same owner.
- ☐ Alternatives limited to the original parcel on which the project is located, the subdivided parcels, any adjacent parcels, and any other land which can reasonably be obtained within the municipality.
- ☐ Alternatives extend to any sites which can reasonably be obtained within the appropriate region of the state.

Negative Determination

Note: No further action under the Wetlands Protection Act is required by the applicant. However, if the Department is requested to issue a Superseding Determination of Applicability, work may not proceed on this project unless the Department fails to act on such request within 35 days of the date the request is post-marked for certified mail or hand delivered to the Department. Work may then proceed at the owner's risk only upon notice to the Department and to the Conservation Commission. Requirements for requests for Superseding Determinations are listed at the end of this document.

☒ 1. The area described in the Request is not an area subject to protection under the Act or the Buffer Zone. SEE ATTACHMENT A

☐ 2. The work described in the Request is within an area subject to protection under the Act, but will not remove, fill, dredge, or alter that area. Therefore, said work does not require the filing of a Notice of Intent.

☐ 3. The work described in the Request is within the Buffer Zone, as defined in the regulations, but will not alter an Area subject to protection under the Act. Therefore, said work does not require the filing of a Notice of Intent, subject to the following conditions (if any).

☐ 4. The work described in the Request is not within an Area subject to protection under the Act (including the Buffer Zone). Therefore, said work does not require the filing of a Notice of Intent, unless and until said work alters an Area subject to protection under the Act.

B. Determination (cont.)

☐ 5. The area described in the Request is subject to protection under the Act. Since the work described therein meets the requirements for the following exemption, as specified in the Act and the regulations, no Notice of Intent is required:

Exempt Activity (site applicable statuatory/regulatory provisions)

☐ 6. The area and/or work described in the Request is not subject to review and approval by:

Name of Municipality

Pursuant to a municipal wetlands ordinance or bylaw.

Town of Bridgewater Wetland By-Law

Name | Ordinance or Bylaw Citation

C. Authorization

This Determination is issued to the applicant and delivered as follows:

☐ by hand delivery on | ☐ by certified mail, return receipt requested on

Date | Date

This Determination is valid for **three years** from the date of issuance (except Determinations for Vegetation Management Plans which are valid for the duration of the Plan). This Determination does not relieve the applicant from complying with all other applicable federal, state, or local statutes, ordinances, bylaws, or regulations.

This Determination must be signed by a majority of the Conservation Commission. A copy must be sent to the appropriate DEP Regional Office (see http://www.mass.gov/dep/about/region.findyour.htm) and the property owner (if different from the applicant).

Signatures:

Date

Attachment A

Order of Conditions

Applicant: **Marilyn's Landing**
645 Walnut Street, Bridgewater, MA 02324

Project location: **Off Plymouth Street, Map 40, Parcel 16 and 17, Bridgewater, MA, 02324**

---

1. The Commission's Negative Determination that finds the isolated area as a non-resource area is based only on the Wetlands Protection Act and the Town of Bridgewater Wetland Bylaws; and the fact that the stormwater runoff from the adjoining closed landfill has been abated by the owner of the landfill. No determination has been made herein relative to any Federal wetlands.

APPENDIX E
BRIDGEWATER AND HALIFAX APPROVAL LETTERS
(2017-2022)

Town of Bridgewater Massachusetts

BRIDGEWATER

Town Manager's Office

Municipal Office Building
66 Central Square
Bridgewater, MA 02324
508-697-0919

July 13, 2022

Millie Garcia-Serrano, Regional Director
MassDEP Southeast Regional Office
20 Riverside Drive
Lakeville, MA 0234 7

Re: Acceptance of Remediation Waste at Marilyn's Landing, Bridgewater, MA

Dear Ms. Garcia-Serrano:

Please be advised that on July 12, 2022, during a duly publicly noticed Town Council Meeting, the Council voted unanimously to approve the acceptance of remediation waste at Marilyn's Landing, provided it meets acceptance criteria under applicable MassDEP regulations and policy. Previously, on February 15, 2017, the Community and Economic Development Committee voted unanimously to recommend approval.

Please see attached the agenda for the Town Council meeting. Minutes to this meeting are pending.

If you have any questions or concerns, please do not hesitate to contact my office directly at 508-697-0919.

Respectfully submitted,

Michael Dutton
Town Manager

Encl.

BRIDGEWATER TOWN COUNCIL

Tuesday, July 12, 2022
7:00 p.m.
Academy Building
66 Central Square
Council Chamber, Room 203
Bridgewater MA

MEETING AGENDA

A. APPROVAL OF MINUTES FROM PREVIOUS MEETINGS
   a) May 24, 2022
   b) June 7, 2022
   c) June 21, 2022

B. ANNOUNCEMENTS FROM THE PRESIDENT

C. PROCLAMATIONS
   a) City of Peace Proclamation *(Town Manager)*

D. CITIZEN OPEN FORUM

E. APPOINTMENTS
   a) Planning Board: Ted Haley "Alternate Member" (Term 2022-2027)
   b) Planning Board: MJ Spagone "Alternate Member" (Term 2022-2027)
   c) Elder Affairs Commission Reappointment: Sandra Alley (2022-2025)
   d) Energy Committee: Kristen Zarrelli (2022-2025)
   e) Conservation Commission: Sara Sperber (2022-2025)
   f) Town Council Finance Committee Appointee

F. HEARINGS
   a) **7:05p.m.** Order O-FY22-065: Laying Out and Accepting a Private Way – Crimson Way *(Moore)*
      At their meeting held 6/1/22, the Planning Board voted unanimously to recommend acceptance. This measure has been duly advertised for public hearing in the Enterprise, on the Town's website and abutters noticed. This measure may be finally considered this evening upon conclusion of the hearing.
   b) **7:08p.m.** Ordinance D-FY22-024: Zoning Ordnance – Zoning Map Amendment – Main Street *(Sousa)*
      This hearing has been duly advertised in the Enterprise and on the Town's website. At their 6/21/22 meeting the Town Council voted to amend and remove "Map 34 Parcel 44".

G. LICENSE TRANSACTIONS

H. PRESENTATIONS
   a) The Public Health Hazards of Raw Milk

I. TOWN MANAGER'S REPORT

a) Mitchell School Update

J. DISCUSSIONS

K. COMMITTEE REPORTS

L. LEGISLATION FOR ACTION

a) Order O-FY22-056: Sale of Raw Milk (*Sousa)*
The Community Economic and Development committee voted 2-1 to return to Town Council without a recommendation at their 6/30/22 meeting.

b) Order O-FY22-057: Order of Taking (*Town Manager)*
The Community Economics and Development Committee voted 3-0 to recommend at their 6/30/22 meeting.

c) Order O-FY22-075: Ratification of the Amended Agreement for the Bristol-Plymouth Regional School District *(Town Manager)*
This Order was not referred to any committee. 14 days have elapsed, therefore it may be finally considered this evening.

d) Resolution R-FY22-010: Acknowledgment of the Acceptance of Remediation Waste at Marilyn's Landing Land Reclamation Project (*Town Manager)*
The Community Economics and Development Committee voted 3-0 to recommend at their 6/30/22 meeting.

e) Resolution R-FY22-011: Amend September 2022 Town Council Meeting Date (*Chase*)
This Resolution was not referred to any committee. 14 days have elapsed, therefore it may be finally considered this evening.

M. OLD BUSINESS

N. NEW BUSINESS

a) Resolution R-FY22-012: A Resolution Adopting the Town of Bridgewater, MA Hazard Mitigation Plan 2022 (*Town Manager)*

b) Ordinance D-FY22-025: General Ordinances. Chapter 50 Buildings, Article II Naming of Town Buildings and Facilities (*Moore)*

O. CITIZEN COMMENTS

P. COUNCIL COMMENTS

Q. EXECUTIVE SESSION

R. ADJOURNMENT

TOWN OF HALIFAX
Commonwealth of Massachusetts

OFFICE OF THE BOARD OF SELECTMEN
499 PLYMOUTH STREET
HALIFAX, MA 02338

TEL: 781-294-1316
FAX: 781-294-7684

April 28, 2022

Ms. Millie Garcia-Sarrano
Regional Director
MassDEP Southeast Regional Office
20 Riverside Drive
Lakeville, MA 02347

Dear Ms. Millie Garcia-Sarrano

Please allow this correspondence to serve as confirmation that the Town of Halifax does not have any concerns relative o the acceptance of remediation waste at Marilyn's Landing and reclamation project.

Sincerely yours,

Gordon C. Andrews
Chair, Board of Selectmen

Bridgewater Town Council

In Town Council, Tuesday, October 5, 2021

Council Resolution: R-FY21-011

Introduced By:	Councilors Rushton
Date Introduced	October 5, 2021
First Reading:	October 5, 2021
Second Reading:	
Amendments Adopted:	
Date Adopted:	
Date Effective:	

Resolution R-FY21-011

ACKNOWLEDGEMENT OF THE ACCEPTANCEOF CATCH BASIN CLEANING AT MARILYN'S LANDING LAND RECLAMATION PROJECT

WHEREAS; on February 28, 2017, Town Council unanimously approved issuance of a letter to the Massachusetts Department of Environmental Protection ("MassDEP") consenting to the land reclamation project at approximately eight (8) acres of land owned by MacDonald Industries, D/B/A Marilyn's Landing that has been mined of its soils, gravel, and stone;

WHEREAS; the Department of Environmental Protection has issued an Administrative Consent Order approving the land reclamation project.;

WHEREAS; the Department of Environmental Protection oversees the reclamation process, including the testing of all fill;

WHEREAS; MacDonald Industries now proposes to accept municipal catch basin cleanings ("CBC") at Marilyn's Landing and to accept CBC from the Town of Bridgewater free of charge;

WHEREAS; acceptance of CBC is subject to sampling as required by MassDEP, and such sampling results shall not exceed existing testing criteria for soil;

WHEREAS; the Town Manager recommends the issuance of municipal consent based upon the DEP policy governing land reclamation, and;

WHEREAS; land reclamation will bring the land contour back to its approximate original form,

NOT FOR ACTION – FIRST READING ONLY.

October 8, 2021

Richard Stromberg, LSP
Boston Environmental Corp.
338 Howard Street
Brockton, MA 02302

Subject: Marilyn's Landing / BFI Halifax Landfill
CBC Stability and Settlement Review
CEC Project 175-313

Dear Mr. Stromberg:

As requested, Civil & Environmental Consultants, Inc. (CEC) has reviewed the impact of placement of catch basin cleanings (CBC) at the Marilyn's Landing Commercial Re-Use Area (MLCRA) and the adjacent BFI Halifax Landfill with respect to the stability and settlement analyses previously performed and included in the BWP SW36 Post-Closure Use permit application. The permit application was prepared to address placement of approved soils on previously capped areas of the landfill. The analyses assumed that only soil would be placed and used material properties in the analyses representative of soil. In order to confirm that placement of CBC would not adversely impact the overall stability or result in settlement not originally contemplated, CEC obtained a sample of CBC to perform laboratory testing to determine the actual material properties. The sample was obtained by sampling soil from several locations within the stockpile, creating a composite sample. The composite CBC sample was tested for direct shear (ASTM D3080), modified Proctor (ASTM D1557), and moisture content (ASTM D2216). The laboratory tests results are attached.

The original stability analyses assumed a shear strength angle of 30 degrees and a cohesion of 105 pounds per square foot (psf). Based on the laboratory results, the CBC material exhibited a shear strength angle of 32.7 degrees and a cohesion of 311 psf. Since the CBC material is stronger than the properties of the soil waste used in the analyses, the placement of CBC fill will not have an impact on the design factor of safety calculated in the permit application.

The original settlement analyses were calculated assuming a unit weight of soil of 120 pounds per cubic foot (pcf). The modified Proctor results for the CBC result in a maximum dry density of 116.5 pcf. The range of in-place unit weight of the CBC will vary based on compaction and moisture content, but given the nature of the material, the CBC unit weight range will be similar to the unit weight used in the calculations and will not alter the acceptable results of the settlement analysis.

It is our understanding that the amount of CBC material that will be placed will range between 10 to 20 percent of the overall soil placed in the project area. Given the results of the laboratory analyses, the CBC fill not have an adverse impact on the results of the stability or settlement previously calculated, regardless of total volume placed. CEC's conclusion is based on the material results attached with this submittal. As additional material is placed in the source CBC stockpile, the material should be visually observed to verify that there is not a substantial difference that would affect the material properties. Additionally, the CBC should be dewatered prior to placement.

If you have any questions on the information provided, please feel free to contact us.

Sincerely,

CIVIL & ENVIRONMENTAL CONSULTANTS, INC.

Karlis Skulte, P.E.
Principal

Amy J. Knight, P.E.
Principal

Enclosures: Laboratory Results

cc: Marilyn MacDonald - MLCRA

RSA GEOLAB

1017 Greeley Ave N
Union, NJ 07083
908-964-0786
www.RSAGeolab.com

Letter of Transmittal

Date: 9-3-21 Job No.: 866 Lab Log: 21-657

Attention: Amy Knight
Civil Environmental Consultants, Inc.
31 Bellows Rd.
Raynham, MA 02767

CC: Karlis Skulte

Re: Marilyns Landing – CBC, Halifax, MA
Project#175-313

Sample(s) ID: **CBC-1**

Dear Ms. Knight,

Please find attached results for the samples referenced above. The following lab testing was performed:

- ASTM D2216 Moisture Content
- ASTM D1557 Modified Proctor
- ASTM D3080 Direct Shear (2500, 5000, 10000 psf)

Regards,
RSA Geolab, LLC

Remarks: If you have any questions, please call 908-964-0786.

Signed: _____

Dr. Raza S. Ahmed
President RSA Geolab, LLC

RSA GEOLAB

1017 Greeley Ave N
Union, NJ 07083
908-964-0786
www.RSAGeolab.com

MOISTURE CONTENTS

TEST METHOD ASTM D-2216

CLIENT: Civil Environmental Consultants, LLC **DATE:** 03-Sep-21

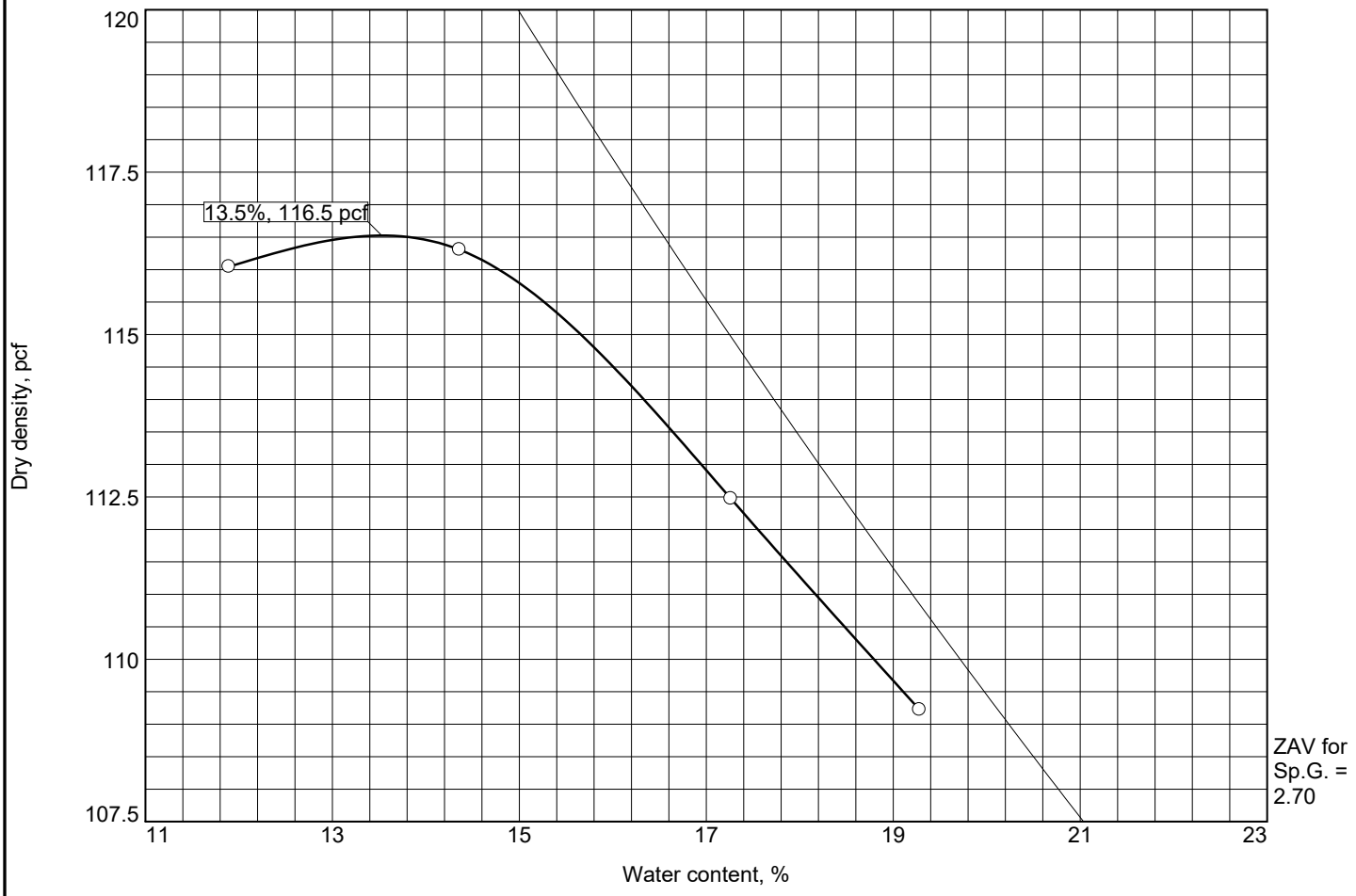
PROJECT: Marilyns Landing - CBC, Halifax, MA
Project#175-313 **PROJECT #:** 848

HOLE #/ SAMPLE #	CBC-1				
DEPTH					
WET WGT. + tare (gms.)	293.1				
DRY WGT. + tare (gms.)	251.1				
WGT. WATER (gms.)	42.0	0.0	0.0	0.0	0.0
TARE (gms.)	7.5				
DRY WGT. (gms.)	243.6	0.0	0.0	0.0	0.0
MOISTURE CONTENT	17.2%	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!

HOLE #/ SAMPLE #					
DEPTH					
WET WGT. + tare (gms.)					
DRY WGT. + tare (gms.)					
WGT. WATER (gms.)	0.0	0.0	0.0	0.0	0.0
TARE (gms.)					
DRY WGT. (gms.)	0.0	0.0	0.0	0.0	0.0
MOISTURE CONTENT	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!

Performed by: MF Entered by: KH Checked by: KP

COMPACTION TEST REPORT



Test specification: ASTM D 1557-12 Method B Modified
ASTM D4718-15 Oversize Corr. Applied to Each Test Point

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > 3/8 in.	% < No.200
	USCS	AASHTO						
				2.7			12.8	

ROCK CORRECTED TEST RESULTS	UNCORRECTED	MATERIAL DESCRIPTION
Maximum dry density = 116.5 pcf	111.2 pcf	Very Dark Brown cmf Sand some, mf Gravel, trace Clay & Silt, organics (visual)
Optimum moisture = 13.5 %	13.5 %	

Project No. 848 **Client:** Civil Environmental Consultants, LLC
Project: Marilyns Landing - CBC, Halifax, MA
Project#175-313
○ **Sample Number:** CBC-1

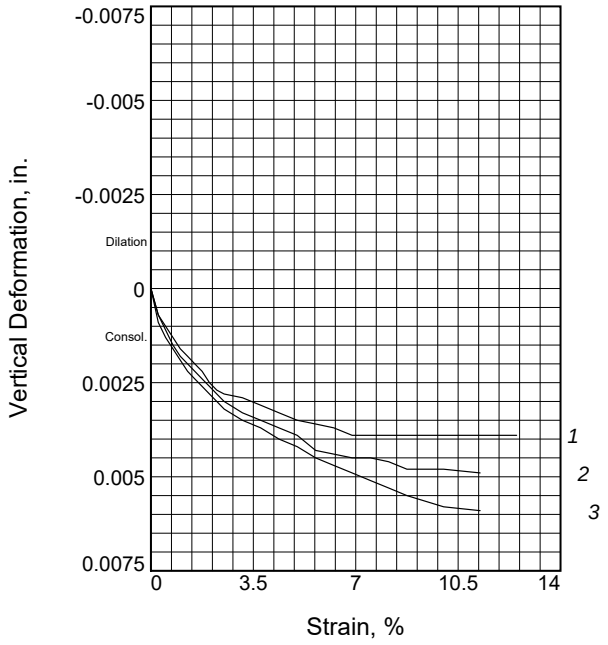
RSA Geolab

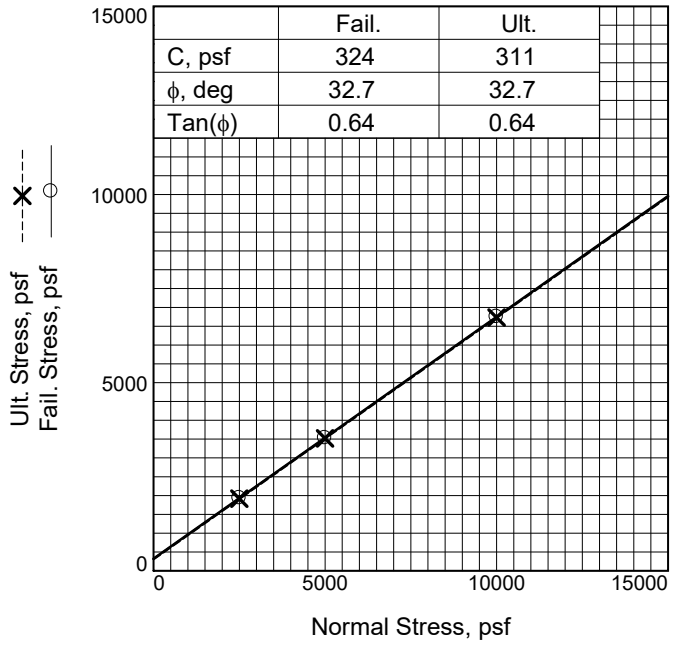
Union, New Jersey

Remarks:
SG Assumed. Machine tested.
9-3-21

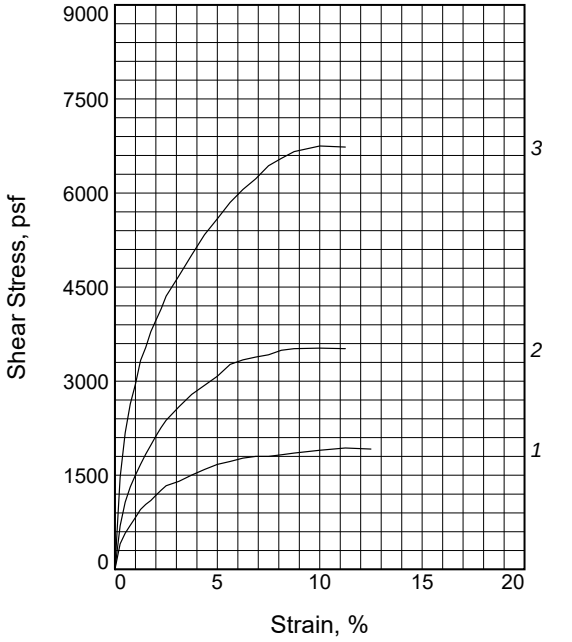
Figure

Tested By: BP **Checked By:** KP





	Fail.	Ult.
C, psf	324	311
ϕ, deg	32.7	32.7
Tan(ϕ)	0.64	0.64



Sample No.		1	2	3
Initial	Water Content, %	17.2	17.4	17.3
	Dry Density, pcf	93.1	93.0	93.0
	Saturation, %	57.4	57.7	57.6
	Void Ratio	0.8105	0.8124	0.8119
	Side Length, in.	4.00	4.00	4.00
	Height, in.	1.00	1.00	1.00
At Test	Water Content, %	21.5	17.3	16.4
	Dry Density, pcf	93.8	94.9	95.4
	Saturation, %	72.7	60.0	57.6
	Void Ratio	0.7970	0.7761	0.7666
	Side Length, in.	4.00	4.00	4.00
	Height, in.	0.99	0.98	0.97
Normal Stress, psf		2500	5000	10000
Fail. Stress, psf		1935	3528	6750
Strain, %		11.3	10.0	10.0
Ult. Stress, psf		1917	3519	6732
Strain, %		12.5	11.3	11.3
Strain rate, in./min.		0.008	0.008	0.008

Sample Type: ASTM D3080
Description: Very Dark Brown cmf Sand some, mf Gravel, trace Clay & Silt, organics (visual)

Assumed Specific Gravity= 2.7
Remarks: Recompacted sample (80%MDD of ASTM D1557, as rec'd moisture). Tested with water in box. Consolidate/Saturate 1 hr.

Figure _____

Client: Civil Environmental Consultants, LLC

Project: Marilyns Landing - CBC, Halifax, MA
Project#175-313
Sample Number: CBC-1

Proj. No.: 848 **Date Sampled:** 9-3-21

DIRECT SHEAR TEST REPORT
RSA Geolab
Union, New Jersey

Tested By: MF/ED **Checked By:** KP

BE IT RESOLVED: The Town Council acknowledges and approves the acceptance of CBC at Marilyn's Landing, provided it is approved by MassDEP and meets all applicable regulatory standards.

Explanation: In 2017 the Town Council unanimously voted a resolution approving a letter of support for Marilyn's Landing land reclamation project. The project straddles the Bridgewater/Halifax town line and is made up of the capped landfill on one side and Marilyn's Landing on the other. As noted in the resolution, the Department of Environmental Protection oversees the project and all fill used to reclaim the land, including determining appropriate materials, testing, and site compliance. This confirmation is sought by the DEP to confirm the Town's understanding that catch basin cleanings are permitted as part of the fill used to reclaim the land. The Town of Halifax has already assented to the DEP request.

Committee Referrals and Dispositions:

Referral(s)	Disposition(s)
•	•

TOWN OF HALIFAX
Commonwealth of Massachusetts

Board of Selectmen
499 Plymouth Street
Halifax, MA 02338

Telephone: 781-294-1316
Fax: 781-294-7684

June 30, 2020

Ms. Marilyn MacDonald
MacDonald Industries
1921 Plymouth Street
Bridgewater, MA 02324

The Halifax Board of Selectmen continues to receive updates about the ongoing work at the Marilyn's Landing site including the progress of bringing in non-COMM 97 soils to provide elevation for the proposed solar field to be constructed once the site work is completed. The Board understands that under Phase III these non-COMM 97 soils will continue to be brought into the site to fill in the "swale" between the two elevated portions of the property and that this work is being done on land located within the Town's boundaries.

Halifax Board of Selectmen

Thomas Millias, Chairman

Gordon C. Andrews, Vice-Chairman

Troy E. Garron, Clerk

Cc: Halifax Board of Health

Community & Economic Development Division
Health Department

Municipal Office Building
66 Central Square
Bridgewater, MA 02324
508-697-0903

April 2, 2019

To: Millie Garcia- Serrano

Regional Director
MassDEP South East Regional Office
20 Riverside Drive
Lakeville Ma 02347

Re: Current Operational Status of ***Marilyn's Landing Bridgewater, MA***

As of 4/1/2019 no new changes have been required by the Bridgewater Health Department in the Town of Bridgewater.

1. No new wells have been installed
2. No increase in truck volume or tonnage has been requested during phase 3
3. No complaints about the project have come to the attention of the Health Department or Town Managers office.
4. No change request has been made for operational hours 6a-6p
5. Project timetable of 3-5yrs as estimated.
6. Solar project time table and intent (Phase 4)

Respectfully,

Eric J. Badger
Health Agent
Bridgewater Health Department
508-697-0903

Community & Economic Development Division
Health Department

Municipal Office Building
66 Central Square
Bridgewater, MA 02324
508-697-0903

April 2, 2019

To: Millie Garcia- Serrano

Regional Director
MassDEP South East Regional Office
20 Riverside Drive
Lakeville Ma 02347

Re: Current Operational Status of ***Marilyn's Landing Bridgewater, MA***

As of 4/1/2019 no new changes have been required by the Bridgewater Health Department in the Town of Bridgewater.

1. No new wells have been installed
2. No increase in truck volume or tonnage has been requested during phase 3
3. No complaints about the project have come to the attention of the Health Department or Town Managers office.
4. No change request has been made for operational hours 6a-6p
5. Project timetable of 3-5yrs as estimated.
6. Solar project time table and intent (Phase 4)

Respectfully,

Eric J. Badger
Health Agent
Bridgewater Health Department
508-697-0903

Bridgewater:
Preserving Our Past, Enriching Our Present, Building Our Future.

Town of Bridgewater Massachusetts

BRIDGEWATER

Community & Economic Development Division
Health Department

Municipal Office Building
66 Central Square
Bridgewater, MA 02324
508-697-0903

June 7, 2018

Millie Gracia-Serrano
Regional Director
Southeast Regional Office
MassDEP
20 Riverside Drive
Lakeville, MA 02367

Re: MacDonald Industries, d/b/a/ Marilyn's Landing

Dear Ms. Garcia-Serrano:

At the request of MacDonald Industries, Inc., d/b/a Marilyn's Landing, the Bridgewater Health Department alongside Bridgewater Town Managers office met with Marilyn MacDonald on May 24, 2018 for an update on the current soil fill project.

Mrs. MacDonald has continued to update our offices periodically as the fill project continues. Our meeting on May 24, 2018 discussed "Phase III" of the soil fill project. In cooperation with Republic Services, Inc. MacDonald Industries proposes to fill the empty space between the Bridgewater site and the Republic site located on the Halifax side. It was also discussed in detail how this would be done. MacDonald Industries proposed using material designated as "COMM-97" soils, subject to approval by Mass DEP.

With approval of MassDEP placement of COMM-97 soils, the swale seems to be the ideal area for "COMM-97" fill soils. After this is accomplished it is the intention of MacDonald Industries to install a Solar Array system. Once this area is filled and meets all approvals by Mass DEP, Town of Halifax, and Town of Bridgewater.

It is no doubt that the long-term benefits of this project with be exponential for both Towns of Bridgewater & Halifax. Anytime you can take a site designated for waste and turn into a site where clean energy can be produced for future generations is always a benefit for everyone.

Please accept this letter as a non-binding letter of support by the Bridgewater Health Department, and Bridgewater Town Manger for the proposed "Phase III" project.

Respectfully,

Eric J. Badger
Health Agent, Bridgewater Health Department

Michael Dutton
Bridgewater Town Manager

Bridgewater:
Preserving Our Past, Enriching Our Present, Build

TOWN OF HALIFAX
COMMONWEALTH OF MASSACHUSETTS
Board of Health
499 Plymouth St., Halifax, MA 02338
Telephone (781) 293 6768 **Fax (781) 293 1738**
Health Agent: cdrinan@town.halifax.ma.us
Administrative Assistant: mselter@town.halifax.ma.us

June 6, 2018

Millie Garcia-
Serrano Regional
Director Southeast
Regional Office
MassDEP
20 Riverside Drive
Lakeville, MA 02367

Re: MacDonald Industries, d/b/a/ Marilyn's Landing

Dear Ms. Garcia-Serrano:

At the request of MacDonald Industries, Inc., d/b/a Marilyn's Landing ("MacDonald"), the Halifax Board of Health ("'BOH") provided public notice of a regularly scheduled BOH meeting on May 16, 2018, with the subject of a soil fill project update on the agenda. See attached notices of agenda.

At the May 16th meeting, Marilyn MacDonald provided an update of its soil fill project activities since her last appearance before the BOH on March 15, 2017.

During the March 15, 2017 BOH meeting, after posing questions to representatives of Marilyn's Landing, its members voted unanimously to support the proposed project, subject to a cooperative agreement with Republic Industries, Inc., obtaining all necessary regulatory approvals, and reserving the right of the BOH to exercise its authority, including inspection of operations upon adequate notice and to sample incoming loads of soil.

Subsequent to the March 15, 2017 Board of Health meeting, additional information was obtained on March 31, 2017 by one of the Board of Health members regarding the DEP approval process and clarification of the details about the proposed finished height of the proposed land filling operation of both Republic Services, Inc. and MacDonald Industries, Inc. Their proposal is to reach a final maximum elevation based on the datum referenced on the Halifax Landfill Expansion Site Plan dated 01-07-1991, Revised to 02-05-1991 by Defeo, Wait & Associates, Inc. of 144 feet. The current height of the landfill, formerly owned by BFI and now owned by Republic Services, Inc. is approximately 64 feet above the base grade of the former BFI landfill. The MacDonald Industries proposal would add another 24' in height to the landfill. The result would make the top of the proposed landfill about 88' above the landfill base.

After reviewing this additional information, and contacting MassDEP to understand its view of this project, I inspected Marilyn's Landing and viewed the area of the proposed fill

project. During my inspection, I found the operations to be free of nuisance conditions and exactly as described by Ms. MacDonald to the BOH during the meeting March 15, 2017. The swale between the closed Halifax Landfill and Marilyn's Landing appeared to be an ideal area for fill deposition and subsequent installation of a solar array system.

On April 5, 2017, during a regularly scheduled meeting whereby the subject matter of the MacDonald Industries, Inc. proposal was posted on the Board's agenda, the aforesaid new information was discussed by the Board members. After deliberating on the matter, its members voted unanimously to affirm the vote taken March 15, 2017.

The BOH issued a letter addressed to you, dated April 5, 2017, affirming the Board's support of activities through Phase II.

During the recent May 16th meeting, Ms. MacDonald reported on the progress in their proposal to expand its current soil fill operation in Bridgewater ("Phase III"). In cooperation with Republic Services, Inc. ("Republic") MacDonald proposes to fill air space between its property and the adjacent closed landfill with materials characterized as "COMM-97" soils, subject to approval by Mass DEP. The BOH has been made aware that both MacDonald and MassDEP have characterized the currently proposed project as "Phase III;" Phase I utilizing RCS-1 soil fill, and Phase II utilizing RCS-2 soil fill, as approved under an administrative consent order issued by MassDEP on November 30, 2017. Ms. MacDonald emphasized that their proposal is to reach a final maximum elevation of 144 feet, a similar height prior to historic excavation of soil at this location. At final grade, MacDonald Industries and Republic Services proposes a solar array spanning across the closed landfill and the MacDonald property.

Provided that MassDEP approves placement of COMM-97 soils, Ms. MacDonald explained that the Town of Halifax would benefit financially through a negotiated community host fee, despite the fact that the material is soil, rather than municipal solid waste. Also, if MacDonald Industries, Inc. and Republic Services receive approval of the solar array project, there may be benefits accrued to Halifax under that permitting process and taxes.

The May 16th BOH meeting concluded with the Board voting unanimously to support the so-called "Phase III" project proposal as described herein.

Please accept this letter as a non-binding letter of support by the Halifax Board of Health for the proposed "Phase III" project.

Very truly yours,

John DeLano
Chairman, Halifax Board of Health

cc: David and Marilyn MacDonald
Charlie Seelig, Town Administrator
Halifax Board of Selectmen
Nick Stefkovich, Republic Ind.

TOWN OF HALIFAX
COMMONWEALTH OF MASSACHUSETTS
Board of Health
499 Plymouth St., Halifax, MA 02338
Telephone (781) 293 6768 **Fax (781) 293 1738**
Health Agent: cdrinan@town.halifax.ma.us
Administrative Assistant: mselter@town.halifax.ma.us

April 5, 2017

Millie Garcia-Serrano
Regional Director
Southeast Regional Office
MassDEP
20 Riverside Drive
Lakeville, MA 02367
Re: MacDonald Industries, d/b/a/ Marilyn's Landing

Dear Ms. Garcia-Serrano:

At the request of MacDonald Industries, Inc., d/b/a Marilyn's Landing, the Halifax Board of Health ("BOH") provided public notice of a regularly scheduled BOH meeting on February 1, 2017, March 1, 1017, March 15, 2017, and April 5, 2017, with the subject of a soil fill project on the agenda. See attached notices of agenda.

At the February 1st meeting, MacDonald Industries described its proposal to expand its current soil fill operation in Bridgewater, in cooperation with Republic Services, Inc., to fill air space between its property and the adjacent closed landfill with material approved by Mass DEP. Their proposal is to reach a final maximum elevation of 144 feet, a similar height prior to historic excavation of soil at this location. At final grade, MacDonald Industries proposes a solar array spanning across the closed landfill and the MacDonald Industries property. A public notice of this BOH agenda item was filed with the Town Clerk on January 30, 2016.

On March 1, 2017, during a regularly scheduled meeting, the BOH addressed an interest in conducting a site visit at the Marilyn's Landing facility. The agenda for this meeting was filed with the Town Clerk on February 27, 2017. A copy of both these notices are attached.

During the March 15, 2017 BOH meeting, after posing questions to representatives of Marilyn's Landing, its members voted unanimously to support the proposed project, subject to a cooperative agreement with Republic Industries, Inc., obtaining all necessary regulatory approvals, and reserving the right of the BOH to exercise its authority, including inspection of operations upon adequate notice and to sample incoming loads of soil.

Subsequent to the March 15, 2017 Board of Health meeting, additional information was obtained on March 31, 2017 by one of the Board of Health members regarding the DEP approval process and clarification of the details about the proposed finished height of the proposed land filling operation of both Republic Services, Inc. and MacDonald Industries, Inc. Their proposal is to reach a final maximum elevation based on the datum referenced on the Halifax Landfill Expansion Site Plan dated 01-07-1991, Revised to 02-05-1991 by Defeo, Wait & Associates, Inc. of 144 feet. The current height of the landfill, formerly owned by BFI and now owned by Republic Services, Inc is approximately 64 feet above the base grade of the former BFI landfill. The MacDonald Industries proposal would add another 24' in height to the landfill. The result would make the top of the proposed landfill about 88' above the landfill base.

In addition, discussions with both DEP and MacDonald Industries, Inc. representatives, clarification was obtained on the nature of the benefits accrued to Halifax residents if the project were to be constructed. The benefits to Halifax would only be accrued through its authority, if any, under the Post Closure Modification of the Republic Services, Inc. landfill. Therefore those benefits would be spelled out in any approval agreements with Republic Services, Inc. Also, if MacDonald Industries, Inc. receives approval of the solar array project, there may be benefits accrued to Halifax under that permitting process.

On April 5, 2017, during a regularly scheduled meeting whereby the subject matter of the MacDonald Industries, Inc. proposal was posted on the Board's agenda, the aforesaid new information was discussed by the Board members. After deliberating on the matter, its members voted unanimously to affirm the vote taken March 15, 2017.

The Board understands that Mass DEP's approval of this project would be issued under an administrative consent order, and would be based on Policy #COMM-15-01 or solid waste regulations at 310 CMR 19.000, as applicable.

Please accept this letter as a non-binding letter of support by the Halifax Board of Health for this proposed project.

Very truly yours,

John DeLano
Chairman, Halifax Board of Health

cc: David and Marilyn MacDonald
Charlie Seelig, Town Administrator
Halifax Board of Selectmen
Christopher October, Republic Industries

Town Manager's Office

Municipal Office Building
66 Central Square
Bridgewater, MA 02324
508-697-0919

March 31, 2017

Millie Garcia-Serrano
Regional Director
Southeast Regional Office
MassDEP
20 Riverside Drive
Lakeville, MA 02367

Re: MacDonald Industries, d/b/a Marilyn's Landing

Dear Ms. Garcia-Serrano:

MacDonald Industries owns approximately 8 acres of land in the Town of Bridgewater upon which it is currently operating a soil fill facility since 8/13/13 under approval by the Board of Health. MacDonald Industries has proposed to expand its operation, in cooperation with Republic Services, Inc., to fill air space between its property and the adjacent closed landfill with material approved by MassDEP. I understand that MassDEP's approval would be based on Policy #COMM-15-01 or solid waste regulations at 310 CMR 19.000, as applicable.

The MacDonald's proposal was included in a duly noticed agenda for the January 24, 2017 Town Council Meeting, which was televised on the local cable channel. Council members voted (unanimously) to approve the proposal, subject to MassDEP approval.

Please call if you have any questions.

Very truly yours,

Michael Dutton
Town Manager

cc: David and Marilyn MacDonald

Town Manager's Office

Municipal Office Building
66 Central Square
Bridgewater, MA 02324
508-697-0919

September 21, 2017

Millie Garcia-Serrano
Regional Director
MassDEP South East Regional Office
20 Riverside Drive
Lakeville, MA 02347

RE: ***Marilyn's Landing Bridgewater, MA (Table 2 RCS-2 Acceptance Criteria)***

Dear Ms. Garcia-Serrano:

Please allow this correspondence to serve as confirmation that the Town of Bridgewater does not have any concerns relative to the proposed Marilyn's Landing project in order to move forward with their ACO and Soil Management Plan. This confirmation is in agreement with our Health Department's response to the Table 2 RCS-2 Acceptance Criteria.

If you have any questions or concerns, please do not hesitate to contact my office directly.

Respectfully Submitted,

Michael Dutton
Town Manager

Community & Economic Development Division
Health Department

Municipal Office Building
66 Central Square
Bridgewater, MA 02324
508-697-0903

September 1, 2017

To: Millie Garcia –Serrano
Regional Director
MassDep South East Regional Office
20 Riverside Drive
Lakeville Ma 02347

Re: ***Marilyn's Landing Bridgewater, MA (Table 2 RCS- 2 Acceptance Criteria)***

I have reviewed the findings of Table 2 RCS- 2 Acceptance Criteria for Marilyn's Landing . All information past and present has been provided to this office as requested. I have found no concern at this time with the findings. If there is anything else your office needs to provide the Bridgewater Health Department, please do so in a timely manner.

Respectfully,

Eric J. Badger
Health Agent
Bridgewater Health Department
508-697-0903

TOWN OF BRIDGEWATER

Board of Health

Brian Penney, Chairman
Eric Colon, Member

TEL: 508-697-0903
FAX: 508-697-0947
lkeane@bridgewaterma.org

Academy Building – 66 Central Square
Bridgewater, MA 02324

May 3, 2013

Mrs. Marilyn MacDonald
645 Walnut Street
Bridgewater, MA 02324

Re: MacDonald Industries, Plymouth St. Bridgewater
Site for Proposed Solar Farm
Request to bring soils onto the property

Dear Mrs. MacDonald:

This letter is to inform you that the Board of Health has voted on the approval to move forward with bringing soils into the land that is to be used for a future solar farm on Plymouth St. As you are aware, the approval and vote were taken at a previous meeting and part of the agreement was that the Board of Health holds regulatory authority over inspection of any of the soils brought into the Town of Bridgewater at any given time.

The Board of Health has authorized me as Health Agent, to test or order to be tested the soils being brought into Bridgewater from any truck or any part of the site as designated by the Agent.

This letter shall serve as notification that MacDonald Industries is hereby authorized by the Board of Health to start the process of bringing soils to the site. The Board of Health should be informed of any questions from other departments or if the process has not yet been completed.

Sincerely,

Eric Badger
Health Agent

C: Mike White, Building Inspector, Dick Monteith, Chairman Conservation Commission, Greg Guimond, Town Planner

TOWN OF HALIFAX
Commonwealth of Massachusetts

Town Administrator
499 Plymouth Street
Halifax, MA 02338

Telephone: 781-294-1316
Fax: 781-294-7684
E-mail: cseelig@town.halifax.ma.us

June 10, 2013

Mr. William L. French, Sr.
W. L. French Excavating Corporation
3 Survey Circle
North Billerica, MA 01862

Dear Mr. French,

As you have requested a copy of my October 26, 2011 letter concerning the McDonald landfill and it has been more than eighteen months since the date of that letter, I wanted to supplement that letter with this one.

The Town's understanding of the project during the interval has not changed, but the Board of Selectmen would appreciate being given sufficient notice before truck traffic begins so that the Board can notify all the Town departments.

Sincerely yours,

Charlie Seelig
Town Administrator
Town of Halifax

TOWN OF HALIFAX
Commonwealth of Massachusetts

Town Administrator
499 Plymouth Street
Halifax, MA 02338

Telephone: 781-294-1316
Fax: 781-294-7684
E-mail: cseelig@town.halifax.ma.us

October 26, 2011

Mr. William L. French, Sr.
W. L. French Excavating Corporation
3 Survey Circle
North Billerica, MA 01862

Dear Mr. French,

Thank you for the presentation yesterday morning concerning the proposal solar energy project at the McDonald landfill on the Bridgewater side of the Halifax/Bridgewater Town Line. The Town understands that fill will be brought in via 50-ton tractor trailer trucks via Route 106 and use the access road, just east of the town line, to travel to the site. The Town understands that you plan to begin to bring in fill sometime between 3 and 6 months from now and the work will continue for two to three years, given the current scope (although this is subject to change). The Town understands that up to 200 tractor-trailer (50 ton) loads of fill per day will be delivered between the hours of 6am and 6pm. You have been notified that there are school bus turnarounds for the Bridgewaters and Halifax at this location and you have been notified about t the pre-school/daycare facility down the street.

After a review of this information with the Board of Selectmen, it was determined that the work does not require any permits or licenses from the Town of Halifax.

Sincerely yours,

Charlie Seelig
Town Administrator
Town of Halifax

Town Manager's Office

Municipal Office Building
66 Central Square
Bridgewater, MA 02324
508-697-0919

September 21, 2017

Millie Garcia-Serrano
Regional Director
MassDEP South East Regional Office
20 Riverside Drive
Lakeville, MA 02347

RE: ***Marilyn's Landing Bridgewater, MA (Table 2 RCS-2 Acceptance Criteria)***

Dear Ms. Garcia-Serrano:

Please allow this correspondence to serve as confirmation that the Town of Bridgewater does not have any concerns relative to the proposed Marilyn's Landing project in order to move forward with their ACO and Soil Management Plan. This confirmation is in agreement with our Health Department's response to the Table 2 RCS-2 Acceptance Criteria.

If you have any questions or concerns, please do not hesitate to contact my office directly.

Respectfully Submitted,

Michael Dutton
Town Manager

Community & Economic Development Division
Health Department

Municipal Office Building
66 Central Square
Bridgewater, MA 02324
508-697-0903

September 1, 2017

To: Millie Garcia –Serrano
Regional Director
MassDep South East Regional Office
20 Riverside Drive
Lakeville Ma 02347

Re: ***Marilyn's Landing Bridgewater, MA (Table 2 RCS- 2 Acceptance Criteria)***

I have reviewed the findings of Table 2 RCS- 2 Acceptance Criteria for Marilyn's Landing . All information past and present has been provided to this office as requested. I have found no concern at this time with the findings. If there is anything else your office needs to provide the Bridgewater Health Department, please do so in a timely manner.

Respectfully,

Eric J. Badger
Health Agent
Bridgewater Health Department
508-697-0903

Community & Economic Development Division
Health Department

Municipal Office Building
66 Central Square
Bridgewater, MA 02324
508-697-0903

December 12, 2018

To: Millie Garcia- Serrano
Regional Director
MassDep South East Regional Office
20 Riverside Drive
Lakeville Ma 02347

Re: ***Marilyn's Landing Bridgewater, MA (Table 1 RCS-2 Acceptance Criteria) "Changes to limits"***

I have reviewed the most recent changes to the minimum soil acceptance criteria in Table 1(RCS-2 Site). I have found no concerns at this time to these changes. If there is anything else which may need to be discussed, please feel free to contact the Bridgewater Health Department.

Respectfully,

Eric J. Badger
Health Agent
Bridgewater Health Department
508-697-0903

APPENDIX F
GROUNDWATER QUALITY DATA
(MLCRA/BFI Republic Landfill)

TABLE 1 - SUMMARY OF GROUNDWATER MONITORING RESULTS (Detected Analytes Only)
MARILYN'S LANDING COMMERCIAL REUSE AREA
946 PLYMOUTH STREET, BRIDGEWATER, MASSACHUSETTS
BEC JOB #18191

Parameter	RCGW-2 Reportable Concentrations (RCs)	MCP - Method 1 Cleanup Standards				SAMPLING LOCATION																					
		GW-1	GW-2	GW-3	UCL	MW-1								MW-2							MW-3							
Sampling Date						1/10/2019	6/11/2019	1/16/2020	6/16/2020	11/30/2020	6/29/2021	11/17/2021	5/17/2022	1/10/2019	6/11 & 7/31/2019	1/16/2020	6/16/2020	11/30/2020	6/29/2021	11/17/2021	5/17/2022	1/10/2019	6/11 & 7/30/2019	1/16/2020	6/16/2020	11/30/2020	6/30/2021	11/17/2021	5/17/2022
SW-846 6020B (µg/L) Metals Digestion																											
ANTIMONY	8000	6	~	8000	80000	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	1.3	1.7	ND (1.0)	ND (1.0)	0.37	ND (1.0)	0.20	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)
ARSENIC	900	10	~	900	9000	ND (0.40)	1.0	0.86	1.0	1.1	0.79	0.82	1.4	4.4	8.9	3.6	3.0	4.1	3.4	2.8	2.2	5.2	5.6	4.1	5.7	3.7	5.1	3.2	2.0
BARIUM	50000	2000	~	50000	100000	15	21	15	11	21	17	39	32	60	72	49	33	45	46	41	32	36	36	24	26	38	39	40	51
BERYLLIUM	200	4	~	200	2000	0.73	1.0	0.36	0.29	0.10	0.10	0.14	0.16	ND (0.40)	ND (0.40)	ND (0.40)	ND (0.40)	ND (0.40)	ND (0.40)	ND (0.40)	ND (0.40)	ND (0.40)	ND (0.40)	ND (0.40)	0.093	0.27	0.20	0.13	0.12
CADMIUM	4	5	~	4	50	1.4	2.7	1.1	0.91	2.1	0.90	0.94	0.65	ND (0.50)	0.11	0.087	0.038	ND (0.20)	0.027	ND (0.20)	ND (0.20)	ND (0.50)	ND (0.20)	0.041	0.041	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.20)
CHROMIUM	300	100	~	300	3000	ND (1.0)	0.81	0.43	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	0.90	0.68	ND (1.0)	1.1	ND (1.0)	ND (1.0)	ND (1.0)	1.8	2.0	0.54	1.1	ND (1.0)	ND (1.0)	ND (1.0)	0.91
LEAD	10	15	~	10	150	ND (1.0)	1.8	0.45	0.43	3.6	4.8	2.6	1.7	1.2	1.8	1.4	2.4	1.3	0.47	0.61	0.48	ND (5.0)	2.6	ND (0.50)	0.25	0.095	ND (0.50)	ND (0.50)	ND (0.50)
NICKEL	200	100	~	200	2000	34	23	9.1	6.5	6.7	18	11	8.8	5.9	3.4	3.2	2.5	2.6	9.0	1.8	1.7	9.6	4.9	5.3	4.7	14	14	8.9	5.9
SELENIUM	100	50	~	100	1000	ND (5.0)	6.7	2.9	2.7	2.6	3.3	1.5	1.3	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)	2.3	3.0	1.1	ND (5.0)	ND (5.0)	5.6	2.4	2.4	2.9	12	1.8	ND (5.0)
SILVER	7	100	~	7	1000	ND (0.50)	ND (0.20)	ND (0.20)	0.30	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.50)	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.50)	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.20)	0.071	ND (0.20)	ND (0.20)
THALLIUM	3000	2	~	3000	30000	ND (0.20)	0.23	0.12	0.11	0.13	0.10	0.11	ND (0.20)	ND (0.20)	0.073	0.061	0.035	0.035	ND (0.20)	ND (0.20)	ND (0.20)	ND (1.0)	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.40)	ND (0.20)	ND (0.20)	ND (0.20)
VANADIUM	4000	30	~	4000	40000	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)	2.4	1.5	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)	2.9	1.5	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)
ZINC	900	5000	~	900	50000	33	81	28	27	23	25	38	53	300	280	260	120	44	60	70	68	54	4.9	11	26	23	6.6	6.3	11
SW-846 7470A (mg/L) Metals Digestion																											
MERCURY	0.02	0.002	~	0.02	0.2	ND (0.00010)	ND (0.00010)	0.000059	0.00017	ND (0.00010)	ND (0.00010)	ND (0.00010)	ND (0.00010)	ND (0.00010)	ND (0.00010)	0.000040	ND (0.00010)	ND (0.00010)	ND (0.00010)	ND (0.00010)	ND (0.00010)	ND (0.00010)	ND (0.00010)	0.000044	ND (0.00010)	ND (0.00010)	ND (0.00010)	ND (0.00010)	ND (0.00010)
Polychlorinated Biphenyls SW-846 8082A (µg/L)						None Detected								None Detected								None Detected							
VOCs SW-846 8260C (µg/L)																											
ACETONE	50000	6300	50000	50000	100000	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (20)	4.2	ND (10)	ND (10)	ND (20)	ND (10)	ND (10)	ND (20)	ND (20)	11	ND (10)	ND (20)	0.38	ND (20)
CHLOROBENZENE	200	100	200	1000	10000	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (2.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (2.0)	ND (1.0)	ND (1.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (1.0)	ND (2.0)	ND (2.0)	ND (2.0)
CHLOROFORM	50	70	50	20000	100000	ND (2.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (4.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (4.0)	ND (2.0)	ND (2.0)	ND (4.0)	ND (4.0)	ND (4.0)	ND (2.0)	ND (4.0)	ND (4.0)	ND (4.0)
1,2-DICHLOROBENZENE	2000	600	8000	2000	80000	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (2.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (2.0)	ND (1.0)	ND (1.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (1.0)	ND (2.0)	ND (2.0)	ND (2.0)
1,4-DICHLOROBENZENE	60	5	60	8000	80000	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (2.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (2.0)	ND (1.0)	ND (1.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (1.0)	ND (2.0)	ND (2.0)	ND (2.0)
TOLUENE	40000	1000	50000	40000	100000	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (2.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (2.0)	ND (1.0)	ND (1.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (1.0)	ND (2.0)	ND (2.0)	ND (2.0)
SW-846 8270D (µg/L)																											
1,4 DIOXANE	6000	0.3	6000	50000	100000	NT	ND (0.20)	ND (0.20)	ND (0.21)	ND (0.19)	ND (0.21)	ND (0.20)	ND (0.19)	NT	ND (0.20)	ND (0.20)	ND (0.19)	ND (0.19)	ND (0.19)	ND (0.19)	ND (0.21)	NT	ND (0.20)	ND (0.20)	ND (0.21)	ND (0.20)	ND (0.19)	ND (0.19)	ND (0.19)
SM21-22 2510B (µmhos/cm)																											
SPECIFIC CONDUCTANCE	~	~	~	~	~	NS*	NS**	2600	1100	3300	2400	2200	2200	NS*	2000	2100	1500	2700	2500	1900	1800	NS*	4200	3500	3000	6200	4800	3300	3000
SM21-22 4500 H B (pH Units)																											
PH	~	~	~	~	~	NS*	NS**	5.1	7.0	5.4	5.5	5.4	5.5	NS*	6.2	6.3	6.5	6.5	6.4	6.5	6.7	NS*	5.9	6.1	5.9	5.3	5.8	6.2	6.0
Pesticides SW-846 8081B (µg/L)						None Detected								None Detected								None Detected							
SW-846 8100 Modified (mg/L)																											
TPH	5	0.2	5	5	50	NS*	NS**	0.29	ND (0.20)	0.28	0.42	0.28	0.39	NS*	0.49	0.29	0.22	0.31	0.42	0.41	0.40	NS*	0.66	0.22	0.23	0.23	0.44	0.38	0.29
Herbicides SW-846 8151A (µg/L)																											
2,4-DB	10000	~	~	~	~	NS*	NS**	ND (0.49)	ND (0.50)	ND (0.49)	ND (0.48)	ND (0.50)	ND (0.48)	NS*	ND (0.50)	ND (0.49)	ND (0.54)	ND (0.54)	ND (0.49)	ND (0.48)	ND (0.54)	NS*	ND (0.50)	ND (0.49)	ND (0.54)	0.42	ND (0.52)	ND (0.48)	ND (0.48)
DALAPON	~	~	~	~	~	NS*	NS**	ND (1.2)	ND (1.2)	ND (1.2)	ND (1.2)	ND (1.2)	ND (1.2)	NS*	ND (1.2)	ND (1.2)	ND (1.3)	ND (1.4)	ND (1.2)	ND (1.2)	ND (1.3)	NS*	ND (1.2)	ND (1.2)	ND (1.3)	ND (1.2)	ND (1.3)	ND (1.2)	ND (1.2)
DICAMBA	50000	~	~	~	~	NS*	NS**	ND (0.049)	ND (0.050)	ND (0.049)	ND (0.048)	ND (0.050)	ND (0.048)	NS*	ND (0.050)	ND (0.049)	ND (0.054)	ND (0.054)	ND (0.049)	ND (0.048)	ND (0.054)	NS*	ND (0.050)	ND (0.049)	ND (0.054)	ND (0.050)	ND (0.052)	ND (0.048)	0.11
MCPP	~	~	~	~	~	NS*	NS**	ND (49)	ND (50)	ND (49)	ND (48)	ND (50)	ND (48)	NS*	ND (50)	ND (49)	ND (54)	ND (54)	ND (49)	ND (48)	ND (54)	NS*	ND (50)	ND (49)	ND (54)	ND (50)	ND (52)	ND (48)	ND (48)
Semi-VOCs SW-846 8270D (µg/L)																											
ACENAPHTHENE	6000	20	~	10000	100000	NS*	NS**	ND (10)	ND (0.30)	ND (0.29)	ND (0.32)	ND (0.30)	ND (0.30)	NS*	ND (5.0)	ND (10)	ND (0.31)	ND (0.29)	ND (0.29)	ND (0.29)	ND (0.32)	NS*	ND (5.4)	ND (9.9)	ND (0.29)	ND (0.29)	ND (0.29)	0.056	ND (0.31)
ACENAPHTHYLENE	40	30	10000	40	100000	NS*	NS**	ND (5.0)	ND (0.20)	ND (0.19)	0.062	ND (0.20)	ND (0.20)	NS*	ND (5.0)	ND (5.0)	ND (0.20)	ND (0.19)	ND (0.19)	ND (0.20)	ND (0.21)	NS*	ND (5.4)	ND (5.0)	ND (0.20)	ND (0.20)	ND (0.20)	0.068	ND (0.21)
ANTHRACENE	30	60	~	30	600	NS*	NS**	ND (10)	ND (0.20)	ND (0.19)	0.057	ND (0.20)	0.048	NS*	ND (5.0)	ND (10)	ND (0.20)	ND (0.19)	0.024	ND (0.20)	0.051	NS*	ND (5.4)	ND (9.9)	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.19)	0.073
BENZO(A)ANTHRACENE	1000	1	~	1000	10000	NS*	NS**	ND (2.0)	ND (0.051)	0.023	0.20	ND (0.049)	0.015	NS*	ND (5.0)	ND (2.0)	ND (0.051)	ND (0.049)	ND (0.049)	ND (0.049)	ND (0.053)	NS*	ND (5.4)	ND (2.0)	ND (0.049)	ND (0.049)	ND (0.049)	ND (0.048)	ND (0.052)
BENZO(A)PYRENE	500	0.2	~	500	5000	NS*	NS**	ND (10)	ND (0.10)	0.029	0.23	ND (0.099)	0.016	NS*	ND (5.0)	ND (10)	ND (0.10)	ND (0.097)	ND (0.097)	ND (0.098)	ND (0.11)	NS*	ND (5.4)	ND (9.9)	ND (0.098)	ND (0.098)	ND (0.098)	ND (0.097)	ND (0.10)
BENZO(B)FLUORANTHENE	400	1	~	400	4000	NS*	NS**	ND (10)	ND (0.051)	0.036	0.30	0.028	0.023	NS*	ND (5.0)	ND (10)	ND (0.051)	ND (0.049)	ND (0.049)	ND (0.049)	ND (0.053)	NS*	ND (5.4)	ND (9.9)	ND (0.049)	ND (0.049)	ND (0.049)	ND (0.048)	ND (0.052)
BENZO(G,H,I)PERYLENE	20	50	~	20	500	NS*	NS**	ND (10)	ND (0.51)	0.022	0.18	ND (0.49)	ND (0.50)	NS*	ND (5.0)	ND (10)	ND (0.51)	ND (0.49)	ND (0.49)	ND (0.49)	ND (0.53)	NS*	ND (5.4)	ND (9.9)	ND (0.49)	ND (0.49)	ND (0.49)	ND (0.48)	ND (0.52)
BENZO(K)FLUORANTHENE	100	1	~	100	1000	NS*	NS**	ND (10)	ND (0.20)	ND (0.19)	0.098	ND (0.20)	ND (0.20)	NS*	ND (5.0)	ND (10)	ND (0.20)	ND (0.19)	ND (0.19)	ND (0.20)	ND (0.21)	NS*	ND (5.4)	ND (9.9)	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.19)	ND (0.21)
BIS(2-ETHYLHEXYL)PHTHALATE	50000	6	~	50000	100000	NS*	NS**	ND (5.0)	ND (2.0)	ND (9.7)	ND (2.2)	ND (2.0)	1.0	NS*	ND (10)	ND (5.0)	ND (2.0)	ND (9.7) *	ND (1.9)	ND (2.0)	1.5	NS*	ND (11)	ND (5.0)	ND (2.0)	ND (9.8)	ND (2.0)	ND (1.9)	1.1
4-CHLOROANILINE	300	20	30000	300	100000	NS*	NS**	ND (10)	ND (10)	ND (9.7)	0.47	ND (9.9)	ND (9.9)	NS*	ND (10)	ND (10)	ND (10)	ND (9.7)	ND (9.7)	ND (9.8)	ND (11)	NS*	ND (11)	ND (9.9)	ND (9.8)	ND (9.8)	ND (9.8)	ND (9.7)	ND (10)
CHRYSENE	70	2	~	70	700	NS*	NS**	ND (10)	ND (0.20)	0.025	0.23	ND (0.20)	0.016	NS*	ND (5.0)	ND (10)	ND (0.20)	ND (0.19)	ND (0.19)	ND (0.20)	ND (0.21)	NS*	ND (5.4)	ND (9.9)	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.19)	ND (0.21)
DIBENZ(A,H)ANTHRACENE	40	0.5	~	40	400	NS*	NS**	ND (10)	ND (0.10)	ND (0.097)	0.041	ND (0.099)	ND (0.099)	NS*	ND (5.0)	ND (10)	ND (0.10)	ND (0.097)	ND (0.097)	ND (0.098)	ND (0.11)	NS*	ND (5.4)	ND (9.9)	ND (0.098)	ND (0.098)	ND (0.098)	ND (0.097)	ND (0.10)
1,4-DICHLOROBENZENE	60	5	60	8000	80000	NS*	NS**	ND (10)	ND (5.1)	ND (4.9)	ND (5.4)	ND (4.9)	ND (5.0)	NS*	ND (5.0)	ND (10)	ND (5.1)	ND (4.9)	ND (4.9)	ND (4.9)	ND (5.3) *	NS*	ND (5.4)	ND (9.9)	ND (4.9)	ND (4.9)	ND (4.9)	ND (4.8)	ND (5.2) *
2,4-DIMETHYLPHENOL	40000	60	40000	50000	100000	NS*	NS**	ND (10)	ND (10)	ND (9.7)	ND (11)	ND (9.9)	ND (9.9)	NS*	ND (10)	ND (10)	ND (10)	ND (9.7)	ND (9.7)	ND (9.8)	ND (11)	NS*	ND (11)	ND (9.9)	ND (9.8)	ND (9.8)	ND (9.8)	1.1	ND (10)
FLUORANTHENE	200	90	~	200	2000	NS*	NS**	ND (10)	ND (0.51)	0.043	0.30	0.027	0.029	NS*	ND (5.0)	ND (10)	ND (0.51)	ND (0.49)	ND (0.49)	ND (0.49)	ND (0.53)	NS*	ND (5.4)	ND (9.9)	ND (0.49)	ND (0.49)	ND (0.49)	ND (0.48)	0.024
FLUORENE	40	30	~	40	400	NS*	NS**	ND (5.0)	ND (1.0)	ND (0.97)	ND (1.1)	ND (0.99)	0.022	NS*	ND (5.0)	ND (5.0)	ND (1.0)	ND (0.97)	ND (0.97)	ND (0.98)	0.021	NS*	ND (5.4)	ND (5.0)	ND (0.98)	ND (0.98)	ND (0.98)	0.060	0.028
INDENO(1,2,3-CD)PYRENE	100	0.5	~	100	1000	NS*	NS**	ND (10)	ND (0.10)	0.023	0.21	ND (0.099)	ND (0.099)	NS*	ND (5.0)	ND (10)	ND (0.10)	ND (0.097)	ND (0.097)	ND (0.098)	ND (0.11)	NS*	ND (5.4)	ND (10)	ND (0.098)	ND (0.098)	ND (0.098)	ND (0.097)	ND (0.10)
2-METHYLNAPHTHALENE	2000	10	2000	20000	100000	NS*	NS**	ND (10)	ND (1.0)	0.15	ND (1.1)	ND (0.99)	ND (0.99)	NS*	ND (5.0)	ND (10)	ND (1.0)	ND (0.97)	ND (0.97)	ND (0.98)	ND (1.1)	NS*	ND (5.4)	ND (10)	ND (0.98)	ND (0.98)	ND (0.98)	ND (0.97)	ND (1.0)
NAPHTHALENE	700	140	700	20000	100000	NS*	NS**	ND (10)	ND (1.0)	0.25	ND (1.1)	ND (0.99)	0.039	NS*	ND (5.0)	ND (10)	ND (1.0)	ND (0.97)	ND (0.97)	ND (0.98)	ND (1.1)	NS*	ND (5.4)	ND (10)	ND (0.98)	ND (0.98)	ND (0.98)	ND (0.97)	0.028
PHENANTHRENE	10000	40	~	10000	100000	NS*	NS**	ND (10)	ND (0.051)	ND (0.049)	0.11	ND (0.049)	0.13	NS*	ND (5.0)	ND (10)	ND (0.051)	ND (0.049)	ND (0.049)	ND (0.049)	0.14	NS*	ND (5.4)	ND (10)	ND (0.049)	ND (0.049)	ND (0.049)	ND (0.048)	0.23
PYRENE	20	60	~	20	600	NS*	NS**	ND (10)	ND (1.0)	0.036	0.30	0.027	0.026	NS*	ND (5.0)	ND (10)	ND (1.0)	ND (0.97)	0.022	ND (0.98)	ND (1.1)	NS*	ND (5.4)	ND (10)	ND (0.98)	ND (0.98)	ND (0.98)	ND (0.97)	ND (1.0)

NOTES:
1. Only laboratory detected analytes shown on summary table.
2. An asterisk (*) following a detection limit indicates that the minimum laboratory reporting limit exceeds one or more of the regulatory criteria.
3. ND = Not detected above the lab reporting limits shown in parenthesis.
4. NT = Not tested/Not Reported under Method Specified.
5. ~ = No Method 1 Standard or UCL available
6. **Green shaded bold values exceed the MCP Reportable Concentrations (RCs).**
7. MCP Metyhod 1 Clenup Standards shown for reference only.
8. * Well Sampled for Full parameters by Others in Dec. 2018 (not needed Jan 2019).
9. ** Well not sampled in July 2019 (Covered)
10. (FD) - Field Duplicate

BOSTON ENVIRONMENTAL CORPORATION

TABLE 1 - SUMMARY OF GROUNDWATER MONITORING RESULTS (Detected Analytes Only)
MARILYN'S LANDING COMMERCIAL REUSE AREA
946 PLYMOUTH STREET, BRIDGEWATER, MASSACHUSETTS
BEC JOB #18191

