

MacDonald Final February 2, 2022

Soil Re-Use Management Plan

Revision 3 (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: February 2, 2022



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1.0 Introduction

1.1 Overview and Site Conditions

The following is a **Third 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 Second Revised SRMP prepared on September 14, 2020 by Richard Stromberg, LSP, which addressed the placement of approximately 1.3 million tons of soil under “Phase III” Soil Fill Activities with constituent levels below RCS-1 and RCS-2. On January 20, 2020, MassDEP conditionally approved the Post-Closure Use permit application. The SRMP also includes provisions for management of Street Sweepings (SS) as allowed under the MassDEP “Reuse and Disposal of Street Sweepings” Policy #BAW-18-001 provided they are adequately characterized.

The purpose of this Third Revised SRMP (“SRMP Revision 3”) is to provide for the acceptance of “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. 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 plans to 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. In this version of the SAC, testing for fecal coliform for CBC material is added to the SAC.

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 a 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.

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 591,468 tons 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 and street sweepings is controlled by final elevations, however, the volume of catch basin cleanings to be accepted is limited to 200,000 tons pursuant to the February 2022 ACO amendment. The soil placement will meet the requirements set forth in the attached revised 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.

MLCRA 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 MacDonald’s 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, and September 2020 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 soils and CBC 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 soil containing contaminant levels that are below RCS-1 and 2 Reportable Concentrations.

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

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MLCRA, 946 Plymouth Street/Rt. 106 Halifax Town Line, Bridgewater, MA and BFI Halifax Landfill

Phone: (508) -245-3745 e-mail michael@macdonald-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

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 CBC material 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 591,468 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 ACO’s, Amendments, SRMP Revisions, and Parties:

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

Since Phase III now includes acceptance of CBC material 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. Once executed, all remaining soil and other material fill activities will be performed in accordance with the first amendment to ACO No. 00009681.

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. The 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. Lastly, the CBC material re-use letters were prepared in June 2020, and April and June 2021 and submitted to MassDEP.

Finally, MassDEP has approved a revised SAC provided in this SRMP, so that they are consistent with SAC at other similar re-use sites and account for additional testing guidance mentioned above. Soil and 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
- 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, and December 2020 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 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. This revision supersedes 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.
- VOC's 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.
- PCB's 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 PCB's 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). 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 or MCP Remediation Waste and meet the following criteria as required in the MCP.

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

As prohibited under 310 CMR 40.0032 of the MCP, candidate soils from Disposal Sites within an RCS-1 area that has oil and/or hazardous material (OHM) at concentrations greater than the RCS-1 Reportable Concentrations are considered Remediation Waste as defined in the MCP and cannot be transported to or reused at the Site.

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

Candidate soils from Disposal Sites within 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.

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. 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.

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 November 2021 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.
- 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 MacDonal 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 MacDonal 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
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.
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.
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.
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.
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.

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)			
	<input type="checkbox"/> YES	<input type="checkbox"/> NO	
Was there any detection of additional chemicals besides those listed in Minimum Analytical Data (SECTION B) ? (check one)			
	<input type="checkbox"/> YES (Fill out SECTION D)	<input type="checkbox"/> 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).			
<input type="checkbox"/> 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.		
<input type="checkbox"/>	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:	
- <i>"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."</i>	
- <i>"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."</i>	

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:	
- <i>"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.</i>	

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"):

<input type="checkbox"/>	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?
<input type="checkbox"/>	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?
<input type="checkbox"/>	Does the QEP Opinion letter describe current and former site usage/history justifying the applicable Category?
<input type="checkbox"/>	Does the QEP Opinion letter describe site contaminants?
<input type="checkbox"/>	Is a site sketch included? Does it identify soil source location and sample locations?
<input type="checkbox"/>	Is material free of visual signs of impact or nuisance conditions, such as staining and discoloration?
<input type="checkbox"/>	Is material free of solid wastes?
<input type="checkbox"/>	Is field screening data from the time of sample collection provided?
<input type="checkbox"/>	Is sample data from multi-point composite samples (3-5 grab samples per composite), with the exception of discrete samples for VOC analysis?
<input type="checkbox"/>	Is all of the Minimum Analytical Data Analysis performed as identified in SECTION B of the Soil Re-Use Approval Request Form?
<input type="checkbox"/>	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)?
<input type="checkbox"/>	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?
<input type="checkbox"/>	Is material free of visible asbestos?
<input type="checkbox"/>	Are complete copies of the laboratory data, chain(s) of custody, and the QA/QC package for the analysis performed included?
<input type="checkbox"/>	If there is data for any sample(s) that are included with the submitted laboratory reports that are <u>not</u> 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?
<input type="checkbox"/>	Was TCLP testing performed for metals or organic compounds when the total concentrations in the material are above the theoretical 20:1 levels?
<input type="checkbox"/>	Is asphalt, brick, and/or concrete mixed with reclamation materials?
<input type="checkbox"/>	Is there a signed Material Shipping Record? Does the quantity of material requested for acceptance match the quantity listed on the MSR?
<input type="checkbox"/>	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:	
<p>"To the best of my knowledge, I certify the information on this form is accurate and complete."</p>	
	<p>Signature Date</p>



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.

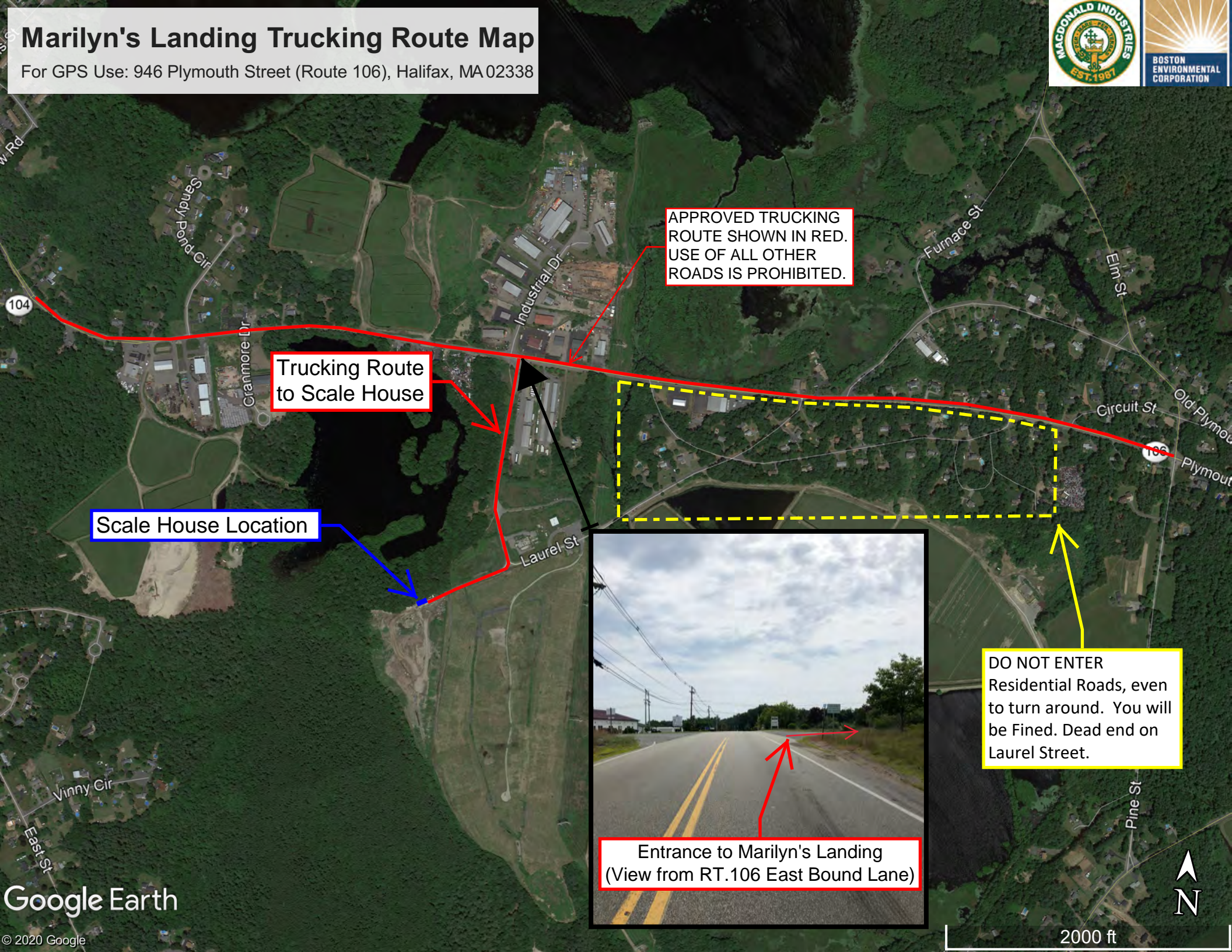
I (print name) _____ Truck Driver for the
Truck Company (print company name) _____ have
read the above Marilyn's Landing Trucking Rules. I understand the Rules, have a
printed copy of the Trucking Route Map, and will follow the Trucking Route and
Trucking Rules.

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

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



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

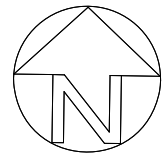


2000 ft

FIGURES



USGS Topographic Map



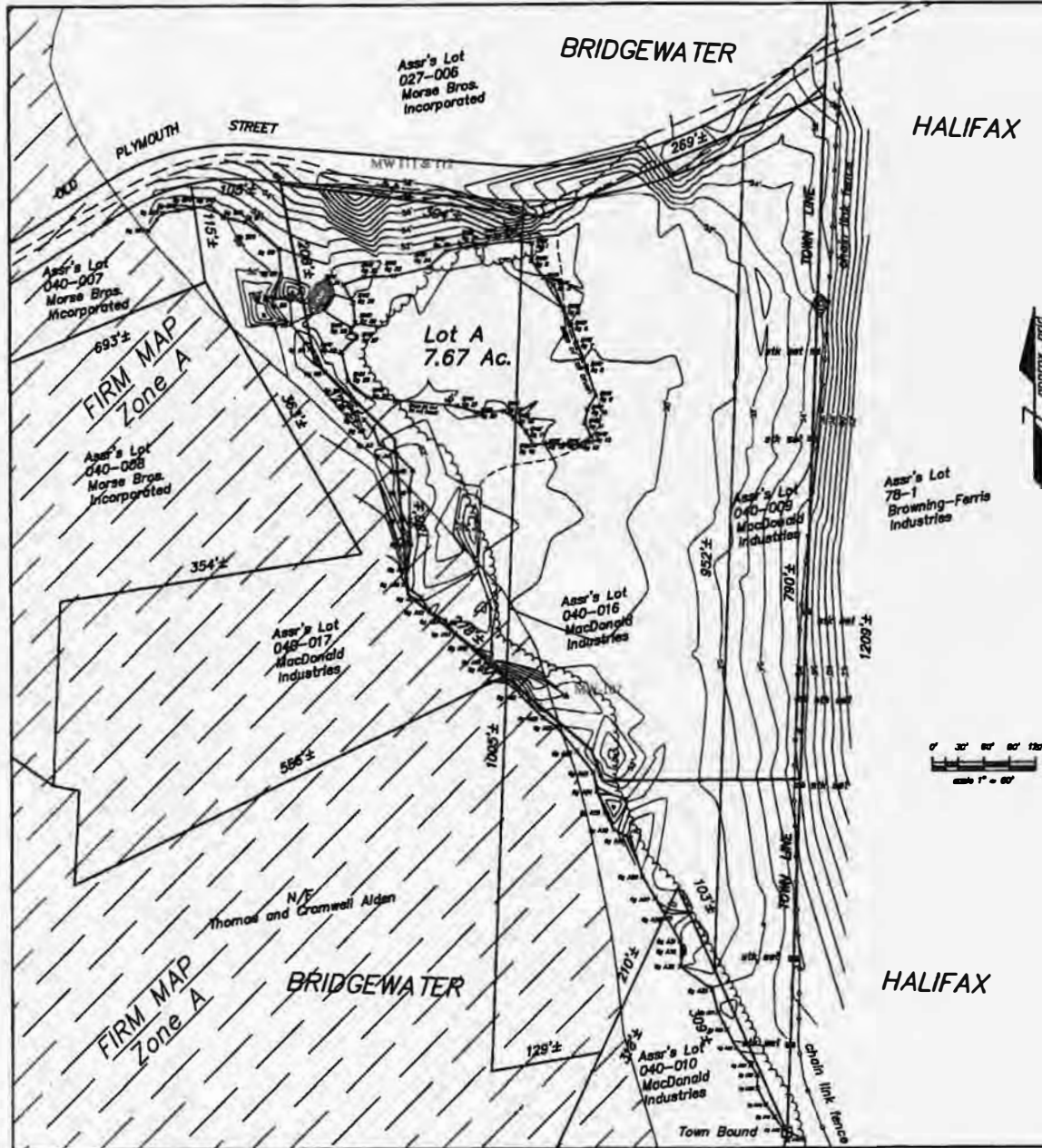
SITE LOCUS
 Marilyn's Landing
 Off Plymouth Street
 Bridgewater, Massachusetts

SCALE: Not Shown

February 2019

FIGURE NO. 1





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

Elevations are on the NAVD 1988 datum.

△ = 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.

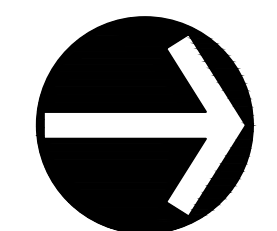
FEMA FIRM Zone A added as hatched area in June 2013.

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: 1 in. = 60 ft.





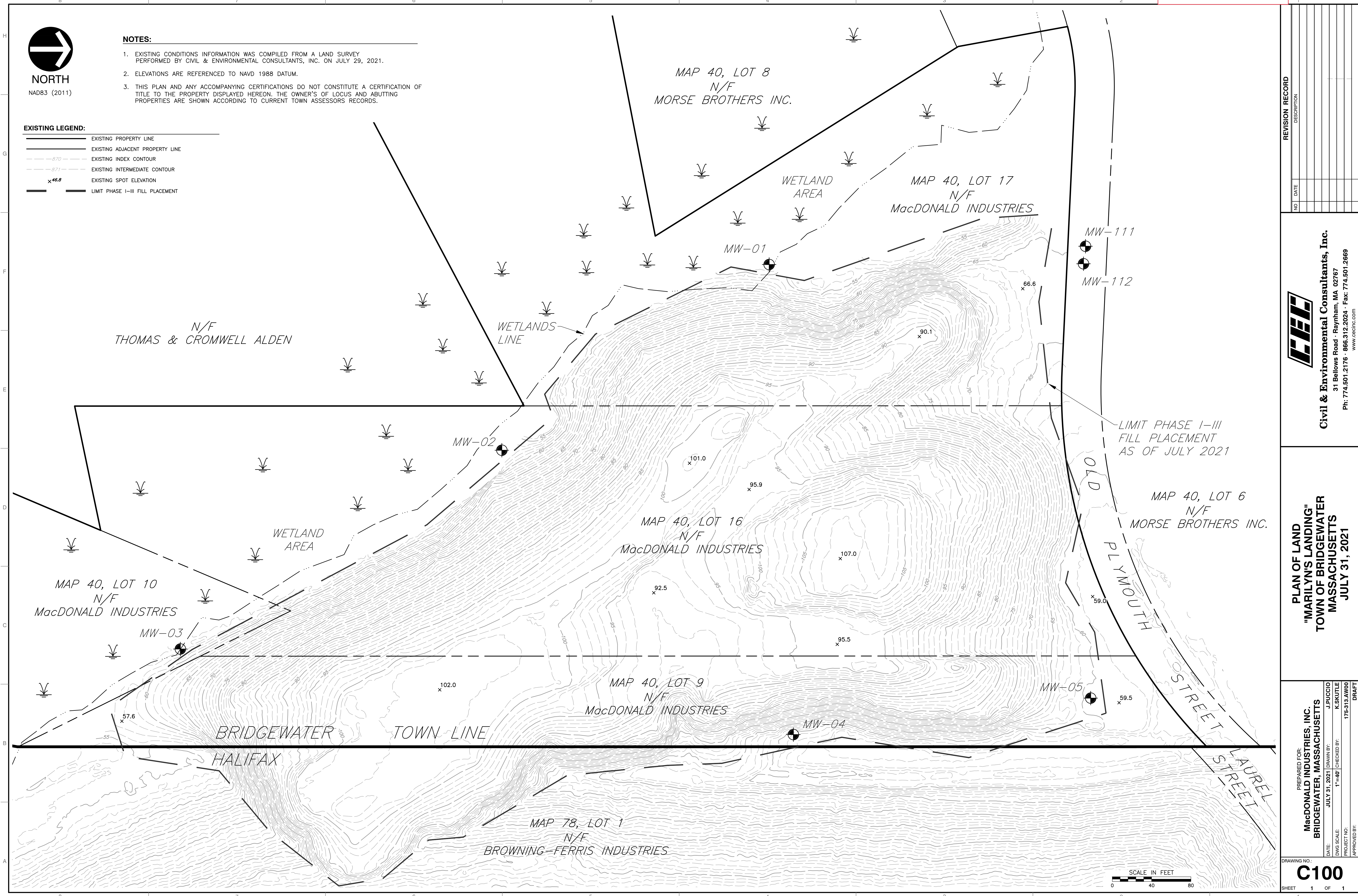
NORTH
NAD83 (2011)

NOTES:

- EXISTING CONDITIONS INFORMATION WAS COMPILED FROM A LAND SURVEY PERFORMED BY CIVIL & ENVIRONMENTAL CONSULTANTS, INC. ON JULY 29, 2021.
- ELEVATIONS ARE REFERENCED TO NAVD 1988 DATUM.
- 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
- x 46.8 EXISTING SPOT ELEVATION
- LIMIT PHASE I-III FILL PLACEMENT



NO.	DATE	DESCRIPTION

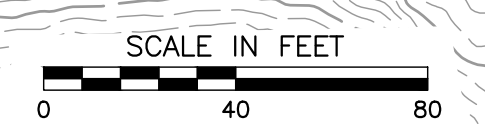
C&E
Civil & Environmental Consultants, Inc.
 31 Belkows Road · Raynham, MA 02767
 Ph: 774.501.2176 · 866.312.2024 · Fax: 774.501.2669
 www.cetinc.com

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: [Signature]

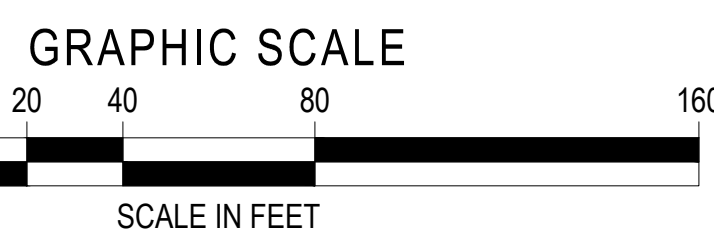
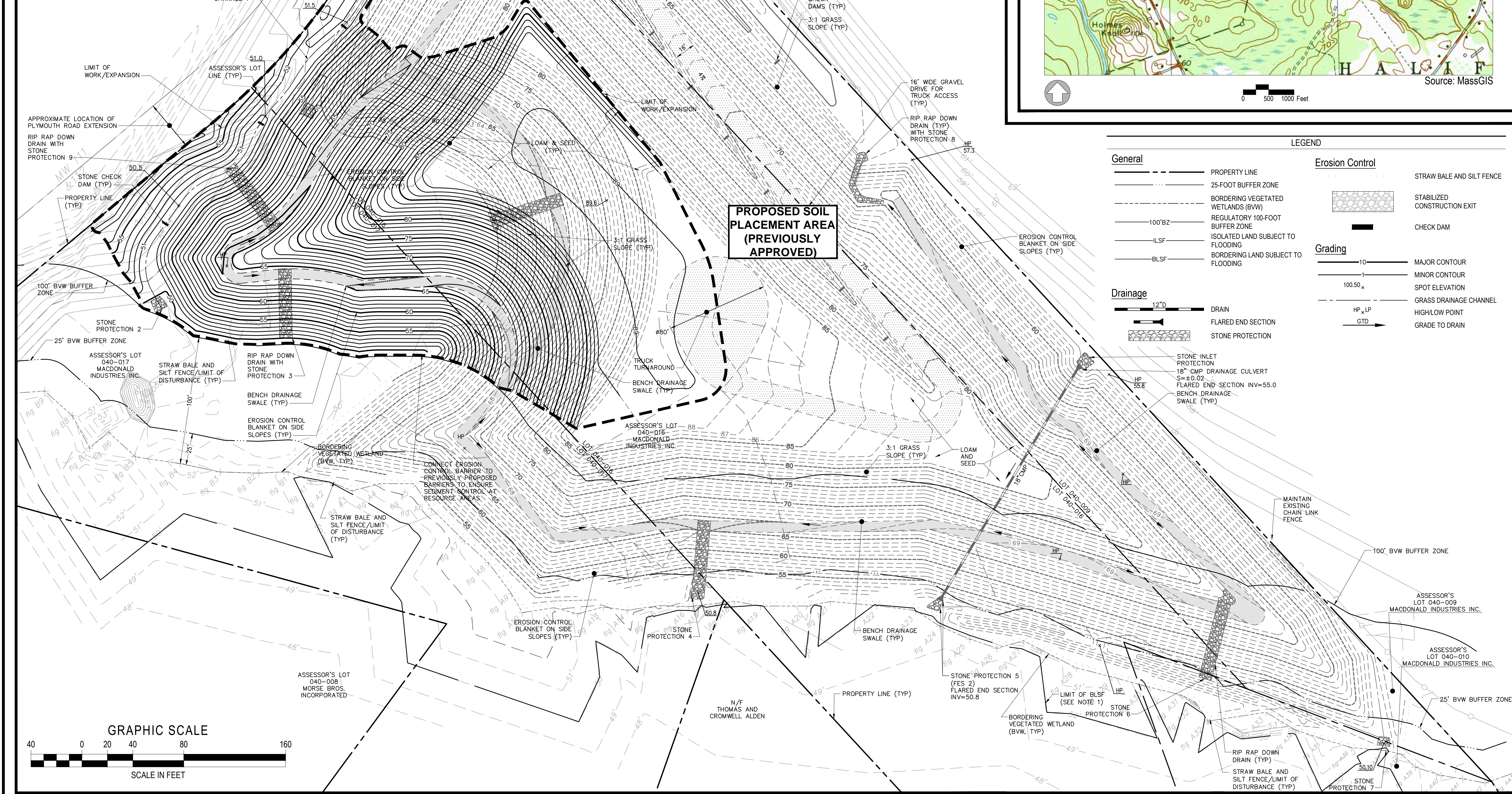
DRAWING NO:
C100
 SHEET 1 OF 1



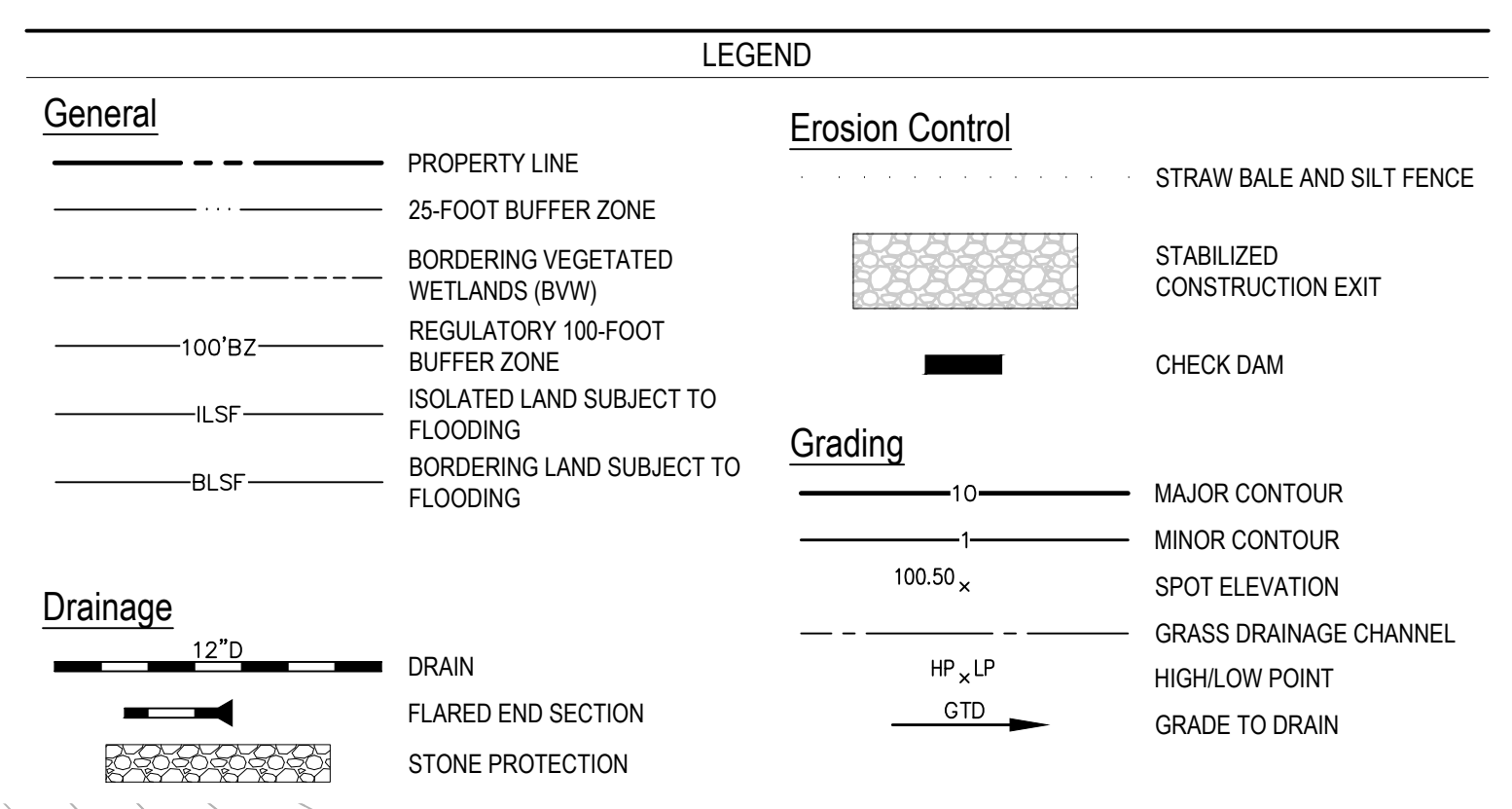
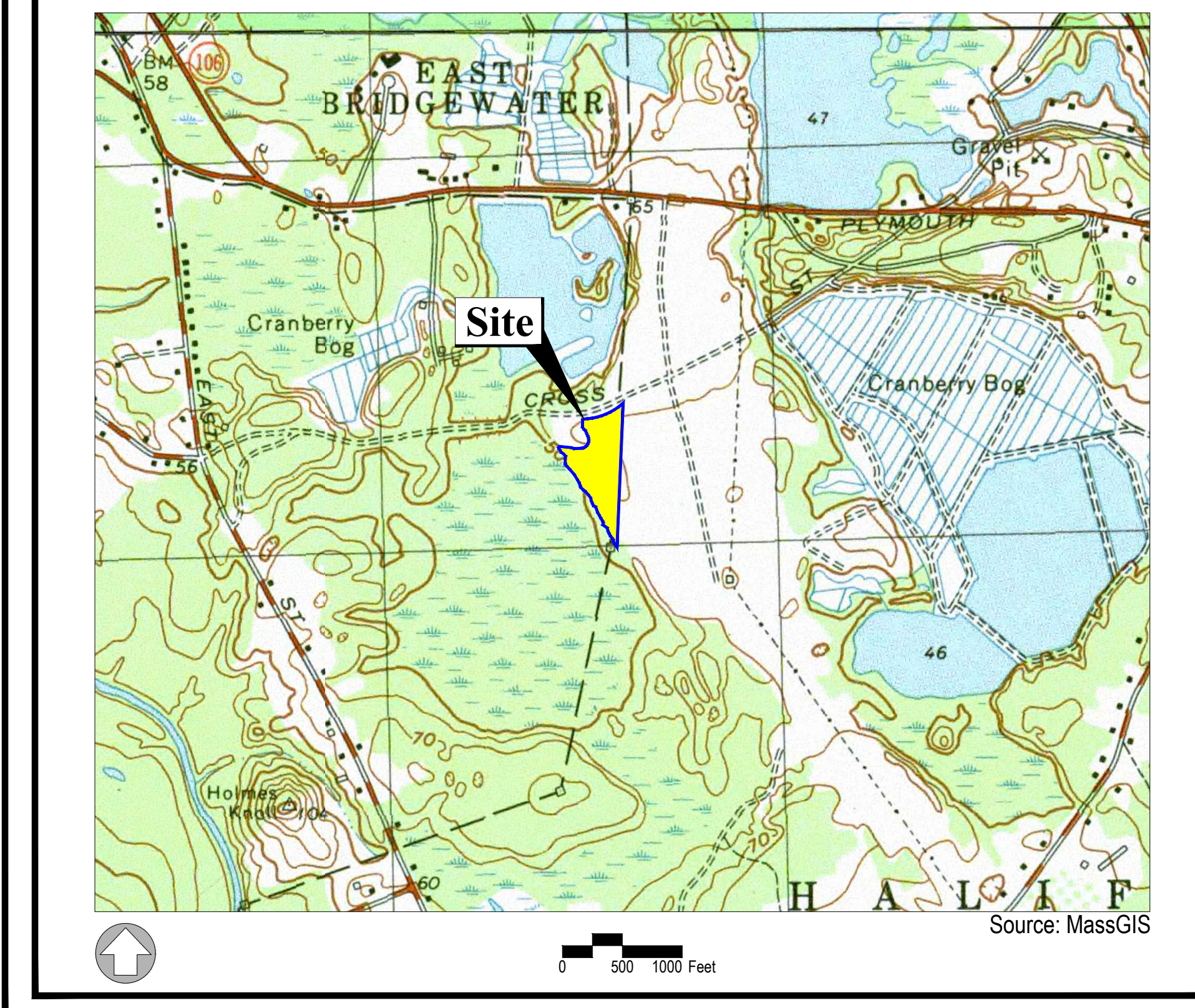
A:\2021\175-313-311-Sump\Draw\175313-311-M083_M1888.mxd(10/30/2021 1:51:00 PM) - Ep: 6/4/2021 2:51 PM

NOTES

- 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.
- 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.
- 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, 2012.
- 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.
- REFER TO SHEET C-2 FOR ADDITIONAL NOTES.



LOCUS MAP



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

FIGURE 3

Christopher J. Barozzi, P.E.
 10.24.17

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

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DRAWING SCALES NOTED ARE FOR 24" x 36" SIZE PRINTED MEDIA ONLY. ALL OTHER PRINTED SIZES ARE DEEMED "NOT TO SCALE".