Parameter	RCGW-2 Reportable Concentrations (RCs)	MCP - Method 1 Cleanup Standards				SAMPLING LOCATION																															
		GW-1	GW-2	GW-3	UCL	MW-4 (determined to be destroyed during May 2022 sampling event)							MW-5									MW-103				MW-106				MW-108				MW-113			
Sampling Date						1/10/2019	6/11 & 7/30/2019	1/16/2020	6/16/2020	11/30/2020	6/29/2021	11/17/2021	1/10/2019	(FD)1/10/2019	6/18 & 7/31/2019	1/16/2020	6/16/2020	11/30/2020	6/29/2021	11/17/2021	5/17/2022	11/30/2020	6/30/2021	11/18/2021	5/18/2022	11/30/2020	6/30/2021	11/18/2021	5/18/2022	11/30/2020	6/30/2021	11/18/2021	5/18/2022	12/29/2020	6/30/2021	11/18/2021	5/18/2022
SW-846 6020B (µg/L) Metals Digestion																																					
ANTIMONY	8000	6	~	8000	80000	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	0.26	0.46	ND (1.0)	ND (1.0)	ND (0.35)	ND (1.0)	ND (1.0)	ND (1.0)	0.42	0.27	0.43	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)
ARSENIC	900	10	~	900	9000	20	28	17	27	22	30	25	ND (0.40)	ND (0.40)	ND (0.64)	0.66	0.68	0.77	1.3	0.60	0.85	30	12	9.5	7.1	ND (0.80)	0.92	1.3	0.67	ND (0.80)	ND (0.80)	0.83	0.59	ND (0.80)	ND (0.80)	0.62	0.33
BARIUM	50000	2000	~	50000	130000	150	140	130	170	150	180	150	52	53	41	26	44	39	39	27	38	27	27	56	30	12	13	5.1	9.1	12	17	21	19	17	8.8	12	17
BERYLLIUM	200	4	~	200	2000	ND (0.40)	ND (0.40)	ND (0.40)	ND (0.40)	ND (0.40)	ND (0.40)	ND (0.40)	ND (0.40)	ND (0.40)	ND (0.091)	ND (0.40)	ND (0.40)	ND (0.40)	ND (0.40)	ND (0.40)	ND (0.40)	ND (0.40)	ND (0.40)	0.29	ND (0.40)	ND (0.40)	0.11	0.073	0.081	ND (0.40)	ND (0.40)	ND (0.40)	ND (0.40)	ND (0.40)	ND (0.40)	ND (0.40)	0.14
CADMIUM	4	5	~	4	50	ND (0.50)	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.20)	**53**	**52**	**6.8**	**16**	**13**	**45**	**9.9**	3.5	3.4	0.13	0.071	0.21	0.078	0.10	0.058	0.037	ND (0.20)	0.077	0.054	0.041	ND (0.20)	ND (0.20)	ND (0.20)	0.029	0.036
CHROMIUM	300	100	~	300	3000	1.1	1.1	0.38	1.1	ND (1.0)	ND (1.0)	0.93	1.4	1.7	1.3	0.82	1.1	ND (1.0)	0.95	ND (1.0)	0.96	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	0.75	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)
LEAD	10	15	~	10	150	ND (1.0)	ND (0.50)	ND (0.50)	0.094	ND (0.50)	0.24	0.34	ND (1.0)	ND (1.0)	0.59	0.59	2.9	1.3	0.40	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	0.19	0.21	0.25	0.16	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	0.46	ND (0.50)	ND (0.50)	0.86
NICKEL	200	100	~	200	2000	ND (5.0)	2.4	2.9	3.2	3.3	6.8	3.4	**230**	**230**	12	35	11	67	17	4.4	4.9	5.5	3.9	8.7	6.3	1.3	2.0	1.6	1.7	2.3	2.7	2.1	1.9	1.4	0.76	0.73	1.3
SELENIUM	100	50	~	100	1000	ND (5.0)	3.9	2.3	5.3	3.2	12	3.4	ND (5.0)	ND (5.0)	ND (1.6)	ND (5.0)	ND (5.0)	ND (5.0)	5.2	1.1	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)
SILVER	7	100	~	7	1000	ND (0.50)	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.20)	0.036	ND (0.20)	ND (0.50)	ND (0.50)	ND (0.18)	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.20)
THALLIUM	3000	2	~	3000	30000	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.20)	0.032	ND (0.20)	0.030	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.20)	0.19	0.097	0.14	0.076	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.20)	0.041	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.20)
VANADIUM	4000	30	~	4000	40000	ND (5.0)	2.1	2.1	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)	ND (1.5)	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)
ZINC	900	5000	~	900	50000	56	7.7	85	9.7	27	9.5	11	**5300**	**6000**	210	760	220	**1900**	160	56	63	5.3	4.0	14	4.9	13	15	11	14	7.2	5.4	ND (10)	4.6	12	ND (10)	ND (10)	5.6
SW-846 7470A (mg/L) Metals Digestion																																					
MERCURY	0.02	0.002	~	0.02	0.2	ND (0.00010)	ND (0.00010)	0.000042	ND (0.00010)	ND (0.00010)	ND (0.00010)	ND (0.00010)	ND (0.00010)	ND (0.00010)	0.00012	0.000040	ND (0.00010)	ND (0.00010)	ND (0.00010)	ND (0.00010)	ND (0.00010)	ND (0.00010)	ND (0.00010)	ND (0.00010)	ND (0.00010)	ND (0.00010)	ND (0.00010)	ND (0.00010)	ND (0.00010)	ND (0.00010)	ND (0.00010)	ND (0.00010)	ND (0.00010)	ND (0.00010)	ND (0.00010)	ND (0.00010)	ND (0.00010)	ND (0.00010)
Polychlorinated Biphenyls SW-846 8082A (µg/L)						None Detected							None Detected									None Detected				None Detected				None Detected				None Detected			
VOCs SW-846 8260C (µg/L)																																					
ACETONE	50000	6300	50000	50000	100000	ND (10)	8.6	ND (50)	ND (50)	ND (10)	ND (40)	ND (200)	ND (10)	NT	ND (3.8)	ND (10)	ND (10)	ND (10)	ND (20)	ND (20)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
CHLOROBENZENE	200	100	200	1000	10000	ND (1.0)	ND (2.0)	ND (5.0)	ND (5.0)	ND (1.0)	ND (4.0)	ND (20)	ND (1.0)	NT	ND (0.15)	ND (1.0)	ND (1.0)	ND (1.0)	ND (2.0)	ND (2.0)	ND (1.0)	0.70	0.24	0.23	0.25	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)
CHLOROFORM	50	70	50	20000	100000	ND (2.0)	ND (4.0)	ND (10)	ND (10)	ND (2.0)	ND (8.0)	ND (40)	ND (2.0)	NT	ND (0.17)	ND (2.0)	ND (2.0)	ND (2.0)	ND (4.0)	ND (4.0)	ND (2.0)	ND (2.0)	ND (2.0)	2.4	ND (2.0)	ND (2.0)	ND (2.0)	2.4	ND (2.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (2.0)
1,2-DICHLOROBENZENE	2000	600	8000	2000	80000	ND (1.0)	ND (2.0)	ND (5.0)	ND (5.0)	ND (1.0)	ND (4.0)	ND (20)	ND (1.0)	NT	ND (0.16)	ND (1.0)	ND (1.0)	ND (1.0)	ND (2.0)	ND (2.0)	ND (1.0)	0.30	0.17	0.13	0.17	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)
1,4-DICHLOROBENZENE	60	5	60	8000	80000	ND (1.0)	ND (2.0)	ND (5.0)	ND (5.0)	ND (1.0)	ND (4.0)	ND (20)	ND (1.0)	NT	ND (0.13)	ND (1.0)	ND (1.0)	ND (1.0)	ND (2.0)	ND (2.0)	ND (1.0)	1.5	0.59	0.41	0.66	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)
TOLUENE	40000	1000	50000	40000	100000	ND (1.0)	ND (2.0)	ND (5.0)	ND (5.0)	ND (1.0)	ND (4.0)	ND (20)	ND (1.0)	NT	ND (0.14)	ND (1.0)	ND (1.0)	ND (1.0)	ND (2.0)	ND (2.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	11	2.6		
SW-846 8270D (µg/L)																																					
1,4 DIOXANE	6000	0.3	6000	50000	100000	NT	ND (0.20)	ND (0.20)	ND (0.21)	ND (0.19)	ND (0.21)	ND (0.20)	NT	NT	ND (0.034)	ND (0.20)	ND (0.20)	ND (0.19)	ND (0.19)	ND (0.19)	ND (0.20)	0.24	ND (0.19)	ND (0.19)	ND (0.20)	ND (0.20)	ND (0.19)	ND (0.19)	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.19)	ND (0.19)	ND (0.20)	ND (0.20)	ND (0.19)	ND (0.19)	ND (0.20)
SM21-22 2510B (µmhos/cm)																																					
SPECIFIC CONDUCTANCE	~	~	~	~	~	NS*	3300	3100	3100	3600	3200	2900	NS*	NS*	680	910	2000	1200	2500	2100	1400	390	180	170	170	42	27	24	32	66	100	150	160	52	52	65	65
SM21-22 4500 H B (pH Units)																																					
PH	~	~	~	~	~	NS*	6.3	6.5	6.5	6.6	6.6	6.6	NS*	NS*	7.3	7	5.2	7.2	6.8	7	7	6.3	6.2	6.1	5.9	5.3	5.2	5.7	5.2	5.6	5.8	6.4	5.8	5.7	5.7	6.3	5.6
Pesticides SW-846 8081B (µg/L)						None Detected							None Detected									None Detected				None Detected				None Detected				None Detected			
SW-846 8100 Modified (mg/L)																																					
TPH	5	0.2	5	5	50	NS*	0.92	0.53	0.61	0.61	0.86	1.3	NS*	NS*	0.25	0.18	ND (0.20)	0.23	0.91	0.67	0.52	ND (0.20)	ND (0.20)	ND (0.19)	0.095	ND (0.19)	0.23	ND (0.20)	0.12	ND (0.20)	ND (0.20)	0.21	0.16	ND (0.20)	0.33	ND (0.20)	0.12
Herbicides SW-846 8151A (µg/L)																																					
2,4-DB	10000	~	~	~	~	NS*	ND (0.50)	ND (0.49)	ND (0.48)	ND (0.49)	ND (0.52)	ND (0.53)	NS*	NS*	ND (0.50)	ND (0.49)	ND (0.52)	ND (0.49)	ND (0.49)	ND (0.48)	ND (0.53)	ND (0.52)	ND (0.49)	ND (0.48)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.48)	ND (0.49)	ND (0.52)	ND (0.51)	ND (0.48)	ND (0.50)	ND (0.49)	ND (0.49)	ND (0.48)	ND (0.53)
DALAPON	~	~	~	~	~	NS*	0.35	ND (1.2)	ND (1.2)	ND (1.2)	ND (1.3)	ND (1.3)	NS*	NS*	ND (1.2)	ND (1.2)	ND (1.3)	ND (1.2)	ND (1.2)	ND (1.2)	ND (1.3)	ND (1.3)	ND (1.2)	ND (1.2)	ND (1.2)	ND (1.2)	ND (1.2)	ND (1.2)	ND (1.2)	ND (1.3)	ND (1.2)	ND (1.2)	ND (1.2)	ND (1.2)	ND (1.2)	ND (1.2)	ND (1.3)
DICAMBA	50000	~	~	~	~	NS*	ND (0.050)	ND (0.049)	ND (0.048)	ND (0.049)	ND (0.052)	ND (0.053)	NS*	NS*	ND (0.050)	ND (0.049)	ND (0.052)	0.096	ND (0.049)	ND (0.048)	ND (0.053)	ND (0.052)	ND (0.049)	ND (0.048)	ND (0.050)	ND (0.050)	ND (0.050)	ND (0.048)	ND (0.049)	ND (0.052)	ND (0.051)	ND (0.048)	ND (0.050)	ND (0.049)	ND (0.049)	ND (0.048)	ND (0.053)
MCPP	~	~	~	~	~	NS*	ND (50)	ND (49)	ND (48)	ND (49)	ND (52)	ND (53)	NS*	NS*	ND (50)	ND (49)	ND (52)	ND (49)	ND (49)	ND (48)	ND (53)	ND (52)	ND (49)	ND (48)	55	15	ND (50)	ND (48)	ND (49)	ND (52)	ND (51)	ND (48)	ND (50)	ND (49)	ND (49)	ND (48)	ND (53)
Semi-VOCs SW-846 8270D (µg/L)																																					
ACENAPHTHENE	6000	20	~	10000	100000	NS*	ND (5.4)	ND (10)	ND (0.29)	0.035	0.041	0.10	NS*	NS*	ND (5.0)	ND (9.9)	ND (0.31)	ND (0.29)	ND (0.29)	ND (0.29)	ND (0.32)	ND (0.29)	ND (0.29)	ND (0.29)	ND (0.29)	ND (0.29)	ND (0.29)	ND (0.30)	ND (0.29)	ND (0.30)	ND (0.30)	ND (0.30)	ND (0.30)	ND (0.31)	ND (0.29)	ND (0.29)	ND (0.30)
ACENAPHTHYLENE	40	30	10000	40	100000	NS*	ND (5.4)	ND (5.0)	ND (0.19)	ND (0.19)	0.028	0.084	NS*	NS*	ND (5.0)	ND (5.0)	ND (0.21)	ND (0.19)	ND (0.20)	ND (0.20)	ND (0.21)	ND (0.20)	ND (0.19)	ND (0.19)	ND (0.20)	ND (0.19)	ND (0.19)	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.21)	ND (0.19)	ND (0.19)	ND (0.20)
ANTHRACENE	30	60	~	30	600	NS*	ND (5.4)	ND (10)	0.053	0.044	0.066	0.079	NS*	NS*	ND (5.0)	ND (9.9)	0.033	0.032	0.066	0.066	0.13	ND (0.20)	ND (0.19)	ND (0.19)	ND (0.20)	ND (0.19)	ND (0.19)	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.21)	ND (0.19)	ND (0.19)	ND (0.20)
BENZO(A)ANTHRACENE	1000	1	~	1000	10000	NS*	ND (5.4)	ND (2.0)	ND (0.048)	ND (0.049)	ND (0.052)	ND (0.049)	NS*	NS*	ND (5.0)	ND (2.0)	ND (0.052)	ND (0.049)	ND (0.049)	ND (0.049)	ND (0.053)	ND (0.049)	ND (0.049)	ND (0.048)	ND (0.049)	ND (0.048)	ND (0.049)	ND (0.049)	ND (0.049)	ND (0.050)	ND (0.050)	ND (0.050)	ND (0.051)	ND (0.052)	ND (0.049)	ND (0.048)	ND (0.050)
BENZO(A)PYRENE	500	0.2	~	500	5000	NS*	ND (5.4)	ND (10)	ND (0.096)	ND (0.097)	0.030	ND (0.097)	NS*	NS*	ND (5.0)	0.13	ND (0.10)	ND (0.097)	ND (0.098)	ND (0.098)	ND (0.11)	0.016	ND (0.097)	ND (0.097)	ND (0.098)	ND (0.096)	ND (0.097)	ND (0.099)	ND (0.098)	ND (0.10)	ND (0.10)	ND (0.10)	ND (0.10)	ND (0.10)	ND (0.097)	ND (0.097)	ND (0.10)
BENZO(B)FLUORANTHENE	400	1	~	400	4000	NS*	ND (5.4)	ND (10)	ND (0.048)	ND (0.049)	0.030	ND (0.049)	NS*	NS*	ND (5.0)	0.02	ND (0.052)	ND (0.049)	ND (0.049)	ND (0.049)	ND (0.053)	0.032	ND (0.049)	ND (0.048)	ND (0.049)	ND (0.048)	ND (0.049)	ND (0.049)	ND (0.049)	ND (0.050)	ND (0.050)	ND (0.050)	ND (0.051)	ND (0.052)	ND (0.049)	ND (0.048)	ND (0.050)
BENZO(G,H,I)PERYLENE	20	50	~	20	500	NS*	ND (5.4)	ND (10)	ND (0.048)	ND (0.049)	0.033	ND (0.049)	NS*	NS*	ND (5.0)	ND (9.9)	ND (0.052)	ND (0.049)	ND (0.049)	ND (0.049)	ND (0.053)	0.037	ND (0.049)	ND (0.048)	ND (0.049)	ND (0.048)	ND (0.049)	ND (0.049)	ND (0.049)	ND (0.050)	ND (0.050)	ND (0.050)	ND (0.051)	ND (0.052)	ND (0.049)	ND (0.048)	ND (0.050)
BENZO(K)FLUORANTHENE	100	1	~	100	1000	NS*	ND (5.4)	ND (10)	ND (0.19)	ND (0.19)	0.029	ND (0.19)	NS*	NS*	ND (5.0)	ND (9.9)	ND (0.21)	ND (0.19)	ND (0.20)	ND (0.20)	ND (0.21)	0.018	ND (4.9)	ND (0.19)	ND (0.20)	ND (0.19)	ND (0.19)	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.21)	ND (0.19)	ND (0.19)	ND (0.20)
BIS(2-ETHYLHEXYL)PHTHALATE	50000	6	~	50000	100000	NS*	ND (11)	ND (5.0)	ND (1.9)	ND (9.7)	ND (2.1)	ND (1.9)	NS*	NS*	ND (9.9)	ND (5.0)	ND (2.1)	ND (9.7)	ND (2.0)	ND (2.0)	ND (11) *	ND (9.8)	ND (1.9)	ND (1.9)	1.0	ND (9.6)	ND (1.9)	ND (2.0)	1.2	ND (10)	ND (2.0)	ND (2.0)	1.1	ND (2.1)	ND (1.9)	ND (1.9)	1.2
4-CHLOROANILINE	300	20	30000	300	100000	NS*	ND (11)	ND (10)	ND (9.6)	ND (9.7)	ND (10)	ND (9.7)	NS*	NS*	ND (9.9)	ND (9.9)	ND (10)	ND (9.7)	ND (9.8)	ND (9.8)	ND (11)	ND (9.8)	ND (9.7)	ND (9.7)	ND (9.8)	ND (9.6)	ND (9.7)	ND (9.9)	ND (9.8)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)
CHRYSENE	70	2	~	70	700	NS*	ND (5.4)	ND (10)	ND (0.19)	ND (0.19)	0.028	ND (0.19)	NS*	NS*	ND (5.0)	ND (9.9)	ND (0.10)	ND (0.097)	ND (0.098)	ND (0.098)	ND (0.11)	0.041	ND (0.097)	ND (0.097)	ND (0.098)	ND (0.096)	ND (0.097)	ND (0.099)	ND (0.098)	ND (0.10)	ND (0.10)	ND (0.10)	ND (0.10)	ND (0.10)	ND (0.097)	ND (0.097)	ND (0.10)
DIBENZ(A,H)ANTHRACENE	40	0.5	~	40	400	NS*	ND (5.4)	ND (10)	ND (0.096)	ND (0.097)	0.076	ND (0.097)	NS*	NS*	ND (5.0)	ND (9.9)	ND (0.10)	ND (0.097)	ND (0.098)	ND (0.098)	ND (0.11)	0.041	ND (0.097)	ND (0.097)	ND (0.098)	ND (0.096)	ND (0.097)	ND (0.099)	ND (0.098)	ND (0.10)	ND (0.10)	ND (0.10)	ND (0.10)	ND (0.10)	ND (0.097)	ND (0.097)	ND (0.10)
1,4-DICHLOROBENZENE	60	5	60	8000	80000	NS*	ND (5.4)	ND (10)	ND (4.8)	ND (4.9)	ND (5.2)	ND (4.9)	NS*	NS*	ND (5.0)	ND (9.9)	ND (5.2)	ND (4.9)	ND (4.9)	ND (4.9)	ND (5.3) *	0.73	0.38	ND (4.8)	ND (4.9)	ND (4.8)	ND (4.9)	ND (4.9)	ND (4.9)	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.1) *	ND (5.2)	ND (4.9)	ND (4.8)	ND (5.0)
2,4-DIMETHYLPHENOL	40000	60	40000	50000	100000	NS*	ND (11)	ND (10)	ND (9.6)	ND (9.7)	ND (10)	ND (9.7)	NS*	NS*	ND (9.9)	ND (9.9)	ND (10)	ND (9.7)	ND (9.8)	ND (9.8)	ND (11)	ND (9.8)	ND (9.7)	ND (9.7)	ND (9.8)	ND (9.6)	ND (9.7)	ND (9.9)	ND (9.8)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (9.7)	ND (9.7)	ND (10)
FLUORANTHENE	200	90	~	200	2000	NS*	ND (5.4)	ND (10)	ND (0.48)	ND (0.49)	0.044	0.036	NS*	NS*	ND (5.0)	ND (9.9)	ND (0.52)	ND (0.49)	ND (0.49)	ND (0.49)	0.031	ND (0.49)	ND (0.49)	ND (0.48)	ND (0.49)	ND (0.48)	ND (0.49)	ND (0.49)	ND (0.49)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.51)	ND (0.52)	ND (0.49)	ND (0.48)	ND (0.50)
FLUORENE	40	30	~	40	400	NS*	ND (5.4)	ND (5.0)	ND (0.96)	ND (0.97)	0.041	0.078	NS*	NS*	ND (5.0)	ND (5.0)	ND (1.0)	ND (0.97)	ND (0.98)	ND (0.98)	0.037	ND (0.98)	ND (0.97)	ND (0.97)	ND (0.98)	ND (0.96)	ND (0.97)	ND (0.99)	ND (0.98)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (0.97)	ND (0.97)	ND (1.0)
INDENO(1,2,3-CD)PYRENE	100	0.5	~	100	1000	NS*	ND (5.4)	ND (10)	ND (0.096)	ND (0.097)	0.050	ND (0.097)	NS*	NS*	ND (5.0)	ND (5.0)	ND (0.10)	ND (0.097)	ND (0.098)	ND (0.098)	ND (0.11)	0.030	ND (0.097)	ND (0.097)	ND (0.098)	ND (0.096)	ND (0.097)	ND (0.099)	ND (0.098)	ND (0.10)	ND (0.10)	ND (0.10)	ND (0.10)	ND (0.10)	ND (0.097)	ND (0.097)	ND (0.10)
2-METHYLNAPHTHALENE	2000	10	2000	20000	100000	NS*	ND (5.4)	ND (10)	ND (0.96)	ND (0.97)	ND (1.0)	ND (0.97)	NS*	NS*	ND (5.0)	ND (5.0)	ND (1.0)	ND (0.97)	ND (0.98)	ND (0.98)	ND (1.1)	ND (0.98)	ND (0.97)	ND (0.97)	ND (0.98)	ND (0.96)	ND (0.97)	ND (0.99)	ND (0.98)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (0.97)	ND (0.97)	ND (1.0)
NAPHTHALENE	700	140	700	20000	100000	NS*	ND (5.4)	ND (10)	ND (0.96)	ND (0.97)	ND (1.0)	ND (0.97)	NS*	NS*	ND (5.0)	ND (5.0)	ND (1.0)	ND (0.97)	ND (0.98)	ND (0.98)	0.034	ND (0.98)	ND (0.97)	ND (0.97)	0.036	ND (0.96)	ND (0.97)	ND (0.99)	ND (0.98)	ND (1.0)	ND (1.0)	ND (1.0)	0.046	ND (1.0)	ND (0.97)	ND (0.97)	ND (1.0)
PHENANTHRENE	10000	40	~	10000	100000	NS*	ND (5.4)	ND (10)	ND (0.048)	ND (0.049)	0.044	0.032	NS*	NS*	ND (5.0)	ND (5.0)	ND (0.052)	0.029	ND (0.049)	ND (0.049)	0.31	ND (0.049)	ND (0.049)	ND (0.048)	ND (0.049)	ND (0.048)	ND (0.049)	ND (0.049)	ND (0.049)	ND (0.050)	ND (0.050)	ND (0.050)	ND (0.051)	ND (0.052)	ND (0.049)	ND (0.048)	ND (0.050)
PYRENE	20	60	~	20	600	NS*	ND (5.4)	ND (10)	ND (0.96)	ND (0.97)	0.042	0.029	NS*	NS*	ND (5.0)	ND (5.0)	ND (1.0)	ND (0.97)	ND (0.98)	ND (0.98)	ND (1.1)	ND (0.98)	ND (0.97)	ND (0.97)	ND (0.98)	ND (0.96)	ND (0.97)	ND (0.99)	ND (0.98)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (0.97)	ND (0.97)	ND (1.0)

NOTES:
1. Only laboratory detected analytes shown on summary table.
2. An asterisk (*) following a detection limit indicates that the minimum laboratory reporting limit exceeds one or more of the regulatory criteria.
3. ND = Not detected above the lab reporting limits shown in parenthesis.
4. NT = Not tested/Not Reported under Method Specified.
5. ~ = No Method 1 Standard or UCL available
6. **Green shaded bold values exceed the MCP Reportable Concentrations (RCs).**
7. MCP Metyhod 1 Clenup Standards shown for reference only.
8. * Well Sampled for Full parameters by Others in Dec. 2018 (not needed Jan 2019).
9. ** Well not sampled in July 2019 (Covered)
10. (FD) - Field Duplicate

BOSTON ENVIRONMENTAL CORPORATION

TABLE 2 - GROUNDWATER ELEVATIONS AND FIELD PARAMETERS
MARILYN'S LANDING COMMERCIAL REUSE AREA
946 PLYMOUTH STREET, BRIDGEWATER, MASSACHUSETTS
BEC JOB #18191

Well ID (top of well casing elev. in ft.)	Date	GROUNDWATER LEVELS		FIELD PARAMETERS					
		DEPTH TO GROUNDWATER (FT)	GROUNDWATER ELEVATION (FT)	TEMPERATURE (°C)	DISSOLVED OXYGEN (MG/L)	SPECIFIC CONDUCTIVITY (uS/CM)	pH (UNITS)	OXIDATIVE REDUCTIVE POTENTIAL (mv)	TURBIDITY (NTU)
MW-1	1/10/2019	3.01	49.98	9.90	0.00	2263	4.53	252.20	87.69
52.99	6/11/2019	3.70	49.29	11.60	0.01	2988	4.57	234.70	31.59
	1/16/2020	3.30	49.69	9.00	2.18	2646	5.07	226.70	23.00
	6/16/2020	3.76	49.23	11.60	0.38	1882	4.92	174.10	11.50
	11/30/2020	5.48	47.51	12.40	0.59	3009	5.29	224.20	21.51
	6/29/2021	4.81	48.18	16.20	0.20	1719	5.30	191.00	92.80
	11/17/2021	3.37	49.62	13.00	0.28	1896	5.18	112.70	47.21
	5/17/2022	3.64	49.35	11.50	0.49	1149	5.14	108.20	43.18
MW-2	1/10/2019	4.54	49.70	8.20	0.34	2214	6.23	64.60	16.67
54.24	6/11/2019	4.99	49.25	11.30	1.34	1333	6.32	53.42	40.18
	1/16/2020	4.75	49.49	8.20	0.33	2115	6.37	80.30	19.90
	6/16/2020	5.41	48.83	11.10	0.41	1425	6.44	33.20	22.90
	11/30/2020	7.39	46.85	11.70	0.63	2315	6.41	26.40	27.35
	6/29/2021	6.34	47.90	13.60	0.16	2429	5.82	81.80	7.20
	11/17/2021	4.91	49.33	12.90	0.06	1664	6.35	-138.70	9.20
	5/17/2022	5.74	48.50	9.90	1.96	1643	6.35	-36.90	19.23
MW-3	1/10/2019	4.83	49.96	8.40	0.06	5099	6.11	-37.00	7.28
54.79	6/11/2019	5.43	49.36	12.20	0.28	6175	6.30	-77.20	2.30
	1/16/2020	4.84	49.95	7.50	0.18	3708	6.22	7.20	14.20
	6/16/2020	5.32	49.47	14.40	0.42	2997	6.14	20.40	22.90
	11/30/2020	7.21	47.58	12.40	2.41	5354	5.61	2.10	210.95
	6/30/2021	6.45	48.34	15.10	0.28	4360	4.68	-10.50	77.00
	11/17/2021	4.79	50.00	12.60	1.40	2957	6.02	-112.70	49.00
	5/17/2022	8.67	46.12	14.20	7.07	2984	6.05	-29.00	8.41
MW-4 (Destroyed)	1/10/2019	3.33	54.47	5.80	0.20	4447	6.48	-53.20	13.94
57.8	6/11/2019	3.94	53.86	15.70	0.09	3578	6.52	-82.90	16.95
	1/16/2020	2.26	55.54	6.20	0.55	3384	6.78	-42.50	111.00
	6/16/2020	3.68	54.12	15.10	0.36	3200	6.67	-106.00	8.70
	11/30/2020	1.89	55.91	11.60	0.62	3301	6.73	-104.00	2.35
	6/29/2021	1.09	56.71	18.60	0.20	2711	6.70	-99.70	143.20
	11/17/2021	Water at Surface	Not Applicable	12.20	0.40	2708	6.62	-71.50	30.82
MW-5	1/10/2019	4.21	55.20	5.00	4.32	856	6.78	124.70	15.12
59.41	6/18/2019	3.43	55.98	15.51	3.74	641	7.00	176.90	1.80
	1/16/2020	3.38	56.03	5.30	2.51	931	7.03	194.00	8.00
	6/16/2020	3.93	55.48	14.10	2.70	1015	7.08	143.70	2.60
	11/30/2020	4.07	55.34	10.70	1.39	1140	7.18	146.10	12.10
	6/29/2021	3.01	56.40	17.90	1.13	2581	6.51	179.80	2.20
	11/17/2021	2.75	56.66	12.20	1.83	1847	6.87	-78.70	2.90
	5/17/2022	2.92	56.49	12.30	3.10	1170	6.88	64.30	2.58
MW-103	11/30/2020	15.58	44.19	12.63	1.05	657	6.55	-96.90	2.90
59.77	6/30/2021	14.95	44.82	13.14	0.25	195	5.75	Not Collected	2.00
	11/18/2021	13.98	45.79	14.60	0.24	130	5.44	83.70	0.92
	5/18/2022	14.45	45.32	10.40	0.34	219	5.93	-46.40	18.00
MW-106	11/30/2020	9.21	47.51	8.27	3.94	41	5.10	137.90	0.02
56.72	6/30/2021	8.59	48.13	14.60	0.49	24	4.29	Not Collected	0.02
	11/18/2021	6.71	50.01	11.00	1.26	22	4.92	142.10	2.26
	5/18/2022	7.40	49.32	9.70	0.35	22	4.95	87.90	20.00
MW-108	11/30/2020	19.06	44.45	13.82	2.44	66	5.47	156.20	0.02
63.51	6/30/2021	18.18	45.33	16.20	4.82	111	3.27	279.20	2.13
	11/18/2021	16.82	46.69	15.90	2.54	144	5.75	-66.90	2.30
	5/18/2022	17.58	45.93	11.90	3.46	142	5.74	107.80	2.65
MW-113	12/29/2020	30.72	45.18	6.93	8.17	49	5.66	227.80	6.86
75.90	6/30/2021	30.58	45.32	14.60	7.74	46	5.08	Not Collected	0.02
	11/18/2021	28.88	47.02	11.40	6.48	64	5.21	105.30	0.02
	5/18/2022	29.48	45.61	11.3	7.4	56.8	5.34	77.1	3.3

BOSTON ENVIRONMENTAL CORPORATION

TABLE 3 - SURFACE WATER MONITORING RESULTS
MARILYN'S LANDING COMMERCIAL REUSE AREA
946 PLYMOUTH STREET, BRIDGEWATER, MASSACHUSETTS
BEC JOB #18191

Parameter	Lowest Ecologically Based Criteria ug/L	SAMPLING LOCATION								
		SG-1B	SG-2				SG-3			
Sampling Date		12/29/2020	11/30/2020	6/30/2021	11/17/2021	5/17/2022	11/30/2020	6/30/2021	11/17/2021	5/17/2022
SW-846 6020B (µg/L) Metals Digestion										
ANTIMONY	300	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)
ARSENIC	36	ND (0.80)	0.88	1.9	0.54	1.8	1.2	1.7	0.80	1.6
BARIUM	41000	36	5.9	15	7.9	14	6.8	15	7.8	12
BERYLLIUM	7.3	0.29	ND (0.40)	ND (0.40)	ND (0.40)	ND (0.40)	ND (0.40)	ND (0.40)	ND (0.40)	ND (0.40)
CADMIUM	0.3	**0.48**	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.20)
CHROMIUM	11	1.6	ND (1.0)	ND (1.0)	ND (1.0)	0.71	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)
LEAD	0.54	**4.8**	0.44	0.20	0.43	0.41	**0.92**	0.24	0.52	0.39
NICKEL	8.2	6.4	ND (5.0)	0.88	0.56	1.5	ND (5.0)	0.85	0.59	1.4
SELENIUM	1.5	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)
SILVER	0.03	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.20)
THALLIUM	110	0.026	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.20)
VANADIUM	160	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)
ZINC	37	**52**	8.3	9.4	4.8	9.5	19	26	5.3	5.5
SW-846 7470A (mg/L) Metals Digestion										
MERCURY	0.77	ND (0.00010)	ND (0.00010)	ND (0.00010)	ND (0.00010)	ND (0.00010)	ND (0.00010)	ND (0.00010)	ND (0.00010)	ND (0.00010)
SW-846 8082A (µg/L)										
PCB 1016	0.014	ND (0.21)	ND (0.14)	ND (0.15)	ND (0.14)	ND (0.15)	ND (0.14)	ND (0.15)	ND (0.16)	ND (0.15)
PCB 1221	0.014	ND (0.21)	ND (0.14)	ND (0.15)	ND (0.14)	ND (0.15)	ND (0.14)	ND (0.15)	ND (0.16)	ND (0.15)
PCB 1232	0.014	ND (0.21)	ND (0.14)	ND (0.15)	ND (0.14)	ND (0.15)	ND (0.14)	ND (0.15)	ND (0.16)	ND (0.15)
PCB 1242	0.014	ND (0.21)	ND (0.14)	ND (0.15)	ND (0.14)	ND (0.15)	ND (0.14)	ND (0.15)	ND (0.16)	ND (0.15)
PCB 1248	0.014	ND (0.21)	ND (0.14)	ND (0.15)	ND (0.14)	ND (0.15)	ND (0.14)	ND (0.15)	ND (0.16)	ND (0.15)
PCB 1254	0.014	ND (0.21)	ND (0.14)	ND (0.15)	ND (0.14)	ND (0.15)	ND (0.14)	ND (0.15)	ND (0.16)	ND (0.15)
PCB 1260	0.014	ND (0.21)	ND (0.14)	ND (0.15)	ND (0.14)	ND (0.15)	ND (0.14)	ND (0.15)	ND (0.16)	ND (0.15)
PCB 1262	0.014	ND (0.21)	ND (0.14)	ND (0.15)	ND (0.14)	ND (0.15)	ND (0.14)	ND (0.15)	ND (0.16)	ND (0.15)
PCB 1268	0.014	ND (0.21)	ND (0.14)	ND (0.15)	ND (0.14)	ND (0.15)	ND (0.14)	ND (0.15)	ND (0.16)	ND (0.15)
SW-846 8260C (µg/L)										
ACETONE	3400	3.9	ND (10)	ND (20)	ND (20)	4.5	ND (10)	ND (20)	ND (20)	ND (20)
TERT-AMYL METHYL ETHER	~	ND (0.50)	ND (0.50)	ND (1.0)	ND (1.0)	ND (1.0)	ND (0.50)	ND (1.0)	ND (1.0)	ND (1.0)
BENZENE	460	ND (1.0)	ND (1.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (1.0)	ND (2.0)	ND (2.0)	ND (2.0)
BROMOBENZENE	~	ND (1.0)	ND (1.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (1.0)	ND (2.0)	ND (2.0)	ND (2.0)
BROMOCHLOROMETHANE	~	ND (1.0)	ND (1.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (1.0)	ND (2.0)	ND (2.0)	ND (2.0)
BROMODICHLOROMETHANE	20000	ND (1.0)	ND (1.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (1.0)	ND (2.0)	ND (2.0)	ND (2.0)
BROMOFORM	2900	ND (2.0)	ND (1.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (1.0)	ND (2.0)	ND (2.0)	ND (2.0)
BROMOMETHANE	30	ND (2.0)	ND (2.0)	ND (4.0)	ND (10)	ND (4.0)	ND (2.0)	ND (4.0)	ND (10)	ND (4.0)
2-BUTANONE (MEK)	200000	ND (10)	ND (10)	ND (20)	ND (20)	ND (20)	ND (10)	ND (20)	ND (20)	ND (20)
N-BUTYLBENZENE	~	ND (1.0)	ND (1.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (1.0)	ND (2.0)	ND (2.0)	ND (2.0)
SEC-BUTYLBENZENE	~	ND (1.0)	ND (1.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (1.0)	ND (2.0)	ND (2.0)	ND (2.0)
TERT-BUTYLBENZENE	~	ND (1.0)	ND (1.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (1.0)	ND (2.0)	ND (2.0)	ND (2.0)
TERT-BUTYLETHYL ETHER	~	ND (0.50)	ND (0.50)	ND (1.0)	ND (1.0)	ND (1.0)	ND (0.50)	ND (1.0)	ND (1.0)	ND (1.0)
CARBON DISULFIDE	~	ND (5.0)	ND (5.0)	ND (10)	ND (10)	ND (10)	ND (5.0)	ND (10)	ND (10)	ND (10)
CARBON TETRACHLORIDE	200	ND (1.0)	ND (1.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (1.0)	ND (2.0)	ND (2.0)	ND (2.0)
CHLOROBENZENE	38	ND (1.0)	ND (1.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (1.0)	ND (2.0)	ND (2.0)	ND (2.0)
CHLORODIBROMOMETHANE	3400	ND (0.50)	ND (0.50)	ND (1.0)	ND (1.0)	ND (1.0)	ND (0.50)	ND (1.0)	ND (1.0)	ND (1.0)
CHLOROETHANE	~	ND (2.0)	ND (2.0)	ND (4.0)	ND (4.0)	ND (4.0)	ND (2.0)	ND (4.0)	ND (4.0)	ND (4.0)
CHLOROFORM	970	ND (2.0)	ND (2.0)	ND (4.0)	ND (4.0)	ND (4.0)	ND (2.0)	ND (4.0)	ND (4.0)	ND (4.0)
CHLOROMETHANE	~	ND (2.0)	ND (2.0)	ND (4.0)	ND (4.0)	ND (4.0)	ND (2.0)	ND (4.0)	ND (4.0)	ND (4.0)
2-CHLOROTOLUENE	~	ND (1.0)	ND (1.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (1.0)	ND (2.0)	ND (2.0)	ND (2.0)
4-CHLOROTOLUENE	~	ND (1.0)	ND (1.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (1.0)	ND (2.0)	ND (2.0)	ND (2.0)
1,2-DIBROMO-3-CHLOROPROPANE	~	ND (2.0)	ND (2.0)	ND (4.0)	ND (4.0)	ND (4.0)	ND (2.0)	ND (4.0)	ND (4.0)	ND (4.0)
1,2-DIBROMOETHANE (EDB)	~	ND (0.50)	ND (0.50)	ND (1.0)	ND (1.0)	ND (1.0)	ND (0.50)	ND (1.0)	ND (1.0)	ND (1.0)
DIBROMOMETHANE	~	ND (1.0)	ND (1.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (1.0)	ND (2.0)	ND (2.0)	ND (2.0)
1,2-DICHLOROBENZENE	~	ND (1.0)	ND (1.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (1.0)	ND (2.0)	ND (2.0)	ND (2.0)
1,3-DICHLOROBENZENE	~	ND (1.0)	ND (1.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (1.0)	ND (2.0)	ND (2.0)	ND (2.0)
1,4-DICHLOROBENZENE	~	ND (1.0)	ND (1.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (1.0)	ND (2.0)	ND (2.0)	ND (2.0)
DICHLORODIFLUOROMETHANE	~	ND (2.0)	ND (2.0)	ND (4.0)	ND (4.0)	ND (4.0)	ND (2.0)	ND (4.0)	ND (4.0)	ND (4.0)
1,1-DICHLOROETHANE	990	ND (1.0)	ND (1.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (1.0)	ND (2.0)	ND (2.0)	ND (2.0)
1,2-DICHLOROETHANE	990	ND (1.0)	ND (1.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (1.0)	ND (2.0)	ND (2.0)	ND (2.0)
1,1-DICHLOROETHYLENE	1200	ND (1.0)	ND (1.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (1.0)	ND (2.0)	ND (2.0)	ND (2.0)
CIS-1,2-DICHLOROETHYLENE	14000	ND (1.0)	ND (1.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (1.0)	ND (2.0)	ND (2.0)	ND (2.0)
TRANS-1,2-DICHLOROETHYLENE	22000	ND (1.0)	ND (1.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (1.0)	ND (2.0)	ND (2.0)	ND (2.0)
1,2-DICHLOROPROPANE	25000	ND (1.0)	ND (1.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (1.0)	ND (2.0)	ND (2.0)	ND (2.0)
1,3-DICHLOROPROPANE	~	ND (0.50)	ND (0.50)	ND (1.0)	ND (1.0)	ND (1.0)	ND (0.50)	ND (1.0)	ND (1.0)	ND (1.0)
2,2-DICHLOROPROPANE	~	ND (1.0)	ND (1.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (1.0)	ND (2.0)	ND (2.0)	ND (2.0)
1,1-DICHLOROPROPENE	~	ND (0.50)	ND (0.50)	ND (1.0)	ND (1.0)	ND (1.0)	ND (0.50)	ND (1.0)	ND (1.0)	ND (1.0)
CIS-1,3-DICHLOROPROPENE	~	ND (0.40)	ND (0.40)	ND (0.80)	ND (0.80)	ND (0.80)	ND (0.40)	ND (0.80)	ND (0.80)	ND (0.80)
TRANS-1,3-DICHLOROPROPENE	~	ND (0.40)	ND (0.40)	ND (0.80)	ND (0.80)	ND (0.80)	ND (0.40)	ND (0.80)	ND (0.80)	ND (0.80)
DIETHYL ETHER	~	ND (2.0)	ND (2.0)	ND (4.0)	ND (4.0)	ND (4.0)	ND (2.0)	ND (4.0)	ND (4.0)	ND (4.0)
DIISOPROPYL ETHER	~	ND (0.50)	ND (0.50)	ND (1.0)	ND (1.0)	ND (1.0)	ND (0.50)	ND (1.0)	ND (1.0)	ND (1.0)
1,4-DIOXANE	990000	ND (50)	ND (50)	ND (100)	ND (100)	ND (100)	ND (50)	ND (100)	ND (100)	ND (100)
ETHYLBENZENE	181	ND (1.0)	ND (1.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (1.0)	ND (2.0)	ND (2.0)	ND (2.0)
HEXACHLOROBUTADIENE	13	ND (0.60)	ND (0.60)	ND (1.2)	ND (1.2)	ND (1.2)	ND (0.60)	ND (1.2)	ND (1.2)	ND (1.2)
2-HEXANONE	~	ND (10)	ND (10)	ND (20)	ND (20)	ND (20)	ND (10)	ND (20)	ND (20)	ND (20)
ISOPROPYLBENZENE	~	ND (1.0)	ND (1.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (1.0)	ND (2.0)	ND (2.0)	ND (2.0)
P-ISOPROPYLTOLUENE	~	ND (1.0)	ND (1.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (1.0)	ND (2.0)	ND (2.0)	ND (2.0)
METHYL TERT-BUTYL ETHER (MTBE)	100000	ND (1.0)	ND (1.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (1.0)	ND (2.0)	ND (2.0)	ND (2.0)
METHYLENE CHLORIDE	~	ND (5.0)	ND (5.0)	ND (10)	ND (10)	ND (10)	ND (5.0)	ND (10)	ND (10)	ND (10)
4-METHYL-2-PENTANONE (MIBK)	~	ND (10)	ND (10)	ND (20)	ND (20)	ND (20)	ND (10)	ND (20)	ND (20)	ND (20)
NAPHTHALENE	72	ND (2.0)	ND (2.0)	ND (4.0)	ND (4.0)	ND (4.0)	ND (2.0)	ND (4.0)	ND (4.0)	ND (4.0)
N-PROPYLBENZENE	~	ND (1.0)	ND (1.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (1.0)	ND (2.0)	ND (2.0)	ND (2.0)
STYRENE	250	ND (1.0)	ND (1.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (1.0)	ND (2.0)	ND (2.0)	ND (2.0)
1,1,1,2-TETRACHLOROETHANE	2000	ND (1.0)	ND (1.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (1.0)	ND (2.0)	ND (2.0)	ND (2.0)
1,1,2,2-TETRACHLOROETHANE	4000	ND (0.50)	ND (0.50)	ND (1.0)	ND (1.0)	ND (1.0)	ND (0.50)	ND (1.0)	ND (1.0)	ND (1.0)
TETRACHLOROETHYLENE	1100	ND (1.0)	ND (1.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (1.0)	ND (2.0)	ND (2.0)	ND (2.0)
TETRAHYDROFURAN	~	ND (2.0)	ND (2.0)	ND (4.0)	ND (4.0)	ND (4.0)	ND (2.0)	ND (4.0)	ND (4.0)	ND (4.0)
TOLUENE	1400	0.16	ND (1.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (1.0)	ND (2.0)	ND (2.0)	ND (2.0)
1,2,3-TRICHLOROBENZENE		ND (2.0)	ND (2.0)	ND (4.0)	ND (4.0)	ND (4.0)	ND (2.0)	ND (4.0)	ND (4.0)	ND (4.0)
1,2,4-TRICHLOROBENZENE	340	ND (1.0)	ND (1.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (1.0)	ND (2.0)	ND (2.0)	ND (2.0)
1,1,1-TRICHLOROETHANE	900	ND (1.0)	ND (1.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (1.0)	ND (2.0)	ND (2.0)	ND (2.0)
1,1,2-TRICHLOROETHANE	15000	ND (1.0)	ND (1.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (1.0)	ND (2.0)	ND (2.0)	ND (2.0)
TRICHLOROETHYLENE	190	ND (1.0)	ND (1.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (1.0)	ND (2.0)	ND (2.0)	ND (2.0)
TRICHLOROFLUOROMETHANE	~	ND (2.0)	ND (2.0)	ND (4.0)	ND (4.0)	ND (4.0)	ND (2.0)	ND (4.0)	ND (4.0)	ND (4.0)
1,2,3-TRICHLOROPROPANE	~	ND (2.0)	ND (2.0)	ND (4.0)	ND (4.0)	ND (4.0)	ND (2.0)	ND (4.0)	ND (4.0)	ND (4.0)
1,2,4-TRIMETHYLBENZENE	~	ND (1.0)	ND (1.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (1.0)	ND (2.0)	ND (2.0)	ND (2.0)
1,3,5-TRIMETHYLBENZENE	~	ND (1.0)	ND (1.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (1.0)	ND (2.0)	ND (2.0)	ND (2.0)
VINYL CHLORIDE	41000	ND (2.0)	ND (2.0)	ND (4.0)	ND (4.0)	ND (4.0)	ND (2.0)	ND (4.0)	ND (4.0)	ND (4.0)
M/P-XYLENE	200	ND (2.0)	ND (2.0)	ND (4.0)	ND (4.0)	ND (4.0)	ND (2.0)	ND (4.0)	ND (4.0)	ND (4.0)
O-XYLENE	200	ND (1.0)	ND (1.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (1.0)	ND (2.0)	ND (2.0)	ND (2.0)
SW-846 8270D (µg/L)										
1,4 DIOXANE	990000	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.19)	ND (0.20)	ND (0.19)	ND (0.19)	ND (0.19)	ND (0.19)
SM21-22 2510B (µmhos/cm)										
SPECIFIC CONDUCTANCE	~	480	130	160	140	190	150	170	150	190
SM21-22 4500 H B (pH Units)										
PH	~	4.6	6.2	6.1	6.1	6.2	6.0	6	5.8	6.1
SW-846 6010 (mg/L) Metals Digestion										
HARDNESS	~	120	12	19	13	20	16	22	14	21
SW-846 8081B (µg/L)										
ALDRIN	0.13	ND (0.053)	ND (0.014)	ND (0.015)	ND (0.014)	ND (0.016)	ND (0.014)	ND (0.015)	ND (0.016)	ND (0.015)
ALPHA-BHC	~	ND (0.053)	ND (0.071)	ND (0.077)	ND (0.071)	ND (0.080)	ND (0.069)	ND (0.077)	ND (0.080)	ND (0.077)
BETA-BHC	~	ND (0.053)	ND (0.071)	ND (0.077)	ND (0.071)	ND (0.080)	ND (0.069)	ND (0.077)	ND (0.080)	ND (0.077)
DELTA-BHC	~	ND (0.053)	ND (0.071)	ND (0.077)	ND (0.071)	ND (0.080)	ND (0.069)	ND (0.077)	ND (0.080)	ND (0.077)
GAMMA-BHC (LINDANE)	~	ND (0.032)	ND (0.014)	ND (0.015)	ND (0.014)	ND (0.016)	ND (0.014)	ND (0.015)	ND (0.016)	ND (0.015)
CHLORDANE	0.004	ND (0.21)	ND (0.14)	ND (0.15)	ND (0.14)	ND (0.16)	ND (0.14)	ND (0.15)	ND (0.16)	ND (0.15)
4,4'-DDD	0.18	ND (0.043)	ND (0.014)	ND (0.015)	ND (0.014)	ND (0.016)	ND (0.014)	ND (0.015)	ND (0.016)	ND (0.015)
4,4'-DDE	1.7	ND (0.043)	ND (0.014)	ND (0.015)	ND (0.014)	ND (0.016)	ND (0.014)	ND (0.015)	ND (0.016)	ND (0.015)
4,4'-DDT	0.001	ND (0.043)	ND (0.014)	ND (0.015)	ND (0.014)	ND (0.016)	ND (0.014)	ND (0.015)	ND (0.016)	ND (0.015)
DIELDRIN	0.0019	ND (0.0021)	ND (0.0014)	ND (0.0015)	ND (0.0014)	ND (0.0016)	ND (0.0014)	ND (0.0015)	ND (0.0016)	ND (0.0015)
ENDOSULFAN I	0.0087	ND (0.053)	ND (0.071)	ND (0.077)	ND (0.071)	ND (0.080)	ND (0.069)	ND (0.077)	ND (0.080)	ND (0.077)
ENDOSULFAN II	0.0087	ND (0.085)	ND (0.071)	ND (0.077)	ND (0.071)	ND (0.080)	ND (0.069)	ND (0.077)	ND (0.080)	ND (0.077)
ENDOSULFAN SULFATE	~	ND (0.085)	ND (0.071)	ND (0.077)	ND (0.071)	ND (0.080)	ND (0.069)	ND (0.077)	ND (0.080)	ND (0.077)
ENDRIN	0.0023	ND (0.085)	ND (0.071)	ND (0.077)	ND (0.071)	ND (0.080)	ND (0.069)	ND (0.077)	ND (0.080)	ND (0.077)
ENDRIN KETONE	~	ND (0.085)	ND (0.071)	ND (0.077)	ND (0.071)	ND (0.080)	ND (0.069)	ND (0.077)	ND (0.080)	ND (0.077)
HEPTACHLOR	0.0036	ND (0.053)	ND (0.014)	ND (0.015)	ND (0.014)	ND (0.016)	ND (0.014)	ND (0.015)	ND (0.016)	ND (0.015)
HEPTACHLOR EPOXIDE	0.0036	ND (0.053)	ND (0.014)	ND (0.015)	ND (0.014)	ND (0.016)	ND (0.014)	ND (0.015)	ND (0.016)	ND (0.015)
HEXACHLOROBENZENE	23	ND (0.053)	ND (0.057)	ND (0.062)	ND (0.057)	ND (0.064)	ND (0.055)	ND (0.062)	ND (0.064)	ND (0.062)
METHOXYCHLOR	0.05	ND (0.53)	ND (0.29)	ND (0.31)	ND (0.29)	ND (0.32)	ND (0.28)	ND (0.31)	ND (0.32)	ND (0.31)
TOXAPHENE	~	ND (1.1)	ND (1.1)	ND (0.77)	ND (0.71)	ND (0.80)	ND (1.1)	ND (0.77)	ND (0.80)	ND (0.77)
SW-846 8100 Modified (mg/L)										
TPH	~	0.30	0.26	1.9	0.39	0.5	0.42	4.8	0.39	0.52
SW-846 8151A (µg/L)										
2,4-D	~	ND (0.49)	ND (0.50)	ND (0.48)	ND (0.49)	ND (0.49)	ND (0.52)	ND (0.49)	ND (0.48)	ND (0.48)
2,4-DB	~	ND (0.49)	0.18	ND (0.48)	ND (0.49)	0.61	0.23	ND (0.49)	ND (0.48)	ND (0.48)
2,4,5-TP (SILVEX)	~	ND (0.049)	ND (0.050)	ND (0.048)	ND (0.049)	ND (0.049)	ND (0.052)	ND (0.049)	ND (0.048)	ND (0.048)
2,4,5-T	~	ND (0.098)	ND (0.10)	ND (0.096)	ND (0.098)	0.026	ND (0.10)	ND (0.098)	ND (0.095)	ND (0.096)
DALAPON	~	ND (1.2)	ND (1.2)	ND (1.2)	ND (1.2)	ND (1.2)	ND (1.3)	ND (1.2)	ND (1.2)	ND (1.2)
DICAMBA	~	0.050	ND (0.050)	ND (0.048)	ND (0.049)	ND (0.049)	ND (0.052)	ND (0.049)	ND (0.048)	ND (0.048)
DICHLOROPROP	~	ND (0.49)	ND (0.50)	ND (0.48)	ND (0.49)	ND (0.49)	ND (0.52)	ND (0.49)	ND (0.48)	ND (0.48)
DINOSEB	~	ND (0.25)	ND (0.25)	ND (0.24)	ND (0.25)	ND (0.24)	ND (0.26)	ND (0.25)	ND (0.24)	ND (0.24)
MCPA	~	ND (49)	ND (50)	ND (48)	ND (49)	ND (49)	ND (52)	ND (49)	ND (48)	ND (48)
MCPP	~	ND (49)	ND (50)	ND (48)	ND (49)	ND (49)	ND (52)	ND (49)	ND (48)	ND (48)
SW-846 8270D (µg/L)										
ACENAPHTHENE	40	ND (1.2)	ND (0.29)	ND (0.59)	ND (0.29)	ND (0.29)	0.070	ND (2.9)	ND (0.29)	ND (0.30)
ACENAPHTHYLENE	0.14	ND (0.80)	ND (0.19)	ND (0.39)	ND (0.19)	ND (0.20)	ND (0.20)	ND (2.0)	ND (0.19)	ND (0.20)
ACETOPHENONE	~	ND (10)	ND (9.5)	ND (9.8)	ND (9.6)	ND (9.8)	ND (9.8)	ND (39)	ND (9.7)	ND (9.9)
ANILINE	~	ND (5.0)	ND (4.8)	ND (4.9)	ND (4.8)	ND (4.9)	ND (4.9)	ND (20)	ND (4.9)	ND (5.0)
ANTHRACENE	0.13	ND (0.80)	ND (0.19)	ND (0.39)	ND (0.19)	0.063	ND (0.20)	ND (2.0)	ND (0.19)	0.052
BENZO(A)ANTHRACENE	1	ND (0.20)	ND (0.048)	ND (0.098)	ND (0.048)	ND (0.049)	0.047	ND (0.49)	ND (0.049)	ND (0.050)
BENZO(A)PYRENE	0.5	ND (0.40)	ND (0.095)	ND (0.20)	ND (0.096)	ND (0.098)	0.047	ND (0.98)	ND (0.097)	ND (0.099)
BENZO(B)FLUORANTHENE	0.42	ND (0.20)	ND (0.048)	ND (0.098)	ND (0.048)	ND (0.049)	0.064	ND (0.49)	ND (0.049)	ND (0.050)
BENZO(G,H,I)PERYLENE	0.02	ND (2.0)	ND (0.48)	ND (0.98)	ND (0.48)	ND (0.49)	**0.031**	ND (4.9)	ND (0.49)	ND (0.50)
BENZO(K)FLUORANTHENE	0.14	ND (0.80)	ND (0.19)	ND (0.39)	ND (0.19)	ND (0.20)	0.023	ND (2.0)	ND (0.19)	ND (0.20)
BIS(2-CHLOROETHOXY)METHANE	~	ND (10)	ND (9.5)	ND (9.8)	ND (9.6)	ND (9.8)	ND (9.8)	ND (39)	ND (9.7)	ND (9.9)
BIS(2-CHLOROETHYL)ETHER	24000	ND (10)	ND (9.5)	ND (9.8)	ND (9.6)	ND (9.8)	ND (9.8)	ND (39)	ND (9.7)	ND (9.9)
BIS(2-CHLOROISOPROPYL)ETHER	24000	ND (10)	ND (9.5)	ND (9.8)	ND (9.6)	ND (9.8)	ND (9.8)	ND (39)	ND (9.7)	ND (9.9)
BIS(2-ETHYLHEXYL)PHTHALATE	160	ND (2.0)	ND (9.5)	ND (2.0)	ND (1.9)	ND (9.8)	ND (9.8)	ND (7.8)	ND (1.9)	ND (9.9)
4-BROMOPHENYL PHENYL ETHER	~	ND (10)	ND (9.5)	ND (9.8)	ND (9.6)	ND (9.8)	ND (9.8)	ND (39)	ND (9.7)	ND (9.9)
BUTYLBENZYLPHTHALATE	~	ND (10)	ND (9.5)	ND (9.8)	ND (9.6)	ND (9.8)	ND (9.8)	6.9	ND (9.7)	ND (9.9)
4-CHLOROANILINE	10	ND (10)	ND (9.5)	ND (9.8)	ND (9.6)	ND (9.8)	ND (9.8)	ND (39)	ND (9.7)	ND (9.9)
2-CHLORONAPHTHALENE	~	ND (10)	ND (9.5)	ND (9.8)	ND (9.6)	ND (9.8)	ND (9.8)	ND (39)	ND (9.7)	ND (9.9)
2-CHLOROPHENOL	260	ND (10)	ND (9.5)	ND (9.8)	ND (9.6)	ND (9.8)	ND (9.8)	ND (39)	ND (9.7)	ND (9.9)
CHRYSENE	0.07	ND (0.80)	ND (0.19)	ND (0.39)	ND (0.19)	ND (0.20)	0.050	ND (2.0)	ND (0.19)	ND (0.20)
DIBENZ(A,H)ANTHRACENE	0.04	ND (0.40)	ND (0.095)	ND (0.20)	ND (0.096)	ND (0.098)	ND (0.098)	ND (0.98)	ND (0.097)	ND (0.099)
DIBENZOFURAN	~	ND (5.0)	ND (4.8)	ND (4.9)	ND (4.8)	ND (4.9)	ND (4.9)	ND (20)	ND (4.9)	ND (5.0)
DI-N-BUTYLPHTHALATE	~	ND (10)	ND (9.5)	ND (9.8)	ND (9.6)	ND (9.8)	ND (9.8)	ND (39)	ND (9.7)	ND (9.9)
1,2-DICHLOROBENZENE	78	ND (5.0)	ND (4.8)	ND (4.9)	ND (4.8)	ND (4.9)	ND (4.9)	ND (20)	ND (4.9)	ND (5.0)
1,3-DICHLOROBENZENE	1500	ND (5.0)	ND (4.8)	ND (4.9)	ND (4.8)	ND (4.9)	ND (4.9)	ND (20)	ND (4.9)	ND (5.0)
1,4-DICHLOROBENZENE	310	ND (5.0)	ND (4.8)	ND (4.9)	ND (4.8)	ND (4.9)	ND (4.9)	ND (20)	ND (4.9)	ND (5.0)
3,3'-DICHLOROBENZIDINE	73	ND (10)	ND (9.5)	ND (9.8)	ND (9.6)	ND (9.8)	ND (9.8)	ND (39)	ND (9.7)	ND (9.9)
2,4-DICHLOROPHENOL	80	ND (10)	ND (9.5)	ND (9.8)	ND (9.6)	ND (9.8)	ND (9.8)	ND (39)	ND (9.7)	ND (9.9)
DIETHYLPHTHALATE	340	ND (10)	ND (9.5)	ND (9.8)	ND (9.6)	ND (9.8)	ND (9.8)	ND (39)	ND (9.7)	ND (9.9)
2,4-DIMETHYLPHENOL	3100	ND (10)	ND (9.5)	ND (9.8)	ND (9.6)	ND (9.8)	ND (9.8)	ND (39)	ND (9.7)	ND (9.9)
DIMETHYLPHTHALATE	23000	ND (10)	ND (9.5)	ND (9.8)	ND (9.6)	ND (9.8)	ND (9.8)	ND (39)	ND (9.7)	ND (9.9)
2,4-DINITROPHENOL	900	ND (10)	ND (9.5)	ND (9.8)	ND (9.6)	ND (9.8)	ND (9.8)	ND (39)	ND (9.7)	ND (9.9)
2,4-DINITROTOLUENE	3800	ND (10)	ND (9.5)	ND (9.8)	ND (9.6)	ND (9.8)	ND (9.8)	ND (39)	ND (9.7)	ND (9.9)
2,6-DINITROTOLUENE	~	ND (10)	ND (9.5)	ND (9.8)	ND (9.6)	ND (9.8)	ND (9.8)	ND (39)	ND (9.7)	ND (9.9)
DI-N-OCTYLPHTHALATE	~	ND (10)	ND (9.5)	ND (9.8)	ND (9.6)	ND (9.8)	ND (9.8)	ND (39)	ND (9.7)	ND (9.9)
1,2-DIPHENYLHYDRAZINE (AZOBENZENE)	~	ND (10)	ND (9.5)	ND (9.8)	ND (9.6)	ND (9.8)	ND (9.8)	ND (39)	ND (9.7)	ND (9.9)
FLUORANTHENE	0.9	ND (2.0)	ND (0.48)	ND (0.98)	ND (0.48)	0.021	0.13	ND (4.9)	ND (0.49)	0.016
FLUORENE	0.14	ND (4.0)	ND (0.95)	ND (2.0)	ND (0.96)	0.026	0.045	ND (9.8)	ND (0.97)	0.025
HEXACHLOROBENZENE	23	ND (2.0)	ND (9.5)	ND (2.0)	ND (1.9)	ND (9.8)	ND (9.8)	ND (7.8)	ND (1.9)	ND (9.9)
HEXACHLOROBUTADIENE	13	ND (2.0)	ND (9.5)	ND (2.0)	ND (1.9)	ND (9.8)	ND (9.8)	ND (7.8)	ND (1.9)	ND (9.9)
HEXACHLOROETHANE	210	ND (2.0)	ND (9.5)	ND (2.0)	ND (1.9)	ND (9.8)	ND (9.8)	ND (7.8)	ND (1.9)	ND (9.9)
INDENO(1,2,3-CD)PYRENE	0.14	ND (0.40)	ND (0.095)	ND (0.20)	ND (0.096)	ND (0.098)	0.034	ND (0.98)	ND (0.097)	ND (0.099)
ISOPHORONE	~	ND (10)	ND (9.5)	ND (9.8)	ND (9.6)	ND (9.8)	ND (9.8)	ND (39)	ND (9.7)	ND (9.9)
2-METHYLNAPHTHALENE	70	ND (4.0)	ND (0.95)	ND (2.0)	ND (0.96)	ND (0.98)	ND (0.98)	ND (9.8)	ND (0.97)	ND (0.99)
O-CRESOL	~	ND (10)	ND (9.5)	ND (9.8)	ND (9.6)	ND (9.8)	ND (9.8)	ND (39)	ND (9.7)	ND (9.9)
M/P-CRESOL	~	ND (10)	ND (9.5)	ND (9.8)	ND (9.6)	ND (9.8)	ND (9.8)	ND (39)	ND (9.7)	ND (9.9)
NAPHTHALENE	72	ND (4.0)	ND (0.95)	ND (2.0)	ND (0.96)	ND (0.98)	ND (0.98)	ND (9.8)	ND (0.97)	0.028
NITROBENZENE	~	ND (10)	ND (9.5)	ND (9.8)	ND (9.6)	ND (9.8)	ND (9.8)	ND (39)	ND (9.7)	ND (9.9)
2-NITROPHENOL	~	ND (10)	ND (9.5)	ND (9.8)	ND (9.6)	ND (9.8)	ND (9.8)	ND (39)	ND (9.7)	ND (9.9)
4-NITROPHENOL	~	ND (10)	ND (9.5)	ND (9.8)	ND (9.6)	ND (9.8)	ND (9.8)	ND (39)	ND (9.7)	ND (9.9)
PENTACHLOROPHENOL	7.9	ND (10)	ND (9.5)	ND (4.9)	ND (4.8)	ND (9.8)	ND (9.8)	ND (20)	ND (4.9)	ND (9.9)
PHENANTHRENE	38	ND (0.20)	ND (0.048)	ND (0.098)	ND (0.048)	0.22	0.088	ND (0.49)	ND (0.049)	0.18
PHENOL	62	ND (10)	ND (9.5)	ND (9.8)	ND (9.6)	ND (9.8)	ND (9.8)	ND (39)	ND (9.7)	ND (9.9)
PYRENE	0.089	ND (4.0)	ND (0.95)	ND (2.0)	ND (0.96)	ND (0.98)	0.085	ND (9.8)	ND (0.97)	ND (0.99)
PYRIDINE	~	ND (5.0)	ND (4.8)	ND (4.9)	ND (4.8)	ND (4.9)	ND (4.9)	ND (20)	ND (4.9)	ND (5.0)
1,2,4-TRICHLOROBENZENE	340	ND (5.0)	ND (4.8)	ND (4.9)	ND (4.8)	ND (4.9)	ND (4.9)	ND (20)	ND (4.9)	ND (5.0)
2,4,5-TRICHLOROPHENOL	130	ND (10)	ND (9.5)	ND (9.8)	ND (9.6)	ND (9.8)	ND (9.8)	ND (39)	ND (9.7)	ND (9.9)
2,4,6-TRICHLOROPHENOL	18	ND (10)	ND (9.5)	ND (9.8)	ND (9.6)	ND (9.8)	ND (9.8)	ND (39)	ND (9.7)	ND (9.9)

Notes:
1. ND = Not detected above the lab reporting limits shown in parenthesis
2. ~ = No Ecologically Based Criteria available
3. BOLD/SHADED values exceed the Lowest Ecologically Based Criteria
4. Surface Water sampling locations SG-1 and SG-1B (replacement for SG-1), were discontinued due to no surface water present.

BOSTON ENVIRONMENTAL CORPORATION

APPENDIX G
STORMWATER POLLUTION PROTECTION PLAN (CEC, May 2022)

(Reduced for File Size)

Stormwater Pollution Prevention Plan (SWPPP)

For Construction Activities At:

Marilyn's Landing
Off Plymouth Street
Bridgewater, Massachusetts

BFI-Halifax Landfill
27 Laurel Street
Halifax, Massachusetts

SWPPP Prepared For:

David MacDonald
645 Walnut Street
Bridgewater, MA 02324-0431
(508) 294-0174
marilynslanding@hotmail.com

SWPPP Prepared By:

Civil & Environmental Consultants, Inc.
Karlis Skulte, P.E.
31 Bellows Road
Raynham, MA 02767
(774) 501-2176
kskulte@cecinc.com

SWPPP Preparation Date:

May 2022

Estimated Project Dates:

Project Start Date: Summer 2020

Project Completion Date: Summer 2025

Contents

SECTION 1: CONTACT INFORMATION/RESPONSIBLE PARTIES

1.1 Operator(s) / Subcontractor(s)

Operator(s):

MacDonald Industries Corporation (MIC)
Address: 645 Walnut Street, Bridgewater, MA 02324-0431
Contact: Mr. David MacDonald
Phone: (508) 294-0174
Email: marilynslanding@gmail.com

Emergency 24-Hour Contact:

MacDonald Industries Corporation
Contact: Mr. David MacDonald
Phone: (508) 294-0174

1.2 Stormwater Team

Stormwater Team			
Name and/or Position, and Contact	Responsibilities	I Have Completed Training Required by CGP Part 6.2	I Have Read the CGP and Understand the Applicable Requirements
Karlis Skulte, P.E. Project Manager Civil & Environmental Consultants, Inc. (774)501-2176 kskulte@cecinc.com	**Initial Development of SWPPP**	☒ Yes ☐ No	☒ Yes Date: 05/02/2022
David MacDonald MacDonald Industries Corporation (508) 294-0174 marilynslanding@hotmail.com	**Owner & Operator** Operational Control over Construction Plans & Specifications, and SWPPP and Permit Compliance	☐ Yes ☐ No	☐ Yes Date:
Christopher Ford, MS Environmental Manager Browning Ferris Industries, Inc. / Republic Services 508-786-7022 CFord2@republicservices.com	**Owner**	☐ Yes ☐ No	☐ Yes Date:

Stormwater Team Members Who Conduct Inspections Pursuant to CGP Part 4			
Name and/or Position and Contact	Training(s) Received	Date Training(s) Completed	If Training is a Non-EPA Training, Confirm that it Satisfies the Minimum Elements of CGP Part 6.3.b
		Date:	☐ Principles and practices of erosion and sediment control and pollution prevention practices at construction sites ☐ Proper installation and maintenance of erosion and sediment controls and pollution prevention practices used at construction sites ☐ Performance of inspections, including the proper completion of required reports and documentation, consistent with the requirements of Part 4
		Date:	☐ Principles and practices of erosion and sediment control and pollution prevention practices at construction sites ☐ Proper installation and maintenance of erosion and sediment controls and pollution prevention practices used at construction sites ☐ Performance of inspections, including the proper completion of required reports and documentation, consistent with the requirements of Part 4
		Date:	☐ Principles and practices of erosion and sediment control and pollution prevention practices at construction sites ☐ Proper installation and maintenance of erosion and sediment controls and pollution prevention practices used at construction sites ☐ Performance of inspections, including the proper completion of required reports and documentation, consistent with the requirements of Part 4

Note: Prior to February 17, 2023, inspections will be conducted by a qualified person knowledgeable in the principles and practice of erosion and sediment controls and pollution prevention, possesses appropriate skills and training to assess conditions at the construction site that could impact stormwater quality, and is able to assess the effectiveness of any stormwater controls selected and installed to meet the requirements of this permit. On or after February 17, 2023, stormwater inspections pursuant to CGP Part 4 will be conducted by a qualified person that has either completed the EPA's construction inspection training program or holds a valid construction inspection certification or license from an equivalent program. Documentation supporting the qualified person's training will be kept in Appendix I.