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)

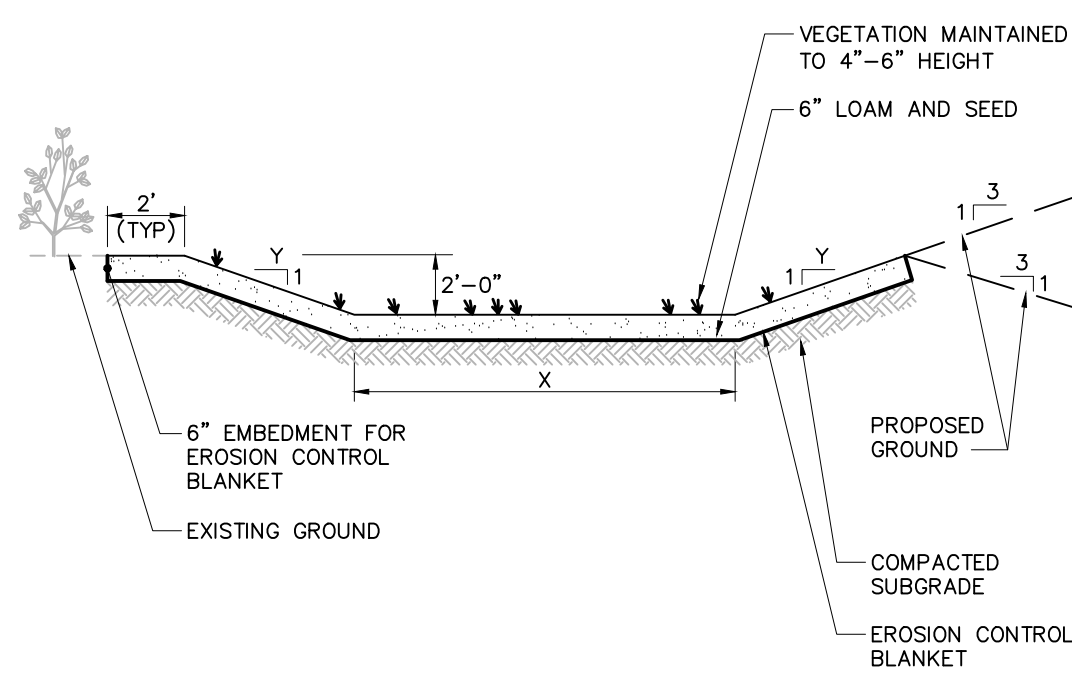
SHEET TITLE:

Grading & Drainage Plan

SCALE: 1" = 40'	SHEET NO: C-1
DESIGNED BY: JVC	
CHECKED BY: KPS	

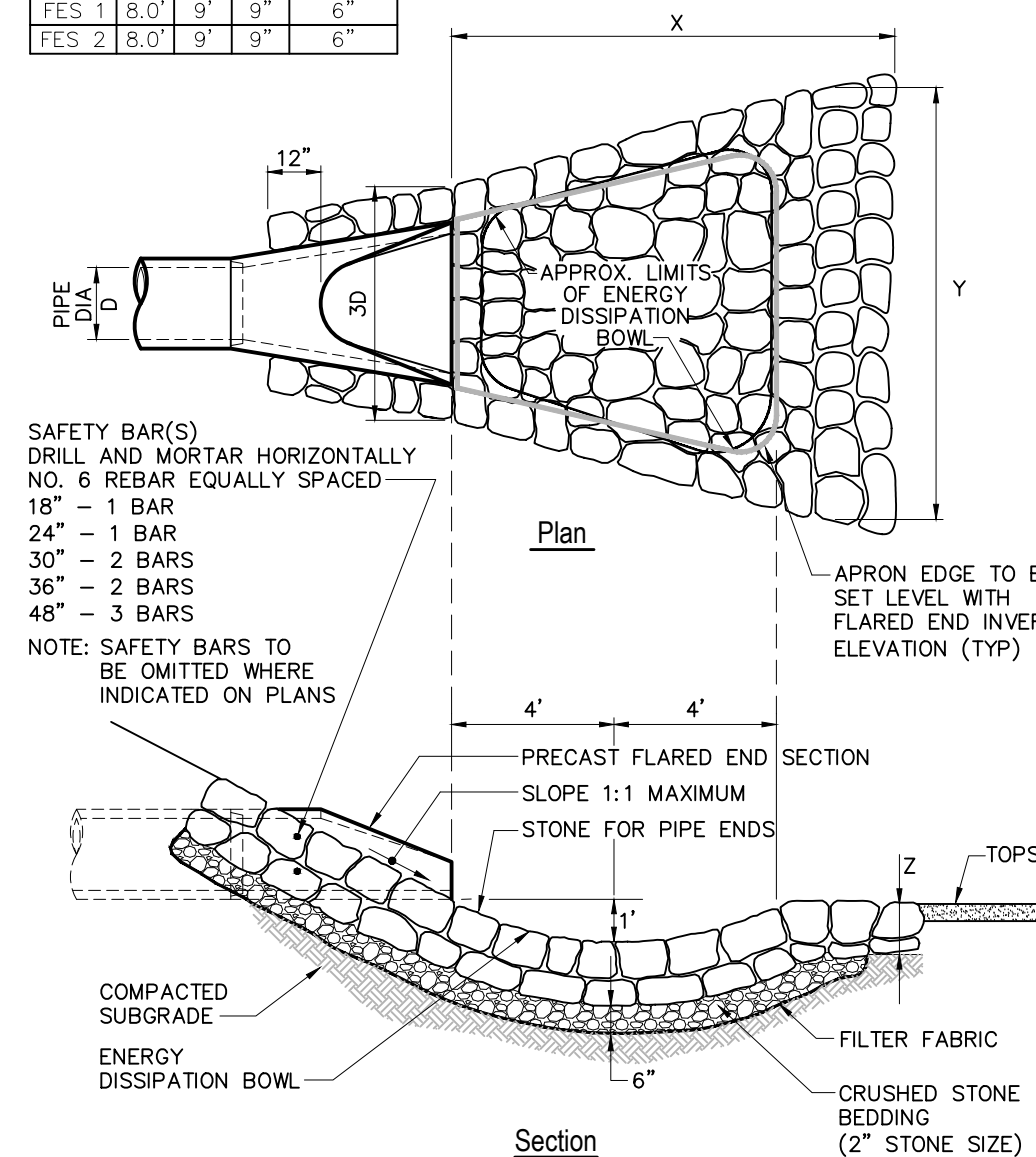
1 OF 2

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



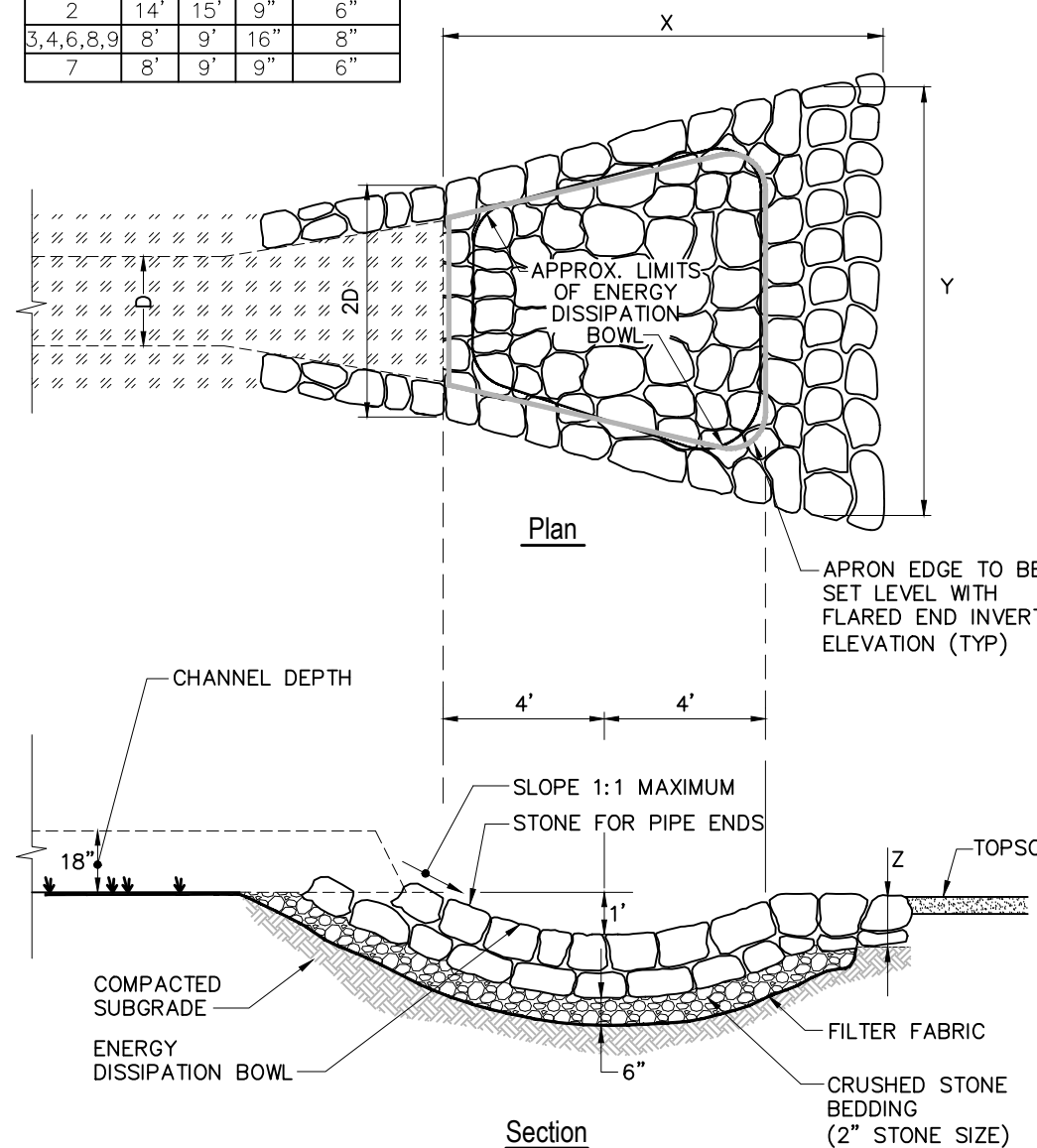
C-1

FES NO.	X	Y	Z	STONE DIA. (D ₅₀)
FES 1	8.0'	9'	9'	6"
FES 2	8.0'	9'	9'	6"

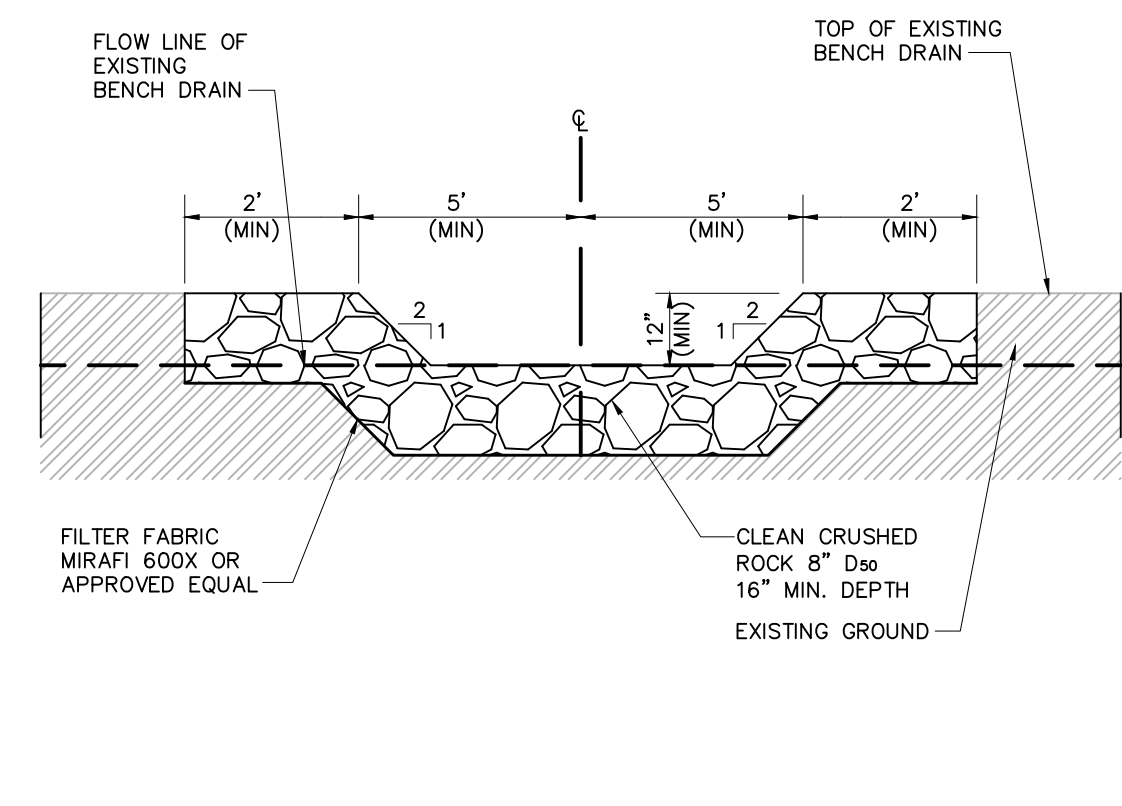


C-1

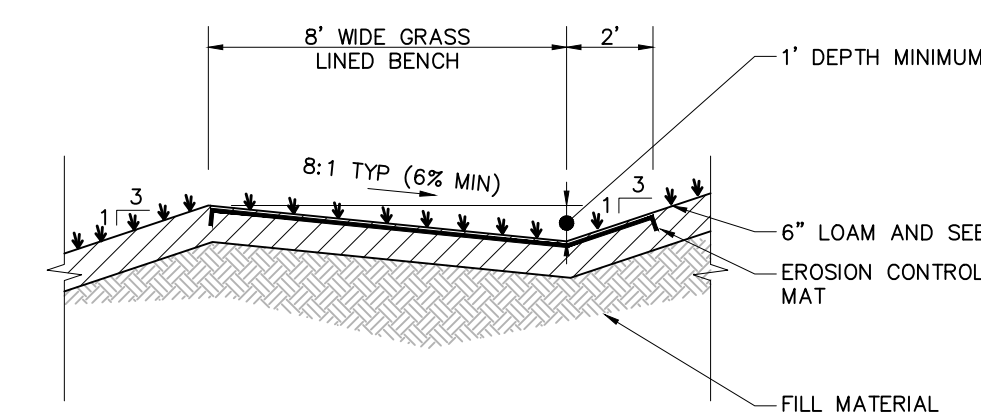
SP NO.	X	Y	Z	STONE DIA. (D ₅₀)
2	14'	15'	9'	6"
3,4,6,8,9	8'	9'	9'	8"
7	8'	9'	9'	6"



C-1



C-1



C-1

- CONSTRUCTION NOTES**
1. LONGITUDINAL SLOPE OF BENCH DRAINAGE SWALE SHALL BE 1% MIN AND 2% MAX.

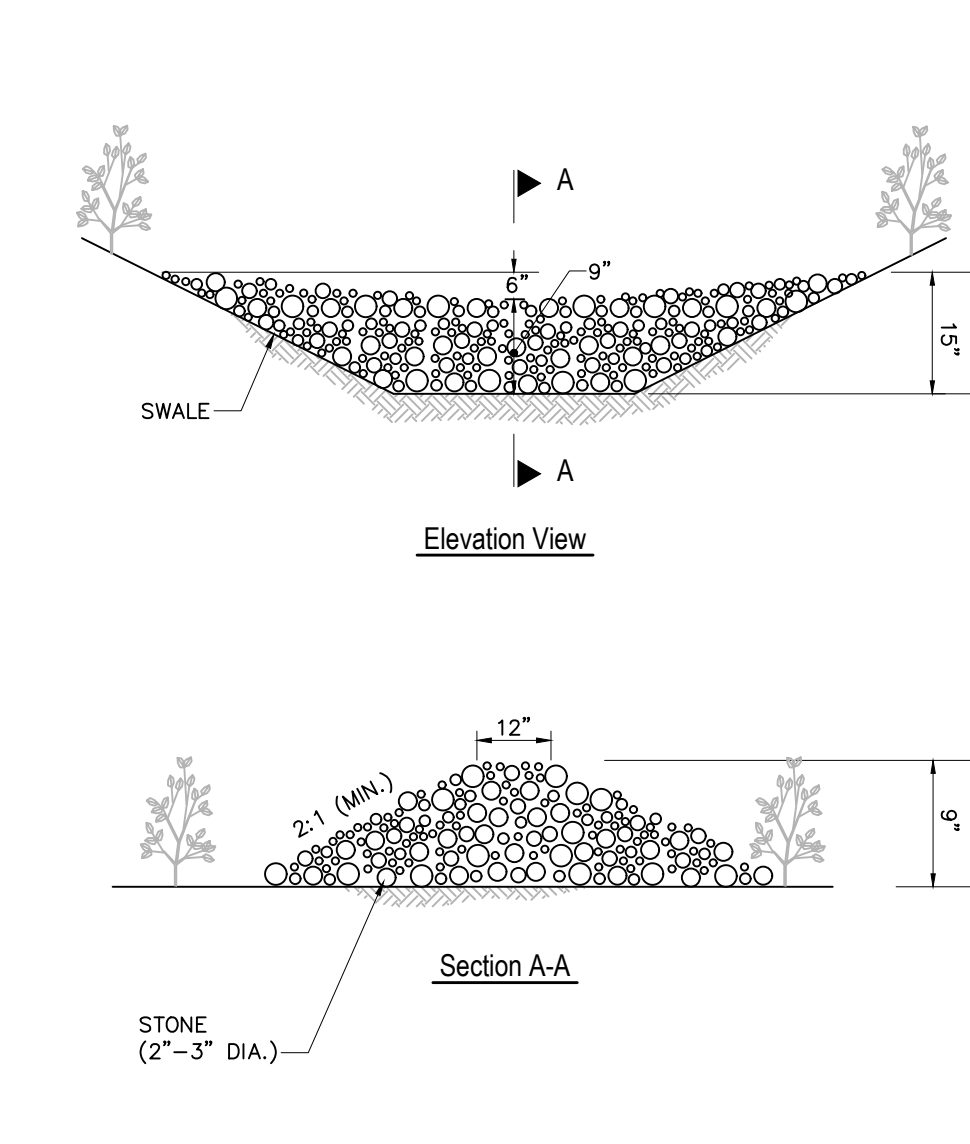
DRAINAGE CHANNEL
SCALE: N.T.S.

FLARED END SECTION (FES) WITH STONE PROTECTION
SCALE: N.T.S.

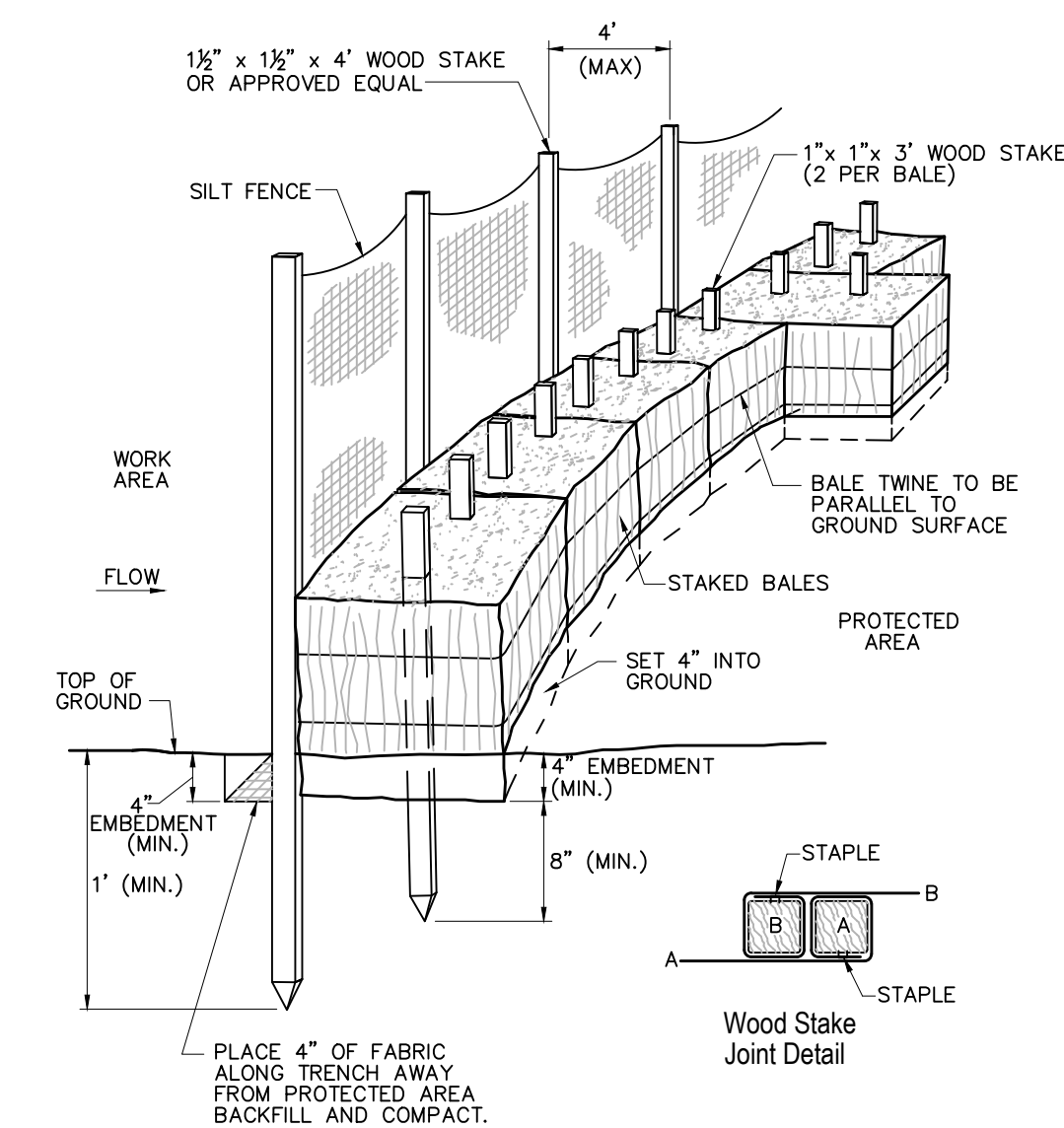
STONE PROTECTION
SCALE: N.T.S.

RIP RAP DOWN DRAIN
SCALE: N.T.S.

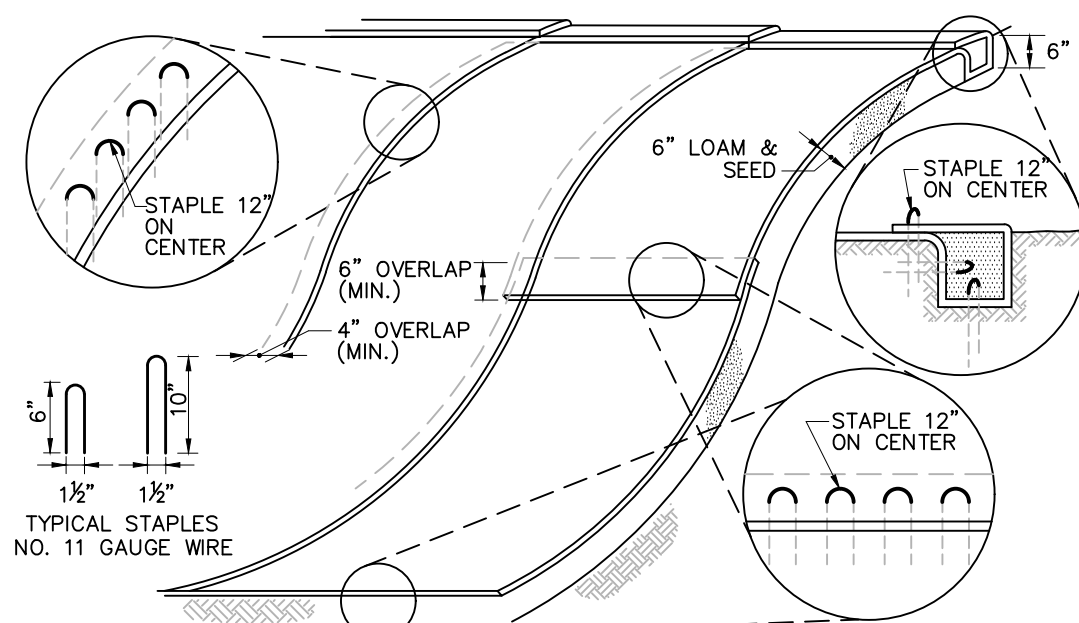
BENCH DRAINAGE SWALE
SCALE: N.T.S.



C-1



C-1



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 SPICED 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.

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.

Demolition:

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

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, SEEDDED, 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:

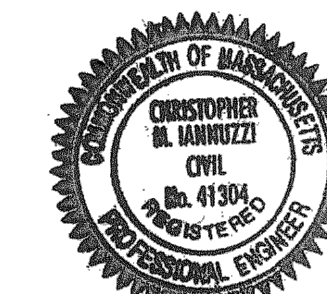
1. PROPOSED BOUNDS AND ANY EXISTING PROPERTY LINE MONUMENTATION DISTURBED DURING CONSTRUCTION SHALL BE SET OR REST BY A PROFESSIONAL LICENSED SURVEYOR.
2. SYMBOLS AND LEGENDS OF PROJECT FEATURES ARE GRAPHIC REPRESENTATIONS AND ARE NOT NECESSARILY SCALED TO THEIR ACTUAL DIMENSIONS OR LOCATIONS ON THE 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.

GENERAL NOTES

GENERAL NOTES

1400 Hancock Street, 4th Floor
Quincy, MA 02169
Tel: 617.481.5985
www.ebiconsulting.com

FIGURE 3 (Details)



Christopher R. Barozzi, P.E.
10.24.17

PREPARED FOR:
MacDonald Industries, Inc.

645 Walnut Street
Bridgewater, Massachusetts 02324
Tel: 508.697.5200

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DRAWING SCALES NOTED ARE FOR 24" x 36" SIZE PRINTED MEDIA ONLY. ALL OTHER PRINTED SIZES ARE DEEMED "NOT TO SCALE".

SUBMITTALS			
NO.	DATE	DESCRIPTION	BY

DATE: March 24, 2017	PROJECT NUMBER: 161600027
-------------------------	------------------------------

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.	SHEET NO: C-2
DESIGNED BY: JVC	
CHECKED BY: KPS	2 OF 2

MassDEP - Bureau of Waste Site Cleanup

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

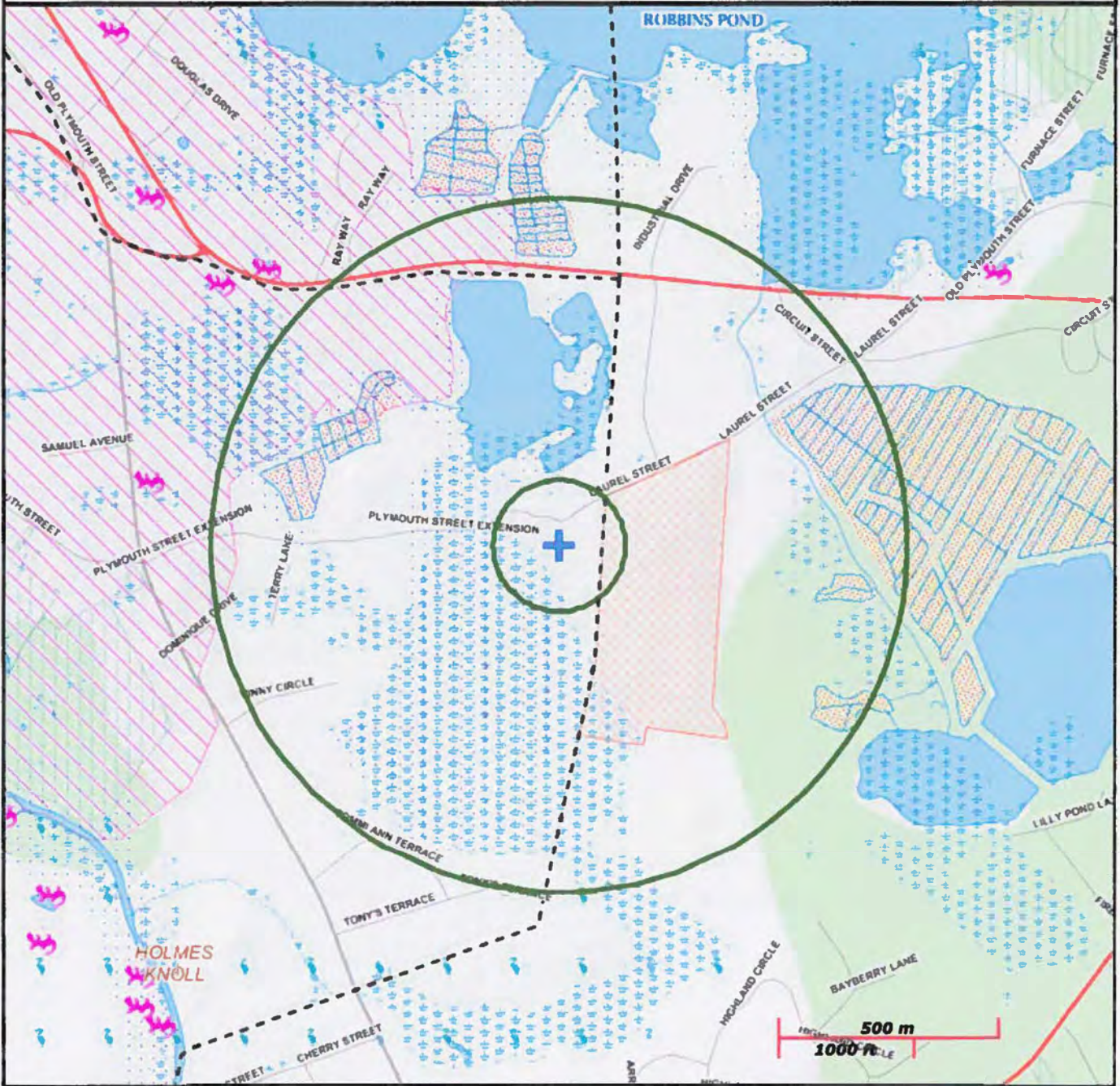
2105 PLYMOUTH STREET BRIDGEWATER, MA
 NAD83 UTM Meters:
 5169689mN, -7892640mE (Zone: 18)
 June 12, 2013

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

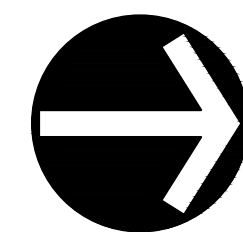


MassDEP

Commonwealth of Massachusetts
 Department of Environmental Protection



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



NORTH

REFERENCE NOTES:

- 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.
- 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.
- 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.
- 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).
- 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 TREETLINE
	EXISTING WETLANDS LINE
	25' BUFFER ZONE
	100' BUFFER ZONE
	EXISTING PAVED ROAD
	EXISTING UNPAVED ROAD
	EXISTING FENCE
	EXISTING LANDFILL GAS LINE
	EXISTING GAS COLLECTION WELL

General Notes and Information: **FIGURE 5**

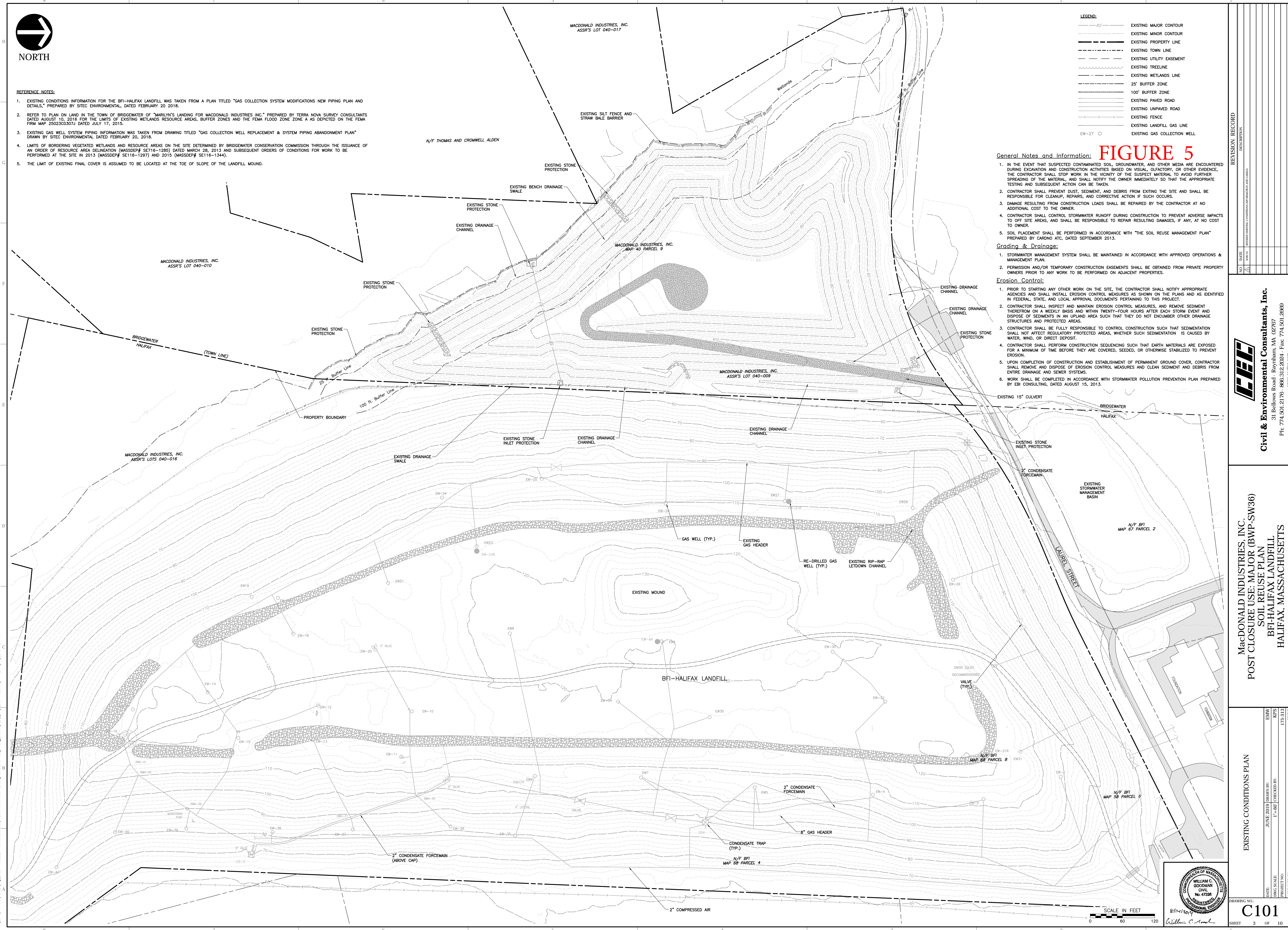
- IN THE EVENT THAT SUSPECTED CONTAMINATED SOIL, GROUNDWATER, AND OTHER MEDIA ARE ENCOUNTERED DURING EXCAVATION AND CONSTRUCTION ACTIVITIES BASED ON VISUAL, OLFACTORY, OR OTHER EVIDENCE, THE CONTRACTOR SHALL STOP WORK IN THE VICINITY OF THE SUSPECT MATERIAL TO AVOID FURTHER SPREADING OF THE MATERIAL,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

Grading & Drainage:

- STORMWATER MANAGEMENT SYSTEM SHALL BE MAINTAINED IN ACCORDANCE WITH APPROVED OPERATIONS & MANAGEMENT PLAN.
- 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:

- 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.
- 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 ENCLUMBER OTHER DRAINAGE STRUCTURES AND PROTECTED AREAS.
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- WORK SHALL BE COMPLETED IN ACCORDANCE WITH STORMWATER POLLUTION PREVENTION PLAN PREPARED BY EBI CONSULTING, DATED AUGUST 15, 2013.



REVISION RECORD

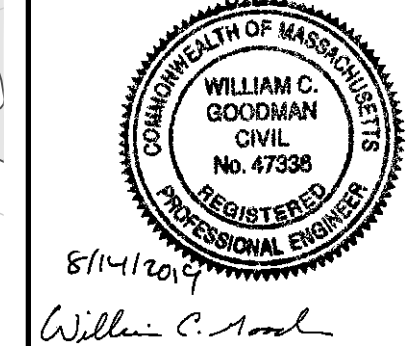
NO.	DATE	DESCRIPTION

C&E
Civil & Environmental Consultants, Inc.
 31 Bellows Road, Raynham, MA 02767
 Ph: 774.501.2176 • Fax: 774.501.2699
 www.ccecinc.com

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

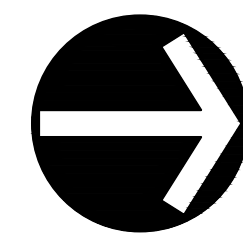
EXISTING CONDITIONS PLAN
 DATE: JUNE 2019 DRAWN BY: WJG
 DWG SCALE: KPS
 PROJECT NO: 175-313
 APPROVED BY: WCC

SCALE IN FEET
0 60 120

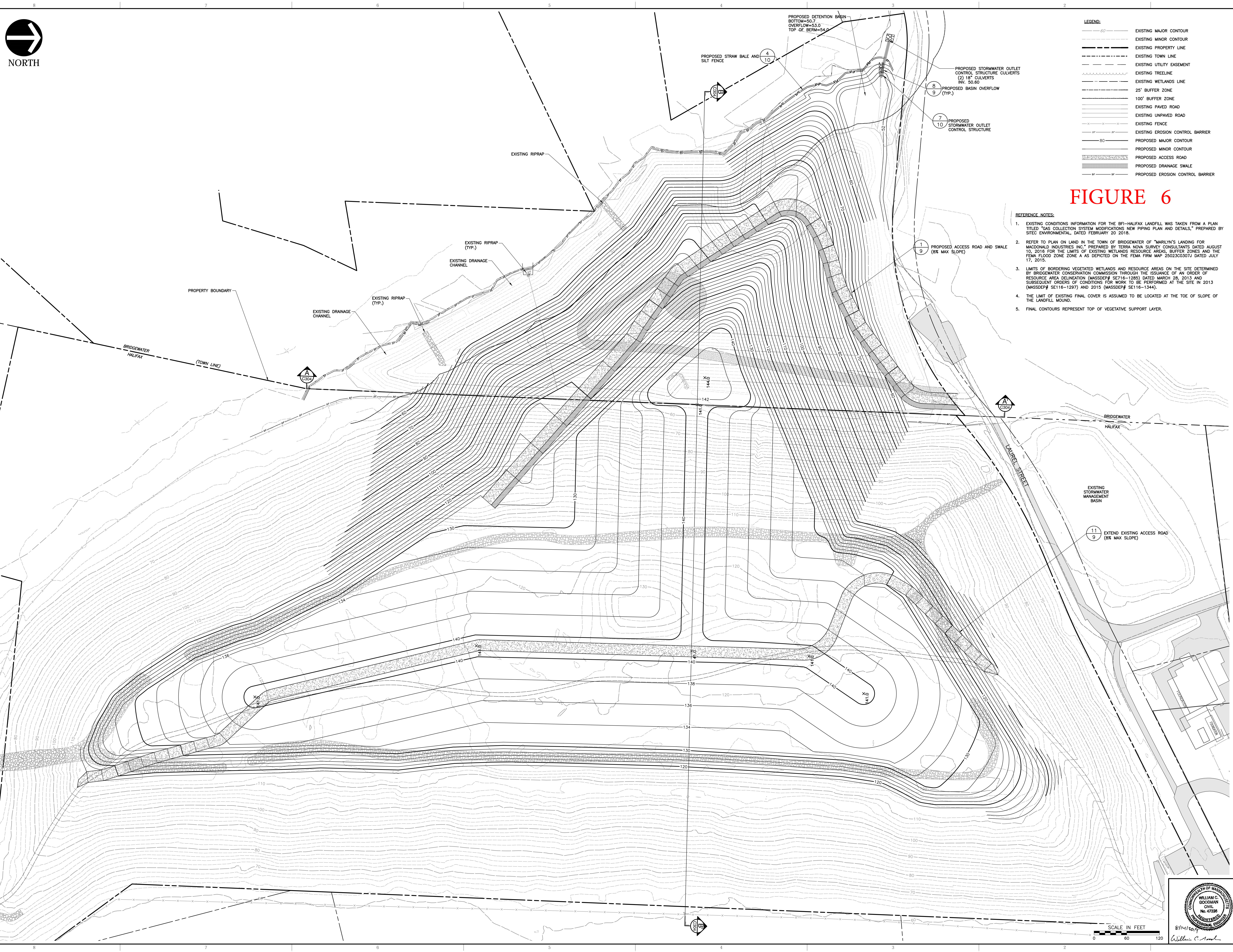


DRAWING NO: **C101**
SHEET 3 OF 10

P:\2017\175-313-BWP\175-313-C101-000\DWG\C101.dwg (1:25) - Macdonal - 04/11/2019 - 09:08:01 - 010 - Existing Conditions Plan - R1 - 8/11/2019 1:28 PM



NORTH



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

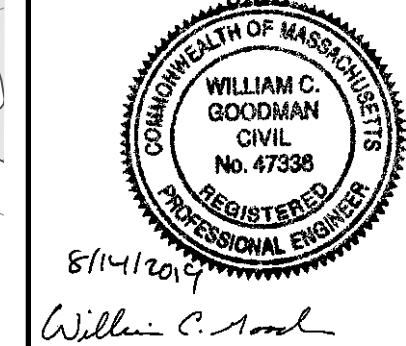
- REFERENCE NOTES:**
- EXISTING CONDITIONS INFORMATION FOR THE BF1-HALIFAX LANDFILL WAS TAKEN FROM A PLAN TITLED "GAS COLLECTION SYSTEM MODIFICATIONS NEW PIPING PLAN AND DETAILS," PREPARED BY SITEC ENVIRONMENTAL, DATED FEBRUARY 20 2018.
 - REFER TO PLAN ON LAND IN THE TOWN OF BRIDGEWATER OF "MARILYN'S LANDING FOR MACDONALD INDUSTRIES INC.," PREPARED BY TERRA NOVA SURVEY CONSULTANTS DATED AUGUST 10, 2018 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.
 - 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).
 - THE LIMIT OF EXISTING FINAL COVER IS ASSUMED TO BE LOCATED AT THE TOE OF SLOPE OF THE LANDFILL MOUND.
 - FINAL CONTOURS REPRESENT TOP OF VEGETATIVE SUPPORT LAYER.

NO.	DATE	REVISION RECORD
1		ISSUED FOR PERMITTING AND CONSTRUCTION

Civil & Environmental Consultants, Inc.
 31 Bellows Road - Raynham, MA 02767
 PH: 774.501.2176 - 866.312.2024 - FAX: 774.501.2069
 www.civilinc.com

MacDONALD INDUSTRIES, INC.
 POST CLOSURE USE: MAJOR (BWP-SW36)
 SOIL REUSE PLAN
 BF1-HALIFAX LANDFILL
 HALIFAX, MASSACHUSETTS

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



SCALE IN FEET
 0 60 120

P:\2017\175-313-000\DWG\C301 - MassDEP Post Closure Use Major (BWP-SW36) - C301 - Proposed Final Grading Plan - Final.dwg (1/23/2019 10:31 AM) - LP: 8/12/2019 10:31 AM

TABLE

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
ACENAPHTHENE	4	3,000	1,500**
ACENAPHTHYLENE	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
HEXACHLOROBTADIENE	30	100	100
HEXACHLOROETHANE	0.7	3	3
INDENO(1,2,3 CD) PYRENE	7	40	40
ISOPHORONE	100	1,000	1,000
2-METHYLNAPHTHALENE	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-DICHLOROETHANE	9	100	0.9
1,3-DICHLOROETHANE	3	200	0.3
1,4-DICHLOROETHANE	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-TRICHLOROETHANE	~	~	~
1,2,4-TRICHLOROETHANE	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
PERFLUOROOCTANESULFONIC 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 constituents 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 asbestos 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,

A handwritten signature in black ink, appearing to read "B. Morrissey".

Brian Morrissey
Director of Solar Development

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

SITE-SPECIFIC HEALTH AND SAFETY PLAN

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APPENDIX D JOB SAFETY ANALYSES

SITE-SPECIFIC HEALTH AND SAFETY PLAN

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

SITE-SPECIFIC HEALTH AND SAFETY PLAN

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	617-908-7094	
	Environmental Sampling & Services, Inc. Mr. Robert Chiodo	716-628-7581	
	Civil & Environmental Consultants, Inc. Karlis Skulte, P.E.	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

SITE-SPECIFIC HEALTH AND SAFETY PLAN

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			

SITE-SPECIFIC HEALTH AND SAFETY PLAN

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

SITE-SPECIFIC HEALTH AND SAFETY PLAN

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.

6/16/2020

Laurel St, Halifax, MA 02338 to 680 Centre Street, Brockton, MA - Google Maps

Google Maps Laurel St, Halifax, MA 02338 to 680 Centre Street, Brockton, MA

Drive 10.3 miles, 22 min



Map data ©2020 1 mi

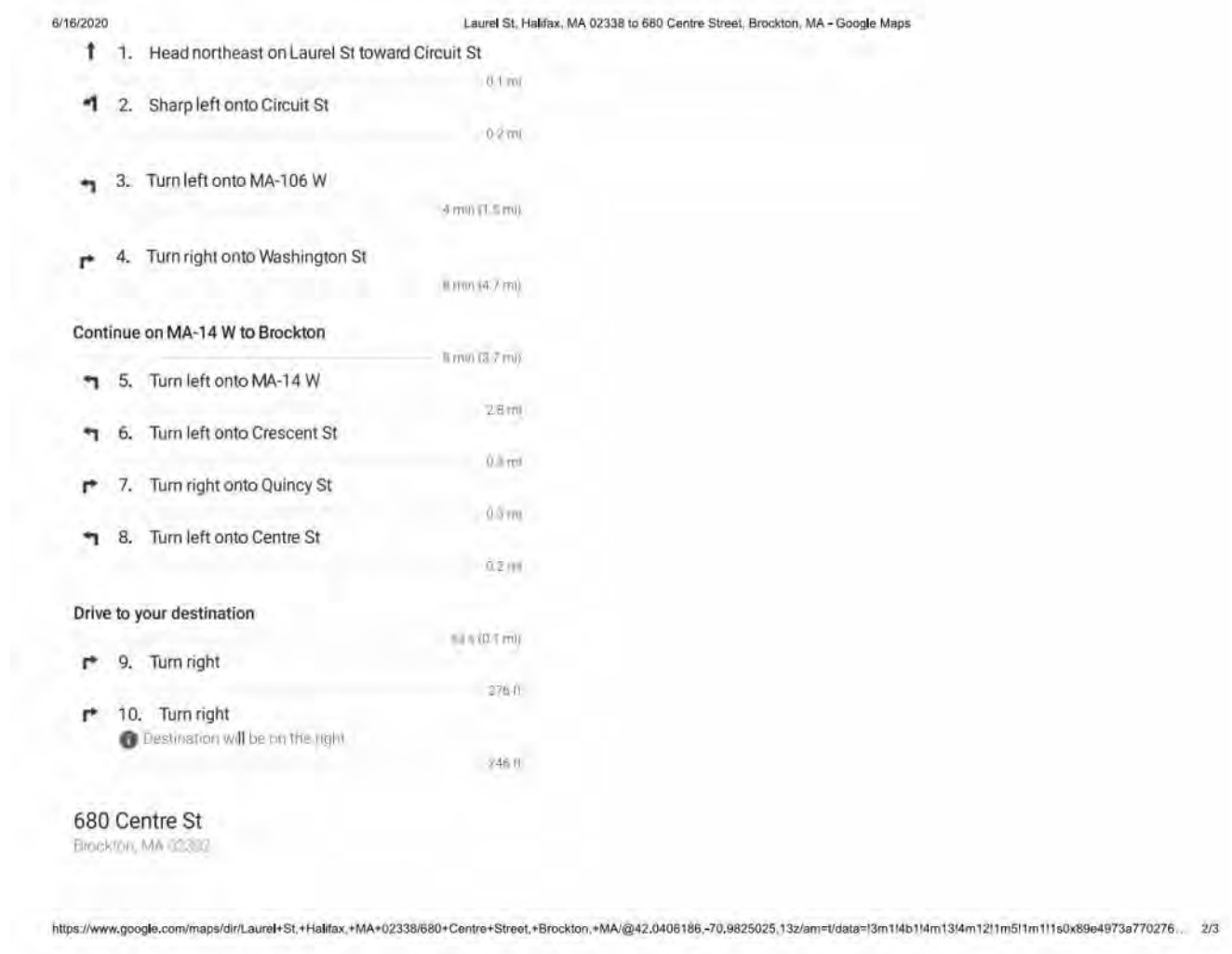
Laurel St
Halifax, MA 02338

Take Circuit St to MA-106 W

1 min (0.3 mi)

<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...> 1/3

SITE-SPECIFIC HEALTH AND SAFETY PLAN



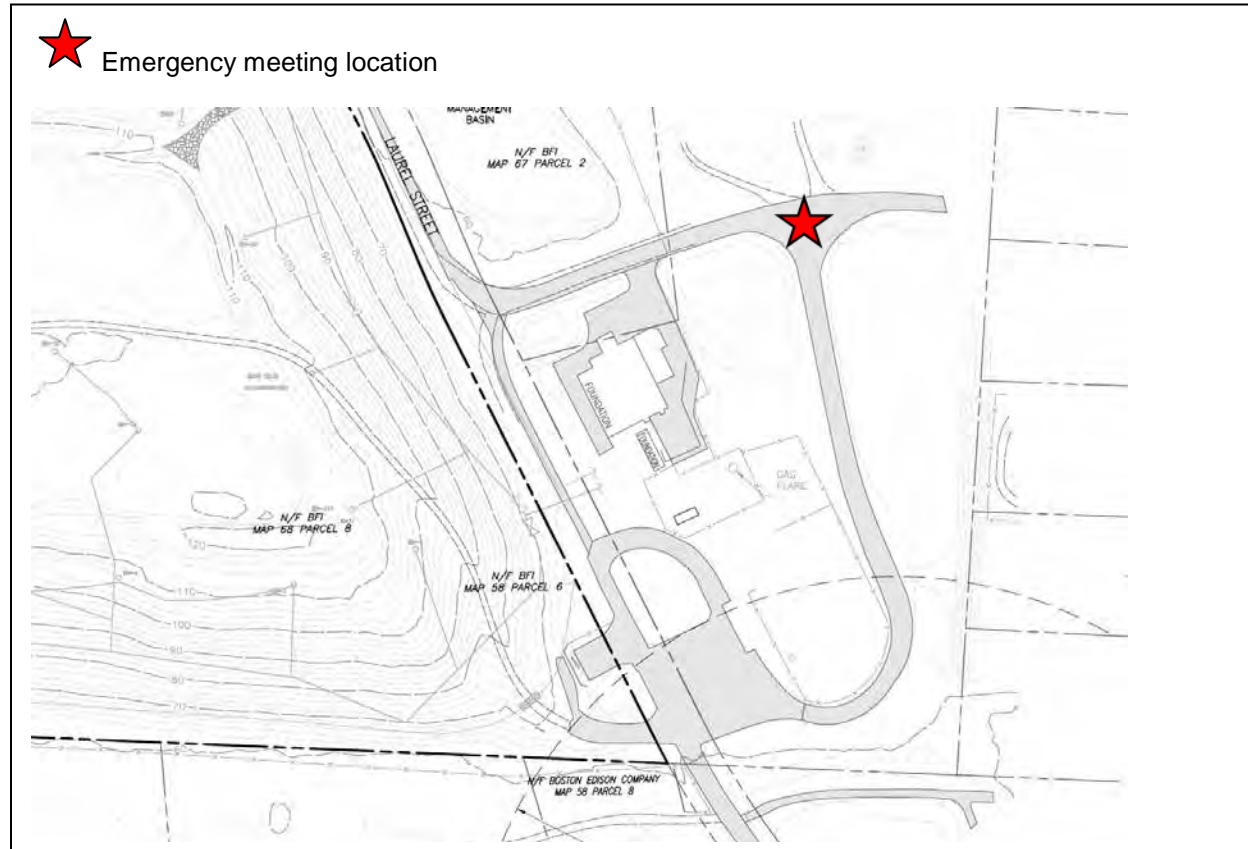
1.4 EMERGENCY RESPONSE PROCEDURES: EVACUATION

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.

SITE-SPECIFIC HEALTH AND SAFETY PLAN



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.

SITE-SPECIFIC HEALTH AND SAFETY PLAN

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

SITE-SPECIFIC HEALTH AND SAFETY PLAN

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.

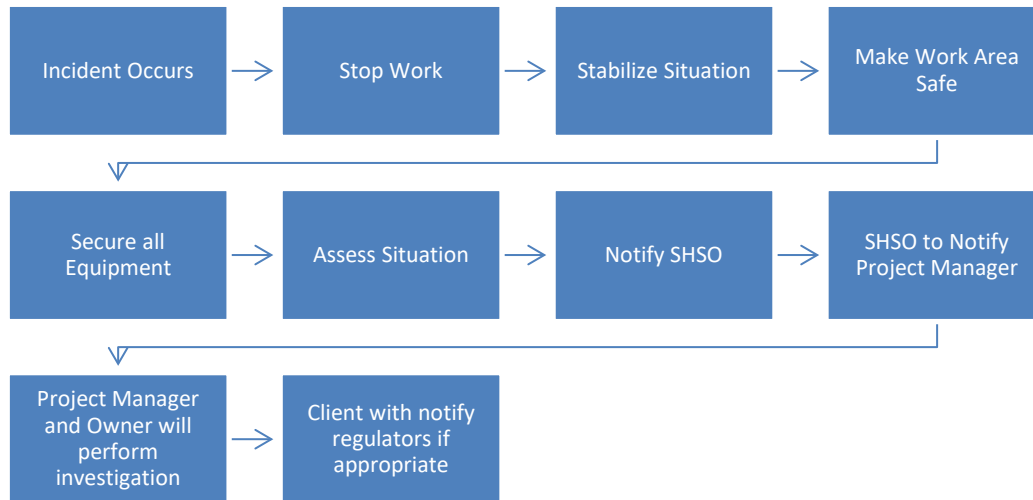
In the event of an incident:

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

SITE-SPECIFIC HEALTH AND SAFETY PLAN

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.**

- 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.

SITE-SPECIFIC HEALTH AND SAFETY PLAN

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	<p>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.</p> <p>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</p>

SITE-SPECIFIC HEALTH AND SAFETY PLAN

Incident Type	Definition
	<p>counted as High Potential; all others should be counted as low potential and reported as normal incidents (see above).</p> <p>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.</p>

SITE-SPECIFIC HEALTH AND SAFETY PLAN

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

SITE-SPECIFIC HEALTH AND SAFETY PLAN

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.

SITE-SPECIFIC HEALTH AND SAFETY PLAN

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-acre 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

SITE-SPECIFIC HEALTH AND SAFETY PLAN

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.

SITE-SPECIFIC HEALTH AND SAFETY PLAN

Potential Airborne Concerns and Air Monitoring Action Levels

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	<ul style="list-style-type: none"> • 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 H ₂ S 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 if Oxygen is below 19.5% by volume.

SITE-SPECIFIC HEALTH AND SAFETY PLAN

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.

SITE-SPECIFIC HEALTH AND SAFETY PLAN

Other Site Hazards

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, lightning, 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 Exhaustion

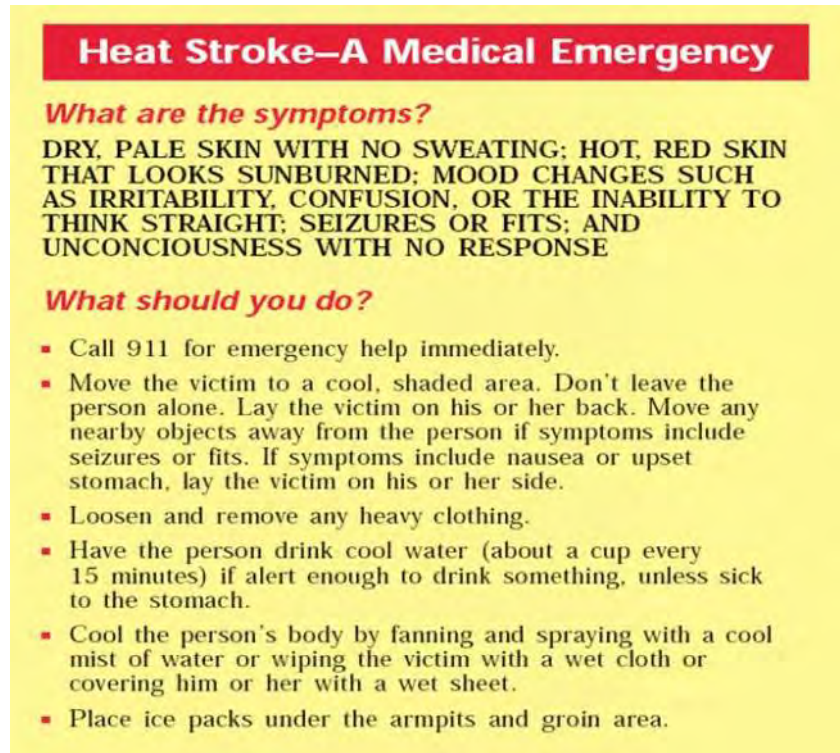
What are the symptoms?
HEADACHES; DIZZINESS OR LIGHTEADEDNESS; WEAKNESS; MOOD CHANGES SUCH AS IRRITABILITY, CONFUSION, OR THE INABILITY TO THINK STRAIGHT; UPSET STOMACH; VOMITING; DECREASED OR DARK-COLORED URINE; FAINTING OR PASSING OUT; AND PALE, CLAMMY SKIN

What should you do?

- Act immediately. If not treated, heat exhaustion may advance to heat stroke or death.
- Move the victim to a cool, shaded area to rest. Don't leave the person alone. If symptoms include dizziness or lightheadedness, lay the victim on his or her back and raise the legs 6 to 8 inches. 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) unless sick to the stomach.
- Cool the person's body by fanning and spraying with a cool mist of water or applying a wet cloth to the person's skin.
- Call 911 for emergency help if the person does not feel better in a few minutes.

SITE-SPECIFIC HEALTH AND SAFETY PLAN

Other Site Hazards



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.

SITE-SPECIFIC HEALTH AND SAFETY PLAN

Other Site Hazards

- 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

SITE-SPECIFIC HEALTH AND SAFETY PLAN

Other Site Hazards

- 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.

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Other Site Hazards

- 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.

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Other Site Hazards

- 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.

SITE-SPECIFIC HEALTH AND SAFETY PLAN

Site Control and Safety Procedures

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.

SITE-SPECIFIC HEALTH AND SAFETY PLAN

Site Control and Safety Procedures

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:

SITE-SPECIFIC HEALTH AND SAFETY PLAN

Site Control and Safety Procedures

- 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.

SITE-SPECIFIC HEALTH AND SAFETY PLAN

Project Team Information

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 (O₂, CO, H₂S, 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: _____

<u>SCOPE OF WORK</u>	<u>HAZARDS PRESENT</u>	<u>CONTROL MEASURES</u>

Daily Safety Topic: _____

ATTENDEES NAMES	
PRINT	SIGNATURE

Appendix C

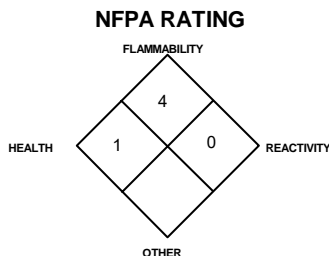
Safety Data Sheets (SDS)

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

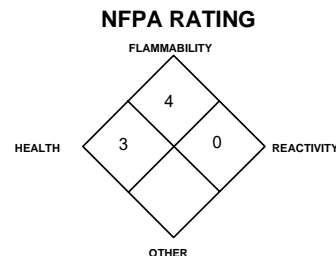
MATERIAL SAFETY DATA SHEET

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

METHANE GAS



LIQUID METHANE



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

1. PRODUCT IDENTIFICATION

CHEMICAL NAME; CLASS:

METHANE - CH₄, Gaseous
METHANE - CH₄, 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		IDLH ppm	OTHER
			TLV ppm	STEL ppm	PEL ppm	STEL ppm		
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.

HEALTH EFFECTS OR RISKS FROM EXPOSURE: An Explanation in **Law 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.

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

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.

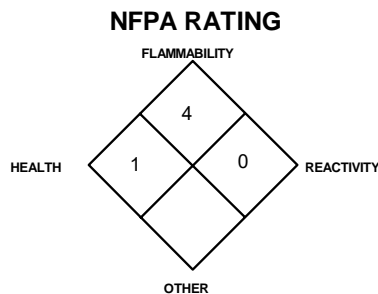
4. FIRST-AID MEASURES (Continued)

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



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

AUTOIGNITION TEMPERATURE:
537°C (999°F)

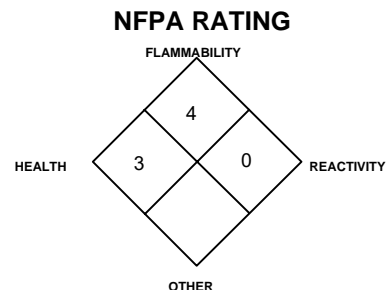
FLAMMABLE LIMITS (in air by volume, %):

Lower (LEL): 5.0%

Upper (UEL): 15.0%

See Section 16 for Definition of Ratings

LIQUID METHANE



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/m³ (0.042 35 lb/ft³)

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. pH: 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.

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:

<u>PROPER SHIPPING NAME:</u>	Methane, compressed
<u>HAZARD CLASS NUMBER and DESCRIPTION:</u>	2.1 (Flammable Gas)
<u>UN IDENTIFICATION NUMBER:</u>	UN 1971
<u>PACKING GROUP:</u>	Not Applicable
<u>DOT LABEL(S) REQUIRED:</u>	Flammable Gas
<u>NORTH AMERICAN EMERGENCY RESPONSE GUIDEBOOK NUMBER (2000):</u>	115

For Liquefied Methane:

<u>PROPER SHIPPING NAME:</u>	Methane, refrigerated liquid
<u>HAZARD CLASS NUMBER and DESCRIPTION:</u>	2.1 (Flammable Gas)
<u>UN IDENTIFICATION NUMBER:</u>	UN 1972
<u>PACKING GROUP:</u>	Not Applicable
<u>DOT LABEL(S) REQUIRED:</u>	Flammable Gas
<u>NORTH AMERICAN EMERGENCY RESPONSE GUIDEBOOK NUMBER (2000):</u>	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.

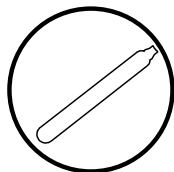
Keep away from heat, flames, and sparks.
Store and use with adequate ventilation.
Use equipment rated for cylinder pressure.
Close valve after each use and when empty.
Use in accordance with the Material Safety Data Sheet.

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. Occupational Safety and Health Administration (**OSHA**). NIOSH issues exposure guidelines called Recommended Exposure Levels (**RELs**). 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: **LD₅₀** - Lethal Dose (solids & liquids) which kills 50% of the exposed animals; **LC₅₀** - 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/m³** 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; **TD₀₁**, **LDLo**, and **LD₀₁**, or **TC**, **TC₀₁**, **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 (H ₂ S); Sulfuretted hydrogen; Sewer gas; Hydrosulfuric acid; dihydrogen sulfide
Product type	: Gas.
Product use	: Synthetic/Analytical chemistry.
Synonym	: Hydrogen sulfide; Hydrogen sulfide (H ₂ S); 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	<p>ACGIH TLV (United States, 3/2017). STEL: 5 ppm 15 minutes. TWA: 1 ppm 8 hours.</p> <p>NIOSH REL (United States, 10/2016). CEIL: 15 mg/m³ 10 minutes. CEIL: 10 ppm 10 minutes.</p> <p>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.</p> <p>OSHA PEL Z2 (United States, 2/2013). AMP: 50 ppm 10 minutes. CEIL: 20 ppm</p>

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 (ft³/lb)	: 11.236
Gas Density (lb/ft³)	: 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	Crustaceans - Gammarus pseudolimnaeus	2 days
	Acute LC50 2 µg/l Fresh water	Fish - Coregonus clupeaformis - Yolk-sac fry	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.)

Health	/	4
Flammability		4
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.)



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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 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	Expert judgment Expert judgment On basis of test data Expert judgment 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	<p>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.</p> <p>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.</p> <p>OSHA PEL (United States, 6/2016). TWA: 9000 mg/m³ 8 hours. TWA: 5000 ppm 8 hours.</p> <p>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.</p>

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 (ft³/lb)** : 8.7719
- Gas Density (lb/ft³)** : 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

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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.)



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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.

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SAFETY DATA SHEET

Oxygen

Section 1. Identification

GHS product identifier	: Oxygen
Chemical name	: oxygen
Other means of identification	: Molecular oxygen; Oxygen molecule; Pure oxygen; O ₂ ; 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; O ₂ ; 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 (ft³/lb)** : 12.0482
- Gas Density (lb/ft³)** : 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.)

Health	/	0
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.)



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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:
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 California Poison Control System: 800-356-3120
Call CHEMTREC
North America: (800) 424-9300
Others: (703) 527-3887 (collect)

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

<u>HAZARDOUS COMPONENTS</u>	<u>% VOLUME</u>	<u>Limits</u>	<u>EXPOSURE GUIDELINE</u>	
			<u>Agency</u>	<u>Type</u>
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 as 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 Density (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/Explosive 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 than 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 Color Haze Rating	Vol % Number Rating	0.05 Max 3.0 Max 2 Max	D 2709 D 1500 D 4176	
Composition Carbon Residue (Ramsbottom)	Wt %	0.35 Max	D 524, D 189	
Volatility 90% Recovered Flash Point Gravity	Deg; F Deg; F Deg; F API	540 Min 640 Min 125 Min (1) 30 Min	D 86 D 86 D 93 D 287, D4052	130 F
Fluidity Pour Point Cloud Point Viscosity @ 104F Lubricity, SLBOCLE Lubricity, HFRR	Deg; F Deg; F cSt cSt grams mm	See Season Table (6) See Season Table (6) 1.9 Min 4.1 Max 3100 Min .45	D 97 D 2500 D 445 D 445 D 6078 D 6079	10 F 3300gm
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 Water & Sediment Ash	PPM Vol % Wt %	30 Max 0.05 Max 0.01 Max	D 2622, D4294 D 1796 D 482	15-20ppm
Additives Cetane Improver Dye	Lb/MBbl	675 Max 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 1610-1200) 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:	<input type="checkbox"/> New <input type="checkbox"/> 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

Marilyn!
 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



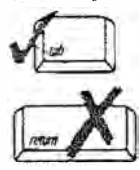
Massachusetts Department of Environmental Protection
 Bureau of Resource Protection - Wetlands
WPA Form 5 – Order of Conditions
 Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

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 MacDonald
 a. First Name b. Last Name

Marilyn's Landing
 c. Organization

P.O. Box 431, 645 Walnut Street
 d. Mailing Address

Bridgewater MA 02324
 e. City/Town f. State 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 Bridgewater
 a. Street Address b. City/Town

40 9, 16, and 17
 c. Assessors Map/Plat Number d. Parcel/Lot Number

Latitude and Longitude, if known: d m s d m s
 d. Latitude e. Longitude



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
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 eDEP Transaction #
 Bridgewater
 City/Town

A. General Information (cont.)

6. Property recorded at the Registry of Deeds for (attach additional information if more than one parcel):
 Plymouth
 a. County
 7400
 c. Book
 b. Certificate Number (if registered land)
 319-2
 d. Page

7. Dates: June 9, 2015 July 14, 2015 July 14, 2015
 a. Date Notice of Intent Filed b. Date Public Hearing Closed 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 Karlis Skulte, P.E., #47703
 b. Prepared By c. Signed and Stamped by
 June 5, 2015 1"=40"
 d. Final Revision Date 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.