Additional Project Contacts		
Department / Project Contact	**Phone Numbers (Bridgewater)**	**Project Numbers (Halifax)**
Fire Emergency	911	911
Fire Rescue	508-697-0900	(781) 293-1751
Public Works	508-697-0919	(781) 293-1760
MA Department of Environmental Protection / Emergency Response/Southeast Region	888-304-1133	888-304-1133

SECTION 2: SITE EVALUATION, ASSESSMENT, AND PLANNING

2.1 Project/Site Information

Project Name and Address

Project/Site Name: Marilyn's Landing/BFI Halifax Landfill Soil Fill Project
Street/Location: Off Plymouth Street
City: Halifax and Bridgewater
State: MA
ZIP Code: 02324
County or Similar Government Division: Plymouth County

Project Latitude/Longitude

Latitude: 41.99067° N (decimal degrees)

Longitude: - 70.901213 ° W (decimal degrees)

Latitude/longitude data source: ☐ Map ☐ GPS ☒ Other (please specify): Google Earth

Horizontal Reference Datum: ☐ NAD 27 ☐ NAD 83 ☒ WGS 84

Additional Site Information

Is your site located on Indian country lands, or on a property of religious or cultural significance to an Indian Tribe?	☐ Yes	☒ No

2.2 Discharge Information

Stormwater treatment controls consist of controls designed as a preliminary treatment process to eliminate or reduce pollutants entering the stormwater system. These treatment controls are located after source and activity BMPs and prior to discharge.

For this construction project, MacDonald Industries Corporation (MIC) and their designated subcontractors are responsible for managing stormwater and groundwater in accordance with applicable contract specifications sections, contract drawings, and NPDES-CGP.

Does your project/site discharge stormwater into a Municipal Separate Storm Sewer System (MS4)?	☐ Yes	☒ No
Are there any waters of the U.S. within 50 feet of your project's earth disturbances?	☒ Yes	☐ No

Point of Discharge ID	Name of receiving water that receives stormwater discharge:	Is the receiving water impaired (on the CWA 303(d) list)?	If yes, list the pollutants that are causing the impairment:	Has a TMDL been completed for this receiving waterbody?	If yes, list TMDL Name and ID:	Pollutant(s) for which there is a TMDL:	Is this receiving water designated as a Tier 2, Tier 2.5, or Tier 3 water?	If yes, specify which Tier (2, 2.5, or 3)?
Receiving Water of the U.S.								
001A	Cross Street Pond (MA62053)	☐ Yes ☒ No		☐ Yes ☒ No			☒ Yes ☐ No	Tier 2
001B	Wetland adjacent to Big South Cranberry Pond	☐ Yes ☒ No		☐ Yes ☒ No			☒ Yes ☐ No	Tier 2
Downstream Waters								
002	Plymouth Street Pond (MA62141)	☐ Yes ☒ No		☐ Yes ☒ No			☒ Yes ☐ No	Tier 2
003	Robbins Pond (MA62162)	☐ Yes ☒ No		☐ Yes ☒ No			☒ Yes ☐ No	Tier 2
004	Satucket River (MA62-10)	☒ Yes ☐ No	Non-Native Aquatic Plants, Temperature	☐ Yes ☒ No			☐ Yes ☒ No	
005	Matfield River (MA62-32)	☒ Yes ☐ No	Algae, Benthic Macroinvertebrate, Dissolved Oxygen, E. Coli, Fecal Coliform, Nutrient/ Eutrophication Biological Indicators, Odor, Phosphorous (Total)	☒ Yes ☐ No	40308	Fecal Coliform E. Coli	☐ Yes ☒ No	

Point of Discharge ID	Name of receiving water that receives stormwater discharge:	Is the receiving water impaired (on the CWA 303(d) list)?	If yes, list the pollutants that are causing the impairment:	Has a TMDL been completed for this receiving waterbody?	If yes, list TMDL Name and ID:	Pollutant(s) for which there is a TMDL:	Is this receiving water designated as a Tier 2, Tier 2.5, or Tier 3 water?	If yes, specify which Tier (2, 2.5, or 3)?
Receiving Water of the U.S.								
006	Taunton River (MA62-01)	☒ Yes ☐ No	Dissolved Oxygen, and E. Coli	☐ Yes ☒ No			☐ Yes ☒ No	
007	Taunton River (MA62-02)	☒ Yes ☐ No	Chlorophyll-a, Enterococcus, Fecal Coliform, Nitrogen (Total), Phosphorus (Total)	☒ Yes ☐ No	40310	Enterococcus, Fecal Coliform	☐ Yes ☒ No	
008	Taunton River (MA62-03)	☒ Yes ☐ No	Dissolved Oxygen, Fecal Coliform, Nitrogen (Total)	☒ Yes ☐ No	40310	Fecal Coliform	☐ Yes ☒ No	
009	Taunton River (MA62-04)	☒ Yes ☐ No	Dissolved Oxygen, Enterococcus, Fecal Coliform, Fish Bioassessments, Nitrogen (Total)	☒ Yes ☐ No	40310	Enterococcus, Fecal Coliform	☐ Yes ☒ No	
010	Mount Hope Bay (MA61-06)	☒ Yes ☐ No	Chlorophyll-A, Dissolved Oxygen, Enterococcus, Fecal Coliform, Fish Bioassessments, Nitrogen (Total), Temperature	☒ Yes ☐ No	38908	Enterococcus Fecal Coliform	☐ Yes ☒ No	

Point of Discharge ID	Name of receiving water that receives stormwater discharge:	Is the receiving water impaired (on the CWA 303(d) list)?	If yes, list the pollutants that are causing the impairment:	Has a TMDL been completed for this receiving waterbody?	If yes, list TMDL Name and ID:	Pollutant(s) for which there is a TMDL:	Is this receiving water designated as a Tier 2, Tier 2.5, or Tier 3 water?	If yes, specify which Tier (2, 2.5, or 3)?
Receiving Water of the U.S.								
011	Rhode Island Sound	☐ Yes ☒ No		☐ Yes ☒ No			☐ Yes ☒ No	

2.3 Nature of the Construction Activities

General Description of Project

Provide a general description of the nature of your construction activities, including the age or dates of past renovations for structures that are undergoing demolition:

The project involves work on ±27.2-acres spread over two properties totaling 63.6-acres. The two properties include the soil re-use site known as Marilyn's Landing, located on the Plymouth Street Extension in Bridgewater, Massachusetts, and the BFI Halifax landfill, a closed municipal solid waste (MSW) landfill, located on Laurel Street in Halifax, Massachusetts. The two properties have an adjoining property line that runs north to south along the town lines of Bridgewater, Massachusetts and Halifax, Massachusetts. Marilyn's Landing was historically used for sand and gravel mining and was assigned as a MassDEP-permitted landfill associated with the adjoining BFI Halifax landfill constructed adjacently to the east in Halifax. The BFI Halifax landfill has been closed since 1996. This project proposes to expand upon an existing permitted project that allowed for the placement of soil fill at Marilyn's Landing.

In 2013 permits were obtained allowing work to commence at the Marilyn's Landing Facility for the placement of soil to a certain level consistent with agreed upon local requirements and the BFI Halifax Landfill to ultimately support a solar development project. A SWPPP was developed and a NOI was submitted to the EPA obtaining coverage under the 2012 Construction General Permit at that time. The placement of soil commenced at that time and has continued. Coincident with the issuance of the 2017 GCP, a revised NOI was filed for the ongoing work at the Site.

This project proposes to extend the vertical and horizontal limits of soil placement to encompass a portion of the BFI Halifax Landfill. The work includes soil placement up to a maximum elevation of 144 feet (NGVD 88) spanning the BFI Halifax landfill and Marilyn's Landing sites, filling the "swale area" in between the two properties. The anticipated volume of fill to be placed onto the BFI-Halifax Landfill site is approximately 580,800 cubic yards and 252,100 cubic yards on the Marilyn's Landing site, totaling 832,900 cubic yards or approximately 1,250,000 tons of soil. The work is limited to a ±27.2-acre area including ±6.8-acres on the Marilyn's Landing property and ±20.4-acres on the BFI Halifax Landfill property. Following the completion of the grading activities, the post-closure use may ultimately support a solar development project in the future.

A revised Soil Re-Use Management Plan (SRMP) is currently being developed by others which will govern the soil placement at the Marilyn's Landing Site. Since this Project includes work on the capped and closed BFI Halifax Landfill owned by a Browning Ferris Industries, Inc. which was not party to the initial ACO or first amendment, a new ACO between MacDonald Industries Inc. and Browning Ferris Industries, Inc. (collectively the "Owners") and MassDEP is required. This ACO is currently being finalized and will govern the soil placement and other elements of the work being performed for this Project.

As proposed, the project includes construction of a gravel access road, earthwork, erosion and sedimentation control, and associated stormwater management improvements to support the placement of soil including the construction of a stormwater detention basin on the western limit of the Marilyn's Landing Facility.

All work is to take place within the limit of work identified on the Site Plans. No offsite locations will be utilized. Disturbance of soil and conditions outside of the limits of work are not expected. The perimeter

of the limit of work is also where the major structural erosion and siltation control measures will be located. Areas within the work area may be disturbed as required, as long as the conditions of the SWPPP are properly maintained per the conditions of the General Permit and Project Specifications, or as directed by the Project Engineer.

The contractor and its designated subcontractors will be required to implement the necessary measures to control soil erosion resulting from demolition/construction operations, prevent flow of sediment from the demolition/construction site, and contain demolition/construction materials (including excavation and backfill) within the protected working area to prevent damage or adverse effects to all existing stormwater catch basins at and bordering the Site.

Business days and hours for the project: 6:00 am – 5:00 pm

Size of Construction Site

Size of Property	The Site is located on two properties adjacent to one another and are owned by two separate owners. The property owned by MacDonald Industries encompasses four (4) separate parcels located off Plymouth Street Extension in Bridgewater, Massachusetts. The four (4) parcels total ±19.8-acres in area. The property owned by BFI Halifax, located on Laurel Street in Halifax, Massachusetts, is approximately ±43.8-acres.
Total Area Expected to be Disturbed by Construction Activities	The work is limited to a ±27.2-acre area including ±6.8-acres on the MIC property and ±20.4-acres on the BFI Halifax property.
Maximum Area Expected to be Disturbed at Any One Time, Including On-site and Off-site Construction Support Areas	±27.2-acres

Type of Construction Site *(check all that apply)*:

☐ Single-Family Residential ☐ Multi-Family Residential ☐ Commercial ☐ Industrial
☐ Institutional ☐ Highway or Road ☐ Utility ☒ Other Soil Placement

Will you be discharging dewatering water from your site? ☐ Yes ☒ No

If yes, will you be discharging dewatering water from a current or former Federal or State remediation site? ☐ Yes ☐ No

Pollutant-Generating Activities

List and describe all pollutant-generating activities and indicate for each activity the associated pollutants or pollutant constituents that could be discharged in stormwater from your construction site. Take into account where potential spills and leaks could occur that contribute pollutants to stormwater discharges, and any known hazardous or toxic substances, such as PCBs and asbestos, that will be disturbed during construction.

Pollutant-Generating Activity (e.g., paving operations; concrete, paint, and stucco washout and waste disposal; solid waste storage and disposal; and dewatering operations)	**Pollutants or Pollutant Constituents** (e.g., sediment, fertilizers, pesticides, paints, caulks, sealants, fluorescent light ballasts, contaminated substrates, solvents, fuels)
N/A	N/A

Construction Support Activities *(only provide if applicable)*

Describe any construction support activities for the project (e.g., concrete or asphalt batch plants, equipment staging yards, material storage areas, excavated material disposal areas, borrow areas):
N/a

Contact information for construction support activity:
N/A

2.4 Sequence and Estimated Dates of Construction Activities

Work activities that would disturb surface soils and impact stormwater water runoff includes filling in of the site, movement and unloading of trucks, grading, construction safety controls, seeding and other miscellaneous improvements to the Project Area.

Work on the Project commenced in the summer of 2013. A SWPPP was developed and a NOI was submitted to the EPA obtaining coverage under the 2012 Construction General Permit at that time. The work has progressed generally in accordance with the Site Plans (Figures 2C-2E) included in Appendix A. Erosion Controls have been modified and placed in accordance with the Site Plans and the associated phase of construction.

The tentative schedule associated with the major planned Site work activities are summarized below. In general, sequencing and timing of disturbances will be continuous until the Project's estimated substantial project completion date. Installation of erosion controls were in place prior to starting work under the previous NOI, and continue to be in place as required by contract drawings and specifications.

Major Activities

Placement of Soil, construction of gravel access road, earthwork, erosion and sedimentation control, and associated stormwater management improvements to support the placement of soil.	
Estimated Start Date of Construction Activities for this Phase	Summer 2020
Estimated End Date of Construction Activities for this Phase	Summer 2025
Estimated Date(s) of Application of Stabilization Measures for Areas of the Site Required to be Stabilized	At commencement of construction activities
Estimated Date(s) when Stormwater Controls will be Removed	After completion of construction activities.

2.5 Authorized Non-Stormwater Discharges

List of Authorized Non-Stormwater Discharges Present at the Site

Authorized Non-Stormwater Discharge	**Will or May Occur at Your Site?**
Discharges from emergency fire-fighting activities	☐ Yes ☒ No
Fire hydrant flushings	☐ Yes ☒ No
Landscape irrigation	☐ Yes ☒ No
Water used to wash vehicles and equipment	☒ Yes ☐ No
Water used to control dust	☒ Yes ☐ No
Potable water including uncontaminated water line flushings	☐ Yes ☒ No
External building washdown (soaps/solvents are not used and external surfaces do not contain hazardous substances)	☐ Yes ☒ No
Pavement wash waters	☐ Yes ☒ No
Uncontaminated air conditioning or compressor condensate	☐ Yes ☒ No
Uncontaminated, non-turbid discharges of ground water or spring water	☐ Yes ☒ No
Foundation or footing drains	☐ Yes ☒ No
Uncontaminated construction dewatering water	☐ Yes ☒ No

(Note: You are required to identify the likely locations of these authorized non-stormwater discharges on your site map. See Section 2.6, below, of this SWPPP Template.)

2.6 Site Maps

C100 – Site Vicinity Plan
C101 – Existing Site Conditions Plan
C300 – Proposed Intermediate Gas System Modifications
C301 – Proposed Final Grades
C302 – Proposed Final Gas System Modifications
C303 – Proposed Stormwater Management Plan
C800 – Detail Sheet (Sheet 1 of 2)
C801 – Detail Sheet (Sheet 2 of 2)

SECTION 3: DOCUMENTATION OF COMPLIANCE WITH OTHER FEDERAL REQUIREMENTS

3.1 Endangered Species Protection

Eligibility Criterion

Following the process outlined in Appendix D of the CGP, under which criterion are you eligible for coverage under this permit?

☐ **Criterion A**: No ESA-listed species and/or designated critical habitat present in action area. Using the process outlined in Appendix D of the CGP, you certify that ESA-listed species and designated critical habitat(s) under the jurisdiction of the USFWS or NMFS are not likely to occur in your site's "action area" as defined in Appendix A of the CGP. *Please Note: NMFS' jurisdiction includes ESA-listed marine and estuarine species that spawn in inland rivers.*

☐ Check to confirm you have provided documentation in your SWPPP as required by CGP Appendix D (Note: reliance on State resources is not acceptable; see CGP Appendix D).

Documentation: N/A

☐ **Criterion B:** Eligibility requirements met by another operator under the 2022 CGP. The construction site's discharges and discharge-related activities were already addressed in another operator's valid certification of eligibility for your "action area" under eligibility Criterion A, C, D, E, or F of the 2022 CGP and you have confirmed that no additional ESA-listed species and/or designated critical habitat under the jurisdiction of USFWS and/or NMFS not considered in the that certification may be present or located in the "action area." To certify your eligibility under this criterion, there must be no lapse of NPDES permit coverage in the other CGP operator's certification. By certifying eligibility under this criterion, you agree to comply with any conditions upon which the other CGP operator's certification was based. You must include in your NOI the NPDES ID from the other 2022 CGP operator's notification of authorization under this permit and list any measures that you must comply with. If your certification is based on another 2022 CGP operator's certification under criterion C, you must provide EPA with the relevant supporting information required of existing dischargers in Criterion C.

☐ Check to confirm you have provided documentation in your SWPPP as required by CGP Appendix D.

Documentation: N/A

Eligibility Criterion

Following the process outlined in Appendix D of the CGP, under which criterion are you eligible for coverage under this permit?

☒ **Criterion C:** Discharges not likely to result in any short- or long-term adverse effects to ESA-listed species and/or designated critical habitat. ESA-listed species and/or designated critical habitat(s) under the jurisdiction of the USFWS and/or NMFS are likely to occur in or near your site's "action area," and you certify to EPA that your site's discharges and discharge-related activities are not likely to result in any short- or long-term adverse effects to ESA-listed threatened or endangered species and/or designated critical habitat. This certification may include consideration of any stormwater controls and/or management practices you will adopt to ensure that your discharges and discharge-related activities are not likely to result in any short- or long-term adverse effects to ESA-listed species and/or designated critical habitat. To certify your eligibility under this criterion, indicate 1) the ESA-listed species and/or designated habitat located in your "action area" using the process outlined in Appendix D of this permit; 2) the distance between the site and the listed species and/or designated critical habitat in the action area (in miles); and 3) a rationale describing specifically how short- or long-term adverse effects to ESA-listed species will be avoided from the discharges and discharge-related activities. (Note: You must include a copy of your site map from your SWPPP showing the upland and in-water extent of your "action area" with your NOI.)

☒ Check to confirm you have provided documentation in your SWPPP as required by CGP Appendix D.

Documentation:

- Information was obtained from US Fish and Wildlife IPaC and NOAA ESA Section 7 Mapper In accordance with Appendix D of the CGP
- Massachusetts Natural Heritage and Endangered Species Program GIS map of Estimated Habitats of Rare Wildlife and Priority Habitats of Rare Species

☐ **Criterion D**: Coordination with USFWS and/or NMFS has successfully concluded. Coordination between you and the USFWS and/or NMFS has concluded. The coordination must have addressed the effects of your site's discharges and discharge-related activities on ESA-listed species and/or designated critical habitat under the jurisdiction of USFWS and/or NMFS, and resulted in a written confirmation from USFWS and/or NMFS that the effects of your site's discharges and discharge-related activities are not likely to result in any short- or long-term adverse effects. By certifying eligibility under this criterion, you agree to comply with any conditions you must meet for your site's discharges and discharge-related activities to not likely result in any short- or long-term adverse effects. You must include copies of the correspondence with the participating agencies in your SWPPP and this NOI.

☐ Check to confirm you have provided documentation in your SWPPP as required by CGP Appendix D.

Documentation: N/A

Eligibility Criterion

Following the process outlined in Appendix D of the CGP, under which criterion are you eligible for coverage under this permit?

☐ **Criterion E:** ESA Section 7 consultation has successfully concluded. Consultation between a Federal agency and the USFWS and/or NMFS under section 7 of the ESA has concluded. Consultations can be either formal or informal, and would have occurred only as a result of a separate Federal action (e.g., during application for an individual wastewater discharge permit or the issuance of a wetlands dredge and fill permit), and the consultation must have addressed the effects of your construction activity's discharges and discharge-related activities on all ESA-listed threatened or endangered species and all designated critical habitat under the jurisdiction of each Service, as appropriate, in your action area. The result of this consultation must be either:

i. A biological opinion currently in effect that determined that the action in question (taking into account the effects of your facility's discharges and discharge-related activities) is likely to adversely affect, but is not likely to jeopardize the continued existence of listed species or result in the destruction or adverse modification of critical habitat. The biological opinion must have included the effects of your facility's discharges and discharge-related activities on all the listed species and designated critical habitat in your action area under the jurisdiction of each Service, as appropriate. To be eligible under (i), any reasonable and prudent measures specified in the incidental take statement must be implemented;

ii. Written concurrence (e.g., letter of concurrence) from the applicable Service(s) with a determination that your facility's discharges and discharge-related activities are not likely to adversely affect ESA-listed species and/or designated critical habitat. The concurrence letter must have included the effects of your facility's discharges and discharge-related activities on all the ESA-listed species and/or designated critical habitat on your species list(s) acquired from USFWS and/or NMFS as part of this worksheet.

The consultation does not warrant reinitiation under 50 CFR §402.16; or, if reinitiation of consultation is required (e.g., due to a new species listing, critical habitat designation, or new information), the Federal action agency has reinitiated the consultation and the result of the consultation is consistent with the statements above. (Note: you must include any reinitiation documentation from the Services or consulting Federal agency with your NOI.) -

☐ Check to confirm you have provided documentation in your SWPPP as required by CGP Appendix D.

Documentation: N/A

Eligibility Criterion

Following the process outlined in Appendix D of the CGP, under which criterion are you eligible for coverage under this permit?

☐ **Criterion F:** Issuance of section 10 permit. Potential take is authorized through the issuance of a permit under section 10 of the ESA by the USFWS and/or NMFS, and this authorization addresses the effects of the site's discharges and discharge-related activities on ESA-listed species and designated critical habitat. You must include copies of the correspondence between yourself and the participating agencies in your SWPPP and your NOI.

☐ Check to confirm you have provided documentation in your SWPPP as required by CGP Appendix D.

Documentation: N/A

3.2 Historic Property Screening Process

CGP Appendix E, Step 1

Do you plan on installing any stormwater controls that require subsurface earth disturbance, including, but not limited to, any of the following stormwater controls at your site? Check all that apply below, and proceed to Appendix E, Step 2.

☐ Dike
☒ Berm
☐ Catch Basin
☒ Pond
☒ Constructed Site Drainage Feature (e.g., ditch, trench, perimeter drain, swale, etc.)
☒ Culvert
☐ Channel
☐ Other type of ground-disturbing stormwater control:

(Note: If you will not be installing any subsurface earth-disturbing stormwater controls, no further documentation is required for Section 3.2 of the Template.)

CGP Appendix E, Step 2

If you answered yes in Step 1, have prior professional cultural resource surveys or other evaluations determined that historic properties do not exist, or have prior disturbances at the site have precluded the existence of historic properties? ☒ YES ☐ NO

- If yes, no further documentation is required for Section 3.2 of the Template and you may provide the prior documentation in your SWPPP.
    - The owner and its consultants have completed federal, state and local environmental review process(s) required for Stormwater Management, Erosion, Drainage and Site Improvements. No historic properties or concerns were raised as part of the permitting processes. Any of these documents related to the Project are available upon request.

- If no, proceed to Appendix E, Step 3.

CGP Appendix E, Step 3

If you answered no in Step 2, have you determined that your installation of subsurface earth-disturbing stormwater controls will have no effect on historic properties? ☐ YES ☐ NO

- If yes, provide documentation of the basis for your determination.
- If no, proceed to Appendix E, Step 4.

CGP Appendix E, Steps 4 and 5

If you answered no in Step 3, did the State Historic Preservation Officer (SHPO), Tribal Historic Preservation Office (THPO), or other Tribal representative (whichever applies) respond to you within 15 calendar days to indicate their views as to the likelihood that historic properties are potentially present on your site and may be impacted by the installation of stormwater controls that require subsurface earth disturbance? ☐ YES ☐ NO

- If yes, describe the nature of their response:
  - ☐ Written indication that no historic properties will be affected by the installation of stormwater controls.
  - ☐ Written indication that adverse effects to historic properties from the installation of stormwater controls can be mitigated by agreed upon actions.
  - ☐ No agreement has been reached regarding measures to mitigate effects to historic properties from the installation of stormwater controls.
  - ☐ Other:
- If no, no further documentation is required for Section 3.2 of the Template.

3.3 Safe Drinking Water Act Underground Injection Control Requirements

Do you plan to install any of the following controls? Check all that apply below.

- ☐ Infiltration trenches (if stormwater is directed to any bored, drilled, driven shaft or dug hole that is deeper than its widest surface dimension, or has a subsurface fluid distribution system)
- ☐ Commercially manufactured pre-cast or pre-built proprietary subsurface detention vaults, chambers, or other devices designed to capture and infiltrate stormwater flow
- ☐ Drywells, seepage pits, or improved sinkholes (if stormwater is directed to any bored, drilled, driven shaft or dug hole that is deeper than its widest surface dimension, or has a subsurface fluid distribution system)

SECTION 4: EROSION AND SEDIMENT CONTROLS AND DEWATERING PRACTICES

This section of this SWPPP provides a description of appropriate controls and measures that will be implemented during the construction activities to be performed at the Site. This plan utilizes controls and measures to the degree that are practicable and in conjunction with the objectives of the goals of the construction activities. The following controls are provided as recommendations for the site contractor and do not constitute or replace the final Stormwater Pollution Prevention Plan that must be fully implemented by the Contractor and owner in Compliance with EPA NPDES regulations and local Bylaws.

It is the Contractors responsibility to incorporate the specifics of this plan into practice and to apply the principles of erosion and sedimentation control in runoff emanating from the construction site.

The principles of erosion and sedimentation control are:

- Fit the activity to the topography and soils;
- Retain or accommodate runoff;
- Minimize the disturbed area and duration of exposure;
- Stabilize disturbed areas immediately;
- Retain sediment; and
- Do not encroach upon areas outside the protected working area.

4.1 Natural Buffers or Equivalent Sediment Controls

Buffer Compliance Alternatives

Are there any receiving waters within 50 feet of your project's earth disturbances? ☒ YES ☐ NO

Check the compliance alternative that you have chosen:

- ☐ (i) I will provide and maintain a 50-foot undisturbed natural buffer.
- ☒ (ii) I will provide and maintain an undisturbed natural buffer that is less than 50 feet and is supplemented by additional erosion and sediment controls that achieve, in combination, the sediment load reduction equivalent to a 50-foot undisturbed natural buffer.
    - Calculations have been performed documenting the estimated sediment removal in accordance with the procedures identified in Appendix G of the CGP. The estimated sediment removal for a 50-foot buffer with the soil on the site is 90% for loam, silt, sand loam or silt loam with a cool season dense grass cover. Refer to Appendix N for supporting calculations.
    - Work will be performed on the Site that will not provide a full 50-foot undisturbed natural buffer. The work will be performed such that a 7-foot undisturbed buffer will be provided in some locations long the westerly limit of work with larger buffers provided elsewhere. Based on information contained in a white paper title "Sediment and Phosphorous removal from simulated stormwater runoff with compost filter socks and silt fence", the removal efficiency of haybales was documents to be approximately 72%. Although the

Project proposes to utilize silt fences in combination with haybales, the 72% removal efficiency was conservatively used in the calculations.

- The calculations indicate that a second row of haybales is warranted to provide the required sediment removal when a natural buffer of less than ten (10) feet is provided. The areas where a second row of haybales is required have been indicated on the Site Plans

☐ (iii) It is infeasible to provide and maintain an undisturbed natural buffer of any size, therefore I will implement erosion and sediment controls that achieve the sediment load reduction equivalent to a 50-foot undisturbed natural buffer.

☐ I qualify for one of the exceptions in Part 2.2.1.b. (If you have checked this box, provide information on the applicable buffer exception that applies, below.)

Buffer Exceptions

Which of the following exceptions to the buffer requirements applies to your site?

☐ There is no discharge of stormwater to waters of the U.S. through the area between the disturbed portions of the site and any waters of the U.S. located within 50 feet of your site .

☐ No natural buffer exists due to preexisting development disturbances (e.g., structures, impervious surfaces) that occurred prior to the initiation of planning for this project.

☐ For "linear construction sites" (defined in Appendix A of the CGP), site constraints (e.g., limited right-of-way) make it infeasible to meet any of the CGP Part 2.2.1.a compliance alternatives, provided that, to the extent feasible, you limit disturbances within 50 feet of the receiving water.

☐ The project qualifies as "small residential lot" construction (defined in Appendix A f the CGPas "a lot being developed for residential purposes that will disturb less than 1 acre of land, but is part of a larger residential project that will ultimately disturb greater than or equal to 1 acre") (see Appendix F, Part F.3.2).

☐ Buffer disturbances are authorized under a CWA Section 404 permit.

☐ Buffer disturbances will occur for the construction of a water-dependent structure or water access area (e.g., pier, boat ramp, and trail).

4.2 Perimeter Controls

General

- Straw bale barriers will be placed to trap sediment transported by runoff before it reaches the drainage system or leaves the construction site. Bales will be set at least four inches into the existing ground to minimize undercutting by runoff. In areas where high runoff velocities or high sediment loads are expected, straw bale barriers will be backed up with silt fencing. This semi-permeable barrier made of a synthetic porous fabric will provide additional protection. The silt fences and straw bale barrier will be replaced as determined by periodic field inspections.
- The erosion control barriers will be inspected and maintained routinely throughout the duration of the project. Following the installation of erosion and sedimentation controls, the site grading and excavation will occur. Silt Fence/Straw bale barriers to be installed prior to the start of construction.

Specific Perimeter Controls

Straw Bales with Silt Fences	
Description: Straw bale barriers will be placed to trap sediment transported by runoff before it reaches the drainage system or leaves the construction site. Bales will be set at least four inches into the existing ground to minimize undercutting by runoff. In areas where high runoff velocities or high sediment loads are expected, straw bale barriers will be backed up with silt fencing.	
Installation	Prior to commencement of soil disturbance.
Maintenance Requirements	Remove sediment before it has accumulated to one-half of the above-ground height of any perimeter control. Inspect straw bales daily for signs of damage or vandalism. Repair or replace as necessary for the duration of the project.
Design Specifications	See Site Plans and Details

Silt Sock	
Description: Silt socks will be placed at the toe of slopes to trap sediment transported by runoff before it reaches the drainage system or leaves the construction site	
Installation	Prior to commencement of soil disturbance.
Maintenance Requirements	Remove sediment before it has accumulated to one-half of the above-ground height of any perimeter control. Inspect silt socks daily for signs of damage or vandalism. Repair or replace as necessary for the duration of the project.
Design Specifications	See Site Plans and Details

Diversion Berm	
Description: Diversion channels/berms will be used to collect runoff from construction areas and discharge to sedimentation basins or straw bale barriers with silt fences.	
Installation	Prior to commencement of soil disturbance.
Maintenance Requirements	Remove sediment before it has accumulated to one-half of the above-ground height of any perimeter control. Inspect diversion berms weekly for signs of damage or vandalism. Repair or replace as necessary for the duration of the project.
Design Specifications	See Site Plans and Details

4.3 Sediment Track-Out

General

- A temporary crushed-stone construction exit will be constructed as detailed on the construction drawings. A cross slope will be placed in the entrance to direct runoff to a settling area and conveyance channels. If deemed necessary after construction begins, a wash pad may be included to wash off vehicle wheels before leaving the project site.
- Vehicle use will be restricted to properly designated exit points.

Specific Track-Out Controls

Gravel Construction Exit	
Description: A temporary crushed-stone construction exit will be constructed as detailed on the construction drawings. A cross slope will be placed in the entrance to direct runoff to a settling area and conveyance channels. The Construction Exit should be constructed with a length of approximately 50-ft long and should consist of a minimum 1" crushed stone. If deemed necessary after construction begins, a wash pad may be included to wash off vehicle wheels before leaving the project site.	
Installation	Prior to commencement of soil disturbance.
Maintenance Requirements	Where sediment has been tracked-out from your site onto paved roads, sidewalks, or other paved areas outside of your site, remove the deposited sediment by the end of the same business day in which the track-out occurs or by the end of the next business day if track-out occurs on a non-business day. Remove the track-out by sweeping, shoveling, or vacuuming these surfaces, or by using other similarly effective means of sediment removal. You are prohibited from hosing or sweeping tracked-out sediment into any stormwater conveyance, storm drain inlet, or water of the U.S.
Design Specifications	See Site Plans and Details

4.4 Stockpiles or Land Clearing Debris Piles Comprised of Sediment or Soil

General

- In the event that the contractor stockpiles materials at the construction site area, the minimum criteria for runoff from stockpiles will be performed in accordance with this SWPPP.
- Stockpiles will be located outside of any natural buffers established and away from any stormwater conveyances, drain inlets, and areas where stormwater flow is concentrated.
- For piles that will be unused for 14 or more days, provide cover via vegetative stabilization (blown straw, erosion control blankets and/or seeding) consistent with Part 2.2.14 of the CGP and as described below.
    - When more than five (5) acres of land disturbance is occurring, initiate the installation of stabilization measures immediately for any areas of exposed soil where construction activities have permanently ceased or will be temporarily inactive for 14 or more calendar

days, and complete the installation of stabilization measures as soon as practicable, but no later than seven (7) calendar days after stabilization has been initiated.

- When less than five (5) acres of land disturbance is occurring, initiate the installation of stabilization measures immediately for any areas of exposed soil where construction activities have permanently ceased or will be temporarily inactive for 14 or more calendar days, and complete the installation of stabilization measures as soon as practicable, but no later than fourteen (14) calendar days after stabilization has been initiated.

Specific Stockpile Controls

Straw Bales with Silt Fences	
Description: Straw bale barriers will be placed to trap sediment along all downgradient perimeter areas. Bales will be set at least four inches into the existing ground to minimize undercutting by runoff. In areas where high runoff velocities or high sediment loads are expected, straw bale barriers will be backed up with silt fencing	
Installation	Prior to placement of stockpile materials.
Maintenance Requirements	Remove sediment before it has accumulated to one-half of the above-ground height of any perimeter control. Inspect straw bales daily for signs of damage or vandalism. Repair or replace as necessary for the duration of the project.
Design Specifications	See Site Plans and Details.

4.5 Minimize Dust

General

- Water will be utilized as needed to control dust. Water will be applied using a water truck or hose as to not create sheeting of water or sediment runoff across the area(s).
- Owner/Contractor will remove debris/soil from side boards and will direct all transporters to cover the trailers contents prior to making site deliveries, or hauling material off the construction site.
- All streets will be maintained so they are kept in a dirt and dust-free state. Street sweeping will be conducted on a daily basis and as needed. Water will be utilized as needed to control dust

4.6 Minimize Steep Slope Disturbances

General

- In the proposed condition, the final grading of the soil fill areas will include 3(h):1(v) slopes which are considered steep slopes per the CGP. Erosion Control Blankets will be used on these steep slopes to minimize discharges from slope disturbance and vegetative slope stabilization will be provided

Specific Steep Slope Controls

Erosion Control Blankets	
Description: Erosion control blankets will be used to minimize erosion on slopes of 3:1 or greater.	
Installation	When construction activities have permanently ceased or will be temporarily inactive for 14 or more calendar days.
Maintenance Requirements	Inspect for erosion. Re-grade and secure blankets as necessary.
Design Specifications	See Site Plans and Details.

Vegetative Stabilization	
Description: Annual grasses, such as annual rye, will be used to ensure rapid germination and production of root mass. Permanent stabilization will be completed with the planting of perennial grasses or legumes. Establishment of temporary and permanent vegetative cover may be established by hydro-seeding or sodding. A suitable topsoil, good seedbed preparation, and adequate lime, fertilizer and water will be provided for effective establishment of these vegetative stabilization methods.	
Installation	When construction activities have permanently ceased or will be temporarily inactive for 14 or more calendar days.
Maintenance Requirements	Inspect for erosion. Re-grade and secure blankets as necessary.
Design Specifications	See Site Plans and Details.

4.7 Topsoil

General

- Native topsoil is not expected to be preserved onsite. However, if preserved, native topsoil will be stockpiled and appropriate erosion controls will be installed in accordance with Section 4.4 of this SWPPP.

4.8 Soil Compaction

General

- Soil compaction will be avoided on a large portion of the Site where final vegetative stabilization will occur due to the steep slopes rendering these areas unsuitable for vehicular travel. Additionally, once final stabilization occurs, the Site will largely be operating passively and will not experience vehicular travel.
- Before seeding or planting areas of exposed soil that have been compacted, techniques will be utilized to rehabilitate and condition the soils as necessary to support vegetative growth.

4.9 Storm Drain Inlets

General

- The Site and adjacent areas do not contain any storm drain inlets.

4.10 Constructed Site Drainage Feature

General

- There are a number of stormwater conveyance channels on the Site. Stone Check Dams will be placed along the entire length of conveyance channels at regular intervals (50'-100') as shown on the Site Plans in order to slow down runoff and minimize erosion. Additionally the conveyance channels will be stabilized using vegetative stabilization practices reducing the potential for erosion as detailed in Section 4.15 of this SWPPP.

Specific Constructed Site Drainage Features

Stone Check Dams	
Description: Stone Check Dams will be placed as needed along conveyance channels at regular intervals (50'-100') in order to slow down runoff and minimize erosion.	
Installation	Install no later than 14 or more calendar days after conveyance channels have been completed.
Maintenance Requirements	Inspect for deterioration or failure. Remove sediment when buildup exceeds 6 inches or half the barrier height.
Design Specifications	See Site Plans and Details.

4.11 Sediment Basins or Similar Impoundments

General

- As the soil placement advances for the Site, temporary sediment basins/traps may be utilized at the discretion of the Owner/Contractor. If utilized, temporary sediment traps must be situated outside waters of the U.S. and the associated 50-ft natural buffer as established under CGP Part 2.2.1. Sediment traps shall only be installed where the tributary drainage area is less than 5 acres. Sediment basins/traps must also utilize outlet structures that withdraw water from the surface, unless infeasible.

Specific Sediment Basin Controls

Sediment Trap
Description: A sediment trap is formed by excavating a pond or by placing an earthen embankment across a low area or drainage swale. An outlet or spillway is constructed using large stones or aggregate to slow the release of runoff. The trap retains the runoff long enough to allow most of the silt to settle out.

<table>
<tr><th colspan="2">Sediment Trap</th></tr>
<tr><td>Installation</td><td>As needed and determined by Owner/Contractor</td></tr>
<tr><td>Maintenance Requirements</td><td>Remove accumulated sediment to maintain at least one-half of the design capacity and conduct all other appropriate maintenance to ensure the basin or impoundment remains in effective operating condition.

Sediment traps should be readily accessible for maintenance and sediment removal. The sediment basin should remain in operation and be properly maintained until the site area is permanently stabilized by vegetation and/or when permanent structures are in place.

Check embankment, emergency spillway, and outlet for erosion damage. Check embankment for: settlement, seepage, or slumping along the toe or around pipe. Look for signs of piping. Repair immediately. Remove trash and other debris from principal spillway, emergency spillway, and pool area. Clean or replace gravel when sediment pool does not drain properly.

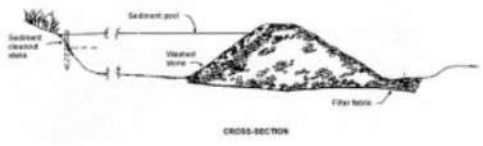
Remove basin after drainage area has been permanently stabilized, inspected, and approved. Before removing dam, drain water and remove sediment; place waste material in designated disposal areas. Smooth site to blend with surrounding area and stabilize.</td></tr>
<tr><td>Design Specifications</td><td>At a minimum, sediment trap provide storage for either (1) the calculated volume of runoff from the 2-year, 24-hour storm (see CGP App. H), or (2) 3,600 cubic feet per acre drained. Locate primary spillway to provide required volume. Primary spillway shall contain hard, angular, well-graded mixture with "d50" of 9 inches minimum. Inside facing lined with a 1-foot thick layer of ½- to

¾-inch washed aggregate.

The length-to-width ratio should be 2:1 or greater; divert inflow to upper end of basin to avoid short-circuiting flow. Length is defined as the average distance from the inlet to the outlet of the trap. Side slopes shall be 3:1 or flatter.

Spillway width
Drainage Area (acres) | Minimum Bottom Width (feet)
1 | 4.0
2 | 6.0
3 | 8.0
4 | 10.0
5 | 12.0

Outlet apron - 5-ft long, minimum, on level grade with filter fabric foundation.

 
CROSS-SECTION</td></tr>
</table>

4.12 Chemical Treatment

Soil Types

List all the soil types including soil types expected to be exposed during construction in areas of the project that will drain to chemical treatment systems and those expected to be found in fill material:

- Water will be utilized as needed to control dust. Water will be applied using a water truck or hose as to not create sheeting of water or sediment runoff across the area(s).

Treatment Chemicals

List all treatment chemicals that will be used at the site and explain why these chemicals are suited to the soil characteristics: N/A

Describe the dosage of all treatment chemicals you will use at the site or the methodology you will use to determine dosage: N/A

Provide information from any applicable Safety Data Sheets (SDS): N/A

Describe how each of the chemicals will be stored consistent with CGP Part 2.2.13c: N/A

Include references to applicable State or local requirements affecting the use of treatment chemicals, and copies of applicable manufacturer's specifications regarding the use of your specific treatment chemicals and/or chemical treatment systems: N/A

Special Controls for Cationic Treatment Chemicals (if applicable)

If the applicable EPA Regional Office authorized you to use cationic treatment chemicals, include the official EPA authorization letter or other communication, and identify the specific controls and implementation procedures designed to ensure that your use of cationic treatment chemicals will not lead to a discharge that does not meet water quality standards: N/A

Schematic Drawings of Stormwater Controls/Chemical Treatment Systems

Provide schematic drawings of any chemically-enhanced stormwater controls or chemical treatment systems to be used for application of treatment chemicals: N/A

Training

Describe the training that personnel who handle and apply chemicals have received prior to permit coverage, or will receive prior to the use of treatment chemicals: N/A

4.13 Dewatering Practices

General

Owner/Contractor and designated subcontractor(s) are responsible for managing stormwater and groundwater in accordance with applicable contract specifications sections including the NPDES-CGP and RGP criteria.

It is not expected that dewatering will be required for the Project. However, if required, collected groundwater and/or stormwater will be diverted or pumped from various locations to temporary ponds that will employ slope and grading, crushed stone, filter fabric, hay bales and/or filter socks to allow onsite recharge or evaporation. The discharge location will be inspected each day that dewatering is conducted. Recharging of groundwater will be performed in such a way as not to create sheeting of water across the site. Depending on volume of groundwater and or stormwater, a recharge well will be installed via a hydraulic excavator and constructed of perforated HDP pipe, filter fabric and stone. If contamination is encountered, all discharging will cease and at a minimum the following testing will be completed:

- Oil and Grease – 15 milligrams per liter (mg/L)
- pH – 6.0-8.5 standard units
- Total Suspended Solids (TSS) – 100 mg/L.

If treatment for contaminants is required, coverage under NPDES Remediation General Permit (RGP) would be required. The Contractor shall be responsible for ensuring that the effluent from the temporary groundwater treatment system is adequately treated to ensure that the NPDES-RGP and NPDES-CGP permit discharge and that reporting requirements are met.

4.14 Other Stormwater Controls

General

- Rip Rap downdrains and stone protection at pipe outlets and downdrains will be installed to minimize erosion.

Specific Stormwater Control Practices

Rip Rap Downdrains	
Description: Rip Rap downdrains will be installed on steep slopes where flow from interceptor swales is directed down the slope of the stockpiled soil.	
Installation	Install as indicated on the Site Plans when construction proceeds to elevations where interception bench drains are shown.
Maintenance Requirements	Inspect for deterioration or failure. Remove sediment, regrade as necessary and replace stone and/or filter fabric as necessary.
Design Specifications	See Site Plans and Details.

Outlet Stone Protection	
Description: Stone protection will be installed at pipe outlets, channel outlets and at the bottom of downdrains.	
Installation	Install immediately after conveyance channels, pipes and downdrains have been completed.
Maintenance Requirements	Inspect for deterioration or failure. Remove sediment, regrade as necessary and replace stone and/or filter fabric as necessary.
Design Specifications	See Site Plans and Details.

4.15 Site Stabilization

Total Amount of Land Disturbance Occurring at Any One Time

☒ *Five Acres or less*

☒ *More than Five Acres*

As work at the Site progresses, and areas are stabilized, the total area of disturbance will continually decrease from the maximum disturbance of ±27.2-acres, such that at times, the limit of disturbance will be less than 5 acres after a certain duration of construction.

For area that will be unused for 14 or more days, provide cover via vegetative stabilization (blown straw, erosion control blankets and/or seeding) consistent with Part 2.2.14 of the CGP and as described below.

- When more than five (5) acres of land disturbance is occurring, Initiate the installation of stabilization measures immediately any areas of exposed soil where construction activities have permanently ceased or will be temporarily inactive for 14 or more calendar days, and complete the installation of stabilization measures as soon as practicable, but no later than seven (7) calendar days after stabilization has been initiated.
- When less than five (5) acres of land disturbance is occurring, Initiate the installation of stabilization measures immediately any areas of exposed soil where construction activities have permanently ceased or will be temporarily inactive for 14 or more calendar days, and complete the installation of stabilization measures as soon as practicable, but no later than fourteen (14) calendar days after stabilization has been initiated.

Erosion Control Blankets	
☐ *Vegetative* ☒ *Non-Vegetative* ☐ *Temporary* ☒*Permanent*	
Description: Erosion control blankets will be used to minimize erosion on slopes of 3:1 or greater.	
Installation	When construction activities have permanently ceased or will be temporarily inactive for 14 or more calendar days.
Maintenance Requirements	Inspect for erosion. Re-grade and secure blankets as necessary.
Design Specifications	See Site Plans and Details.

Vegetative Stabilization	
☒ *Vegetative* ☐ *Non-Vegetative* ☒ *Temporary* ☒*Permanent*	
Description: Annual grasses, such as annual rye, will be used to ensure rapid germination and production of root mass. Permanent stabilization will be completed with the planting of perennial grasses or legumes. Establishment of temporary and permanent vegetative cover may be established by hydro-seeding or sodding. A suitable topsoil, good seedbed preparation, and adequate lime, fertilizer and water will be provided for effective establishment of these vegetative stabilization methods.	
Installation	When construction activities have permanently ceased or will be temporarily inactive for 14 or more calendar days.
Maintenance Requirements	Inspect for erosion. Re-grade and secure blankets as necessary.
Design Specifications	See Site Plans and Details.

SECTION 5: POLLUTION PREVENTION CONTROLS

5.1 Potential Sources of Pollution

To minimize the potential for contaminants to enter or runoff the Site during construction activities, fuel oil, diesel fuel, gasoline in trucks and equipment and other equipment related fluids must be properly stored. Additional fluids or dry bulk materials such as cleaning and adhesive chemicals, paints, concrete, asphalt, or other hazardous materials to be used on the Project Site will be stored onsite in accordance with applicable MSDS requirements. The Contractor will establish secure storage areas that collect any spillage to meet applicable requirements.

The Contractor shall actively maintain and manage the Site activities with the procedures outlined in this Plan. In the event of petroleum or other deleterious substance spill, action will be taken by the Contractor to contain and remove the spill. The Contractor will comply with the relevant section(s) of the Oil Pollution Prevention Act, 40 CFR part 112 and Section 311 of the CWA.

The following oil and hazardous materials will be stored in accordance with their manufacturers requirements provided in their respective MSDS sheets;

- Gasoline,
- Diesel,
- Maintenance oils, fluids.

Construction Site Pollutants		
Pollutant-Generating Activity	**Pollutants or Pollutant Constituents** (That could be discharged if exposed to stormwater)	**Location on Site** (Or reference SWPPP site map where this is shown)
Equipment and vehicle fueling and maintenance	Oils & Gasoline	NE corner of Site near construction trailer at entrance to Site.
Equipment and vehicle washing	Oils	NE corner of Site near construction trailer at entrance to Site.
Application of fertilizers/herbicides		As needed and determined by Contractor/Owner
Construction and Domestic Waste	Trash & debris	NE corner of Site in or near construction trailer at entrance to Site.
Sanitary Waste	Sanitary waste	NE corner of Site in or near construction trailer at entrance to Site.

5.2 Spill Prevention and Response

All project personnel share the responsibility for the initial control and reporting of the oil and other substance spill, especially the personnel that first discover the spill. The site Health and Safety Officer will be responsible for determining the necessary safety equipment and for establishing safety practices to be followed by the Contractor during the clean-up operations. All personnel will be trained in the use of and location of this equipment, prior to the commencement of the construction.

The Contractor's goal is to provide effective, efficient and coordinated action to minimize or mitigate damages to the environment and public health and welfare from oil or other substance discharges, conforming to applicable federal, state local regulations and other provisions and restrictions. A CEC representative will be on call for supervising the cleanup of spills and releases occurring during the project and will be either a Massachusetts Licensed Site Professional (LSP) or his/her designee/representative reporting all activities directly to the LSP. If CEC determines that the cleanup operations are beyond the capacity of the Contractor, assistance shall be requested from an environmental emergency response contractor.

The Contractor will retain an Environmental Emergency Response Contractor (ERC) for this project responsible for Emergency Spill Operations. The environmental emergency response contractor will employ its Corporate Health and Safety Plan and Spill Prevention Control and Countermeasure plan. These plans were developed in accordance with standard industry procedures and local, state and federal regulations and policies. These plans will be referenced when a spill or release is discovered, and the control of the spill or release is beyond the scope of the SWPPP. The Contractor's Project Manager is responsible for giving the Site Safety and Health Officer direction for initiating the Hazardous Materials Health and Safety Plan as directed by Owner's Environmental Department.

Alert and reporting procedures will become effective immediately upon observance and indication of a spill or discharge of oil or other substances on the project. Reportable observations are:

1. Any leaks or spills
2. Any soils which are discolored or have an odor
3. Any discharge of oil or other similar substances from drain pipes

The Owner's Engineer, CEC, will be informed immediately of all substantial spills, releases, or other substance discharges. All telephone numbers for the Emergency Response agencies will be posted on site. The Contractor or its Subcontractor(s) will implement control and countermeasures immediately.

Fueling will take place adjacent to the work zones. Major maintenance activities will take place at the equipment storage area. Fueling and maintenance shall not occur within 100 feet of the wetlands, any other resource area or within the associated buffer zones.

5.3 Fueling and Maintenance of Equipment or Vehicles

General

- All re-fueling shall be done outside of any environmentally sensitive areas and will be located away from waters of the U.S. and stormwater inlets or conveyances so that stormwater coming into contact with these activities cannot reach waters of the U.S.
- Fuel oil, diesel fuel, gasoline in trucks and equipment and other equipment related fluids must be properly stored. Additional fluids or dry bulk materials such as cleaning and adhesive chemicals, paints, concrete, asphalt, or other hazardous materials to be used on the Project Site will be stored onsite in accordance with applicable federal, state and local regulatory requirements. The Contractor will establish secure storage areas that collect any spillage to meet requirements of Bridgewater Fire Department regarding the storage of flammable materials
- Adequate supplies shall be available at all times to handle spills, leaks, and disposal of used liquids.
- Drip pans and absorbents shall be utilized under or around leaky vehicles and all oil and oily wastes will be recycled in accordance with appropriate federal, state, tribal, or local requirements.
- The Contractor shall actively maintain and manage the Site activities with the procedures outlined in this Plan. In the event of petroleum or other deleterious substance spill, action will be taken by the Contractor to contain and remove the spill. The Contractor will comply with the relevant section(s) of the Oil Pollution Prevention Act, 40 CFR part 112 and Section 311 of the CWA. Spills or contaminated surfaces shall be cleaned up immediately, using dry clean up measures. Do not clean contaminated surfaces by hosing the area down, and eliminate the source of the spill to prevent a discharge or a continuation of an ongoing discharge.

Responsibility

All project personnel share the responsibility for the initial control and reporting of the oil and other substance spill, especially the personnel that first discover the spill. The Site Health and Safety Officer will be responsible for determining the necessary safety equipment and for establishing safety practices to be followed by the subcontractors during the clean-up operations. All personnel will be trained in the use of and location of this equipment, prior to the commencement of the construction

The goal is to provide effective, efficient and coordinated action to minimize or mitigate damages to the environment and public health and welfare from oil or other substance discharges, conforming to applicable federal, state local regulations and other provisions and restrictions. MIC will engage a representative to be on call or on-site andwill be a qualified by OSHA training requirements (29 CFR 1910.120) and will have the responsibility and authority for supervising the cleanup of spills and releases occurring during the project and will be either a Massachusetts Licensed Site Professional (LSP) or his/her designee/representative reporting all activities directly to the LSP. If the LSP determines that the cleanup operations are beyond the capacity of the Contractor, assistance shall be requested from an environmental emergency response contractor.

MIC will retain an Environmental Emergency Response Contractor (ERC) for this project to respond to any Emergency Spill Operations and provide oversight, as required, including LSP Services. The ERC will employ its Corporate Health and Safety Plan and Spill Prevention Control and Countermeasure plan.

These plans will be developed in accordance with standard industry procedures and local, state and federal regulations and policies. These plans will be referenced when a spill or release is discovered, and the control of the spill or release is beyond the scope of the SWPPP. The Construction Manager's Project Superintendent is responsible for giving the Site Safety and Health Officer Instructions for initiating the Hazardous Materials Health and Safety Plan.

Spill containment and reporting procedures will become effective immediately upon observance and indication of a spill or discharge of oil or other substances on the project.

Reportable observations are:

1. Any leaks or spills
2. Any soils which are discolored or have an odor
3. Any discharge of oil or other similar substances from drain pipes

The Owner's Engineer and LSP will be informed immediately of all substantial spills, releases, or other substance discharges. All telephone numbers for the Emergency Response agencies will be posted on site. The Contractor or its Subcontractor(s) will implement control and countermeasures immediately and complete the Spill Status Report provided in this SWPPP.

Pollution Prevention Practices

Minor Spill (< 10 GALLONS)

All efforts will be made to contain the spill by erecting an earthen berm or barrier. The area will be remediated in accordance with all applicable state and federal regulations.

Large Spill (>10 GALLONS)

The Owners / generator are under obligation to report to the proper government agencies per Massachusetts state regulations 310 CMR 40.00 for petroleum and anti-freeze spills in an amount greater than 10 gallons total volume. The Contractor's Project Manager, Owner's Engineer, and Licensed Site Professional shall be notified immediately. The Massachusetts Department of Environmental Protection will be notified within two (2) hours following consultation with the Project Manager and Owners.

The spill will be contained to the smallest area possible using booms, berms, or other effective barriers.

5.4 Washing of Equipment and Vehicles

General

To limit tracking of soil and sediment offsite, trucks will be loaded within work zones as well as outside work zone. The following procedures may be utilized. Prior to exiting disturbed areas that are beingexcavated, equipment and transport vehicles may be brushed by dry brush methods if the equipment potentially came in contact with soil and or sediment materials. If dry brush methods are not successful, washing with

water methods may be utilized. Efforts will be made to unload; use and load transport equipment in a manner that prevents contact of the vehicles with materials and, therefore, minimizing the need for brushing and/or washing.

All equipment and vehicle washing shall be done outside of any environmentally sensitive areas and will be located away from waters of the U.S. and stormwater inlets or conveyances so that stormwater coming into contact with these activities cannot reach waters of the U.S. Ensure there is no discharge of soaps, solvents, or detergents in equipment and vehicle wash water. All runoff will drain to perimeter controls as described in Section 4.2 of this SWPPP.

Storage of soaps, detergents, or solvents, shall have either (1) cover (e.g., plastic sheeting, temporary roofs) to minimize the exposure of these detergents to precipitation and to stormwater, or (2) a similarly effective means designed to minimize the discharge of pollutants from these areas.

5.5 Storage, Handling, and Disposal of Building Products, Materials, and Wastes

5.5.1 Building Materials and Building Products

N/A

5.5.2 Pesticides, Herbicides, Insecticides, Fertilizers, and Landscape Materials

General

No pesticides are to be used unless a single spot treatment is required for a specific control application. Fertilizer usage should be avoided. If deemed necessary, slow release fertilizer should be used. Fertilizer may be used to begin the establishment of vegetation in bare or damaged areas, but should not be applied on a regular basis unless necessary.

Herbicide Application

Herbicide treatment of oriental bittersweet may be applied in two manners – foliar spraying and cut stump application. Careful use of herbicide is the most effective, efficient and least destructive means of removing large invasive species. Currently glyphosate is the most effective active ingredient for killing invasive species. It comes in two forms: (1) "Roundup" and other glyphosate products for use on dry sites and (2) "Rodeo" for use on wet or standing water sites. Glyphosate applied in late July or August is most effective. It can be sprayed onto foliage in a one percent solution. Glyphosate is a nonselective herbicide, however, and will kill any green foliage that it comes in contact with. Great care must be taken to avoid treating non target plants. A more selective method of applying glyphosate is to cut the stems near the ground and paint or dab the fresh cut surface with a 50 percent solution of the herbicide.

The cut-stump method involves cutting the stem to approximately two-inches above the ground surface then painting the cut surface immediately with concentrated herbicides (25% Application Intensity for glyphosate). It may be necessary to follow the cut-stump treatment with foliar spray approximately two weeks after treatment.

Rodeo or Roundup (glyphosate)

Glyphosate will provide good control of invasive species when applied from July to early September. Many formulations of glyphosate are sold but only those labeled for aquatic use can be applied in or

near water. For example, the Rodeo and Glypro formulations of glyphosatecan be used in water. With the Rodeo or Glypro formulations, a nonionic surfactant approved for aquatic sites at 0.25% vol/vol must be added to the spray solution.

Roundup and similar glyphosate formulations can be used to remove invasive species from large plantings or infestations away from water. Glyphosate has no soil residual so it could be used to remove invasive species located within an ornamental planting without having to dig in the flower bed. Best results have been obtained when glyphosate is applied as a 1 to 1.5% concentration (1 to 1.5 gallons glyphosate per 100 gallons of water) or (1.3 to 1.9 fl. oz./gallon of water) at bloom or shortly thereafter.

A variety of sprayers, including backpack sprayers, can be used to control invasive species in aquatic sites. Wick application is also effective but is labor intensive. Spray dye added to the tank may be useful to ensure uniform application to invasive species with minimal herbicide applied to desirable plants.

Eliminating the entire vegetative cover will promote invasive species seed germination, which can result in an increase in plant density rather than control. Since glyphosate does not provide residual control, treated areas will need to be monitored for re-growth from the roots or seedlings for several years. A 2,4-D formulation labeled for use near water applied as a 2% solution (2 gallons 2,4-D per 100 gallons of water) or (2.6 fl. oz./gallon of water) will prevent seedling establishment when applied in early fall or spring before the plants can establish perennial characteristics. Regardless of the herbicide applied, the infested areas should be monitored to ensure that invasive species do not re-infest from root or seed.

5.5.3 Diesel Fuel, Oil, Hydraulic Fluids, Other Petroleum Products, and Other Chemicals

General

The equipment superintendent or designee will monitor all truck unloading procedures to verify all hoses are tight and do not leak, and if necessary, to tighten, adjust or replace them to prevent a release of any kind. In the event of a major spill, alert and initial report procedures will be implemented, and an emergency response contractor will be called in to perform the cleanup.

Equipment

Motorized equipment that requires fuel and oil to operate will be inspected prior to the start of each work shift by the operator (in the field) to ensure there is no leakage of oil, fuel, or other material. Trucks will be inspected prior to use for potential leaks or drips. If a leak is found, repairs will be made immediately, and spillage will be cleaned up manually using absorbent material. Vehicles that are found to be leaking will be immediately taken out of service until repairs can be made.

Drum Storage

There will be no drum storage onsite. The following section describes procedures in the event temporary-emergency storage is required.

Petroleum liquids and other substances stored in drums will be kept in a drum container that consists of a drum rack and drip containment pan that is capable of containing 110% of the OHM should the drum rupture. Drum storage, if any, will be located in a secure area within the Project limits away from environmental areas of concern.

Lubrication /Oil Maintenance

Replacement lubrication will be directly deposited from the lubrication truck to the equipment lubrication reservoir. No other container system will be used to transport oil to the equipment. Mobile equipment will be serviced off site or in the lay-down area. Equipment that cannot be moved will be serviced in the field. The Contractor will place absorbent pads below the service area prior to initiating service activities in the field. Waste disposal will be completed by the Contractor or by a waste disposal firm.

Miscellaneous lubricants for operating equipment will be limited to daily quantities. Used oil will not be managed or stored onsite and will be disposed of properly.

5.5.4 Hazardous or Toxic Waste

General

No Hazardous or toxic waste is anticipated to be present on site. If utilized or found to be present, the SWPPP will be modified. If applicable, any hazardous or toxic waste will be properly stored, managed and removed from the site pursuant to appropriate regulations, manufactures recommendations and Material Safety Data Sheets (MSDS).

5.5.5 Construction and Domestic Waste

General

The contractor will properly manage and dispose of all residual construction / domestic waste not utilized on site.

Specific Pollution Prevention Practices

Dumpsters	
Description: The contractor will utilize and secure dumpsters / rolloffs as deemed appropriate for sorting, temporary storage and disposal of waste. Waste disposal will be completed by the Contractor or by a waste disposal firm.	
Installation	Start of Construction
Maintenance Requirements	Containers will be removed and replaced if appropriate when they are adequately filled or at the end of a specific construction task as deemed necessary by the construction supervisor. Keep waste container lids closed when not in use and close lids at the end of the business day for those containers that are actively used throughout the day. For waste containers that do not have lids, provide either (1) cover (e.g., a tarp, plastic sheeting, temporary roof) to minimize exposure of wastes to precipitation, or (2) a similarly effective means designed to minimize the discharge of pollutants(e.g., secondary containment). On business days, clean up and dispose of waste in designated waste containers. Clean up immediately if containers overflow.
Design Specifications	N/A

5.5.6 Sanitary Waste

General

The contractor will supply appropriate sanitary waste facilities for onsite workers.

Specific Pollution Prevention Practices

Sanitary Facilities	
Description: Portable sanitary facilities will be utilized at the site and pumped out at a time frame sufficient to keep odor and material from disturbing personnel at the site or every 4weeks	
Installation	Start of Construction
Maintenance Requirements	For sanitary waste, position portable toilets so that they are secure and will not be tipped or knocked over, and located away from waters of the U.S. and stormwater inlets or conveyances Units will be inspected at least once per month and emptied regularly and as needed.
Design Specifications	N/A

5.6 Washing of Applicators and Containers used for Stucco, Paint, Concrete, Form Release Oils, Cutting Compounds, or Other Materials

General

Washing of application and containers used for paint, concrete or other materials is not anticipated to occur at the Site.

5.7 Application of Fertilizers

General

Use of fertilizers is not anticipated for the construction phase of the site, and fertilizer usage should be avoided. If deemed necessary, slow release fertilizer should be used. Fertilizer may be used to begin the establishment of vegetation in bare or damaged areas, but should not be applied on a regular basis unless necessary.

- Apply at the appropriate time of year for your location, and preferably timed to coincide as closely as possible to the period of maximum vegetation uptake and growth;
- Avoid applying when a rain event greater than 0.5 inches is forecast in the next 48 hours;
- Do not apply to frozen ground;
- Never apply to stormwater conveyance channels; and
- Follow all other federal, state, tribal, and local requirements regarding fertilizer application.

5.8 Other Pollution Prevention Practices

General

Discharges of toxic or hazardous substances from a spill or other release are prohibited, consistent with Part 1.3.5. Where a leak, spill, or other release containing a hazardous substance or oil in an amount equal to or in excess of a reportable quantity established under either 40 CFR 110, 40 CFR 117, or 40 CFR 302 occurs during a 24-hour period, you must notify the National Response Center (NRC) at (800) 424-8802 or, in the Washington, DC metropolitan area, call (202) 267-2675 in accordance with the requirements of 40 CFR 110, 40 CFR 117, and 40 CFR 302 as soon as you have knowledge of the release. You must also, within seven (7) calendar days of knowledge of the release, provide a description of the release, the circumstances leading to the release, and the date of the release. State, tribal, or local requirements may necessitate additional reporting of spills or discharges to local emergency response, public health, or drinking water supply agencies.

SECTION 6: INSPECTION, MAINTENANCE, AND CORRECTIVE ACTION

6.1 Inspection Personnel and Procedures

Site Inspection Schedule

Select the inspection frequency(ies) that applies, based on CGP Parts 4.2, 4.3, or 4.4

Standard Frequency:

☐ Every 7 calendar days

☐ Every 14 calendar days and within 24 hours of either:

- A storm event that produces 0.25 inches or more of rain within a 24-hour period (including when there are multiple, smaller storms that alone produce less than 0.25 inches but together produce 0.25 inches or more in 24 hours), or
- A storm event that produces 0.25 inches or more of rain within a 24-hour period on the first day of a storm and continues to produce 0.25 inches or more of rain on subsequent days (you conduct an inspection within 24 hours of the first day of the storm and within 24 hours after the last day of the storm that produces 0.25 inches or more of rain (i.e., only two inspections would be required for such a storm event)), or
- A discharge caused by snowmelt from a storm event that produces 3.25 inches or more of snow within a 24-hour period.

Increased Frequency (if applicable):

For areas of sites discharging to sediment or nutrient-impaired waters or to waters designated as Tier 2, Tier 2.5, or Tier 3

☒ Every 7 days and within 24 hours of either:

- A storm event that produces 0.25 inches or more of rain within a 24-hour period, or
- A discharge caused by snowmelt from a storm event that produces 3.25 inches or more of snow within a 24-hour period.

Reduced Frequency (if applicable)

For stabilized areas

☐ Twice during first month, no more than 14 calendar days apart; then once per month after first month until permit coverage is terminated consistent with Part 9 in any area of your site where the stabilization steps in 2.2.14.a have been completed.

For stabilized areas on "linear construction sites" (as defined in Appendix A)

☐ Twice during first month, no more than 14 calendar days apart; then once more within 24 hours of a storm event that produces 0.25 inches or more of rain within a 24-hour period, or within 24 hours of a snowmelt discharge from a storm event that produces 3.25 inches or more of snow within a 24-hour period

For arid, semi-arid, or drought-stricken areas during seasonally dry periods or during drought

☐ Once per month and within 24 hours of either:

- A storm event that produces 0.25 inches or more of rain within a 24-hour period, or
- A snowmelt discharge from a storm event that produces 3.25 inches or more of snow within a 24-hour period.

Insert beginning and ending month identified as the seasonally dry period for your area or the valid period of drought:

- Beginning month of the seasonally dry period:
- Ending month of the seasonally dry period:

For frozen conditions where construction activities are being conducted

☒ Once per month

Insert beginning and ending dates of frozen conditions on your site:

- Beginning date of frozen conditions: January 15
- Ending date of frozen conditions: March 15

For frozen conditions where construction activities are suspended

☒ Inspections are temporarily suspended

Insert beginning and ending dates of frozen conditions on your site:

- Beginning date of frozen conditions: January 15
- Ending date of frozen conditions: March 15

Dewatering Inspection Schedule

Select the inspection frequency that applies based on CGP Part 4.3.2

Dewatering Inspection
☒ Once per day on which the discharge of dewatering water occurs.

Rain Gauge Location (if applicable)

N/A

Inspection Report Forms

The Inspection Report Form is attached in Appendix D.

6.2 Corrective Action

Personnel Responsible for Corrective Actions
MacDonald Industries
Address: 645 Walnut Street, Bridgewater, MA 023-0431
Contact: Mr. David MacDonald
Phone (508) 294- 0174

Corrective Action Forms
The Corrective Action Form and associated instructions for completion are attached as Appendix E.

6.3 Delegation of Authority

Duly Authorized Representative(s) or Position(s):

MacDonald Industries
Address: 645 Walnut Street, Bridgewater, MA 023-0431
Contact: Mr. David MacDonald
Phone (508) 294- 0174

SECTION 7: TURBIDITY BENCHMARK MONITORING FOR DEWATERING DISCHARGES

It's not anticipated that dewatering will be required. However, if required, discharge from dewatering will be directed to various temporary ponds that do not discharge offsite. As no discharge from dewatering will be discharging offsite, turbidity monitoring is not required. Should the Permittee pursue discharging dewatering water offsite, all applicable state and federal regulations will be followed, and the section below will be updated with appropriate information, in accordance with the 2022 CGP and corresponding state specific permit conditions.

Procedures:

<table>
<tr><td>Collecting and evaluating samples methodology:</td><td>• At least one turbidity sample will be collected from each dewatering discharge location each day discharge occurs.
• Samples will be measured using a turbidity meter that reports results in nephelometric turbidity units (NTUs) and follows conforms with a Part-136-approved method. The turbidity meter will have a calibration verification conducted prior to each day's use, consistent with the manufacturer's instructions.</td></tr>
<tr><td>Reporting results and keeping monitoring information records:</td><td>• Reports of weekly average turbidity data will be submitted to EPA using the EPA's NPDES eReporting Tool no longer than 30 days following the end of each monitoring quarter as outline below:

<table><tr><th>Monitoring Quarter</th><th>Months</th><th>Reporting Deadline</th></tr><tr><td>1</td><td>January 1 – March 31</td><td>April 30</td></tr><tr><td>2</td><td>April 1 – June 30</td><td>July 30</td></tr><tr><td>3</td><td>July 1 – September 30</td><td>October 30</td></tr><tr><td>4</td><td>October 1 – December 31</td><td>January 30</td></tr></table>
• Reports will be kept with this SWPPP and retained for a period of three years from the date this permit expires or from the date the Site's authorization is terminated</td></tr>
<tr><td>Taking corrective action when necessary</td><td>• The benchmark threshold for turbidity is a weekly average of turbidity results that exceeds 50 NTUs. The benchmark threshold is not an effluent limitation, and a benchmark exceedance is not a permit violation. However, failure to conduct required action to remediate turbidity exceedances is a permit violation.
• Should corrective actions be necessary, the Permittee will pursue corrective actions as delineated in Section 5.2 of the 2022 CGP.</td></tr>
</table>

Turbidity Meter:

Type of turbidity meter:	

A copy of the turbidity meter manual and manufacturer instructions will be inserted into Appendix P, if applicable.

Coordinating Arrangements for Turbidity Monitoring (if applicable):

Permitted operator name:	
Permitted operator NPDES ID:	
Coordinating Arrangement: (Describe the coordinating arrangement including which parties are tasked with specifc responsibilities):	

Alternate turbidity benchmark (if applicable):

Alternate turbidity benchmark (NTU)	
Data and documentation used to request the alternate benchmark	

SECTION 8: CERTIFICATION AND NOTIFICATION

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.

Name: _____ Title: _____

Signature: _____ Date: _____

SWPPP APPENDICES

Attach the following documentation to the SWPPP:

Appendix A – Site Maps

Appendix B – Copy of 2022 CGP

Appendix C – NOI and EPA Authorization Email

Appendix D – Site Inspection Forms

Appendix E – Corrective Action Log

Appendix F – SWPPP Amendment Log

Appendix G – Subcontractor Certifications/Agreements

Appendix H – Grading and Stabilization Activities Log

Appendix I – Training Documentation

Appendix J – Delegation of Authority

Appendix K – Endangered Species Documentation

Appendix L – Excerpt of Soil Re-Use Management Plan

Appendix M – Regulatory Approvals and Conditions

Appendix N – Buffer Zone Compliance Calculations

Appendix O – Impaired and High Quality Water Supporting Information

Appendix P - Turbidity Monitoring Sampling Documentation

Appendix A – Site Maps

NORTH

REFERENCE NOTES:

1. EXISTING CONDITIONS INFORMATION FOR THE BFI-HALIFAX LANDFILL WAS TAKEN FROM A PLAN TITLED "GAS COLLECTION SYSTEM MODIFICATIONS NEW PIPING PLAN AND DETAILS," PREPARED BY SITEC ENVIRONMENTAL, DATED FEBRUARY 20 2018.
2. REFER TO PLAN ON LAND IN THE TOWN OF BRIDGEWATER OF "MARILYN'S LANDING FOR MACDONALD INDUSTRIES INC." PREPARED BY TERRA NOVA SURVEY CONSULTANTS DATED AUGUST 10, 2016 FOR THE LIMITS OF EXISTING WETLANDS RESOURCE AREAS, BUFFER ZONES AND THE FEMA FLOOD ZONE ZONE A AS DEPICTED ON THE FEMA FIRM MAP 25023C0307J DATED JULY 17, 2015.
3. EXISTING GAS WELL SYSTEM PIPING INFORMATION WAS TAKEN FROM DRAWING TITLED "GAS COLLECTION WELL REPLACEMENT & SYSTEM PIPING ABANDONMENT PLAN" DRAWN BY SITEC ENVIRONMENTAL DATED FEBRUARY 20, 2018.
4. LIMITS OF BORDERING VEGETATED WETLANDS AND RESOURCE AREAS ON THE SITE DETERMINED BY BRIDGEWATER CONSERVATION COMMISSION THROUGH THE ISSUANCE OF AN ORDER OF RESOURCE AREA DELINEATION (MASSDEP# SE716-1285) DATED MARCH 28, 2013 AND SUBSEQUENT ORDERS OF CONDITIONS FOR WORK TO BE PERFORMED AT THE SITE IN 2013 (MASSDEP# SE116-1297) AND 2015 (MASSDEP# SE116-1344).
5. THE LIMIT OF EXISTING FINAL COVER IS ASSUMED TO BE LOCATED AT THE TOE OF SLOPE OF THE LANDFILL MOUND.

LEGEND:

- EXISTING MAJOR CONTOUR
- EXISTING MINOR CONTOUR
- EXISTING PROPERTY LINE
- EXISTING TOWN LINE
- EXISTING UTILITY EASEMENT
- EXISTING TREELINE
- EXISTING WETLANDS LINE
- 25' BUFFER ZONE
- 100' BUFFER ZONE
- EXISTING PAVED ROAD
- EXISTING UNPAVED ROAD
- EXISTING FENCE
- EXISTING LANDFILL GAS LINE
- EXISTING SILT FENCE
- EW-27 EXISTING GAS COLLECTION WELL

General Notes and Information:

1. IN THE EVENT THAT SUSPECTED CONTAMINATED SOIL, GROUNDWATER, AND OTHER MEDIA ARE ENCOUNTERED DURING EXCAVATION AND CONSTRUCTION ACTIVITIES BASED ON VISUAL, OLFACTORY, OR OTHER EVIDENCE, THE CONTRACTOR SHALL STOP WORK IN THE VICINITY OF THE SUSPECT MATERIAL TO AVOID FURTHER SPREADING OF THE MATERIAL, AND SHALL NOTIFY THE OWNER IMMEDIATELY SO THAT THE APPROPRIATE TESTING AND SUBSEQUENT ACTION CAN BE TAKEN.
2. CONTRACTOR SHALL PREVENT DUST, SEDIMENT, AND DEBRIS FROM EXITING THE SITE AND SHALL BE RESPONSIBLE FOR CLEANUP, REPAIRS, AND CORRECTIVE ACTION IF SUCH OCCURS.
3. DAMAGE RESULTING FROM CONSTRUCTION LOADS SHALL BE REPAIRED BY THE CONTRACTOR AT NO ADDITIONAL COST TO THE OWNER.
4. CONTRACTOR SHALL CONTROL STORMWATER RUNOFF DURING CONSTRUCTION TO PREVENT ADVERSE IMPACTS TO OFF SITE AREAS, AND SHALL BE RESPONSIBLE TO REPAIR RESULTING DAMAGES, IF ANY, AT NO COST TO OWNER.
5. SOIL PLACEMENT SHALL BE PERFORMED IN ACCORDANCE WITH "THE SOIL REUSE MANAGEMENT PLAN" PREPARED BY CARDNO ATC, DATED SEPTEMBER 2013.

Grading & Drainage:

1. STORMWATER MANAGEMENT SYSTEM SHALL BE MAINTAINED IN ACCORDANCE WITH APPROVED OPERATIONS & MANAGEMENT PLAN.
2. PERMISSION AND/OR TEMPORARY CONSTRUCTION EASEMENTS SHALL BE OBTAINED FROM PRIVATE PROPERTY OWNERS PRIOR TO ANY WORK TO BE PERFORMED ON ADJACENT PROPERTIES.

Erosion Control:

1. PRIOR TO STARTING ANY OTHER WORK ON THE SITE, THE CONTRACTOR SHALL NOTIFY APPROPRIATE AGENCIES AND SHALL INSTALL EROSION CONTROL MEASURES AS SHOWN ON THE PLANS AND AS IDENTIFIED IN FEDERAL, STATE, AND LOCAL APPROVAL DOCUMENTS PERTAINING TO THIS PROJECT.
2. CONTRACTOR SHALL INSPECT AND MAINTAIN EROSION CONTROL MEASURES, AND REMOVE SEDIMENT THEREFROM ON A WEEKLY BASIS AND WITHIN TWENTY-FOUR HOURS AFTER EACH STORM EVENT AND DISPOSE OF SEDIMENTS IN AN UPLAND AREA SUCH THAT THEY DO NOT ENCUMBER OTHER DRAINAGE STRUCTURES AND PROTECTED AREAS.
3. CONTRACTOR SHALL BE FULLY RESPONSIBLE TO CONTROL CONSTRUCTION SUCH THAT SEDIMENTATION SHALL NOT AFFECT REGULATORY PROTECTED AREAS, WHETHER SUCH SEDIMENTATION IS CAUSED BY WATER, WIND, OR DIRECT DEPOSIT.
4. CONTRACTOR SHALL PERFORM CONSTRUCTION SEQUENCING SUCH THAT EARTH MATERIALS ARE EXPOSED FOR A MINIMUM OF TIME BEFORE THEY ARE COVERED, SEEDED, OR OTHERWISE STABILIZED TO PREVENT EROSION.
5. UPON COMPLETION OF CONSTRUCTION AND ESTABLISHMENT OF PERMANENT GROUND COVER, CONTRACTOR SHALL REMOVE AND DISPOSE OF EROSION CONTROL MEASURES AND CLEAN SEDIMENT AND DEBRIS FROM ENTIRE DRAINAGE AND SEWER SYSTEMS.
6. WORK SHALL BE COMPLETED IN ACCORDANCE WITH STORMWATER POLLUTION PREVENTION PLAN PREPARED BY EBI CONSULTING, DATED AUGUST 15, 2013.

MACDONALD INDUSTRIES, INC. ASSR'S LOT 040-017
N/F THOMAS AND CROMWELL ALDEN
MACDONALD INDUSTRIES, INC. ASSR'S LOT 040-010
MACDONALD INDUSTRIES, INC. MAP 40 PARCEL 9
MACDONALD INDUSTRIES, INC. ASSR'S LOT 040-009
MACDONALD INDUSTRIES, INC. ASSR'S LOTS 040-016
BRIDGEWATER
HALIFAX
(TOWN LINE)
PROPERTY BOUNDARY
25' Buffer Line
100 ft. Buffer Line
Wetlands
EXISTING SILT FENCE AND STRAW BALE BARRIER
EXISTING STONE PROTECTION
EXISTING BENCH DRAINAGE SWALE
EXISTING DRAINAGE CHANNEL
EXISTING STONE INLET PROTECTION
EXISTING DRAINAGE SWALE
EXISTING MOUND
BFI-HALIFAX LANDFILL
GAS WELL (TYP.)
EXISTING GAS HEADER
RE-DRILLED GAS WELL (TYP.)
EXISTING RIP-RAP LETDOWN CHANNEL
EXISTING 15" CULVERT
2" CONDENSATE FORCEMAIN
EXISTING STORMWATER MANAGEMENT BASIN
LAUREL STREET
FOUNDATION
CHIMNEY
N/F BFI MAP 67 PARCEL 2
N/F BFI MAP 68 PARCEL 8
N/F BFI MAP 58 PARCEL 5
N/F BFI MAP 68 PARCEL 4
VALVE (TYP.)
EW30 (OLD) DECOMMISSIONED
8" GAS HEADER
CONDENSATE TRAP (TYP.)
2" CONDENSATE FORCEMAIN (ABOVE CAP)
2" COMPRESSED AIR
MONITORING PORT
4" VALVE
8" VALVE
4" LATERAL
VALVE

SCALE IN FEET
0 60 120

DRAFT

NO.	DATE	REVISION RECORD DESCRIPTION
1	8/26/20	REVISED EXISTING CONDITIONS INFORMATION AND LABELS

Civil & Environmental Consultants, Inc.
31 Bellows Road · Raynham, MA 02767
Ph: 774.501.2178 · 866.312.2024 · Fax: 774.501.2669
www.cecinc.com

MacDONALD INDUSTRIES, INC.
POST CLOSURE USE: MAJOR (BWP-SW36)
SOIL REUSE PLAN
BFI-HALIFAX LANDFILL
HALIFAX, MASSACHUSETTS

EXISTING CONDITIONS PLAN

DATE:	MAY 2020
DWG. SCALE:	1"=60'
DRAWN BY:	EMW
CHECKED BY:	DRAFT
PROJECT NO:	175-313
APPROVED BY:	DRAFT

DRAWING NO.:
C101
SHEET 3 OF 10

P:\2017\175-313\-CAD\dwg\CAD - MassDEP Post Closure Use\175313-CAD-C101-Existing Conditions Rev_R3.dwg(EXISTING) 10/5/2020 - wellesj - LPL 5/21/2020 6:59 PM

NORTH

PROPOSED DETENTION BASIN
BOTTOM=50.7
OVERFLOW=53.0
TOP OF BERM=54.0

PROPOSED STORMWATER OUTLET CONTROL STRUCTURE CULVERTS (2) 18" CULVERTS INV. 50.60

8/9 PROPOSED BASIN OVERFLOW (TYP.)

7/10 PROPOSED STORMWATER OUTLET CONTROL STRUCTURE

EXISTING RIPRAP

EXISTING RIPRAP (TYP.)

EXISTING DRAINAGE CHANNEL

EXISTING RIPRAP (TYP.)

EXISTING DRAINAGE CHANNEL

PROPERTY BOUNDARY

BRIDGEWATER
HALIFAX
(TOWN LINE)

A C304

1/9 PROPOSED ACCESS ROAD AND SWALE (8% MAX SLOPE)

A C304

BRIDGEWATER
HALIFAX

LAUREL STREET

EXISTING STORMWATER MANAGEMENT BASIN

11/9 EXTEND EXISTING ACCESS ROAD (8% MAX SLOPE)

B C303

SCALE IN FEET
0 60 120

DRAFT

LEGEND:

- EXISTING MAJOR CONTOUR
- EXISTING MINOR CONTOUR
- EXISTING PROPERTY LINE
- EXISTING TOWN LINE
- EXISTING UTILITY EASEMENT
- EXISTING TREELINE
- EXISTING WETLANDS LINE
- 25' BUFFER ZONE
- 100' BUFFER ZONE
- EXISTING PAVED ROAD
- EXISTING UNPAVED ROAD
- EXISTING FENCE
- PROPOSED MAJOR CONTOUR
- PROPOSED MINOR CONTOUR
- PROPOSED ACCESS ROAD
- PROPOSED DRAINAGE SWALE

REFERENCE NOTES:

1. EXISTING CONDITIONS INFORMATION FOR THE BFI-HALIFAX LANDFILL WAS TAKEN FROM A PLAN TITLED "GAS COLLECTION SYSTEM MODIFICATIONS NEW PIPING PLAN AND DETAILS," PREPARED BY SITEC ENVIRONMENTAL, DATED FEBRUARY 20 2018.
2. REFER TO PLAN ON LAND IN THE TOWN OF BRIDGEWATER OF "MARILYN'S LANDING FOR MACDONALD INDUSTRIES INC." PREPARED BY TERRA NOVA SURVEY CONSULTANTS DATED AUGUST 10, 2016 FOR THE LIMITS OF EXISTING WETLANDS RESOURCE AREAS, BUFFER ZONES AND THE FEMA FLOOD ZONE ZONE A AS DEPICTED ON THE FEMA FIRM MAP 25023C0307J DATED JULY 17, 2015.
3. LIMITS OF BORDERING VEGETATED WETLANDS AND RESOURCE AREAS ON THE SITE DETERMINED BY BRIDGEWATER CONSERVATION COMMISSION THROUGH THE ISSUANCE OF AN ORDER OF RESOURCE AREA DELINEATION (MASSDEP# SE716-1285) DATED MARCH 28, 2013 AND SUBSEQUENT ORDERS OF CONDITIONS FOR WORK TO BE PERFORMED AT THE SITE IN 2013 (MASSDEP# SE116-1297) AND 2015 (MASSDEP# SE116-1344).
4. THE LIMIT OF EXISTING FINAL COVER IS ASSUMED TO BE LOCATED AT THE TOE OF SLOPE OF THE LANDFILL MOUND.
5. FINAL CONTOURS REPRESENT TOP OF VEGETATIVE SUPPORT LAYER.
8. EROSION CONTROLS DEPICTED ON SHEET C303 SHALL BE CONSIDERED MINIMUM EROSION CONTROLS TO BE IMPLEMENTED AT THE SITE FOR STORMWATER RUNOFF. THE CONTRACTOR IS RESPONSIBLE FOR MANAGEMENT OF RUNOFF AND SEQUENCING AND MAINTENANCE OF BEST MANAGEMENT PRACTICES.

REVISION RECORD

NO.	DATE	DESCRIPTION
1	8/26/19	REVISED EXISTING CONDITIONS INFORMATION AND LABELS
2	12/2/2020	REVISED EROSION CONTROLS AND DETAILS

Civil & Environmental Consultants, Inc.
31 Bellows Road · Raynham, MA 02767
Ph: 774.501.2176 · 866.312.2024 · Fax: 774.501.2669
www.cecinc.com

MacDONALD INDUSTRIES, INC.
POST CLOSURE USE: MAJOR (BWP-SW36)
SOIL REUSE PLAN
BFI-HALIFAX LANDFILL
HALIFAX, MASSACHUSETTS

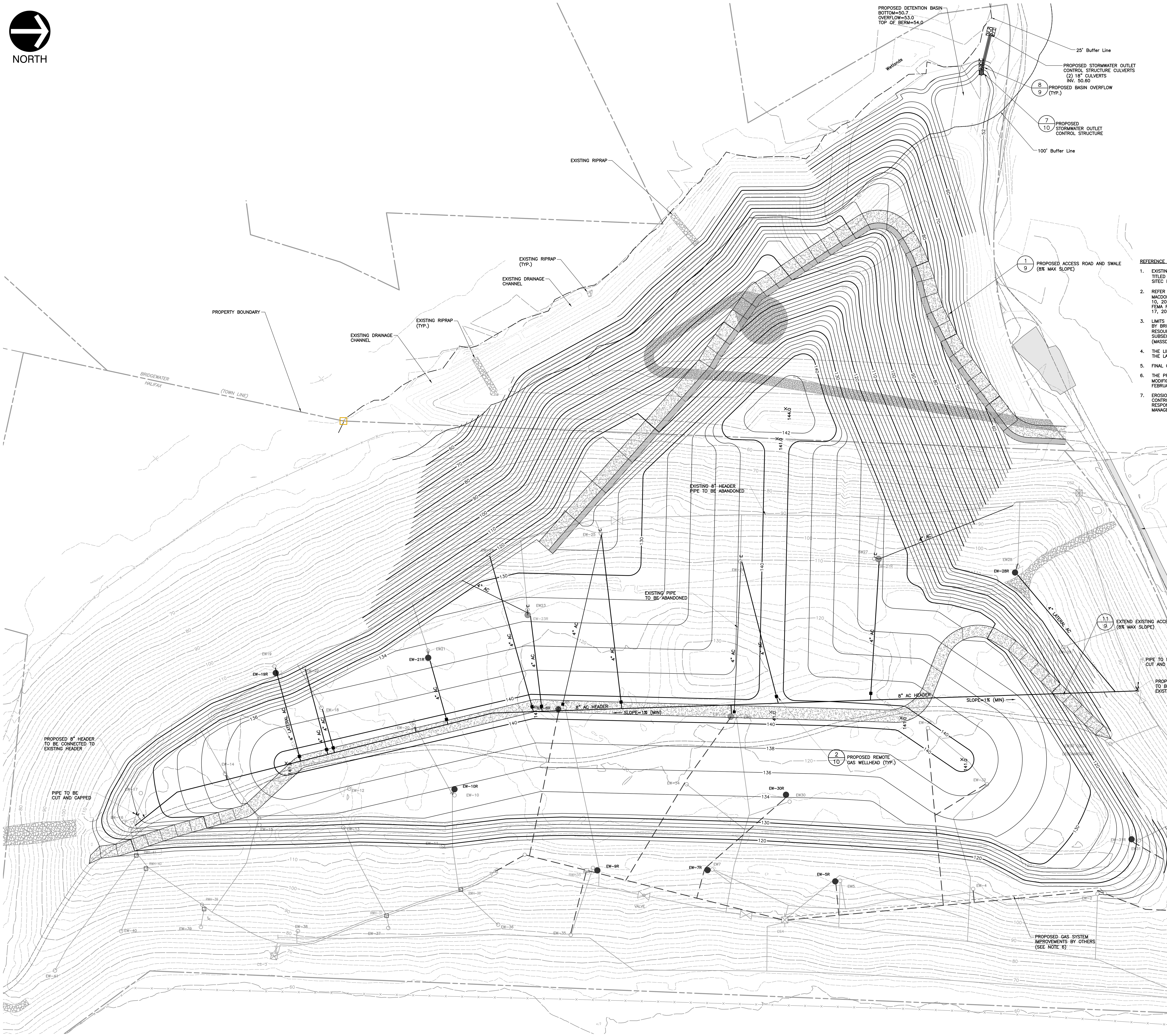
PROPOSED GRADING PLAN

DRAWING NO.: C301

SHEET 5 OF 10

DATE:	MAY 2020
DWG SCALE:	1"= 60'
PROJECT NO:	175-313
DRAWN BY:	EMW
CHECKED BY:	DRAFT
APPROVED BY:	DRAFT

P:\2017\175-313\-CAD\Dwg\Civil3 - MassDEP Post Closure (dat)\175313-CIV01-C301-Proposed Post Grading Plans_R5.dwg(PROPOSED) LS(12/02/2020 - earlison) - LP: 12/7/2020 4:19 PM



LEGEND:

— 60 —	EXISTING MAJOR CONTOUR
	EXISTING MINOR CONTOUR
	EXISTING PROPERTY LINE
	EXISTING TOWN LINE
	EXISTING UTILITY EASEMENT
	EXISTING TREELINE
	EXISTING WETLANDS LINE
	25' BUFFER ZONE
	100' BUFFER ZONE
	EXISTING PAVED ROAD
	EXISTING UNPAVED ROAD
	EXISTING FENCE
	EXISTING LANDFILL GAS LINE
■	PROPOSED REMOTE GAS WELL HEAD
	PROPOSED GAS LINE
AC	ABOVE CAP
BC	BELOW CAP
EW-27 ○	EXISTING GAS COLLECTION WELL
EW-27R ●	EXISTING GAS COLLECTION WELL REDRILL
EW-8R ●	PROPOSED GAS COLLECTION WELL REDRILL (BY OTHERS)
	PROPOSED FORCE MAIN (BY OTHERS)
	PROPOSED GAS LINE (BY OTHERS)

REFERENCE NOTES:

1. EXISTING CONDITIONS INFORMATION FOR THE BFI-HALIFAX LANDFILL WAS TAKEN FROM A PLAN TITLED "GAS COLLECTION SYSTEM MODIFICATIONS NEW PIPING PLAN AND DETAILS," PREPARED BY SITEC ENVIRONMENTAL, DATED FEBRUARY 20 2018.
2. REFER TO PLAN ON LAND IN THE TOWN OF BRIDGEWATER OF "MARILYN'S LANDING FOR MACDONALD INDUSTRIES INC." PREPARED BY TERRA NOVA SURVEY CONSULTANTS DATED AUGUST 10, 2016 FOR THE LIMITS OF EXISTING WETLANDS RESOURCE AREAS, BUFFER ZONES AND THE FEMA FLOOD ZONE ZONE A AS DEPICTED ON THE FEMA FIRM MAP 25023C0307J DATED JULY 17, 2015.
3. LIMITS OF BORDERING VEGETATED WETLANDS AND RESOURCE AREAS ON THE SITE DETERMINED BY BRIDGEWATER CONSERVATION COMMISSION THROUGH THE ISSUANCE OF AN ORDER OF RESOURCE AREA DELINEATION (MASSDEP# SE716-1285) DATED MARCH 28, 2013 AND SUBSEQUENT ORDERS OF CONDITIONS FOR WORK TO BE PERFORMED AT THE SITE IN 2013 (MASSDEP# SE116-1297) AND 2015 (MASSDEP# SE116-1344).
4. THE LIMIT OF EXISTING FINAL COVER IS ASSUMED TO BE LOCATED AT THE TOE OF SLOPE OF THE LANDFILL MOUND.
5. FINAL CONTOURS REPRESENTS TOP OF VEGETATIVE SUPPORT SOIL.
6. THE PROPOSED DASHED GAS SYSTEM IMPROVEMENTS SHOWN WERE PERMITTED UNDER A PERMIT MODIFICATION (TRANSMITTAL NO. 277645), PREPARED BY SITEC ENVIRONMENTAL, DATED FEBRUARY 20, 2018 AND WILL BE CONSTRUCTED BY OTHERS.
7. EROSION CONTROLS DEPICTED ON SHEET C303 SHALL BE CONSIDERED MINIMUM EROSION CONTROLS TO BE IMPLEMENTED AT THE SITE FOR STORMWATER RUNOFF. THE CONTRACTOR IS RESPONSIBLE FOR MANAGEMENT OF RUNOFF AND SEQUENCING AND MAINTENANCE OF BEST MANAGEMENT PRACTICES.

REVISION RECORD

NO	DATE	DESCRIPTION
1	8/09/19	REVISED EXISTING CONDITIONS INFORMATION AND LABELS
2	5/22/2020	REVISED EROSION CONTROLS AND DETAILS

Civil & Environmental Consultants, Inc.
31 Bellows Road · Raynham, MA 02767
Ph: 774.501.2176 · 866.312.2024 · Fax: 774.501.2669
www.cecinc.com

MacDONALD INDUSTRIES, INC.
POST CLOSURE USE: MAJOR (BWP-SW36)
SOIL REUSE PLAN
BFI-HALIFAX LANDFILL
HALIFAX, MASSACHUSETTS

PROPOSED FINAL GAS SYSTEM MODIFICATIONS

DATE:	MAY 2020	DRAWN BY:	EMW
DWG SCALE:	1"=60'	CHECKED BY:	DRAF
PROJECT NO:	175-313	APPROVED BY:	DRAFT

DRAWING NO.: C302

SHEET 6 OF 10

NORTH

PROPOSED FLARED END SECTION WITH STONE PROTECTION (9/9)

PROPOSED STRAW BALE AND SILT FENCE (4/10)

PROPOSED LETDOWN CHANNEL (TYP.) (10/9)

PROPOSED 24" DIA HDPE CULVERT
INV. EL. IN = 83.0
INV. EL. OUT = 82.5

PROPOSED SIDESLOPE DIVERSION BERM 5% MIN. (TYP.) (4/9)

EXISTING RIPRAP

EXISTING STRAW BALE AND SILT FENCE

EXISTING DRAINAGE CHANNEL

EXISTING RIPRAP (TYP.)

EXISTING DRAINAGE CHANNEL

BRIDGEWATER
HALIFAX
(TOWN LINE)

PROPOSED DIVERSION BERM (TYP.) (4/9)

PERIMETER EROSION CONTROLS. CONTRACTOR TO COORDINATE AND MODIFY EROSION CONTROLS BASED ON CONSTRUCTION PROGRESS.

INSTALL STONE CHECK DAMS AS NEEDED BASED ON CONSTRUCTION PROGRESS.

PROPOSED DIVERSION BERM (SEE NOTE 6)

INSTALL STONE CHECK DAMS AS NEEDED BASED ON CONSTRUCTION PROGRESS.

PERIMETER EROSION CONTROLS. CONTRACTOR TO COORDINATE AND MODIFY EROSION CONTROLS BASED ON CONSTRUCTION PROGRESS.

25' WETLANDS BUFFER LINE

PROPOSED STORMWATER OUTLET CONTROL STRUCTURE CULVERTS (2) 18" CULVERTS INV. 50.60

PROPOSED BASIN OVERFLOW (8/9) (TYP.)

PROPOSED STORMWATER OUTLET CONTROL STRUCTURE (7/10)

100' WETLANDS BUFFER LINE

PROPOSED DETENTION BASIN
BOTTOM=50.7
OVERFLOW=53.0
TOP OF BERM=54.0

PROPOSED DRAINAGE SWALE (TYP.)

PERIMETER EROSION CONTROLS. CONTRACTOR TO COORDINATE AND MODIFY EROSION CONTROLS BASED ON CONSTRUCTION PROGRESS.

PROPOSED SIDESLOPE DIVERSION BERM 5% MIN SLOPE (TYP.) (4/9)

STABILIZED CONSTRUCTION EXIT

BRIDGEWATER
HALIFAX

EXISTING CULVERT

PROPOSED LET-DOWN CHANNEL MID-SLOPE INLET (TYP.) (6/9)

EXISTING STORMWATER MANAGEMENT BASIN

PERIMETER EROSION CONTROLS. CONTRACTOR TO COORDINATE AND MODIFY EROSION CONTROLS BASED ON CONSTRUCTION PROGRESS.

LAUREL STREET

FOREMAN WAY

LEARNER

STABILIZED CONSTRUCTION EXIT

LEGEND:

- EXISTING MAJOR CONTOUR
- EXISTING MINOR CONTOUR
- EXISTING PROPERTY LINE
- EXISTING TOWN LINE
- EXISTING UTILITY EASEMENT
- EXISTING TREELINE
- EXISTING WETLANDS LINE
- 25' BUFFER ZONE
- 100' BUFFER ZONE
- PROPOSED MAJOR CONTOUR
- PROPOSED MINOR CONTOUR
- PROPOSED ACCESS ROAD
- PROPOSED DRAINAGE SWALE
- EXISTING SILT FENCE
- EXISTING DRAINAGE SWALE
- PROPOSED DRAINAGE SWALE
- PROPOSED DIVERSION BERM
- PROPOSED DRAINAGE CULVERT
- PROPOSED HAYBALE WITH SILT FENCE
- PROPOSED PERIMETER EROSION CONTROL

REFERENCE NOTES:

1. EXISTING CONDITIONS INFORMATION FOR THE BFI–HALIFAX LANDFILL WAS TAKEN FROM A PLAN TITLED "GAS COLLECTION SYSTEM MODIFICATIONS NEW PIPING PLAN AND DETAILS," PREPARED BY SITEC ENVIRONMENTAL, DATED FEBRUARY 20 2018.
2. REFER TO PLAN ON LAND IN THE TOWN OF BRIDGEWATER OF "MARILYN'S LANDING FOR MACDONALD INDUSTRIES INC." PREPARED BY TERRA NOVA SURVEY CONSULTANTS DATED AUGUST 10, 2016 FOR THE LIMITS OF EXISTING WETLANDS RESOURCE AREAS, BUFFER ZONES AND THE FEMA FLOOD ZONE ZONE A AS DEPICTED ON THE FEMA FIRM MAP 25023C0307J DATED JULY 17, 2015.
3. LIMITS OF BORDERING VEGETATED WETLANDS AND RESOURCE AREAS ON THE SITE DETERMINED BY BRIDGEWATER CONSERVATION COMMISSION THROUGH THE ISSUANCE OF AN ORDER OF RESOURCE AREA DELINEATION (MASSDEP# SE116-1285) DATED MARCH 28, 2013 AND SUBSEQUENT ORDERS OF CONDITIONS FOR WORK TO BE PERFORMED AT THE SITE IN 2013 (MASSDEP# SE116-1297) AND 2015 (MASSDEP# SE116-1344).
4. THE LIMIT OF EXISTING FINAL COVER IS ASSUMED TO BE LOCATED AT THE TOE OF SLOPE OF THE LANDFILL MOUND.
5. FINAL CONTOURS REPRESENT TOP OF VEGETATIVE SUPPORT LAYER.
6. DIVERSION BERM ALIGNMENT MAY BE MODIFIED BASED ON EXISTING LANDFILL GAS INFRASTRUCTURE AT THE TIME OF CONSTRUCTION.
7. EROSION CONTROLS DEPICTED ON THIS PLAN SHALL BE CONSIDERED MINIMUM EROSION CONTROLS TO BE IMPLEMENTED AT THE SITE FOR STORMWATER RUNOFF. THE CONTRACTOR IS RESPONSIBLE FOR MANAGEMENT OF RUNOFF AND SEQUENCING AND MAINTENANCE OF BEST MANAGEMENT PRACTICES.

SCALE IN FEET
0 60 120

DRAFT

REVISION RECORD

NO.	DATE	DESCRIPTION
1	8/26/19	REVISED EXISTING CONDITIONS INFORMATION AND LABELS
2	12/2/2020	REVISED EROSION CONTROLS AND DETAILS

Civil & Environmental Consultants, Inc.
31 Bellows Road · Raynham, MA 02767
Ph: 774.501.2178 · 866.312.2024 · Fax: 774.501.2669
www.cecinc.com

MacDONALD INDUSTRIES, INC.
POST CLOSURE USE: MAJOR (BWP-SW36)
SOIL REUSE PLAN
BFI-HALIFAX LANDFILL
HALIFAX, MASSACHUSETTS

PROPOSED STORMWATER DESIGN AND EROSION CONTROLS

DATE:	MAY 2020
DRAWN BY:	EMW
DWG SCALE:	1"=60'
CHECKED BY:	DRAFT
PROJECT NO:	176-313
APPROVED BY:	DRAFT

DRAWING NO.:
C303
SHEET 7 OF 10

A:\2017\176-313\-CADD\Dwg\Civil - MacDP Post Closure Use\176313-C303-Stormwater_SU.dwg(STORMWATER) LS:(9/23/2020 - earlison) - LP: 9/28/2020 8:52 AM

APPENDIX H

PRIVATE REGISTERED WELL DATABASE IN BRIDGEWATER NEAR MLCRA

March 13, 2019 BEC Project 18191

Mr. Mark Dakers, Chief
Solid Waste Management Section
Bureau of Air and Waste
MassDEP- Southeast Regional Office
20 Riverside Drive
Lakeville, MA 02347

Subject: Private Well Use Research – Area Adjacent to Marilyn's Landing Commercial Re-use Area (MLCRA) and Halifax Landfill**,** Off Plymouth Street, Bridgewater/Halifax, MA

Dear Mr. Dakers:

In accordance with your request in providing the "Amendment No.1 to Enforcement Document No. 00006711, Enforcement Document No. 00006711", ("Amended ACO") dated March 4, 2019, we are providing the results of our recent research on private well use in the area adjacent to MLCRA and the Halifax Landfill.

Private Well Search Results

The search area extended about ½ mile around the borders of MLCRA and the Halifax Landfill as shown on the attached map. The well search in the Town of Bridgewater was performed and results were described in the Revised Soil Re-Use Management Plan (SRMP) dated February 26, 2019. There were no indications of private wells used for domestic drinking purposes based on the MassDEP "Data Portal" for registered wells. A table depicting the information for the Bridgewater wells in the area is attached. Bridgewater indicated a "D" for domestic use in the table. No wells were indicated to be domestic on this database. A map is provided that shows the nearby Bridgewater wells in green, presumed to be non-domestic "non-drinking" water wells.

BEC provided the street names and addresses for properties in the Town of Halifax to the Halifax Board of Health (BOH) and entered the information into a database similar to that used by Bridgewater (See attached table). The addresses, and lot numbers were used by the Halifax BOH to identify domestic irrigation and private drinking water wells shown on the table. The map shows the irrigation and drinking water wells in red and purple. The wells are located on the upgradient side of the landfills and none are within ½ mile.

Conclusions

Based on the records provided by local BOH and MassDEP databases, there are no known domestic drinking water wells within ½ mile of the MLCRA or Halifax Landfill.

Closing

Please call me at (617) 908-7094 or email me at rstromberg@bostonenvcorp.com if you have any questions.

Sincerely,

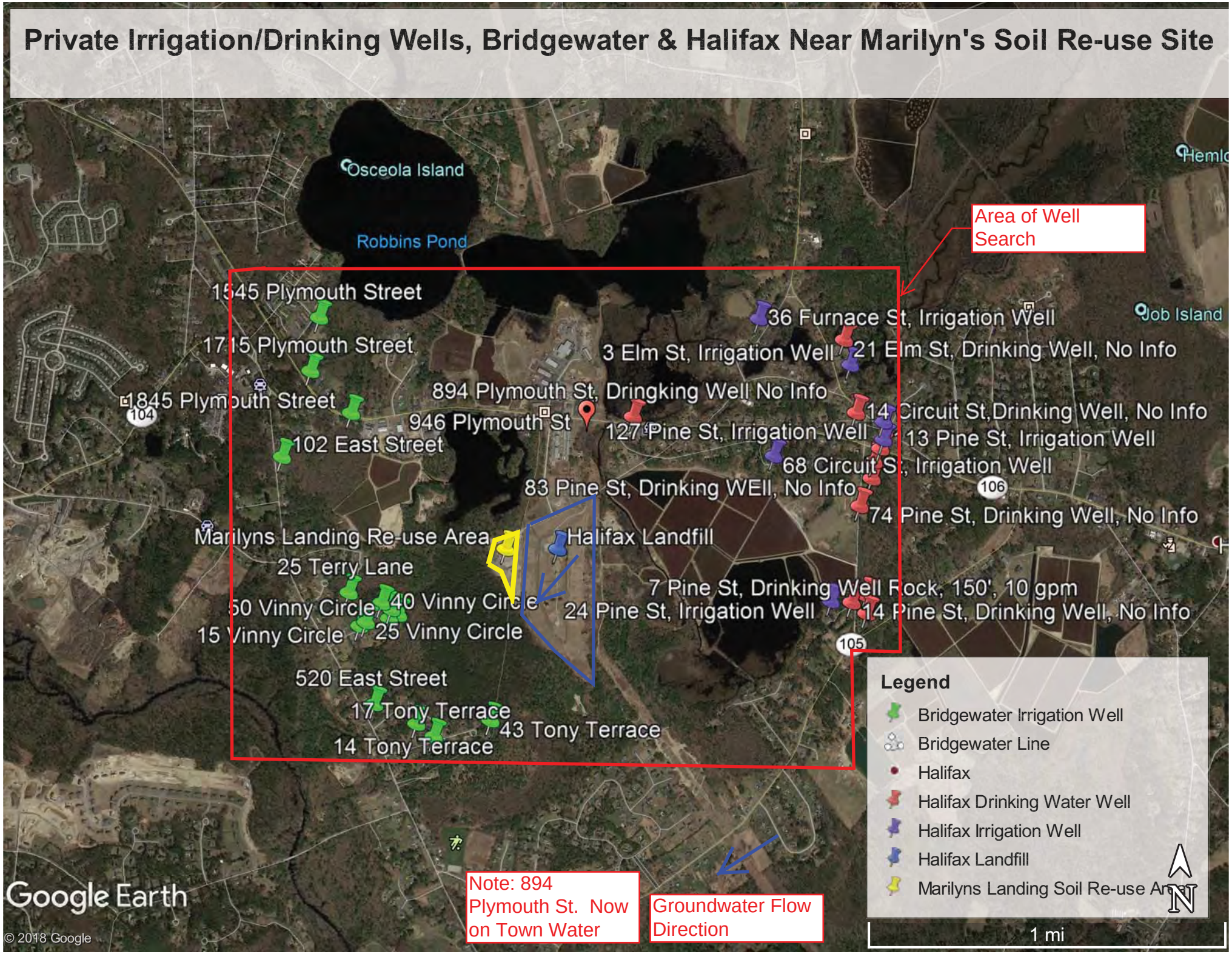
Richard Stromberg, CPG, LSP
Senior Project Manager

CC: M. MacDonald
R. Stromberg, LSP (BEC)
D. Nagle, Esq. (Donald P. Nagle, P.C.)

Attachments

Figure

Private Irrigation/Drinking Wells, Bridgewater & Halifax Near Marilyn's Soil Re-use Site



Tables

No "D" for domestic well indicated.

* - Verified by Board of Health/Water Department

D - Domestic - No Town Water

As of March 12, 2018

WELL WATER PERMITS

	Street	Lot		Septage Permit#		Well Permit#	Plan	Log	Lab	*	Reg#
102	East Street			00-60		W05-22	X	X	7/13/2006		617
520	East Street	not in use owners	awaiting testing	00-91		W02-53	X	X	9/23/2002		503
426	Plymouth Street						X	X	7/1/2008		658
623	Plymouth Street					W94-9	X	X	8/9/1994		156
681	Plymouth Street			TOWN		W02-72	X	X	10/28/2002		507
1545	Plymouth Street			2001-12		W05-15	X	X	8/25/2005		602
1715	Plymouth Street	Lot #2		2001-52		W04-24	X	X	9/24/04&1 1/09/04		579
1845	Plymouth Street Ext.			77-74		1977	X	X	6/19/1979		141
25	Terry Lane			84-32		W84-3	X	X	5/7/1984		319
14	Tony Terrace			89-236		W95-9	X	X	5/26/1995		171
17	Tony Terrace	Lot 14		89-250		W00-30	X	X	7/6/2000		366
43	Tony Terrace			89-267		W98-31	X	X	10/8/1999		313
15	Vinny Circle	Lot 10		84-9		W00-39	X	X	7/14/2000		381
25	Vinny Circle			84-8		W99-56	X	X	1/21/2001		453
40	Vinny Circle	Lot 4		84-24		W00-32	X		6/14/2000		365
45	Vinny Circle			84-23		W03-18	X	X	8/11/2003		546
50	Vinny Circle					W99-105	X	X	10/6/1999		312
55	Vinny Circle			84-22		W03-42	X	X	7/10/2003		540

Note: Wells shown above were not indicated to be private drinking water wells based on Bridgewater BOH records. Has not been verified by BEC

D - Domestic - No Town Water

Update 1- March 12, 2019 (Red Well Permit # = Private Residential Well)

LIST OF ADDRESSES SURROUNDING HALIFAX LANDFILL WITH POTENTIAL WELLS

	Street	Lot	Domestic	Septage Permit#	Well Permit#	Plan	Log	Lab	*	Reg#/Notes
300	Industrial Drive	46-13A	no known wells on Industrial Dr.							
350	Industrial Drive	47-5A	none known							
400	Industrial Drive	47-12A	none known							
450	Industrial Drive	47-6A	none known							
500-500A	Industrial Drive	47-11A	none known							
550	Industrial Drive	47-6A	none known							
600	Industrial Drive	47-10A	none known							
650	Industrial Drive	47-8A	none known							
700	Industrial Drive	47-9A	none known							
14	Furnace Street	48-4	none known							
24	Furnace Street	48-4A	none known							
25	Furnace Street	48-5	none known							
36	Furnace Street	48-4B	irrigation		0000-IW-291					No info on DEP Data Portal.
44	Furnace Street	48-3	none known							
767	Plymouth Street	48-20	none known							
770	Plymouth Street	59-5B	none known							
780	Plymouth Street	59-5A	none known							
781	Plymouth Street	48-19	none known							
783	Plymouth Street	48-18	none known							
786	Plymouth Street	48-25	none known							
789	Plymouth Street	48-17	none known							
792	Plymouth Street	48-24	none known							
795	Plymouth Street	48-16	none known							
798	Plymouth Street	48-23	none known							
804	Plymouth Street	48-22	none known							
810	Plymouth Street	59-26	none known							
3	Elm Street	48-14	irrigation		2005-IW-10					DEP records only show 6 "Elm Street" wells installed from 1965-1997, no address given
21	Elm Street	48-9A	drinking well		0000-W-024					DEP records only show 6 "Elm Street" wells installed from 1965-1997, no address given. No file on record at Halifax.
27	Elm Street	48-9B	none known							
28	Elm Street	48-8A	none known							
42	Elm Street	48-7	none known							
725	Plymouth Street	59-8	none known							
732	Plymouth Street	59-9	none known							
735	Plymouth Street	59-16	none known							
739	Plymouth Street	59-17	none known							
743	Plymouth Street		none known							
746	Plymouth Street	59-6	none known							
749	Plymouth Street		none known							
83	Pine Street	59-21	drinking well		0000-W-165					Only DEP records are for 0, 24, and 7 Pine Street. Water well record on file Halifax. 17' deep,5 gpm, 1973, Tested, Suitable for Drinking.
93	Pine Street	59-30	drinking well		0000-W-166					Only DEP records are for 0, 24, and 7 Pine Street. Septic Only Permit on File Halifax.
98	Pine Street	59-14								
101	Pine Street	59-29	drinking well		0000-W-167					Only DEP records are for 0, 24, and 7 Pine Street. Septic Only Permit on File Halifax.
113	Pine Street	59-11	irrigation		2000-I-14					Only DEP records are for 0, 24, and 7 Pine Street
116	Pine Street	59-13-1	none known							
126	Pine Street	59-13-1A	none known							
127	Pine Street	59-10	irrigation		1999-I-02					DEP Info says only 30' screen, 10 gpm, air hammer, 1999
14	Circuit Street	59-12	drinking well		0000-W-015					DEP has 5 records on Circuit Street installed from 1969-1989 only address given is 64B Circuit Street. Septic Only Permit on File Halifax.
19	Circuit Street	59-6C	none known							
28	Circuit Street	59-13A	none known							
39	Circuit Street	59-28	none known							
49	Circuit Street	59-5C	none known							
62	Circuit Street	59-13-6	none known							
65A	Circuit Street	59-1D	none known							
67	Circuit Street	59-4A	none known							
68	Circuit Street	59-1B	irrigation		2003-IW-10					DEP has 5 records on Circuit Street installed from 1969-1989 only address given is 64B Circuit Street
70	Circuit Street	59-1B-1	none known							
74	Circuit Street	59-35	none known							
77	Circuit Street	59-15A	none known							
78	Circuit Street	59-1E	none known							
82	Circuit Street	59-1F	none known							
83	Circuit Street	59-2A	none known							
90	Circuit Street	59-32	none known							
91	Circuit Street	59-22	none known							
96	Circuit Street	58-18	none known							
97	Circuit Street	58-13	none known							
736	Plymouth Street	59-13	none known							
810	Plymouth Street	59-13-3	none known							
814	Plymouth Street	59-13-4	none known							
815	Plymouth Street	59-5	none known							
818	Plymouth Street	59-13-5	none known							
825	Plymouth Street	59-27	none known							
829	Plymouth Street	59-4	none known							
833	Plymouth Street	59-31	none known							
837	Plymouth Street	59-15	none known							
841A-B	Plymouth Street	59-25	none known							
843A-B	Plymouth Street	59-2B	none known							
845	Plymouth Street	59-2	none known							
104	Circuit Street	58-17	none known							
105	Circuit Street	58-12	none known							
106	Circuit Street	58-5F	none known							
109	Circuit Street	58-15	none known							
110	Circuit Street	58-5E	none known							
129	Circuit Street	58-21	none known							
139	Circuit Street	58-22	none known							
150	Circuit Street	58-14	none known							
874	Plymouth Street	58-16	none known							
880	Plymouth Street	58-24	none known							
888	Plymouth Street	58-23	none known							
894	Plymouth Street	58-4	drinking well		0000-W-177					DEP has 15 well records for Plymouth Street but none at this address. Halifax Records indicate 21' deep well installed in 1967 for Stella's Restaurant as Transient Public well. Transferred to Town Water. Well disconnected.
917	Plymouth Street	58-2B	none known							
920	Plymouth Street	58-3B	none known							
925	Plymouth Street	58-1A	none known							
926	Plymouth Street	58-3B	none known							
933	Plymouth Street	58-2A	none known							
934	Plymouth Street	58-3D	none known							
940	Plymouth Street	58-3E	none known							
946	Plymouth Street	?	none known							
27	Laurel Street	57-3F	none known							
437	Laurel Street	35-2	none known							
447	Laurel Street	58-14B	none known							
457	Laurel Street	58-14C	none known							
5	Pine Street	69-2A	none known							
7	Pine Street	69-3A	drinking		0000-W-162					Sand & Clay to 70', bedrock 70-150', water level 12', 10 gpm, gray-black bedrock. Well sampled in 1995. "Suitable to Drink".
14	Pine Street	69-7	drinking		0000-W-163					Only DEP records are for 0, 24, and 7 Pine Street. Septic Only Permit on File Halifax.
19	Pine Street	69-3C	drinking		1996-W-12					Halifax Reedords. 200' well, 95 feet Sand over Bedrock. Well in Bedrock. 15 gpm. In 1996 tested "Suitable for Drinking" except aestheitc Iron/Manganese problem.
20	Pine Street	69-2B	none known							Only DEP records are for 0, 24, and 7 Pine Street
24	Pine Street	69-2C	irrigation		0000-IW-305					Well depth 16', 14 gpm.
44	Pine Street	69-4	none known							
74	Pine Street		drinking		0000-W-164					Only DEP records are for 0, 24, and 7 Pine Street. No Records at Halifax.

Note: Well Permit with "0000" = "Grandfathered well" at Halifax BOH installed prior to 2000.

BOSTON ENVIRONMENTAL CORPORATION

APPENDIX I

GROUNDWATER

MONITORING PLAN UPDATE

Updated Groundwater Monitoring Plan

Revision 2 (Phase II-III Filling Program)

Marilyn's Landing Commercial Re-Use Area (MLCRA)
946 Plymouth Street/ Rt. 106 Halifax Town Line
Bridgewater, Massachusetts and;
BFI Halifax Landfill, Halifax, Massachusetts

July 28, 2020

Prepared for:

Marilyn and David MacDonald
MacDonald Industries Inc.
645 Walnut Street
Bridgewater, Massachusetts 02324

Prepared by:
Richard Stromberg, LSP
Boston Environmental Corp.
338 Howard Street
Brockton, MA 02302

Table of Contents

1.0 INTRODUCTION

1.1 Introduction and Site Conditions

The following is an "Updated Groundwater Monitoring Plan" prepared in support of the closure of the Marilyn's Landing Commercial Re-Use Area (MLCRA) and the adjacent Halifax Landfill located off Plymouth Street in Bridgewater and Halifax, Massachusetts. The plan is provided as an appendix to the Revised "Soil Re-Use Management Plan" (SRMP- Revision-2 dated August 2020) and is also known as "Phase III". The plan for the Phase I and II work is completed and includes previously approved scopes of work for the groundwater monitoring at the MLCRA portion and groundwater and surface water at the Halifax Landfill portion. The attached Figure shows the sampling locations in each respective area. The sampling programs have been done semi-annually as approved by MassDEP at both areas to date under COMM-15-01 for MLCRA and 310 CMR 19.132 for the Halifax Landfill.

The MLCRA work is being done by Boston Environmental Corp. (BEC) as the LSP for MacDonald's in the Summer and Winter months and the Halifax Landfill work is being done in the Spring and Fall months by Environmental Sampling & Services, Inc. (ES&S), on behalf of Browning Ferris Industries (BFI), c/o Republic Services. Semi-annual reports are submitted to MassDEP by the respective consultants. Constituents tested by the respective parties differs as described further below. MassDEP requires a consolidated monitoring and reporting plan for the combined Phase III Area under COMM-15-01 that adequately assesses potential impact to surface and groundwater from the Phase III activities.

1.2 Conceptual Site Model for the Phase III Re-use Area

MassDEP requested BEC propose a monitoring network based on the hydrogeological "Conceptual Site Model" (CSM) understanding of the flow system and landfill structure. BEC has evaluated existing data at MLCRA and has collaborated with BFI/Republics consultants during the Phase II program to understand flow conditions.

The landfill contains a soil and vegetative cover over a 40 mil High Density Polyethylene Geomembrane Cap. The goal of the expanded monitoring program is to assess "first receptor" media around the landfill before and after placement of the new soils.

The monitoring network at MLCRA consists of five shallow monitoring wells. The existing BFI monitor well network includes 16 shallow wells at the water table and deeper wells forming couplets based on the BFI well construction logs provided to BEC by Republic as shown in Appendix I. The shallow BFI wells range from about 5-25' deep and the deeper wells about 30-78'. Wells generally contain 10' well screens to assess shallow and deeper overburden groundwater. The hydrogeologic conditions, as BEC understands them, are that precipitation will percolate the cap and migrate downslope in all directions after encountering the poly liner. Infiltrated precipitation would then migrate laterally down slope to surface water, existing retention basins, and shallow groundwater. The goal of the first phase of monitoring is to complete a "Baseline" round in the Summer of 2020 to assess current conditions in the select existing surface water points being monitored by BFI/Republic and four shallow wells

triangulated around the BFI landfill (MW-103, 106, 108, and 113) with well screens in the interval of 5-25'.

This will provide baseline conditions in shallow groundwater and surface water as a first receptor around the landfill. Baseline information already exists in the MLCRA wells. Sampling of the combined points would then continue in the MLCRA and BFI sampling points as part of the semi-annual monitoring in the Winter and Summer months to follow. Any exceedances to MCP GW-1 and 3 standards or conditions that may pose a risk to human or ecological receptors would be assessed at the time data is collected pursuant to Massachusetts Solid Waste Regulations, 310 CMR 19.000 and the Massachusetts Contingency Plan, 310 CMR 40.00, including the Adequately Regulated provisions at 310 CMR 40.0110 and 310 CMR 40.0114 where applicable.

If deemed necessary by BEC, additional wells may then be included in subsequent rounds to be approved by MassDEP through future amendments to the SRMP. This provision is included in the current and new ACO. To date, only a few minor metal exceedances to "GW-3" standards have been found in the MLCRA network not requiring additions assessment or wells.

1.3 Owner Agreements for Sampling

The owners of the respective properties have agreed to the components of this plan. "Baseline" monitoring data has been developed at the MLCRA area consistent with COMM-05-01 in Phases I and II. A "Baseline" testing program is required from select existing wells and surface water locations at the Halifax Landfill to compare to existing MLCRA data. Once the baseline testing is done at Halifax, expected in the Summer of 2020, the consolidated program will be continued semi-annually until 4 years following completion. Any modifications to the program, identified as data is collected will be submitted to MassDEP for approval as part of the established "Quarterly Construction Status Reports" that are being submitted by BEC. BFI/Republic will continue with their monitoring program under their existing permit

1.4 Current Groundwater Monitoring at MLCRA

MacDonald's LSP (BEC) has implemented a semi-annual groundwater monitoring program to monitor shallow groundwater quality and assess potential changes to environmental conditions at the MLCRA Site during and after Phase I-II Activities. A "Groundwater Monitoring Plan" was submitted to MassDEP in August 2018 by Mr. Mark Germano (Former LSP), along with semi-annual testing completed since that time. The plan was approved in April 2018. To date, no significant constituent detections have been noted that would alter this program (See Monthly and Quarterly Reports submitted to MassDEP under RTN 4-26987).

The parameters included in the approved MLCRA sampling are: Dissolved Massachusetts Contingency Plan (MCP) 14 metals, Dissolved PCBs, VOCs, 1,4 dioxane, Pesticides, Herbicides, TPH, SVOCs, pH, and Conductance. Testing will be conducted using method Reporting Limits (RLs) consistent with MCP Method 1 GW-1 standards or "Drinking Water Standards" and Compendium of Analytical Methods. Monitor wells included in the current program are MW-1, 2, 3, 4, and 5 shallow overburden wells shown on the map.

During purging with a peristaltic pump and flow through cell, depths to water, Temperature, Dissolved Oxygen (DO), Conductance, pH, Oxidation-Reduction Potential (ORP), and Turbidity readings are collected every 5 minutes. Readings are considered stable when three (3) consecutive readings were within the "Low Stress/ Low Flow" guidelines.

Well elevations and groundwater data are shown on Table 1 for all the Site wells. Based on groundwater elevation data obtained by BEC, flow in the MLCRA area is from the two upgradient wells MW-4 and 5 toward the southwest (MW-1,2, and 3). The latest round was completed in June 2020. Shallow groundwater flow for the entire Site is expected to be radially around it.

Table 2 depicts the results for the BEC sampling to date. When required by MassDEP and/or determined from monitoring results or other SRMP activity at the project location, MacDonald shall conduct an appropriate risk assessment and associated mitigation, if necessary, when any potential or adverse impact(s) have been identified as a result of project activities. To date, no adverse impacts have been noted to groundwater.

1.5 Current Groundwater Monitoring at Halifax Landfill

Environmental Sampling & Services, Inc. (ES&S), on behalf of Browning Ferris Industries (BFI) and Republic has submitted "Semi-annual Water Quality Monitoring Reports" to MassDEP in the Fall and Spring of each year for the past 25 years or so that summarize groundwater and surface water quality testing. The latest BFI/ES&S "Semi-annual Water Quality Monitoring Report" was submitted in May 2020 and is provided in Appendix B. The sampling is being conducted in accordance with 310 CMR 19.132 "Environmental Monitoring Requirements". Sampling procedures used are generally the same as those employed by BEC.

That program consists of 16 monitor wells (MW-101 through 116) positioned around the landfill as shown on the map. Surface water locations are SG -1, 2, and 3. The wells and water are sampled for: Dissolved 14 Metals (Methods 6010C, 6020A, 7470A), VOC, Chloride, Total Alkalinity, Total Cyanide, Nitrate, Chemical Oxygen Demand (COD), Sulfate, Total Dissolved Solids (TDS), Turbidity, pH, Conductance, plus field parameters (pH, Conductance, Turbidity, DO, and Temperature). The reports describe the sampling procedures, results, exceedances in narrative discussion and tabular summaries of data. Groundwater results are compared to MassDEP "Drinking Water Standards and Guidelines" (2016), specifically Massachusetts Maximum Contaminant Levels (MMCLs) and "Secondary Maximum Contaminant Levels" (SMCLs). According to ES&S these are designed for water which is delivered to any user of a public water system which are not directly applicable to groundwater or surface water at the Halifax Landfill. Groundwater levels are also collected. The groundwater flow interpreted by ES&S is generally toward the east around that landfill.

1.6 Combined Monitoring Program and Coordination

Under the combined Phase III program, BEC will add the three surface water sampling locations and BFI wells MW-103, 106, 108, and 113 to its MLCRA monitoring program. The first Baseline round will be conducted in the Summer of 2020. The rationale for these additions is to assess runoff which is being managed by MacDonald and shallow groundwater conditions around the landfill where the soil is being placed. The data will be evaluated by BEC and the current MLCRA wells and the new points around the landfill will be adjusted, if necessary, in follow-up semi-annual sampling.

1.7 Coordination and Reporting

BEC and ES&S will collaborate with respect to results and review of the respective programs in the event results indicate an unexpected outlier or condition of readily apparent harm to human or environmental receptors. Reports are submitted to regulating agencies as required under the appropriate permits or approvals and for public information purposes. Reports will be submitted under a new RTN that will be established by MassDEP for the Phase III program.

FIGURE

Proposed "Baseline" BFI Monitor Wells and Surface Water Sampling Points (Summer 2020)

MW-111 — REPUBLIC GROUNDWATER WELLS

MW-2 — MARILYN'S LANDING GROUNDWATER WELLS

MW-107 Well Destroyed

N/F MACDONALD INDUSTRIES, INC. MAP 40 PARCEL 11

BRIDGEWATER HALIFAX

N/F MACDONALD INDUSTRIES, INC. MAP 40 PARCEL 10

N/F MACDONALD INDUSTRIES, INC. MAP 40 PARCEL 9

WETLAND AREA

UPLAND AREA

N/F BFI MAP 77 PARCEL 1

2,178,209± SQ.FT. 50.00 ACRES

N/F BFI MAP 78 PARCEL 1

1,905,891± SQ.FT. 43.75 ACRES

LANDFILL ACCESS ROAD

INFILTRATION BASIN (BRUSH)

N/F BFI MAP 67 PARCEL 2

6' CHAIN LINK FENCE

LAUREL (FUTURE 80') STREET

PAVED DRIVEWAY

DENSE BRUSH

GAS FLARE

N/F BFI MAP 57 PARCEL 3

N/F BFI MAP 57 PARCEL 3F

N/F RICHARD V. GREELEY MAP 57 PARCEL 3E

N/F PS-1 REATLY TRUST MAP 57 PARCEL 3D

N/F DAVID J. FENTON JR., TRUSTEE MAP 57 PARCEL 3C

N/F DAVID J. FENTON JR., TRUSTEE MAP 57 PARCEL 3B

N/F BFI MAP 77 PARCEL 3

N/F BFI MAP 77 PARCEL 2

N/F BFI MAP 77 PARCEL 5

INFILTRATION BASIN

UTILITY POLES

DENSE BRUSH

N/F BOSTON EDISON COMPANY MAP 68 PARCEL 6

N/F BOSTON EDISON COMPANY MAP 68 PARCEL 10

N/F BOSTON EDISON COMPANY MAP 68 PARCEL 5

N/F BOSTON EDISON COMPANY MAP 68 PARCEL 4

N/F BFI MAP 68 PARCEL 8

N/F BOSTON EDISON COMPANY MAP 58 PARCEL 8

N/F BOSTON EDISON COMPANY MAP 68 PARCEL 7

N/F BOSTON EDISON COMPANY MAP 58 PARCEL 10

N/F BOSTON EDISON COMPANY MAP 58 PARCEL 9

N/F C.O. BOSWORTH JR. & D.O. BOSWORTH MAP 68 PARCEL 9

N/F BFI MAP 68 PARCEL 2

249,816± SQ.FT. 5.73 ACRES

UNNAMED STREAM

N/F ELAINE WILLIAMS MAP 58 PARCEL 14A

N/F SHAWN R. LEAHY MAP 58 PARCEL 14

N/F STEPHANIE M. CLANCY MAP 58 PARCEL 14B

N/F SHAWN R. LEAHY MAP 58 PARCEL 14C

EXISTING BUILDING (TYP.)

MW-101, MW-102, MW-103, MW-104, MW-105, MW-106, MW-108, MW-109, MW-110, MW-112, MW-113, MW-114, MW-115, MW-116

GMP-2, GMP-3, GMP-4, GMP-5, GMP-6, GMP-7

SG-1, SG-2, SG-3

SITEC ENVIRONMENTAL
Civil and Environmental Engineering
Land Use Planning and Surveying
Hazardous and Solid Waste Consultants

769 Plain Street, Unit C
Marshfield, MA 02050
PHONE (781) 319-0100
FAX (781) 834-4783

project: BFI HALIFAX – LAUREL STREET LANDFILL
HALIFAX, MASSACHUSETTS

client: BROWNING-FERRIS INDUSTRIES, INC. (MA)
1080 AIRPORT ROAD
FALL RIVER, MASSACHUSETTS

drawing title: GROUNDWATER MONITORING WELL LOCATIONS

scale: 1"=120'
date: MAY 22, 2019
drawn:
checked:
approved:
drawing number: S-1

No.	Date		Chkd.	Aprvd.

LEGEND

- SURVEYED PROPERTY LINE
- ASSESSORS LINE (APPROXIMATE)
- GMP-3 — GAS MONITORING PROBE
- MW-101 — GROUNDWATER MONITORING WELL
- SG-2 — SURFACE WATER MONITORING LOCATION
- BRUSH LINE
- TREELINE
- 80 — EXISTING CONTOUR
- 51.6 × — EXISTING SPOT GRADE
- CHAIN LINK FENCE
- UP • — UTILITY POLE
- 79 / 58.17 — SURVEY CONTROL POINT
- RIP RAP AREA

NOTES:

1. SURVEYED PROPERTY LINES SHOWN ON THIS DRAWING TAKEN FROM "PLAN OF LAND IN HALIFAX, MA SHOWNING PARCELS OF LAND OWNED B BROWNING-FERRIS INDUSTRIES, INC." PREPARED BY SAIC ENGINEERING, INC., DATED NOVEMBER 25, 1996.
2. TOPOGRAPHY AND OTHER PHYSICAL FEATURES SHOWN ON THIS DRAWING FROM AERIAL SURVEY PERFORMED BY COOPER AERIAL SURVEYS CO. OF PHOENIX, AZ ON OCTOBER 18, 2012.