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

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. <input type="checkbox"/> Bank	_____ a. linear feet	_____ b. linear feet	_____ c. linear feet	_____ d. linear feet
5. <input type="checkbox"/> Bordering Vegetated Wetland	_____ a. square feet	_____ b. square feet	_____ c. square feet	_____ d. square feet
6. <input type="checkbox"/> 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. <input type="checkbox"/> 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. <input type="checkbox"/> 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. <input type="checkbox"/> 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



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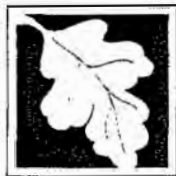
Provided by MassDEP:
 SE116-1344
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B. Findings (cont.)

Coastal Resource Area Impacts: Check all that apply below. (For Approvals Only)

	Proposed Alteration	Permitted Alteration	Proposed Replacement	Permitted Replacement
10. <input type="checkbox"/> Designated Port Areas	Indicate size under Land Under the Ocean, below			
11. <input type="checkbox"/> Land Under the Ocean	a. <u> </u> square feet	b. <u> </u> square feet		
	c. <u> </u> c/y dredged	d. <u> </u> c/y dredged		
12. <input type="checkbox"/> Barrier Beaches	Indicate size under Coastal Beaches and/or Coastal Dunes below			
13. <input type="checkbox"/> Coastal Beaches	a. <u> </u> square feet	b. <u> </u> square feet	<u> </u> c. nourishment cu yd	<u> </u> d. nourishment cu yd
14. <input type="checkbox"/> Coastal Dunes	a. <u> </u> square feet	b. <u> </u> square feet	<u> </u> c. nourishment cu yd	<u> </u> d. nourishment cu yd
15. <input type="checkbox"/> Coastal Banks	a. <u> </u> linear feet	b. <u> </u> linear feet		
16. <input type="checkbox"/> Rocky Intertidal Shores	a. <u> </u> square feet	b. <u> </u> square feet		
17. <input type="checkbox"/> Salt Marshes	a. <u> </u> square feet	b. <u> </u> square feet	<u> </u> c. square feet	<u> </u> d. square feet
18. <input type="checkbox"/> Land Under Salt Ponds	a. <u> </u> square feet	b. <u> </u> square feet		
	c. <u> </u> c/y dredged	d. <u> </u> c/y dredged		
19. <input type="checkbox"/> Land Containing Shellfish	a. <u> </u> square feet	b. <u> </u> square feet	<u> </u> c. square feet	<u> </u> d. square feet
20. <input type="checkbox"/> Fish Runs	Indicate size under Coastal Banks, Inland Bank, Land Under the Ocean, and/or inland Land Under Waterbodies and Waterways, above			
	a. <u> </u> c/y dredged	b. <u> </u> c/y dredged		
21. <input type="checkbox"/> Land Subject to Coastal Storm Flowage	a. <u> </u> square feet	b. <u> </u> square feet		



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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.



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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 than 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.



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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.



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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.



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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).



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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 _____

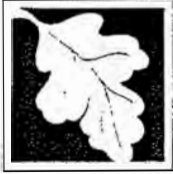
Therefore, work on this project may not go forward unless and until a revised Notice of Intent is submitted which provides measures which are adequate to meet these standards, and a final Order of Conditions is issued.

- 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):



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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:

[Signature] _____
[Signature] _____
[Signature] _____

by hand delivery on

by certified mail, return receipt requested, on

Date

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 appellants.

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.



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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 SE116-1344
 Project Location 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



Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands

DEP File Number:

WPA Form 7 – Extension Permit for Orders of Conditions

SE116-1297
Provided by DEP

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40



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

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.



1. Applicant:

David and Marilyn MacDonald, Marilyn's Landing

Name

PO Box 431, 645 Walnut Street

Mailing Address

Bridgewater

City/Town

MA

State

02324

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

[Handwritten signatures]

David & Marilyn MacDonald
645 Walnut St
Bridgewater MA 02324



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

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

City/Town

MA

State

02324

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

10/08/2013

Consultants

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

40

Assessors Map/Plat Number

Bridgewater, MA

City/Town

16 and 17

Parcel/Lot Number



WPA Form 2 – Determination of Applicability

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

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



WPA Form 2 – Determination of Applicability

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

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.



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

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 statutory/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
(2017-2019)



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 ACCEPTANCE OF 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,



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.

Richard Stromberg, LSP
CEC Project 175-313
Page 2
October 8, 2021

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.

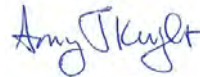
If you have any questions on the information provided, please feel free to contact us.

Sincerely,

CIVIL & ENVIRONMENTAL CONSULTANTS, INC.



Karlis Skulte, P.E.
Principal



Amy J. Knight, P.E.
Principal

Enclosures: Laboratory Results

cc: Marilyn MacDonald - MLCRA



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: Marilyn's 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's Geolab's Geotechnical Laboratory testing was performed and results reported in accordance with ASTM standards and accepted industry standards. No other representations or warranties either express or implied are given. RSA Geolab, LLC neither accepts responsibility for nor makes claim to the final use and purpose of the material tested. RSA Geolab, LLC owns all rights, title and interest of the work product. This report is intended for client's sole and exclusive use and not for the benefit of others and may not be used or relied upon by others. These documents must be considered proprietary information and should not be reproduced without the written approval of RSA Geolab, LLC.



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

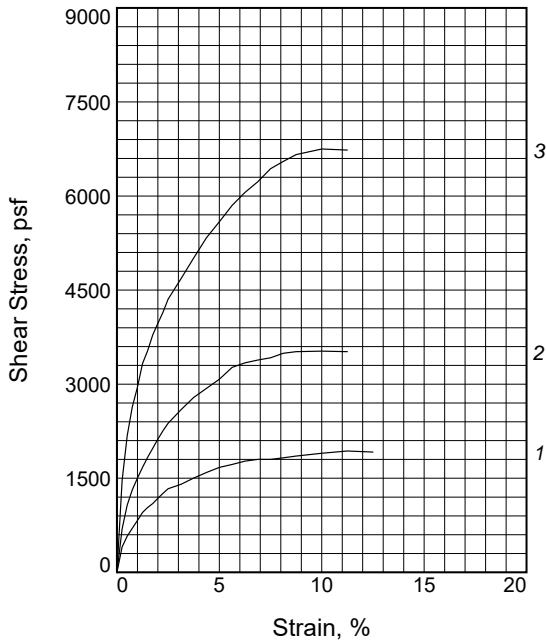
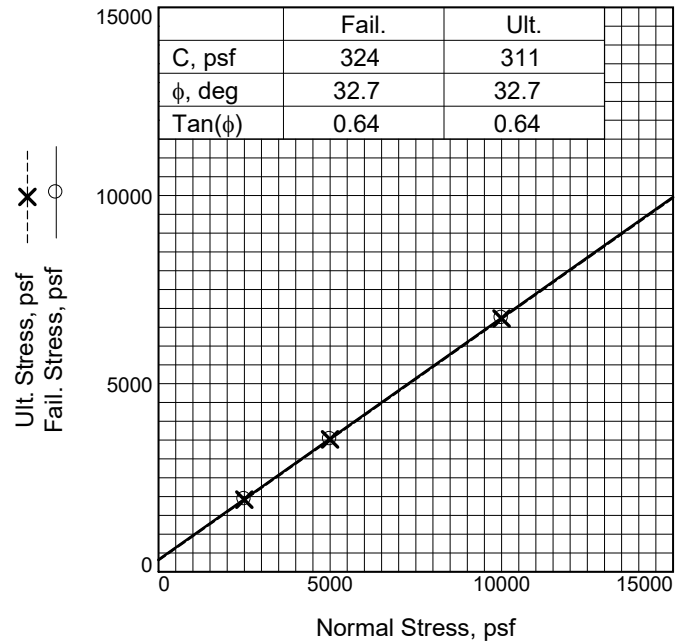
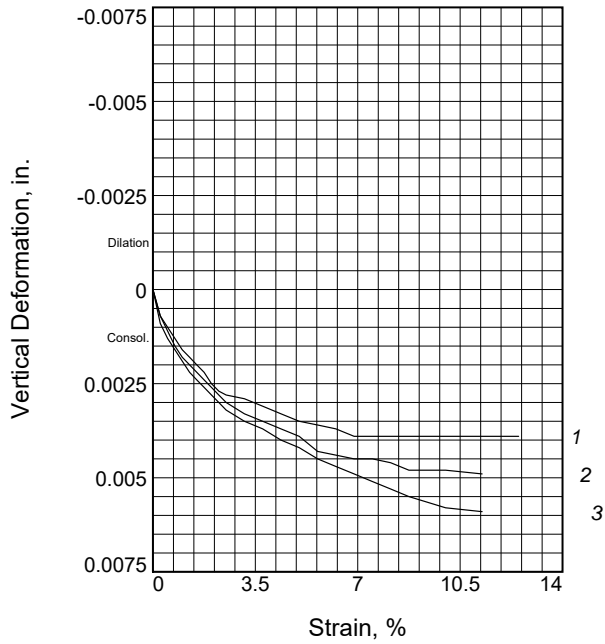
PROJECT: Marilyns Landing - CBC, Halifax, MA
 Project#175-313

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



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: Marilyn's 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

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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.*



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.

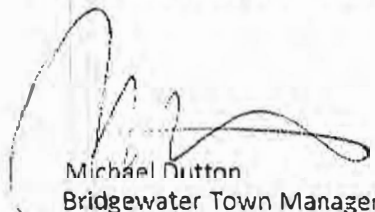
With approval of MassDEP placement of COMM-97 soils, the swale seems to be the ideal area for "COMM-97" fill soils. After this is accomplished it is the intention of MacDonald Industries to install a Solar Array system. Once this area is filled and meets all approvals by Mass DEP, Town of Halifax, and Town of Bridgewater.

It is no doubt that the long-term benefits of this project will 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 Manager for the proposed "Phase III" project.

Respectfully,


Eric J. Badger
Health Agent, Bridgewater Health Department


Michael Dutton
Bridgewater Town Manager

Bridgewater:

Preserving Our Past, Embracing Our Present, Building Our Future



**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.

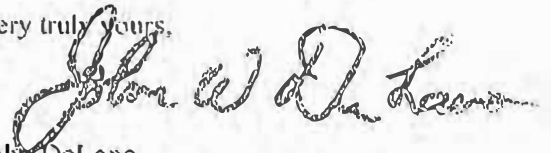
During the recent May 16th meeting, Ms. MacDonald reported on the progress in their proposal to expand its current soil fill operation in Bridgewater ("Phase III"). In cooperation with Republic Services, Inc. ("Republic") MacDonald proposes to fill air space between its property and the adjacent closed 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, 2017, 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.

Millie Garcia-Serrano
Re: MacDonald Industries, d/b/a/ Marilyn's Landing
04-05-2017
Page 2

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

Town of
Bridgewater
Massachusetts



BRIDGEWATER

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

Bridgewater:
Preserving Our Past. Enriching Our Present. Building Our Future.

TOWN OF BRIDGEWATER

Board of Health

Brian Penney, Chairman
Eric Colon, Member



TEL: 508-697-0903
FAX: 508-697-0947
ikeane@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,

A handwritten signature in black ink, appearing to read "Eric Badger".

Eric Badger
Health Agent

C: Mike White, Building Inspector, Dick Monteith, Chairman Conservation Commission,
Greg Guimond, Town Planner

www.bridgewaterma.org



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 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 of
Bridgewater
Massachusetts



BRIDGEWATER

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

Bridgewater:

Preserving Our Past. Enriching Our Present. Building Our Future.



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

Bridgewater:

Preserving Our Past. Enriching Our Present. Building Our Future.



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,

A handwritten signature in black ink, appearing to be "EJB", with a long horizontal line extending to the right.

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												
						1/10/2019	6/11/2019	1/16/2020	6/16/2020	11/30/2020	6/29/2021	1/10/2019	6/11 & 7/31/2019	1/16/2020	6/16/2020	11/30/2020	6/29/2021	1/10/2019	6/11 & 7/30/2019	1/16/2020	6/16/2020	11/30/2020	6/30/2021				
SW-846 6020B (µg/L) Metals Digestion																											
SAMPLING DATE																											
ANTIMONY	8000	6	~	8000	80000	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)	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	4.4	8.9	3.6	3.0	4.1	3.4	5.2	5.6	4.1	5.7	3.7	5.1				
BARIUM	50000	2000	~	50000	100000	15	21	15	11	21	17	60	72	49	33	45	46	36	36	24	26	38	39				
BERYLLIUM	200	4	~	200	2000	0.73	1.0	0.36	0.29	0.10	0.10	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				
CADMIUM	4	5	~	4	50	1.4	2.7	1.1	0.91	2.1	0.90	ND (0.50)	0.11	0.087	0.038	ND (0.20)	0.027	ND (0.50)	ND (0.20)	0.041	0.041	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)	0.90	0.68	ND (1.0)	1.1	ND (1.0)	1.8	2.0	0.54	1.1	ND (1.0)	ND (1.0)				
LEAD	10	15	~	10	150	ND (1.0)	1.8	0.45	0.43	3.6	4.8	1.2	1.8	1.4	2.4	0.47	1.3	0.47	ND (5.0)	2.6	ND (0.50)	0.25	0.095	ND (0.50)			
NICKEL	200	100	~	200	2000	34	23	9.1	6.5	6.7	18	5.9	3.4	3.2	2.5	2.6	9.0	9.6	4.9	5.3	4.7	14	14				
SELENIUM	100	50	~	100	1000	ND (5.0)	6.7	2.9	2.7	2.6	3.3	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)	2.3	3.0	ND (5.0)	5.6	2.4	2.4	2.9	12				
SILVER	7	100	~	7	1000	ND (0.50)	ND (0.20)	ND (0.20)	0.30	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 (0.50)	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.20)	0.071				
THALLIUM	3000	2	~	3000	30000	ND (0.20)	0.23	0.12	0.11	0.13	0.10	ND (0.20)	0.073	0.061	0.035	0.035	ND (0.20)	ND (1.0)	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.40)	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)	2.4	1.5	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)				
ZINC	900	5000	~	900	50000	33	81	28	27	23	25	300	280	260	120	44	60	54	4.9	11	26	23	6.6				
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)	0.000040	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)			
Polychlorinated Biphenyls SW-846 8082A (µg/L)																											
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 (20)	4.2	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (20)	11	ND (10)	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 (2.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	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 (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 (1.0)	ND (1.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (1.0)	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 (2.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (1.0)	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)	NT	ND (0.20)	ND (0.20)	ND (0.19)	ND (0.19)	ND (0.19)	NT	ND (0.20)	ND (0.20)	ND (0.21)	ND (0.20)	ND (0.19)				
SM21-22 2510B (µmhos/cm)																											
SPECIFIC CONDUCTANCE	~	~	~	~	~	NS*	NS**	2600	1100	3300	2400	NS*	2000	2100	1500	2700	2500	NS*	4200	3500	3000	6200	4800				
SM21-22 4500 H B (pH Units)																											
PH	~	~	~	~	~	NS*	NS**	5.1	7.0	5.4	5.5	NS*	6.2	6.3	6.5	6.5	6.4	NS*	5.9	6.1	5.9	5.3	5.8				
Pesticides SW-846 8081B (µg/L)																											
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	NS*	0.49	0.29	0.22	0.31	0.42	NS*	0.66	0.22	0.23	0.23	0.44				
Herbicides SW-846 8151A (µg/L)																											
2,4-DB	10000	~	~	~	~	NS*	NS**	ND (0.49)	ND (0.50)	ND (0.49)	ND (0.48)	NS*	ND (0.50)	ND (0.49)	ND (0.54)	ND (0.54)	ND (0.49)	NS*	ND (0.50)	ND (0.49)	ND (0.54)	0.42	ND (0.52)				
DALAPON	~	~	~	~	~	NS*	NS**	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)	NS*	ND (1.2)	ND (1.2)	ND (1.3)	ND (1.2)	ND (1.3)	ND (1.3)			
DICAMBA	50000	~	~	~	~	NS*	NS**	ND (0.049)	ND (0.050)	ND (0.049)	ND (0.048)	NS*	ND (0.050)	ND (0.049)	ND (0.054)	ND (0.054)	ND (0.049)	NS*	ND (0.050)	ND (0.049)	ND (0.054)	ND (0.050)	ND (0.052)				
MCPP	~	~	~	~	~	NS*	NS**	ND (49)	ND (50)	ND (49)	ND (48)	NS*	ND (50)	ND (49)	ND (54)	ND (54)	ND (49)	NS*	ND (50)	ND (49)	ND (54)	ND (50)	ND (52)				
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)	NS*	ND (5.0)	ND (10)	ND (0.31)	ND (0.29)	ND (0.29)	NS*	ND (5.4)	ND (9.9)	ND (0.29)	ND (0.29)	ND (0.29)				
ACENAPHTHYLENE	40	30	10000	40	100000	NS*	NS**	ND (5.0)	ND (0.20)	ND (0.19)	0.062	NS*	ND (5.0)	ND (5.0)	ND (0.20)	ND (0.19)	ND (0.19)	NS*	ND (5.4)	ND (5.0)	ND (0.20)	ND (0.20)	ND (0.20)				
ANTHRACENE	30	60	~	30	600	NS*	NS**	ND (10)	ND (0.20)	ND (0.19)	0.057	NS*	ND (5.0)	ND (10)	ND (0.20)	ND (0.19)	0.024	NS*	ND (5.4)	ND (9.9)	ND (0.20)	ND (0.20)	ND (0.20)				
BENZO(A)ANTHRACENE	1000	1	~	1000	10000	NS*	NS**	ND (2.0)	ND (0.051)	0.023	0.20	NS*	ND (5.0)	ND (2.0)	ND (0.051)	ND (0.049)	ND (0.049)	NS*	ND (5.4)	ND (2.0)	ND (0.049)	ND (0.049)	ND (0.049)				
BENZO(A)PYRENE	500	0.2	~	500	5000	NS*	NS**	ND (10)	ND (0.10)	0.029	0.23	NS*	ND (5.0)	ND (10)	ND (0.10)	ND (0.097)	ND (0.097)	NS*	ND (5.4)	ND (9.9)	ND (0.098)	ND (0.098)	ND (0.098)				
BENZO(B)FLUORANTHENE	400	1	~	400	4000	NS*	NS**	ND (10)	ND (0.051)	0.036	0.30	NS*	ND (5.0)	ND (10)	ND (0.051)	ND (0.049)	ND (0.049)	NS*	ND (5.4)	ND (9.9)	ND (0.049)	ND (0.049)	ND (0.049)				
BENZO(G,H,I)PERYLENE	20	50	~	20	500	NS*	NS**	ND (10)	ND (0.51)	0.022	0.18	NS*	ND (5.0)	ND (10)	ND (0.51)	ND (0.49)	ND (0.49)	NS*	ND (5.4)	ND (9.9)	ND (0.49)	ND (0.49)	ND (0.49)				
BENZO(K)FLUORANTHENE	100	1	~	100	1000	NS*	NS**	ND (10)	ND (0.20)	ND (0.19)	0.098	NS*	ND (5.0)	ND (10)	ND (0.20)	ND (0.19)	ND (0.19)	NS*	ND (5.4)	ND (9.9)	ND (0.20)	ND (0.20)	ND (0.20)				
4-CHLOROANILINE	300	20	30000	300	100000	NS*	NS**	ND (10)	ND (10)	ND (9.7)	0.47	NS*	ND (10)	ND (10)	ND (10)	ND (9.7)	ND (9.7)	NS*	ND (11)	ND (9.9)	ND (9.8)	ND (9.8)	ND (9.8)				
CHRYSENE	70	2	~	70	700	NS*	NS**	ND (10)	ND (0.20)	0.025	0.23	NS*	ND (5.0)	ND (10)	ND (0.20)	ND (0.19)	ND (0.19)	NS*	ND (5.4)	ND (9.9)	ND (0.20)	ND (0.20)	ND (0.20)				
DIBENZ(A,H)ANTHRACENE	40	0.5	~	40	400	NS*	NS**	ND (10)	ND (0.10)	ND (0.097)	0.041	NS*	ND (5.0)	ND (10)	ND (0.10)	ND (0.097)	ND (0.097)	NS*	ND (5.4)	ND (9.9)	ND (0.098)	ND (0.098)	ND (0.098)				
1,4-DICHLOROBENZENE	60	5	60	8000	80000	NS*	NS**	ND (10)	ND (5.1)	ND (4.9)	ND (5.4)	NS*	ND (5.0)	ND (10)	ND (5.1)	ND (4.9)	ND (4.9)	NS*	ND (5.4)	ND (9.9)	ND (4.9)	ND (4.9)	ND (4.9)				
FLUORANTHENE	200	90	~	200	2000	NS*	NS**	ND (10)	ND (0.51)	0.043	0.30	NS*	ND (5.0)	ND (10)	ND (0.51)	ND (0.49)	ND (0.49)	NS*	ND (5.4)	ND (9.9)	ND (0.49)	ND (0.49)	ND (0.49)				
FLUORENE	40	30	~	40	400	NS*	NS**	ND (5.0)	ND (1.0)	ND (0.97)	ND (1.1)	NS*	ND (5.0)	ND (5.0)	ND (1.0)	ND (0.97)	ND (0.97)	NS*	ND (5.4)	ND (5.0)	ND (0.98)	ND (0.98)	ND (0.98)				
INDENO(1,2,3-CD)PYRENE	100	0.5	~	100	1000	NS*	NS**	ND (10)	ND (0.10)	0.023	0.21	NS*	ND (5.0)	ND (10)	ND (0.10)	ND (0.097)	ND (0.097)	NS*	ND (5.4)	ND (10)	ND (0.098)	ND (0.098)	ND (0.098)				
2-METHYLNAPHTHALENE	2000	10	2000	20000	100000	NS*	NS**	ND (10)	ND (1.0)	0.15	ND (1.1)	NS*	ND (5.0)	ND (10)	ND (1.0)	ND (0.97)	ND (0.97)	NS*	ND (5.4)	ND (10)	ND (0.98)	ND (0.98)	ND (0.98)				

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					MW-5					MW-103		MW-106		MW-108		MW-113					
						1/10/2019	6/11 & 7/30/2019	1/16/2020	6/16/2020	11/30/2020	6/29/2021	1/10/2019	(FD)1/10/2019	6/18 & 7/31/2019	1/16/2020	6/16/2020	11/30/2020	6/29/2021	11/30/2020	6/30/2021	11/30/2020	6/30/2021	11/30/2020	6/30/2021	12/29/2020	6/30/2021	
Sampling Date						1/10/2019	6/11 & 7/30/2019	1/16/2020	6/16/2020	11/30/2020	6/29/2021	1/10/2019	(FD)1/10/2019	6/18 & 7/31/2019	1/16/2020	6/16/2020	11/30/2020	6/29/2021	11/30/2020	6/30/2021	11/30/2020	6/30/2021	11/30/2020	6/30/2021	12/29/2020	6/30/2021	
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	ND (1.0)	ND (1.0)	ND (0.35)	ND (1.0)	ND (1.0)	ND (1.0)	0.42	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	ND (0.40)	ND (0.40)	ND (0.64)	0.66	0.68	0.77	1.3	30	12	ND (0.80)	0.92	ND (0.80)	ND (0.80)	ND (0.80)	ND (0.80)	
BARIIUM	50000	2000	~	50000	100000	150	140	130	170	150	180	52	53	41	26	44	39	39	27	27	12	13	12	17	17	8.8	
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 (0.091)	ND (0.40)	ND (0.40)	ND (0.40)	ND (0.40)	ND (0.40)	ND (0.40)	0.11	ND (0.40)	ND (0.40)	ND (0.40)	ND (0.40)	ND (0.40)	
CADMIUM	4	5	~	4	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	0.13	0.071	0.10	0.058	0.077	0.054	ND (0.20)	ND (0.20)	
CHROMIUM	300	100	~	300	3000	1.1	1.1	0.38	1.1	ND (1.0)	ND (1.0)	1.4	1.7	1.3	0.82	1.1	ND (1.0)	0.95	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	ND (1.0)	ND (1.0)	0.59	0.59	2.9	1.3	0.40	ND (0.50)	ND (0.50)	0.19	0.21	ND (0.50)	ND (0.50)	0.46	ND (0.50)	
NICKEL	200	100	~	200	2000	ND (5.0)	2.4	2.9	3.2	3.3	6.8	230	230	12	35	11	67	17	5.5	3.9	1.3	2.0	2.3	2.7	1.4	0.76	
SELENIUM	100	50	~	100	1000	ND (5.0)	3.9	2.3	5.3	3.2	12	ND (5.0)	ND (5.0)	ND (1.6)	ND (5.0)	ND (5.0)	ND (5.0)	5.2	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 (0.50)	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)	
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)	0.032	ND (0.20)	0.030	ND (0.20)	ND (0.20)	0.19	0.097	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	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)	
ZINC	900	5000	~	900	50000	56	7.7	85	9.7	27	9.5	5300	6000	210	760	220	1900	160	5.3	4.0	13	15	7.2	5.4	12	ND (10)	
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)	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)
Polychlorinated Biphenyls SW-846 8082A (µg/L)																											
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 (10)	NT	ND (3.8)	ND (10)	ND (10)	ND (10)	ND (20)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	
CHLOROGENZENE	200	100	200	1000	10000	ND (1.0)	ND (2.0)	ND (5.0)	ND (5.0)	ND (1.0)	ND (4.0)	ND (1.0)	NT	ND (0.15)	ND (1.0)	ND (1.0)	ND (1.0)	ND (2.0)	0.70	0.24	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	
1,2-DICHLOROGENZENE	2000	600	8000	2000	80000	ND (1.0)	ND (2.0)	ND (5.0)	ND (5.0)	ND (1.0)	ND (4.0)	ND (1.0)	NT	ND (0.16)	ND (1.0)	ND (1.0)	ND (1.0)	ND (2.0)	0.30	0.17	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	
1,4-DICHLOROGENZENE	60	5	60	8000	80000	ND (1.0)	ND (2.0)	ND (5.0)	ND (5.0)	ND (1.0)	ND (4.0)	ND (1.0)	NT	ND (0.13)	ND (1.0)	ND (1.0)	ND (1.0)	ND (2.0)	1.5	0.59	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	
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)	NT	NT	ND (0.034)	ND (0.20)	ND (0.20)	ND (0.19)	ND (0.19)	0.24	ND (0.19)	ND (0.20)	ND (0.19)	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.19)	
SM21-22 2510B (µmhos/cm)																											
SPECIFIC CONDUCTANCE	~	~	~	~	~	NS*	3300	3100	3100	3600	3200	NS*	NS*	680	910	2000	1200	2500	390	180	42	27	66	100	52	52	
SM21-22 4500 H B (pH Units)																											
PH	~	~	~	~	~	NS*	6.3	6.5	6.5	6.6	6.6	NS*	NS*	7.3	7	5.2	7.2	6.8	6.3	6.2	5.3	5.2	5.6	5.8	5.7	5.7	
Pesticides SW-846 8081B (µg/L)																											
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	NS*	NS*	0.25	0.18	ND (0.20)	0.23	0.91	ND (0.20)	ND (0.20)	ND (0.19)	0.23	ND (0.20)	ND (0.20)	ND (0.20)	0.33	
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)	NS*	NS*	ND (0.50)	ND (0.49)	ND (0.52)	ND (0.49)	ND (0.49)	ND (0.52)	ND (0.49)	ND (0.50)	ND (0.50)	ND (0.52)	ND (0.51)	ND (0.49)	ND (0.49)	
DALAPON	~	~	~	~	~	NS*	0.35	ND (1.2)	ND (1.2)	ND (1.2)	ND (1.3)	NS*	NS*	ND (1.2)	ND (1.2)	ND (1.2)	ND (1.2)	ND (1.2)	ND (1.2)	ND (1.2)	ND (1.2)	ND (1.2)	ND (1.2)	ND (1.2)	ND (1.2)	ND (1.2)	
DICAMBA	50000	~	~	~	~	NS*	ND (0.050)	ND (0.049)	ND (0.048)	ND (0.049)	ND (0.052)	NS*	NS*	ND (0.050)	ND (0.049)	ND (0.052)	0.096	ND (0.049)	ND (0.052)	ND (0.049)	ND (0.050)	ND (0.050)	ND (0.052)	ND (0.051)	ND (0.049)	ND (0.049)	
MCPP	~	~	~	~	~	NS*	ND (50)	ND (49)	ND (48)	ND (49)	ND (52)	NS*	NS*	ND (50)	ND (49)	ND (52)	ND (49)	ND (49)	ND (52)	ND (49)	15	ND (50)	ND (52)	ND (51)	ND (49)	ND (49)	
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	NS*	NS*	ND (5.0)	ND (9.9)	ND (0.31)	ND (0.29)	ND (0.29)	ND (0.29)	ND (0.29)	ND (0.29)	ND (0.29)	ND (0.30)	ND (0.30)	ND (0.31)	ND (0.29)	
ACENAPHTHYLENE	40	30	10000	40	100000	NS*	ND (5.4)	ND (5.0)	ND (0.19)	ND (0.19)	0.028	NS*	NS*	ND (5.0)	ND (5.0)	ND (0.21)	ND (0.19)	ND (0.20)	ND (0.19)	ND (0.19)	ND (0.19)	ND (0.20)	ND (0.20)	ND (0.21)	ND (0.19)	ND (0.19)	
ANTHRACENE	30	60	~	30	600	NS*	ND (5.4)	ND (10)	0.053	0.044	0.066	NS*	NS*	ND (5.0)	ND (9.9)	0.033	0.032	0.066	ND (0.20)	ND (0.19)	ND (0.19)	ND (0.19)	ND (0.20)	ND (0.20)	ND (0.21)	ND (0.19)	
BENZO(A)ANTHRACENE	1000	1	~	1000	10000	NS*	ND (5.4)	ND (2.0)	ND (0.048)	ND (0.049)	ND (0.052)	NS*	NS*	ND (5.0)	ND (2.0)	ND (0.052)	ND (0.049)	ND (0.049)	ND (0.049)	ND (0.049)	ND (0.049)	ND (0.050)	ND (0.050)	ND (0.052)	ND (0.049)	ND (0.049)	
BENZO(A)PYRENE	500	0.2	~	500	5000	NS*	ND (5.4)	ND (10)	ND (0.096)	ND (0.097)	0.030	NS*	NS*	ND (5.0)	0.13	ND (0.10)	ND (0.097)	ND (0.098)	0.016	ND (0.097)	ND (0.096)	ND (0.097)	ND (0.10)	ND (0.10)	ND (0.097)	ND (0.097)	
BENZO(B)FLUORANTHENE	400	1	~	400	4000	NS*	ND (5.4)	ND (10)	ND (0.048)	ND (0.049)	0.030	NS*	NS*	ND (5.0)	0.02	ND (0.052)	ND (0.049)	ND (0.049)	0.032	ND (0.049)	ND (0.048)	ND (0.049)	ND (0.050)	ND (0.050)	ND (0.052)	ND (0.049)	
BENZO(G,H,I)PERYLENE	20	50	~	20	500	NS*	ND (5.4)	ND (10)	ND (0.48)	ND (0.49)	0.033	NS*	NS*	ND (5.0)	ND (9.9)	ND (0.52)	ND (0.49)	ND (0.49)	0.037	ND (0.49)	ND (0.48)	ND (0.49)	ND (0.50)	ND (0.50)	ND (0.49)	ND (0.49)	
BENZO(K)FLUORANTHENE	100	1	~	100	1000	NS*	ND (5.4)	ND (10)	ND (0.19)	ND (0.19)	0.029	NS*	NS*	ND (5.0)	ND (9.9)	ND (0.21)	ND (0.19)	ND (0.20)	0.018	ND (0.19)	ND (0.19)	ND (0.20)	ND (0.20)	ND (0.21)	ND (0.19)	ND (0.19)	
4-CHLOROANILINE	300	20	30000	300	100000	NS*	ND (11)	ND (10)	ND (9.6)	ND (9.7)	ND (10)	NS*	NS*	ND (9.9)	ND (9.9)	ND (10)	ND (9.7)	ND (9.8)	ND (9.8)	ND (9.7)	ND (9.6)	ND (9.7)	ND (10)	ND (10)	ND (10)	ND (9.7)	
CHRYSENE	70	2	~	70	700	NS*	ND (5.4)	ND (10)	ND (0.19)	ND (0.19)	0.028	NS*	NS*	ND (5.0)	ND (9.9)	ND (0.21)	ND (0.19)	ND (0.20)	ND (0.20)	ND (0.19)	ND (0.19)	ND (0.20)	ND (0.20)	ND (0.21)	ND (0.19)	ND (0.19)	
DIBENZ(A,H)ANTHRACENE	40	0.5	~	40	400	NS*	ND (5.4)	ND (10)	ND (0.096)	ND (0.097)	0.076	NS*	NS*	ND (5.0)	ND (9.9)	ND (0.10)	ND (0.097)	ND (0.098)	0.041	ND (0.097)	ND (0.096)	ND (0.097)	ND (0.10)	ND (0.10)	ND (0.10)	ND (0.097)	
1,4-DICHLOROGENZENE	60	5	60	8000	80000	NS*	ND (5.4)	ND (10)	ND (4.8)	ND (4.9)	ND (5.2)	NS*	NS*	ND (5.0)	ND (9.9)	ND (5.2)	ND (4.9)	ND (4.9)	0.73	0.38	ND (4.8)	ND (4.9)	ND (5.0)	ND (5.2)	ND (4.9)	ND (4.9)	
FLUORANTHENE	200	90	~	2000	20000																						