TABLES

TABLE 1: BFI HALIFAX LANDFILL MARILYN'S LANDING WELL DATA

GROUNDWATER MONITORING WELL SURVEY DATA					
BFI Groundwater Wells	Ground Surface Elevation	Top of Outer Casing Elevation	Top of Inner PVC Elevation		
MW-101	56.54	58.97	58.55		
MW-102	56.47	58.67	58.61		
MW-103	56.65	59.87	59.83		
MW-104	57.27	60.17	60.1		
MW-105	53.31	55.96	55.9		
MW-106	54.53	56.65	56.77		
MW-108	62.93	63.72	63.81		
MW-109	52.26	54.08	54.17		
MW-110	52.02	54.62	54.68		
MW-111	64.92	67.15	67.11		
MW-112	65.82	67.84	67.91		
MW-113	76.06	78.33	78.32		
MW-114	76.25	78.2	78.28		
MW-115	63.37	64.02	64.18		
MW-116	53.45	56.08	56		
Marilyn's Landing Groundwater Wells	Ground Surface Elevation	Top of Outer Casing Elevation	Top of Inner PVC Elevation	Northing (Y)	Easting (X)
MW-1	53.93	53.72	53.11	361449.1812	762588.2036
MW-2	54.88	55	54.6	361168.3302	762763.8414
MW-3	55.81	55.51	55.11	360831.7354	762950.1228
MW-4	58.7	58.79	58.23	361450.7184	763067.2447
MW-5	60.21	60.3	59.85	361754.7358	763044.7672

Elevation Datum: NGVD 1929

TABLE 1 - GROUNDWATER MONITORING RESULTS
MARILYN'S LANDING COMMERCIAL REUSE AREA
946 PLYMOUTH STREET
BRIDGEWATER, MASSACHUSETTS
BEC JOB #18191

Parameter	Reportable Concentrations (RCs)	MCP - Method 1 Cleanup Standards			SAMPLING LOCATION																				
	RCGW-2	GW-2	GW-3	UCL	MW-1				MW-2				MW-3				MW-4				MW-5				
Sampling Date					1/10/2019	6/11/2019	1/16/2020	6/16/2020	1/10/2019	6/11 & 7/31/2019	1/16/2020	6/16/2020	1/10/2019	6/11 & 7/30/2019	1/16/2020	6/16/2020	1/10/2019	6/11 & 7/30/2019	1/16/2020	6/16/2020	1/10/2019	(FD)1/10/2019	6/18 & 7/31/2019	1/16/2020	6/16/2020
SW-846 6020B (µg/L) Metals Digestion																									
ANTIMONY	8000	~	8000	80000	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	1.3	1.7	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (0.35)	ND (1.0)	ND (1.0)
ARSENIC	900	~	900	9000	ND (0.40)	1.0	0.86	1.0	4.4	8.9	3.6	3.0	5.2	5.6	4.1	5.7	20	28	17	27	ND (0.40)	ND (0.40)	ND (0.64)	0.66	0.68
BARIUM	50000	~	50000	100000	15	21	15	11	60	72	49	33	36	36	24	26	150	140	130	170	52	53	41	26	44
BERYLLIUM	200	~	200	2000	0.73	1.0	0.36	0.29	ND (0.40)	ND (0.40)	ND (0.40)	ND (0.40)	ND (0.40)	ND (0.40)	ND (0.40)	0.093	ND (0.40)	ND (0.40)	ND (0.40)	ND (0.40)	ND (0.40)	ND (0.40)	ND (0.091)	ND (0.40)	ND (0.40)
CADMIUM	4	~	4	50	1.4	2.7	1.1	0.91	ND (0.50)	0.11	0.087	0.038	ND (0.50)	ND (0.20)	0.041	0.041	ND (0.50)	ND (0.20)	ND (0.20)	ND (0.20)	**53**	**52**	**6.8**	**16**	**13**
CHROMIUM	300	~	300	3000	ND (1.0)	0.81	0.43	ND (1.0)	ND (1.0)	0.90	0.68	ND (1.0)	1.8	2.0	0.54	1.1	1.1	1.1	0.38	1.1	1.4	1.7	1.3	0.82	1.1
LEAD	10	~	10	150	ND (1.0)	1.8	0.45	0.43	1.2	1.8	1.4	2.4	ND (5.0)	2.6	ND (0.50)	0.25	ND (1.0)	ND (0.50)	ND (0.50)	0.094	ND (1.0)	ND (1.0)	0.59	0.59	2.9
NICKEL	200	~	200	2000	34	23	9.1	6.5	5.9	3.4	3.2	2.5	9.6	4.9	5.3	4.7	ND (5.0)	2.4	2.9	3.2	**230**	**230**	12	35	11
SELENIUM	100	~	100	1000	ND (5.0)	6.7	2.9	2.7	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)	5.6	2.4	2.4	ND (5.0)	3.9	2.3	5.3	ND (5.0)	ND (5.0)	ND (1.6)	ND (5.0)	ND (5.0)
SILVER	7	~	7	1000	ND (0.50)	ND (0.20)	ND (0.20)	0.30	ND (0.50)	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.50)	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.50)	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.50)	ND (0.50)	ND (0.18)	ND (0.20)	ND (0.20)
THALLIUM	3000	~	3000	30000	ND (0.20)	0.23	0.12	0.11	ND (0.20)	0.073	0.061	0.035	ND (1.0)	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.20)	0.032	ND (0.20)	0.030
VANADIUM	4000	~	4000	40000	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)	2.4	1.5	ND (5.0)	ND (5.0)	2.9	1.5	ND (5.0)	ND (5.0)	2.1	2.1	ND (5.0)	ND (5.0)	ND (5.0)	ND (1.5)	ND (5.0)	ND (5.0)
ZINC	900	~	900	50000	33	81	28	27	300	280	260	120	54	4.9	11	26	56	7.7	85	9.7	**5300**	**6000**	210	760	220
SW-846 7470A (mg/L) Metals Digestion																									
MERCURY	0.02	~	0.02	0.2	ND (0.00010)	ND (0.00010)	0.000059	0.00017	ND (0.00010)	ND (0.00010)	0.000040	ND (0.00010)	ND (0.00010)	ND (0.00010)	0.000044	ND (0.00010)	ND (0.00010)	ND (0.00010)	0.000042	ND (0.00010)	ND (0.00010)	ND (0.00010)	0.00012	0.000040	ND (0.00010)
SW-846 8082A (µg/L)																									
PCB 1016	5	5	10	100	ND (0.32)	ND (0.32)	ND (0.30)	ND (0.16)	ND (0.32)	ND (0.31)	ND (0.30)	ND (0.15)	ND (0.32)	ND (0.31)	ND (0.30)	ND (0.15)	ND (0.32)	ND (0.33)	ND (0.30)	ND (0.14)	ND (0.32)	NT	ND (0.31)	ND (0.31)	ND (0.15)
PCB 1221	5	5	10	100	ND (0.32)	ND (0.32)	ND (0.30)	ND (0.16)	ND (0.32)	ND (0.31)	ND (0.30)	ND (0.15)	ND (0.32)	ND (0.31)	ND (0.30)	ND (0.15)	ND (0.32)	ND (0.33)	ND (0.30)	ND (0.14)	ND (0.32)	NT	ND (0.27)	ND (0.31)	ND (0.15)
PCB 1232	5	5	10	100	ND (0.32)	ND (0.32)	ND (0.30)	ND (0.16)	ND (0.32)	ND (0.31)	ND (0.30)	ND (0.15)	ND (0.32)	ND (0.31)	ND (0.30)	ND (0.15)	ND (0.32)	ND (0.33)	ND (0.30)	ND (0.14)	ND (0.32)	NT	ND (0.33)	ND (0.31)	ND (0.15)
PCB 1242	5	5	10	100	ND (0.32)	ND (0.32)	ND (0.30)	ND (0.16)	ND (0.32)	ND (0.31)	ND (0.30)	ND (0.15)	ND (0.32)	ND (0.31)	ND (0.30)	ND (0.15)	ND (0.32)	ND (0.33)	ND (0.30)	ND (0.14)	ND (0.32)	NT	ND (0.29)	ND (0.31)	ND (0.15)
PCB 1248	5	5	10	100	ND (0.32)	ND (0.32)	ND (0.30)	ND (0.16)	ND (0.32)	ND (0.31)	ND (0.30)	ND (0.15)	ND (0.32)	ND (0.31)	ND (0.30)	ND (0.15)	ND (0.32)	ND (0.33)	ND (0.30)	ND (0.14)	ND (0.32)	NT	ND (0.32)	ND (0.31)	ND (0.15)
PCB 1254	5	5	10	100	ND (0.32)	ND (0.32)	ND (0.30)	ND (0.16)	ND (0.32)	ND (0.31)	ND (0.30)	ND (0.15)	ND (0.32)	ND (0.31)	ND (0.30)	ND (0.15)	ND (0.32)	ND (0.33)	ND (0.30)	ND (0.14)	ND (0.32)	NT	ND (0.18)	ND (0.31)	ND (0.15)
PCB 1260	5	5	10	100	ND (0.32)	ND (0.32)	ND (0.30)	ND (0.16)	ND (0.32)	ND (0.31)	ND (0.30)	ND (0.15)	ND (0.32)	ND (0.31)	ND (0.30)	ND (0.15)	ND (0.32)	ND (0.33)	ND (0.30)	ND (0.14)	ND (0.32)	NT	ND (0.33)	ND (0.31)	ND (0.15)
PCB 1262	5	5	10	100	ND (0.32)	ND (0.32)	ND (0.30)	ND (0.16)	ND (0.32)	ND (0.31)	ND (0.30)	ND (0.15)	ND (0.32)	ND (0.31)	ND (0.30)	ND (0.15)	ND (0.32)	ND (0.33)	ND (0.30)	ND (0.14)	ND (0.32)	NT	ND (0.23)	ND (0.31)	ND (0.15)
PCB 1268	5	5	10	100	ND (0.32)	ND (0.32)	ND (0.30)	ND (0.16)	ND (0.32)	ND (0.31)	ND (0.30)	ND (0.15)	ND (0.32)	ND (0.31)	ND (0.30)	ND (0.15)	ND (0.32)	ND (0.33)	ND (0.30)	ND (0.14)	ND (0.32)	NT	ND (0.21)	ND (0.31)	ND (0.15)
SW-846 8260C (µg/L)																									
ACETONE	50000	50000	50000	100000	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (20)	4.2	ND (10)	ND (20)	ND (20)	11	ND (10)	8.6	ND (50)	ND (50)	ND (10)	NT	ND (3.8)	ND (10)	ND (10)
TERT-AMYL METHYL ETHER	~	~	~	~	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (1.0)	ND (0.50)	ND (0.50)	ND (1.0)	ND (1.0)	ND (1.0)	ND (0.50)	ND (1.0)	ND (2.5)	ND (2.5)	ND (0.50)	NT	ND (0.14)	ND (0.50)	ND (0.50)
BENZENE	1000	1000	10000	100000	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (2.0)	ND (1.0)	ND (1.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (1.0)	ND (2.0)	ND (5.0)	ND (5.0)	ND (1.0)	NT	ND (0.18)	ND (1.0)	ND (1.0)
BROMOBENZENE	10000	~	~	~	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (2.0)	ND (1.0)	ND (1.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (1.0)	ND (2.0)	ND (5.0)	ND (5.0)	ND (1.0)	NT	ND (0.15)	ND (1.0)	ND (1.0)
BROMOCHLOROMETHANE	~	~	~	~	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (2.0)	ND (1.0)	ND (1.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (1.0)	ND (2.0)	ND (5.0)	ND (5.0)	ND (1.0)	NT	ND (0.32)	ND (1.0)	ND (1.0)
BROMODICHLOROMETHANE	6	6	50000	100000	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (2.0)	ND (1.0)	ND (1.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (1.0)	ND (2.0)	ND (5.0) *	ND (5.0)	ND (1.0)	NT	ND (0.16)	ND (1.0)	ND (1.0)
BROMOFORM	700	700	50000	100000	ND (2.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (2.0)	ND (1.0)	ND (2.0)	ND (1.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (5.0) *	ND (5.0)	ND (2.0)	NT	ND (0.46)	ND (1.0)	ND (1.0)
BROMOMETHANE	7	7	800	8000	ND (2.0)	ND (2.0)	ND (2.0)	ND (5.0)	ND (2.0)	ND (2.0)	ND (4.0)	ND (5.0)	ND (2.0)	ND (4.0)	ND (4.0)	ND (10)	ND (2.0)	ND (4.0)	ND (10) *	ND (25)	ND (2.0)	NT	ND (0.78)	ND (2.0)	ND (5.0)
2-BUTANONE (MEK)	50000	50000	50000	100000	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (20)	ND (10)	ND (10)	ND (20)	ND (20)	ND (20)	ND (10)	ND (20)	ND (50)	ND (50)	ND (10)	NT	ND (1.9)	ND (10)	ND (10)
N-BUTYLBENZENE	~	~	~	~	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (2.0)	ND (1.0)	ND (1.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (1.0)	ND (2.0)	ND (5.0)	ND (5.0)	ND (1.0)	NT	ND (0.21)	ND (1.0)	ND (1.0)
SEC-BUTYLBENZENE	~	~	~	~	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (2.0)	ND (1.0)	ND (1.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (1.0)	ND (2.0)	ND (5.0)	ND (5.0)	ND (1.0)	NT	ND (0.16)	ND (1.0)	ND (1.0)
TERT-BUTYLBENZENE	10000	~	~	~	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (2.0)	ND (1.0)	ND (1.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (1.0)	ND (2.0)	ND (5.0)	ND (5.0)	ND (1.0)	NT	ND (0.17)	ND (1.0)	ND (1.0)
TERT-BUTYLETHYL ETHER	~	~	~	~	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (1.0)	ND (0.50)	ND (0.50)	ND (1.0)	ND (1.0)	ND (1.0)	ND (0.50)	ND (1.0)	ND (2.5)	ND (2.5)	ND (0.50)	NT	ND (0.16)	ND (0.50)	ND (0.50)
CARBON DISULFIDE	10000	~	~	~	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)	ND (10)	ND (5.0)	ND (5.0)	ND (10)	ND (10)	ND (10)	ND (5.0)	ND (10)	ND (25)	ND (25)	ND (5.0)	NT	ND (4.4)	ND (5.0)	ND (5.0)
CARBON TETRACHLORIDE	2	2	5000	50000	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (2.0)	ND (1.0)	ND (1.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (1.0)	ND (2.0)	ND (5.0) *	ND (5.0)	ND (1.0)	NT	ND (0.11)	ND (1.0)	ND (1.0)
CHLOROBENZENE	200	200	1000	10000	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (2.0)	ND (1.0)	ND (1.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (1.0)	ND (2.0)	ND (5.0)	ND (5.0)	ND (1.0)	NT	ND (0.15)	ND (1.0)	ND (1.0)
CHLORODIBROMOMETHANE	20	20	50000	~	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (1.0)	ND (0.50)	ND (0.50)	ND (1.0)	ND (1.0)	ND (1.0)	ND (0.50)	ND (1.0)	ND (2.5) *	ND (2.5)	ND (0.50)	NT	ND (0.21)	ND (0.50)	ND (0.50)
CHLOROETHANE	10000	~	~	~	ND (2.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (4.0)	ND (2.0)	ND (2.0)	ND (4.0)	ND (4.0)	ND (4.0)	ND (2.0)	ND (4.0)	ND (10)	ND (10)	ND (2.0)	NT	ND (0.35)	ND (2.0)	ND (2.0)
CHLOROFORM	50	50	20000	100000	ND (2.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (4.0)	ND (2.0)	ND (2.0)	ND (4.0)	ND (4.0)	ND (4.0)	ND (2.0)	ND (4.0)	ND (10)	ND (10)	ND (2.0)	NT	ND (0.17)	ND (2.0)	ND (2.0)
CHLOROMETHANE	10000	~	~	~	ND (2.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (4.0)	ND (2.0)	ND (2.0)	ND (4.0)	ND (4.0)	ND (4.0)	ND (2.0)	ND (4.0)	ND (10)	ND (10)	ND (2.0)	NT	ND (0.45)	ND (2.0)	ND (2.0)
2-CHLOROTOLUENE	10000	~	~	~	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (2.0)	ND (1.0)	ND (1.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (1.0)	ND (2.0)	ND (5.0)	ND (5.0)	ND (1.0)	NT	ND (0.12)	ND (1.0)	ND (1.0)
4-CHLOROTOLUENE	10000	~	~	~	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (2.0)	ND (1.0)	ND (1.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (1.0)	ND (2.0)	ND (5.0)	ND (5.0)	ND (1.0)	NT	ND (0.14)	ND (1.0)	ND (1.0)
1,2-DIBROMO-3-CHLOROPROPANE	1000	~	~	~	ND (2.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (4.0)	ND (2.0)	ND (2.0)	ND (4.0)	ND (4.0)	ND (4.0)	ND (2.0)	ND (4.0)	ND (10)	ND (10)	ND (2.0)	NT	ND (0.53)	ND (2.0)	ND (2.0)
1,2-DIBROMOETHANE (EDB)	2	2	50000	100000	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (1.0)	ND (0.50)	ND (0.50)	ND (1.0)	ND (1.0)	ND (1.0)	ND (0.50)	ND (1.0)	ND (2.5)	ND (2.5)	ND (0.50)	NT	ND (0.19)	ND (0.50)	ND (0.50)
DIBROMOMETHANE	50000	~	~	~	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (2.0)	ND (1.0)	ND (1.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (1.0)	ND (2.0)	ND (5.0)	ND (5.0)	ND (1.0)	NT	ND (0.37)	ND (1.0)	ND (1.0)
1,2-DICHLOROBENZENE	2000	8000	2000	80000	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (2.0)	ND (1.0)	ND (1.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (1.0)	ND (2.0)	ND (5.0)	ND (5.0)	ND (1.0)	NT	ND (0.16)	ND (1.0)	ND (1.0)
1,3-DICHLOROBENZENE	6000	6000	50000	100000	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (2.0)	ND (1.0)	ND (1.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (1.0)	ND (2.0)	ND (5.0)	ND (5.0)	ND (1.0)	NT	ND (0.12)	ND (1.0)	ND (1.0)
1,4-DICHLOROBENZENE	60	60	8000	80000	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (2.0)	ND (1.0)	ND (1.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (1.0)	ND (2.0)	ND (5.0)	ND (5.0)	ND (1.0)	NT	ND (0.13)	ND (1.0)	ND (1.0)
DICHLORODIFLUOROMETHANE	100000	~	~	~	ND (2.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (4.0)	ND (2.0)	ND (2.0)	ND (4.0)	ND (4.0)	ND (4.0)	ND (2.0)	ND (4.0)	ND (10)	ND (10)	ND (2.0)	NT	ND (0.26)	ND (2.0)	ND (2.0)
1,1-DICHLOROETHANE	2000	2000	20000	100000	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (2.0)	ND (1.0)	ND (1.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (1.0)	ND (2.0)	ND (5.0)	ND (5.0)	ND (1.0)	NT	ND (0.16)	ND (1.0)	ND (1.0)
1,2-DICHLOROETHANE	5	5	20000	100000	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (2.0)	ND (1.0)	ND (1.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (1.0)	ND (2.0)	ND (5.0)	ND (5.0)	ND (1.0)	NT	ND (0.41)	ND (1.0)	ND (1.0)
1,1-DICHLOROETHYLENE	80	80	30000	100000	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (2.0)	ND (1.0)	ND (1.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (1.0)	ND (2.0)	ND (5.0)	ND (5.0)	ND (1.0)	NT	ND (0.32)	ND (1.0)	ND (1.0)
CIS-1,2-DICHLOROETHYLENE	20	20	50000	100000	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (2.0)	ND (1.0)	ND (1.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (1.0)	ND (2.0)	ND (5.0)	ND (5.0)	ND (1.0)	NT	ND (0.13)	ND (1.0)	ND (1.0)
TRANS-1,2-DICHLOROETHYLENE	80	80	50000	100000	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (2.0)	ND (1.0)	ND (1.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (1.0)	ND (2.0)	ND (5.0)	ND (5.0)	ND (1.0)	NT	ND (0.31)	ND (1.0)	ND (1.0)
1,2-DICHLOROPROPANE	3	3	50000	100000	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (2.0)	ND (1.0)	ND (1.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (1.0)	ND (2.0)	ND (5.0) *	ND (5.0)	ND (1.0)	NT	ND (0.20)	ND (1.0)	ND (1.0)
1,3-DICHLOROPROPANE	50000	~	~	~	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (1.0)	ND (0.50)	ND (0.50)	ND (1.0)	ND (1.0)	ND (1.0)	ND (0.50)	ND (1.0)	ND (2.5)	ND (2.5)	ND (0.50)	NT	ND (0.11)	ND (0.50)	ND (0.50)
2,2-DICHLOROPROPANE	9	~	~	~	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (2.0)	ND (1.0)	ND (1.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (1.0)	ND (2.0)	ND (5.0)	ND (5.0)	ND (1.0)	NT	ND (0.20)	ND (1.0)	ND (1.0)
1,1-DICHLOROPROPENE	5	~	~	~	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (1.0)	ND (0.50)	ND (0.50)	ND (1.0)	ND (1.0)	ND (1.0)	ND (0.50)	ND (1.0)	ND (2.5)	ND (2.5)	ND (0.50)	NT	ND (0.16)	ND (0.50)	ND (0.50)
CIS-1,3-DICHLOROPROPENE	5	10	200	2000	ND (0.40)	ND (0.40)	ND (0.40)	ND (0.40)	ND (0.40)	ND (0.40)	ND (0.80)	ND (0.40)	ND (0.40)	ND (0.80)	ND (0.80)	ND (0.80)	ND (0.40)	ND (0.80)	ND (2.0)	ND (2.0)	ND (0.40)	NT	ND (0.13)	ND (0.40)	ND (0.40)
TRANS-1,3-DICHLOROPROPENE	5	10	200	2000	ND (0.40)	ND (0.40)	ND (0.40)	ND (0.40)	ND (0.40)	ND (0.40)	ND (0.80)	ND (0.40)	ND (0.40)	ND (0.80)	ND (0.80)	ND (0.80)	ND (0.40)	ND (0.80)	ND (2.0)	ND (2.0)	ND (0.40)	NT	ND (0.23)	ND (0.40)	ND (0.40)
DIETHYL ETHER	10000	~	~	~	ND (2.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (4.0)	ND (2.0)	ND (2.0)	ND (4.0)	ND (4.0)	ND (4.0)	ND (2.0)	ND (4.0)	ND (10)	ND (10)	ND (2.0)	NT	ND (0.34)	ND (2.0)	ND (2.0)
DIISOPROPYL ETHER	10000	~	~	~	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (1.0)	ND (0.50)	ND (0.50)	ND (1.0)	ND (1.0)	ND (1.0)	ND (0.50)	ND (1.0)	ND (2.5)	ND (2.5)	ND (0.50)	NT	ND (0.17)	ND (0.50)	ND (0.50)
1,4-DIOXANE [6]	6000	6000	50000	100000	ND (50)	ND (50)	ND (50)	ND (50)	ND (50)	ND (50)	ND (100)	ND (50)	ND (50)	ND (100)	ND (100)	ND (100)	ND (50)	ND (100)	ND (250)	ND (250)	ND (50)	NT	ND (22)	ND (50)	ND (50)
ETHYLBENZENE	5000	20000	5000	100000	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (2.0)	ND (1.0)	ND (1.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (1.0)	ND (2.0)	ND (5.0)	ND (5.0)	ND (1.0)	NT	ND (0.13)	ND (1.0)	ND (1.0)
HEXACHLOROBUTADIENE	50	50	3000	30000	ND (0.60)	ND (0.60)	ND (0.60)	ND (0.60)	ND (0.60)	ND (0.60)	ND (1.2)	ND (0.60)	ND (0.60)	ND (1.2)	ND (1.2)	ND (1.2)	ND (0.60)	ND (1.2)	ND (3.0)	ND (3.0)	ND (0.60)	NT	ND (0.47)	ND (0.60)	ND (0.60)
2-HEXANONE	10000	~	~	~	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (20)	ND (10)	ND (10)	ND (20)	ND (20)	ND (20)	ND (10)	ND (20)	ND (50)	ND (50)	ND (10)	NT	ND (1.5)	ND (10)	ND (10)
ISOPROPYLBENZENE	100000	~	~	~	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (2.0)	ND (1.0)	ND (1.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (1.0)	ND (2.0)	ND (5.0)	ND (5.0)	ND (1.0)	NT	ND (0.17)	ND (1.0)	ND (1.0)
P-ISOPROPYLTOLUENE	10000	~	~	~	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (2.0)	ND (1.0)	ND (1.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (1.0)	ND (2.0)	ND (5.0)	ND (5.0)	ND (1.0)	NT	ND (0.20)	ND (1.0)	ND (1.0)
METHYL TERT-BUTYL ETHER (MTBE)	5000	50000	50000	100000	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (2.0)	ND (1.0)	ND (1.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (1.0)	ND (2.0)	ND (5.0)	ND (5.0)	ND (1.0)	NT	ND (0.25)	ND (1.0)	ND (1.0)
METHYLENE CHLORIDE	10000	2000	50000	100000	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)	ND (10)	ND (5.0)	ND (5.0)	ND (10)	ND (10)	ND (10)	ND (5.0)	ND (10)	ND (25)	ND (25)	ND (5.0)	NT	ND (0.34)	ND (5.0)	ND (5.0)
4-METHYL-2-PENTANONE (MIBK)	50000	50000	50000	100000	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (20)	ND (10)	ND (10)	ND (20)	ND (20)	ND (20)	ND (10)	ND (20)	ND (50)	ND (50)	ND (10)	NT	ND (1.7)	ND (10)	ND (10)
NAPHTHALENE	700	700	20000	100000	ND (2.0)	ND (5.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (5.0)	ND (4.0)	ND (2.0)	ND (2.0)	ND (10)	ND (4.0)	ND (4.0)	ND (2.0)	ND (10)	ND (10)	ND (10)	ND (2.0)	NT	ND (0.31)	ND (2.0)	ND (2.0)
N-PROPYLBENZENE	10000	~	~	~	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (2.0)	ND (1.0)	ND (1.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (1.0)	ND (2.0)	ND (5.0)	ND (5.0)	ND (1.0)	NT	ND (0.13)	ND (1.0)	ND (1.0)
STYRENE	100	100	6000	60000	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (2.0)	ND (1.0)	ND (1.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (1.0)	ND (2.0)	ND (5.0)	ND (5.0)	ND (1.0)	NT	ND (0.11)	ND (1.0)	ND (1.0)
1,1,1,2-TETRACHLOROETHANE	10	10	50000	100000	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (2.0)	ND (1.0)	ND (1.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (1.0)	ND (2.0)	ND (5.0)	ND (5.0)	ND (1.0)	NT	ND (0.27)	ND (1.0)	ND (1.0)
1,1,2,2-TETRACHLOROETHANE	9	9	50000	100000	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (1.0)	ND (0.50)	ND (0.50)	ND (1.0)	ND (1.0)	ND (1.0)	ND (0.50)	ND (1.0)	ND (2.5)	ND (2.5)	ND (0.50)	NT	ND (0.22)	ND (0.50)	ND (0.50)
TETRACHLOROETHYLENE	50	50	30000	100000	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (2.0)	ND (1.0)	ND (1.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (1.0)	ND (2.0)	ND (5.0)	ND (5.0)	ND (1.0)	NT	ND (0.18)	ND (1.0)	ND (1.0)
TETRAHYDROFURAN	50000	~	~	~	ND (2.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (4.0)	ND (2.0)	ND (2.0)	ND (4.0)	ND (4.0)	ND (4.0)	ND (2.0)	ND (4.0)	ND (10)	ND (10)	ND (2.0)	NT	ND (0.51)	ND (2.0)	ND (2.0)
TOLUENE	40000	50000	40000	100000	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (2.0)	ND (1.0)	ND (1.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (1.0)	ND (2.0)	ND (5.0)	ND (5.0)	ND (1.0)	NT	ND (0.14)	ND (1.0)	ND (1.0)
1,2,3-TRICHLOROBENZENE	~	~	~	~	ND (2.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (4.0)	ND (2.0)	ND (2.0)	ND (4.0)	ND (4.0)	ND (4.0)	ND (2.0)	ND (4.0)	ND (10)	ND (10)	ND (2.0)	NT	ND (0.57)	ND (2.0)	ND (2.0)
1,2,4-TRICHLOROBENZENE	200	200	50000	100000	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (2.0)	ND (1.0)	ND (1.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (1.0)	ND (2.0)	ND (5.0)	ND (5.0)	ND (1.0)	NT	ND (0.40)	ND (1.0)	ND (1.0)
1,1,1-TRICHLOROETHANE	4000	4000	20000	100000	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (2.0)	ND (1.0)	ND (1.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (1.0)	ND (2.0)	ND (5.0)	ND (5.0)	ND (1.0)	NT	ND (0.20)	ND (1.0)	ND (1.0)
1,1,2-TRICHLOROETHANE	900	900	50000	100000	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (2.0)	ND (1.0)	ND (1.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (1.0)	ND (2.0)	ND (5.0)	ND (5.0)	ND (1.0)	NT	ND (0.16)	ND (1.0)	ND (1.0)
TRICHLOROETHYLENE	5	5	5000	50000	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (2.0)	ND (1.0)	ND (1.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (1.0)	ND (2.0)	ND (5.0)	ND (5.0)	ND (1.0)	NT	ND (0.24)	ND (1.0)	ND (1.0)
TRICHLOROFLUOROMETHANE	100000	~	~	~	ND (2.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (4.0)	ND (2.0)	ND (2.0)	ND (4.0)	ND (4.0)	ND (4.0)	ND (2.0)	ND (4.0)	ND (10)	ND (10)	ND (2.0)	NT	ND (0.33)	ND (2.0)	ND (2.0)
1,2,3-TRICHLOROPROPANE	10000	~	~	~	ND (2.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (4.0)	ND (2.0)	ND (2.0)	ND (4.0)	ND (4.0)	ND (4.0)	ND (2.0)	ND (4.0)	ND (10)	ND (10)	ND (2.0)	NT	ND (0.25)	ND (2.0)	ND (2.0)
1,2,4-TRIMETHYLBENZENE	100000	~	~	~	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (2.0)	ND (1.0)	ND (1.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (1.0)	ND (2.0)	ND (5.0)	ND (5.0)	ND (1.0)	NT	ND (0.18)	ND (1.0)	ND (1.0)
1,3,5-TRIMETHYLBENZENE	1000	~	~	~	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (2.0)	ND (1.0)	ND (1.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (1.0)	ND (2.0)	ND (5.0)	ND (5.0)	ND (1.0)	NT	ND (0.14)	ND (1.0)	ND (1.0)
VINYL CHLORIDE	2	2	50000	100000	ND (2.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (4.0) *	ND (2.0)	ND (2.0)	ND (4.0) *	ND (4.0) *	ND (4.0)	ND (2.0)	ND (4.0) *	ND (10) *	ND (10)	ND (2.0)	NT	ND (0.45)	ND (2.0)	ND (2.0)
M/P-XYLENE	3000	3000	5000	100000	ND (2.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (4.0)	ND (2.0)	ND (2.0)	ND (4.0)	ND (4.0)	ND (4.0)	ND (2.0)	ND (4.0)	ND (10)	ND (10)	ND (2.0)	NT	ND (0.30)	ND (2.0)	ND (2.0)
O-XYLENE	3000	3000	5000	100000	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (2.0)	ND (1.0)	ND (1.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (1.0)	ND (2.0)	ND (5.0)	ND (5.0)	ND (1.0)	NT	ND (0.17)	ND (1.0)	ND (1.0)
SW-846 8270D (µg/L)																									
1,4 DIOXANE	6000				NA	ND (0.20)	ND (0.20)	ND (0.21)	NA	ND (0.20)	ND (0.20)	ND (0.19)	NA	ND (0.20)	ND (0.20)	ND (0.21)	NA	ND (0.20)	ND (0.20)	ND (0.21)	NA	NT	ND (0.034)	ND (0.20)	ND (0.20)
SM21-22 2510B (µmhos/cm)																									
SPECIFIC CONDUCTANCE	~	~	~	~	NS*	NS**	2600	1100	NS*	2000	2100	1500	NS*	4200	3500	3000	NS*	3300	3100	3100	NS*	NS*	680	910	2000
SM21-22 4500 H B (pH Units)																									
PH	~	~	~	~	NS*	NS**	5.1	7.0	NS*	6.2	6.3	6.5	NS*	5.9	6.1	5.9	NS*	6.3	6.5	6.5	NS*	NS*	7.3	7	5.2
SW-846 8081B (µg/L)																									
ALDRIN	2	2	30	300	NS*	NS**	ND (0.074)	ND (0.016)	NS*	ND (0.052)	ND (0.074)	ND (0.015)	NS*	ND (0.062)	ND (0.077)	ND (0.015)	NS*	ND (0.059)	ND (0.074)	ND (0.014)	NS*	NS*	ND (0.052)	ND (0.077)	ND (0.015)
ALPHA-BHC	5000	~	~	~	NS*	NS**	ND (0.074)	ND (0.080)	NS*	ND (0.052)	ND (0.074)	ND (0.077)	NS*	ND (0.062)	ND (0.077)	ND (0.074)	NS*	ND (0.059)	ND (0.074)	ND (0.069)	NS*	NS*	ND (0.052)	ND (0.077)	ND (0.077)
BETA-BHC	1000	~	~	~	NS*	NS**	ND (0.074)	ND (0.080)	NS*	ND (0.052)	ND (0.074)	ND (0.077)	NS*	ND (0.062)	ND (0.077)	ND (0.074)	NS*	ND (0.059)	ND (0.074)	ND (0.069)	NS*	NS*	ND (0.052)	ND (0.077)	ND (0.077)
DELTA-BHC	1000	~	~	~	NS*	NS**	ND (0.074)	ND (0.080)	NS*	ND (0.052)	ND (0.074)	ND (0.077)	NS*	ND (0.062)	ND (0.077)	ND (0.074)	NS*	ND (0.059)	ND (0.074)	ND (0.069)	NS*	NS*	ND (0.052)	ND (0.077)	ND (0.077)
GAMMA-BHC (LINDANE)	4	200	4	~	NS*	NS**	ND (0.044)	ND (0.016)	NS*	ND (0.031)	ND (0.044)	ND (0.015)	NS*	ND (0.037)	ND (0.046)	ND (0.015)	NS*	ND (0.035)	ND (0.044)	ND (0.014)	NS*	NS*	ND (0.031)	ND (0.046)	ND (0.015)
CHLORDANE	2	~	2	20	NS*	NS**	ND (0.30)	ND (0.16)	NS*	ND (0.21)	ND (0.30)	ND (0.15)	NS*	ND (0.25)	ND (0.31)	ND (0.15)	NS*	ND (0.24)	ND (0.30)	ND (0.14)	NS*	NS*	ND (0.21)	ND (0.31)	ND (0.15)
4,4'-DDD	50	~	50	500	NS*	NS**	ND (0.059)	ND (0.016)	NS*	ND (0.042)	ND (0.059)	ND (0.015)	NS*	ND (0.049)	ND (0.062)	ND (0.015)	NS*	ND (0.047)	ND (0.059)	ND (0.014)	NS*	NS*	ND (0.042)	ND (0.062)	ND (0.015)
4,4'-DDE	400	~	400	4000	NS*	NS**	ND (0.059)	ND (0.016)	NS*	ND (0.042)	ND (0.059)	ND (0.015)	NS*	ND (0.049)	ND (0.062)	ND (0.015)	NS*	ND (0.047)	ND (0.059)	ND (0.014)	NS*	NS*	ND (0.042)	ND (0.062)	ND (0.015)
4,4'-DDT	1	~	1	10	NS*	NS**	ND (0.059)	ND (0.016)	NS*	ND (0.042)	ND (0.059)	ND (0.015)	NS*	ND (0.049)	ND (0.062)	ND (0.015)	NS*	ND (0.047)	ND (0.059)	ND (0.014)	NS*	NS*	ND (0.042)	ND (0.062)	ND (0.015)
DIELDRIN	0.5	8	0.5	80	NS*	NS**	ND (0.0030)	ND (0.0016)	NS*	ND (0.0021)	ND (0.0030)	ND (0.0015)	NS*	ND (0.0025)	ND (0.0031)	ND (0.0015)	NS*	ND (0.0024)	ND (0.0030)	ND (0.0014)	NS*	NS*	ND (0.0021)	ND (0.0031)	ND (0.0015)
ENDOSULFAN I	2	~	2	100	NS*	NS**	ND (0.074)	ND (0.080)	NS*	ND (0.052)	ND (0.074)	ND (0.077)	NS*	ND (0.062)	ND (0.077)	ND (0.074)	NS*	ND (0.059)	ND (0.074)	ND (0.069)	NS*	NS*	ND (0.052)	ND (0.077)	ND (0.077)
ENDOSULFAN II	2	~	2	100	NS*	NS**	ND (0.12)	ND (0.080)	NS*	ND (0.083)	ND (0.12)	ND (0.077)	NS*	ND (0.099)	ND (0.12)	ND (0.074)	NS*	ND (0.094)	ND (0.12)	ND (0.069)	NS*	NS*	ND (0.083)	ND (0.12)	ND (0.077)
ENDOSULFAN SULFATE	~	~	~	~	NS*	NS**	ND (0.12)	ND (0.080)	NS*	ND (0.083)	ND (0.12)	ND (0.077)	NS*	ND (0.099)	ND (0.12)	ND (0.074)	NS*	ND (0.094)	ND (0.12)	ND (0.069)	NS*	NS*	ND (0.083)	ND (0.12)	ND (0.077)
ENDRIN	5	~	5	50	NS*	NS**	ND (0.12)	ND (0.080)	NS*	ND (0.083)	ND (0.12)	ND (0.077)	NS*	ND (0.099)	ND (0.12)	ND (0.074)	NS*	ND (0.094)	ND (0.12)	ND (0.069)	NS*	NS*	ND (0.083)	ND (0.12)	ND (0.077)
ENDRIN KETONE	~	~	~	~	NS*	NS**	ND (0.12)	ND (0.080)	NS*	ND (0.083)	ND (0.12)	ND (0.077)	NS*	ND (0.099)	ND (0.12)	ND (0.074)	NS*	ND (0.094)	ND (0.12)	ND (0.069)	NS*	NS*	ND (0.083)	ND (0.12)	ND (0.077)
HEPTACHLOR	1	2	1	20	NS*	NS**	ND (0.074)	ND (0.016)	NS*	ND (0.052)	ND (0.074)	ND (0.015)	NS*	ND (0.062)	ND (0.077)	ND (0.015)	NS*	ND (0.059)	ND (0.074)	ND (0.014)	NS*	NS*	ND (0.052)	ND (0.077)	ND (0.015)
HEPTACHLOR EPOXIDE	2	7	2	70	NS*	NS**	ND (0.074)	ND (0.016)	NS*	ND (0.052)	ND (0.074)	ND (0.015)	NS*	ND (0.062)	ND (0.077)	ND (0.015)	NS*	ND (0.059)	ND (0.074)	ND (0.014)	NS*	NS*	ND (0.052)	ND (0.077)	ND (0.015)
HEXACHLOROBENZENE	1	1	6000	60000	NS*	NS**	ND (0.074)	ND (0.064)	NS*	ND (0.052)	ND (0.074)	ND (0.062)	NS*	ND (0.062)	ND (0.077)	ND (0.059)	NS*	ND (0.059)	ND (0.074)	ND (0.055)	NS*	NS*	ND (0.052)	ND (0.077)	ND (0.062)
METHOXYCHLOR	10	~	10	400	NS*	NS**	ND (0.74)	ND (0.32)	NS*	ND (0.52)	ND (0.74)	ND (0.31)	NS*	ND (0.62)	ND (0.77)	ND (0.30)	NS*	ND (0.59)	ND (0.74)	ND (0.28)	NS*	NS*	ND (0.52)	ND (0.77)	ND (0.31)
TOXAPHENE	1000	~	~	~	NS*	NS**	ND (1.5)	NT	NS*	ND ()	ND (1.5)	NT	NS*	ND ()	ND (1.5)	NT	NS*	ND ()	ND (1.5)	NT	NS*	NS*	ND ()	ND (1.5)	NT
SW-846 8100 Modified (mg/L)																									
TPH	5	5	5	50	NS*	NS**	0.29	ND (0.20)	NS*	0.49	0.29	0.22	NS*	0.66	0.22	0.23	NS*	0.92	0.53	0.61	NS*	NS*	0.25	0.18	ND (0.20)
SW-846 8151A (µg/L)																									
2,4-D	10000	~	~	~	NS*	NS**	ND (0.49)	ND (0.50)	NS*	ND (0.50)	ND (0.49)	ND (0.54)	NS*	ND (0.50)	ND (0.49)	ND (0.54)	NS*	ND (0.50)	ND (0.49)	ND (0.48)	NS*	NS*	ND (0.50)	ND (0.49)	ND (0.52)
2,4-DB	10000	~	~	~	NS*	NS**	ND (0.49)	ND (0.50)	NS*	ND (0.50)	ND (0.49)	ND (0.54)	NS*	ND (0.50)	ND (0.49)	ND (0.54)	NS*	ND (0.50)	ND (0.49)	ND (0.48)	NS*	NS*	ND (0.50)	ND (0.49)	ND (0.52)
2,4,5-TP (SILVEX)	10000	~	~	~	NS*	NS**	ND (0.049)	ND (0.050)	NS*	ND (0.050)	ND (0.049)	ND (0.054)	NS*	ND (0.050)	ND (0.049)	ND (0.054)	NS*	ND (0.050)	ND (0.049)	ND (0.048)	NS*	NS*	ND (0.050)	ND (0.049)	ND (0.052)
2,4,5-T	10000	~	~	~	NS*	NS**	ND (0.098)	ND (0.10)	NS*	ND (0.10)	ND (0.098)	ND (0.11)	NS*	ND (0.10)	ND (0.097)	ND (0.11)	NS*	ND (0.10)	ND (0.098)	ND (0.096)	NS*	NS*	ND (0.10)	ND (0.097)	ND (0.10)
DALAPON	~	~	~	~	NS*	NS**	ND (1.2)	ND (1.2)	NS*	ND (1.2)	ND (1.2)	ND (1.3)	NS*	ND (1.2)	ND (1.2)	ND (1.3)	NS*	0.35	ND (1.2)	ND (1.2)	NS*	NS*	ND (1.2)	ND (1.2)	ND (1.3)
DICAMBA	50000	~	~	~	NS*	NS**	ND (0.049)	ND (0.050)	NS*	ND (0.050)	ND (0.049)	ND (0.054)	NS*	ND (0.050)	ND (0.049)	ND (0.054)	NS*	ND (0.050)	ND (0.049)	ND (0.048)	NS*	NS*	ND (0.050)	ND (0.049)	ND (0.052)
DICHLOROPROP	~	~	~	~	NS*	NS**	ND (0.49)	ND (0.50)	NS*	ND (0.50)	ND (0.49)	ND (0.54)	NS*	ND (0.50)	ND (0.49)	ND (0.54)	NS*	ND (0.50)	ND (0.49)	ND (0.48)	NS*	NS*	ND (0.50)	ND (0.49)	ND (0.52)
DINOSEB	50000	~	~	~	NS*	NS**	ND (0.25)	ND (0.25)	NS*	ND (0.25)	ND (0.25)	ND (0.27)	NS*	ND (0.25)	ND (0.24)	ND (0.27)	NS*	ND (0.25)	ND (0.25)	ND (0.26)	NS*	NS*	ND (0.25)	ND (0.24)	ND (0.26)
MCPA	10000	~	~	~	NS*	NS**	ND (49)	ND (50)	NS*	ND (50)	ND (49)	ND (54)	NS*	ND (50)	ND (49)	ND (54)	NS*	ND (50)	ND (49)	ND (52)	NS*	NS*	ND (50)	ND (49)	ND (52)
MCPP	~	~	~	~	NS*	NS**	ND (49)	ND (50)	NS*	ND (50)	ND (49)	ND (54)	NS*	ND (50)	ND (49)	ND (54)	NS*	ND (50)	ND (49)	ND (48)	NS*	NS*	ND (50)	ND (49)	ND (52)
SW-846 8270D (µg/L)																									
ACENAPHTHENE	6000	~	10000	100000	NS*	NS**	ND (10)	ND (0.30)	NS*	ND (5.0)	ND (10)	ND (0.31)	NS*	ND (5.4)	ND (9.9)	ND (0.29)	NS*	ND (5.4)	ND (10)	ND (0.29)	NS*	NS*	ND (5.0)	ND (9.9)	ND (0.31)
ACENAPHTHYLENE	40	10000	40	100000	NS*	NS**	ND (5.0)	ND (0.20)	NS*	ND (5.0)	ND (5.0)	ND (0.20)	NS*	ND (5.4)	ND (5.0)	ND (0.20)	NS*	ND (5.4)	ND (5.0)	ND (0.19)	NS*	NS*	ND (5.0)	ND (5.0)	ND (0.21)
ACETOPHENONE	100000	~	~	~	NS*	NS**	ND (10)	ND (10)	NS*	ND (10)	ND (10)	ND (10)	NS*	ND (11)	ND (9.9)	ND (9.8)	NS*	ND (11)	ND (10)	ND (9.6)	NS*	NS*	ND (9.9)	ND (9.9)	ND (10)
ANILINE	100000	~	~	~	NS*	NS**	ND (10)	ND (5.1)	NS*	ND (5.0)	ND (10)	ND (5.1)	NS*	ND (5.4)	ND (9.9)	ND (4.9)	NS*	ND (5.4)	ND (10)	ND (4.8)	NS*	NS*	ND (5.0)	ND (9.9)	ND (5.2)
ANTHRACENE	30	~	30	600	NS*	NS**	ND (10)	ND (0.20)	NS*	ND (5.0)	ND (10)	ND (0.20)	NS*	ND (5.4)	ND (9.9)	ND (0.20)	NS*	ND (5.4)	ND (10)	0.053	NS*	NS*	ND (5.0)	ND (9.9)	0.033
BENZO(A)ANTHRACENE	1000	~	1000	10000	NS*	NS**	ND (2.0)	ND (0.051)	NS*	ND (5.0) *	ND (2.0)	ND (0.051)	NS*	ND (5.4) *	ND (2.0)	ND (0.049)	NS*	ND (5.4) *	ND (2.0)	ND (0.048)	NS*	NS*	ND (5.0) *	ND (2.0)	ND (0.052)
BENZO(A)PYRENE	500	~	500	5000	NS*	NS**	ND (10)	ND (0.10)	NS*	ND (5.0) *	ND (10)	ND (0.10)	NS*	ND (5.4) *	ND (9.9)	ND (0.098)	NS*	ND (5.4) *	ND (10)	ND (0.096)	NS*	NS*	ND (5.0) *	0.13	ND (0.10)
BENZO(B)FLUORANTHENE	400	~	400	4000	NS*	NS**	ND (10)	ND (0.051)	NS*	ND (5.0) *	ND (10)	ND (0.051)	NS*	ND (5.4) *	ND (9.9)	ND (0.049)	NS*	ND (5.4) *	ND (10)	ND (0.048)	NS*	NS*	ND (5.0) *	0.02	ND (0.052)
BENZO(G,H,I)PERYLENE	20	~	20	500	NS*	NS**	ND (10)	ND (0.51)	NS*	ND (5.0)	ND (10)	ND (0.51)	NS*	ND (5.4)	ND (9.9)	ND (0.49)	NS*	ND (5.4)	ND (10)	ND (0.48)	NS*	NS*	ND (5.0)	ND (9.9)	ND (0.52)
BENZO(K)FLUORANTHENE	100	~	100	1000	NS*	NS**	ND (10)	ND (0.20)	NS*	ND (5.0) *	ND (10)	ND (0.20)	NS*	ND (5.4) *	ND (9.9)	ND (0.20)	NS*	ND (5.4) *	ND (10)	ND (0.19)	NS*	NS*	ND (5.0) *	ND (9.9)	ND (0.21)
BIS(2-CHLOROETHOXY)METHANE	50000	~	~	~	NS*	NS**	ND (10)	ND (10)	NS*	ND (10)	ND (10)	ND (10)	NS*	ND (11)	ND (9.9)	ND (9.8)	NS*	ND (11)	ND (10)	ND (9.6)	NS*	NS*	ND (9.9)	ND (9.9)	ND (10)
BIS(2-CHLOROETHYL)ETHER	30	30	50000	100000	NS*	NS**	ND (5.0)	ND (10)	NS*	ND (10)	ND (5.0)	ND (10)	NS*	ND (11)	ND (5.0)	ND (9.8)	NS*	ND (11)	ND (5.0)	ND (9.6)	NS*	NS*	ND (9.9)	ND (5.0)	ND (10)
BIS(2-CHLOROISOPROPYL)ETHER	100	100	50000	100000	NS*	NS**	ND (10)	ND (10)	NS*	ND (10)	ND (10)	ND (10)	NS*	ND (11)	ND (9.9)	ND (9.8)	NS*	ND (11)	ND (10)	ND (9.6)	NS*	NS*	ND (9.9)	ND (9.9)	ND (10)
BIS(2-ETHYLHEXYL)PHTHALATE	50000	~	50000	100000	NS*	NS**	ND (5.0)	ND (2.0)	NS*	ND (10) *	ND (5.0)	ND (2.0)	NS*	ND (11) *	ND (5.0)	ND (2.0)	NS*	ND (11) *	ND (5.0)	ND (1.9)	NS*	NS*	ND (9.9) *	ND (5.0)	ND (2.1)
4-BROMOPHENYL PHENYL ETHER	10000	~	~	~	NS*	NS**	ND (5.0)	ND (10)	NS*	ND (10)	ND (5.0)	ND (10)	NS*	ND (11)	ND (5.0)	ND (9.8)	NS*	ND (11)	ND (5.0)	ND (9.6)	NS*	NS*	ND (9.9)	ND (5.0)	ND (10)
BUTYLBENZYLPHTHALATE	10000	~	~	~	NS*	NS**	ND (5.0)	ND (10)	NS*	ND (10)	ND (5.0)	ND (10)	NS*	ND (11)	ND (5.0)	ND (9.8)	NS*	ND (11)	ND (5.0)	ND (9.6)	NS*	NS*	ND (9.9)	ND (5.0)	ND (10)
4-CHLOROANILINE	300	30000	300	100000	NS*	NS**	ND (10)	ND (10)	NS*	ND (10)	ND (10)	ND (10)	NS*	ND (11)	ND (9.9)	ND (9.8)	NS*	ND (11)	ND (10)	ND (9.6)	NS*	NS*	ND (9.9)	ND (9.9)	ND (10)
2-CHLORONAPHTHALENE	100000	~	~	~	NS*	NS**	ND (10)	ND (10)	NS*	ND (10)	ND (10)	ND (10)	NS*	ND (11)	ND (9.9)	ND (9.8)	NS*	ND (11)	ND (10)	ND (9.6)	NS*	NS*	ND (9.9)	ND (9.9)	ND (10)
2-CHLOROPHENOL	7000	20000	7000	100000	NS*	NS**	ND (10)	ND (10)	NS*	ND (10)	ND (10)	ND (10)	NS*	ND (11) *	ND (9.9)	ND (9.8)	NS*	ND (11) *	ND (10)	ND (9.6)	NS*	NS*	ND (9.9)	ND (9.9)	ND (10)
CHRYSENE	70	~	70	700	NS*	NS**	ND (10)	ND (0.20)	NS*	ND (5.0) *	ND (10)	ND (0.20)	NS*	ND (5.4) *	ND (9.9)	ND (0.20)	NS*	ND (5.4) *	ND (10)	ND (0.19)	NS*	NS*	ND (5.0) *	ND (9.9)	ND (0.21)
DIBENZ(A,H)ANTHRACENE	40	~	40	400	NS*	NS**	ND (10)	ND (0.10)	NS*	ND (5.0) *	ND (10)	ND (0.10)	NS*	ND (5.4) *	ND (9.9)	ND (0.098)	NS*	ND (5.4) *	ND (10)	ND (0.096)	NS*	NS*	ND (5.0) *	ND (9.9)	ND (0.10)
DIBENZOFURAN	10000	~	~	~	NS*	NS**	ND (10)	ND (5.1)	NS*	ND (5.0)	ND (10)	ND (5.1)	NS*	ND (5.4)	ND (9.9)	ND (4.9)	NS*	ND (5.4)	ND (10)	ND (4.8)	NS*	NS*	ND (5.0)	ND (9.9)	ND (5.2)
DI-N-BUTYLPHTHALATE	5000	~	~	~	NS*	NS**	ND (10)	ND (10)	NS*	ND (10)	ND (10)	ND (10)	NS*	ND (11)	ND (9.9)	ND (9.8)	NS*	ND (11)	ND (10)	ND (9.6)	NS*	NS*	ND (9.9)	ND (9.9)	ND (10)
1,2-DICHLOROBENZENE	2000	8000	2000	80000	NS*	NS**	ND (10)	ND (5.1)	NS*	ND (5.0)	ND (10)	ND (5.1)	NS*	ND (5.4)	ND (9.9)	ND (4.9)	NS*	ND (5.4)	ND (10)	ND (4.8)	NS*	NS*	ND (5.0)	ND (9.9)	ND (5.2)
1,3-DICHLOROBENZENE	6000	6000	50000	100000	NS*	NS**	ND (10)	ND (5.1)	NS*	ND (5.0)	ND (10)	ND (5.1)	NS*	ND (5.4)	ND (9.9)	ND (4.9)	NS*	ND (5.4)	ND (10)	ND (4.8)	NS*	NS*	ND (5.0)	ND (9.9)	ND (5.2)
1,4-DICHLOROBENZENE	60	60	8000	80000	NS*	NS**	ND (10)	ND (5.1)	NS*	ND (5.0)	ND (10)	ND (5.1)	NS*	ND (5.4) *	ND (9.9)	ND (4.9)	NS*	ND (5.4) *	ND (10)	ND (4.8)	NS*	NS*	ND (5.0)	ND (9.9)	ND (5.2)
3,3'-DICHLOROBENZIDINE	2000	~	2000	20000	NS*	NS**	ND (2.0)	ND (10)	NS*	ND (10)	ND (2.0)	ND (10)	NS*	ND (11)	ND (2.0)	ND (9.8)	NS*	ND (11)	ND (2.0)	ND (9.6)	NS*	NS*	ND (9.9)	ND (2.0)	ND (10)
2,4-DICHLOROPHENOL	2000	30000	2000	100000	NS*	NS**	ND (10)	ND (10)	NS*	ND (10)	ND (10)	ND (10)	NS*	ND (11)	ND (9.9)	ND (9.8)	NS*	ND (11) *	ND (10)	ND (9.6)	NS*	NS*	ND (9.9)	ND (9.9)	ND (10)
DIETHYLPHTHALATE	9000	50000	9000	100000	NS*	NS**	ND (2.0)	ND (10)	NS*	ND (10)	ND (2.0)	ND (10)	NS*	ND (11)	ND (2.0)	ND (9.8)	NS*	ND (11)	ND (2.0)	ND (9.6)	NS*	NS*	ND (9.9)	ND (2.0)	ND (10)
2,4-DIMETHYLPHENOL	40000	40000	50000	100000	NS*	NS**	ND (10)	ND (10)	NS*	ND (10)	ND (10)	ND (10)	NS*	ND (11)	ND (9.9)	ND (9.8)	NS*	ND (11)	ND (10)	ND (9.6)	NS*	NS*	ND (9.9)	ND (9.9)	ND (10)
DIMETHYLPHTHALATE	50000	50000	50000	100000	NS*	NS**	ND (10)	ND (10)	NS*	ND (10)	ND (10)	ND (10)	NS*	ND (11)	ND (9.9)	ND (9.8)	NS*	ND (11)	ND (10)	ND (9.6)	NS*	NS*	ND (9.9)	ND (9.9)	ND (10)
2,4-DINITROPHENOL	20000	50000	20000	100000	NS*	NS**	ND (10)	ND (10)	NS*	ND (10)	ND (10)	ND (10)	NS*	ND (11)	ND (9.9)	ND (9.8)	NS*	ND (11)	ND (10)	ND (9.6)	NS*	NS*	ND (9.9)	ND (9.9)	ND (10)
2,4-DINITROTOLUENE	20000	20000	50000	100000	NS*	NS**	ND (10)	ND (10)	NS*	ND (10)	ND (10)	ND (10)	NS*	ND (11)	ND (9.9)	ND (9.8)	NS*	ND (11)	ND (10)	ND (9.6)	NS*	NS*	ND (9.9)	ND (9.9)	ND (10)
2,6-DINITROTOLUENE	10000	~	~	~	NS*	NS**	ND (10)	ND (10)	NS*	ND (10)	ND (10)	ND (10)	NS*	ND (11)	ND (9.9)	ND (9.8)	NS*	ND (11)	ND (10)	ND (9.6)	NS*	NS*	ND (9.9)	ND (9.9)	ND (10)
DI-N-OCTYLPHTHALATE	100000	~	~	~	NS*	NS**	ND (10)	ND (10)	NS*	ND (10)	ND (10)	ND (10)	NS*	ND (11)	ND (9.9)	ND (9.8)	NS*	ND (11)	ND (10)	ND (9.6)	NS*	NS*	ND (9.9)	ND (9.9)	ND (10)
1,2-DIPHENYLHYDRAZINE (AZOBENZENE)	5000	~	~	~	NS*	NS**	ND (10)	ND (10)	NS*	ND (10)	ND (10)	ND (10)	NS*	ND (11)	ND (9.9)	ND (9.8)	NS*	ND (11)	ND (10)	ND (9.6)	NS*	NS*	ND (9.9)	ND (9.9)	ND (10)
FLUORANTHENE	200	~	200	2000	NS*	NS**	ND (10)	ND (0.51)	NS*	ND (5.0)	ND (10)	ND (0.51)	NS*	ND (5.4)	ND (9.9)	ND (0.49)	NS*	ND (5.4)	ND (10)	ND (0.48)	NS*	NS*	ND (5.0)	ND (9.9)	ND (0.52)
FLUORENE	40	~	40	400	NS*	NS**	ND (5.0)	ND (1.0)	NS*	ND (5.0)	ND (5.0)	ND (1.0)	NS*	ND (5.4)	ND (5.0)	ND (0.98)	NS*	ND (5.4)	ND (5.0)	ND (0.96)	NS*	NS*	ND (5.0)	ND (5.0)	ND (1.0)
HEXACHLOROBENZENE	1	1	6000	60000	NS*	NS**	ND (5.0)	ND (2.0)	NS*	ND (10) *	ND (5.0)	ND (2.0)	NS*	ND (11) *	ND (5.0)	ND (2.0)	NS*	ND (11) *	ND (5.0)	ND (1.9)	NS*	NS*	ND (9.9) *	ND (5.0)	ND (2.1)
HEXACHLOROBUTADIENE	50	50	3000	30000	NS*	NS**	ND (10)	ND (2.0)	NS*	ND (10)	ND (10)	ND (2.0)	NS*	ND (11) *	ND (9.9)	ND (2.0)	NS*	ND (11) *	ND (10)	ND (1.9)	NS*	NS*	ND (9.9) *	ND (9.9)	ND (2.1)
HEXACHLOROETHANE	100	100	50000	100000	NS*	NS**	ND (10)	ND (2.0)	NS*	ND (10)	ND (10)	ND (2.0)	NS*	ND (11) *	ND (9.9)	ND (2.0)	NS*	ND (11) *	ND (10)	ND (1.9)	NS*	NS*	ND (9.9) *	ND (9.9)	ND (2.1)
INDENO(1,2,3-CD)PYRENE	100	~	100	1000	NS*	NS**	ND (10)	ND (0.10)	NS*	ND (5.0)	ND (10)	ND (0.10)	NS*	ND (5.4) *	ND (10)	ND (0.098)	NS*	ND (5.4) *	ND (10)	ND (0.096)	NS*	NS*	ND (5.0) *	ND (5.0)	ND (0.10)
ISOPHORONE	10000	~	~	~	NS*	NS**	ND (10)	ND (10)	NS*	ND (10)	ND (10)	ND (10)	NS*	ND (11)	ND (10)	ND (9.8)	NS*	ND (11)	ND (10)	ND (9.6)	NS*	NS*	ND (9.9)	ND (9.9)	ND (10)
2-METHYLNAPHTHALENE	2000	2000	20000	100000	NS*	NS**	ND (10)	ND (1.0)	NS*	ND (5.0)	ND (10)	ND (1.0)	NS*	ND (5.4)	ND (10)	ND (0.98)	NS*	ND (5.4)	ND (10)	ND (0.96)	NS*	NS*	ND (5.0)	ND (5.0)	ND (1.0)
O-CRESOL	50000	~	~	~	NS*	NS**	ND (10)	ND (10)	NS*	ND (10)	ND (10)	ND (10)	NS*	ND (11)	ND (10)	ND (9.8)	NS*	ND (11)	ND (10)	ND (9.6)	NS*	NS*	ND (9.9)	ND (9.9)	ND (10)
M/P-CRESOL	50000	~	~	~	NS*	NS**	ND (10)	ND (10)	NS*	ND (10)	ND (10)	ND (10)	NS*	ND (11)	ND (10)	ND (9.8)	NS*	ND (11)	ND (10)	ND (9.6)	NS*	NS*	ND (9.9)	ND (9.9)	ND (10)
NAPHTHALENE	700	700	20000	100000	NS*	NS**	ND (10)	ND (1.0)	NS*	ND (5.0)	ND (10)	ND (1.0)	NS*	ND (5.4)	ND (10)	ND (0.98)	NS*	ND (5.4)	ND (10)	ND (0.96)	NS*	NS*	ND (5.0)	ND (5.0)	ND (1.0)
NITROBENZENE	50000	~	~	~	NS*	NS**	ND (10)	ND (10)	NS*	ND (10)	ND (10)	ND (10)	NS*	ND (11)	ND (10)	ND (9.8)	NS*	ND (11)	ND (10)	ND (9.6)	NS*	NS*	ND (9.9)	ND (9.9)	ND (10)
2-NITROPHENOL	10000	~	~	~	NS*	NS**	ND (10)	ND (10)	NS*	ND (10)	ND (10)	ND (10)	NS*	ND (11)	ND (10)	ND (9.8)	NS*	ND (11)	ND (10)	ND (9.6)	NS*	NS*	ND (9.9)	ND (9.9)	ND (10)
4-NITROPHENOL	10000	~	~	~	NS*	NS**	ND (10)	ND (10)	NS*	ND (10)	ND (10)	ND (10)	NS*	ND (11)	ND (10)	ND (9.8)	NS*	ND (11)	ND (10)	ND (9.6)	NS*	NS*	ND (9.9)	ND (9.9)	ND (10)
PENTACHLOROPHENOL	200	~	200	2000	NS*	NS**	ND (10)	ND (10)	NS*	ND (10) *	ND (10)	ND (10)	NS*	ND (11) *	ND (10)	ND (9.8)	NS*	ND (11) *	ND (10)	ND (9.6)	NS*	NS*	ND (9.9) *	ND (9.9)	ND (10)
PHENANTHRENE	10000	~	10000	100000	NS*	NS**	ND (10)	ND (0.051)	NS*	ND (5.0)	ND (10)	ND (0.051)	NS*	ND (5.4)	ND (10)	ND (0.049)	NS*	ND (5.4)	ND (10)	ND (0.048)	NS*	NS*	ND (5.0)	ND (5.0)	ND (0.052)
PHENOL	2000	50000	2000	100000	NS*	NS**	ND (10)	ND (10)	NS*	ND (10)	ND (10)	ND (10)	NS*	ND (11)	ND (10)	ND (9.8)	NS*	ND (11)	ND (10)	ND (9.6)	NS*	NS*	ND (9.9)	ND (9.9)	ND (10)
PYRENE	20	~	20	600	NS*	NS**	ND (10)	ND (1.0)	NS*	ND (5.0)	ND (10)	ND (1.0)	NS*	ND (5.4)	ND (10)	ND (0.98)	NS*	ND (5.4)	ND (10)	ND (0.96)	NS*	NS*	ND (5.0)	ND (5.0)	ND (1.0)
PYRIDINE	50000	~	~	~	NS*	NS**	ND (10)	ND (5.1)	NS*	ND (5.0)	ND (10)	ND (5.1)	NS*	ND (5.4)	ND (10)	ND (4.9)	NS*	ND (5.4)	ND (10)	ND (4.8)	NS*	NS*	ND (5.0)	ND (5.0)	ND (5.2)
1,2,4-TRICHLOROBENZENE	200	200	50000	100000	NS*	NS**	ND (10)	ND (5.1)	NS*	ND (5.0)	ND (10)	ND (5.1)	NS*	ND (5.4)	ND (10)	ND (4.9)	NS*	ND (5.4)	ND (10)	ND (4.8)	NS*	NS*	ND (5.0)	ND (5.0)	ND (5.2)
2,4,5-TRICHLOROPHENOL	3000	50000	3000	100000	NS*	NS**	ND (10)	ND (10)	NS*	ND (10)	ND (10)	ND (10)	NS*	ND (11)	ND (10)	ND (9.8)	NS*	ND (11)	ND (10)	ND (9.6)	NS*	NS*	ND (9.9)	ND (9.9)	ND (10)
2,4,6-TRICHLOROPHENOL	500	5000	500	50000	NS*	NS**	ND (10)	ND (10)	NS*	ND (10)	ND (10)	ND (10)	NS*	ND (11) *	ND (10)	ND (9.8)	NS*	ND (11) *	ND (10)	ND (9.6)	NS*	NS*	ND (9.9)	ND (9.9)	ND (10)

Notes:
1. An asterisk (*) following a detection limit indicates that the minimum laboratory reporting limit exceeds one or more of the regulatory criteria.
2. ND = Not detected above the lab reporting limits shown in parenthesis.
3. NT = Not tested.
4. ~ = No Method 1 Standard or UCL available
5. Green shaded bold values exceed the MCP Reportable Concentrations (RCs).
6. * Well Sampled Full parameters Dec 2018 (not needed Jan 2019).
7. ** Well not sampled in July 2019 (Covered)
8. (FD) - Field Duplicate

BOSTON ENVIRONMENTAL CORPORATION

APPENDIX A

ENVIRONMENTAL SAMPLING & SERVICES, INC.
7183 BALLA DRIVE
NORTH TONAWANDA, NEW YORK 14120
(716) 628-7581

May 26, 2020

Mr. Mark Dakers
Massachusetts Department
of Environmental Protection
Southeast Region
20 Riverside Drive
Lakeville, MA 02347

RE: BFI SANITARY LANDFILL
HALIFAX, MASSACHUSETTS

Dear Mr. Dakers:

Enclosed, please find the Spring 2020, Monitoring Report for the Halifax Landfill for samples taken April 6-7, 2020 by EST Associates and analyzed by Test America Laboratories, Amherst, New York.

Pursuant to the requirements of the Solid Waste Management Facility Regulations, section 19.132(1) – Environmental Monitoring Requirements, we are hereby making notification that the results of this sampling round indicate that the concentrations of several parameters tested exceed federal (MCL) and state (MMCL) drinking water standards.

For your review, the attached report has been prepared which summarizes the monitoring wells and surface water locations at which the exceedances are reported, the specific parameters exceeded, the analytical results, and the corresponding MCLs and MMCLs. Also included is a site map showing the location of the wells and the flow of the groundwater.

If you have any questions or require additional information, please contact Chris Ford at (508) 786-7022 or myself at (716) 628-7581.

Sincerely,

Robert Chiodo
President

Enclosures

File: 1HA.B.10/1HA.D.2

CC: Board of Health Members, Town of Halifax
Chris Ford – Republic Services (2 copies)

SEMI-ANNUAL WATER QUALITY MONITORING REPORT

BFI – HALIFAX SANITARY LANDFILL

SPRING 2020

MAY 2020

PREPARED BY:

ENVIRONMENTAL SAMPLING & SERVICES, INC.
7183 BALLA DRIVE
NORTH TONAWANDA, NEW YORK 14120

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

1.0 INTRODUCTION

This report was prepared by Environmental Sampling & Services, Inc. (ES&S) for Browning-Ferris Industries, Inc. (BFI) to evaluate and characterize groundwater and surface water quality at the Halifax Sanitary Landfill (the landfill) as represented by samples collected in April, 2020. Monitoring well MW-107 was abandoned as a result of construction on the off-site property that this well was located. Surface water location SG-1 was also located in this area. Both locations are no longer monitored as part of the current program.

The BFI Halifax Sanitary Landfill is located off Plymouth Street (Route 106) in Halifax, Massachusetts (see Figure 1, Site Locus Map). The landfill is bordered by wetlands and Marilyn's Landing impacted soil disposal facility to the west, undeveloped land to the south, a Boston Edison power transmission easement, cranberry bogs, and residential properties to the east, and Route 106 and cranberry bogs to the north. The property consists of approximately 70 acres, of which 44.5 acres have been landfilled.

In accordance with the requirements of 310 CMR 19.132, Environmental Monitoring Requirements, Browning-Ferris Industries has implemented an environmental monitoring program at the Halifax landfill. This program involves monitoring of groundwater and surface water. The program conforms to the sampling schedules contained in the regulations and provides for chemical and physical analysis in addition to the minimum required parameters. This report includes a summary of water quality at each well, a tabulation of the analytical data for the last 9 events and a listing of Drinking Water Standard Exceedances.

The groundwater monitoring program consists of sixteen (16) monitoring wells (MW-101 through MW-116) positioned around the periphery of the landfill. Wells MW-101 through MW-115 are overburden wells and well MW-116 is a well screened in the bedrock There are also three (3) separate surface water locations (SW-1, SW-2 and SW-3) around the property. The locations of the monitoring wells are shown on Figure 3. The surface water locations are shown on Figure 3.

Groundwater contours, shown on Figure 3, were drawn according to static water levels in the landfill monitoring wells recorded prior to sampling the wells and listed on Figure 2. Groundwater contours are based on water levels from nine (9) of the fourteen (14) overburden monitoring wells with screens spanning the water table. As indicated on the groundwater contour map, flow is generally to the east at the site and is consistent with previous events.

2.0 GROUNDWATER QUALITY DATA SUMMARY

2.1 Sampling Procedures

EST Associates visited the Halifax landfill and sampled groundwater from the fifteen (15) monitoring wells and two (2) surface water sampling locations on April 6-7, 2020. The samples were analyzed for the organic and inorganic parameters specified in 310 CMR 19.132, Environmental Monitoring Requirements by Test America Laboratories. Standard BFI sampling

procedures were used throughout the sampling event. A brief description of these procedures is provided below and is also described in the attached field report from EST Associates.

Equipment used for field analytical work was calibrated before sampling. Prior to sampling, the static groundwater level and depth of each well was measured using an electronic water level indicator. This information was used to calculate the volume of standing water in the well and the volume of water to be purged. Specific conductance, pH, temperature, turbidity and dissolved oxygen were measured after the sampling of a groundwater well or surface water location.

The wells were purged of three well volumes with purge pumps with dedicated tubing. Water levels were allowed to stabilize prior to collecting the samples. The samples were collected with dedicated bailers and transferred directly to the sample containers and appropriately preserved. The samples were packed in ice for shipment to the laboratory.

One field blank and one trip blank were prepared during the sampling event. The field blank was submitted for the complete suite of analyses and the trip blank was analyzed for volatiles only. The samples were transported under chain of custody to Test America Laboratories; a Massachusetts certified laboratory, in Amherst, New York.

2.2 Sampling Results

A brief description of water quality is presented below for each monitoring well. The Massachusetts Department of Environmental Protection (DEP) revised the Massachusetts Drinking Water Standards and Guidelines in the Spring of 2016. Revised maximum contaminant levels for drinking water (MCLs) promulgated by the U.S. Environmental Protection Agency (EPA) became effective in Nov. 1992 and Jan. 1994.

Massachusetts Maximum Contaminant Levels (MMCLs) are maximum permissible levels of a contaminant in water, which is delivered to any user of a public water system, and thus are not directly applicable to groundwater or surface water at the Halifax Landfill. The MMCLs are health based standards. The Secondary Maximum Contaminant Levels (SMCLs) are designed to regulate the aesthetic parameters of public drinking water supplies. The Massachusetts Office of Research and Standards Guidelines (ORSG) offers recommended allowable concentrations for parameters without MMCLs or SMCLs. Table 1 lists the Drinking Water Standard Exceedances from the April 2020 event for groundwater wells and surface water locations.

In addition to reporting parameter concentrations at or above the practical quantitation limits (PQL), the analytical laboratory reported the concentrations of analytes detected between the PQL and the method detection limit (MDL). These concentrations are denoted with a "J," which was defined in the laboratory report as "probable presence below listed detection limit." "J" values reported by the laboratory are indicated in the tables and text of this report in the same fashion.