**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 52.99	1/10/2019	3.01	49.98	9.90	0.00	2263	4.53	252.20	87.69
	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
MW-2 54.24	1/10/2019	4.54	49.70	8.20	0.34	2214	6.23	64.60	16.67
	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
MW-3 54.79	1/10/2019	4.83	49.96	8.40	0.06	5099	6.11	-37.00	7.28
	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
MW-4 57.8	1/10/2019	3.33	54.47	5.80	0.20	4447	6.48	-53.20	13.94
	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
MW-5 59.41	1/10/2019	4.21	55.20	5.00	4.32	856	6.78	124.70	15.12
	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
MW-103 59.77	11/30/2020	15.58	44.19	12.63	1.05	657	6.55	-96.90	2.90
	6/30/2021	14.95	44.82	13.14	0.25	195	5.75	Not Collected	2.00
MW-106 56.72	11/30/2020	9.21	47.51	8.27	3.94	41	5.10	137.90	0.02
	6/30/2021	8.59	48.13	14.60	0.49	24	4.29	Not Collected	0.02
MW-108 63.51	11/30/2020	19.06	44.45	13.82	2.44	66	5.47	156.20	0.02
	6/30/2021	18.18	45.33	16.20	4.82	111	3.27	279.20	2.13
MW-113 75.90	12/29/2020	30.72	45.18	6.93	8.17	49	5.66	227.80	6.86
	6/30/2021	30.58	45.32	14.60	7.74	46	5.08	Not Collected	0.02

**APPENDIX G
STORMWATER POLLUTION
PROTECTION PLAN (CEC,
August 2021)**

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:

06/23/2020

Estimated Project Dates:

Project Start Date: Summer 2020

Project Completion Date: Summer 2025

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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 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	<input type="checkbox"/> Yes Date:
David MacDonald MacDonald Industries Corporation (508) 294-0174 marilynslanding@hotmail.com	Owner & Operator Operational Control over Construction Plans & Specifications, and SWPPP, and Permit Compliance	<input type="checkbox"/> Yes Date:
Christopher Ford, MS Environmental Manager Browning Ferris Industries, Inc. / Republic Services 508-786-7022 CFord2@republicservices.com	Owner	<input type="checkbox"/> Yes Date:

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
Project Street/Location: Off Plymouth Street
City: Halifax & Bridgewater
State: MA
ZIP Code: 02324
County or Similar Subdivision: Plymouth County
Business days and hours for the project: 6:00 am – 5:00 pm

Project Latitude/Longitude

Latitude: 41.990677° N Longitude: - 70.901213 ° W
(decimal degrees) (decimal degrees)
Latitude/longitude data source:

Map GPS Other (please specify): Google Earth

Horizontal Reference Datum:

NAD 27 NAD 83 WGS 84

Additional Project Information

Are you requesting permit coverage as a "federal operator" as defined in [Appendix A](#) of the 2017 CGP? Yes No

Is the project/site located on Indian country lands, or located on a property of religious or cultural significance to an Indian tribe? Yes No

If yes, provide the name of the Indian tribe associated with the area of Indian country (including the name of Indian reservation if applicable), or if not in Indian country, provide the name of the Indian tribe associated with the property: _____

If you are conducting earth-disturbing activities in response to a public emergency, document the cause of the public emergency (e.g., *natural disaster, extreme flooding conditions*), information substantiating its occurrence (e.g., *state disaster declaration*), and a description of the construction necessary to reestablish effective public services: _____

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

For each point of discharge, provide a point of discharge ID (a unique 3-digit ID, e.g., 001, 002), the name of the first water of the U.S. that receives stormwater directly from the point of discharge and/or from the MS4 that the point of discharge discharges to, and the following receiving water information, if applicable:								
Point of Discharge ID	Name of receiving water:	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 US								
001A	Cross Street Pond	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No			<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
001B	Wetland adjacent to Big South Cranberry Pond	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No			<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
Downstream Waters								
002	Plymouth Street Pond (MA62141)	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No			<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
003	Robbins Pond (MA62162)	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No			<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
004	Satucket River (MA62-10)	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No			<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
005	Matfiled River (MA62-32)	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Algae, Benthic Macroinvertebrate, Dissolved Oxygen, Escherichia Coli (E. Coli),	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	40308	Fecal Coliform	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	

			Fecal Coliform, Odor, and Phosphorous (Total)					
006	Taunton River (MA62-01)	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	E. Coli	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No			<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Tier 2 (Class B - High Quality Water)
007	Taunton River (MA62-03)	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Fecal Coliform, Dissolved Oxygen	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	40310	Fecal Coliform	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Tier 2 (Class SB - High Quality Water)
008	Mount Hope Bay (MA61-06)	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Chlorophyll-A, Enterococcus, Fecal Coliform, Fish Bioassessments, Nitrogen (Total), Temperature	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	38908	Fecal Coliform	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
009	Rhode Island Sound	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No			<input type="checkbox"/> Yes <input checked="" type="checkbox"/> 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 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.

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	±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 there be demolition of any structure built or renovated before January 1, 1980? Yes No

If yes, do any of the structures being demolished have at least 10,000 square feet of floor space? Yes No N/A

Was the pre-development land use used for agriculture (see [Appendix A](#) for definition of "agricultural land")? Yes No

Pollutant-Generating Activities

List and describe all pollutant-generating activities and indicate for each activity the type of pollutant that will be generated. 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:

NA

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

Type of Authorized Non-Stormwater Discharge	Likely to be Present at Your Site?	
Discharges from emergency fire-fighting activities	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
Fire hydrant flushings	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
Landscape irrigation	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
Waters used to wash vehicles and equipment	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No
Water used to control dust	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No
Potable water including uncontaminated water line flushings	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
External building wash-down (soaps/solvents are not used and external surfaces do not contain hazardous substances)	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
Pavement wash waters	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
Uncontaminated air conditioning or compressor condensate	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
Uncontaminated, non-turbid discharges of ground water or spring water	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
Foundation or footing drains	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
Construction dewatering water	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> 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 the SWPPP Template.)

2.6 Site Maps

Instructions (see CGP Part 7.2.4):

- Attach site maps in Appendix A of the Template. For most projects, a series of site maps is necessary and recommended. The first should show the undeveloped site and its current features. An additional map or maps should be created to show the developed site or, for more complicated sites, show the major phases of development.

These maps must include the following features:

- Boundaries of the property and of the locations where construction will occur, including:
 - ✓ Locations where earth-disturbing activities will occur, noting any phasing of construction activities and any demolition activities;
 - ✓ Approximate slopes before and after major grading activities. Note areas of steep slopes, as defined in CGP Appendix A;
 - ✓ Locations where sediment, soil, or other construction materials will be stockpiled;
 - ✓ Locations of any crossings of waters of the U.S.;
 - ✓ Designated points where vehicles will exit onto paved roads;
 - ✓ Locations of structures and other impervious surfaces upon completion of construction; and
 - ✓ Locations of on-site and off-site construction support activity areas covered by this permit (see Part 1.2.1.c).
- Locations of all waters of the U.S., including wetlands, on your site and within one mile downstream of the site's discharge point. Indicate which waterbodies are listed as impaired, and which are identified by your state, tribe, or EPA as Tier 2, Tier 2.5, or Tier 3 waters.
- Areas of federally-listed critical habitat for endangered or threatened species within the site and/or at discharge locations.
- Type and extent of pre-construction cover on the site (e.g., vegetative cover, forest, pasture, pavement, structures)
- Drainage pattern(s) of stormwater and authorized non-stormwater before and after major grading activities.
- Stormwater and authorized non-stormwater discharge locations, including:
 - ✓ Locations where stormwater and/or authorized non-stormwater will be discharged to storm drain inlets; and
 - ✓ Locations where stormwater or allowable non-stormwater will be discharged to waters of the U.S. (including wetlands).
- Locations of all potential pollutant-generating activities.
- Locations of stormwater controls, including natural buffer areas and any shared controls utilized to comply with the permit.
- Locations where polymers, flocculants, or other treatment chemicals will be used and stored.

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

Under which criterion listed in [Appendix D](#) 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 this permit, 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 this permit.

Basis statement content/Supporting documentation: A basis statement supporting the selection of Criterion A should identify the USFWS and NMFS information sources used. Attaching aerial image(s) of the site to your NOI is helpful to EPA, USFWS, and NMFS in confirming eligibility under this criterion. Please Note: NMFS' jurisdiction includes ESA-listed marine and estuarine species that spawn in inland rivers. Check the applicable source(s) of information you relied upon:

- Specific communication with staff of the USFWS and/or NMFS.
- Species list from USFWS and/or NMFS. See the [CGP ESA webpage, Step 2](#) for available websites.

- Criterion B:** Eligibility requirements met by another operator under the 2017 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 2017 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 2017CGP operator's notification of authorization under this permit. If your certification is based on another 2017 CGP operator's certification under criterion C, you must provide EPA with the relevant supporting information required of existing dischargers in criterion C in your NOI form.

Basis statement content/Supporting documentation: A basis statement supporting the selection of Criterion B should identify the eligibility criterion of the other CGP NOI, the authorization date, and confirmation that the authorization is effective.

- ✓ Provide the 9-digit NPDES ID number from the other operator's NOI under the 2017 CGP:
- ✓ Authorization date of the other 2017 CGP operator:
- ✓ Eligibility criterion of the other 2017 CGP operator: A C D E F
- ✓ Provide a brief summary of the basis the other operator used for selecting criterion A, C, D, E, or F:

- Criterion C:** Discharges not likely to adversely affect 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 adversely affect 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 adversely affect 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 adverse effects to ESA-listed species will be avoided from the discharges and discharge-related activities. You must also include a copy of your site map from your SWPPP showing the upland and in-water extent of your "action area" with this NOI.

Basis statement content/Supporting documentation: A basis statement supporting the selection of Criterion C should identify the information resources and expertise (e.g., state or federal biologists) used to arrive at this conclusion. Any supporting documentation should explicitly state that both ESA-listed species and designated critical habitat under the jurisdiction of the USFWS and/or NMFS were considered in the evaluation.

- ✓ Resources used to make determination:

Information was obtained from the US Fish and Wildlife – IpaC - Information for Planning and Consultation Website in accordance with Section 2 of the CGP.

A review of the Natural Heritage & Endangered Species Program which is part of the Massachusetts Division of Fisheries and Wildlife was also performed indicating that the action area is located outside of any habitat areas and there will be no adverse effect on potential species habitat. Refer to Figure 3 for reference.

The owner and its consultants have also completed federal, state and local environmental review process(s) required for Stormwater Management, Erosion, Drainage and Site Improvements. Any of these documents related to the Project are available upon request.

- ✓ ESA-listed Species/Critical Habitat in action area:

According to the USFWS letter, there are 2 species on the list: Northern Long-Eared Bat; and Plymouth Redbelly Turtle. The list identifies that our location is outside the designated critical habitat. Furthermore, there are no critical habitats within the project area. The owner and its consultants have completed federal, state and local environmental review process(s) required for Stormwater Management, Erosion, Drainage and Site Improvements.

- ✓ Distance between site and ESA-listed Species/Critical Habitat:

The Site is located 28.5 miles from identified Long-Eared Bat Habitat, and 13 miles from identified critical habitat for the Plymouth Redbelly turtle. Additionally, as part of local permitting, a comprehensive environmental review was performed and no habitat was found at the Site.

- ✓ How adverse effects will be avoided:

As part of the local and state permitting process, a comprehensive environmental review was performed and no habitat was found at the Site. Construction will be performed within the limit of work as shown on the Plans, and erosion controls will be implemented at the Site in accordance with this SWPPP.

- 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 concurrence from USFWS and/or NMFS that your site's discharges and discharge-related activities are not likely to adversely affect listed species and/or critical habitat. You must include copies of the correspondence with the participating agencies in your SWPPP and this NOI.

Basis statement content/Supporting documentation: A basis statement supporting the selection of Criterion D should identify whether USFWS or NMFS or both agencies participated in coordination, the field office/regional office(s) providing that coordination, and the date that coordination concluded.

- ✓ Agency coordinated with: USFWS NMFS
- ✓ Field/regional office(s) providing coordination:
- ✓ Date coordination concluded:
- ✓ Attach copies of any letters or other communication between you and the U.S. Fish & Wildlife Service or National Marine Fisheries Service concluding coordination activities.

-
- 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. The consultation must have addressed the effects of the construction site's discharges and discharge-related activities on ESA-listed species and/or designated critical habitat under the jurisdiction of USFWS and/or NMFS. To certify eligibility under this criterion, Indicate the result of the consultation:

- Biological opinion from USFWS and/or NMFS that concludes that the action in question (taking into account the effects of your site's discharges and discharge-related activities) is not likely to jeopardize the continued existence of listed species, nor the destruction or adverse modification of critical habitat; or
- Written concurrence from USFWS and/or NMFS with a finding that the site's discharges and discharge-related activities are not likely to adversely affect ESA-listed species and/or designated critical habitat. You must include copies of the correspondence between yourself and the USFWS and/or NMFS in your SWPPP and this NOI.

Basis statement content/Supporting documentation: A basis statement supporting the selection of Criterion E should identify the federal action agency(ies) involved, the field office/regional office(s) providing that consultation, any tracking numbers of identifiers associated with that consultation (e.g., IPaC number, PCTS number), and the date the consultation was completed.

- ✓ Federal agency(ies) involved:
- ✓ Field/regional office(s) providing consultation:
- ✓ Tracking numbers associated with consultation:
- ✓ Date consultation completed:
- ✓ Attach copies of any letters or other communication between you and the U.S. Fish & Wildlife Service or National Marine Fisheries Service concluding consultation.

-
- 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.

Basis statement content/Supporting documentation: A basis statement supporting the selection of Criterion F should identify whether USFWS or NMFS or both agencies provided a section 10 permit, the field office/regional office(s) providing permit(s), any tracking numbers of identifiers associated with that consultation (e.g., IPaC number, PCTS number), and the date the permit was granted.

- ✓ Agency providing section 10 permit: USFWS NMFS
- ✓ Field/regional office(s) providing permit:
- ✓ Tracking numbers associated with consultation:
- ✓ Date permit granted:
- ✓ Attach copies of any letters or other communication between you and the U.S. Fish & Wildlife Service or National Marine Fisheries Service.

3.2 Historic Preservation

Appendix E, Step 1

Do you plan on installing 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
- Stormwater Conveyance Channel (e.g., ditch, trench, perimeter drain, swale, etc.)
- Culvert
- Other type of ground-disturbing stormwater control:

(Note: If you will not be installing any ground-disturbing stormwater controls, no further documentation is required for Section 3.2 of the Template.)

Appendix E, Step 2

If you answered yes in Step 1, have prior surveys or evaluations conducted on the site already determined that historic properties do not exist, or that 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.

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.

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.

Appendix E, Step 4

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 whether the subsurface earth disturbances caused by the installation of stormwater controls affect historic properties? YES NO

If no, no further documentation is required for Section 3.2 of the Template.

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:

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)

None of the above are proposed to be conducted.

SECTION 4: EROSION AND SEDIMENT CONTROLS

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 waters of the U.S. 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, which in combination achieves 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 M 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 the water of the U.S. that is located 50 feet from my construction disturbances.
- No natural buffer exists due to preexisting development disturbances that occurred prior to the initiation of planning for this project.
- For a "linear construction sites" (defined in Appendix A), site constraints (e.g., limited right-of-way) make it infeasible to meet any of the CGP Part 2.2.1.a compliance alternatives.
- The project qualifies as "small residential lot" construction (defined in Appendix A) (see Appendix G, Part G.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 Stockpiled 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.

- o 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 and/or calcium chloride 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) and a laborer will apply calcium chloride by hand.

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 Stormwater Conveyance Channels

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 Conveyance Channel Controls

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.

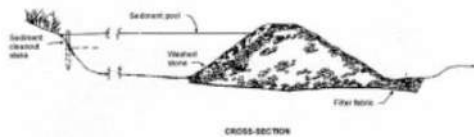
4.11 Sediment Basins

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.	
Installation	As needed and determined by Owner/Contractor
Maintenance Requirements	<p>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.</p> <p>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.</p> <p>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.</p> <p>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.</p>

<p>Design Specifications</p>	<p>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.</p> <p>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.</p> <table border="1"> <thead> <tr> <th>Spillway width Drainage Area (acres)</th> <th>Minimum Bottom Width (feet)</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>4.0</td> </tr> <tr> <td>2</td> <td>6.0</td> </tr> <tr> <td>3</td> <td>8.0</td> </tr> <tr> <td>4</td> <td>10.0</td> </tr> <tr> <td>5</td> <td>12.0</td> </tr> </tbody> </table> <p>Outlet apron - 5-ft long, minimum, on level grade with filter fabric foundation.</p> 	Spillway width Drainage Area (acres)	Minimum Bottom Width (feet)	1	4.0	2	6.0	3	8.0	4	10.0	5	12.0
Spillway width Drainage Area (acres)	Minimum Bottom Width (feet)												
1	4.0												
2	6.0												
3	8.0												
4	10.0												
5	12.0												

4.12 Chemical Treatment

Soil Types

List all the soil types (including soil types expected to be found in fill material) that are expected to be exposed during construction in areas of the project that will drain to chemical treatment systems:

- Water and/or calcium chloride 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) and a laborer will apply calcium chloride by hand.

Treatment Chemicals

List all treatment chemicals that will be used at the site and explain why these chemicals are suited to the soil characteristics:

- Calcium Chloride

Describe the dosage of all treatment chemicals you will use at the site or the methodology you will use to determine dosage:

- Calcium chloride will be spread by hand to provide traction on ice or slippery surfaces during winter months.

Provide information from any applicable Safety Data Sheets (SDS): N/A

Describe how each of the chemicals will be stored:

- Calcium chloride will be stored in 5 gallon buckets to minimize access to water.

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 an exceedance of 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. 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	
<input type="checkbox"/> <i>Vegetative</i> <input checked="" type="checkbox"/> <i>Non-Vegetative</i> <input type="checkbox"/> <i>Temporary</i> <input checked="" type="checkbox"/> <i>Permanent</i>	
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	
<input checked="" type="checkbox"/> <i>Vegetative</i> <input type="checkbox"/> <i>Non-Vegetative</i> <input checked="" type="checkbox"/> <i>Temporary</i> <input checked="" type="checkbox"/> <i>Permanent</i>	
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 STANDARDS

5.1 Potential Sources of Pollution

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
- Calcium Chloride

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 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 and will be 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 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 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.

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 and will 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 being excavated, 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 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 glyphosate can 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	<p>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.</p> <p>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).</p> <p>On business days, clean up and dispose of waste in designated waste containers.</p> <p>Clean up immediately if containers overflow.</p>
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 4 weeks	
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 Paint, Concrete 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 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 before heavy rains that could cause excess nutrients to be discharged;
- 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

Personnel Responsible for Inspections

Mr. David MacDonald
MacDonald Industries Corporation
Phone: (508) 294-0174

Note: All personnel conducting inspections must be considered a "qualified person." CGP Part 4.1 clarifies that a "qualified person" is a person knowledgeable in the principles and practices of erosion and sediment controls and pollution prevention, who possesses the appropriate skills and training to assess conditions at the construction site that could impact stormwater quality, and the appropriate skills and training to assess the effectiveness of any stormwater controls selected and installed to meet the requirements of this permit.

Inspection Schedule

Standard Frequency:
<input checked="" type="checkbox"/> Every 7 days <input type="checkbox"/> Every 14 days and within 24 hours of a 0.25" rain or the occurrence of runoff from snowmelt sufficient to cause a discharge
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 <input type="checkbox"/> Every 7 days and within 24 hours of a 0.25" rain
Reduced Frequency (if applicable)
For stabilized areas <input type="checkbox"/> Twice during first month, no more than 14 calendar days apart; then once per month after first month;
For stabilized areas on "linear construction sites" <input type="checkbox"/> Twice during first month, no more than 14 calendar days apart; then once more within 24 hours of a 0.25" rain
For arid, semi-arid, or drought-stricken areas during seasonally dry periods or during drought <input type="checkbox"/> Once per month and within 24 hours of a 0.25" rain Insert beginning and ending dates of the seasonally-defined dry period for your area or the valid period of drought: <ul style="list-style-type: none"> ▪ Beginning date of seasonally dry period: ▪ Ending date of seasonally dry period:
For frozen conditions where earth-disturbing activities are being conducted <input checked="" type="checkbox"/> Once per month Insert beginning and ending dates of frozen conditions on your site:

- | |
|--|
| <ul style="list-style-type: none">▪ Beginning date of frozen conditions: <u>January 15</u>▪ Ending date of frozen conditions: <u>March 15</u> |
|--|

Rain Gauge Location (if applicable)

N/A

Inspection Report Forms

The Inspection Report Form and associated instructions for completion are attached as 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: TRAINING

Table 7-1: Documentation for Completion of Training

Name	Describe Training	Date Training Completed

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: _____

[Repeat as needed for multiple construction operators at the site.]

SWPPP APPENDICES

Attach the following documentation to the SWPPP:

Appendix A – Site Maps

Appendix B – Copy of 2017 CGP

(Note: The 2017 CGP is available at <https://www.epa.gov/npdes/epas-2017-construction-general-permit-cgp-and-related-documents>)

Appendix C – NOI and EPA Authorization Email

Appendix D – Inspection Form

(Note: EPA has developed a sample inspection form that CGP operators can use. The form is available at <https://www.epa.gov/npdes/stormwater-discharges-construction-activities#resources>)

Appendix E – Corrective Action Form

(Note: EPA has developed a sample corrective action form that CGP operators can use. The form is available at <https://www.epa.gov/npdes/stormwater-discharges-construction-activities#resources>)

Appendix F – SWPPP Amendment Log

Appendix G – Subcontractor Certifications/Agreements

Appendix H – Grading and Stabilization Activities Log

Appendix I – Training Log

Appendix J – Delegation of Authority

Appendix K – Endangered Species Documentation

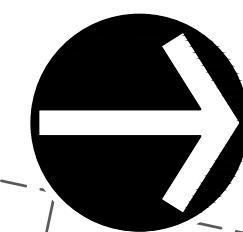
Appendix L – Excerpt of Soil Re-Use Management Plan

Appendix M – Regulatory Approvals

Appendix N – Buffer Zone Calculations

Appendix O – Impaired and High Quality Waters Information

Appendix A – Site Maps



NORTH

LEGEND:

---	EXISTING MAJOR CONTOUR
- - -	EXISTING MINOR CONTOUR
---	EXISTING PROPERTY LINE
---	EXISTING TOWN LINE
---	EXISTING UTILITY EASEMENT
---	EXISTING TREENLINE
---	EXISTING WETLANDS LINE
---	25' BUFFER ZONE
---	100' BUFFER ZONE
---	EXISTING PAVED ROAD
---	EXISTING UNPAVED ROAD
---	EXISTING FENCE
---	EXISTING LANDFILL GAS LINE
---	EXISTING SILT FENCE
---	EXISTING GAS COLLECTION WELL

General Notes and Information:

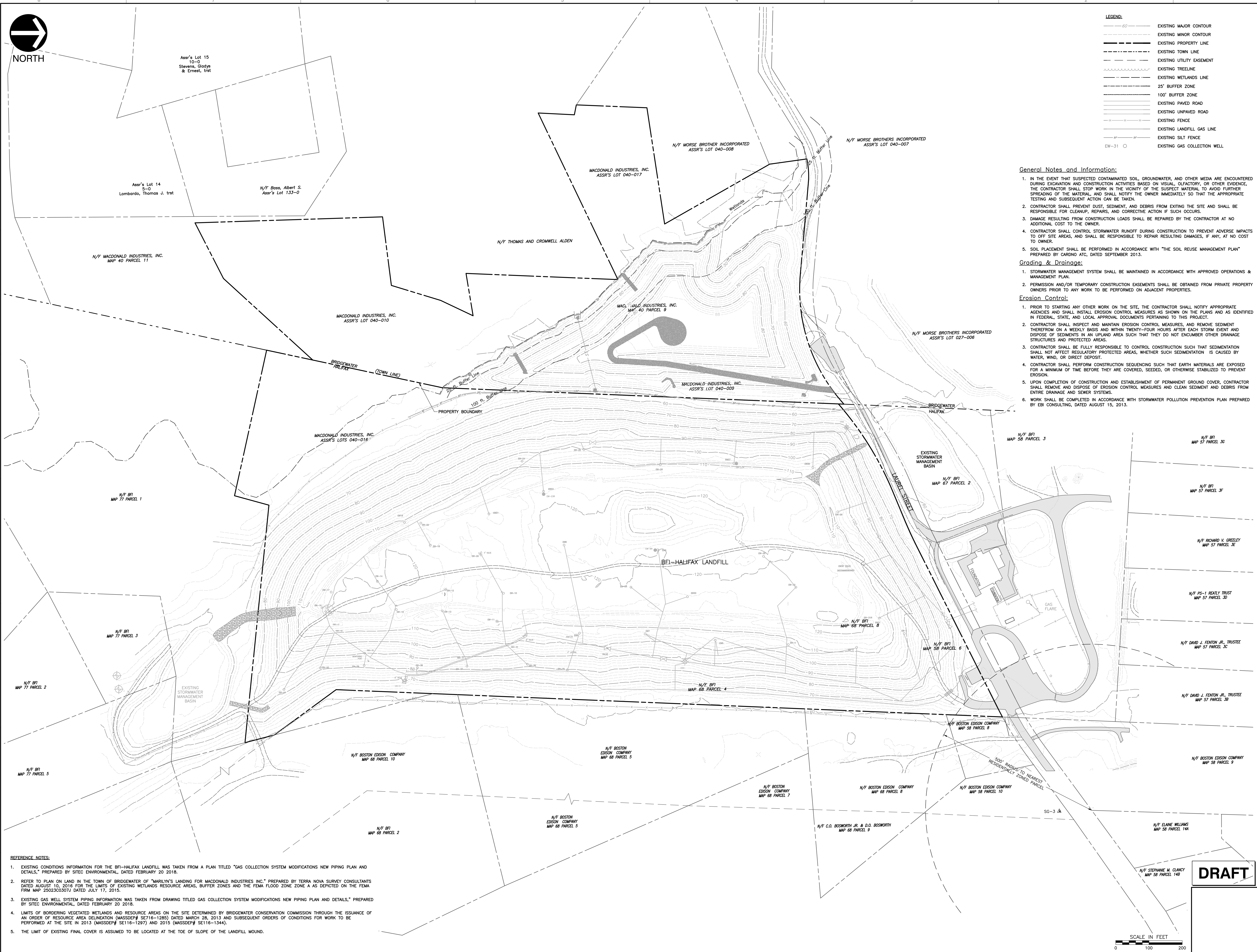
1. IN THE EVENT THAT SUSPECTED CONTAMINATED SOIL, GROUNDWATER, AND OTHER MEDIA ARE ENCOUNTERED DURING EXCAVATION AND CONSTRUCTION ACTIVITIES BASED ON VISUAL, OLFACTORY, OR OTHER EVIDENCE, THE CONTRACTOR SHALL STOP WORK IN THE VICINITY OF THE SUSPECT MATERIAL TO AVOID FURTHER SPREADING OF THE MATERIAL, 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:

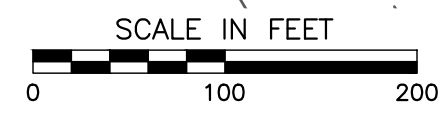
1. STORMWATER MANAGEMENT SYSTEM SHALL BE MAINTAINED IN ACCORDANCE WITH APPROVED OPERATIONS & MANAGEMENT PLAN.
2. PERMISSION AND/OR TEMPORARY CONSTRUCTION EASEMENTS SHALL BE OBTAINED FROM PRIVATE PROPERTY OWNERS PRIOR TO ANY WORK TO BE PERFORMED ON ADJACENT PROPERTIES.

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.

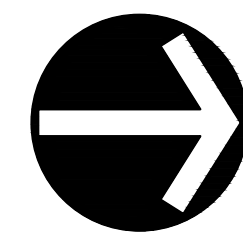


- REFERENCE NOTES:**
1. EXISTING CONDITIONS INFORMATION FOR THE BFI-HALIFAX LANDFILL WAS TAKEN FROM A PLAN TITLED "GAS COLLECTION SYSTEM MODIFICATIONS NEW PIPING PLAN AND DETAILS," PREPARED BY SITEC ENVIRONMENTAL, DATED FEBRUARY 20 2018.
 2. REFER TO PLAN ON LAND IN THE TOWN OF BRIDGEWATER OF "MARILYN'S 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 2502300307J DATED JULY 17, 2015.
 3. EXISTING GAS WELL SYSTEM PIPING INFORMATION WAS TAKEN FROM DRAWING TITLED GAS COLLECTION SYSTEM MODIFICATIONS NEW PIPING PLAN AND DETAILS," PREPARED 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# 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).
 5. THE LIMIT OF EXISTING FINAL COVER IS ASSUMED TO BE LOCATED AT THE TOE OF SLOPE OF THE LANDFILL MOUND.



DRAFT

<p>REVISION RECORD</p> <table border="1"> <thead> <tr> <th>NO.</th> <th>DATE</th> <th>DESCRIPTION</th> </tr> </thead> <tbody> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> </tbody> </table>	NO.	DATE	DESCRIPTION										<p>Civil & Environmental Consultants, Inc. 31 Belovos Road · Raynham, MA 02767 Ph: 774.501.2176 · 866.312.2024 · Fax: 774.501.2669 www.cenric.com</p>
	NO.	DATE	DESCRIPTION										
<p>MacDONALD INDUSTRIES, INC. POST CLOSURE USE: MAJOR (BWP-SW36) SOIL REUSE PLAN BFI-HALIFAX LANDFILL HALIFAX, MASSACHUSETTS</p>													
<p>SITE VICINITY PLAN</p> <p>DATE: MAY 2020 DRAWN BY: [Name] DWG SCALE: 1"=100' CHECKED BY: [Name]</p>													
<p>DRAWING NO.: C100</p> <p>SHEET 2 OF 10</p>													



NORTH

REFERENCE NOTES:

- 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.
- 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.
- 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.
- 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).
- 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 TREETLINE
---	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:

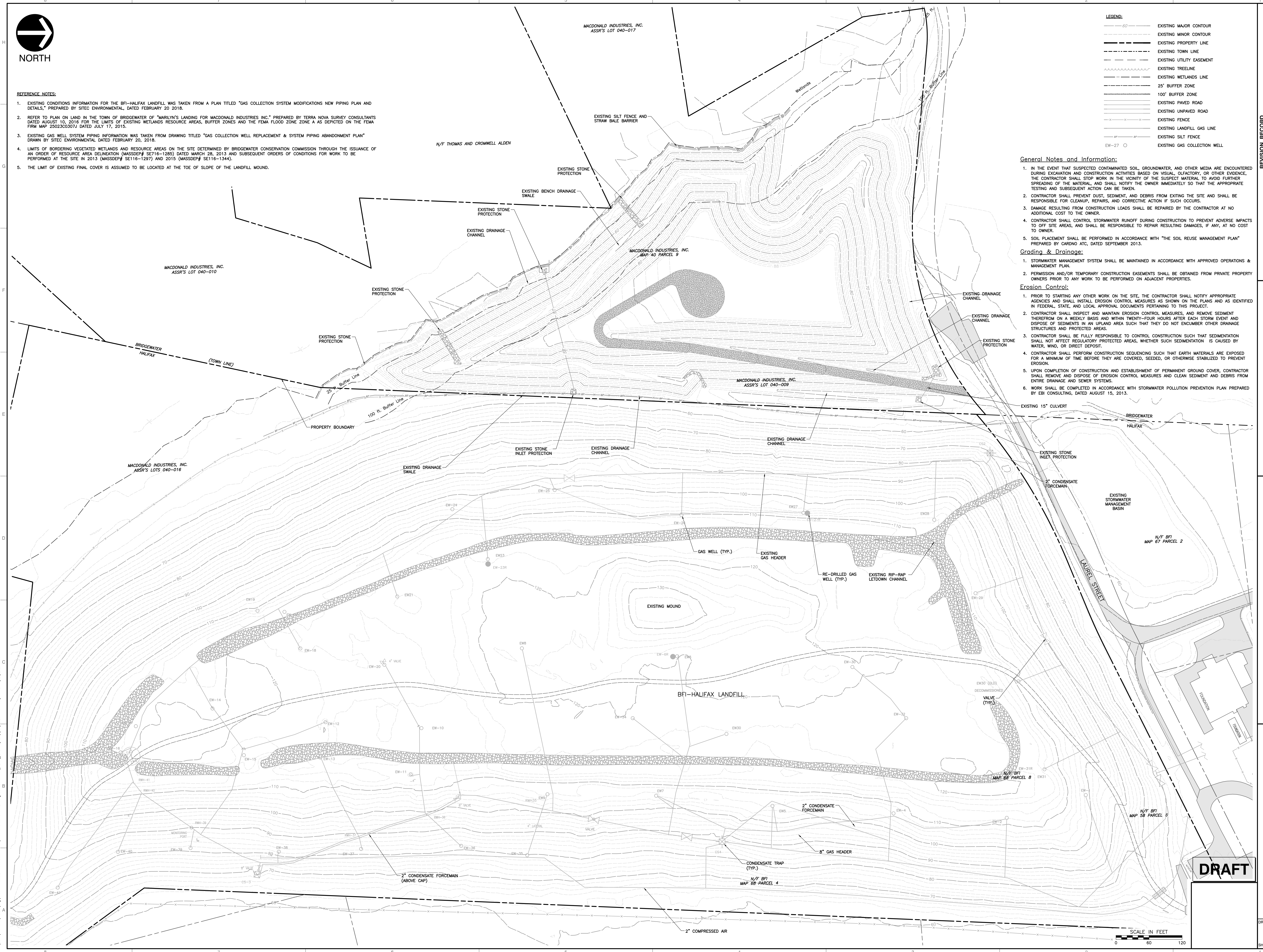
- IN THE EVENT THAT SUSPECTED CONTAMINATED SOIL, GROUNDWATER, AND OTHER MEDIA ARE ENCOUNTERED DURING EXCAVATION AND CONSTRUCTION ACTIVITIES BASED ON VISUAL, OLFACTORY, OR OTHER EVIDENCE, THE CONTRACTOR SHALL STOP WORK IN THE VICINITY OF THE SUSPECTED MATERIAL TO AVOID FURTHER SPREADING OF THE MATERIAL,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

Grading & Drainage:

- STORMWATER MANAGEMENT SYSTEM SHALL BE MAINTAINED IN ACCORDANCE WITH APPROVED OPERATIONS & MANAGEMENT PLAN.
- 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:

- 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.
- 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.
- 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.
- 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.
- 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.
- WORK SHALL BE COMPLETED IN ACCORDANCE WITH STORMWATER POLLUTION PREVENTION PLAN PREPARED BY EBI CONSULTING, DATED AUGUST 15, 2013.



REVISION RECORD

NO.	DATE	DESCRIPTION

EEC
Civil & Environmental Consultants, Inc.
 31 Belows Road - Rayham, MA 02767
 Ph: 774.501.2176 - 866.312.2024 - Fax: 774.501.2669
 www.eecinc.com

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

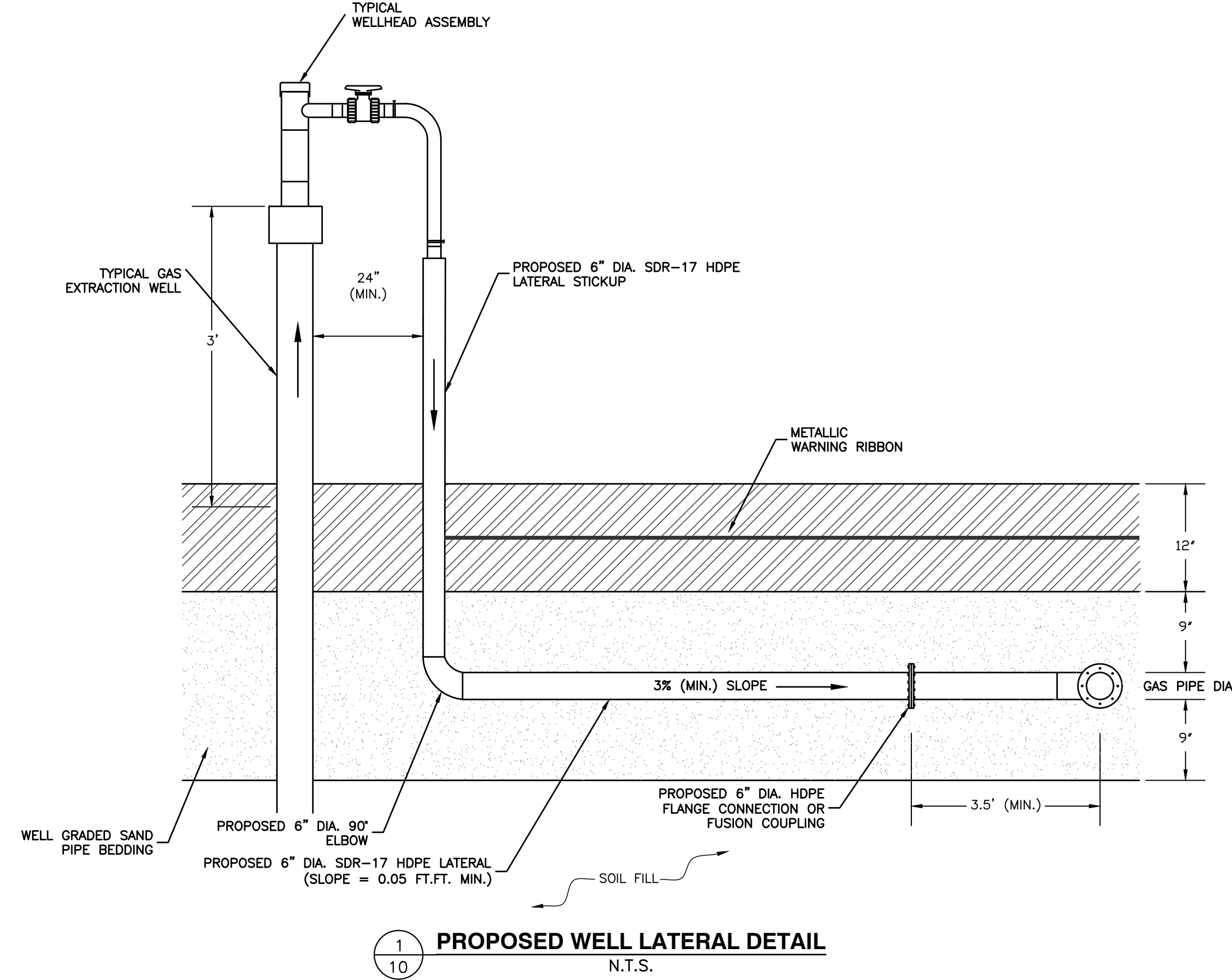
EXISTING CONDITIONS PLAN

DATE:	MAY 2020	DRAWN BY:	T=87
DWG SCALE:	1"=80'	CHECKED BY:	
PROJECT NO.:		APPROVED BY:	

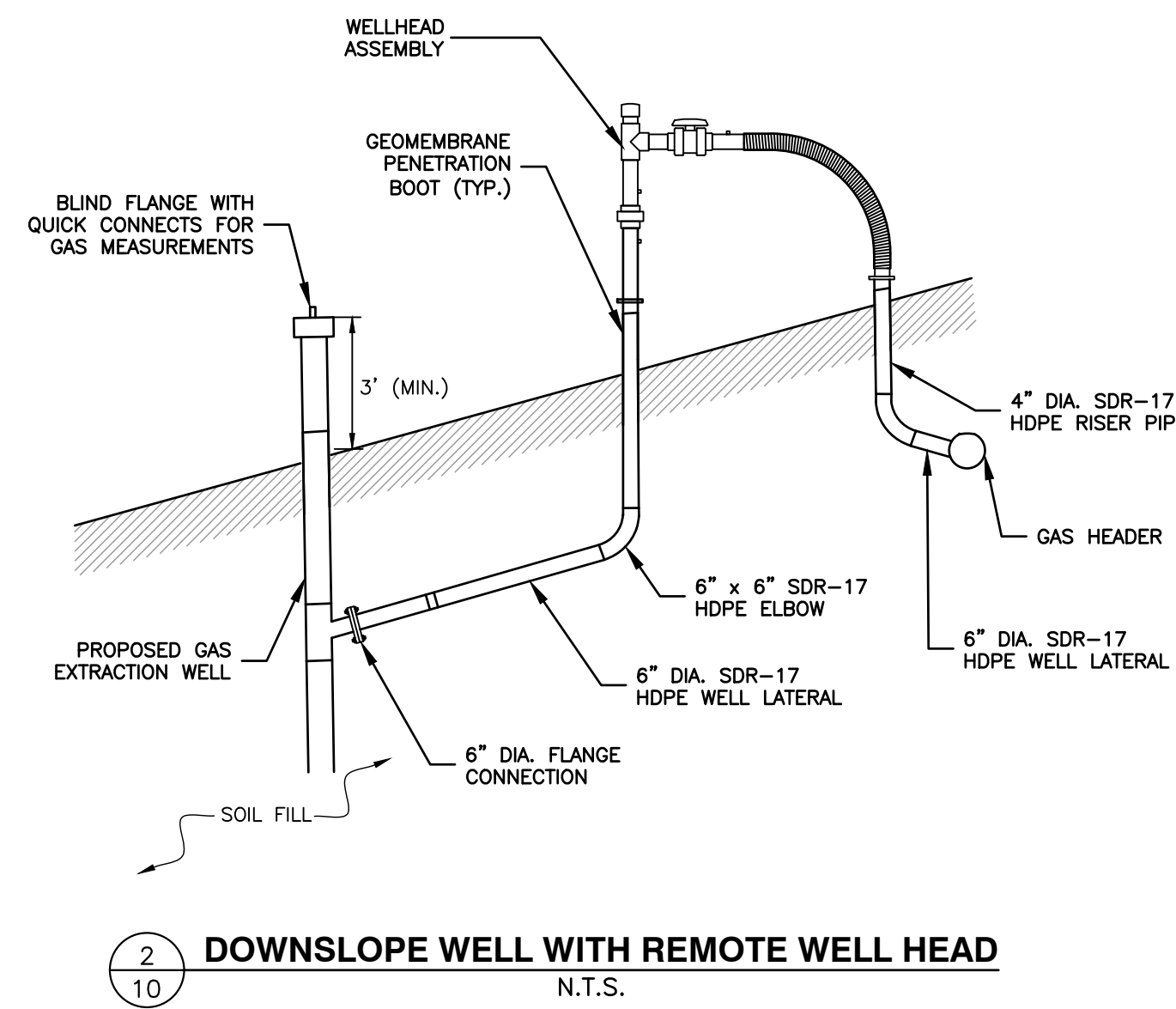
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DRAFT

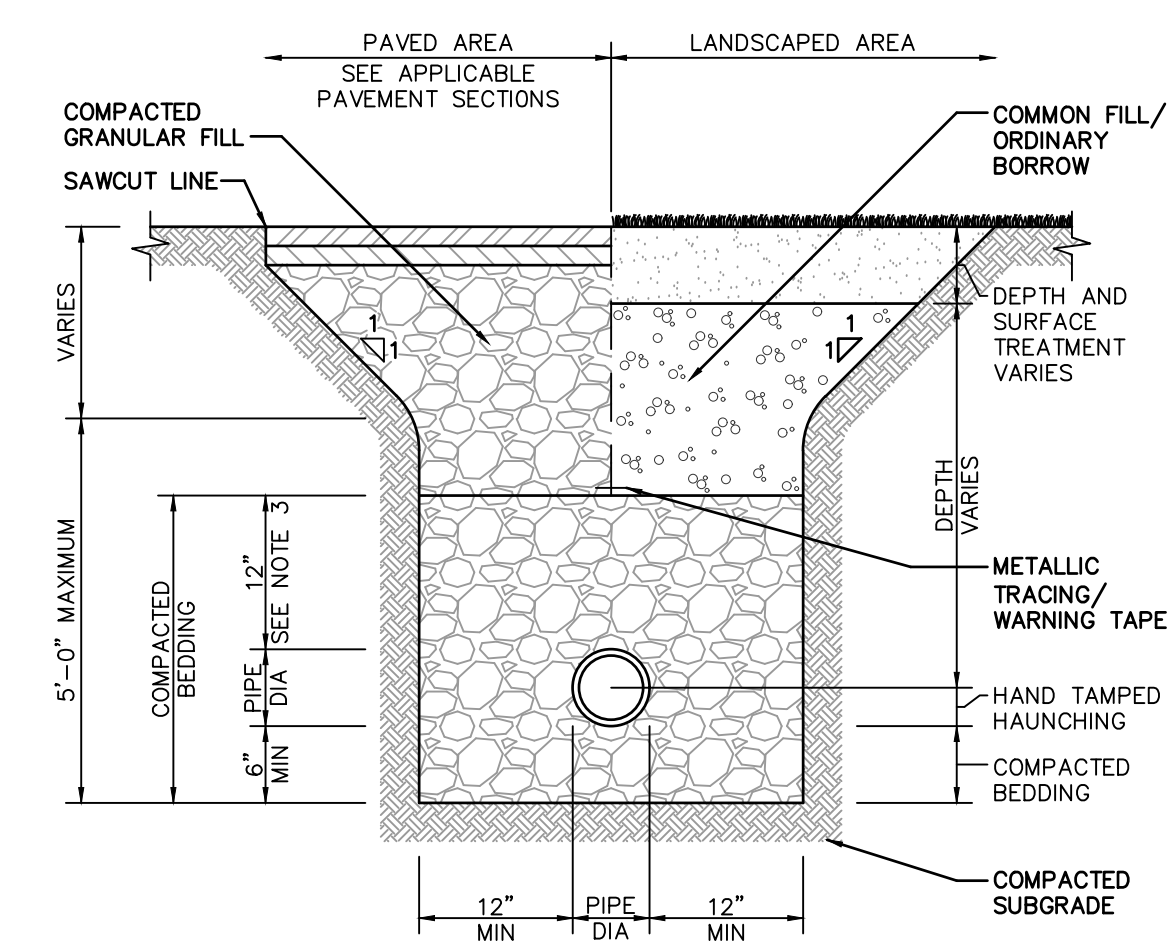
SCALE IN FEET
 0 60 120



1
10 **PROPOSED WELL LATERAL DETAIL**
N.T.S.

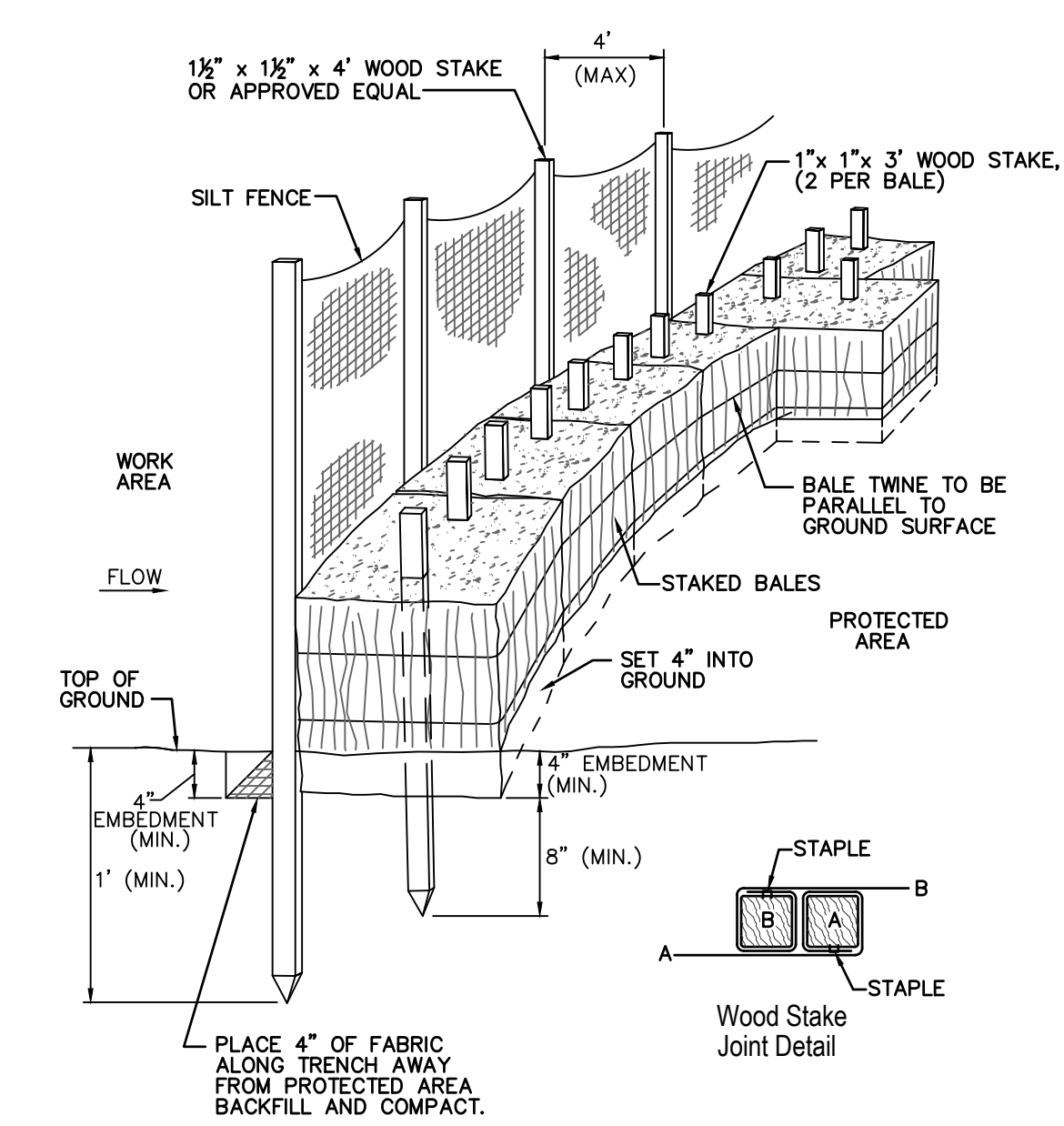


2
10 **DOWNSLOPE WELL WITH REMOTE WELL HEAD**
N.T.S.



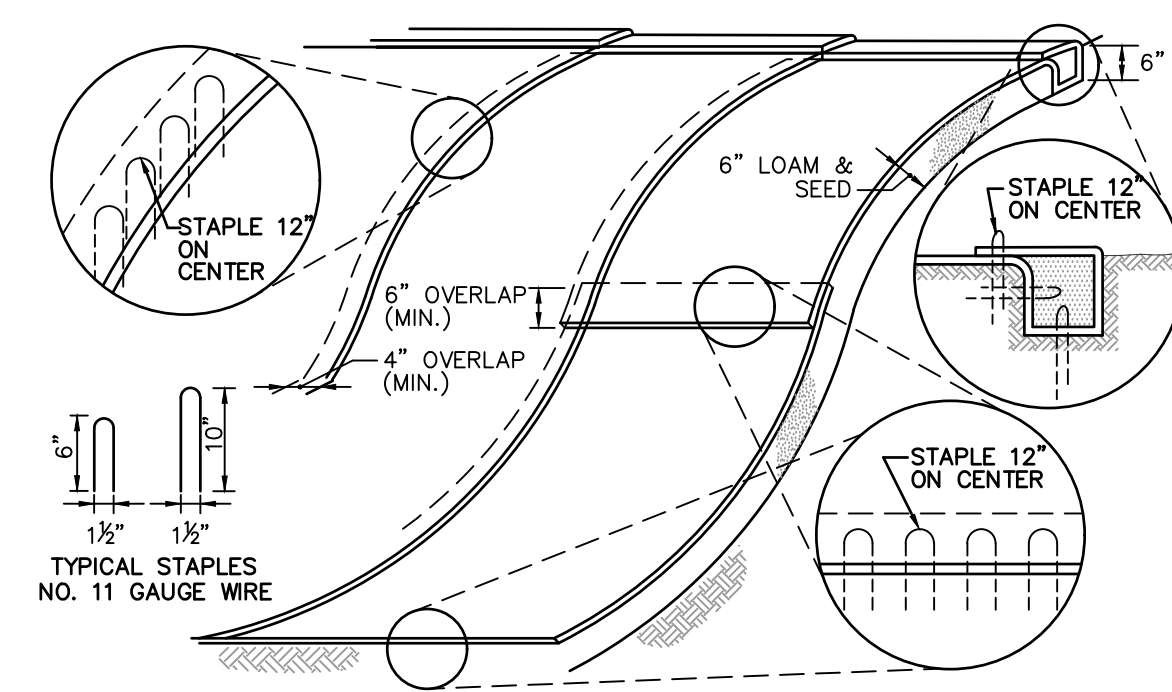
- CONSTRUCTION NOTES**
- WHERE UTILITY TRENCHES ARE CONSTRUCTED THROUGH DETENTION BASIN BERMS OR OTHER SUCH SPECIAL SECTIONS, PLACE TRENCH BACKFILL WITH MATERIALS SIMILAR TO THE SPECIAL SECTION REQUIREMENTS.
 - USE METALLIC TRACING/WARNING TAPE OVER ALL PIPES.
 - FOR HIGH DENSITY POLYETHYLENE (HDPE) PIPE, DIMENSION IS 24 INCHES.

3
10 **UTILITY TRENCH**
N.T.S.



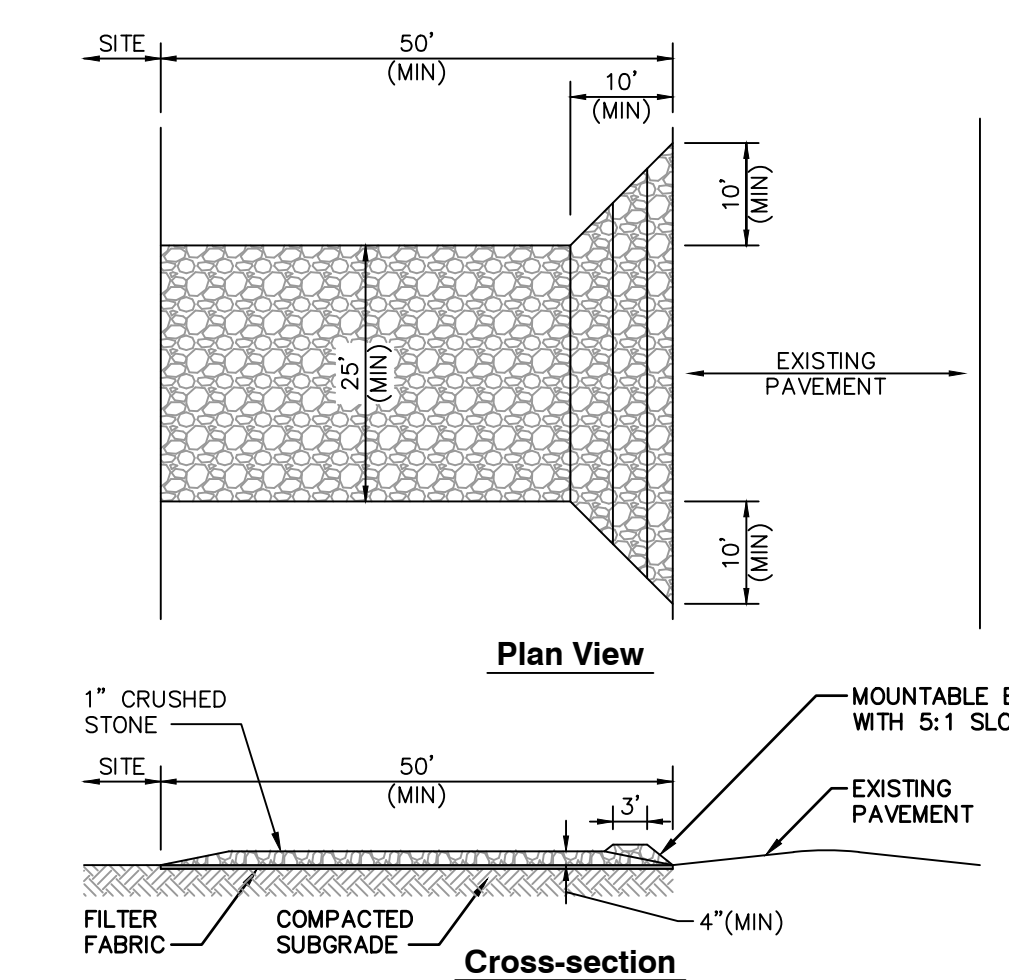
- NOTES:**
- PLACE ONE STRAW BALE PERPENDICULAR ALONG STRAW BALE BARRIER (100' O.C.).

4
10 **SILTFENCE AND STRAW BALE BARRIER**
N.T.S.



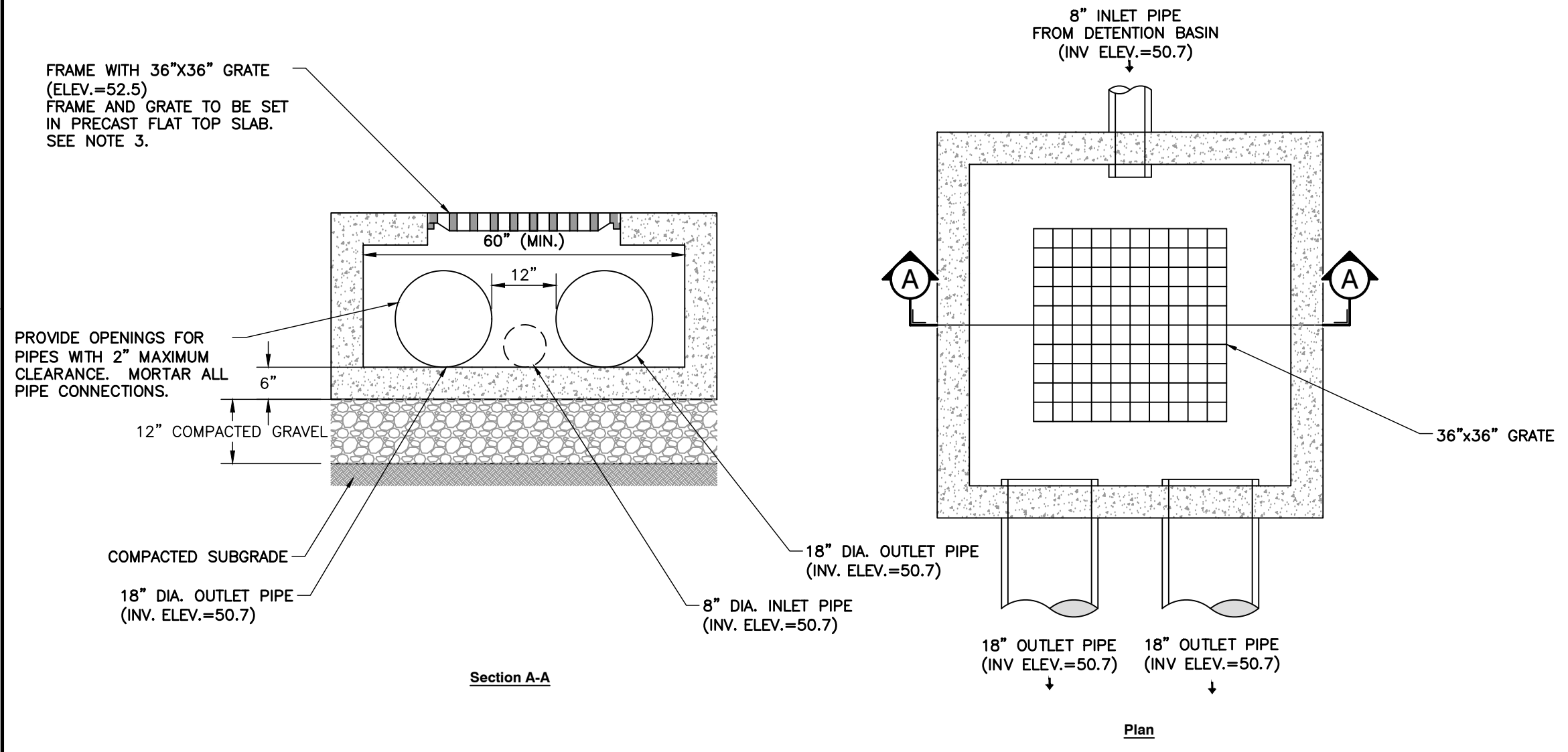
- NOTES:**
- BEGIN AT THE TOP OF BLANKET INSTALLATION AREA BY ANCHORING BLANKET IN A 6" DEEP TRENCH BACKFILL AND COMPACT TRENCH AFTER STAPLING.
 - ROLL THE BLANKET DOWN THE SLOPE IN THE DIRECTION OF THE WATER FLOW.
 - THE EDGES OF BLANKETS MUST BE STAPLED WITH APPROX. 4 INCH OVERLAP WHERE 2 OR MORE STRIP WIDTHS ARE REQUIRED.
 - WHEN BLANKETS MUST BE SPICED DOWN THE SWALE, PLACE UPPER BLANKET END OVER LOWER END WITH 6 INCH (MIN.) OVERLAP AND STAPLE BOTH TOGETHER.
 - 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.
 - TO BE PLACED ON SLOPES 3:1 OR GREATER, AS SHOWN ON PLANS.

5
10 **EROSION CONTROL BLANKET ON SLOPE**
N.T.S.



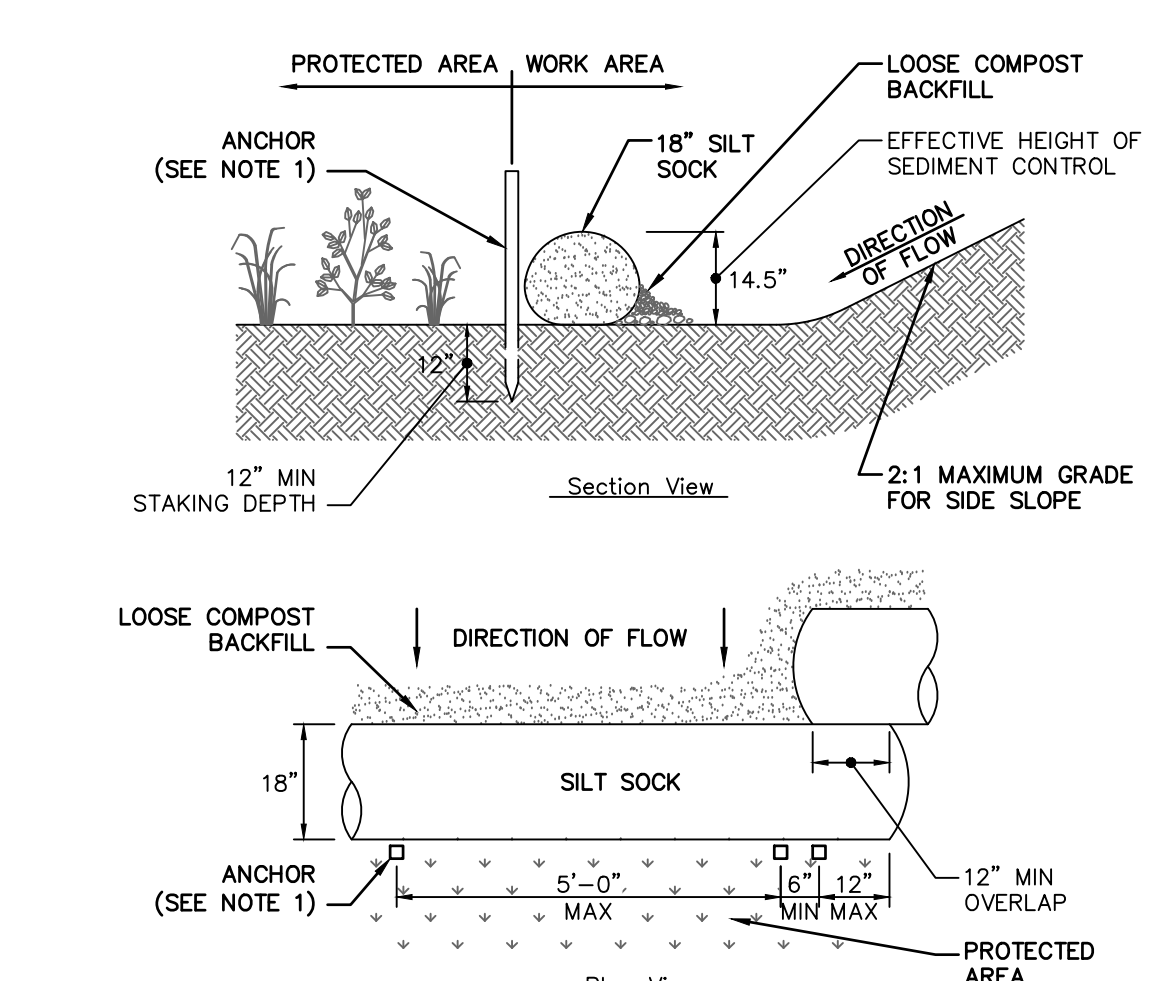
- NOTES:**
- ENTRANCE WIDTH SHALL BE A TWENTY-FIVE (25) FOOT MINIMUM, BUT NOT LESS THAN THE FULL WIDTH AT POINTS WHERE INGRESS OR EGRESS OCCURS.
 - THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION WHICH SHALL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHTS-OF-WAY. THIS MAY REQUIRE PERIODIC TOP DRESSING WITH ADDITIONAL STONE AS CONDITIONS DEMAND AND REPAIR OR CLEANOUT OF ANY MEASURES USED TO TRAP SEDIMENT. ALL SEDIMENT SPILLED, DROPPED, WASHED OR TRACKED ONTO PUBLIC RIGHTS-OF-WAY MUST BE REMOVED IMMEDIATELY. PERIODIC INSPECTION AND MAINTENANCE SHALL BE PROVIDED AS NEEDED.
 - STABILIZED CONSTRUCTION ENTRANCE SHALL BE REMOVED PRIOR TO FINAL FINISHED MATERIALS BEING INSTALLED.