A summary of the last nine sampling events is provided in Table 2 for groundwater wells and in Table 3 for surface water.

Downgradient wells are located generally east of the landfill and include MW-101, MW-102, MW-103, MW-104, MW-105, MW-109 and MW-110. Data from the upgradient wells indicate that the background water contains levels of iron and manganese, which are generally higher than limits recommended by the EPA for aesthetic purposes. The upgradient water quality is similar to waters derived from glacial outwash material in Southeastern Massachusetts.

Monitoring Well 101 (Downgradient)

The pH (5.32) was below the SMCL range of 6.5-8.5. The turbidity (8.49 NTU) was above the SMCL (5 NTU). No other inorganic parameters exceeded drinking water standards or guidelines.

These exceedances are consistent with the previous 8 sampling events.

There were no VOCs detected during this monitoring period at well MW-101. This is consistent with historical VOC data.

Monitoring Well 102 (Downgradient)

The turbidity (42.6 NTU) was above the SMCL (5 NTU). The concentration of arsenic (0.13 mg/l) exceeded the MMCL (0.01 mg/l). Iron and manganese (47 mg/l and 0.98 mg/l, respectively) were detected in excess of the SMCLs (0.3 mg/l and 0.05 mg/l, respectively). No other inorganic parameters exceeded drinking water standards or guidelines.

These exceedances are consistent with the previous 8 sampling events.

1,4-Dichlorobenzene (1.5 ug/l, limit 5 ug/l) was detected at a level below its drinking water standard. No other VOCs were detected during this monitoring period. This is consistent with historical VOC data.

Monitoring Well 103 (Downgradient)

The pH (5.41) was below the SMCL range of 6.5-8.5. The turbidity (7.91 NTU) was above the SMCL (5 NTU). Iron and manganese (24 mg/l and 2.7 mg/l, respectively) were detected in excess of the SMCLs (0.3 mg/l and 0.05 mg/l, respectively). No other inorganic parameters exceeded drinking water standards or guidelines.

There were no VOCs detected during this monitoring period at well MW-103. This is consistent with historical VOC data.

Monitoring Well 104 (Downgradient)

The concentration of arsenic (0.089 mg/l) exceeded the MMCL (0.01 mg/l). Iron and manganese (78 mg/l and 3.1 mg/l, respectively) were detected in excess of the SMCLs (0.3 mg/l and 0.05 mg/l, respectively). No other inorganic parameters exceeded drinking water standards or guidelines.

1,4-Dichlorobenzene (1.6 ug/l, limit 5 ug/l) was detected at a level below its drinking water standard. No other VOCs were detected during this monitoring period. This is consistent with historical VOC data.

Monitoring Well 105 (Downgradient)

The pH (4.72) was below the SMCL range of 6.5-8.5. Manganese (0.14 mg/l) was detected in excess of the SMCL (0.05 mg/l). No other inorganic parameters exceeded drinking water standards or guidelines.

These exceedances are consistent with the previous 8 sampling events.

There were no VOCs detected during this monitoring period at well MW-105. This is consistent with historical VOC data.

Monitoring Well 106

The pH (4.62) was below the SMCL range of 6.5-8.5. Iron (0.61 mg/l) was detected in excess of the SMCL (0.3 mg/l). No other inorganic parameters exceeded drinking water standards or guidelines.

These exceedances are consistent with the previous 8 sampling events.

There were no VOCs detected during this monitoring period at well MW-106. This is consistent with historical VOC data.

Monitoring Well 107

Monitoring well MW-107 was abandoned as a result of construction on the off-site property that this well was located. This location is no longer monitored as part of the current program.

Monitoring Well 108

The pH (5.38) was below the SMCL range of 6.5-8.5. No other inorganic parameters exceeded drinking water standards or guidelines.

These exceedances are consistent with the previous 8 sampling events.

There were no VOCs detected during this monitoring period at well MW-108. This is consistent with historical VOC data.

Monitoring Well 109 (Downgradient)

The pH (5.30) was below the SMCL range of 6.5-8.5. The turbidity (5.01 NTU) was above the SMCL (5 NTU). No other inorganic parameters exceeded drinking water standards or guidelines.

These exceedances are consistent with the previous 8 sampling events.

There were no VOCs detected during this monitoring period at well MW-109. This is consistent with historical VOC data.

Monitoring Well 110 (Downgradient)

The pH (6.02) was below the SMCL range of 6.5-8.5. The turbidity (11.3 NTU) was above the SMCL (5 NTU). Manganese (0.51 mg/l) was detected in excess of the SMCL (0.05 mg/l). No other inorganic parameters exceeded drinking water standards or guidelines.

These exceedances are consistent with the previous 8 sampling events.

There were no VOCs detected during this monitoring period at well MW-110. This is consistent with historical VOC data.

Monitoring Well 111

The pH (5.36) was below the SMCL range of 6.5-8.5. The turbidity (10.2 NTU) was above the SMCL (5 NTU). No other inorganic parameters exceeded drinking water standards or guidelines.

These exceedances are consistent with the previous 8 sampling events.

There were no VOCs detected during this monitoring period at well MW-111. This is consistent with historical VOC data.

Monitoring Well 112

The pH (5.70) was below the SMCL range of 6.5-8.5. The turbidity (7.11 NTU) was above the SMCL (5 NTU). No other inorganic parameters exceeded drinking water standards or guidelines.

These exceedances are consistent with the previous 8 sampling events.

There were no VOCs detected during this monitoring period at well MW-112. This is consistent with historical VOC data.

Monitoring Well 113

The pH (5.37) was below the SMCL range of 6.5-8.5. No other inorganic parameters exceeded drinking water standards or guidelines.

These exceedances are consistent with the previous 8 sampling events.

There were no VOCs detected during this monitoring period at well MW-113. This is consistent with historical VOC data.

Monitoring Well 114

The pH (5.68) was below the SMCL range of 6.5-8.5. The turbidity (6.47 NTU) was above the SMCL (5 NTU). Iron and manganese (11 mg/l and 0.11 mg/l, respectively) were detected in excess of the SMCLs (0.3 mg/l and 0.05 mg/l, respectively). No other inorganic parameters exceeded drinking water standards or guidelines.

These exceedances are consistent with the previous 8 sampling events.

There were no VOCs detected during this monitoring period at well MW-114. This is consistent with historical VOC data.

Monitoring Well 115

The pH (6.16) was below the SMCL range of 6.5-8.5. The turbidity (5.81 NTU) was above the SMCL (5 NTU). No other inorganic parameters exceeded drinking water standards or guidelines.

These exceedances are consistent with the previous 8 sampling events.

There were no VOCs detected during this monitoring period at well MW-115. This is consistent with historical VOC data.

Monitoring Well 116

The pH (6.34) was below the SMCL range of 6.5-8.5. Iron and manganese (4.0 mg/l and 2.5 mg/l, respectively) were detected in excess of the SMCLs (0.3 mg/l and 0.05 mg/l, respectively). No other inorganic parameters exceeded drinking water standards or guidelines.

No other inorganic parameters exceeded drinking water standards or guidelines.

These exceedances are consistent with the previous 8 sampling events.

Ethyl ether (2.2 ug/l, no limit) and 1,1-Dichloroethane (1.6 ug/l, limit 70 ug/l) were detected at levels below their drinking water standards. No other VOCs were detected during this monitoring period. This is consistent with historical VOC data.

3.0 SURFACE WATER QUALITY DATA SUMMARY

Surface water sampling locations around the site include, SG-1, SG-2 and SG-3. Summary tables are included in Table 3.

Surface Water SG-1

Surface water location SG-1 was removed from monitoring as part of the current program due to construction in the area off-site where this was located.

Surface Water SG-2

The pH (5.81) was below the SMCL range of 6.5-8.5. Iron (0.83 mg/l) was detected in excess of the SMCL (0.3 mg/l).

No other inorganic parameters exceeded drinking water standards or guidelines.

These exceedances are consistent with the previous 8 sampling events.

There were no VOCs detected during this monitoring period at SG-2. This is consistent with historical VOC data.

Surface Water SG-3

The pH (5.74) was below the SMCL range of 6.5-8.5. The turbidity (5.98 NTU) was above the SMCL (5 NTU). Iron (0.80 mg/l) was detected in excess of the SMCL (0.3 mg/l).

No other inorganic parameters exceeded drinking water standards or guidelines.

These exceedances are consistent with the previous 8 sampling events.

There were no VOCs detected during this monitoring period at well SG-3. This is consistent with historical VOC data.

FIGURES

FIGURE 1

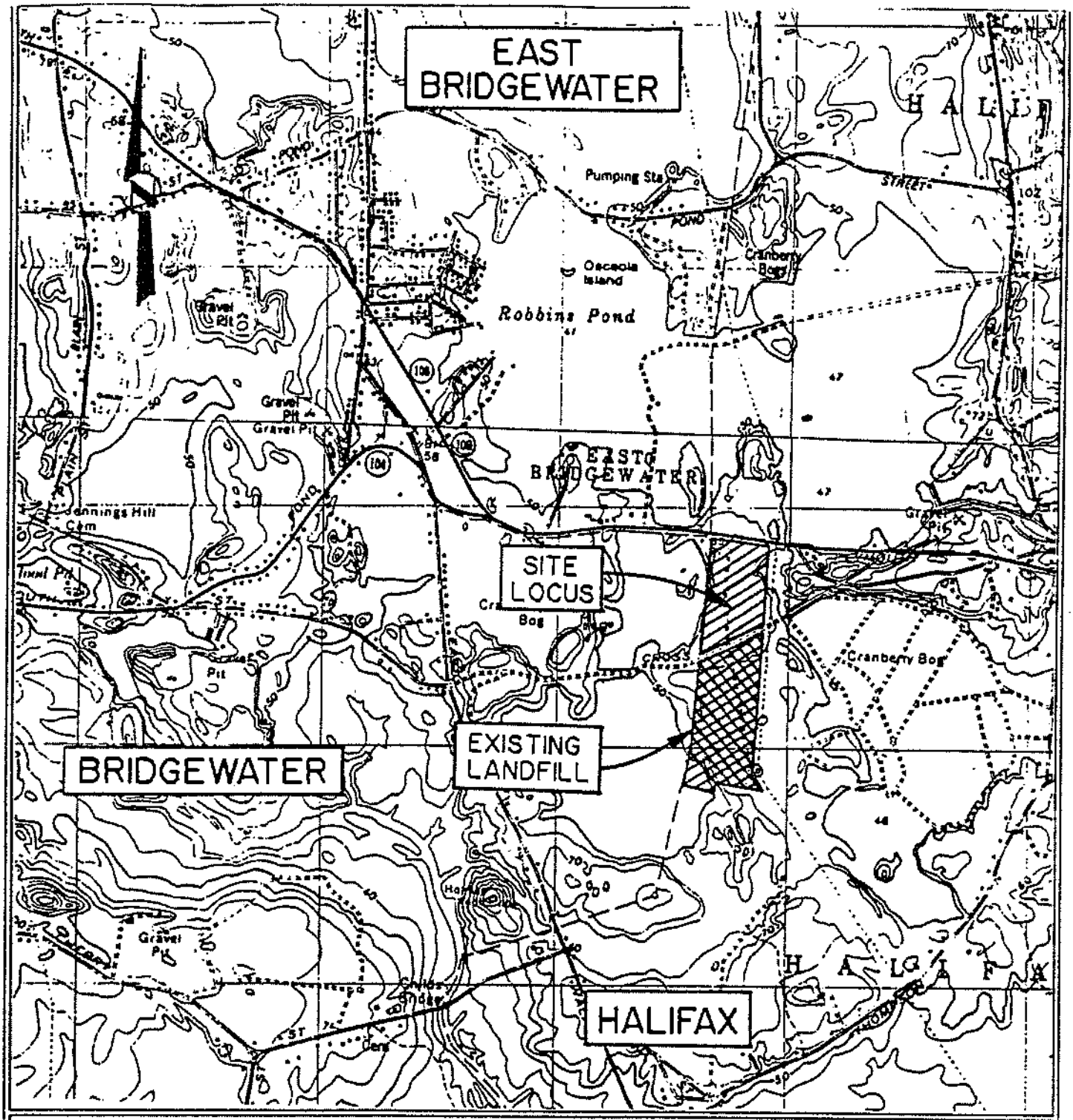


FIGURE 1

SITE LOCUS MAP

SCALE: 1:25,000

BASE MAP: U.S.G.S. BRIDGEWATER, MASSACHUSETTS
U.S.G.S. WHITMAN, MASSACHUSETTS

DEFEO, WAIT & PARÉ, INC.
Environmental Engineers & Scientists
31 BELLOWS ROAD, RAYNHAM, MASSACHUSETTS 02767

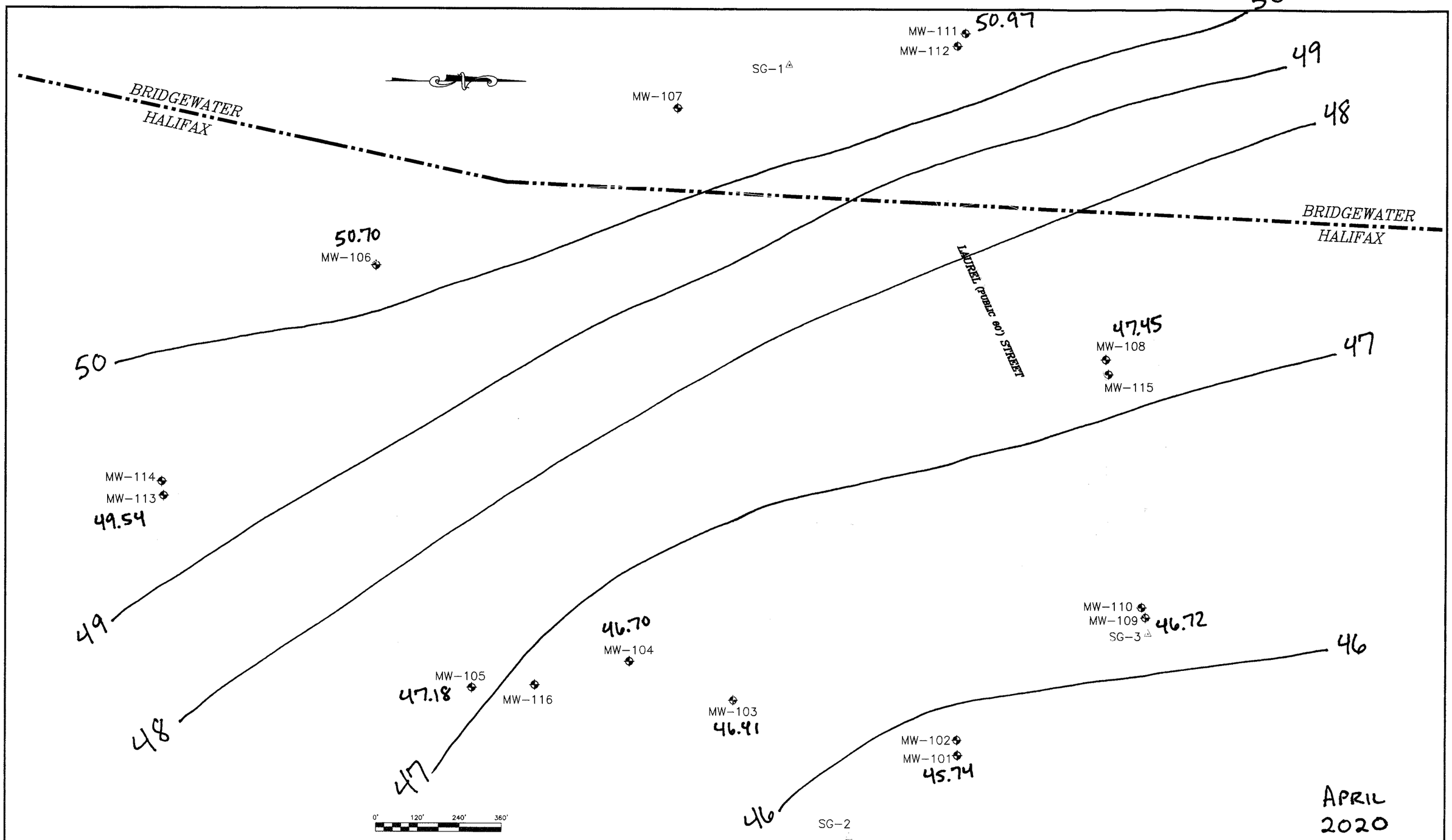
FIGURE 2

BFI - HALIFAX WATER LEVELS APRIL 6, 2020

WELL NUMBER	RISER ELEVATION	DEPTH TO WATER	WATER LEVEL ELEVATION
MW-101	58.55	12.81	**45.74**
MW-102	58.61	12.42	**46.19**
MW-103	59.83	13.42	**46.41**
MW-104	60.10	13.40	**46.70**
MW-105	55.90	8.72	**47.18**
MW-106	56.77	6.07	**50.70**
MW-107	55.29	NA	**NA**
MW-108	63.81	16.36	**47.45**
MW-109	54.17	7.45	**46.72**
MW-110	54.68	8.10	**46.58**
MW-111	67.11	16.14	**50.97**
MW-112	67.91	17.85	**50.06**
MW-113	78.32	28.78	**49.54**
MW-114	78.28	28.78	**49.50**
MW-115	64.18	16.89	**47.29**
MW-116	56.00	9.01	**46.99**

MW-107 - ABANDONED - SEPT 2016 AS A RESULT OF CONSTRUCTION

FIGURE 3



SITEC ENVIRONMENTAL
Civil and Environmental Engineering
Land Use Planning and Surveying
Hazardous and Solid Waste Consultants

769 Plain Street, Unit C
Marshfield, MA 02050
PHONE (781) 319-0100
FAX (781) 834-4783

project:
BFI HALIFAX – LAUREL STREET LANDFILL
HALIFAX, MASSACHUSETTS

client:
BROWNING-FERRIS INDUSTRIES, INC. (MA)
1080 AIRPORT ROAD
FALL RIVER, MASSACHUSETTS

drawing title:
OVERALL EXISTING CONDITIONS & ENVIRONMENTAL MONITORING PLAN

scale: AS SHOWN
date: FEB. 4, 2014
drawn: JAC
checked: MQ
approved: ARQ
drawing number: S-1

No.	Date		Chkd.	Aprvd.

LEGEND

- SURVEYED PROPERTY LINE
- ASSESSORS LINE (APPROXIMATE)
- MW-101 GROUNDWATER MONITORING WELL
- SG-2 SURFACE WATER MONITORING LOCATION
- BRUSH LINE
- TREELINE
- EXISTING CONTOUR
- CHAIN LINK FENCE
- UTILITY POLE

NOTES:
1. SURVEYED PROPERTY LINES SHOWN ON THIS DRAWING TAKEN FROM "PLAN OF LAND IN HALIFAX, MA SHOWNING PARCELS OF LAND OWNED B BROWNING-FERRIS INDUSTRIES, INC." PREPARED BY SAIC ENGINEERING, INC., DATED NOVEMBER 25, 1996.
2. TOPOGRAPHY AND OTHER PHYSICAL FEATURES SHOWN ON THIS DRAWING FROM AERIAL SURVEY PERFORMED BY COOPER AERIAL SURVEYS CO. OF PHOENIX, AZ ON OCTOBER 18, 2012.

TABLES

Table 1 – Drinking Water Standard Exceedances

Table 2 - Groundwater Data – Most Recent 9 Events

Table 3 – Surface Water Data – Most Recent 9 Events

TABLE 1

TABLE I **DRINKING WATER STANDARD EXCEEDENCES**
HALIFAX LANDFILL **APRIL 2020**

MONITORING LOCATION	PARAMETER	ANALYTICAL RESULT	MCL	MMCL
MW-101	pH	5.32	>6.5-8.5	>6.5-8.5
	Turbidity	8.5	5 NTU	5 NTU
MW-102	Turbidity	42.6	5 NTU	5 NTU
	Arsenic, Dissolved	0.13 mg/l	0.01 mg/l	0.01 mg/l
	Iron, Dissolved	47 mg/l	0.3 mg/l	0.3 mg/l
	Manganese, Dissolved	0.98 mg/l	0.05 mg/l	0.05 mg/l
MW-103	pH	5.41	>6.5-8.5	>6.5-8.5
	Turbidity	7.9	5 NTU	5 NTU
	Iron, Dissolved	24 mg/l	0.3 mg/l	0.3 mg/l
	Manganese, Dissolved	4.7 mg/l	0.05 mg/l	0.05 mg/l
MW-104	Turbidity	5.31	5 NTU	5 NTU
	Arsenic, Dissolved	0.089 mg/l	0.01 mg/l	0.01 mg/l
	Iron, Dissolved	78 mg/l	0.3 mg/l	0.3 mg/l
	Manganese, Dissolved	3.1 mg/l	0.05 mg/l	0.05 mg/l
MW-105	pH	4.72	>6.5-8.5	>6.5-8.5
	Manganese, Dissolved	0.14 mg/l	0.05 mg/l	0.05 mg/l
MW-106	pH	4.62	>6.5-8.5	>6.5-8.5
	Iron, Dissolved	0.61 mg/l	0.3 mg/l	0.3 mg/l
MW-107	Well Abandoned And Removed From Monitoring Program.			
MW-108	pH	5.38	>6.5-8.5	>6.5-8.5
MW-109	pH	5.30	>6.5-8.5	>6.5-8.5
	Turbidity	5.01	5 NTU	5 NTU
MW-110	pH	6.02	>6.5-8.5	>6.5-8.5
	Turbidity	11.3	5 NTU	5 NTU
	Manganese, Dissolved	0.51 mg/l	0.05 mg/l	0.05 mg/l
MW-111	pH	5.36	>6.5-8.5	>6.5-8.5
	Turbidity	10.2	5 NTU	5 NTU
MW-112	pH	5.70	>6.5-8.5	>6.5-8.5
	Turbidity	7.1	5 NTU	5 NTU
MW-113	pH	5.37	>6.5-8.5	>6.5-8.5
MW-114	pH	5.68	>6.5-8.5	>6.5-8.5
	Turbidity	6.47	5 NTU	5 NTU
	Iron, Dissolved	11 mg/l	0.3 mg/l	0.3 mg/l
	Manganese, Dissolved	0.11 mg/l	0.05 mg/l	0.05 mg/l

TABLE I **DRINKING WATER STANDARD EXCEEDENCES**
HALIFAX LANDFILL **APRIL 2020**

MONITORING LOCATION	PARAMETER	ANALYTICAL RESULT	MCL	MMCL
MW-114	pH	5.68	>6.5-8.5	>6.5-8.5
DUP	Turbidity	6.47	5 NTU	5 NTU
	Iron, Dissolved	11 mg/l	0.3 mg/l	0.3 mg/l
	Manganese, Dissolved	0.11 mg/l	0.05 mg/l	0.05 mg/l
MW-115	pH	6.16	>6.5-8.5	>6.5-8.5
	Turbidity	5.81	5 NTU	5 NTU
MW-116	pH	6.34	>6.5-8.5	>6.5-8.5
	Iron, Dissolved	4.0 mg/l	0.3 mg/l	0.3 mg/l
	Manganese, Total	2.5 mg/l	0.05 mg/l	0.05 mg/l
SG-1	Surface Water Location Removed From Monitoring Program.			
SG-2	pH	5.81	>6.5-8.5	>6.5-8.5
	Iron, Dissolved	0.83 mg/l	0.3 mg/l	0.3 mg/l
SG-3	pH	5.74	>6.5-8.5	>6.5-8.5
	Turbidity	5.98	5 NTU	5 NTU
	Iron, Dissolved	0.80 mg/l	0.3 mg/l	0.3 mg/l

NOTE: The laboratory detection limit for 1,2-Dibromo-3-Chloropropane exceeds the drinking water standard for all samples analyzed. This does not necessarily mean there was an exceedence.

TABLE 2

BFI - Halifax Sanitary Landfill **Halifax, Mass.**

MW-101	Units	4/28/16	9/15/16	4/24/17	9/13/17	5/10/18	9/13/18	4/9/19	9/3/19	4/6/20
Water Level (MSL)	feet	45.56	43.62	46.02	43.87	45.96	44.43	45.54	43.82	45.74
pH	S.U.	8.14	7.36	7.23	6.76	**6.13**	**5.20**	**5.79**	**5.48**	**5.32**
Conductance (umhos/cm)	us/cm	121	54	80	97	82	51	60	48	55
Turbidity	NTU	2.60	3.20	3.00	5.00	0.70	0.00	2.30	0.02	**8.49**
Alkalinity as CaCO3	mg/l	11	10	21	14	15	nd	13	12	22
COD	mg/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Chloride	mg/l	5.0	4.9	5.5	5.4	5.6	4.6	4.2	4.2	3.6
Cyanide, Total	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Nitrate as N	mg/l	1.9	1.3	1.9	0.78	2.6	0.87	1.7	0.25	0.73
Solids, dis: TDS	mg/l	81	38	38	44	45	24	31	22	67
Sulfate	mg/l	6.6	nd	nd	nd	5.6	nd	nd	nd	nd
Arsenic (As) dis	mg/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Barium (Ba) dis	mg/l	0.011	0.011	0.009	0.0074	0.0082	0.0062	0.0061	0.0056	0.0084
Cadmium (Cd) dis	mg/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Calcium (Ca) dis	mg/l	5.0	3.8	4.5	3.4	4.5	2.7	3.5	2.8	4.7
Chromium (Cr) dis	mg/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Copper (Cu) dis	mg/l	nd	nd	nd	nd	0.015	nd	nd	nd	nd
Iron (Fe) dis	mg/l	**0.48**	**1.1**	nd	0.26	nd	nd	nd	0.074	nd
Lead (Pb) dis	mg/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Manganese (Mn) dis	mg/l	0.013	0.022	0.0086	0.011	0.0074	0.0053	0.0056	0.0140	0.011
Mercury (Hg) dis	mg/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Selenium (Se) dis	mg/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Silver (Ag) dis	mg/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Sodium (Na) dis	mg/l	4.0	3.2	4.0	3.3	4.1	3.3	3.5	3.6	4.8
Zinc (Zn) dis	mg/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,1,1,2-Tetrachloroethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,1,1-Trichloroethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,1,2,2-Tetrachloroethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,1,2-Trichloroethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,1-Dichloroethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,1-Dichloroethene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,1-Dichloropropene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,2,3-Trichlorobenzene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,2,3-Trichloropropane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,2,4-Trichlorobenzene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,2,4-Trimethylbenzene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,2-Dibromo-3-chloropropan	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,2-Dibromoethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,2-Dichlorobenzene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,2-Dichloroethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,2-Dichloropropane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,3,5-Trimethylbenzene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,3-Dichlorobenzene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,3-Dichloropropane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,4-Dichlorobenzene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,4-Dioxane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
2,2-Dichloropropane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
2-Chloroethylvinyl ether	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
2-Hexanone	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Acetone	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd

J - Probable presence below listed detection. ns - not sampled (dry conditions or frozen)

BFI - Halifax Sanitary Landfill **Halifax, Mass.**

MW-101	Units	4/28/16	9/15/16	4/24/17	9/13/17	5/10/18	9/13/18	4/9/19	9/3/19	4/6/20
Acrolein	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Acrylonitrile	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Benzene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Bromobenzene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Bromochloromethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Bromodichloromethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Bromoform	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Bromomethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Carbon disulfide	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Carbon tetrachloride	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Chlorobenzene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Chloroethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Chloroform	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
cis-1,2-Dichloroethene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
cis-1,3-Dichloropropene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Dibromochloromethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Dibromomethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Dichlorodifluoromethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Ethyl ether	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Ethyl methacrylate	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Ethylbenzene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Hexachlorobutadiene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Iodomethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Isopropylbenzene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
m+p-Xylenes	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
2-Butanone	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
4-Methyl-2-pentanone	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Methylene chloride	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Methyl-tert-butyl ether	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Naphthalene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
n-Butylbenzene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
n-Propylbenzene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
o-Chlorotoluene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
o-Xylene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
p-Chlorotoluene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
p-cymene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
sec-Butylbenzene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Styrene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
tert-Butylbenzene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Tetrachloroethene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Tetrahydrofuran	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Toluene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
trans-1,2-Dichloroethene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
trans-1,3-Dichloropropene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
trans-1,4-Dichloro-2-butene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Trichloroethyene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Trichlorofluoromethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Vinyl acetate	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Vinyl chloride	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd

J - Probable presence below listed detection. ns - not sampled (dry conditions or frozen)

BFI - Halifax Sanitary Landfill **Halifax, Mass.**

MW-102	Units	4/28/16	9/15/16	4/24/17	9/13/17	5/10/18	9/13/18	4/9/19	9/3/19	4/7/20
Water Level (MSL)	feet	45.18	43.24	45.64	43.80	45.48	44.03	45.60	44.22	46.19
pH	S.U.	6.60	7.07	7.11	7.12	**6.40**	**5.85**	**6.41**	**6.32**	6.59
Conductance (umhos/cm)	us/cm	360	280	404	353	319	313	276	326	314
Turbidity	NTU	**8.6**	1.0	3.0	**8.2**	5.0	0.0	**7.7**	**20**	**42.6**
Alkalinity as CaCO3	mg/l	95	120	120	120	66	79	63	61	74
COD	mg/l	nd	13	nd	nd	nd	nd	nd	15	nd
Chloride	mg/l	11	12	14	13	15	15	13	14	11
Cyanide, Total	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Nitrate as N	mg/l	0.84	nd	0.065	nd	0.40	0.052	nd	nd	nd
Solids, dis: TDS	mg/l	180	170	110	130	110	79	96	130	190
Sulfate	mg/l	10	nd	nd	nd	6.2	nd	nd	nd	nd
Arsenic (As) dis	mg/l	0.0097	**0.13**	**0.13**	**0.13**	**0.013**	**0.13**	**0.12**	**0.12**	**0.13**
Barium (Ba) dis	mg/l	0.0076	0.018	0.016	0.014	0.008	0.013	0.012	0.014	0.012
Cadmium (Cd) dis	mg/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Calcium (Ca) dis	mg/l	23	22	18	16	18	15	14	15	13
Chromium (Cr) dis	mg/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Copper (Cu) dis	mg/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Iron (Fe) dis	mg/l	**4.1**	**70**	**60**	**53**	**19**	**49**	**46**	**50**	**47**
Lead (Pb) dis	mg/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Manganese (Mn) dis	mg/l	**2.3**	**1.4**	**1.1**	**1.0**	**1.3**	**1.0**	**0.97**	**1.0**	**0.98**
Mercury (Hg) dis	mg/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Selenium (Se) dis	mg/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Silver (Ag) dis	mg/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Sodium (Na) dis	mg/l	10	10	9.9	8.9	9.4	8.4	8.9	10	10
Zinc (Zn) dis	mg/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,1,1,2-Tetrachloroethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,1,1-Trichloroethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,1,2,2-Tetrachloroethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,1,2-Trichloroethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,1-Dichloroethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,1-Dichloroethene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,1-Dichloropropene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,2,3-Trichlorobenzene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,2,3-Trichloropropane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,2,4-Trichlorobenzene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,2,4-Trimethylbenzene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,2-Dibromo-3-chloropropan	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,2-Dibromoethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,2-Dichlorobenzene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,2-Dichloroethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,2-Dichloropropane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,3,5-Trimethylbenzene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,3-Dichlorobenzene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,3-Dichloropropane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,4-Dichlorobenzene	ug/l	nd	1.5	2.0	1.6	1.8	1.8	1.7	1.7	1.5
1,4-Dioxane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
2,2-Dichloropropane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
2-Chloroethylvinyl ether	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
2-Hexanone	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Acetone	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd

J - Probable presence below listed detection. ns - not sampled (dry conditions or frozen)

BFI - Halifax Sanitary Landfill **Halifax, Mass.**

MW-102	Units	4/28/16	9/15/16	4/24/17	9/13/17	5/10/18	5/10/18	5/10/18	9/3/19	4/7/20
Acrolein	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Acrylonitrile	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Benzene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Bromobenzene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Bromochloromethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Bromodichloromethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Bromoform	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Bromomethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Carbon disulfide	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Carbon tetrachloride	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Chlorobenzene	ug/l	nd	1.2	1.2	nd	nd	nd	nd	nd	nd
Chloroethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Chloroform	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
cis-1,2-Dichloroethene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
cis-1,3-Dichloropropene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Dibromochloromethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Dibromomethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Dichlorodifluoromethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Ethyl ether	ug/l	nd	1.4	1.3	nd	nd	nd	nd	nd	nd
Ethyl methacrylate	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Ethylbenzene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Hexachlorobutadiene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Iodomethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Isopropylbenzene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
m+p-Xylenes	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
2-Butanone	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
4-Methyl-2-pentanone	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Methylene chloride	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Methyl-tert-butyl ether	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Naphthalene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
n-Butylbenzene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
n-Propylbenzene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
o-Chlorotoluene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
o-Xylene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
p-Chlorotoluene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
p-cymene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
sec-Butylbenzene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Styrene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
tert-Butylbenzene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Tetrachloroethene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Tetrahydrofuran	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Toluene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
trans-1,2-Dichloroethene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
trans-1,3-Dichloropropene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
trans-1,4-Dichloro-2-butene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Trichloroethyene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Trichlorofluoromethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Vinyl acetate	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Vinyl chloride	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd

J - Probable presence below listed detection. ns - not sampled (dry conditions or frozen)

BFI - Halifax Sanitary Landfill **Halifax, Mass.**

MW-103	Units	4/28/16	9/15/16	4/24/17	9/13/17	5/10/18	9/13/18	4/9/19	9/3/19	4/6/20
Water Level (MSL)	feet	45.52	43.34	46.06	43.95	46.16	44.11	46.09	44.39	46.41
pH	S.U.	**6.20**	7.17	6.66	7.16	5.98	**6.34**	**6.22**	**6.35**	**5.41**
Conductance (umhos/cm)	us/cm	342	676	308	798	306	662	277	584	155
Turbidity	NTU	**24.8**	4.0	**21.0**	**20.9**	**11.6**	**7.4**	**10.6**	**5.35**	**7.91**
Alkalinity as CaCO3	mg/l	96	140	70	81	39	140	40	78	60
COD	mg/l	27	33	nd	33	12	nd	12	65	17
Chloride	mg/l	4.4	5.0	4.3	5.7	4.0	6.1	3.6	4.5	3.0
Cyanide, Total	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Nitrate as N	mg/l	1.0	nd	7.7	nd	1.9	nd	nd	0.15	2.0
Solids, dis: TDS	mg/l	200	170	110	260	91	240	77	210	140
Sulfate	mg/l	19	14	23	33	18	16	21	31	14
Arsenic (As) dis	mg/l	**0.027**	**0.055**	**0.018**	**0.028**	0.0021	**0.043**	**0.018**	**0.058**	0.0065
Barium (Ba) dis	mg/l	0.036	0.038	0.081	0.040	0.076	0.038	0.027	0.033	0.082
Cadmium (Cd) dis	mg/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Calcium (Ca) dis	mg/l	11	13	12	13	14	13	10	11	9.9
Chromium (Cr) dis	mg/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Copper (Cu) dis	mg/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Iron (Fe) dis	mg/l	**100**	**190**	**77**	**190**	**25**	**190**	**95**	**200**	**24**
Lead (Pb) dis	mg/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Manganese (Mn) dis	mg/l	**4.2**	**4.0**	**5.7**	**4.2**	**5.8**	**4.2**	**4.0**	**3.3**	**2.7**
Mercury (Hg) dis	mg/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Selenium (Se) dis	mg/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Silver (Ag) dis	mg/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Sodium (Na) dis	mg/l	4.6	4.3	5.2	4.1	4.7	4.2	4.2	4.1	4.7
Zinc (Zn) dis	mg/l	nd	nd	nd	nd	0.015	nd	nd	nd	nd
1,1,1,2-Tetrachloroethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,1,1-Trichloroethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,1,2,2-Tetrachloroethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,1,2-Trichloroethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,1-Dichloroethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,1-Dichloroethene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,1-Dichloropropene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,2,3-Trichlorobenzene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,2,3-Trichloropropane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,2,4-Trichlorobenzene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,2,4-Trimethylbenzene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,2-Dibromo-3-chloropropan	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,2-Dibromoethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,2-Dichlorobenzene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,2-Dichloroethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,2-Dichloropropane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,3,5-Trimethylbenzene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,3-Dichlorobenzene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,3-Dichloropropane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,4-Dichlorobenzene	ug/l	2.8	3.0	1.1	2.9	nd	2.6	1.0	2.4	nd
1,4-Dioxane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
2,2-Dichloropropane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
2-Chloroethylvinyl ether	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
2-Hexanone	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Acetone	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd

J - Probable presence below listed detection. ns - not sampled (dry conditions or frozen)

BFI - Halifax Sanitary Landfill **Halifax, Mass.**

MW-103	Units	4/28/16	9/15/16	4/24/17	9/13/17	5/10/18	9/13/18	4/9/19	9/3/19	4/6/20
Acrolein	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Acrylonitrile	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Benzene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Bromobenzene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Bromochloromethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Bromodichloromethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Bromoform	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Bromomethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Carbon disulfide	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Carbon tetrachloride	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Chlorobenzene	ug/l	1.1	1.3	nd	1.3	nd	nd	nd	nd	nd
Chloroethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Chloroform	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
cis-1,2-Dichloroethene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
cis-1,3-Dichloropropene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Dibromochloromethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Dibromomethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Dichlorodifluoromethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Ethyl ether	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Ethyl methacrylate	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Ethylbenzene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Hexachlorobutadiene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Iodomethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Isopropylbenzene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
m+p-Xylenes	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
2-Butanone	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
4-Methyl-2-pentanone	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Methylene chloride	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Methyl-tert-butyl ether	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Naphthalene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
n-Butylbenzene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
n-Propylbenzene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
o-Chlorotoluene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
o-Xylene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
p-Chlorotoluene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
p-cymene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
sec-Butylbenzene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Styrene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
tert-Butylbenzene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Tetrachloroethene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Tetrahydrofuran	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Toluene	ug/l	nd	nd	nd	nd	2.1	1.6	nd	nd	nd
trans-1,2-Dichloroethene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
trans-1,3-Dichloropropene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
trans-1,4-Dichloro-2-butene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Trichloroethyene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Trichlorofluoromethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Vinyl acetate	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Vinyl chloride	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd

J - Probable presence below listed detection. ns - not sampled (dry conditions or frozen)

BFI - Halifax Sanitary Landfill **Halifax, Mass.**

MW-104	Units	4/28/16	9/15/16	4/24/17	9/13/17	5/10/18	9/13/18	4/9/19	9/3/19	4/6/20
Water Level (MSL)	feet	45.07	43.28	46.27	43.98	46.09	44.12	46.29	44.47	46.70
pH	S.U.	6.70	7.27	7.30	6.80	**6.17**	**6.02**	6.52	**6.44**	6.61
Conductance (umhos/cm)	us/cm	560	632	647	510	502	494	377	489	386
Turbidity	NTU	1.0	2.6	**6.0**	3.9	**14**	0.0	3.8	4.12	**5.31**
Alkalinity as CaCO3	mg/l	110	180	150	170	100	99	70	93	79
COD	mg/l	21	23	nd	12	15	nd	nd	12	26
Chloride	mg/l	24	26	33	24	20	28	18	28	16
Cyanide, Total	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Nitrate as N	mg/l	nd	nd	0.077	nd	nd	0.060	nd	0.15	0.10
Solids, dis: TDS	mg/l	160	220	160	220	150	120	120	180	160
Sulfate	mg/l	9.9	6.5	13	28	21	7.3	13	13	14
Arsenic (As) dis	mg/l	**0.11**	**0.084**	**0.14**	**0.084**	**0.100**	**0.090**	**0.076**	**0.080**	**0.089**
Barium (Ba) dis	mg/l	0.037	0.042	0.055	0.036	0.035	0.036	0.026	0.037	0.033
Cadmium (Cd) dis	mg/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Calcium (Ca) dis	mg/l	17	19	19	16	15	16	12	17	15
Chromium (Cr) dis	mg/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Copper (Cu) dis	mg/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Iron (Fe) dis	mg/l	**90**	**96**	**120**	**76**	**75**	**79**	**61**	**85**	**78**
Lead (Pb) dis	mg/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Manganese (Mn) dis	mg/l	**3.2**	**3.3**	**3.8**	**2.7**	**2.7**	**3.0**	**2.3**	**3.2**	**3.1**
Mercury (Hg) dis	mg/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Selenium (Se) dis	mg/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Silver (Ag) dis	mg/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Sodium (Na) dis	mg/l	18	21	21	20	18	17	15	19	17
Zinc (Zn) dis	mg/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,1,1,2-Tetrachloroethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,1,1-Trichloroethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,1,2,2-Tetrachloroethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,1,2-Trichloroethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,1-Dichloroethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,1-Dichloroethene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,1-Dichloropropene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,2,3-Trichlorobenzene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,2,3-Trichloropropane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,2,4-Trichlorobenzene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,2,4-Trimethylbenzene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,2-Dibromo-3-chloropropan	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,2-Dibromoethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,2-Dichlorobenzene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,2-Dichloroethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,2-Dichloropropane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,3,5-Trimethylbenzene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,3-Dichlorobenzene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,3-Dichloropropane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,4-Dichlorobenzene	ug/l	2.0	2.3	2.4	2.6	2.3	2.4	1.7	2.0	1.6
1,4-Dioxane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
2,2-Dichloropropane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
2-Chloroethylvinyl ether	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
2-Hexanone	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Acetone	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd

J - Probable presence below listed detection. ns - not sampled (dry conditions or frozen)

BFI - Halifax Sanitary Landfill **Halifax, Mass.**

MW-104	Units	4/28/16	9/15/16	4/24/17	9/13/17	5/10/18	9/13/18	4/9/19	9/3/19	4/6/20
Acrolein	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Acrylonitrile	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Benzene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Bromobenzene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Bromochloromethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Bromodichloromethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Bromoform	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Bromomethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Carbon disulfide	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Carbon tetrachloride	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Chlorobenzene	ug/l	1.2	1.5	1.5	1.5	1.1	1.5	nd	1.3	nd
Chloroethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Chloroform	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
cis-1,2-Dichloroethene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
cis-1,3-Dichloropropene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Dibromochloromethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Dibromomethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Dichlorodifluoromethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Ethyl ether	ug/l	nd	1.4	1.5	1.3	nd	nd	nd	nd	nd
Ethyl methacrylate	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Ethylbenzene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Hexachlorobutadiene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Iodomethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Isopropylbenzene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
m+p-Xylenes	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
2-Butanone	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
4-Methyl-2-pentanone	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Methylene chloride	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Methyl-tert-butyl ether	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Naphthalene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
n-Butylbenzene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
n-Propylbenzene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
o-Chlorotoluene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
o-Xylene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
p-Chlorotoluene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
p-cymene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
sec-Butylbenzene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Styrene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
tert-Butylbenzene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Tetrachloroethene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Tetrahydrofuran	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Toluene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
trans-1,2-Dichloroethene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
trans-1,3-Dichloropropene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
trans-1,4-Dichloro-2-butene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Trichloroethyene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Trichlorofluoromethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Vinyl acetate	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Vinyl chloride	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd

J - Probable presence below listed detection. ns - not sampled (dry conditions or frozen)

BFI - Halifax Sanitary Landfill **Halifax, Mass.**

MW-105	Units	4/28/16	9/15/16	5/26/17	9/13/17	5/10/18	9/13/18	4/9/19	9/3/19	4/7/20
Water Level (MSL)	feet	46.31	43.42	46.37	44.19	46.87	44.30	46.76	44.60	47.18
pH	S.U.	7.09	6.97	6.90	6.86	**6.01**	**5.80**	**5.85**	**5.20**	**4.72**
Conductance (umhos/cm)	us/cm	63	50	112	90	61	54	55	44	47
Turbidity	NTU	4.7	2.6	2.0	**9.7**	3.1	**7.4**	2.6	0.02	2.52
Alkalinity as CaCO3	mg/l	10	nd	12	17	17	nd	13	nd	28
COD	mg/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Chloride	mg/l	5.7	4.9	5.8	5.4	4.1	5.5	3.0	3.9	3.3
Cyanide, Total	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Nitrate as N	mg/l	0.19	0.23	0.27	0.29	nd	0.12	nd	0.11	0.11
Solids, dis: TDS	mg/l	64	34	51	33	60	29	30	nd	23
Sulfate	mg/l	6.8	7.5	6.9	6.6	6.6	nd	nd	7.5	5.5
Arsenic (As) dis	mg/l	nd	0.0031	nd	nd	nd	0.0055	nd	nd	nd
Barium (Ba) dis	mg/l	0.015	0.006	0.012	0.013	0.011	0.013	0.011	0.0084	0.011
Cadmium (Cd) dis	mg/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Calcium (Ca) dis	mg/l	4.3	2.3	4.6	4.0	4.9	2.3	4.5	2.0	3.8
Chromium (Cr) dis	mg/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Copper (Cu) dis	mg/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Iron (Fe) dis	mg/l	0.16	**6.7**	nd	0.16	0.056	**6.2**	nd	0.074	0.052
Lead (Pb) dis	mg/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Manganese (Mn) dis	mg/l	**0.12**	**0.19**	**0.075**	**0.20**	0.048	**0.15**	**0.064**	**0.099**	**0.14**
Mercury (Hg) dis	mg/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Selenium (Se) dis	mg/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Silver (Ag) dis	mg/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Sodium (Na) dis	mg/l	3.8	3.6	3.8	4.1	3.4	3.5	2.7	3.2	3.1
Zinc (Zn) dis	mg/l	0.019	0.031	0.011	0.027	0.012	0.026	nd	nd	0.011
1,1,1,2-Tetrachloroethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,1,1-Trichloroethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,1,2,2-Tetrachloroethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,1,2-Trichloroethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,1-Dichloroethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,1-Dichloroethene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,1-Dichloropropene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,2,3-Trichlorobenzene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,2,3-Trichloropropane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,2,4-Trichlorobenzene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,2,4-Trimethylbenzene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,2-Dibromo-3-chloropropan	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,2-Dibromoethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,2-Dichlorobenzene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,2-Dichloroethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,2-Dichloropropane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,3,5-Trimethylbenzene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,3-Dichlorobenzene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,3-Dichloropropane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,4-Dichlorobenzene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,4-Dioxane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
2,2-Dichloropropane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
2-Chloroethylvinyl ether	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
2-Hexanone	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Acetone	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd

J - Probable presence below listed detection. ns - not sampled (dry conditions or frozen)

BFI - Halifax Sanitary Landfill **Halifax, Mass.**

MW-105	Units	4/28/16	9/15/16	5/26/17	9/13/17	5/10/18	9/13/18	4/9/19	9/3/19	4/7/20
Acrolein	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Acrylonitrile	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Benzene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Bromobenzene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Bromochloromethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Bromodichloromethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Bromoform	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Bromomethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Carbon disulfide	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Carbon tetrachloride	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Chlorobenzene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Chloroethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Chloroform	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
cis-1,2-Dichloroethene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
cis-1,3-Dichloropropene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Dibromochloromethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Dibromomethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Dichlorodifluoromethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Ethyl ether	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Ethyl methacrylate	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Ethylbenzene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Hexachlorobutadiene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Iodomethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Isopropylbenzene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
m+p-Xylenes	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
2-Butanone	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
4-Methyl-2-pentanone	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Methylene chloride	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Methyl-tert-butyl ether	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Naphthalene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
n-Butylbenzene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
n-Propylbenzene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
o-Chlorotoluene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
o-Xylene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
p-Chlorotoluene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
p-cymene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
sec-Butylbenzene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Styrene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
tert-Butylbenzene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Tetrachloroethene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Tetrahydrofuran	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Toluene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
trans-1,2-Dichloroethene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
trans-1,3-Dichloropropene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
trans-1,4-Dichloro-2-butene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Trichloroethyene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Trichlorofluoromethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Vinyl acetate	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Vinyl chloride	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd

J - Probable presence below listed detection. ns - not sampled (dry conditions or frozen)

BFI - Halifax Sanitary Landfill **Halifax, Mass.**

MW-106	Units	4/28/16	9/15/16	4/24/17	9/13/17	5/10/18	9/13/18	4/9/19	9/4/19	4/7/20
Water Level (MSL)	feet	49.42	46.93	50.34	45.85	45.85	46.93	50.41	47.64	50.70
pH	S.U.	**5.70**	6.86	6.58	**6.38**	**6.42**	**5.65**	**5.92**	**5.62**	**4.62**
Conductance (umhos/cm)	us/cm	28	56	45	54	54	61	35	58	24
Turbidity	NTU	2.40	1.00	2.00	**9.0**	**7.4**	0.0	**33.9**	1.29	3.17
Alkalinity as CaCO3	mg/l	nd	nd	13	14	16	nd	nd	13	10
COD	mg/l	nd	13	nd	50	41	nd	nd	19	15
Chloride	mg/l	1.8	2.5	2.1	0.71	2.50	3.0	2.6	0.83	2.3
Cyanide, Total	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Nitrate as N	mg/l	0.19	nd	0.18	nd	nd	nd	0.15	nd	0.23
Solids, dis: TDS	mg/l	57	37	50	16	18	28	15	42	70
Sulfate	mg/l	8.6	5.8	7.5	5.0	nd	nd	nd	nd	nd
Arsenic (As) dis	mg/l	0.0016	0.0053	0.0013	0.0026	0.0016	0.0079	nd	0.0013	0.0015
Barium (Ba) dis	mg/l	0.0064	0.011	0.0081	0.020	0.0088	0.012	0.0068	0.011	0.0061
Cadmium (Cd) dis	mg/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Calcium (Ca) dis	mg/l	2.8	4.0	3.1	3.2	4.2	3.5	3.5	4.0	1.8
Chromium (Cr) dis	mg/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Copper (Cu) dis	mg/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Iron (Fe) dis	mg/l	**0.46**	**2.5**	**0.37**	**1.5**	**3.5**	**5.0**	**0.59**	**2.8**	**0.61**
Lead (Pb) dis	mg/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Manganese (Mn) dis	mg/l	**0.099**	**0.11**	**0.12**	**0.10**	**0.35**	**0.21**	**0.067**	**0.093**	0.023
Mercury (Hg) dis	mg/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Selenium (Se) dis	mg/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Silver (Ag) dis	mg/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Sodium (Na) dis	mg/l	2.2	2.7	2.3	1.4	2.5	2.5	2.2	2.5	1.8
Zinc (Zn) dis	mg/l	nd	nd	nd	0.011	nd	nd	nd	nd	0.011
1,1,1,2-Tetrachloroethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,1,1-Trichloroethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,1,2,2-Tetrachloroethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,1,2-Trichloroethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,1-Dichloroethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,1-Dichloroethene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,1-Dichloropropene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,2,3-Trichlorobenzene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,2,3-Trichloropropane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,2,4-Trichlorobenzene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,2,4-Trimethylbenzene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,2-Dibromo-3-chloropropan	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,2-Dibromoethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,2-Dichlorobenzene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,2-Dichloroethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,2-Dichloropropane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,3,5-Trimethylbenzene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,3-Dichlorobenzene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,3-Dichloropropane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,4-Dichlorobenzene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,4-Dioxane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
2,2-Dichloropropane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
2-Chloroethylvinyl ether	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
2-Hexanone	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Acetone	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd

J - Probable presence below listed detection. ns - not sampled (dry conditions or frozen)

BFI - Halifax Sanitary Landfill **Halifax, Mass.**

MW-106	Units	4/28/16	9/15/16	4/24/17	9/13/17	5/10/18	9/13/18	4/9/19	9/4/19	4/7/20
Acrolein	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Acrylonitrile	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Benzene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Bromobenzene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Bromochloromethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Bromodichloromethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Bromoform	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Bromomethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Carbon disulfide	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Carbon tetrachloride	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Chlorobenzene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Chloroethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Chloroform	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
cis-1,2-Dichloroethene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
cis-1,3-Dichloropropene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Dibromochloromethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Dibromomethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Dichlorodifluoromethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Ethyl ether	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Ethyl methacrylate	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Ethylbenzene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Hexachlorobutadiene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Iodomethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Isopropylbenzene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
m+p-Xylenes	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
2-Butanone	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
4-Methyl-2-pentanone	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Methylene chloride	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Methyl-tert-butyl ether	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Naphthalene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
n-Butylbenzene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
n-Propylbenzene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
o-Chlorotoluene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
o-Xylene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
p-Chlorotoluene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
p-cymene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
sec-Butylbenzene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Styrene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
tert-Butylbenzene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Tetrachloroethene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Tetrahydrofuran	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Toluene	ug/l	nd	nd	nd	9.9	2.4	5.5	nd	nd	nd
trans-1,2-Dichloroethene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
trans-1,3-Dichloropropene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
trans-1,4-Dichloro-2-butene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Trichloroethyene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Trichlorofluoromethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Vinyl acetate	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Vinyl chloride	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd

J - Probable presence below listed detection. ns - not sampled (dry conditions or frozen)

BFI - Halifax Sanitary Landfill **Halifax, Mass.**

MW-107	Units	10/2/15	4/28/16	9/15/16	5/26/17	9/13/17	5/10/18	9/13/18	4/9/19	9/4/19	4/7/20
Water Level (MSL)	feet	47.94	49.27	NA	NA	NA	NA	NA	NA	NA	NA
pH	S.U.	6.65	5.29	NA	NA	NA	NA	NA	NA	NA	NA
Conductance (umhos/cm)	us/cm	1401	2902	NA	NA	NA	NA	NA	NA	NA	NA
Turbidity	NTU	**121**	**46**	NA	NA	NA	NA	NA	NA	NA	NA
Alkalinity as CaCO3	mg/l	nd	nd	NA	NA	NA	NA	NA	NA	NA	NA
COD	mg/l	38	100	NA	NA	NA	NA	NA	NA	NA	NA
Chloride	mg/l	**390**	**1000**	NA	NA	NA	NA	NA	NA	NA	NA
Cyanide, Total	ug/l	nd	nd	NA	NA	NA	NA	NA	NA	NA	NA
Nitrate as N	mg/l	1.5	0.54	NA	NA	NA	NA	NA	NA	NA	NA
Solids, dis: TDS	mg/l	**930**	**2500**	NA	NA	NA	NA	NA	NA	NA	NA
Sulfate	mg/l	140	440	NA	NA	NA	NA	NA	NA	NA	NA
Arsenic (As) dis	mg/l	0.0041	0.0043	NA	NA	NA	NA	NA	NA	NA	NA
Barium (Ba) dis	mg/l	0.24	0.093	NA	NA	NA	NA	NA	NA	NA	NA
Cadmium (Cd) dis	mg/l	nd	nd	NA	NA	NA	NA	NA	NA	NA	NA
Calcium (Ca) dis	mg/l	67	240	NA	NA	NA	NA	NA	NA	NA	NA
Chromium (Cr) dis	mg/l	nd	nd	NA	NA	NA	NA	NA	NA	NA	NA
Copper (Cu) dis	mg/l	nd	nd	NA	NA	NA	NA	NA	NA	NA	NA
Iron (Fe) dis	mg/l	**19**	**9.4**	NA	NA	NA	NA	NA	NA	NA	NA
Lead (Pb) dis	mg/l	nd	nd	NA	NA	NA	NA	NA	NA	NA	NA
Manganese (Mn) dis	mg/l	**2.30**	**1.3**	NA	NA	NA	NA	NA	NA	NA	NA
Mercury (Hg) dis	mg/l	nd	nd	NA	NA	NA	NA	NA	NA	NA	NA
Selenium (Se) dis	mg/l	nd	nd	NA	NA	NA	NA	NA	NA	NA	NA
Silver (Ag) dis	mg/l	nd	nd	NA	NA	NA	NA	NA	NA	NA	NA
Sodium (Na) dis	mg/l	190	480	NA	NA	NA	NA	NA	NA	NA	NA
Zinc (Zn) dis	mg/l	0.012	0.023	NA	NA	NA	NA	NA	NA	NA	NA
1,1,1,2-Tetrachloroethane	ug/l	nd	nd	NA	NA	NA	NA	NA	NA	NA	NA
1,1,1-Trichloroethane	ug/l	nd	nd	NA	NA	NA	NA	NA	NA	NA	NA
1,1,2,2-Tetrachloroethane	ug/l	nd	nd	NA	NA	NA	NA	NA	NA	NA	NA
1,1,2-Trichloroethane	ug/l	nd	nd	NA	NA	NA	NA	NA	NA	NA	NA
1,1-Dichloroethane	ug/l	nd	nd	NA	NA	NA	NA	NA	NA	NA	NA
1,1-Dichloroethene	ug/l	nd	nd	NA	NA	NA	NA	NA	NA	NA	NA
1,1-Dichloropropene	ug/l	nd	nd	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3-Trichlorobenzene	ug/l	nd	nd	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3-Trichloropropane	ug/l	nd	nd	NA	NA	NA	NA	NA	NA	NA	NA
1,2,4-Trichlorobenzene	ug/l	nd	nd	NA	NA	NA	NA	NA	NA	NA	NA
1,2,4-Trimethylbenzene	ug/l	nd	nd	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dibromo-3-chloropropan	ug/l	nd	nd	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dibromoethane	ug/l	nd	nd	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichlorobenzene	ug/l	nd	nd	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichloroethane	ug/l	nd	nd	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichloropropane	ug/l	nd	nd	NA	NA	NA	NA	NA	NA	NA	NA
1,3,5-Trimethylbenzene	ug/l	nd	nd	NA	NA	NA	NA	NA	NA	NA	NA
1,3-Dichlorobenzene	ug/l	nd	nd	NA	NA	NA	NA	NA	NA	NA	NA
1,3-Dichloropropane	ug/l	nd	nd	NA	NA	NA	NA	NA	NA	NA	NA
1,4-Dichlorobenzene	ug/l	nd	nd	NA	NA	NA	NA	NA	NA	NA	NA
1,4-Dioxane	ug/l	nd	nd	NA	NA	NA	NA	NA	NA	NA	NA
2,2-Dichloropropane	ug/l	nd	nd	NA	NA	NA	NA	NA	NA	NA	NA
2-Chloroethylvinyl ether	ug/l	nd	nd	NA	NA	NA	NA	NA	NA	NA	NA
2-Hexanone	ug/l	nd	nd	NA	NA	NA	NA	NA	NA	NA	NA
Acetone	ug/l	nd	nd	NA	NA	NA	NA	NA	NA	NA	NA

WELL ABANDONED - SEPTEMBER 2016 AS A RESULT OF CONSTRUCTION IN THE AREA

MW-107	Units	10/2/15	4/28/16	9/15/16	5/26/17	9/13/17	5/10/18	9/13/18	4/9/19	9/4/19	4/7/20
Acrolein	ug/l	nd	nd	NA	NA	NA	NA	NA	NA	NA	NA
Acrylonitrile	ug/l	nd	nd	NA	NA	NA	NA	NA	NA	NA	NA
Benzene	ug/l	nd	nd	NA	NA	NA	NA	NA	NA	NA	NA
Bromobenzene	ug/l	nd	nd	NA	NA	NA	NA	NA	NA	NA	NA
Bromochloromethane	ug/l	nd	nd	NA	NA	NA	NA	NA	NA	NA	NA
Bromodichloromethane	ug/l	nd	nd	NA	NA	NA	NA	NA	NA	NA	NA
Bromoform	ug/l	nd	nd	NA	NA	NA	NA	NA	NA	NA	NA
Bromomethane	ug/l	nd	nd	NA	NA	NA	NA	NA	NA	NA	NA
Carbon disulfide	ug/l	nd	nd	NA	NA	NA	NA	NA	NA	NA	NA
Carbon tetrachloride	ug/l	nd	nd	NA	NA	NA	NA	NA	NA	NA	NA
Chlorobenzene	ug/l	nd	nd	NA	NA	NA	NA	NA	NA	NA	NA
Chloroethane	ug/l	nd	nd	NA	NA	NA	NA	NA	NA	NA	NA
Chloroform	ug/l	nd	nd	NA	NA	NA	NA	NA	NA	NA	NA
cis-1,2-Dichloroethene	ug/l	nd	nd	NA	NA	NA	NA	NA	NA	NA	NA
cis-1,3-Dichloropropene	ug/l	nd	nd	NA	NA	NA	NA	NA	NA	NA	NA
Dibromochloromethane	ug/l	nd	nd	NA	NA	NA	NA	NA	NA	NA	NA
Dibromomethane	ug/l	nd	nd	NA	NA	NA	NA	NA	NA	NA	NA
Dichlorodifluoromethane	ug/l	nd	nd	NA	NA	NA	NA	NA	NA	NA	NA
Ethyl ether	ug/l	nd	nd	NA	NA	NA	NA	NA	NA	NA	NA
Ethyl methacrylate	ug/l	nd	nd	NA	NA	NA	NA	NA	NA	NA	NA
Ethylbenzene	ug/l	nd	nd	NA	NA	NA	NA	NA	NA	NA	NA
Hexachlorobutadiene	ug/l	nd	nd	NA	NA	NA	NA	NA	NA	NA	NA
Iodomethane	ug/l	nd	nd	NA	NA	NA	NA	NA	NA	NA	NA
Isopropylbenzene	ug/l	nd	nd	NA	NA	NA	NA	NA	NA	NA	NA
m+p-Xylenes	ug/l	nd	nd	NA	NA	NA	NA	NA	NA	NA	NA
2-Butanone	ug/l	nd	nd	NA	NA	NA	NA	NA	NA	NA	NA
4-Methyl-2-pentanone	ug/l	nd	nd	NA	NA	NA	NA	NA	NA	NA	NA
Methylene chloride	ug/l	nd	nd	NA	NA	NA	NA	NA	NA	NA	NA
Methyl-tert-butyl ether	ug/l	nd	nd	NA	NA	NA	NA	NA	NA	NA	NA
Naphthalene	ug/l	nd	nd	NA	NA	NA	NA	NA	NA	NA	NA
n-Butylbenzene	ug/l	nd	nd	NA	NA	NA	NA	NA	NA	NA	NA
n-Propylbenzene	ug/l	nd	nd	NA	NA	NA	NA	NA	NA	NA	NA
o-Chlorotoluene	ug/l	nd	nd	NA	NA	NA	NA	NA	NA	NA	NA
o-Xylene	ug/l	nd	nd	NA	NA	NA	NA	NA	NA	NA	NA
p-Chlorotoluene	ug/l	nd	nd	NA	NA	NA	NA	NA	NA	NA	NA
p-cymene	ug/l	nd	nd	NA	NA	NA	NA	NA	NA	NA	NA
sec-Butylbenzene	ug/l	nd	nd	NA	NA	NA	NA	NA	NA	NA	NA
Styrene	ug/l	nd	nd	NA	NA	NA	NA	NA	NA	NA	NA
tert-Butylbenzene	ug/l	nd	nd	NA	NA	NA	NA	NA	NA	NA	NA
Tetrachloroethene	ug/l	nd	nd	NA	NA	NA	NA	NA	NA	NA	NA
Tetrahydrofuran	ug/l	nd	nd	NA	NA	NA	NA	NA	NA	NA	NA
Toluene	ug/l	nd	nd	NA	NA	NA	NA	NA	NA	NA	NA
trans-1,2-Dichloroethene	ug/l	nd	nd	NA	NA	NA	NA	NA	NA	NA	NA
trans-1,3-Dichloropropene	ug/l	nd	nd	NA	NA	NA	NA	NA	NA	NA	NA
trans-1,4-Dichloro-2-butene	ug/l	nd	nd	NA	NA	NA	NA	NA	NA	NA	NA
Trichloroethyene	ug/l	nd	nd	NA	NA	NA	NA	NA	NA	NA	NA
Trichlorofluoromethane	ug/l	nd	nd	NA	NA	NA	NA	NA	NA	NA	NA
Vinyl acetate	ug/l	nd	nd	NA	NA	NA	NA	NA	NA	NA	NA
Vinyl chloride	ug/l	nd	nd	NA	NA	NA	NA	NA	NA	NA	NA

WELL ABANDONED - SEPTEMBER 2016 AS A RESULT OF CONSTRUCTION IN THE AREA

BFI - Halifax Sanitary Landfill **Halifax, Mass.**

MW-108	Units	4/28/16	9/15/16	5/26/17	9/13/17	5/10/18	9/13/18	4/9/19	9/3/19	4/7/20
Water Level (MSL)	feet	46.13	43.53	46.61	43.80	48.04	44.21	44.86	44.89	47.45
pH	S.U.	**5.98**	6.94	6.73	6.80	6.58	**5.65**	**6.22**	**5.25**	**5.38**
Conductance (umhos/cm)	us/cm	111	91	142	141	153	81	153	85	74
Turbidity	NTU	**7.00**	3.4	2.0	2.0	2.2	0.0	1.6	4.4	0.13
Alkalinity as CaCO3	mg/l	22	13	24	73	32	nd	22	nd	26
COD	mg/l	nd	nd	nd	nd	16	nd	nd	nd	nd
Chloride	mg/l	5.1	5.0	5.1	5.3	4.1	5.0	3.7	4.3	4.6
Cyanide, Total	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Nitrate as N	mg/l	1.9	1.3	2.3	nd	2.2	0.81	1.6	0.71	1.2
Solids, dis: TDS	mg/l	89	45	62	100	61	38	64	30	120
Sulfate	mg/l	9.0	9.0	9.7	11	12	11	16	12	10
Arsenic (As) dis	mg/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Barium (Ba) dis	mg/l	0.011	0.014	0.014	0.0072	0.015	0.016	0.016	0.016	0.013
Cadmium (Cd) dis	mg/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Calcium (Ca) dis	mg/l	8.7	6.1	11	14	14	5	13	6.2	7.7
Chromium (Cr) dis	mg/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Copper (Cu) dis	mg/l	nd	nd	nd	nd	0.026	nd	nd	nd	nd
Iron (Fe) dis	mg/l	0.22	0.11	nd	0.24	nd	nd	nd	0.088	0.056
Lead (Pb) dis	mg/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Manganese (Mn) dis	mg/l	**0.27**	**0.18**	**0.14**	0.036	0.019	**0.089**	0.011	0.017	0.024
Mercury (Hg) dis	mg/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Selenium (Se) dis	mg/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Silver (Ag) dis	mg/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Sodium (Na) dis	mg/l	3.6	3.2	3.8	12	3.8	3.1	3.7	3.4	3.8
Zinc (Zn) dis	mg/l	nd	nd	nd	nd	0.021	nd	nd	nd	nd
1,1,1,2-Tetrachloroethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,1,1-Trichloroethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,1,2,2-Tetrachloroethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,1,2-Trichloroethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,1-Dichloroethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,1-Dichloroethene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,1-Dichloropropene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,2,3-Trichlorobenzene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,2,3-Trichloropropane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,2,4-Trichlorobenzene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,2,4-Trimethylbenzene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,2-Dibromo-3-chloropropan	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,2-Dibromoethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,2-Dichlorobenzene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,2-Dichloroethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,2-Dichloropropane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,3,5-Trimethylbenzene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,3-Dichlorobenzene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,3-Dichloropropane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,4-Dichlorobenzene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,4-Dioxane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
2,2-Dichloropropane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
2-Chloroethylvinyl ether	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
2-Hexanone	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Acetone	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd

J - Probable presence below listed detection. ns - not sampled (dry conditions or frozen)

BFI - Halifax Sanitary Landfill **Halifax, Mass.**

MW-108	Units	4/28/16	9/15/16	5/26/17	9/13/17	5/10/18	9/13/18	4/9/19	9/3/19	4/7/20
Acrolein	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Acrylonitrile	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Benzene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Bromobenzene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Bromochloromethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Bromodichloromethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Bromoform	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Bromomethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Carbon disulfide	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Carbon tetrachloride	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Chlorobenzene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Chloroethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Chloroform	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
cis-1,2-Dichloroethene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
cis-1,3-Dichloropropene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Dibromochloromethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Dibromomethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Dichlorodifluoromethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Ethyl ether	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Ethyl methacrylate	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Ethylbenzene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Hexachlorobutadiene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Iodomethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Isopropylbenzene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
m+p-Xylenes	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
2-Butanone	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
4-Methyl-2-pentanone	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Methylene chloride	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Methyl-tert-butyl ether	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Naphthalene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
n-Butylbenzene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
n-Propylbenzene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
o-Chlorotoluene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
o-Xylene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
p-Chlorotoluene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
p-cymene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
sec-Butylbenzene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Styrene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
tert-Butylbenzene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Tetrachloroethene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Tetrahydrofuran	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Toluene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
trans-1,2-Dichloroethene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
trans-1,3-Dichloropropene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
trans-1,4-Dichloro-2-butene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Trichloroethyene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Trichlorofluoromethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Vinyl acetate	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Vinyl chloride	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd

J - Probable presence below listed detection. ns - not sampled (dry conditions or frozen)

BFI - Halifax Sanitary Landfill **Halifax, Mass.**

MW-109	Units	4/28/16	9/15/16	4/24/17	9/13/17	5/10/18	9/13/18	4/9/19	9/3/19	4/6/20
Water Level (MSL)	feet	45.75	43.46	46.25	44.65	46.44	45.96	46.31	45.62	46.72
pH	S.U.	**6.07**	7.28	7.07	6.60	6.80	**5.66**	**5.18**	**5.18**	**5.30**
Conductance (umhos/cm)	us/cm	141	60	204	332	214	51	207	116	66
Turbidity	NTU	0.96	1.6	**6.0**	2.1	1.5	0.0	2.6	2.0	**5.01**
Alkalinity as CaCO3	mg/l	nd	nd	11	13	nd	nd	nd	nd	12
COD	mg/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Chloride	mg/l	5.3	8.5	16	90	56	7.1	55	24	12
Cyanide, Total	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Nitrate as N	mg/l	0.15	1.8	2.0	1.7	1.8	1.4	1.3	1.6	0.83
Solids, dis: TDS	mg/l	120	24	43	200	110	28	110	23	29
Sulfate	mg/l	20	nd	5.3	5.5	6.8	nd	nd	8.5	6.5
Arsenic (As) dis	mg/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Barium (Ba) dis	mg/l	0.013	0.019	0.020	0.083	0.054	0.014	0.055	0.032	0.025
Cadmium (Cd) dis	mg/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Calcium (Ca) dis	mg/l	18	4.8	6.0	8.5	6.3	3.3	5.7	3.9	5.1
Chromium (Cr) dis	mg/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Copper (Cu) dis	mg/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Iron (Fe) dis	mg/l	0.13	nd	0.24	nd	nd	nd	nd	nd	0.081
Lead (Pb) dis	mg/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Manganese (Mn) dis	mg/l	**0.38**	0.021	0.029	**0.064**	0.033	0.028	0.036	0.065	0.035
Mercury (Hg) dis	mg/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Selenium (Se) dis	mg/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Silver (Ag) dis	mg/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Sodium (Na) dis	mg/l	8.7	5.7	8.0	49	34	4.9	33	16	11
Zinc (Zn) dis	mg/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,1,1,2-Tetrachloroethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,1,1-Trichloroethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,1,2,2-Tetrachloroethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,1,2-Trichloroethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,1-Dichloroethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,1-Dichloroethene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,1-Dichloropropene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,2,3-Trichlorobenzene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,2,3-Trichloropropane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,2,4-Trichlorobenzene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,2,4-Trimethylbenzene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,2-Dibromo-3-chloropropan	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,2-Dibromoethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,2-Dichlorobenzene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,2-Dichloroethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,2-Dichloropropane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,3,5-Trimethylbenzene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,3-Dichlorobenzene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,3-Dichloropropane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,4-Dichlorobenzene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,4-Dioxane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
2,2-Dichloropropane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
2-Chloroethylvinyl ether	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
2-Hexanone	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Acetone	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd

J - Probable presence below listed detection. ns - not sampled (dry conditions or frozen)

BFI - Halifax Sanitary Landfill **Halifax, Mass.**

MW-109	Units	4/28/16	9/15/16	4/24/17	9/13/17	5/10/18	9/13/18	4/9/19	9/3/19	4/6/20
Acrolein	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Acrylonitrile	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Benzene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Bromobenzene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Bromochloromethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Bromodichloromethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Bromoform	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Bromomethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Carbon disulfide	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Carbon tetrachloride	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Chlorobenzene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Chloroethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Chloroform	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
cis-1,2-Dichloroethene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
cis-1,3-Dichloropropene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Dibromochloromethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Dibromomethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Dichlorodifluoromethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Ethyl ether	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Ethyl methacrylate	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Ethylbenzene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Hexachlorobutadiene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Iodomethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Isopropylbenzene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
m+p-Xylenes	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
2-Butanone	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
4-Methyl-2-pentanone	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Methylene chloride	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Methyl-tert-butyl ether	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Naphthalene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
n-Butylbenzene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
n-Propylbenzene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
o-Chlorotoluene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
o-Xylene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
p-Chlorotoluene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
p-cymene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
sec-Butylbenzene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Styrene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
tert-Butylbenzene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Tetrachloroethene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Tetrahydrofuran	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Toluene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
trans-1,2-Dichloroethene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
trans-1,3-Dichloropropene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
trans-1,4-Dichloro-2-butene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Trichloroethyene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Trichlorofluoromethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Vinyl acetate	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Vinyl chloride	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd

J - Probable presence below listed detection. ns - not sampled (dry conditions or frozen)

BFI - Halifax Sanitary Landfill **Halifax, Mass.**

MW-110	Units	4/28/16	9/15/16	4/24/17	9/13/17	5/10/18	9/13/18	4/9/19	9/3/19	4/7/20
Water Level (MSL)	feet	45.38	43.06	46.02	43.94	46.11	43.90	45.92	44.68	46.58
pH	S.U.	7.19	7.00	7.00	6.73	6.51	**5.39**	**6.02**	**6.08**	**6.02**
Conductance (umhos/cm)	us/cm	133	180	203	201	205	200	189	229	198
Turbidity	NTU	**25.0**	1.7	**6.0**	**5.1**	1.0	0.0	1.5	**7.0**	**11.3**
Alkalinity as CaCO3	mg/l	nd	73	69	86	73	77	74	74	70
COD	mg/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Chloride	mg/l	21	5.9	5.4	5.5	5.3	5.8	5.0	5.9	5.2
Cyanide, Total	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Nitrate as N	mg/l	2.4	0.30	0.22	nd	0.24	nd	0.17	nd	0.19
Solids, dis: TDS	mg/l	68	97	100	150	110	140	120	120	90
Sulfate	mg/l	6.0	24	25	34	25	34	25	35	29
Arsenic (As) dis	mg/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Barium (Ba) dis	mg/l	0.026	0.014	0.013	0.014	0.011	0.014	0.012	0.015	0.013
Cadmium (Cd) dis	mg/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Calcium (Ca) dis	mg/l	6.3	18	16	20	17	19	20	20	17
Chromium (Cr) dis	mg/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Copper (Cu) dis	mg/l	nd	nd	nd	nd	0.014	nd	nd	nd	nd
Iron (Fe) dis	mg/l	0.054	**1.6**	nd	**0.68**	nd	0.15	nd	0.23	0.27
Lead (Pb) dis	mg/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Manganese (Mn) dis	mg/l	0.038	**0.71**	**0.23**	**0.69**	**0.28**	**0.63**	**0.47**	**0.80**	**0.51**
Mercury (Hg) dis	mg/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Selenium (Se) dis	mg/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Silver (Ag) dis	mg/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Sodium (Na) dis	mg/l	11	8.4	7.6	8.6	7.8	8.3	8.6	8.8	7.5
Zinc (Zn) dis	mg/l	nd	nd	nd	nd	0.011	nd	nd	nd	nd
1,1,1,2-Tetrachloroethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,1,1-Trichloroethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,1,2,2-Tetrachloroethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,1,2-Trichloroethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,1-Dichloroethane	ug/l	nd	1.4	1.1	1.3	nd	nd	nd	nd	nd
1,1-Dichloroethene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,1-Dichloropropene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,2,3-Trichlorobenzene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,2,3-Trichloropropane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,2,4-Trichlorobenzene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,2,4-Trimethylbenzene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,2-Dibromo-3-chloropropan	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,2-Dibromoethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,2-Dichlorobenzene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,2-Dichloroethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,2-Dichloropropane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,3,5-Trimethylbenzene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,3-Dichlorobenzene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,3-Dichloropropane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,4-Dichlorobenzene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,4-Dioxane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
2,2-Dichloropropane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
2-Chloroethylvinyl ether	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
2-Hexanone	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Acetone	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd

J - Probable presence below listed detection. ns - not sampled (dry conditions or frozen)

BFI - Halifax Sanitary Landfill **Halifax, Mass.**

MW-110	Units	4/28/16	9/15/16	4/24/17	9/13/17	5/10/18	9/13/18	4/9/19	9/3/19	4/7/20
Acrolein	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Acrylonitrile	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Benzene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Bromobenzene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Bromochloromethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Bromodichloromethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Bromoform	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Bromomethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Carbon disulfide	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Carbon tetrachloride	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Chlorobenzene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Chloroethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Chloroform	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
cis-1,2-Dichloroethene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
cis-1,3-Dichloropropene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Dibromochloromethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Dibromomethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Dichlorodifluoromethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Ethyl ether	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Ethyl methacrylate	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Ethylbenzene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Hexachlorobutadiene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Iodomethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Isopropylbenzene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
m+p-Xylenes	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
2-Butanone	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
4-Methyl-2-pentanone	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Methylene chloride	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Methyl-tert-butyl ether	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Naphthalene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
n-Butylbenzene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
n-Propylbenzene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
o-Chlorotoluene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
o-Xylene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
p-Chlorotoluene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
p-cymene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
sec-Butylbenzene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Styrene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
tert-Butylbenzene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Tetrachloroethene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Tetrahydrofuran	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Toluene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
trans-1,2-Dichloroethene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
trans-1,3-Dichloropropene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
trans-1,4-Dichloro-2-butene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Trichloroethyene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Trichlorofluoromethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Vinyl acetate	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Vinyl chloride	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd

J - Probable presence below listed detection. ns - not sampled (dry conditions or frozen)

BFI - Halifax Sanitary Landfill **Halifax, Mass.**

MW-111	Units	4/28/16	9/15/16	5/26/17	9/13/17	5/10/18	9/13/18	4/9/19	9/4/19	4/7/20
Water Level (MSL)	feet	50.70	46.09	51.14	46.93	51.70	47.42	51.14	47.94	50.97
pH	S.U.	**5.52**	7.32	**6.40**	na	**6.05**	**5.24**	**5.46**	**5.47**	**5.36**
Conductance (umhos/cm)	us/cm	42	41	34	na	44	60	39	52	36
Turbidity	NTU	**14.0**	2.0	5.0	na	3.7	0.0	3.8	1.91	**10.2**
Alkalinity as CaCO3	mg/l	nd	37	nd	na	nd	11	nd	nd	nd
COD	mg/l	nd	nd	nd	na	nd	nd	nd	nd	nd
Chloride	mg/l	5.8	3.9	6.1	na	7.1	6.6	6.2	8.5	4.3
Cyanide, Total	ug/l	nd	nd	nd	na	nd	nd	nd	nd	nd
Nitrate as N	mg/l	nd	nd	nd	na	nd	nd	nd	0.16	nd
Solids, dis: TDS	mg/l	19	29	18	na	nd	29	18	34	14
Sulfate	mg/l	6.2	6.1	nd	na	6.2	nd	nd	nd	7.4
Arsenic (As) dis	mg/l	nd	nd	nd	na	nd	nd	nd	nd	nd
Barium (Ba) dis	mg/l	0.0089	0.0034	0.0094	na	0.012	0.0043	0.0096	0.0072	0.0087
Cadmium (Cd) dis	mg/l	nd	nd	nd	na	nd	nd	nd	nd	nd
Calcium (Ca) dis	mg/l	1.2	nd	1.2	na	1.2	nd	0.79	0.59	0.73
Chromium (Cr) dis	mg/l	nd	nd	nd	na	nd	nd	nd	nd	nd
Copper (Cu) dis	mg/l	nd	0.013	nd	na	nd	nd	nd	nd	nd
Iron (Fe) dis	mg/l	nd	nd	nd	na	nd	0.22	nd	nd	nd
Lead (Pb) dis	mg/l	nd	nd	nd	na	nd	nd	nd	nd	nd
Manganese (Mn) dis	mg/l	0.016	0.0063	0.0099	na	0.011	0.0090	0.038	0.016	0.020
Mercury (Hg) dis	mg/l	nd	nd	nd	na	nd	nd	nd	nd	nd
Selenium (Se) dis	mg/l	nd	nd	nd	na	nd	nd	nd	nd	nd
Silver (Ag) dis	mg/l	nd	nd	nd	na	nd	nd	nd	nd	nd
Sodium (Na) dis	mg/l	4.0	9.0	4.5	na	4.8	12	4.8	7.5	4.7
Zinc (Zn) dis	mg/l	nd	nd	nd	na	nd	nd	nd	nd	nd
1,1,1,2-Tetrachloroethane	ug/l	nd	nd	nd	na	nd	nd	nd	nd	nd
1,1,1-Trichloroethane	ug/l	nd	nd	nd	na	nd	nd	nd	nd	nd
1,1,2,2-Tetrachloroethane	ug/l	nd	nd	nd	na	nd	nd	nd	nd	nd
1,1,2-Trichloroethane	ug/l	nd	nd	nd	na	nd	nd	nd	nd	nd
1,1-Dichloroethane	ug/l	nd	nd	nd	na	nd	nd	nd	nd	nd
1,1-Dichloroethene	ug/l	nd	nd	nd	na	nd	nd	nd	nd	nd
1,1-Dichloropropene	ug/l	nd	nd	nd	na	nd	nd	nd	nd	nd
1,2,3-Trichlorobenzene	ug/l	nd	nd	nd	na	nd	nd	nd	nd	nd
1,2,3-Trichloropropane	ug/l	nd	nd	nd	na	nd	nd	nd	nd	nd
1,2,4-Trichlorobenzene	ug/l	nd	nd	nd	na	nd	nd	nd	nd	nd
1,2,4-Trimethylbenzene	ug/l	nd	nd	nd	na	nd	nd	nd	nd	nd
1,2-Dibromo-3-chloropropan	ug/l	nd	nd	nd	na	nd	nd	nd	nd	nd
1,2-Dibromoethane	ug/l	nd	nd	nd	na	nd	nd	nd	nd	nd
1,2-Dichlorobenzene	ug/l	nd	nd	nd	na	nd	nd	nd	nd	nd
1,2-Dichloroethane	ug/l	nd	nd	nd	na	nd	nd	nd	nd	nd
1,2-Dichloropropane	ug/l	nd	nd	nd	na	nd	nd	nd	nd	nd
1,3,5-Trimethylbenzene	ug/l	nd	nd	nd	na	nd	nd	nd	nd	nd
1,3-Dichlorobenzene	ug/l	nd	nd	nd	na	nd	nd	nd	nd	nd
1,3-Dichloropropane	ug/l	nd	nd	nd	na	nd	nd	nd	nd	nd
1,4-Dichlorobenzene	ug/l	nd	nd	nd	na	nd	nd	nd	nd	nd
1,4-Dioxane	ug/l	nd	nd	nd	na	nd	nd	nd	nd	nd
2,2-Dichloropropane	ug/l	nd	nd	nd	na	nd	nd	nd	nd	nd
2-Chloroethylvinyl ether	ug/l	nd	nd	nd	na	nd	nd	nd	nd	nd
2-Hexanone	ug/l	nd	nd	nd	na	nd	nd	nd	nd	nd
Acetone	ug/l	nd	nd	nd	na	nd	nd	nd	nd	nd

J - Probable presence below listed detection. na - not analyzed (insufficient recharge)

BFI - Halifax Sanitary Landfill **Halifax, Mass.**

MW-111	Units	4/28/16	9/15/16	5/26/17	9/13/17	5/10/18	9/13/18	4/9/19	9/4/19	4/7/20
Acrolein	ug/l	nd	nd	nd	na	nd	nd	nd	nd	nd
Acrylonitrile	ug/l	nd	nd	nd	na	nd	nd	nd	nd	nd
Benzene	ug/l	nd	nd	nd	na	nd	nd	nd	nd	nd
Bromobenzene	ug/l	nd	nd	nd	na	nd	nd	nd	nd	nd
Bromochloromethane	ug/l	nd	nd	nd	na	nd	nd	nd	nd	nd
Bromodichloromethane	ug/l	nd	nd	nd	na	nd	nd	nd	nd	nd
Bromoform	ug/l	nd	nd	nd	na	nd	nd	nd	nd	nd
Bromomethane	ug/l	nd	nd	nd	na	nd	nd	nd	nd	nd
Carbon disulfide	ug/l	nd	nd	nd	na	nd	nd	nd	nd	nd
Carbon tetrachloride	ug/l	nd	nd	nd	na	nd	nd	nd	nd	nd
Chlorobenzene	ug/l	nd	nd	nd	na	nd	nd	nd	nd	nd
Chloroethane	ug/l	nd	nd	nd	na	nd	nd	nd	nd	nd
Chloroform	ug/l	nd	nd	nd	na	nd	nd	nd	nd	nd
cis-1,2-Dichloroethene	ug/l	nd	nd	nd	na	nd	nd	nd	nd	nd
cis-1,3-Dichloropropene	ug/l	nd	nd	nd	na	nd	nd	nd	nd	nd
Dibromochloromethane	ug/l	nd	nd	nd	na	nd	nd	nd	nd	nd
Dibromomethane	ug/l	nd	nd	nd	na	nd	nd	nd	nd	nd
Dichlorodifluoromethane	ug/l	nd	nd	nd	na	nd	nd	nd	nd	nd
Ethyl ether	ug/l	nd	nd	nd	na	nd	nd	nd	nd	nd
Ethyl methacrylate	ug/l	nd	nd	nd	na	nd	nd	nd	nd	nd
Ethylbenzene	ug/l	nd	nd	nd	na	nd	nd	nd	nd	nd
Hexachlorobutadiene	ug/l	nd	nd	nd	na	nd	nd	nd	nd	nd
Iodomethane	ug/l	nd	nd	nd	na	nd	nd	nd	nd	nd
Isopropylbenzene	ug/l	nd	nd	nd	na	nd	nd	nd	nd	nd
m+p-Xylenes	ug/l	nd	nd	nd	na	nd	nd	nd	nd	nd
2-Butanone	ug/l	nd	nd	nd	na	nd	nd	nd	nd	nd
4-Methyl-2-pentanone	ug/l	nd	nd	nd	na	nd	nd	nd	nd	nd
Methylene chloride	ug/l	nd	nd	nd	na	nd	nd	nd	nd	nd
Methyl-tert-butyl ether	ug/l	nd	nd	nd	na	nd	nd	nd	nd	nd
Naphthalene	ug/l	nd	nd	nd	na	nd	nd	nd	nd	nd
n-Butylbenzene	ug/l	nd	nd	nd	na	nd	nd	nd	nd	nd
n-Propylbenzene	ug/l	nd	nd	nd	na	nd	nd	nd	nd	nd
o-Chlorotoluene	ug/l	nd	nd	nd	na	nd	nd	nd	nd	nd
o-Xylene	ug/l	nd	nd	nd	na	nd	nd	nd	nd	nd
p-Chlorotoluene	ug/l	nd	nd	nd	na	nd	nd	nd	nd	nd
p-cymene	ug/l	nd	nd	nd	na	nd	nd	nd	nd	nd
sec-Butylbenzene	ug/l	nd	nd	nd	na	nd	nd	nd	nd	nd
Styrene	ug/l	nd	nd	nd	na	nd	nd	nd	nd	nd
tert-Butylbenzene	ug/l	nd	nd	nd	na	nd	nd	nd	nd	nd
Tetrachloroethene	ug/l	nd	nd	nd	na	nd	nd	nd	nd	nd
Tetrahydrofuran	ug/l	nd	nd	nd	na	nd	nd	nd	nd	nd
Toluene	ug/l	nd	nd	nd	na	nd	nd	nd	nd	nd
trans-1,2-Dichloroethene	ug/l	nd	nd	nd	na	nd	nd	nd	nd	nd
trans-1,3-Dichloropropene	ug/l	nd	nd	nd	na	nd	nd	nd	nd	nd
trans-1,4-Dichloro-2-butene	ug/l	nd	nd	nd	na	nd	nd	nd	nd	nd
Trichloroethyene	ug/l	nd	nd	nd	na	nd	nd	nd	nd	nd
Trichlorofluoromethane	ug/l	nd	nd	nd	na	nd	nd	nd	nd	nd
Vinyl acetate	ug/l	nd	nd	nd	na	nd	nd	nd	nd	nd
Vinyl chloride	ug/l	nd	nd	nd	na	nd	nd	nd	nd	nd

J - Probable presence below listed detection. na - not analyzed (insufficient recharge)

BFI - Halifax Sanitary Landfill **Halifax, Mass.**

MW-112	Units	4/28/16	9/15/16	5/26/17	9/13/17	5/10/18	9/13/18	4/9/19	9/4/19	4/7/20
Water Level (MSL)	feet	46.92	43.32	47.28	44.27	47.67	44.78	47.65	47.74	50.06
pH	S.U.	**5.98**	7.61	6.88	6.81	**6.02**	**5.47**	**5.92**	**5.70**	**5.70**
Conductance (umhos/cm)	us/cm	54	47	108	442	61	56	56	61	64
Turbidity	NTU	**10.0**	3.0	1.8	3.0	1.6	0.0	1.7	1.08	**7.11**
Alkalinity as CaCO3	mg/l	nd	10	13	12	14	12	11	10	12
COD	mg/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Chloride	mg/l	4.8	4.7	5.1	4.8	5.9	5.8	5.8	7.4	7.9
Cyanide, Total	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Nitrate as N	mg/l	0.099	0.11	0.15	0.18	0.22	0.23	0.31	0.41	0.49
Solids, dis: TDS	mg/l	41	26	50	40	nd	35	34	40	nd
Sulfate	mg/l	7.1	nd	7.0	6.8	7.2	7.3	5.9	7.3	6.8
Arsenic (As) dis	mg/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Barium (Ba) dis	mg/l	0.0039	0.0041	0.0041	0.0045	0.0042	0.0043	0.0044	0.0043	0.0048
Cadmium (Cd) dis	mg/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Calcium (Ca) dis	mg/l	2.5	2.5	2.8	2.4	2.8	2.8	2.9	2.9	3.0
Chromium (Cr) dis	mg/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Copper (Cu) dis	mg/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Iron (Fe) dis	mg/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Lead (Pb) dis	mg/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Manganese (Mn) dis	mg/l	nd	0.0037	nd	0.0052	nd	nd	nd	nd	nd
Mercury (Hg) dis	mg/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Selenium (Se) dis	mg/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Silver (Ag) dis	mg/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Sodium (Na) dis	mg/l	5.4	5.3	5.9	5.2	5.8	6.0	6.0	5.8	5.9
Zinc (Zn) dis	mg/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,1,1,2-Tetrachloroethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,1,1-Trichloroethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,1,2,2-Tetrachloroethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,1,2-Trichloroethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,1-Dichloroethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,1-Dichloroethene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,1-Dichloropropene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,2,3-Trichlorobenzene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,2,3-Trichloropropane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,2,4-Trichlorobenzene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,2,4-Trimethylbenzene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,2-Dibromo-3-chloropropan	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,2-Dibromoethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,2-Dichlorobenzene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,2-Dichloroethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,2-Dichloropropane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,3,5-Trimethylbenzene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,3-Dichlorobenzene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,3-Dichloropropane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,4-Dichlorobenzene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,4-Dioxane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
2,2-Dichloropropane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
2-Chloroethylvinyl ether	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
2-Hexanone	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Acetone	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd

J - Probable presence below listed detection. ns - not sampled (dry conditions or frozen)

BFI - Halifax Sanitary Landfill **Halifax, Mass.**

MW-112	Units	4/28/16	9/15/16	5/26/17	9/13/17	5/10/18	9/13/18	4/9/19	9/4/19	4/7/20
Acrolein	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Acrylonitrile	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Benzene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Bromobenzene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Bromochloromethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Bromodichloromethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Bromoform	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Bromomethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Carbon disulfide	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Carbon tetrachloride	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Chlorobenzene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Chloroethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Chloroform	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
cis-1,2-Dichloroethene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
cis-1,3-Dichloropropene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Dibromochloromethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Dibromomethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Dichlorodifluoromethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Ethyl ether	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Ethyl methacrylate	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Ethylbenzene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Hexachlorobutadiene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Iodomethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Isopropylbenzene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
m+p-Xylenes	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
2-Butanone	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
4-Methyl-2-pentanone	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Methylene chloride	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Methyl-tert-butyl ether	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Naphthalene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
n-Butylbenzene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
n-Propylbenzene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
o-Chlorotoluene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
o-Xylene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
p-Chlorotoluene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
p-cymene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
sec-Butylbenzene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Styrene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
tert-Butylbenzene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Tetrachloroethene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Tetrahydrofuran	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Toluene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
trans-1,2-Dichloroethene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
trans-1,3-Dichloropropene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
trans-1,4-Dichloro-2-butene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Trichloroethyene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Trichlorofluoromethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Vinyl acetate	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Vinyl chloride	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd

J - Probable presence below listed detection. ns - not sampled (dry conditions or frozen)

BFI - Halifax Sanitary Landfill **Halifax, Mass.**

MW-113	Units	4/28/16	9/15/16	4/24/17	9/13/17	5/10/18	9/13/18	4/9/19	9/4/19	4/6/20
Water Level (MSL)	feet	46.74	43.90	47.44	43.99	48.13	43.98	47.80	47.05	49.54
pH	S.U.	**5.70**	ns	**6.44**	7.59	**6.23**	**5.91**	**5.89**	**5.99**	**5.37**
Conductance (umhos/cm)	us/cm	50	ns	66	54	101	56	57	63	52
Turbidity	NTU	**7.0**	ns	3.0	**6.0**	3.0	0.0	2.8	0.97	0.02
Alkalinity as CaCO3	mg/l	nd	ns	nd	nd	nd	nd	nd	nd	nd
COD	mg/l	nd	ns	nd	nd	nd	nd	nd	nd	nd
Chloride	mg/l	6.5	ns	5.4	7.8	4.7	8.7	7.2	9.7	6.9
Cyanide, Total	ug/l	nd	ns	nd	nd	nd	nd	nd	nd	nd
Nitrate as N	mg/l	1.1	ns	1.2	0.80	4.0	1.1	0.94	1.1	0.42
Solids, dis: TDS	mg/l	40	ns	39	30	35	37	30	46	26
Sulfate	mg/l	5.9	ns	5.6	nd	11	nd	nd	5.4	7.1
Arsenic (As) dis	mg/l	nd	ns	nd	nd	nd	nd	nd	nd	nd
Barium (Ba) dis	mg/l	0.0091	ns	0.0094	0.014	0.029	0.012	0.016	0.014	0.011
Cadmium (Cd) dis	mg/l	nd	ns	nd	nd	nd	nd	nd	nd	nd
Calcium (Ca) dis	mg/l	2.5	ns	2.4	2.5	2.9	2.5	2.3	2.6	2.8
Chromium (Cr) dis	mg/l	nd	ns	nd	nd	nd	nd	nd	nd	nd
Copper (Cu) dis	mg/l	nd	ns	nd	nd	0.038	nd	nd	nd	nd
Iron (Fe) dis	mg/l	nd	ns	nd	nd	0.099	nd	nd	nd	nd
Lead (Pb) dis	mg/l	nd	ns	nd	nd	nd	nd	nd	nd	nd
Manganese (Mn) dis	mg/l	0.0081	ns	0.014	0.0085	**0.14**	0.011	0.021	0.0096	0.0084
Mercury (Hg) dis	mg/l	nd	ns	nd	nd	nd	nd	nd	nd	nd
Selenium (Se) dis	mg/l	nd	ns	nd	nd	nd	nd	nd	nd	nd
Silver (Ag) dis	mg/l	nd	ns	nd	nd	nd	nd	nd	nd	nd
Sodium (Na) dis	mg/l	4.3	ns	4.3	4.5	6.8	4.5	4.6	5.1	6.3
Zinc (Zn) dis	mg/l	nd	ns	nd	nd	0.035	nd	nd	nd	nd
1,1,1,2-Tetrachloroethane	ug/l	nd	ns	nd	nd	nd	nd	nd	nd	nd
1,1,1-Trichloroethane	ug/l	nd	ns	nd	nd	nd	nd	nd	nd	nd
1,1,2,2-Tetrachloroethane	ug/l	nd	ns	nd	nd	nd	nd	nd	nd	nd
1,1,2-Trichloroethane	ug/l	nd	ns	nd	nd	nd	nd	nd	nd	nd
1,1-Dichloroethane	ug/l	nd	ns	nd	nd	nd	nd	nd	nd	nd
1,1-Dichloroethene	ug/l	nd	ns	nd	nd	nd	nd	nd	nd	nd
1,1-Dichloropropene	ug/l	nd	ns	nd	nd	nd	nd	nd	nd	nd
1,2,3-Trichlorobenzene	ug/l	nd	ns	nd	nd	nd	nd	nd	nd	nd
1,2,3-Trichloropropane	ug/l	nd	ns	nd	nd	nd	nd	nd	nd	nd
1,2,4-Trichlorobenzene	ug/l	nd	ns	nd	nd	nd	nd	nd	nd	nd
1,2,4-Trimethylbenzene	ug/l	nd	ns	nd	nd	nd	nd	nd	nd	nd
1,2-Dibromo-3-chloropropan	ug/l	nd	ns	nd	nd	nd	nd	nd	nd	nd
1,2-Dibromoethane	ug/l	nd	ns	nd	nd	nd	nd	nd	nd	nd
1,2-Dichlorobenzene	ug/l	nd	ns	nd	nd	nd	nd	nd	nd	nd
1,2-Dichloroethane	ug/l	nd	ns	nd	nd	nd	nd	nd	nd	nd
1,2-Dichloropropane	ug/l	nd	ns	nd	nd	nd	nd	nd	nd	nd
1,3,5-Trimethylbenzene	ug/l	nd	ns	nd	nd	nd	nd	nd	nd	nd
1,3-Dichlorobenzene	ug/l	nd	ns	nd	nd	nd	nd	nd	nd	nd
1,3-Dichloropropane	ug/l	nd	ns	nd	nd	nd	nd	nd	nd	nd
1,4-Dichlorobenzene	ug/l	nd	ns	nd	nd	nd	nd	nd	nd	nd
1,4-Dioxane	ug/l	nd	ns	nd	nd	nd	nd	nd	nd	nd
2,2-Dichloropropane	ug/l	nd	ns	nd	nd	nd	nd	nd	nd	nd
2-Chloroethylvinyl ether	ug/l	nd	ns	nd	nd	nd	nd	nd	nd	nd
2-Hexanone	ug/l	nd	ns	nd	nd	nd	nd	nd	nd	nd
Acetone	ug/l	nd	ns	nd	nd	nd	nd	nd	nd	nd

J - Probable presence below listed detection. ns - not sampled (insufficient recharge) echarge)

BFI - Halifax Sanitary Landfill **Halifax, Mass. Mass.**

MW-113	Units	4/28/16	9/15/16	4/24/17	9/13/17	5/10/18	9/13/18	4/9/19	9/4/19	4/6/20
Acrolein	ug/l	nd	ns	nd	nd	nd	nd	nd	nd	nd
Acrylonitrile	ug/l	nd	ns	nd	nd	nd	nd	nd	nd	nd
Benzene	ug/l	nd	ns	nd	nd	nd	nd	nd	nd	nd
Bromobenzene	ug/l	nd	ns	nd	nd	nd	nd	nd	nd	nd
Bromochloromethane	ug/l	nd	ns	nd	nd	nd	nd	nd	nd	nd
Bromodichloromethane	ug/l	nd	ns	nd	nd	nd	nd	nd	nd	nd
Bromoform	ug/l	nd	ns	nd	nd	nd	nd	nd	nd	nd
Bromomethane	ug/l	nd	ns	nd	nd	nd	nd	nd	nd	nd
Carbon disulfide	ug/l	nd	ns	nd	nd	nd	nd	nd	nd	nd
Carbon tetrachloride	ug/l	nd	ns	nd	nd	nd	nd	nd	nd	nd
Chlorobenzene	ug/l	nd	ns	nd	nd	nd	nd	nd	nd	nd
Chloroethane	ug/l	nd	ns	nd	nd	nd	nd	nd	nd	nd
Chloroform	ug/l	nd	ns	nd	nd	nd	nd	nd	nd	nd
cis-1,2-Dichloroethene	ug/l	nd	ns	nd	nd	nd	nd	nd	nd	nd
cis-1,3-Dichloropropene	ug/l	nd	ns	nd	nd	nd	nd	nd	nd	nd
Dibromochloromethane	ug/l	nd	ns	nd	nd	nd	nd	nd	nd	nd
Dibromomethane	ug/l	nd	ns	nd	nd	nd	nd	nd	nd	nd
Dichlorodifluoromethane	ug/l	nd	ns	nd	nd	nd	nd	nd	nd	nd
Ethyl ether	ug/l	nd	ns	nd	nd	nd	nd	nd	nd	nd
Ethyl methacrylate	ug/l	nd	ns	nd	nd	nd	nd	nd	nd	nd
Ethylbenzene	ug/l	nd	ns	nd	nd	nd	nd	nd	nd	nd
Hexachlorobutadiene	ug/l	nd	ns	nd	nd	nd	nd	nd	nd	nd
Iodomethane	ug/l	nd	ns	nd	nd	nd	nd	nd	nd	nd
Isopropylbenzene	ug/l	nd	ns	nd	nd	nd	nd	nd	nd	nd
m+p-Xylenes	ug/l	nd	ns	nd	nd	nd	nd	nd	nd	nd
2-Butanone	ug/l	nd	ns	nd	nd	nd	nd	nd	nd	nd
4-Methyl-2-pentanone	ug/l	nd	ns	nd	nd	nd	nd	nd	nd	nd
Methylene chloride	ug/l	nd	ns	nd	nd	nd	nd	nd	nd	nd
Methyl-tert-butyl ether	ug/l	nd	ns	nd	nd	nd	nd	nd	nd	nd
Naphthalene	ug/l	nd	ns	nd	nd	nd	nd	nd	nd	nd
n-Butylbenzene	ug/l	nd	ns	nd	nd	nd	nd	nd	nd	nd
n-Propylbenzene	ug/l	nd	ns	nd	nd	nd	nd	nd	nd	nd
o-Chlorotoluene	ug/l	nd	ns	nd	nd	nd	nd	nd	nd	nd
o-Xylene	ug/l	nd	ns	nd	nd	nd	nd	nd	nd	nd
p-Chlorotoluene	ug/l	nd	ns	nd	nd	nd	nd	nd	nd	nd
p-cymene	ug/l	nd	ns	nd	nd	nd	nd	nd	nd	nd
sec-Butylbenzene	ug/l	nd	ns	nd	nd	nd	nd	nd	nd	nd
Styrene	ug/l	nd	ns	nd	nd	nd	nd	nd	nd	nd
tert-Butylbenzene	ug/l	nd	ns	nd	nd	nd	nd	nd	nd	nd
Tetrachloroethene	ug/l	nd	ns	nd	nd	nd	nd	nd	nd	nd
Tetrahydrofuran	ug/l	nd	ns	nd	nd	nd	nd	nd	nd	nd
Toluene	ug/l	nd	ns	nd	nd	nd	nd	nd	nd	nd
trans-1,2-Dichloroethene	ug/l	nd	ns	nd	nd	nd	nd	nd	nd	nd
trans-1,3-Dichloropropene	ug/l	nd	ns	nd	nd	nd	nd	nd	nd	nd
trans-1,4-Dichloro-2-butene	ug/l	nd	ns	nd	nd	nd	nd	nd	nd	nd
Trichloroethyene	ug/l	nd	ns	nd	nd	nd	nd	nd	nd	nd
Trichlorofluoromethane	ug/l	nd	ns	nd	nd	nd	nd	nd	nd	nd
Vinyl acetate	ug/l	nd	ns	nd	nd	nd	nd	nd	nd	nd
Vinyl chloride	ug/l	nd	ns	nd	nd	nd	nd	nd	nd	nd

J - Probable presence below listed detection. ns - not sampled (insufficient recharge)

BFI - Halifax Sanitary Landfill **Halifax, Mass.**

MW-114	Units	4/28/16	9/15/16	4/24/17	9/13/17	5/10/18	9/13/18	4/9/19	9/4/19	4/6/20
Water Level (MSL)	feet	49.34	45.94	50.07	46.58	50.49	55.53	50.32	47.03	49.50
pH	S.U.	**5.52**	6.90	7.40	7.42	**6.09**	**5.98**	**6.18**	**5.90**	**5.68**
Conductance (umhos/cm)	us/cm	62	51	62	216	89	83	80	71	73
Turbidity	NTU	3.7	2.9	2.0	1.0	3.0	**31.8**	4.4	1.23	**6.47**
Alkalinity as CaCO3	mg/l	nd	nd	14	16	nd	nd	nd	nd	19
COD	mg/l	nd	nd	nd	12	nd	nd	nd	nd	nd
Chloride	mg/l	7.5	7.6	7.6	8.7	7.8	9.1	7.5	7.6	6.9
Cyanide, Total	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Nitrate as N	mg/l	0.57	0.55	1.1	0.11	0.71	0.68	0.22	0.21	0.16
Solids, dis: TDS	mg/l	41	37	12	63	20	40	28	44	30
Sulfate	mg/l	6.1	nd	6.8	10	6.5	nd	nd	7.1	8.8
Arsenic (As) dis	mg/l	nd	nd	nd	nd	nd	nd	0.0020	0.0015	0.0026
Barium (Ba) dis	mg/l	0.0090	0.0087	0.0080	0.0073	0.0071	0.0076	0.0065	0.0060	0.0072
Cadmium (Cd) dis	mg/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Calcium (Ca) dis	mg/l	2.6	2.6	2.6	3.0	2.4	2.5	2.2	2.0	2.3
Chromium (Cr) dis	mg/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Copper (Cu) dis	mg/l	nd	nd	nd	nd	0.012	nd	nd	nd	nd
Iron (Fe) dis	mg/l	0.081	0.17	**3.7**	**11**	**12**	**6.8**	**8.3**	**6.9**	**11**
Lead (Pb) dis	mg/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Manganese (Mn) dis	mg/l	0.010	0.012	**0.059**	**0.17**	**0.077**	0.047	**0.054**	**0.054**	**0.11**
Mercury (Hg) dis	mg/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Selenium (Se) dis	mg/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Silver (Ag) dis	mg/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Sodium (Na) dis	mg/l	4.5	4.6	6.0	5.7	5.3	5.2	5.2	4.9	7.0
Zinc (Zn) dis	mg/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,1,1,2-Tetrachloroethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,1,1-Trichloroethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,1,2,2-Tetrachloroethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,1,2-Trichloroethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,1-Dichloroethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,1-Dichloroethene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,1-Dichloropropene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,2,3-Trichlorobenzene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,2,3-Trichloropropane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,2,4-Trichlorobenzene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,2,4-Trimethylbenzene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,2-Dibromo-3-chloropropan	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,2-Dibromoethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,2-Dichlorobenzene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,2-Dichloroethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,2-Dichloropropane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,3,5-Trimethylbenzene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,3-Dichlorobenzene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,3-Dichloropropane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,4-Dichlorobenzene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,4-Dioxane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
2,2-Dichloropropane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
2-Chloroethylvinyl ether	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
2-Hexanone	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Acetone	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd

J - Probable presence below listed detection. ns - not sampled (dry conditions or frozen)

BFI - Halifax Sanitary Landfill **Halifax, Mass.**

MW-114	Units	4/28/16	9/15/16	4/24/17	9/13/17	5/10/18	9/13/18	4/9/19	9/4/19	4/6/20
Acrolein	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Acrylonitrile	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Benzene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Bromobenzene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Bromochloromethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Bromodichloromethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Bromoform	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Bromomethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Carbon disulfide	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Carbon tetrachloride	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Chlorobenzene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Chloroethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Chloroform	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
cis-1,2-Dichloroethene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
cis-1,3-Dichloropropene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Dibromochloromethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Dibromomethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Dichlorodifluoromethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Ethyl ether	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Ethyl methacrylate	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Ethylbenzene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Hexachlorobutadiene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Iodomethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Isopropylbenzene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
m+p-Xylenes	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
2-Butanone	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
4-Methyl-2-pentanone	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Methylene chloride	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Methyl-tert-butyl ether	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Naphthalene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
n-Butylbenzene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
n-Propylbenzene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
o-Chlorotoluene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
o-Xylene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
p-Chlorotoluene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
p-cymene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
sec-Butylbenzene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Styrene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
tert-Butylbenzene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Tetrachloroethene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Tetrahydrofuran	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Toluene	ug/l	nd	nd	nd	nd	1.6	9.7	24	nd	nd
trans-1,2-Dichloroethene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
trans-1,3-Dichloropropene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
trans-1,4-Dichloro-2-butene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Trichloroethyene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Trichlorofluoromethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Vinyl acetate	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Vinyl chloride	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd

J - Probable presence below listed detection. ns - not sampled (dry conditions or frozen)

BFI - Halifax Sanitary Landfill **Halifax, Mass.**

MW-115	Units	4/28/16	9/15/16	5/26/17	9/13/17	5/10/18	9/13/18	4/9/19	9/3/19	4/7/20
Water Level (MSL)	feet	46.36	43.71	46.81	44.85	47.27	44.36	47.04	44.81	47.29
pH	S.U.	6.53	7.51	7.00	6.64	**6.17**	6.51	**6.26**	**6.26**	**6.16**
Conductance (umhos/cm)	us/cm	141	139	134	108	156	166	100	118	100
Turbidity	NTU	**9.0**	1.6	3.9	5.0	1.4	0.0	0.0	**5.2**	**5.81**
Alkalinity as CaCO3	mg/l	46	54	40	14	45	43	38	40	40
COD	mg/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Chloride	mg/l	6.0	5.8	6.4	5.3	6.4	6.6	6.4	7.0	7.3
Cyanide, Total	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Nitrate as N	mg/l	nd	nd	0.057	1.5	nd	nd	nd	0.057	0.13
Solids, dis: TDS	mg/l	74	68	76	54	54	66	62	30	29
Sulfate	mg/l	5.9	nd	nd	12	6.5	nd	nd	5.0	5.9
Arsenic (As) dis	mg/l	nd	nd	nd	0.0016	nd	nd	nd	nd	nd
Barium (Ba) dis	mg/l	0.0053	0.0052	0.0048	0.016	0.0050	0.0051	0.0044	0.0051	0.0045
Cadmium (Cd) dis	mg/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Calcium (Ca) dis	mg/l	10	11	10	6.6	9.8	10	9	10	8.8
Chromium (Cr) dis	mg/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Copper (Cu) dis	mg/l	nd	nd	nd	nd	0.014	nd	nd	nd	nd
Iron (Fe) dis	mg/l	nd	0.078	nd	**0.36**	nd	nd	nd	nd	nd
Lead (Pb) dis	mg/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Manganese (Mn) dis	mg/l	0.0076	0.024	0.0084	**0.16**	0.0064	0.023	0.0073	0.016	0.030
Mercury (Hg) dis	mg/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Selenium (Se) dis	mg/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Silver (Ag) dis	mg/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Sodium (Na) dis	mg/l	9.2	9.1	8.1	3.3	8.1	7.9	7.3	8.0	6.7
Zinc (Zn) dis	mg/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,1,1,2-Tetrachloroethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,1,1-Trichloroethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,1,2,2-Tetrachloroethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,1,2-Trichloroethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,1-Dichloroethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,1-Dichloroethene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,1-Dichloropropene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,2,3-Trichlorobenzene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,2,3-Trichloropropane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,2,4-Trichlorobenzene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,2,4-Trimethylbenzene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,2-Dibromo-3-chloropropan	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,2-Dibromoethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,2-Dichlorobenzene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,2-Dichloroethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,2-Dichloropropane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,3,5-Trimethylbenzene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,3-Dichlorobenzene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,3-Dichloropropane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,4-Dichlorobenzene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,4-Dioxane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
2,2-Dichloropropane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
2-Chloroethylvinyl ether	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
2-Hexanone	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Acetone	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd

J - Probable presence below listed detection. ns - not sampled (dry conditions or frozen)

BFI - Halifax Sanitary Landfill **Halifax, Mass.**

MW-115	Units	4/28/16	9/15/16	5/26/17	9/13/17	5/10/18	9/13/18	4/9/19	9/3/19	4/7/20
Acrolein	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Acrylonitrile	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Benzene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Bromobenzene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Bromochloromethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Bromodichloromethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Bromoform	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Bromomethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Carbon disulfide	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Carbon tetrachloride	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Chlorobenzene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Chloroethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Chloroform	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
cis-1,2-Dichloroethene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
cis-1,3-Dichloropropene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Dibromochloromethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Dibromomethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Dichlorodifluoromethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Ethyl ether	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Ethyl methacrylate	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Ethylbenzene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Hexachlorobutadiene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Iodomethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Isopropylbenzene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
m+p-Xylenes	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
2-Butanone	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
4-Methyl-2-pentanone	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Methylene chloride	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Methyl-tert-butyl ether	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Naphthalene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
n-Butylbenzene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
n-Propylbenzene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
o-Chlorotoluene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
o-Xylene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
p-Chlorotoluene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
p-cymene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
sec-Butylbenzene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Styrene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
tert-Butylbenzene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Tetrachloroethene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Tetrahydrofuran	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Toluene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
trans-1,2-Dichloroethene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
trans-1,3-Dichloropropene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
trans-1,4-Dichloro-2-butene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Trichloroethyene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Trichlorofluoromethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Vinyl acetate	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Vinyl chloride	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd

J - Probable presence below listed detection. ns - not sampled (dry conditions or frozen)

BFI - Halifax Sanitary Landfill **Halifax, Mass.**

MW-116	Units	4/28/16	9/15/16	4/24/17	9/13/17	5/10/18	9/13/18	4/9/19	9/3/19	4/7/20
Water Level (MSL)	feet	46.04	43.40	46.49	43.99	46.69	44.31	46.65	44.61	46.99
pH	S.U.	**6.40**	7.40	7.55	7.34	6.52	**6.41**	**6.32**	**6.43**	**6.34**
Conductance (umhos/cm)	us/cm	270	227	237	224	238	231	241	290	232
Turbidity	NTU	3.1	1.0	4.0	**7.1**	**6.0**	0.0	**6.9**	4.4	3.64
Alkalinity as CaCO3	mg/l	96	110	120	94	99	90	100	110	110
COD	mg/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Chloride	mg/l	11	11	13	10	11	10	11	11	11
Cyanide, Total	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Nitrate as N	mg/l	nd	nd	nd	nd	0.14	nd	nd	nd	nd
Solids, dis: TDS	mg/l	180	140	150	150	130	130	140	130	110
Sulfate	mg/l	12	nd	5.1	nd	7.5	nd	nd	nd	5.5
Arsenic (As) dis	mg/l	nd	0.0055	0.0068	0.0082	nd	0.0078	0.0082	**0.011**	0.0081
Barium (Ba) dis	mg/l	nd	0.0086	0.010	0.010	nd	0.0098	0.011	0.014	0.012
Cadmium (Cd) dis	mg/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Calcium (Ca) dis	mg/l	23	24	24	23	22	22	24	23	25
Chromium (Cr) dis	mg/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Copper (Cu) dis	mg/l	nd	nd	nd	nd	0.010	nd	nd	nd	nd
Iron (Fe) dis	mg/l	nd	**2.8**	**3.5**	**4.0**	nd	**3.8**	**4.1**	**5.6**	**4.0**
Lead (Pb) dis	mg/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Manganese (Mn) dis	mg/l	nd	**1.9**	**2.3**	**2.2**	0.0080	**2.3**	**2.4**	**2.7**	**2.5**
Mercury (Hg) dis	mg/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Selenium (Se) dis	mg/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Silver (Ag) dis	mg/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Sodium (Na) dis	mg/l	15	13	14	13	14	12	13	13	13
Zinc (Zn) dis	mg/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,1,1,2-Tetrachloroethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,1,1-Trichloroethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,1,2,2-Tetrachloroethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,1,2-Trichloroethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,1-Dichloroethane	ug/l	nd	1.3	1.4	1.8	nd	2.0	1.6	1.4	1.6
1,1-Dichloroethene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,1-Dichloropropene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,2,3-Trichlorobenzene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,2,3-Trichloropropane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,2,4-Trichlorobenzene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,2,4-Trimethylbenzene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,2-Dibromo-3-chloropropan	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,2-Dibromoethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,2-Dichlorobenzene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,2-Dichloroethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,2-Dichloropropane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,3,5-Trimethylbenzene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,3-Dichlorobenzene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,3-Dichloropropane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,4-Dichlorobenzene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,4-Dioxane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
2,2-Dichloropropane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
2-Chloroethylvinyl ether	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
2-Hexanone	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Acetone	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd

J - Probable presence below listed detection. ns - not sampled (dry conditions or frozen) or frozen) or frozen)

BFI - Halifax Sanitary Landfill **Halifax, Mass. Mass. Mass.**

MW-116	Units	4/28/16	9/15/16	4/24/17	9/13/17	5/10/18	5/10/18	4/9/19	9/3/19	9/3/19
Acrolein	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Acrylonitrile	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Benzene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Bromobenzene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Bromochloromethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Bromodichloromethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Bromoform	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Bromomethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Carbon disulfide	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Carbon tetrachloride	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Chlorobenzene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Chloroethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Chloroform	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
cis-1,2-Dichloroethene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
cis-1,3-Dichloropropene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Dibromochloromethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Dibromomethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Dichlorodifluoromethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Ethyl ether	ug/l	nd	2.0	2.2	2.5	nd	2.2	2.4	1.9	2.2
Ethyl methacrylate	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Ethylbenzene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Hexachlorobutadiene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Iodomethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Isopropylbenzene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
m+p-Xylenes	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
2-Butanone	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
4-Methyl-2-pentanone	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Methylene chloride	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Methyl-tert-butyl ether	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Naphthalene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
n-Butylbenzene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
n-Propylbenzene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
o-Chlorotoluene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
o-Xylene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
p-Chlorotoluene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
p-cymene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
sec-Butylbenzene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Styrene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
tert-Butylbenzene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Tetrachloroethene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Tetrahydrofuran	ug/l	nd	nd	nd	nd	nd	nd	nd	76	nd
Toluene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
trans-1,2-Dichloroethene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
trans-1,3-Dichloropropene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
trans-1,4-Dichloro-2-butene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Trichloroethyene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Trichlorofluoromethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Vinyl acetate	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Vinyl chloride	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd

J - Probable presence below listed detection. ns - not sampled (dry conditions or frozen)

TABLE 3

BFI - Halifax Sanitary Landfill **Halifax, Mass.**

SURFACE WATER SG-1	Units	4/28/16	9/15/16	4/24/17	9/13/17	5/10/18	9/13/18	4/9/19	9/3/19	4/6/20
pH	S.U.	**5.45**	ns	ns	ns	ns	ns	ns	ns	ns
Conductance (umhos/cm)	us/cm	318	ns	ns	ns	ns	ns	ns	ns	ns
Turbidity	NTU	**85.0**	ns	ns	ns	ns	ns	ns	ns	ns
Alkalinity as CaCO3	mg/l	nd	ns	ns	ns	ns	ns	ns	ns	ns
COD	mg/l	33	ns	ns	ns	ns	ns	ns	ns	ns
Chloride	mg/l	87	ns	ns	ns	ns	ns	ns	ns	ns
Cyanide, Total	ug/l	nd	ns	ns	ns	ns	ns	ns	ns	ns
Nitrate as N	mg/l	nd	ns	ns	ns	ns	ns	ns	ns	ns
Solids, dis: TDS	mg/l	210	ns	ns	ns	ns	ns	ns	ns	ns
Sulfate	mg/l	37	ns	ns	ns	ns	ns	ns	ns	ns
Arsenic (As) total	mg/l	nd	ns	ns	ns	ns	ns	ns	ns	ns
Barium (Ba) total	mg/l	0.12	ns	ns	ns	ns	ns	ns	ns	ns
Cadmium (Cd) total	mg/l	nd	ns	ns	ns	ns	ns	ns	ns	ns
Calcium (Ca) total	mg/l	13	ns	ns	ns	ns	ns	ns	ns	ns
Chromium (Cr) total	mg/l	0.028	ns	ns	ns	ns	ns	ns	ns	ns
Copper (Cu) total	mg/l	0.022	ns	ns	ns	ns	ns	ns	ns	ns
Iron (Fe) total	mg/l	**25**	ns	ns	ns	ns	ns	ns	ns	ns
Lead (Pb) total	mg/l	**0.062**	ns	ns	ns	ns	ns	ns	ns	ns
Manganese (Mn) total	mg/l	**0.49**	ns	ns	ns	ns	ns	ns	ns	ns
Mercury (Hg) total	mg/l	0.00036	ns	ns	ns	ns	ns	ns	ns	ns
Selenium (Se) total	mg/l	nd	ns	ns	ns	ns	ns	ns	ns	ns
Silver (Ag) total	mg/l	nd	ns	ns	ns	ns	ns	ns	ns	ns
Sodium (Na) total	mg/l	50.0	ns	ns	ns	ns	ns	ns	ns	ns
Zinc (Zn) total	mg/l	0.090	ns	ns	ns	ns	ns	ns	ns	ns
1,1,1,2-Tetrachloroethane	ug/l	nd	ns	ns	ns	ns	ns	ns	ns	ns
1,1,1-Trichloroethane	ug/l	nd	ns	ns	ns	ns	ns	ns	ns	ns
1,1,2,2-Tetrachloroethane	ug/l	nd	ns	ns	ns	ns	ns	ns	ns	ns
1,1,2-Trichloroethane	ug/l	nd	ns	ns	ns	ns	ns	ns	ns	ns
1,1-Dichloroethane	ug/l	nd	ns	ns	ns	ns	ns	ns	ns	ns
1,1-Dichloroethene	ug/l	nd	ns	ns	ns	ns	ns	ns	ns	ns
1,1-Dichloropropene	ug/l	nd	ns	ns	ns	ns	ns	ns	ns	ns
1,2,3-Trichlorobenzene	ug/l	nd	ns	ns	ns	ns	ns	ns	ns	ns
1,2,3-Trichloropropane	ug/l	nd	ns	ns	ns	ns	ns	ns	ns	ns
1,2,4-Trichlorobenzene	ug/l	nd	ns	ns	ns	ns	ns	ns	ns	ns
1,2,4-Trimethylbenzene	ug/l	nd	ns	ns	ns	ns	ns	ns	ns	ns
1,2-Dibromo-3-chloropropan	ug/l	nd	ns	ns	ns	ns	ns	ns	ns	ns
1,2-Dibromoethane	ug/l	nd	ns	ns	ns	ns	ns	ns	ns	ns
1,2-Dichlorobenzene	ug/l	nd	ns	ns	ns	ns	ns	ns	ns	ns
1,2-Dichloroethane	ug/l	nd	ns	ns	ns	ns	ns	ns	ns	ns
1,2-Dichloropropane	ug/l	nd	ns	ns	ns	ns	ns	ns	ns	ns
1,3,5-Trimethylbenzene	ug/l	nd	ns	ns	ns	ns	ns	ns	ns	ns
1,3-Dichlorobenzene	ug/l	nd	ns	ns	ns	ns	ns	ns	ns	ns
1,3-Dichloropropane	ug/l	nd	ns	ns	ns	ns	ns	ns	ns	ns
1,4-Dichlorobenzene	ug/l	nd	ns	ns	ns	ns	ns	ns	ns	ns
1,4-Dioxane	ug/l	nd	ns	ns	ns	ns	ns	ns	ns	ns
2,2-Dichloropropane	ug/l	nd	ns	ns	ns	ns	ns	ns	ns	ns
2-Chloroethylvinyl ether	ug/l	nd	ns	ns	ns	ns	ns	ns	ns	ns
2-Hexanone	ug/l	nd	ns	ns	ns	ns	ns	ns	ns	ns
Acetone	ug/l	nd	ns	ns	ns	ns	ns	ns	ns	ns
Acrolein	ug/l	nd	ns	ns	ns	ns	ns	ns	ns	ns

SURFACE WATER LOCATION REMOVED AS THE RESULT OF CONSTRUCTION IN AREA AS OF SEPT. 2016

SURFACE WATER SG-1	Units	4/28/16	9/15/16	4/24/17	9/13/17	5/10/18	9/13/18	4/9/19	9/3/19	4/6/20
Acrylonitrile	ug/l	nd	ns	ns	ns	ns	ns	ns	ns	ns
Benzene	ug/l	nd	ns	ns	ns	ns	ns	ns	ns	ns
Bromobenzene	ug/l	nd	ns	ns	ns	ns	ns	ns	ns	ns
Bromochloromethane	ug/l	nd	ns	ns	ns	ns	ns	ns	ns	ns
Bromodichloromethane	ug/l	nd	ns	ns	ns	ns	ns	ns	ns	ns
Bromoform	ug/l	nd	ns	ns	ns	ns	ns	ns	ns	ns
Bromomethane	ug/l	nd	ns	ns	ns	ns	ns	ns	ns	ns
Carbon disulfide	ug/l	nd	ns	ns	ns	ns	ns	ns	ns	ns
Carbon tetrachloride	ug/l	nd	ns	ns	ns	ns	ns	ns	ns	ns
Chlorobenzene	ug/l	nd	ns	ns	ns	ns	ns	ns	ns	ns
Chloroethane	ug/l	nd	ns	ns	ns	ns	ns	ns	ns	ns
Chloroform	ug/l	nd	ns	ns	ns	ns	ns	ns	ns	ns
cis-1,2-Dichloroethene	ug/l	nd	ns	ns	ns	ns	ns	ns	ns	ns
cis-1,3-Dichloropropene	ug/l	nd	ns	ns	ns	ns	ns	ns	ns	ns
Dibromochloromethane	ug/l	nd	ns	ns	ns	ns	ns	ns	ns	ns
Dibromomethane	ug/l	nd	ns	ns	ns	ns	ns	ns	ns	ns
Dichlorodifluoromethane	ug/l	nd	ns	ns	ns	ns	ns	ns	ns	ns
Ethyl ether	ug/l	nd	ns	ns	ns	ns	ns	ns	ns	ns
Ethyl methacrylate	ug/l	nd	ns	ns	ns	ns	ns	ns	ns	ns
Ethylbenzene	ug/l	nd	ns	ns	ns	ns	ns	ns	ns	ns
Hexachlorobutadiene	ug/l	nd	ns	ns	ns	ns	ns	ns	ns	ns
Iodomethane	ug/l	nd	ns	ns	ns	ns	ns	ns	ns	ns
Isopropylbenzene	ug/l	nd	ns	ns	ns	ns	ns	ns	ns	ns
m+p-Xylenes	ug/l	nd	ns	ns	ns	ns	ns	ns	ns	ns
2-Butanone	ug/l	nd	ns	ns	ns	ns	ns	ns	ns	ns
4-Methyl-2-pentanone	ug/l	nd	ns	ns	ns	ns	ns	ns	ns	ns
Methylene chloride	ug/l	nd	ns	ns	ns	ns	ns	ns	ns	ns
Methyl-tert-butyl ether	ug/l	nd	ns	ns	ns	ns	ns	ns	ns	ns
Naphthalene	ug/l	nd	ns	ns	ns	ns	ns	ns	ns	ns
n-Butylbenzene	ug/l	nd	ns	ns	ns	ns	ns	ns	ns	ns
n-Propylbenzene	ug/l	nd	ns	ns	ns	ns	ns	ns	ns	ns
o-Chlorotoluene	ug/l	nd	ns	ns	ns	ns	ns	ns	ns	ns
o-Xylene	ug/l	nd	ns	ns	ns	ns	ns	ns	ns	ns
p-Chlorotoluene	ug/l	nd	ns	ns	ns	ns	ns	ns	ns	ns
p-cymene	ug/l	nd	ns	ns	ns	ns	ns	ns	ns	ns
sec-Butylbenzene	ug/l	nd	ns	ns	ns	ns	ns	ns	ns	ns
Styrene	ug/l	nd	ns	ns	ns	ns	ns	ns	ns	ns
tert-Butylbenzene	ug/l	nd	ns	ns	ns	ns	ns	ns	ns	ns
Tetrachloroethene	ug/l	nd	ns	ns	ns	ns	ns	ns	ns	ns
Tetrahydrofuran	ug/l	nd	ns	ns	ns	ns	ns	ns	ns	ns
Toluene	ug/l	nd	ns	ns	ns	ns	ns	ns	ns	ns
trans-1,2-Dichloroethene	ug/l	nd	ns	ns	ns	ns	ns	ns	ns	ns
trans-1,3-Dichloropropene	ug/l	nd	ns	ns	ns	ns	ns	ns	ns	ns
trans-1,4-Dichloro-2-butene	ug/l	nd	ns	ns	ns	ns	ns	ns	ns	ns
Trichloroethyene	ug/l	nd	ns	ns	ns	ns	ns	ns	ns	ns
Trichlorofluoromethane	ug/l	nd	ns	ns	ns	ns	ns	ns	ns	ns
Vinyl acetate	ug/l	nd	ns	ns	ns	ns	ns	ns	ns	ns
Vinyl chloride	ug/l	nd	ns	ns	ns	ns	ns	ns	ns	ns

SURFACE WATER LOCATION REMOVED AS THE RESULT OF CONSTRUCTION IN AREA AS OF SEPT. 2016

BFI - Halifax Sanitary Landfill **Halifax, Mass.**

SURFACE WATER SG-2	Units	4/28/16	9/15/16	4/24/17	9/13/17	5/10/18	9/13/18	4/9/19	9/4/19	4/6/20
pH	S.U.	**6.32**	7.26	6.87	6.88	5.91	**5.59**	**5.51**	**5.72**	**5.81**
Conductance (umhos/cm)	us/cm	147	207.3	166	240	216	195	159	190	163
Turbidity	NTU	**35.0**	**13.4**	**30.0**	**24.6**	**18.1**	**23.1**	**41.3**	1.71	4.93
Alkalinity as CaCO3	mg/l	nd	nd	nd	14	nd	nd	20	nd	nd
COD	mg/l	25	21	44	24	300	36	53	46	39
Chloride	mg/l	42	51	44	58	53	53	47	54	35
Cyanide, Total	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Nitrate as N	mg/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Solids, dis: TDS	mg/l	140	100	85	140	120	130	100	140	110
Sulfate	mg/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Arsenic (As) total	mg/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Barium (Ba) total	mg/l	0.0094	0.0085	0.0130	0.013	0.018	0.015	0.010	0.013	0.0089
Cadmium (Cd) total	mg/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Calcium (Ca) total	mg/l	3.8	3.9	4.4	5.0	3.9	4.4	3.1	4.0	2.9
Chromium (Cr) total	mg/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Copper (Cu) total	mg/l	nd	nd	nd	nd	0.028	nd	nd	nd	nd
Iron (Fe) total	mg/l	**1.3**	**0.73**	**2.5**	0.17	**3.3**	**0.77**	**0.65**	**0.59**	**0.83**
Lead (Pb) total	mg/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Manganese (Mn) total	mg/l	**0.086**	0.025	**0.20**	0.046	**0.24**	**0.088**	**0.052**	**0.15**	0.036
Mercury (Hg) total	mg/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Selenium (Se) total	mg/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Silver (Ag) total	mg/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Sodium (Na) total	mg/l	24	29	23	35	31	29	25	27	21
Zinc (Zn) total	mg/l	nd	nd	nd	nd	0.025	nd	0.014	nd	nd
1,1,1,2-Tetrachloroethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,1,1-Trichloroethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,1,2,2-Tetrachloroethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,1,2-Trichloroethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,1-Dichloroethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,1-Dichloroethene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,1-Dichloropropene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,2,3-Trichlorobenzene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,2,3-Trichloropropane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,2,4-Trichlorobenzene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,2,4-Trimethylbenzene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,2-Dibromo-3-chloropropan	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,2-Dibromoethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,2-Dichlorobenzene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,2-Dichloroethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,2-Dichloropropane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,3,5-Trimethylbenzene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,3-Dichlorobenzene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,3-Dichloropropane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,4-Dichlorobenzene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,4-Dioxane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
2,2-Dichloropropane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
2-Chloroethylvinyl ether	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
2-Hexanone	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Acetone	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Acrolein	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd

J - Probable presence below listed detection. ns - not sampled (dry conditions or frozen)

BFI - Halifax Sanitary Landfill **Halifax, Mass.**

SURFACE WATER SG-2	Units	4/28/16	9/15/16	4/24/17	9/13/17	5/10/18	9/13/18	4/9/19	9/4/19	4/6/20
Acrylonitrile	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Benzene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Bromobenzene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Bromochloromethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Bromodichloromethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Bromoform	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Bromomethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Carbon disulfide	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Carbon tetrachloride	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Chlorobenzene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Chloroethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Chloroform	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
cis-1,2-Dichloroethene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
cis-1,3-Dichloropropene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Dibromochloromethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Dibromomethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Dichlorodifluoromethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Ethyl ether	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Ethyl methacrylate	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Ethylbenzene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Hexachlorobutadiene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Iodomethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Isopropylbenzene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
m+p-Xylenes	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
2-Butanone	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
4-Methyl-2-pentanone	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Methylene chloride	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Methyl-tert-butyl ether	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Naphthalene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
n-Butylbenzene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
n-Propylbenzene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
o-Chlorotoluene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
o-Xylene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
p-Chlorotoluene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
p-cymene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
sec-Butylbenzene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Styrene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
tert-Butylbenzene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Tetrachloroethene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Tetrahydrofuran	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Toluene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
trans-1,2-Dichloroethene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
trans-1,3-Dichloropropene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
trans-1,4-Dichloro-2-butene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Trichloroethyene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Trichlorofluoromethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Vinyl acetate	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Vinyl chloride	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd

J - Probable presence below listed detection.

ns - not sampled (dry conditions or frozen)

BFI - Halifax Sanitary Landfill **Halifax, Mass.**

SURFACE WATER SG-3	Units	4/28/16	9/15/16	4/24/17	9/13/17	5/10/18	9/13/18	4/9/19	9/3/19	4/7/20
pH	S.U.	**6.34**	7.19	6.75	**6.29**	**5.91**	**5.38**	**5.72**	**5.71**	**5.74**
Conductance (umhos/cm)	us/cm	74	258	167	481	209	193	164	170	134
Turbidity	NTU	2.7	4.6	**32.0**	**19.8**	**6.0**	**19.1**	**34.6**	2.93	**5.98**
Alkalinity as CaCO3	mg/l	nd	13	nd	14	nd	nd	nd	nd	nd
COD	mg/l	28	26	45	35	87	21	53	90	53
Chloride	mg/l	42	61	43	57	53	55	47	48	34
Cyanide, Total	ug/l	nd	nd	0.012	nd	nd	nd	nd	nd	nd
Nitrate as N	mg/l	nd	nd	nd	nd	nd	nd	nd	0.055	nd
Solids, dis: TDS	mg/l	140	140	110	140	120	120	90	96	88
Sulfate	mg/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Arsenic (As) total	mg/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Barium (Ba) total	mg/l	0.0095	0.016	0.014	0.014	0.065	0.014	0.011	0.018	0.0089
Cadmium (Cd) total	mg/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Calcium (Ca) total	mg/l	3.7	5.8	4.3	5.0	3.9	4.1	3.2	3.9	2.9
Chromium (Cr) total	mg/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Copper (Cu) total	mg/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Iron (Fe) total	mg/l	**1.4**	**1.5**	**2.8**	0.21	**3.1**	**0.67**	**0.72**	**4.9**	**0.80**
Lead (Pb) total	mg/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Manganese (Mn) total	mg/l	**0.11**	**0.081**	**0.22**	**0.058**	**0.29**	**0.15**	**0.06**	**0.41**	0.039
Mercury (Hg) total	mg/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Selenium (Se) total	mg/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Silver (Ag) total	mg/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Sodium (Na) total	mg/l	23	35	23	34	32	28	25	71	71
Zinc (Zn) total	mg/l	nd	nd	0.014	nd	0.024	nd	nd	nd	nd
1,1,1,2-Tetrachloroethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,1,1-Trichloroethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,1,2,2-Tetrachloroethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,1,2-Trichloroethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,1-Dichloroethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,1-Dichloroethene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,1-Dichloropropene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,2,3-Trichlorobenzene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,2,3-Trichloropropane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,2,4-Trichlorobenzene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,2,4-Trimethylbenzene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,2-Dibromo-3-chloropropan	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,2-Dibromoethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,2-Dichlorobenzene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,2-Dichloroethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,2-Dichloropropane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,3,5-Trimethylbenzene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,3-Dichlorobenzene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,3-Dichloropropane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,4-Dichlorobenzene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,4-Dioxane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
2,2-Dichloropropane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
2-Chloroethylvinyl ether	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
2-Hexanone	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Acetone	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Acrolein	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd

J - Probable presence below listed detection. ns - not sampled (dry conditions or frozen)

BFI - Halifax Sanitary Landfill **Halifax, Mass.**

SURFACE WATER SG-3	Units	4/28/16	9/15/16	4/24/17	9/13/17	5/10/18	9/13/18	9/13/18	9/3/19	4/7/20
Acrylonitrile	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Benzene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Bromobenzene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Bromochloromethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Bromodichloromethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Bromoform	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Bromomethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Carbon disulfide	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Carbon tetrachloride	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Chlorobenzene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Chloroethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Chloroform	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
cis-1,2-Dichloroethene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
cis-1,3-Dichloropropene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Dibromochloromethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Dibromomethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Dichlorodifluoromethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Ethyl ether	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Ethyl methacrylate	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Ethylbenzene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Hexachlorobutadiene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Iodomethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Isopropylbenzene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
m+p-Xylenes	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
2-Butanone	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
4-Methyl-2-pentanone	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Methylene chloride	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Methyl-tert-butyl ether	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Naphthalene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
n-Butylbenzene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
n-Propylbenzene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
o-Chlorotoluene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
o-Xylene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
p-Chlorotoluene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
p-cymene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
sec-Butylbenzene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Styrene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
tert-Butylbenzene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Tetrachloroethene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Tetrahydrofuran	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Toluene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
trans-1,2-Dichloroethene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
trans-1,3-Dichloropropene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
trans-1,4-Dichloro-2-butene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Trichloroethyene	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Trichlorofluoromethane	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Vinyl acetate	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd
Vinyl chloride	ug/l	nd	nd	nd	nd	nd	nd	nd	nd	nd

J - Probable presence below listed detection.

ns - not sampled (dry conditions or frozen)

APPENDIX A

Boring Logs and Well Construction Forms

DeFeo, Wait & Paré, Inc.