6
10 **STABILIZED CONSTRUCTION EXIT**
N.T.S.



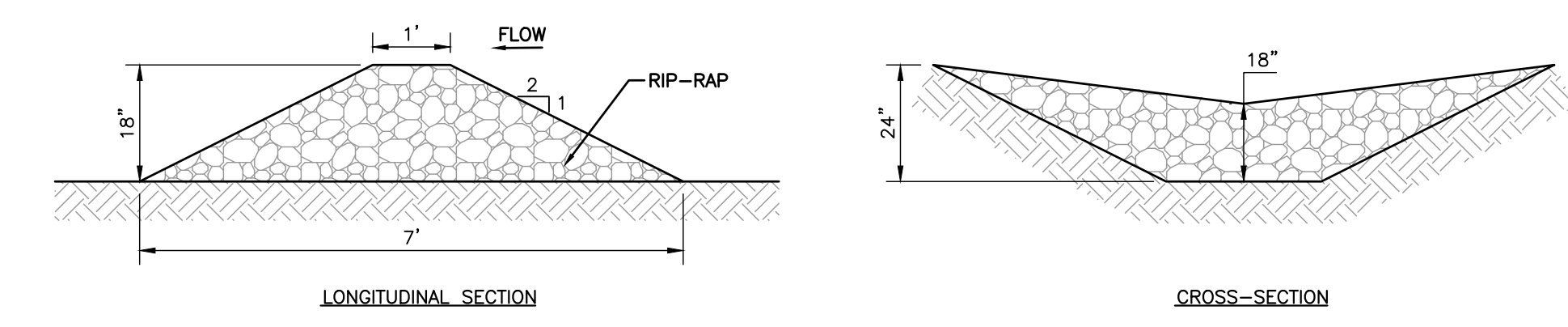
- CONSTRUCTION NOTES**
- STRUCTURE TO BE PRECAST CONCRETE, MINIMUM 4,000 PSI. ALL SECTIONS TO BE DESIGNED TO MEET OR EXCEED HS-20 LOADING.
 - BASE TO BE SINGLE POUR MONOLITHIC SECTION.
 - FINAL INTERNAL DIMENSIONS AND DETAILING TO BE COORDINATED WITH PRECAST MANUFACTURERS PRIOR TO CONSTRUCTION.
 - SEE PLANS FOR WEIR ELEVATIONS AND CONFIGURATIONS.

7
10 **OUTLET CONTROL STRUCTURE**
N.T.S.



- CONSTRUCTION NOTES**
- ANCHOR TO BE A 2" X 2" X 36" HARD WOOD STAKE, OR APPROVED EQUAL.
 - COMPOST FOR SILT SOCK FILL MATERIAL TO BE PROVIDED BY THE MANUFACTURER IN CONJUNCTION WITH THE ENGINEER TO PROVIDE THE REQUIRED REMOVAL OF SEDIMENT OR OTHER POLLUTANTS FROM RUNOFF.
 - COMPOST MATERIAL SHALL BE DISPERSER ON SITE, AS DETERMINED BY THE LOCAL CONSERVATION AGENT OR THE DESIGN ENGINEER.
 - SILT SOCK SHALL BE INSPECTED PER LOCAL AND STATE REQUIREMENTS. REPAIR OR REPLACEMENT SHALL BE PERFORMED PROMPTLY, AS NEEDED.
 - METHOD OF INSTALLATION SHALL BE AS PER MANUFACTURER'S RECOMMENDATIONS.

8
10 **SILT SOCK EROSION CONTROL BARRIER**
N.T.S.



- NOTES:**
- STONE SIZE SHALL AT A MINIMUM MEET THE REQUIREMENTS OF RIDOT STANDARD SPECIFICATIONS M.01.09, TABLE 1 GRADATION II AS PROVIDED BELOW.

SIEVE	GRADATION % PASSING
2-1/4"	100
2"	90-100
1-1/2"	30-55
1-1/4"	0-25
1"	0-5

9
10 **TEMPORARY CHECK DAM**
N.T.S.

REVISION RECORD

NO.	DATE	DESCRIPTION

Environmental Consultants, Inc.
333 Baldwin Road - Pittsburgh, PA 15205
412-429-2324 - 800-865-2324
www.ecinc.com

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

DETAILS SHEET 2 OF 2
JUNE 2019 DRAWN BY: [Name]
DRAFT
AS SHOWN CHECKED BY: [Name]
175-313
PROJECT NO.
APPROVED BY: [Name]

DRAFT

Appendix B – Copy of 2017 CGP

**National Pollutant Discharge Elimination System
General Permit for Discharges from
Construction Activities
(as modified)**

In compliance with the provisions of the Clean Water Act, 33 U.S.C. §1251 et. seq., (hereafter CWA), as amended by the Water Quality Act of 1987, P.L. 100-4, "operators" of construction activities (defined in Appendix A) that meet the requirements of Part 1.1 of this National Pollutant Discharge Elimination System (NPDES) general permit, are authorized to discharge pollutants in accordance with the effluent limitations and conditions set forth herein. Permit coverage is required from the "commencement of construction activities" (see Appendix A) until one of the conditions for terminating CGP coverage has been met (see Part 8.2).

This permit becomes effective on **June 27, 2019**.

This permit and the authorization to discharge expire at 11:59pm, **February 16, 2022**.

Signed and issued this 14th day of May 2019
Deborah Szaro,
Acting Regional Administrator, EPA Region 1.

Signed and issued this 14th day of May 2019
Charles W. Maguire,
Director, Water Division, EPA Region 6.

Signed and issued this 14th day of May 2019
Jeff Gratz,
Deputy Director, Water Division, EPA Region 2.

Signed and issued this 14th day of May 2019
Jeffery Robichaud,
Director, Water Division, EPA Region 7.

Signed and issued this 14th day of May 2019
Jose C. Font,
Acting Director, Caribbean Environmental
Protection Division, EPA Region 2.

Signed and issued this 14th day of May 2019
Darcy O'Connor,
Director, Water Division, EPA Region 8.

Signed and issued this 14th day of May 2019
Catharine McManus,
Deputy Director, Water Division, EPA Region 3.

Signed and issued this 14th day of May 2019
Tomás Torres,
Director, Water Division, EPA Region 9.

Signed and issued this 14th day of May 2019
Jeaneanne M. Gettle,
Director, Water Division, EPA Region 4.

Signed and issued this 14th day of May 2019
Daniel D. Opalski,
Director, Water Division, EPA Region 10.

Signed and issued this 14th day of May 2019
Joan M. Tanaka,
Acting Director, Water Division, EPA Region 5.

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1 HOW TO OBTAIN COVERAGE UNDER THE CONSTRUCTION GENERAL PERMIT (CGP)

To be covered under this permit, you must meet the eligibility conditions and follow the requirements for obtaining permit coverage in this Part.

1.1 ELIGIBILITY CONDITIONS

1.1.1 You are an “operator” of a construction site for which discharges will be covered under this permit. For the purposes of this permit and in the context of stormwater discharges associated with construction activity, an “operator” is any party associated with a construction project that meets either of the following two criteria:

- a. The party has operational control over construction plans and specifications, including the ability to make modifications to those plans and specifications; or
- b. The party has day-to-day operational control of those activities at a project that are necessary to ensure compliance with the permit conditions.

Where there are multiple operators associated with the same project, all operators must obtain permit coverage.¹ Subcontractors generally are not considered operators for the purposes of this permit.

1.1.2 Your site’s construction activities:

- a. Will disturb one or more acres of land, or will disturb less than one acre of land but are part of a common plan of development or sale that will ultimately disturb one or more acres of land; or
- b. Have been designated by EPA as needing permit coverage under 40 CFR 122.26(a)(1)(v) or 40 CFR 122.26(b)(15)(ii);

1.1.3 Your site is located in an area where EPA is the permitting authority (see Appendix B);

1.1.4 Discharges from your site are not:

- a. Already covered by a different NPDES permit for the same discharge; or
- b. In the process of having coverage under a different NPDES permit for the same discharge denied, terminated, or revoked.^{2, 3}

1.1.5 You are able to demonstrate that you meet one of the criteria listed in Appendix D with respect to the protection of species that are federally listed as endangered or threatened under the Endangered Species Act (ESA) and federally designated critical habitat;

1.1.6 You have completed the screening process in Appendix E relating to the protection of historic properties; and

¹ If the operator of a “construction support activity” (see Part 1.2.1c) is different than the operator of the main site, that operator must also obtain permit coverage. See Part 7.1 for clarification on the sharing of permit-related functions between and among operators on the same site and for conditions that apply to developing a SWPPP for multiple operators associated with the same site.

² Parts 1.1.4a and 1.1.4b do not include sites currently covered under the 2012 CGP that are in the process of obtaining coverage under this permit, nor sites covered under this permit that are transferring coverage to a different operator.

³ Notwithstanding a site being made ineligible for coverage under this permit because it falls under the description of Parts 1.1.4a or 1.1.4b, above, EPA may waive the applicable eligibility requirement after specific review if it determines that coverage under this permit is appropriate.

- 1.1.7** You have complied with all requirements in Part 9 imposed by the applicable state, Indian tribe, or territory in which your construction activities and/or discharge will occur.
- 1.1.8** For “new sources” (as defined in Appendix A) only:
- a. EPA has not, prior to authorization under this permit, determined that discharges from your site will cause, have the reasonable potential to cause, or contribute to an excursion above any applicable water quality standard. Where such a determination is made prior to authorization, EPA may notify you that an individual permit application is necessary. However, EPA may authorize your coverage under this permit after you have included appropriate controls and implementation procedures designed to bring your discharge into compliance with this permit, specifically the requirement to meet water quality standards. In the absence of information demonstrating otherwise, EPA expects that compliance with the requirements of this permit, including the requirements applicable to such discharges in Part 3, will result in discharges that will not cause, have the reasonable potential to cause, or contribute to an excursion above any applicable water quality standard.
 - b. Discharges from your site to a Tier 2, Tier 2.5, or Tier 3 water⁴ will not lower the water quality of the applicable water. In the absence of information demonstrating otherwise, EPA expects that compliance with the requirements of this permit, including the requirements applicable to such discharges in Part 3.2, will result in discharges that will not lower the water quality of such waters.
- 1.1.9** If you plan to add “cationic treatment chemicals” (as defined in Appendix A) to stormwater and/or authorized non-stormwater prior to discharge, you may not submit your Notice of Intent (NOI) unless and until you notify your applicable EPA Regional Office (see Appendix L) in advance and the EPA Regional Office authorizes coverage under this permit after you have included appropriate controls and implementation procedures designed to ensure that your use of cationic treatment chemicals will not lead to discharges that cause an exceedance of water quality standards.

1.2 TYPES OF DISCHARGES AUTHORIZED⁵

- 1.2.1** The following stormwater discharges are authorized under this permit provided that appropriate stormwater controls are designed, installed, and maintained (see Parts 2 and 3):
- a. Stormwater discharges, including stormwater runoff, snowmelt runoff, and surface runoff and drainage, associated with construction activity under 40 CFR 122.26(b)(14) or 122.26(b)(15)(i);
 - b. Stormwater discharges designated by EPA as needing a permit under 40 CFR 122.26(a)(1)(v) or 122.26(b)(15)(ii);

⁴ Note: Your site will be considered to discharge to a Tier 2, Tier 2.5, or Tier 3 water if the first water to which you discharge is identified by a state, tribe, or EPA as a Tier 2, Tier 2.5, or Tier 3 water. For discharges that enter a storm sewer system prior to discharge, the first water of the U.S. to which you discharge is the waterbody that receives the stormwater discharge from the storm sewer system. See list of Tier 2, Tier 2.5, and Tier 3 waters in Appendix F.

⁵ See “Discharge” as defined in Appendix A. Note: Any discharges not expressly authorized in this permit cannot become authorized or shielded from liability under CWA section 402(k) by disclosure to EPA, state, or local authorities after issuance of this permit via any means, including the Notice of Intent (NOI) to be covered by the permit, the SWPPP, or during an inspection.

- c. Stormwater discharges from construction support activities (*e.g., concrete or asphalt batch plants, equipment staging yards, material storage areas, excavated material disposal areas, borrow areas*) provided that:
 - i. The support activity is directly related to the construction site required to have permit coverage for stormwater discharges;
 - ii. The support activity is not a commercial operation, nor does it serve multiple unrelated construction sites;
 - iii. The support activity does not continue to operate beyond the completion of the construction activity at the site it supports; and
 - iv. Stormwater controls are implemented in accordance with Part 2 and Part 3 for discharges from the support activity areas.
 - d. Stormwater discharges from earth-disturbing activities associated with the construction of staging areas and the construction of access roads conducted prior to active mining.
- 1.2.2** The following non-stormwater discharges associated with your construction activity are authorized under this permit provided that, with the exception of water used to control dust and to irrigate vegetation in stabilized areas, these discharges are not routed to areas of exposed soil on your site and you comply with any applicable requirements for these discharges in Parts 2 and 3:
- a. Discharges from emergency fire-fighting activities;
 - b. Fire hydrant flushings;
 - c. Landscape irrigation;
 - d. Water used to wash vehicles and equipment, provided that there is no discharge of soaps, solvents, or detergents used for such purposes;
 - e. Water used to control dust;
 - f. Potable water including uncontaminated water line flushings;
 - g. External building washdown, provided soaps, solvents, and detergents are not used, and external surfaces do not contain hazardous substances (as defined in Appendix A) (*e.g., paint or caulk containing polychlorinated biphenyls (PCBs)*);
 - h. Pavement wash waters, provided spills or leaks of toxic or hazardous substances have not occurred (unless all spill material has been removed) and where soaps, solvents, and detergents are not used. You are prohibited from directing pavement wash waters directly into any water of the U.S., storm drain inlet, or stormwater conveyance, unless the conveyance is connected to a sediment basin, sediment trap, or similarly effective control;
 - i. Uncontaminated air conditioning or compressor condensate;
 - j. Uncontaminated, non-turbid discharges of ground water or spring water;
 - k. Foundation or footing drains where flows are not contaminated with process materials such as solvents or contaminated ground water; and
 - l. Construction dewatering water discharged in accordance with Part 2.4.
- 1.2.3** Also authorized under this permit are discharges of stormwater listed above in Part 1.2.1, or authorized non-stormwater discharges listed above in Part 1.2.2, commingled with a

discharge authorized by a different NPDES permit and/or a discharge that does not require NPDES permit authorization.

1.3 PROHIBITED DISCHARGES⁶

- 1.3.1 Wastewater from washout of concrete, unless managed by an appropriate control as described in Part 2.3.4;
- 1.3.2 Wastewater from washout and cleanout of stucco, paint, form release oils, curing compounds, and other construction materials;
- 1.3.3 Fuels, oils, or other pollutants used in vehicle and equipment operation and maintenance;
- 1.3.4 Soaps, solvents, or detergents used in vehicle and equipment washing or external building washdown; and
- 1.3.5 Toxic or hazardous substances from a spill or other release.

To prevent the above-listed prohibited non-stormwater discharges, operators must comply with the applicable pollution prevention requirements in Part 2.3.

1.4 SUBMITTING YOUR NOTICE OF INTENT (NOI)

All "operators" (as defined in Appendix A) associated with your construction site, who meet the Part 1.1 eligibility requirements, and who seek coverage under this permit, must submit to EPA a complete and accurate NOI in accordance with the deadlines in **Table 1** prior to commencing construction activities.

Exception: If you are conducting construction activities in response to a public emergency (e.g., *mud slides, earthquake, extreme flooding conditions, widespread disruption in essential public services*), and the related work requires immediate authorization to avoid imminent endangerment to human health, public safety, or the environment, or to reestablish essential public services, you may discharge on the condition that a complete and accurate NOI is submitted within 30 calendar days after commencing construction activities (see Table 1) establishing that you are eligible for coverage under this permit. You must also provide documentation in your Stormwater Pollution Prevention Plan (SWPPP) to substantiate the occurrence of the public emergency.

1.4.1 Prerequisite for Submitting Your NOI

You must develop a SWPPP consistent with Part 7 before submitting your NOI for coverage under this permit.

1.4.2 How to Submit Your NOI

You must use EPA's NPDES eReporting Tool (NeT) to electronically prepare and submit your NOI for coverage under the 2017 CGP, unless you received a waiver from your EPA Regional Office.

To access NeT, go to <https://www.epa.gov/npdes/stormwater-discharges-construction-activities#ereporting>.

Waivers from electronic reporting may be granted based on one of the following conditions:

⁶ EPA includes these prohibited non-stormwater discharges here as a reminder to the operator that the only non-stormwater discharges authorized by this permit are at Part 1.2.2. Any unauthorized non-stormwater discharges must be covered under an individual permit or alternative general permit.

- a. If your operational headquarters is physically located in a geographic area (i.e., ZIP code or census tract) that is identified as under-served for broadband Internet access in the most recent report from the Federal Communications Commission; or
- b. If you have limitations regarding available computer access or computer capability.

If the EPA Regional Office grants you approval to use a paper NOI, and you elect to use it, you must complete the form in Appendix J.

1.4.3 Deadlines for Submitting Your NOI and Your Official Date of Permit Coverage

Table 1 provides the deadlines for submitting your NOI and the official start date of your permit coverage, which differ depending on when you commence construction activities.

Table 1 NOI Submittal Deadlines and Official Start Date for Permit Coverage.

Type of Operator	NOI Submittal Deadline ⁷	Permit Authorization Date ⁸
Operator of a new site (i.e., a site where construction activities commence on or after February 16, 2017)	At least 14 calendar days before commencing construction activities.	14 calendar days after EPA notifies you that it has received a complete NOI, unless EPA notifies you that your authorization is delayed or denied.
Operator of an existing site (i.e., a site with 2012 CGP coverage where construction activities commenced prior to February 16, 2017)	No later than May 17, 2017 .	
New operator of a permitted site (i.e., an operator that through transfer of ownership and/or operation replaces the operator of an already permitted construction site that is either a "new site" or an "existing site")	At least 14 calendar days before the date the transfer to the new operator will take place.	
Operator of an "emergency-related project" (i.e., a project initiated in response to a public emergency (e.g., mud slides, earthquake, extreme flooding conditions, disruption in essential public services), for which the related work requires immediate authorization to avoid imminent endangerment to human health or the environment, or to reestablish essential public services)	No later than 30 calendar days after commencing construction activities.	You are considered provisionally covered under the terms and conditions of this permit immediately, and fully covered 14 calendar days after EPA notifies you that it has received a complete NOI, unless EPA notifies you that your authorization is delayed or denied.

1.4.4 Modifying your NOI

⁷ If you miss the deadline to submit your NOI, any and all discharges from your construction activities will continue to be unauthorized under the CWA until they are covered by this or a different NPDES permit. EPA may take enforcement action for any unpermitted discharges that occur between the commencement of construction activities and discharge authorization.

⁸ Discharges are not authorized if your NOI is incomplete or inaccurate or if you are not eligible for permit coverage.

If after submitting your NOI you need to correct or update any fields, you may do so by submitting a "Change NOI" form using NeT. Waivers from electronic reporting may be granted as specified in Part 1.4.1. If the EPA Regional Office has granted you approval to submit a paper NOI modification, you may indicate any NOI changes on the same NOI form in Appendix J.

When there is a change to the site's operator, the new operator must submit a new NOI, and the previous operator must submit a Notice of Termination (NOT) form as specified in Part 8.3.

1.4.5 Your Official End Date of Permit Coverage

Once covered under this permit, your coverage will last until the date that:

- a. You terminate permit coverage consistent with Part 8; or
- b. You receive permit coverage under a different NPDES permit or a reissued or replacement version of this permit after expiring on February 16, 2022; or
- c. You fail to submit an NOI for coverage under a revised or replacement version of this permit before the deadline for existing construction sites where construction activities continue after this permit has expired.

1.5 REQUIREMENT TO POST A NOTICE OF YOUR PERMIT COVERAGE

You must post a sign or other notice of your permit coverage at a safe, publicly accessible location in close proximity to the construction site. The notice must be located so that it is visible from the public road that is nearest to the active part of the construction site, and it must use a font large enough to be readily viewed from a public right-of-way.⁹ At a minimum, the notice must include:

- a. The NPDES ID (*i.e.*, permit tracking number assigned to your NOI);
- b. A contact name and phone number for obtaining additional construction site information;
- c. The Uniform Resource Locator (URL) for the SWPPP (if available), or the following statement: "If you would like to obtain a copy of the Stormwater Pollution Prevention Plan (SWPPP) for this site, contact the EPA Regional Office at [*include the appropriate CGP Regional Office contact information found at <https://www.epa.gov/npdes/contact-us-stormwater#regional>*];" and
- d. The following statement "If you observe indicators of stormwater pollutants in the discharge or in the receiving waterbody, contact the EPA through the following website: <https://www.epa.gov/enforcement/report-environmental-violations>."

2 TECHNOLOGY-BASED EFFLUENT LIMITATIONS

You must comply with the following technology-based effluent limitations in this Part for all authorized discharges.¹⁰

⁹ If the active part of the construction site is not visible from a public road, then place the notice of permit coverage in a position that is visible from the nearest public road and as close as possible to the construction site.

¹⁰ For each of the effluent limits in Part 2, as applicable to your site, you must include in your SWPPP (1) a description of the specific control(s) to be implemented to meet the effluent limit; (2) any applicable design specifications; (3) routine maintenance specifications; and (4) the projected schedule for its (their)

2.1 GENERAL STORMWATER CONTROL DESIGN, INSTALLATION, AND MAINTENANCE REQUIREMENTS

You must design, install, and maintain stormwater controls required in Parts 2.2 and 2.3 to minimize the discharge of pollutants in stormwater from construction activities. To meet this requirement, you must:

2.1.1 Account for the following factors in designing your stormwater controls:

- a. The expected amount, frequency, intensity, and duration of precipitation;
- b. The nature of stormwater runoff and run-on at the site, including factors such as expected flow from impervious surfaces, slopes, and site drainage features. You must design stormwater controls to control stormwater volume, velocity, and peak flow rates to minimize discharges of pollutants in stormwater and to minimize channel and streambank erosion and scour in the immediate vicinity of discharge points; and
- c. The soil type and range of soil particle sizes expected to be present on the site.

2.1.2 Design and install all stormwater controls in accordance with good engineering practices, including applicable design specifications.¹¹

2.1.3 Complete installation of stormwater controls by the time each phase of construction activities has begun.

- a. By the time construction activity in any given portion of the site begins, install and make operational any downgradient sediment controls (*e.g., buffers, perimeter controls, exit point controls, storm drain inlet protection*) that control discharges from the initial site clearing, grading, excavating, and other earth-disturbing activities.¹²
- b. Following the installation of these initial controls, install and make operational all stormwater controls needed to control discharges prior to subsequent earth-disturbing activities.

2.1.4 Ensure that all stormwater controls are maintained and remain in effective operating condition during permit coverage and are protected from activities that would reduce their effectiveness.

- a. Comply with any specific maintenance requirements for the stormwater controls listed in this permit, as well as any recommended by the manufacturer.¹³
- b. If at any time you find that a stormwater control needs routine maintenance, you must immediately initiate the needed maintenance work, and complete such work by the close of the next business day.

installation/implementation. See Part 7.2.6.

¹¹ Design specifications may be found in manufacturer specifications and/or in applicable erosion and sediment control manuals or ordinances. Any departures from such specifications must reflect good engineering practices and must be explained in your SWPPP. You must also comply with any additional design and installation requirements specified for the effluent limits in Parts 2.2 and 2.3.

¹² Note that the requirement to install stormwater controls prior to each phase of construction activities for the site does not apply to the earth disturbance associated with the actual installation of these controls. Operators should take all reasonable actions to minimize the discharges of pollutants during the installation of stormwater controls.

¹³ Any departures from such maintenance recommendations made by the manufacturer must reflect good engineering practices and must be explained in your SWPPP.

- c. If at any time you find that a stormwater control needs repair or replacement, you must comply with the corrective action requirements in Part 5.

2.2 EROSION AND SEDIMENT CONTROL REQUIREMENTS

You must implement erosion and sediment controls in accordance with the following requirements to minimize the discharge of pollutants in stormwater from construction activities.

2.2.1 Provide and maintain natural buffers and/or equivalent erosion and sediment controls when a water of the U.S. is located within 50 feet of the site's earth disturbances.

- a. **Compliance Alternatives.** For any discharges to waters of the U.S. located within 50 feet of your site's earth disturbances, you must comply with one of the following alternatives:
 - i. Provide and maintain a 50-foot undisturbed natural buffer; or
 - ii. Provide and maintain an undisturbed natural buffer that is less than 50 feet and is supplemented by erosion and sediment controls that achieve, in combination, the sediment load reduction equivalent to a 50-foot undisturbed natural buffer; or
 - iii. If infeasible to provide and maintain an undisturbed natural buffer of any size, implement erosion and sediment controls to achieve the sediment load reduction equivalent to a 50-foot undisturbed natural buffer.

See Appendix G, Part G.2 for additional conditions applicable to each compliance alternative.

- b. **Exceptions.** See Appendix G, Part G.2 for exceptions to the compliance alternatives.

2.2.2 Direct stormwater to vegetated areas and maximize stormwater infiltration and filtering to reduce pollutant discharges, unless infeasible.

2.2.3 Install sediment controls along any perimeter areas of the site that will receive pollutant discharges.¹⁴

- a. Remove sediment before it has accumulated to one-half of the above-ground height of any perimeter control.
- b. **Exception.** For areas at "linear construction sites" (as defined in Appendix A) where perimeter controls are infeasible (*e.g., due to a limited or restricted right-of-way*), implement other practices as necessary to minimize pollutant discharges to perimeter areas of the site.

2.2.4 Minimize sediment track-out.

- a. Restrict vehicle use to properly designated exit points;
- b. Use appropriate stabilization techniques¹⁵ at all points that exit onto paved roads.

¹⁴ Examples of perimeter controls include filter berms, silt fences, vegetative strips, and temporary diversion dikes.

¹⁵ Examples of appropriate stabilization techniques include the use of aggregate stone with an underlying geotextile or non-woven filter fabric, and turf mats.

- i. **Exception:** Stabilization is not required for exit points at linear utility construction sites that are used only episodically and for very short durations over the life of the project, provided other exit point controls¹⁶ are implemented to minimize sediment track-out;
 - c. Implement additional track-out controls¹⁷ as necessary to ensure that sediment removal occurs prior to vehicle exit; and
 - d. 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.¹⁸
- 2.2.5 Manage stockpiles or land clearing debris piles composed, in whole or in part, of sediment and/or soil:**
- a. Locate the piles outside of any natural buffers established under Part 2.2.1 and away from any stormwater conveyances, drain inlets, and areas where stormwater flow is concentrated;
 - b. Install a sediment barrier along all downgradient perimeter areas;¹⁹
 - c. For piles that will be unused for 14 or more days, provide cover²⁰ or appropriate temporary stabilization (consistent with Part 2.2.14);
 - d. You are prohibited from hosing down or sweeping soil or sediment accumulated on pavement or other impervious surfaces into any stormwater conveyance, storm drain inlet, or water of the U.S.
- 2.2.6 Minimize dust.** On areas of exposed soil, minimize dust through the appropriate application of water or other dust suppression techniques to control the generation of pollutants that could be discharged in stormwater from the site.
- 2.2.7 Minimize steep slope disturbances.** Minimize the disturbance of "steep slopes" (as defined in Appendix A).

¹⁶ Examples of other exit point controls include preventing the use of exit points during wet periods; minimizing exit point use by keeping vehicles on site to the extent possible; limiting exit point size to the width needed for vehicle and equipment usage; using scarifying and compaction techniques on the soil; and avoiding establishing exit points in environmentally sensitive areas (e.g., karst areas; steep slopes).

¹⁷ Examples of additional track-out controls include the use of wheel washing, rumble strips, and rattle plates.

¹⁸ Fine grains that remain visible (*i.e.*, staining) on the surfaces of off-site streets, other paved areas, and sidewalks after you have implemented sediment removal practices are not a violation of Part 2.2.4.

¹⁹ Examples of sediment barriers include berms, dikes, fiber rolls, silt fences, sandbags, gravel bags, or straw bale.

²⁰ Examples of cover include tarps, blown straw and hydroseeding.

2.2.8 Preserve native topsoil, unless infeasible.²¹

2.2.9 Minimize soil compaction.²² In areas of your site where final vegetative stabilization will occur or where infiltration practices will be installed:

- a. Restrict vehicle and equipment use in these locations to avoid soil compaction; and
- b. Before seeding or planting areas of exposed soil that have been compacted, use techniques that rehabilitate and condition the soils as necessary to support vegetative growth.

2.2.10 Protect storm drain inlets.

- a. Install inlet protection measures that remove sediment from discharges prior to entry into any storm drain inlet that carries stormwater flow from your site to a water of the U.S., provided you have authority to access the storm drain inlet;²³ and
- b. Clean, or remove and replace, the protection measures as sediment accumulates, the filter becomes clogged, and/or performance is compromised. Where there is evidence of sediment accumulation adjacent to the inlet protection measure, remove the deposited sediment by the end of the same business day in which it is found or by the end of the following business day if removal by the same business day is not feasible.

2.2.11 Control stormwater discharges, including both peak flowrates and total stormwater volume, to minimize channel and streambank erosion and scour in the immediate vicinity of discharge points.²⁴

2.2.12 If you install a sediment basin or similar impoundment:

- a. Situate the basin or impoundment outside of any water of the U.S. and any natural buffers established under Part 2.2.1;
- b. Design the basin or impoundment to avoid collecting water from wetlands;
- c. Design the basin or impoundment to provide storage for either:
 - i. The calculated volume of runoff from a 2-year, 24-hour storm (see Appendix H); or
 - ii. 3,600 cubic feet per acre drained.

²¹ Stockpiling topsoil at off-site locations, or transferring topsoil to other locations, is an example of a practice that is consistent with the requirements in Part 2.2.8. Preserving native topsoil is not required where the intended function of a specific area of the site dictates that the topsoil be disturbed or removed. For example, some sites may be designed to be highly impervious after construction, and therefore little or no vegetation is intended to remain, or may not have space to stockpile native topsoil on site for later use, in which case, it may not be feasible to preserve topsoil.

²² Minimizing soil compaction is not required where the intended function of a specific area of the site dictates that it be compacted.

²³ Inlet protection measures can be removed in the event of flood conditions or to prevent erosion.

²⁴ Examples of control measures that can be used to comply with this requirement include the use of erosion controls and/or velocity dissipation devices (e.g., check dams, sediment traps), within and along the length of a stormwater conveyance and at the outfall to slow down runoff.

- d. Utilize outlet structures that withdraw water from the surface of the sediment basin or similar impoundment, unless infeasible;²⁵
- e. Use erosion controls and velocity dissipation devices to prevent erosion at inlets and outlets; and
- f. 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.

2.2.13 If using treatment chemicals (e.g., polymers, flocculants, coagulants):

- a. **Use conventional erosion and sediment controls before and after the application of treatment chemicals.** Chemicals may only be applied where treated stormwater is directed to a sediment control (e.g., *sediment basin, perimeter control*) before discharge.
- b. **Select appropriate treatment chemicals.** Chemicals must be appropriately suited to the types of soils likely to be exposed during construction and present in the discharges being treated (i.e., *the expected turbidity, pH, and flow rate of stormwater flowing into the chemical treatment system or area*).
- c. **Minimize discharge risk from stored chemicals.** Store all treatment chemicals in leak-proof containers that are kept under storm-resistant cover and surrounded by secondary containment structures (e.g., *spill berms, decks, spill containment pallets*), or provide equivalent measures designed and maintained to minimize the potential discharge of treatment chemicals in stormwater or by any other means (e.g., *storing chemicals in a covered area, having a spill kit available on site and ensuring personnel are available to respond expeditiously in the event of a leak or spill*).
- d. **Comply with state/local requirements.** Comply with applicable state and local requirements regarding the use of treatment chemicals.
- e. **Use chemicals in accordance with good engineering practices and specifications of the chemical provider/supplier.** Use treatment chemicals and chemical treatment systems in accordance with good engineering practices, and with dosing specifications and sediment removal design specifications provided by the provider/supplier of the applicable chemicals, or document in your SWPPP specific departures from these specifications and how they reflect good engineering practice.
- f. **Ensure proper training.** Ensure that all persons who handle and use treatment chemicals at the construction site are provided with appropriate, product-specific training. Among other things, the training must cover proper dosing requirements.
- g. **Perform additional measures specified by the EPA Regional Office for the authorized use of cationic chemicals.** If you have been authorized to use cationic chemicals at your site pursuant to Part 1.1.9, you must perform all additional measures as conditioned by your authorization to ensure that the use of such chemicals will not cause an exceedance of water quality standards.