PROJECT: BFI-Halifax
LOCATION: Halifax, Massachusetts
CLIENT: Browning-Ferris Industries
SURFACE ELEVATION: 54.3 feet

BORING #: 102 B301
JOB #: 89-32
MW-116 Page 1 of 2
DATUM: MSL Relative

	Casing	Core Barrel	Sampler
Type	—	HQ	split spoon
Size (ID)	6"/5"	—	—
Augers		Bit:	
Hammer Wt: 140#/300#		Hammer Fall:	30"

GROUNDWATER LEVELS

DATE	TIME	DEPTH TO BOTTOM CASING	DEPTH TO BOTTOM OF HOLE	DEPTH TO WATER
02-19-92	10:54	78.4	80'	10.35

Drilling Co: Geo Logic, Inc.
Driller: D. Green
Inspector: P. Dillon
Start Date: 02-04-92
End Date: 02-10-92

Depth (Ft)	SAMPLE No.	Depth	Pen/Rec	Blows/6"	Sample Description	Stratum Description	Equipment Installed	PID	Rmk
					Gray-Brown M-C SAND				
	S-1	4-6	24"	3/10/10/12	and GRAVEL			0	
5									
	S-2	9-11	24"	6/10/10/12	Brown F-M SAND;			0	
10					Some SILT				
	S-3	14-16	18"	27/31/27				10	
15									
					Gray-Brown M-C SAND;				
					Some Fine Gravel;				
	S-4	19-21	24"	5/10/9/11	Trace Silt			12	
20									
	S-5	24-26	24"	6/12/12/13				5	
25									
	S-6	29-31	18"	20/15/12/30				2	
30									

REMARKS:

NOTES:
- Stratification lines represent approximate boundary between soil types; transitions may be gradual.
- Groundwater level readings have been made at times and under conditions stated. Fluctuations in groundwater level may occur due to other factors than those present at the time the measurements were made.

Proportions Used		Cohesionless Density		Cohesive Density		SUMMARY:
trace	0 - 10%	0 - 4	Very Loose	0 - 4	Soft	Soil Boring:
little	10 - 20%	4 - 10	Loose	4 - 8	Med. Stiff	Rock Coring:
some	20 - 35%	10 - 30	Med. Dense	8 - 15	Stiff	Soil Samples:
and	35 - 50%	30 - 50	Dense	15 - 30	Very Stiff	Rock Samples:
		> 50	Very Dense	> 30	Hard	Well Screen:

DeFeo, Wait & Paré, Inc.

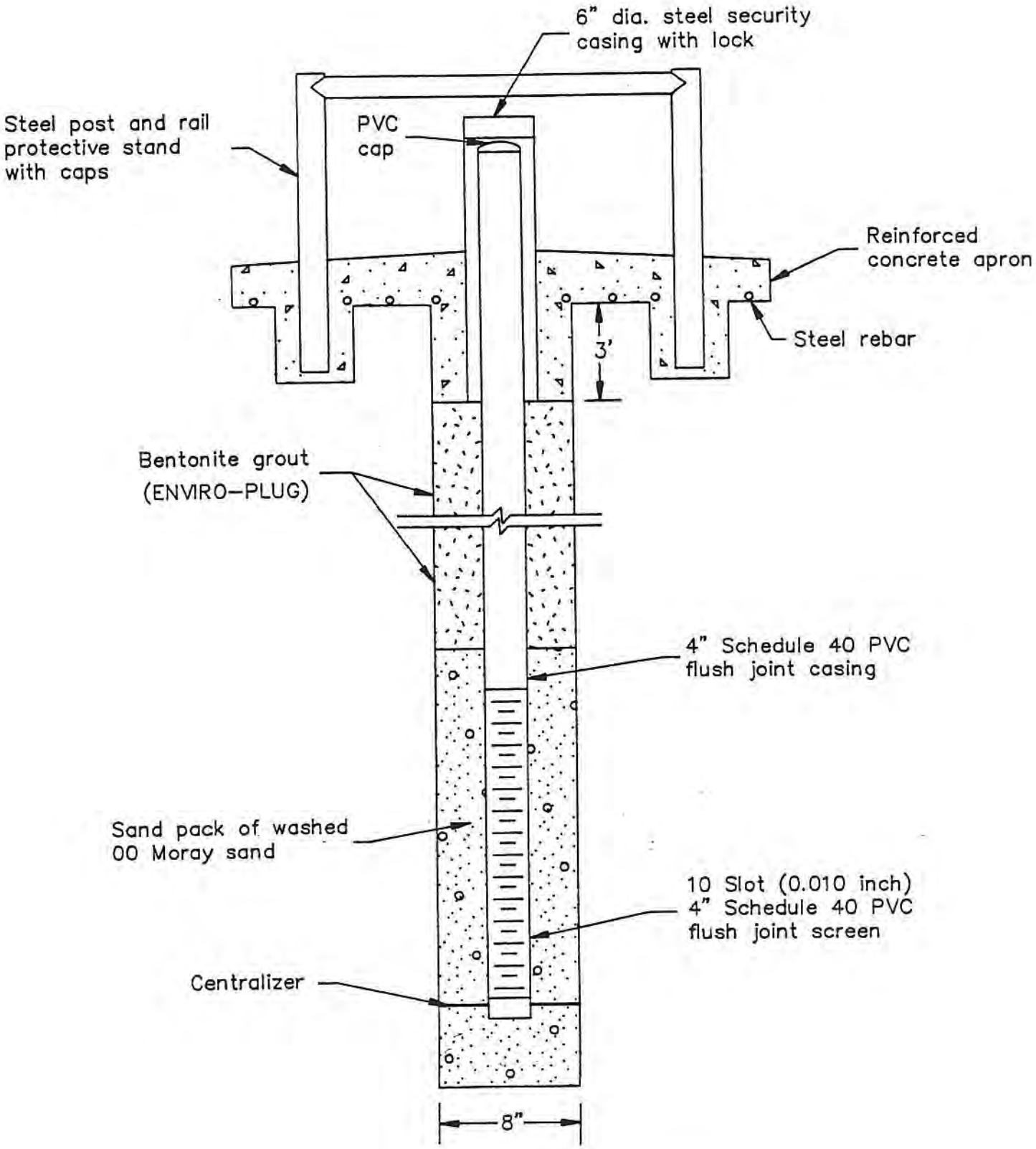
PROJECT: BFI-Halifax
LOCATION: Halifax, Massachusetts
CLIENT: Browning-Ferris Industries
SURFACE ELEVATION:

BORING #: 202 B3(
JOB #: 89-
MW-116 Page 2 of
DATUM: Bedrock well

Depth (Ft)	SAMPLE No.	Depth	Pen/Rec	Blows/6"	Sample Description	Stratum Description	Equipment Installed	PID ppm	Rm
35									
	S-7	34-36	20"	6/12/12/15	Brown Fine Silty SAND;				
40					Some M-C SAND				
	S-8		24"	31/50/49/41	Dense Gray Medium SILT;				
45					Some F-M SAND; Trace GRAVEL;				
					TILL				
	S-9		*24"	12/20/20/40					
50									
	S-10		*18"	35/65/75/100					
55					Gray Shale RQD >50%				
					Gray Clay Seam				
					Core Run #1:				
60					Gray Shale				
					RQD = 75%				
65									
70					Core Run #2:				
					Gray Shale				
					RQD = 93%				
75					Bottom of Hole 80'				

REMARKS: *300 lb. Hammer

Proportions Used		Cohesionless Density		Cohesive Density		SUMMARY:
trace	0 - 10%	0 - 4	Very Loose	0 - 4	Soft	Soil Boring:
little	10 - 20%	4 - 10	Loose	4 - 8	Med. Stiff	Rock Coring:
some	20 - 35%	10 - 30	Med. Dense	8 - 15	Stiff	Soil Samples:
and	35 - 50%	30 - 50	Dense	15 - 30	Very Stiff	Rock Samples:
		> 50	Very Dense	> 30	Hard	Well Screen:



TYPICAL MONITORING WELL DESIGN
BFI LANDFILL, HALIFAX

GROUND WATER MONITORING WELL

WELL NO. 101

Location of Site: BFI Halifax

Well Drilling Contractor: Hydro Group

Driller: Darrell Leam Hydrogeologist: Mack Lewis

Purpose of Well: Ground water monitoring

Comments:

Northing:

Easting:

Collar Elevation: 58.92

Date Completed: 3/21/88

Total Depth: 20.1

WELL CONSTRUCTION DETAILS

Lock: Brass Master padlock

Cap: 11 gauge steel

TYPE OF SURFACE CASING: 6" ϕ schedule 40 steel

58.92 MSL - Surf. Casing Collar Elev.

58.88 MSL - Riser Pipe Collar Elev.

2.5 FT. - Riser Pipe Height Above Ground Elev.

56.40 - GROUND ELEV. MSL

3.0 FT. - Depth of Surface Seal Below Ground

Type of Surface Seal: Reinforced concrete apron

Quan. Used:

3.0 FT. - Depth of Surface Casing Below Ground

6.0 IN. - Inner Diam. of Surf. Casing

8.0 IN. - Diam. of Borehole

Type of Riser Pipe: Schedule 40 PVC Triflex

4 IN. - Inner Diam. - Riser Pipe

4.5 IN. - Outer Diam. - Riser Pipe

Type of Riser Joint/Coupling: Flush Joint casing

49.30 MSL - Top of Screen Elev.

Type of Coupling Joint-Screen to Riser Pipe: Flush joint casing

Type of Screen: wire wound Johnson screen

Screening Size: 10 slot

Screening Opening: .010 inch

39.30 MSL - Bottom of Screen Elev.

0.2 FT. - Length of Tailpiece/Diam. Section, Sump.

38.80 MSL Plug Elevation

Type of Plug: Sediment cap

20.1 FT. - Total Depth of Well

ANNULAR SPACE DETAILS

56.40 MSL Ground Surface Elevation

Type of Backfill: Cement bentonite slurry

No. Bags Cement: 2

No. Bags Bentonite:

Type of Bentonite: "QuickGel" bentonite clay

6.3 FT. Depth to Top of Seal

52.30 MSL Top of Seal Elev.

7.0 FT. Total Seal Interval

Type of Seal: Bentonite pellets

9.3 FT. Depth to top of Sand Pack

50.30 MSL Elev. of Top of Sand Pack

Type of Sand Pack: "Flint shot" silica sand

Source of Sand: Ottawa Silica company

Quantity of Sand Used: 400 lbs

13.2 FT. Total Sand Pack Interval

37.40 MSL Bottom of Sand Pack Elevation

Type of Backfill Below Sand Pack: Sand back to bottom of boring

21.5 FT. Total Borehole Depth

37.40 MSL Elev. of Borehole Bottom

Note: Show Elev. where water 1st. encountered & Static Level.

Soil Zone: NA

From: MSL Elev.

To: MSL Elev.

Weathered Zone: NA

From: MSL Elev.

To: MSL Elev.

Soil/Rock Above Aquifer:

From: MSL Elev.

To: MSL Elev.

AQUIFER MONITORED:

From: 49.30 MSL Elev.

To: 39.30 MSL Elev.

Brown fine to med sand and gravel

Soil/Rock Below Aquifer: NA

From: MSL Elev.

To: MSL Elev.

47.40 MSL - Water 1st. Encountered

44.10 MSL - Static (Steady) Water Level

Location Within: GROUND WATER MONITORING WELL — WELL NO.: 102

Location of Site: BFI Halifax
Well Driller/Contractor: Hydro Group — Geologist: Mark Lewis
Purpose of Well: Ground Water Monitoring
Comments:

Northing:
Easting:
Collection: 58.63
Date Completed: 3/22/88
Total Depth: 60.8

WELL CONSTRUCTION DETAILS

LOCK: Brass Master padlock
CAP: 11 gauge steel
TYPE OF SURFACE CASING: 6 inch diameter Schedule 40 steel

58.63 MSL - Surf. Casing Collar Elev.
58.55 MSL - Riser Pipe Collar Elev.
3.0 Ft. - Riser Pipe Height Above Ground Elev.
56.08 - GROUND ELEV., MSL
3.0 Ft. - Depth of Surface Seal Below Ground
Type of Surface Seal: reinforced concrete apron
Quan. Used:
3.0 Ft. - Depth of Surface Casing Below Ground
6 IN. - Inner Diam. of Surf. Casing
8.0 IN. - Diam. of Borehole

Type of Riser Pipe: Schedule 40 PVC Trilock
4.0 IN. - Inner Diam. - Riser Pipe
4.5 IN. - Outer Diam. - Riser Pipe
Type of Riser Joint/Coupling: Trilock flush joint casing

-8.33 MSL - Top of Screen Elev.
Type of Coupling Joint-Screen to Riser Pipe: flush joint
Type of Screen: Wire wound Johnson Screen
Opening Size: 10 slot
Opening Spacing: .010 inch
-1.67 MSL - Bottom of Screen Elev.
0.2 Ft. - Length of Tailpiece/Diam. Bottom/Cup.
-2.17 MSL - Plug Elevation
Type of Plug: Sediment cup
60.8 Ft. - Total Depth of Well

47.50 MSL - Water 1st. Encountered
45.93 MSL - Static (Stable) Water Level

Note: Show Elev. Water 1st. encountered, & Static Level.

Soil Zone:
From: MSL Elev.
To: MSL Elev.

Soil/Rock Above Aquifer:
From: MSL Elev.
To: MSL Elev.

Aquifer Monitored:
From: 8.33 MSL Elev.
To: -1.67 MSL Elev.
Brown fine to medium sand and gravel some silty clay

Soil/Rock Below Aquifer: NA
From: MSL Elev.
To: MSL Elev.

ANNULAR SPACE DETAILS

56.08 MSL Ground Surface Elevation
Type of Backfill: cement-bentonite slurry
No. Bags Cement: 12
No. Bags Bentonite:
Type of Bentonite: "Quick Gell" Bentonite clay

39.0 Ft. Depth to top of initial sand pack
25 Ft. Total sand pack interval
42.5 Ft. Depth to Top of Seal
15.83 MSL Top of Seal Elev.
2.0 Ft. Total Seal Interval
Type of Seal: bentonite pellets
44.5 Ft. Depth to top of Sand Pack
13.83 MSL Elev. of Top of Sand Pack
Type of Sand Pack: #1 slot Silica Sand
Source of Sand: Ottawa Silica Company
Quantity of Sand Used: 550 lbs
17.5 Ft. Total Sand Pack Interval

-3.37 MSL Bottom of Sand Pack Elevation
Type of Backfill Below Sand Pack: Sand pack to bottom of boring
63.0 Ft. Total Borehole Depth
-3.37 MSL Elev. of Borehole Bottom

GROUND WATER MONITORING WELL

WELL NO.: 103

Location of Site: BFI Halifax
Drilling Contractor: Hydro Group
Driller: Darrell Learn & Geologist: Mark Lewis
Purpose of Well: Ground Water monitoring
Remarks:

Warning:
Casing:
Collar Elevation: 59.82
Date Completed: 3/18/88
Total Depth: 20.5

WELL CONSTRUCTION DETAILS

LOCK: Brass Master Padlock
CAP: 11 gague steel
TYPE OF SURFACE CASING: 6 inch diameter Schedule 40 steel

59.82 MSL - Surf. Casing Collar Elev.
59.79 MSL - Riser Pipe Collar Elev.
3.4 ft. - Riser Pipe Height Above Ground Elev.
52.13 - GROUND ELEV.: MSL
3.0 ft. - Depth of Surface Seal Below Ground
Type of Surface Seal: reinforced Concrete apron
Quan. Used:
3.0 ft. - Depth of Surface Casing Below Ground
6.0 IN. - Inner Diam. of Surf Casing
8.0 IN. - Diam. of Borehole

Type of Riser Pipe: Schedule 40 PVC Trilock
4.0 IN. - Inner Diam. - Riser Pipe
4.5 IN. - Outer Diam. - Riser Pipe
Type of Riser Joint/Coupling: Trilock flush joint casing

49.70 MSL - Top of Screen Elev.
Type of Coupling Joint-Screen to Riser Pipe: flush joint

Type of Screen: Wire wound Johnson screen
Opening Size: 10 slot
Opening Spacing: .010 inch

39.7 MSL - Bottom of Screen Elev.

0.2 ft. - Length of Tailpiece/Diam. Section/Cup.

39.20 MSL - Plug Elevation
Type of Plug: Sediment Cup

20.5 ft. - Total Depth of Well

ANNULAR SPACE DETAILS

57.13 MSL Ground Surface Elevation

Type of Backfill: cement-bentonite slurry
No. Bags Cement:
No. Bags Bentonite:
Type of Bentonite: "Quick Gell" bentonite clay

6.65 ft. Depth to Top of Seal
52.0 MSL Top of Seal Elev.
3.0 ft. Total Seal Interval
Type of Seal: Wyoming bentonite Pellets
8.65 ft. Depth to top of Sand Pack from Ground Surf.
50.0 MSL Elev. of Top of Sand Pack
Type of Sand Pack: "Flint shot" silica sand
Source of Sand: Ottawa silica company
Quantity of Sand Used: 300 lbs

13.75 ft. Total Sand Pack Interval

37.3 MSL Bottom of Sand Pack Elevation

Type of Backfill Below Sand Pack: Sand pack to bottom of boring

32.4 ft. Total Borehole Depth
37.3 MSL Elev. of Borehole Bott

Fill Zone:
From: MSL Elev.
To: MSL Elev.

Note: Show Elev. where water 1st. encountered, & Static Level.

Unconsol. Zone:
From: MSL Elev.
To: MSL Elev.

Soil/Rock Above
Aquifer:
From: MSL Elev.
To: MSL Elev.

Screened Interval:
From: 49.7 MSL Elev.
To: 39.7 MSL Elev.

Brown fine silty sand, some fine to medium quartz

Soil/Rock Below
Aquifer: NA
From: MSL Elev.
To: MSL Elev.

48.13 MSL - Water 1st. Encountered
46.20 MSL - Static (Stable) Water Level

GROUND WATER MONITORING WELL

WELL NO. 104

Location of Site: BFI Halifax

Well Drilling Contractor: Hydro Group

Driller: Darrell Learn Geologist: Mark Lewis

Purpose of Well: Ground Water Monitoring

Comments:

Marking:

Casing:

Mon/Elev: 59.92

Date Completed: 3/23/88

Total Depth: 40.8

WELL CONSTRUCTION DETAILS

LOCK: Brass Master Padlock

CAP: 11 gauge steel

TYPE OF SURFACE CASING: 6 inch diameter Schedule 40 steel

59.92 MSL - Surf. Casing Collar Elev.

59.94 MSL - Riser Pipe Collar Elev.

3.0 Ft. - Riser Pipe Height Above Ground Elev.

57.10 - GROUND ELEV. MSL

3.0 Ft. - Depth of Surface Seal Below Ground

Type of Surface Seal: reinforced concrete apron

Quan. Used:

3.0 Ft. - Depth of Surface Casing Below Ground

6.0 IN. - Inner Diam. of Surf Casing

8.0 IN. - Diam. of Borehole

Type of Riser Pipe: Schedule 40 PVC Trilock

4.0 IN. - Inner Diam. - Riser Pipe

4.5 IN. - Outer Diam. - Riser Pipe

Type of Riser Joint/Coupling: Trilock flush joint casing

29.3 MSL - Top of Screen Elev.

Type of Coupling Joint-Screen to Riser Pipe: flush joint

Type of Screen: Wire wound Johnson screen

Opening Size: 10 slot

Opening Spacing: .010 inch

19.3 MSL - Bottom of Screen Elev.

0.2 Ft. - Length of Tailpiece/Blank Section/Cap.

18.8 MSL - Plug Elevation

Type of Plug: Sediment cup

40.8 Ft. - Total Depth of Well

ANNULAR SPACE DETAILS

57.10 MSL Ground Surface Elevation

Type of Backfill: Cement-bentonite slurry

No. Bags Cement: 8

No. Bags Bentonite: 40 lbs

Type of Bentonite: "Quick Gell" bentonite clay

26.0 ft Depth to top of Initial Sand
1.0 ft Total sand pack interval

27.0 Ft. Depth to Top of Seal

32.3 MSL Top of Seal Elev.

2.0 Ft. Total Seal Interval

Type of Seal: bentonite pellets

29.0 Ft. Depth to top of Sand Pack

30.3 MSL Elev. of Top of Sand

Type of Sand Pack: "Flint shot" silica sand

Source of Sand: Ottawa Silica Company

Quantity of Sand Used: 600 lbs.

12.5 Ft. Total Sand Pack Interv.

18.1 MSL Bottom of Sand Pack Elevation

Type of Backfill Below Sand Pack: Sand back to bottom of boring

41.5 Ft. Total Borehole Depth

18.1 MSL Elev. of Borehole Bott.

Water Level Observations: Water Elev. where water 1st. encountered & Static Level.

Soil Zone: From: MSL Elev. To: MSL Elev.

Weathered Zone: From: MSL Elev. To: MSL Elev.

Soil/Rock Above Aquifer: From: MSL Elev. To: MSL Elev.

Aquifer Monitored: From: 29.3 MSL Elev. To: 19.3 MSL Elev.

Brown fine to coarse sand and gravel

Soil/Rock Below Aquifer: N/A From: MSL Elev. To: MSL Elev.

48.10 MSL - Water 1st. Encountered

44.16 MSL - Static (Stable) Water Level

53 MSL Grade
36 MSL Bottom of screen
17' BG to bottom of screen · 10' screen ⇒ 7-17' BG

INSTALLATION DETAIL: GROUND WATER MONITORING WELL — WELL NO.: 105

Location of Site: BFI Halifax
Drill Driller Contractor: Hydro Group
Driller: Darrell Learn — Geologist: Mark Lewis
Purpose of Well: Ground Water Monitoring
Comments:

Northing:
Easting:
Collar Elevation: 55.83
Date Completed: 3/17/88
Total Depth: 20.0

WELL CONSTRUCTION MATERIALS

Lock: Brass master padlock
Cap: 11 gague steel
TYPE OF SURFACE CASING: 6 inch diameter schedule 40 steel
55.83 MSL - Surf. Casing Collar Elev.
55.85 MSL - Riser Pipe Collar Elev.
3.0 ft. - Riser Pipe Height Above Ground Elev.
52.88 - GROUND ELEV., MSL
3.0 ft. - Depth of Surface Seal Below Ground
Type of Surface Seal: reinforced concrete apron
Quan. Used:
3.0 ft. - Depth of Surface Casing Below Ground
6.0 IN. - Inner Diam. of Surf Casing
8.0 IN. - Diam. of Borehole

Water: Show Elev. where water 1st. encountered, & Static Level.

Fill Zone: From: MSL Elev. To: MSL Elev.

Unconsol. Zone: From: MSL Elev. To: MSL Elev.

Fill/Rock Above Aquifer: From: MSL Elev. To: MSL Elev.

Type of Riser Pipe: Schedule 40 PVC Tri lock
4.0 IN. - Inner Diam. - Riser Pipe
4.5 IN. - Outer Diam. - Riser Pipe
Type of Riser Joint/Coupling: Tri lock flush joint casing

45.93 MSL - Top of Screen Elev.
Type of Coupling Joint-Screen to Riser Pipe: flush joint
Type of Screen: wire wound Johnson screen
Opening Size: 10 slot
Opening Diameter: .010 inch
35.93 MSL - Bottom of Screen Elev.

0.2 ft. - Length of Tailpiece/Blank Section/Cup.
35.43 MSL - Tip Elevation
Type of Plug: Sediment Cup
20.0 ft. - Total Depth of Well

Aquifer Monitored: From: 45.93 MSL Elev. To: 35.93 MSL Elev.
Grey-brown fine to coarse sand and gravel some cobbles and silty clay

Fill/Rock Below Aquifer: NA
From: MSL Elev. To: MSL Elev.

45.88 MSL - Water 1st. Encountered
44.46 MSL - Static (Stable) Water Level

ANNULAR SPACE DETAILS

52.88 MSL Ground Surface Elevation

Type of Backfill: Cement-bentonite slurry
No. Bags Cement:
No. Bags Bentonite:
Type of Bentonite: "Quick Gell" bentonite clay

6.5 ft. Depth to Top of Seal
48.93 MSL Top of Seal Elev.
2.0 ft. Total Seal Interval
Type of Seal: Bentonite pellets

8.5 ft. Depth to top of Sand Pack
46.93 MSL Elev. of Top of Sand Pack
Type of Sand Pack: "Flint shot" silica sand
Source of Sand: Ottawa Silica Company
Quantity of Sand Used: 500 lbs

14.9 ft. Total Sand Pack Interval

32.03 MSL Bottom of Sand Pack Elevation

Type of Backfill Below Sand Pack: Sand pack to bottom of boring

23.4 ft. Total Borehole Depth
32.03 MSL Elev. of Borehole Bott.

Screen = 3.5 – 13.5' BG

WELL NO.: 106

Location of Site: BFI Halifax

Well Drilling Contractor: Hydro Group

Driller: Darrell Learn Inspected: Mark Lewis

Purpose of Well: Ground Water Monitoring

Casing Elev.: 56.73

Date Placed: 3/15/85

Total Depth: 16.3

WELL CONSTRUCTION DETAILS

Lock: Brass Master padlock

Cap: 11 gague steel

Type of Surface Casing: 6 inch diameter schedule 40 steel

56.73 MSL - Surf. Casing Collar Elev.

56.73 MSL - Riser Pipe Collar Elev.

2.3 ft. - Riser Pipe Height Above Ground Elev.

54.23 - GROUND ELEV., MSL

1.0 ft. - Depth of Surface Seal Below Ground

Type of Surface Seal: reinforced concrete apron

Quan. used:

1.0 ft. - Depth of Surface Casing Below Ground

6.0 IN. - Inner Diam. of Surf. Casing

8.0 IN. - Diam. of Borehole

Type of Riser Pipe: Schedule 40 PVC Tri lock

4.0 IN. - Inner Diam. - Riser Pipe

4.5 IN. - Outer Diam. - Riser Pipe

Type of Riser Joint/Coupling: Tri lock flush joint casing

50.70 MSL - Top of Screen Elev.

Type of Coupling Joint-Screen to Riser Pipe: flush joint

Type of Screen: wire wound Johnson screen

Opening Size: 10 slot

Opening Spacing: .010 inch

40.70 MSL - Bottom of Screen Elev.

0.2 ft. - Length of Tailpiece/Diam. Section: Cap

40.20 MSL - Plug Elevation

Type of Plug: Sediment cup

16.3 ft. - Total Depth of Well

48.93 MSL - Water 1st. Encountered

48.29 MSL - Static (Stable) Water Level

ANNULAR SPACE DETAILS

54.23 MSL Ground Surface Elevation

Type of Backfill: Cement - bentonite slurry

No. Bags Cement: 2

No. Bags Bentonite:

Type of Bentonite: Quick Gel bentonite clay

2.7 ft. Depth to Top of Seal

54.0 MSL Top of Seal Elev.

2.0 ft. Total Seal Interval

Type of Seal: Bentonite pellets

7.7 ft. Depth to Top of Sand Pack from Ground Surf.

52.0 MSL Elev. of Top of Sand

Type of Sand Pack: Flint Shot silica sand

Source of Sand: Ottawa Silica Company

Quantity of Sand Used: 500 lbs

13.0 ft. Total Sand Pack Interval

39.0 MSL Bottom of Sand Pack Elevation

Type of Backfill Below Sand Pack: Sand Pack to bottom of boring

17.5 ft. Total Borehole Depth

39.0 MSL Elev. of Borehole Bott

Water Show Elev. where water 1st. encountered, & Static Level

Soil Zone:

From: MSL Elev.

To: MSL Elev.

Weathered Zone:

From: MSL Elev.

To: MSL Elev.

Soil/Rock Above Aquifer:

From: MSL Elev.

To: MSL Elev.

Aquifer Monitored:

From: 50.7 MSL Elev.

To: 40.7 MSL Elev.

grey brown silty sand and gravel trace cobbles and clay

Soil/Rock Below Aquifer: NA

From: MSL Elev.

To: MSL Elev.

10' Screen = 1.2 - 11.2 'BG

Well No.: 107

Location of Site: BFI Halifax
Drilling Contractor: Hydro Group
Driller: Darrell Learn
Purpose of Well: Ground Water Monitoring
Witnessed: Mark Lewis
Northing:
Easting:
Elevation: 55.21
Date Completed: 3/16/88
Total Depth: 16.7

Well Construction Features

Lock: Brass Master padlock
Cap: 11 gauge steel
Type of Surface Casing: 6 inch diam. Schedule 40 steel

55.21 MSL - Surf. Casing Collar Elev.
55.29 MSL - Riser Pipe Collar Elev.
2.0 FT. - Riser Pipe Height Above Ground Elev.
52.71 - Ground Elev., MSL
1.0 FT. - Depth of Surface Seal Below Ground
Type of Surface Seal: Reinforced concrete apron
Quan. Used:
1.0 FT. - Depth of Surface Casing Below Ground
6.0 IN. - Inner Diam. of Surf. Casing
8.0 IN. - Diam. of Borehole

Type of Riser Pipe: Schedule 40 PVC Trilock
4.0 IN. - Inner Diam. - Riser Pipe
4.5 IN. - Outer Diam. - Riser Pipe
Type of Riser Joint/Coupling: Trilock flush joint casing

51.51 MSL - Top of Screen Elev.
Type of Coupling Joint-Screen to Riser Pipe: flush joint
Type of Screen: wire wound Johnson Screen
Opening Size: 10 slot
Opening Material: .010
41.51 MSL - Bottom of Screen Elev.
0.2 FT. - Length of Tailpiece/Diam.: Section/Cap.
38.31 MSL - Plug Elevation
Type of Plug: sediment cap
16.7 FT. - Total Depth of Well

Annular Space Details

52.71 MSL Ground Surface Elevation
Type of Backfill: cement-bentonite slurry
No. Bags Cement:
No. Bags Bentonite:
Type of Bentonite: "Quick Gell" bentonite clay

3.2 FT. Depth to Top of Seal
51.81 MSL Top of Seal Elev.
2.0 FT. Total Seal Interval
Type of Seal: Bentonite pellets
5.2 FT. Depth to top of Sand Pack from Ground Surf.
49.81 MSL Elev. of Top of Sand Pack
Type of Sand Pack: "Flint shot" silica sand
Source of Sand: Ottawa Silica Company
Quantity of Sand Used: 400 lbs
12.3 FT. Total Sand Pack Interval
37.51 MSL Bottom of Sand Pack Elevation
Type of Backfill Below Sand Pack: Sand pack to bottom of boring
17.5 FT. Total Borehole Depth
37.51 MSL Elev. of Borehole Bott.

Unconsolidated Deposits

Note: Show Elev. where water 1st. encountered, & Static Level.
Soil Zone:
From: MSL Elev.
To: MSL Elev.

Weathered Zone:
From: MSL Elev.
To: MSL Elev.

Soil/Rock Above Aquifer:
From: MSL Elev.
To: MSL Elev.

Aquifer Monitored:
From: 51.51 MSL Elev.
To: 41.51 MSL Elev.
Grey-brown silty sand and gravel trace cobbles and clay

Soil/Rock Below Aquifer: NA
From: MSL Elev.
To: MSL Elev.

49.21 MSL - Water 1st. Encountered
48.57 MSL - Static (Stable) Water Level

Installation Type: GROUND WATER MONITORING WELL — Well No.: 108

Location of Site: BFI Halifax
Drilling Contractor: Hydro Group
Driller: Darrell Learn — Geologist: Mark Lewis
Purpose of Well: Ground Water Monitoring
Comments:

Marching:
Casing:
Collection: 63.63
Date Completed: 3/16/88
Total Depth: 25.3

WELL CONSTRUCTION DETAILS

Lock: Brass Master padlock
Cap: 11 gague steel
Type of Surface Casing: 6 inch diam Schedule 40 Steel

63.63 MSL - Surf. Casing Collar Elev.
63.51 MSL - Riser Pipe Collar Elev.
3.0 ft. - Riser Pipe Height Above Ground Elev.
60.63 - Ground Surface Elev., MSL
3.0 ft. - Depth of Surface Seal Below Ground
Type of Surface Seal: reinforced concrete apron
Quan. Used:
3.0 ft. - Depth of Surface Casing Below Ground
6.0 in. - Inner Diam. of Surf. Casing
8.0 in. - Diam. of Borehole

Type of Riser Pipe: Schedule 40 PVC Tri lock
4.0 in. - Inner Diam. - Riser Pipe
4.5 in. - Outer Diam. - Riser Pipe
Type of Riser Joint/Coupling: Tri lock - flush joint casing

48.85 MSL - Top of Screen Elev.
Type of Coupling Joint-Screen to Riser Pipe: flush joint
Type of Screen: wire wound Johnson screen
Screening Slot: 10 slot
Screening Opening: .010 inch

38.85 MSL - Bottom of Screen Elev.
0.2 ft. - Length of Tailpiece/Blank Section/Sump
38.35 MSL - Plug Elevation
Type of Plug: Sediment cup
25.3 ft. - Total Depth of Well

ANNULAR SPACE DETAILS

60.63 MSL Ground Surface Elevation
Type of Backfill: cement-bentonite slurry
No. Bags Cement: 1
No. Bags Bentonite:
Type of Bentonite: "Quick Gell" bentonite clay

11.8 ft. Depth to Top of Seal
51.85 MSL Top of Seal Elev.
2.0 ft. Total Seal Interval
Type of Seal: Bentonite pellets

13.8 ft. Depth to top of Sand Pack from Ground Surf.
49.85 MSL Elev. of Top of Sand Pack
Type of Sand Pack: #1 Flint Shot Silica Sand
Source of Sand: Ottawa Silica Company
Quantity of Sand Used: 900 lbs
12.7 ft. Total Sand Pack Interval

37.15 MSL Bottom of Sand Pack Elevation
Type of Backfill Below Sand Pack: Sand pack to bottom of boring
26.5 ft. Total Borehole Depth
37.15 MSL Elev. of Borehole Bottom

Water: Show Elev. where water 1st. encountered, & Static Level.

Soil Zone:
From: MSL Elev.
To: MSL Elev.

Unconsolidated Deposits:
From: 48.85 MSL Elev.
To: 38.85 MSL Elev.
brown coarse gravel fine to coarse sand, silt and fine clay

Bedrock:
From: MSL Elev.
To: MSL Elev.

Soil/Rock Above Aquifer:
From: MSL Elev.
To: MSL Elev.

Soil/Rock Below Aquifer: NA
From: MSL Elev.
To: MSL Elev.

46.63 MSL - Water 1st. Encountered
44.15 MSL - Static (Stable) Water Level

DEFEO, WAIT HYDROGEOLOGIC SERVICES, INC.

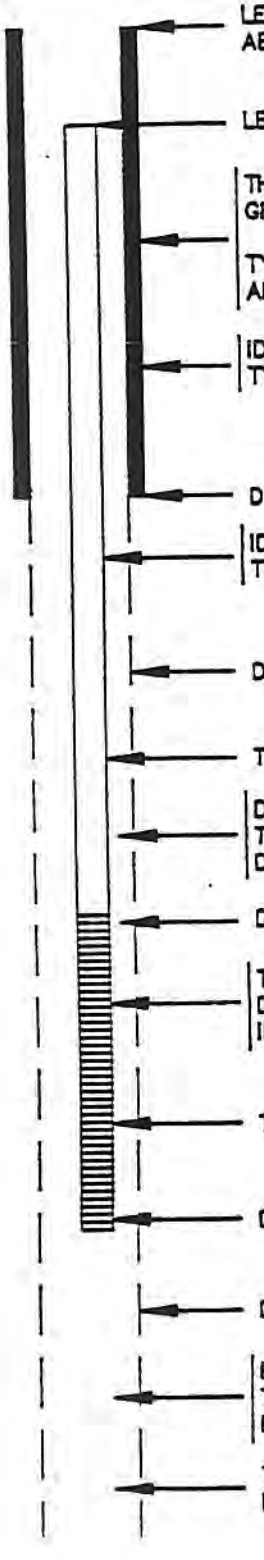
GROUNDWATER OBSERVATION WELL REPORT

PROJECT: BFI - Halifax Landfill
LOCATION: Halifax
CLIENT: BFI
CONTRACTOR: - DRILLER: F. G. Sullivan
LOGGED BY: DTM DATE: 11-29-90 - 11-30-90
CHECKED BY: PMD DATE:

WELL NO.: 109
BORING NO.:
LOCATION:
PROJECT NO.:

ELEV. TOP OF PROTECTIVE CASING 54.03
SURVEY DATUM M.S.L.
GROUND ELEVATION 52.3 Con Pad 51.9

GENERAL SOIL CONDITIONS (Not to Scale)



LENGTH OF PROTECTIVE CASING ABOVE GROUND SURFACE	2.2'
LENGTH OF RISER PIPE ABOVE GROUND SURFACE	2.3'
THICKNESS OF SURFACE SEAL BELOW GROUND SURFACE, IF ANY	5'
TYPE OF SURFACE SEAL (INDICATE ANY ADDITIONAL SEALS)	Concrete
ID OF PROTECTIVE CASING	6"
TYPE OF PROTECTIVE CASING	Steel
DEPTH BOTTOM OF CASING	2.8'
ID AND OD OF RISER PIPE	ID = 4"
TYPE OF RISER PIPE	PVC
DIAMETER OF BOREHOLE	8"
TYPE OF BACKFILL AROUND RISER PIPE	Enviro-Plug
DEPTH TOP OF SEAL, IF ANY	N/A
TYPE OF SEAL	N/A
DEPTH BOTTOM OF SEAL	N/A
DEPTH TOP OF PERVIOUS SECTION	7.3'
TYPE OF PERVIOUS SECTION	PVC
DESCRIBE OPENINGS	10 Slot
ID AND OD OF PERVIOUS SECTION	ID = 4"
TYPE OF BACKFILL AROUND PERVIOUS SECTION	00 Moray Sa
DEPTH BOTTOM OF PERVIOUS SECTION	17.3'
DEPTH BOTTOM OF SAND COLUMN	N/A
ELEV./DEPTH TOP OF SEAL, IF ANY	N/A
TYPE OF SEAL	N/A
ELEV./DEPTH BOTTOM OF SEAL	N/A
TYPE OF BACKFILL BELOW PERVIOUS SECTION, IF ANY	N/A

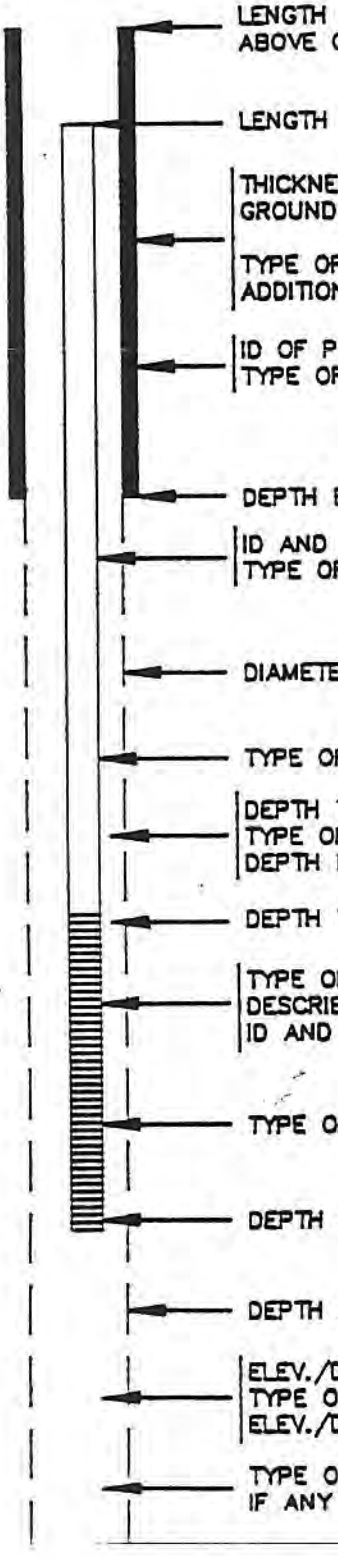
DEFEO, WAIT HYDROGEOLOGIC SERVICES, INC.

GROUNDWATER OBSERVATION WELL REPORT

PROJECT: BFI - Halifax Landfill
LOCATION: Halifax
CLIENT: BFI
CONTRACTOR: - DRILLER: F. G. Sullivan
LOGGED BY: DTM DATE: 11-27-90 - 11-29-90
CHECKED BY: PMD DATE:

PAGE 1 OF 1
WELL NO.: 110
BORING NO.:
LOCATION:
PROJECT NO.:

ELEV. TOP OF PROTECTIVE CASING 54.58
SURVEY DATUM M.S.L.
GROUND ELEVATION 52.2 Con Pad 51.8



LENGTH OF PROTECTIVE CASING ABOVE GROUND SURFACE	2.8'
LENGTH OF RISER PIPE ABOVE GROUND SURFACE	2.9'
THICKNESS OF SURFACE SEAL BELOW GROUND SURFACE, IF ANY	5'
TYPE OF SURFACE SEAL (INDICATE ANY ADDITIONAL SEALS)	Concrete
ID OF PROTECTIVE CASING	6"
TYPE OF PROTECTIVE CASING	Steel
DEPTH BOTTOM OF CASING	2.2'
ID AND OD OF RISER PIPE	ID = 4"
TYPE OF RISER PIPE	PVC
DIAMETER OF BOREHOLE	8"
TYPE OF BACKFILL AROUND RISER PIPE	Enviro-Plug
DEPTH TOP OF SEAL, IF ANY	N/A
TYPE OF SEAL	N/A
DEPTH BOTTOM OF SEAL	N/A
DEPTH TOP OF PERVIOUS SECTION	37.9'
TYPE OF PERVIOUS SECTION	PVC
DESCRIBE OPENINGS	10 Slot
ID AND OD OF PERVIOUS SECTION	ID = 4"
TYPE OF BACKFILL AROUND PERVIOUS SECTION	00 Morav San
DEPTH BOTTOM OF PERVIOUS SECTION	47.9'
DEPTH BOTTOM OF SAND COLUMN	N/A
ELEV./DEPTH TOP OF SEAL, IF ANY	N/A
TYPE OF SEAL	N/A
ELEV./DEPTH BOTTOM OF SEAL	N/A
TYPE OF BACKFILL BELOW PERVIOUS SECTION, IF ANY	N/A

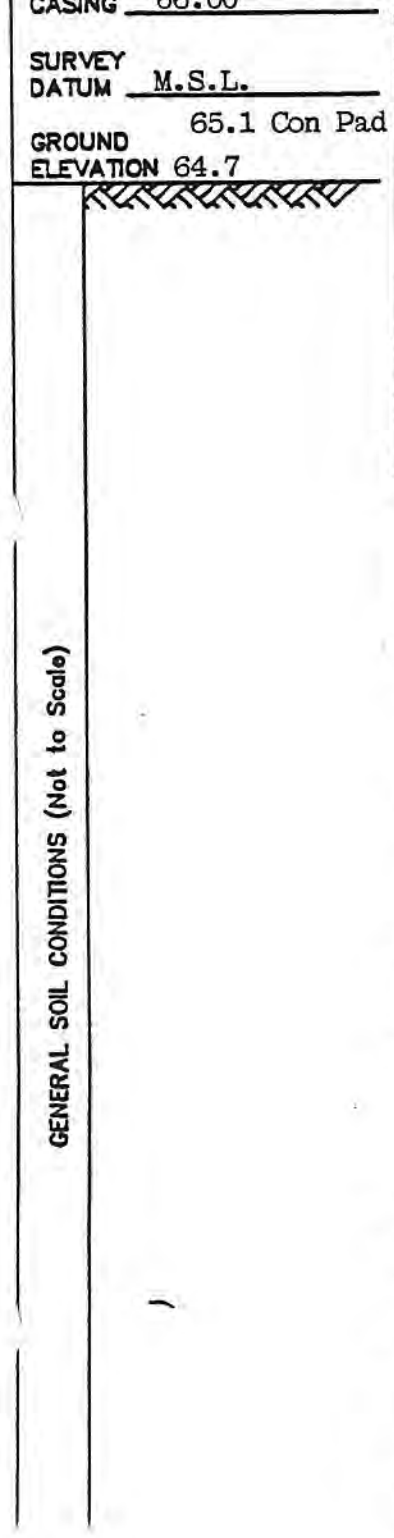
DEFEO, WALT HYDROGEOLOGIC SERVICES, INC.

GROUNDWATER OBSERVATION WELL REPORT

PROJECT: BFI - Halifax Landfill
LOCATION: Halifax
CLIENT: BFI
CONTRACTOR: - DRILLER: F. G. Sullivan
LOGGED BY: DTM DATE: 9-12-90 - 9-17-90
CHECKED BY: PMD DATE:

PAGE 1 OF 1
WELL NO.: 111
BORING NO.:
LOCATION:
PROJECT NO.:

ELEV. TOP OF PROTECTIVE CASING 66.00
SURVEY DATUM M.S.L.
65.1 Con Pad
GROUND ELEVATION 64.7



LENGTH OF PROTECTIVE CASING ABOVE GROUND SURFACE	2.3'
LENGTH OF RISER PIPE ABOVE GROUND SURFACE	2.3'
THICKNESS OF SURFACE SEAL BELOW GROUND SURFACE, IF ANY	5'
TYPE OF SURFACE SEAL (INDICATE ANY ADDITIONAL SEALS)	Concrete
ID OF PROTECTIVE CASING	6"
TYPE OF PROTECTIVE CASING	Steel
DEPTH BOTTOM OF CASING	2.7'
ID AND OD OF RISER PIPE	ID = 4"
TYPE OF RISER PIPE	PVC
DIAMETER OF BOREHOLE	8"
TYPE OF BACKFILL AROUND RISER PIPE	Enviro-Plug
DEPTH TOP OF SEAL, IF ANY	N/A
TYPE OF SEAL	N/A
DEPTH BOTTOM OF SEAL	N/A
DEPTH TOP OF PERVIOUS SECTION	12.7'
TYPE OF PERVIOUS SECTION	PVC
DESCRIBE OPENINGS	10 Slot
ID AND OD OF PERVIOUS SECTION	ID = 4"
TYPE OF BACKFILL AROUND PERVIOUS SECTION	00 Morav Sanc
DEPTH BOTTOM OF PERVIOUS SECTION	22.7'
DEPTH BOTTOM OF SAND COLUMN	N/A
ELEV./DEPTH TOP OF SEAL, IF ANY	N/A
TYPE OF SEAL	N/A
ELEV./DEPTH BOTTOM OF SEAL	N/A
TYPE OF BACKFILL BELOW PERVIOUS SECTION, IF ANY	N/A

GROUNDWATER OBSERVATION WELL REPORT

PROJECT: BFI - Halifax Landfill
LOCATION: Halifax
CLIENT: BFI
CONTRACTOR: - DRILLER: F. G. Sullivan
LOGGED BY: DTM DATE: 9-17-90 - 9-21-90
CHECKED BY: PMD DATE:

PAGE 1 OF 1
WELL NO.: 112
BORING NO.:
LOCATION:
PROJECT NO.:

ELEV. TOP OF PROTECTIVE CASING 67.67
SURVEY DATUM M.S.L.
65.6 Con Pad
GROUND ELEVATION 65.2

GENERAL SOIL CONDITIONS (Not to Scale)

LENGTH OF PROTECTIVE CASING ABOVE GROUND SURFACE	2.5'
LENGTH OF RISER PIPE ABOVE GROUND SURFACE	2.6'
THICKNESS OF SURFACE SEAL BELOW GROUND SURFACE, IF ANY	5'
TYPE OF SURFACE SEAL (INDICATE ANY ADDITIONAL SEALS)	Concrete
ID OF PROTECTIVE CASING	6"
TYPE OF PROTECTIVE CASING	Steel
DEPTH BOTTOM OF CASING	2.5'
ID AND OD OF RISER PIPE	ID = 4"
TYPE OF RISER PIPE	PVC
DIAMETER OF BOREHOLE	8"
TYPE OF BACKFILL AROUND RISER PIPE	Enviro-Plug
DEPTH TOP OF SEAL, IF ANY	N/A
TYPE OF SEAL	N/A
DEPTH BOTTOM OF SEAL	N/A
DEPTH TOP OF PERVIOUS SECTION	29.6'
TYPE OF PERVIOUS SECTION	PVC
DESCRIBE OPENINGS	10 Slot
ID AND OD OF PERVIOUS SECTION	ID = 4"
TYPE OF BACKFILL AROUND PERVIOUS SECTION	00 Morav San
DEPTH BOTTOM OF PERVIOUS SECTION	34.6'
DEPTH BOTTOM OF SAND COLUMN	N/A
ELEV./DEPTH TOP OF SEAL, IF ANY	N/A
TYPE OF SEAL	N/A
ELEV./DEPTH BOTTOM OF SEAL	N/A
TYPE OF BACKFILL BELOW PERVIOUS SECTION, IF ANY	N/A

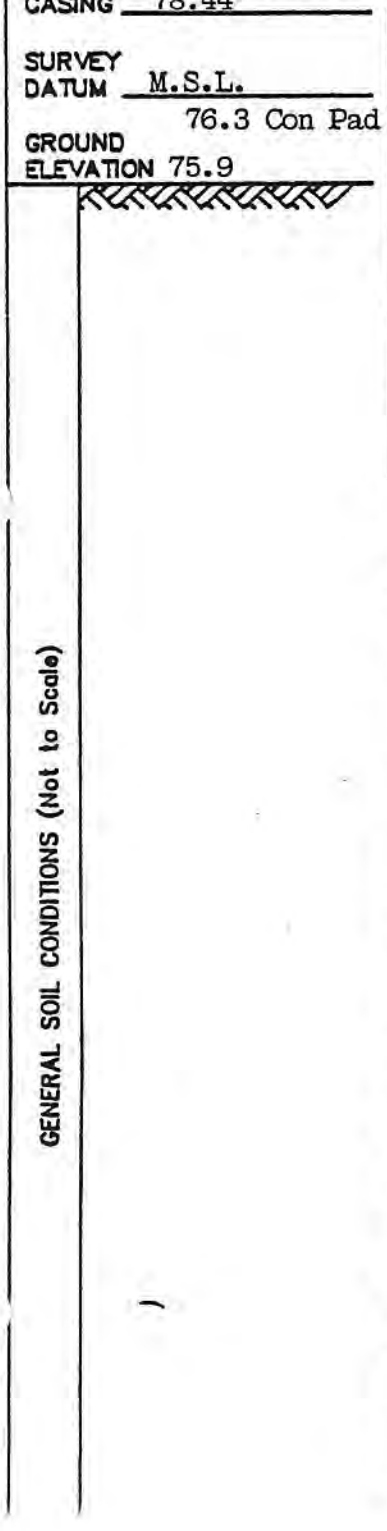
DEFEO, WAIT HYDROGEOLOGIC SERVICES, INC.

GROUNDWATER OBSERVATION WELL REPORT

PROJECT: BFI - Halifax Landfill
LOCATION: Halifax
CLIENT: BFI
CONTRACTOR: - DRILLER: F. G. Sullivan
LOGGED BY: DTM DATE: 10-01-90 - 10-02-90
CHECKED BY: PMD DATE:

PAGE 1 OF 1
WELL NO.: 113
BORING NO.:
LOCATION:
PROJECT NO.:

ELEV. TOP OF PROTECTIVE CASING 78.44
SURVEY DATUM M.S.L.
76.3 Con Pad
GROUND ELEVATION 75.9



LENGTH OF PROTECTIVE CASING ABOVE GROUND SURFACE	2.6'
LENGTH OF RISER PIPE ABOVE GROUND SURFACE	2.6'
THICKNESS OF SURFACE SEAL BELOW GROUND SURFACE, IF ANY	5'
TYPE OF SURFACE SEAL (INDICATE ANY ADDITIONAL SEALS)	Concrete
ID OF PROTECTIVE CASING	6"
TYPE OF PROTECTIVE CASING	Steel
DEPTH BOTTOM OF CASING	2.4'
ID AND OD OF RISER PIPE	ID = 4"
TYPE OF RISER PIPE	PVC
DIAMETER OF BOREHOLE	8"
TYPE OF BACKFILL AROUND RISER PIPE	Enviro-Plug
DEPTH TOP OF SEAL, IF ANY	N/A
TYPE OF SEAL	N/A
DEPTH BOTTOM OF SEAL	N/A
DEPTH TOP OF PERVIOUS SECTION	23.0'
TYPE OF PERVIOUS SECTION	PVC
DESCRIBE OPENINGS	10 Slot
ID AND OD OF PERVIOUS SECTION	ID = 4"
TYPE OF BACKFILL AROUND PERVIOUS SECTION	00 Moray San
DEPTH BOTTOM OF PERVIOUS SECTION	33.0'
DEPTH BOTTOM OF SAND COLUMN	N/A
ELEV./DEPTH TOP OF SEAL, IF ANY	N/A
TYPE OF SEAL	N/A
ELEV./DEPTH BOTTOM OF SEAL	N/A
TYPE OF BACKFILL BELOW PERVIOUS SECTION, IF ANY	N/A

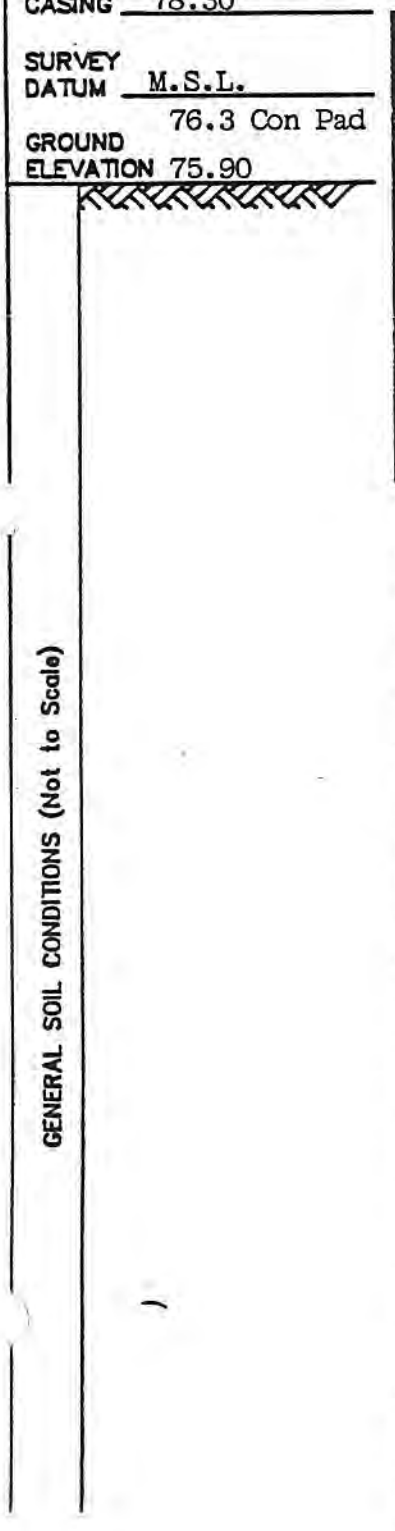
DEFEO, WAIT HYDROGEOLOGIC SERVICES, INC.

GROUNDWATER OBSERVATION WELL REPORT

PROJECT: BFI - Halifax Landfill
LOCATION: Halifax
CLIENT: BFI
CONTRACTOR: - DRILLER: F. G. Sullivan
LOGGED BY: DTM DATE: 9-25-90 - 9-28-90
CHECKED BY: PMD DATE:

PAGE 1 OF 1
WELL NO.: 114
BORING NO.:
LOCATION:
PROJECT NO.:

ELEV. TOP OF PROTECTIVE CASING 78.30
SURVEY DATUM M.S.L.
76.3 Con Pad
GROUND ELEVATION 75.90



LENGTH OF PROTECTIVE CASING ABOVE GROUND SURFACE	2.4'
LENGTH OF RISER PIPE ABOVE GROUND SURFACE	2.5'
THICKNESS OF SURFACE SEAL BELOW GROUND SURFACE, IF ANY	5'
TYPE OF SURFACE SEAL (INDICATE ANY ADDITIONAL SEALS)	Concrete
ID OF PROTECTIVE CASING	6"
TYPE OF PROTECTIVE CASING	Steel
DEPTH BOTTOM OF CASING	2.6'
ID AND OD OF RISER PIPE	ID = 4"
TYPE OF RISER PIPE	PVC
DIAMETER OF BOREHOLE	8"
TYPE OF BACKFILL AROUND RISER PIPE	Enviro-Plug
DEPTH TOP OF SEAL, IF ANY	N/A
TYPE OF SEAL	N/A
DEPTH BOTTOM OF SEAL	N/A
DEPTH TOP OF PERVIOUS SECTION	37.3'
TYPE OF PERVIOUS SECTION	PVC
DESCRIBE OPENINGS	10 Slot
ID AND OD OF PERVIOUS SECTION	ID = 4"
TYPE OF BACKFILL AROUND PERVIOUS SECTION	00 Morav Sand
DEPTH BOTTOM OF PERVIOUS SECTION	47.3'
DEPTH BOTTOM OF SAND COLUMN	N/A
ELEV./DEPTH TOP OF SEAL, IF ANY	N/A
TYPE OF SEAL	N/A
ELEV./DEPTH BOTTOM OF SEAL	N/A
TYPE OF BACKFILL BELOW PERVIOUS SECTION, IF ANY	N/A

DEFEO, WALT HYDROGEOLOGIC SERVICES, INC.

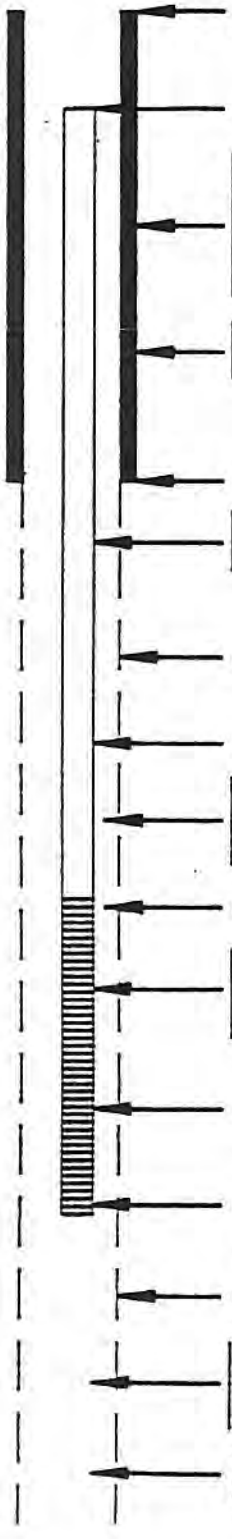
GROUNDWATER OBSERVATION WELL REPORT

PROJECT: BFI - Halifax Landfill
LOCATION: Halifax
CLIENT: BFI
CONTRACTOR: - DRILLER: F. G. Sullivan
LOGGED BY: DTM DATE: 9-18-90 - 9-24-90
CHECKED BY: PMD DATE:

PAGE 1 OF 1
WELL NO.: 115
BORING NO.:
LOCATION:
PROJECT NO.:

ELEV. TOP OF PROTECTIVE CASING 63.96
SURVEY DATUM M.S.L.
61.9 Con Pad
GROUND ELEVATION 61.5

GENERAL SOIL CONDITIONS (Not to Scale)



LENGTH OF PROTECTIVE CASING ABOVE GROUND SURFACE	2.5'
LENGTH OF RISER PIPE ABOVE GROUND SURFACE	2.7'
THICKNESS OF SURFACE SEAL BELOW GROUND SURFACE, IF ANY	5'
TYPE OF SURFACE SEAL (INDICATE ANY ADDITIONAL SEALS)	Concrete
ID OF PROTECTIVE CASING	6"
TYPE OF PROTECTIVE CASING	Steel
DEPTH BOTTOM OF CASING	2.5'
ID AND OD OF RISER PIPE	ID = 4"
TYPE OF RISER PIPE	PVC
DIAMETER OF BOREHOLE	8"
TYPE OF BACKFILL AROUND RISER PIPE	Enviro-Plug
DEPTH TOP OF SEAL, IF ANY	N/A
TYPE OF SEAL	N/A
DEPTH BOTTOM OF SEAL	N/A
DEPTH TOP OF PERVIOUS SECTION	36.3'
TYPE OF PERVIOUS SECTION	PVC
DESCRIBE OPENINGS	10 Slot
ID AND OD OF PERVIOUS SECTION	ID = 4"
TYPE OF BACKFILL AROUND PERVIOUS SECTION	00 Moray Sand
DEPTH BOTTOM OF PERVIOUS SECTION	46.3'
DEPTH BOTTOM OF SAND COLUMN	N/A
ELEV./DEPTH TOP OF SEAL, IF ANY	N/A
TYPE OF SEAL	N/A
ELEV./DEPTH BOTTOM OF SEAL	N/A
TYPE OF BACKFILL BELOW PERVIOUS SECTION, IF ANY	N/A

DEFEO, WAIT & PARÉ, INC.

GROUNDWATER OBSERVATION WELL INSTALLATION REPORT

Project Name: BFI - Halifax Landfill Location: Between MW-104 and MW-105
Project No. 89-32 Boring No. B301 Well No. MW-116
Logged by: PMD
Contractor: Geologic, Inc. Driller: DG
Completion Date/Boring 02-21-92 Completion Date/Well 02-25-92
Survey Datum MSL

Bedrock well log for B-301

Elevation of Top of Protective Casing 55.99
(Depth to Groundwater measured from this point)

Ground Elevation 54.3

General Soil Conditions (Not to Scale)

Length of Surface Casing Above Ground Surface	1.7'
Length of Riser Pipe Above Ground Surface	1.6'
Thickness of Surface Seal Below Ground Surface, if any	6'
Type of Surface Seal (Indicate any additional seals)	Concrete
ID of Surface Casing	6"
Type of Surface Casing	Steel
Depth of Bottom of Casing	3.3'
ID if Riser Pipe	4"
Type of Riser Pipe	PVC
Diameter of Borehole	6"
Type of Backfill Around Riser Pipe	Bentonit Slurry
Depth Top of Seal, if any	N/A
Type of Seal	Bentonit
Depth Bottom of Seal	66.4"
Depth Top of Pervious Section	68.4'
Type of Pervious Section	PVC
Describe Openings	10-Slot
ID of Pervious Section	4"
Type of Backfill Around Pervious Section	Moray Sa
Depth Bottom of Pervious Section	78.4'
Depth Bottom of Sand Column	N/A
Elev./Depth Top of Seal, if any	N/A
Type of Seal	N/A
Elev./Depth botom of Seal	N/A

68 — 78' BG

APPENDIX J

MASSDEP MEMORANDUM TO W.L. FRENCH (DEC. 2013)

Commonwealth of Massachusetts
Executive Office of Energy & Environmental Affairs

Department of Environmental Protection

Northeast Regional Office • 2058 Lowell Street, Wilmington MA 01887 • 978-694-3200

DEVAL L. PATRICK
Governor

RICHARD K. SULLIVAN JR.
Secretary

KENNETH L. KIMMELL
Commissioner

December 23, 2013

William French
W.L. French Excavating Corporation
3 Survey Circle,
North Billerica, MA 01862

RE: TEWKSBURY – St Mary Cemetery

Dear Mr. French:

On December 11, 2013, you contacted this office seeking the Department's position on several matters pertaining to the September 20, 2013 Consent Order for the cemetery expansion project at the subject site. The agency's response in this regard is provided below:

Volatile Organic Compounds (VOC)

Under the Consent Order, concentrations of any VOC present in a soil shipment must be less than 10% of its MassDEP Reportable Concentration value applicable to residential (i.e., S-1) soils, as determined using the MassDEP "Compendium of Analytical Methods" (CAM) testing procedures and protocols.

At issue are the analytical Reporting (Detection) Limits achievable in "routine" VOC analyses, which are adequate for common soil contaminants, but are too high for less common compounds, such as 1,4-Dioxane. When these uncommon contaminants are present, laboratories must employ special sample preparation and testing procedures to achieve the appropriate detection levels. You have asked whether it is necessary to employ these special procedures on soils that are not expected to contain these uncommon contaminants.

Consistent with the flexibility provided in CAM and in the Massachusetts Contingency Plan (MCP) on the choice of analytes and Reporting Limits, we believe use of "routine" VOC testing procedures, with typical Reporting Limits (i.e., 0.1 to 0.9 mg/kg) is sufficient and compliant with the requirements of the Consent Order, as long as the soil being tested is unlikely to contain these less common contaminants, based upon site history, use, and other available and relevant site-specific information. However, if you elect to employ the special procedures on soils, MassDEP will not object. Be advised, though, should the results of any special laboratory procedures indicate a reportable concentration, you must comply with requirements of M.G.L. c.21E and the MCP and nothing in the ACO excuses noncompliance.

Nickel

Under the Consent Order, concentrations of Nickel in soil shipments must be at or below 20 mg/kg, which is the current Reportable Concentration for this contaminant in residential (S-1) areas. You have indicated that detections of this metal have been reported up to 40 mg/kg in soils generated at construction sites where there has been no release of hazardous chemicals, including Nickel, suggesting that these levels are of natural origin.

Based upon historical databases, Nickel has been shown to be naturally occurring in Massachusetts soils up to 48 mg/kg, with even higher values reported in more recent studies conducted in the greater Boston area. As such, it is not unreasonable to assume that values up to 40 – 50 mg/kg may indeed by "background" at any given site in the greater Boston area.

Naturally occurring levels of metals in soil are not regulated by M.G.L. c. 21E or the Massachusetts Contingency Plan, except if they are moved to other locations where indigenous concentrations are significantly lower, in which case they may be classified and regulated by the Department as a "release". However, the most current scientific studies on Nickel have demonstrated that it is significantly less toxic than previously believed. For this reason, and as you know, imminent changes to the Massachusetts Contingency Plan anticipated in early 2014 will increase the current S-1 Reportable Concentration of 20 mg/kg to 600 mg/kg.

Given the latest information on "background" levels of Nickel in Massachusetts, and the pending changes to its Reportable Concentration, the Department will exercise its enforcement discretion and allow the re-use/filling of soils with naturally occurring levels of Nickel up to 50 mg/kg at Saint Mary's as part of the cemetery expansion project.

Please let me know if you have any additional questions or concerns.

Very Truly Yours,

Eric Worrall
Acting Regional Director

CC: John Fitzgerald, Heidi Zisch - MassDEP