²⁵ The circumstances in which it is infeasible to design outlet structures in this manner are rare. Exceptions may include areas with extended cold weather, where using surface outlets may not be feasible during certain time periods (although they must be used during other periods). If you determine that it is infeasible to meet this requirement, you must provide documentation in your SWPPP to support your determination, including the specific conditions or time periods when this exception will apply.

2.2.14 Stabilize exposed portions of the site. Implement and maintain stabilization measures (e.g., seeding protected by erosion controls until vegetation is established, sodding, mulching, erosion control blankets, hydromulch, gravel) that minimize erosion from exposed portions of the site in accordance with Parts 2.2.14a and 2.2.14b.

a. Stabilization Deadlines:²⁶

Total Amount of Land Disturbance Occurring At Any One Time ²⁷	Deadline
<p>i. Five acres or less (≤5.0)</p> <p>Note: this includes sites disturbing more than five acres (>5.0) total over the course of a project, but that limit disturbance at any one time (i.e., phase the disturbance) to five acres or less (≤5.0)</p>	<ul style="list-style-type: none"> • Initiate the installation of stabilization measures immediately²⁸ in any areas of exposed soil where construction activities have permanently ceased or will be temporarily inactive for 14 or more calendar days;²⁹ and • Complete the installation of stabilization measures as soon as practicable, but no later than 14 calendar days after stabilization has been initiated.³⁰

²⁶ EPA may determine, based on an inspection carried out under Part 4.8 and corrective actions required under Part 5.3, that the level of sediment discharge on the site makes it necessary to require a faster schedule for completing stabilization. For instance, if sediment discharges from an area of exposed soil that is required to be stabilized are compromising the performance of existing stormwater controls, EPA may require stabilization to correct this problem.

²⁷ Limiting disturbances to five (5) acres or less at any one time means that at no time during the project do the cumulative earth disturbances exceed five (5) acres. The following examples would qualify as limiting disturbances at any one time to five (5) acres or less:

1. The total area of disturbance for a project is five (5) acres or less.
2. The total area of disturbance for a project will exceed five (5) acres, but the operator ensures that no more than five (5) acres will be disturbed at any one time through implementation of stabilization measures. In this way, site stabilization can be used to “free up” land that can be disturbed without exceeding the five (5)-acre cap to qualify for the 14-day stabilization deadline. For instance, if an operator completes stabilization of two (2) acres of land on a five (5)-acre disturbance, then two (2) additional acres could be disturbed while still qualifying for the longer 14-day stabilization deadline.

²⁸ The following are examples of activities that would constitute the immediate initiation of stabilization:

1. Prepping the soil for vegetative or non-vegetative stabilization as long as seeding, planting, and/or installation of non-vegetative stabilization products takes place as soon as practicable, but no later than one (1) calendar day of completing soil preparation;
2. Applying mulch or other non-vegetative product to the exposed area;
3. Seeding or planting the exposed area;
4. Starting any of the activities in # 1 – 3 on a portion of the entire area that will be stabilized; and
5. Finalizing arrangements to have stabilization product fully installed in compliance with the deadlines for completing stabilization.

²⁹ The requirement to initiate stabilization immediately is triggered as soon as you know that construction work on a portion of the site is temporarily ceased and will not resume for 14 or more days, or as soon as you know that construction work is permanently ceased. In the context of this provision, “immediately” means as soon as practicable, but no later than the end of the next business day, following the day when the construction activities have temporarily or permanently ceased.

³⁰ If vegetative stabilization measures are being implemented, stabilization is considered “installed” when all activities necessary to seed or plant the area are completed. If non-vegetative stabilization measures are being implemented, stabilization is considered “installed” when all such measures are implemented or applied.

ii. More than five acres (>5.0)	<ul style="list-style-type: none"> • Initiate the installation of stabilization measures immediately³¹ in any areas of exposed soil where construction activities have permanently ceased or will be temporarily inactive for 14 or more calendar days;³² and • Complete the installation of stabilization measures as soon as practicable, but no later than seven (7) calendar days after stabilization has been initiated.³³
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iii. **Exceptions:**

(a) Arid, semi-arid, and drought-stricken areas (as defined in Appendix A). If it is the seasonally dry period or a period in which drought is occurring, and vegetative stabilization measures are being used:

- (i) Immediately initiate and, within 14 calendar days of a temporary or permanent cessation of work in any portion of your site, complete the installation of temporary non-vegetative stabilization measures to the extent necessary to prevent erosion;
- (ii) As soon as practicable, given conditions or circumstances on the site, complete all activities necessary to seed or plant the area to be stabilized; and
- (iii) If construction is occurring during the seasonally dry period, indicate in your SWPPP the beginning and ending dates of the seasonally dry period and your site conditions. Also include the schedule you will follow for initiating and completing vegetative stabilization.

(b) Operators that are affected by unforeseen circumstances³⁴ that delay the initiation and/or completion of vegetative stabilization:

- (i) Immediately initiate and, within 14 calendar days, complete the installation of temporary non-vegetative stabilization measures to prevent erosion;
- (ii) Complete all soil conditioning, seeding, watering or irrigation installation, mulching, and other required activities related to the planting and initial establishment of vegetation as soon as conditions or circumstances allow it on your site; and
- (iii) Document in the SWPPP the circumstances that prevent you from meeting the deadlines in Part 2.2.14a and the schedule you will follow for initiating and completing stabilization.

(c) Discharges to a sediment- or nutrient-impaired water or to a water that is identified by your state, tribe, or EPA as Tier 2, Tier 2.5, or Tier 3 for antidegradation purposes. Complete stabilization as soon as

³¹ See footnote 27

³² See footnote 28

³³ See footnote 29

³⁴ Examples include problems with the supply of seed stock or with the availability of specialized equipment and unsuitability of soil conditions due to excessive precipitation and/or flooding.

practicable, but no later than seven (7) calendar days after stabilization has been initiated.

b. Final Stabilization Criteria (for any areas not covered by permanent structures):

- i. Establish uniform, perennial vegetation (*i.e., evenly distributed, without large bare areas*) that provides 70 percent or more of the cover that is provided by vegetation native to local undisturbed areas; and/or
- ii. Implement permanent non-vegetative stabilization measures³⁵ to provide effective cover.
- iii. **Exceptions:**
 - (a) **Arid, semi-arid, and drought-stricken areas** (as defined in Appendix A). Final stabilization is met if the area has been seeded or planted to establish vegetation that provides 70 percent or more of the cover that is provided by vegetation native to local undisturbed areas within three (3) years and, to the extent necessary to prevent erosion on the seeded or planted area, non-vegetative erosion controls have been applied that provide cover for at least three years without active maintenance.
 - (b) **Disturbed areas on agricultural land that are restored to their preconstruction agricultural use.** The Part 2.2.14b final stabilization criteria does not apply.
 - (c) **Areas that need to remain disturbed.** In limited circumstances, stabilization may not be required if the intended function of a specific area of the site necessitates that it remain disturbed, and only the minimum area needed remains disturbed (*e.g., dirt access roads, utility pole pads, areas being used for storage of vehicles, equipment, materials*).

2.3 POLLUTION PREVENTION REQUIREMENTS³⁶

You must implement pollution prevention controls in accordance with the following requirements to minimize the discharge of pollutants in stormwater and to prevent the discharge of pollutants from spilled or leaked materials from construction activities.

2.3.1 For equipment and vehicle fueling and maintenance:

- a. Provide an effective means of eliminating the discharge of spilled or leaked chemicals, including fuels and oils, from these activities;³⁷

³⁵ Examples of permanent non-vegetative stabilization measures include riprap, gravel, gabions, and geotextiles.

³⁶ Under this permit, you are not required to minimize exposure for any products or materials where the exposure to precipitation and to stormwater will not result in a discharge of pollutants, or where exposure of a specific material or product poses little risk of stormwater contamination (such as final products and materials intended for outdoor use).

³⁷ Examples of effective means include:

- Locating activities 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.;
- Providing secondary containment (*e.g., spill berms, decks, spill containment pallets*) and cover where appropriate; and
- Having a spill kit available on site and ensuring personnel are available to respond expeditiously in the event of a leak or spill.

- b. If applicable, comply with the Spill Prevention Control and Countermeasures (SPCC) requirements in 40 CFR part 112 and Section 311 of the CWA;
- c. Ensure adequate supplies are available at all times to handle spills, leaks, and disposal of used liquids;
- d. Use drip pans and absorbents under or around leaky vehicles;
- e. Dispose of or recycle oil and oily wastes in accordance with other federal, state, tribal, or local requirements; and
- f. Clean up spills or contaminated surfaces 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.

2.3.2 For equipment and vehicle washing:

- a. Provide an effective means of minimizing the discharge of pollutants from equipment and vehicle washing, wheel wash water, and other types of wash waters;³⁸
- b. Ensure there is no discharge of soaps, solvents, or detergents in equipment and vehicle wash water; and
- c. For storage of soaps, detergents, or solvents, provide 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.

2.3.3 For storage, handling, and disposal of building products, materials, and wastes:

- a. *For building materials and building products*³⁹, provide either (1) cover (e.g., *plastic sheeting, temporary roofs*) to minimize the exposure of these products to precipitation and to stormwater, or (2) a similarly effective means designed to minimize the discharge of pollutants from these areas.

Minimization of exposure is not required in cases where the exposure to precipitation and to stormwater will not result in a discharge of pollutants, or where exposure of a specific material or product poses little risk of stormwater contamination (such as final products and materials intended for outdoor use).

- b. *For pesticides, herbicides, insecticides, fertilizers, and landscape materials:*
 - i. In storage areas, provide either (1) cover (e.g., *plastic sheeting, temporary roofs*) to minimize the exposure of these chemicals to precipitation and to stormwater, or (2) a similarly effective means designed to minimize the discharge of pollutants from these areas; and
 - ii. Comply with all application and disposal requirements included on the registered pesticide, herbicide, insecticide, and fertilizer label (see also Part 2.3.5).
- c. *For diesel fuel, oil, hydraulic fluids, other petroleum products, and other chemicals:*

³⁸ Examples of effective means include locating activities away from waters of the U.S. and stormwater inlets or conveyances and directing wash waters to a sediment basin or sediment trap, using filtration devices, such as filter bags or sand filters, or using other similarly effective controls.

³⁹ Examples of building materials and building products typically present at construction sites include asphalt sealants, copper flashing, roofing materials, adhesives, concrete admixtures, and gravel and mulch stockpiles.

- i. Store chemicals in water-tight containers, and provide either (1) cover (e.g., *plastic sheeting, temporary roofs*) to minimize the exposure of these containers to precipitation and to stormwater, or (2) a similarly effective means designed to minimize the discharge of pollutants from these areas (e.g., *having a spill kit available on site and ensuring personnel are available to respond expeditiously in the event of a leak or spill*), or provide secondary containment (e.g., *spill berms, decks, spill containment pallets*); and
 - ii. Clean up spills immediately, using dry clean-up methods where possible, and dispose of used materials properly. You are prohibited from hosing the area down to clean surfaces or spills. Eliminate the source of the spill to prevent a discharge or a furtherance of an ongoing discharge.
- d. *For hazardous or toxic wastes:*⁴⁰
- i. Separate hazardous or toxic waste from construction and domestic waste;
 - ii. Store waste in sealed containers, which are constructed of suitable materials to prevent leakage and corrosion, and which are labeled in accordance with applicable Resource Conservation and Recovery Act (RCRA) requirements and all other applicable federal, state, tribal, or local requirements;
 - iii. Store all outside containers within appropriately-sized secondary containment (e.g., *spill berms, decks, spill containment pallets*) to prevent spills from being discharged, or provide a similarly effective means designed to prevent the discharge of pollutants from these areas (e.g., *storing chemicals in a covered area, having a spill kit available on site*);
 - iv. Dispose of hazardous or toxic waste in accordance with the manufacturer's recommended method of disposal and in compliance with federal, state, tribal, and local requirements;
 - v. Clean up spills immediately, using dry clean-up methods, and dispose of used materials properly. You are prohibited from hosing the area down to clean surfaces or spills. Eliminate the source of the spill to prevent a discharge or a furtherance of an ongoing discharge; and
 - vi. Follow all other federal, state, tribal, and local requirements regarding hazardous or toxic waste.
- e. *For construction and domestic wastes:*⁴¹
- i. Provide waste containers (e.g., *dumpster, trash receptacle*) of sufficient size and number to contain construction and domestic wastes;
 - ii. 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,

⁴⁰ Examples of hazardous or toxic waste that may be present at construction sites include paints, caulks, sealants, fluorescent light ballasts, solvents, petroleum-based products, wood preservatives, additives, curing compounds, and acids.

⁴¹ Examples of construction and domestic waste include packaging materials, scrap construction materials, masonry products, timber, pipe and electrical cuttings, plastics, styrofoam, concrete, demolition debris; and other trash or building materials.

- or (2) a similarly effective means designed to minimize the discharge of pollutants (e.g., secondary containment);
- iii. On business days, clean up and dispose of waste in designated waste containers; and
- iv. Clean up immediately if containers overflow.
- f. 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.

2.3.4 For washing applicators and containers used for stucco, paint, concrete, form release oils, curing compounds, or other materials:

- a. Direct wash water into a leak-proof container or leak-proof and lined pit designed so that no overflows can occur due to inadequate sizing or precipitation;
- b. Handle washout or cleanout wastes as follows:
 - i. Do not dump liquid wastes in storm sewers or waters of the U.S.;
 - ii. Dispose of liquid wastes in accordance with applicable requirements in Part 2.3.3; and
 - iii. Remove and dispose of hardened concrete waste consistent with your handling of other construction wastes in Part 2.3.3; and
- c. Locate any washout or cleanout activities as far away as possible from waters of the U.S. and stormwater inlets or conveyances, and, to the extent feasible, designate areas to be used for these activities and conduct such activities only in these areas.

2.3.5 For the application of fertilizers:

- a. Apply at a rate and in amounts consistent with manufacturer's specifications, or document in the SWPPP departures from the manufacturer specifications where appropriate in accordance with Part 7.2.6.b.ix;
- b. 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;
- c. Avoid applying before heavy rains that could cause excess nutrients to be discharged;
- d. Never apply to frozen ground;
- e. Never apply to stormwater conveyance channels; and
- f. Follow all other federal, state, tribal, and local requirements regarding fertilizer application.

2.3.6 Emergency Spill Notification Requirements

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.

2.4 CONSTRUCTION DEWATERING REQUIREMENTS

Comply with the following requirements to minimize the discharge of pollutants in ground water or accumulated stormwater that is removed from excavations, trenches, foundations, vaults, or other similar points of accumulation, in accordance with Part 1.2.2.⁴²

- 2.4.1 Treat dewatering discharges with controls to minimize discharges of pollutants;⁴³
- 2.4.2 Do not discharge visible floating solids or foam;
- 2.4.3 Use an oil-water separator or suitable filtration device (such as a cartridge filter) that is designed to remove oil, grease, or other products if dewatering water is found to contain these materials;
- 2.4.4 To the extent feasible, use vegetated, upland areas of the site to infiltrate dewatering water before discharge. You are prohibited from using waters of the U.S. as part of the treatment area;
- 2.4.5 At all points where dewatering water is discharged, comply with the velocity dissipation requirements of Part 2.2.11;
- 2.4.6 With backwash water, either haul it away for disposal or return it to the beginning of the treatment process; and
- 2.4.7 Replace and clean the filter media used in dewatering devices when the pressure differential equals or exceeds the manufacturer's specifications.

3 WATER QUALITY-BASED EFFLUENT LIMITATIONS

3.1 GENERAL EFFLUENT LIMITATION TO MEET APPLICABLE WATER QUALITY STANDARDS

Discharges must be controlled as necessary to meet applicable water quality standards. Discharges must also comply with any additional state or tribal requirements that are in Part 9.

In the absence of information demonstrating otherwise, EPA expects that compliance with the conditions in this permit will result in stormwater discharges being controlled as necessary to meet applicable water quality standards. If at any time you become aware, or EPA determines, that discharges are not being controlled as necessary to meet applicable water quality standards, you must take corrective action as required in Parts 5.1 and 5.2, and document the corrective actions as required in Part 5.4.

⁴² Uncontaminated, clear (non-turbid) dewatering water can be discharged without being routed to a control.

⁴³ Appropriate controls include sediment basins or sediment traps, sediment socks, dewatering tanks, tube settlers, weir tanks, filtration systems (e.g., *bag or sand filters*), and passive treatment systems that are designed to remove sediment. Appropriate controls to use downstream of dewatering controls to minimize erosion include vegetated buffers, check dams, riprap, and grouted riprap at outlets.

EPA may insist that you install additional controls (to meet the narrative water quality-based effluent limit above) on a site-specific basis, or require you to obtain coverage under an individual permit, if information in your NOI or from other sources indicates that your discharges are not controlled as necessary to meet applicable water quality standards. This includes situations where additional controls are necessary to comply with a wasteload allocation in an EPA-established or approved TMDL.

If during your coverage under a previous permit, you were required to install and maintain stormwater controls specifically to meet the assumptions and requirements of an EPA-approved or established TMDL (for any parameter) or to otherwise control your discharge to meet water quality standards, you must continue to implement such controls as part of your coverage under this permit.

3.2 DISCHARGE LIMITATIONS FOR SITES DISCHARGING TO SENSITIVE WATERS⁴⁴

For any portion of the site that discharges to a sediment or nutrient-impaired water or to a water that is identified by your state, tribe, or EPA as Tier 2, Tier 2.5, or Tier 3 for antidegradation purposes, you must comply with the inspection frequency specified in 4.3 and you must comply with the stabilization deadline specified in Part 2.2.14.a.iii.(c).⁴⁵

If you discharge to a water that is impaired for a parameter other than a sediment-related parameter or nutrients, EPA will inform you if any additional controls are necessary for your discharge to be controlled as necessary to meet water quality standards, including for it to be consistent with the assumptions of any available wasteload allocation in any applicable TMDL, or if coverage under an individual permit is necessary.

In addition, on a case-by-case basis, EPA may notify operators of new sites or operators of existing sites with increased discharges that additional analyses, stormwater controls, or other measures are necessary to comply with the applicable

⁴⁴ Sensitive waters include waters that are impaired and Tier 2, Tier 2.5, and Tier 3 waters.

“Impaired waters” are those waters identified by the state, tribe, or EPA as not meeting an applicable water quality standard and (1) requires development of a TMDL (pursuant to section 303(d) of the CWA; or (2) is addressed by an EPA-approved or established TMDL; or (3) is not in either of the above categories but the waterbody is covered by a pollution control program that meets the requirements of 40 CFR 130.7(b)(1). Your construction site will be considered to discharge to an impaired water if the first water of the U.S. to which you discharge is an impaired water for the pollutants contained in the discharge from your site. For discharges that enter a storm sewer system prior to discharge, the first water of the U.S. to which you discharge is the waterbody that receives the stormwater discharge from the storm sewer system. For assistance in determining whether your site discharges to impaired waters, EPA has developed a tool that is available both within the electronic NOI form in NeT, and at <https://water.epa.gov/polwaste/npdes/stormwater/discharge.cfm>.

Tiers 2, 2.5 and 3 refer to waters either identified by the state as high quality waters or Outstanding National Resource Waters under 40 CFR 131.12(a)(2) and (3). For the purposes of this permit, you are considered to discharge to a Tier 2, Tier 2.5, or Tier 3 water if the first water of the U.S. to which you discharge is identified by a state, tribe, or EPA as Tier 2, Tier 2.5, or Tier 3. For discharges that enter a storm sewer system prior to discharge, the water of the U.S. to which you discharge is the first water of the U.S. that receives the stormwater discharge from the storm sewer system. See list of Tier 2, Tier 2.5, and Tier 3 waters in Appendix F.

EPA may determine on a case-by-case basis that a site discharges to a sensitive water.

⁴⁵ If you qualify for any of the reduced inspection frequencies in Part 4.4, you may conduct inspections in accordance with Part 4.4 for any portion of your site that discharges to a sensitive water.

antidegradation requirements, or notify you that an individual permit application is necessary.

If you discharge to a water that is impaired for polychlorinated biphenyls (PCBs) and are engaging in demolition of any structure with at least 10,000 square feet of floor space built or renovated before January 1, 1980, you must:

- a. Implement controls⁴⁶ to minimize the exposure of PCB-containing building materials, including paint, caulk, and pre-1980 fluorescent lighting fixtures, to precipitation and to stormwater; and
- b. Ensure that disposal of such materials is performed in compliance with applicable state, federal, and local laws.

4 SITE INSPECTION REQUIREMENTS

4.1 PERSON(S) RESPONSIBLE FOR INSPECTING SITE

The person(s) inspecting your site may be a person on your staff or a third party you hire to conduct such inspections. You are responsible for ensuring that the person who conducts inspections is a "qualified person."⁴⁷

4.2 FREQUENCY OF INSPECTIONS.⁴⁸

At a minimum, you must conduct a site inspection in accordance with one of the two schedules listed below, unless you are subject to the Part 4.3 site inspection frequency for discharges to sensitive waters or qualify for a Part 4.4 reduction in the inspection frequency:

4.2.1 At least once every seven (7) calendar days; *or*

4.2.2 Once every 14 calendar days *and* within 24 hours of the occurrence of a storm event of 0.25 inches or greater, or the occurrence of runoff from snowmelt sufficient to cause a discharge.⁴⁹ To determine if a storm event of 0.25 inches or greater has occurred on your site, you must either keep a properly maintained rain gauge on your site, or obtain the storm event information from a weather station that is representative of your location. For any day of rainfall during normal business hours that measures 0.25 inches or greater, you must record the total rainfall measured for that day in accordance with Part 4.7.1d.

⁴⁶ Examples of controls to minimize exposure of PCBs to precipitation and stormwater include separating work areas from non-work areas and selecting appropriate personal protective equipment and tools, constructing a containment area so that all dust or debris generated by the work remains within the protected area, using tools that minimize dust and heat (<212°F). For additional information, refer to Part 2.3.3 of the CGP Fact Sheet.

⁴⁷ A "qualified person" is a person knowledgeable in the principles and practice of erosion and sediment controls and pollution prevention, who possesses the appropriate skills and training to assess conditions at the construction site that could impact stormwater quality, and the appropriate skills and training to assess the effectiveness of any stormwater controls selected and installed to meet the requirements of this permit.

⁴⁸ Inspections are only required during the site's normal working hours.

⁴⁹ "Within 24 hours of the occurrence of a storm event" means that you must conduct an inspection within 24 hours once a storm event has produced 0.25 inches within a 24-hour period, even if the storm event is still continuing. Thus, if you have elected to inspect bi-weekly in accordance with Part 4.2.2 and there is a storm event at your site that continues for multiple days, and each day of the storm produces 0.25 inches or more of rain, you must conduct an inspection within 24 hours of the first day of the storm and within 24 hours after the end of the storm.

4.3 INCREASE IN INSPECTION FREQUENCY FOR SITES DISCHARGING TO SENSITIVE WATERS.

For any portion of the site that discharges to a sediment or nutrient-impaired water or to a water that is identified by your state, tribe, or EPA as Tier 2, Tier 2.5, or Tier 3 for antidegradation purposes (see Part 3.2), instead of the inspection frequency specified in Part 4.2, you must conduct inspections in accordance with the following inspection frequencies:

Once every seven (7) calendar days *and* within 24 hours of the occurrence of a storm event of 0.25 inches or greater, or the occurrence of runoff from snowmelt sufficient to cause a discharge. To determine if a storm event of 0.25 inches or greater has occurred on your site, you must either keep a properly maintained rain gauge on your site, or obtain the storm event information from a weather station that is representative of your location. For any day of rainfall during normal business hours that measures 0.25 inches or greater, you must record the total rainfall measured for that day in accordance with Part 4.7.1d.

4.4 REDUCTIONS IN INSPECTION FREQUENCY

4.4.1 Stabilized areas.

- a. You may reduce the frequency of inspections to twice per month for the first month, no more than 14 calendar days apart, then once per month in any area of your site where the stabilization steps in 2.2.14a have been completed. If construction activity resumes in this portion of the site at a later date, the inspection frequency immediately increases to that required in Parts 4.2 and 4.3, as applicable. You must document the beginning and ending dates of this period in your SWPPP.
- b. **Exception.** For “linear construction sites” (as defined in Appendix A) where disturbed portions have undergone final stabilization at the same time active construction continues on others, you may reduce the frequency of inspections to twice per month for the first month, no more than 14 calendar days apart, in any area of your site where the stabilization steps in 2.2.14a have been completed. After the first month, inspect once more within 24 hours of the occurrence of a storm event of 0.25 inches or greater. If there are no issues or evidence of stabilization problems, you may suspend further inspections. If “wash-out” of stabilization materials and/or sediment is observed, following re-stabilization, inspections must resume at the inspection frequency required in Part 4.4.1a. Inspections must continue until final stabilization is visually confirmed following a storm event of 0.25 inches or greater.

- ##### 4.4.2 Arid, semi-arid, or drought-stricken areas (as defined in Appendix A).
- If it is the seasonally dry period or a period in which drought is occurring, you may reduce the frequency of inspections to once per month and within 24 hours of the occurrence of a storm event of 0.25 inches or greater. You must document that you are using this reduced schedule and the beginning and ending dates of the seasonally dry period in your SWPPP. To determine if a storm event of 0.25 inches or greater has occurred on your site, you must either keep a properly maintained rain gauge on your site, or obtain the storm event information from a weather station that is representative of your location. For any day of rainfall during normal business hours that measures 0.25 inches or greater, you must record the total rainfall measured for that day in accordance with Part 4.7.1d.

4.4.3 Frozen conditions:

- a. If you are suspending construction activities due to frozen conditions, you may temporarily suspend inspections on your site until thawing conditions (as defined in Appendix A) begin to occur if:

- i. Runoff is unlikely due to continuous frozen conditions that are likely to continue at your site for at least three (3) months based on historic seasonal averages. If unexpected weather conditions (such as above freezing temperatures or rain events) make discharges likely, you must immediately resume your regular inspection frequency as described in Parts 4.2 and 4.3, as applicable;
 - ii. Land disturbances have been suspended; and
 - iii. All disturbed areas of the site have been stabilized in accordance with Part 2.2.14a.
- b. If you are still conducting construction activities during frozen conditions, you may reduce your inspection frequency to once per month if:
- i. Runoff is unlikely due to continuous frozen conditions that are likely to continue at your site for at least three (3) months based on historic seasonal averages. If unexpected weather conditions (such as above freezing temperatures or rain events) make discharges likely, you must immediately resume your regular inspection frequency as described in Parts 4.2 and 4.3, as applicable; and
 - ii. Except for areas in which you are actively conducting construction activities, disturbed areas of the site have been stabilized in accordance with Part 2.2.14a.

You must document the beginning and ending dates of this period in your SWPPP.

4.5 AREAS THAT MUST BE INSPECTED

During your site inspection, you must at a minimum inspect the following areas of your site:

- 4.5.1** All areas that have been cleared, graded, or excavated and that have not yet completed stabilization consistent with Part 2.2.14a;
- 4.5.2** All stormwater controls (including pollution prevention controls) installed at the site to comply with this permit;⁵⁰
- 4.5.3** Material, waste, borrow, and equipment storage and maintenance areas that are covered by this permit;
- 4.5.4** All areas where stormwater typically flows within the site, including drainageways designed to divert, convey, and/or treat stormwater;
- 4.5.5** All points of discharge from the site; and
- 4.5.6** All locations where stabilization measures have been implemented.

You are not required to inspect areas that, at the time of the inspection, are considered unsafe to your inspection personnel.

4.6 REQUIREMENTS FOR INSPECTIONS

During your site inspection, you must at a minimum:

- 4.6.1** Check whether all stormwater controls (*i.e.*, *erosion and sediment controls and pollution prevention controls*) are properly installed, appear to be operational, and are working as intended to minimize pollutant discharges;

⁵⁰ This includes the requirement to inspect for sediment that has been tracked out from the site onto paved roads, sidewalks, or other paved areas consistent with Part 2.2.4.

- 4.6.2 Check for the presence of conditions that could lead to spills, leaks, or other accumulations of pollutants on the site;
- 4.6.3 Identify any locations where new or modified stormwater controls are necessary to meet the requirements of Parts 2 and/or 3;
- 4.6.4 Check for signs of visible erosion and sedimentation (*i.e.*, *sediment deposits*) that have occurred and are attributable to your discharge at points of discharge and, if applicable, the banks of any waters of the U.S. flowing within or immediately adjacent to the site;
- 4.6.5 Identify any incidents of noncompliance observed;
- 4.6.6 If a discharge is occurring during your inspection:
 - a. Identify all discharge points at the site; and
 - b. Observe and document the visual quality of the discharge, and take note of the characteristics of the stormwater discharge, including color; odor; floating, settled, or suspended solids; foam; oil sheen; and other indicators of stormwater pollutants.
- 4.6.7 Based on the results of your inspection, complete any necessary maintenance under Part 2.1.4 and corrective action under Part 5.

4.7 INSPECTION REPORT

- 4.7.1 You must complete an inspection report within 24 hours of completing any site inspection. Each inspection report must include the following:
 - a. The inspection date;
 - b. Names and titles of personnel making the inspection;
 - c. A summary of your inspection findings, covering at a minimum the observations you made in accordance with Part 4.6, including any necessary maintenance or corrective actions;
 - d. If you are inspecting your site at the frequency specified in Part 4.2.2, Part 4.3, or Part 4.4.1b, and you conducted an inspection because of rainfall measuring 0.25 inches or greater, you must include the applicable rain gauge or weather station readings that triggered the inspection; and
 - e. If you determined that it is unsafe to inspect a portion of your site, you must describe the reason you found it to be unsafe and specify the locations to which this condition applies.
- 4.7.2 Each inspection report must be signed in accordance with Appendix I, Part I.11 of this permit.
- 4.7.3 You must keep a copy of all inspection reports at the site or at an easily accessible location, so that it can be made available at the time of an on-site inspection or upon request by EPA.
- 4.7.4 You must retain all inspection reports completed for this Part for at least three (3) years from the date that your permit coverage expires or is terminated.

4.8 INSPECTIONS BY EPA

You must allow EPA, or an authorized representative of EPA, to conduct the following activities at reasonable times. To the extent that you are utilizing shared controls that are

not on site to comply with this permit, you must make arrangements for EPA to have access at all reasonable times to those areas where the shared controls are located.

- 4.8.1 Enter onto all areas of the site, including any construction support activity areas covered by this permit, any off-site areas where shared controls are utilized to comply with this permit, discharge locations, adjoining waterbodies, and locations where records are kept under the conditions of this permit;
- 4.8.2 Access and copy any records that must be kept under the conditions of this permit;
- 4.8.3 Inspect your construction site, including any construction support activity areas covered by this permit (see Part 1.2.1c), any stormwater controls installed and maintained at the site, and any off-site shared controls utilized to comply with this permit; and
- 4.8.4 Sample or monitor for the purpose of ensuring compliance.

5 CORRECTIVE ACTIONS

5.1 CONDITIONS TRIGGERING CORRECTIVE ACTION.

You must take corrective action to address any of the following conditions identified at your site:

- 5.1.1 A stormwater control needs repair or replacement (beyond routine maintenance required under Part 2.1.4); or
- 5.1.2 A stormwater control necessary to comply with the requirements of this permit was never installed, or was installed incorrectly; or
- 5.1.3 Your discharges are causing an exceedance of applicable water quality standards; or
- 5.1.4 A prohibited discharge has occurred (see Part 1.3).

5.2 CORRECTIVE ACTION DEADLINES

For any corrective action triggering conditions in Part 5.1, you must:

- 5.2.1 Immediately take all reasonable steps to address the condition, including cleaning up any contaminated surfaces so the material will not discharge in subsequent storm events;
- 5.2.2 When the problem does not require a new or replacement control or significant repair, the corrective action must be completed by the close of the next business day;
- 5.2.3 When the problem requires a new or replacement control or significant repair, install the new or modified control and make it operational, or complete the repair, by no later than seven (7) calendar days from the time of discovery. If it is infeasible to complete the installation or repair within seven (7) calendar days, you must document in your records why it is infeasible to complete the installation or repair within the 7-day timeframe and document your schedule for installing the stormwater control(s) and making it operational as soon as feasible after the 7-day timeframe. Where these actions result in changes to any of the stormwater controls or procedures documented in your SWPPP, you must modify your SWPPP accordingly within seven (7) calendar days of completing this work.

5.3 CORRECTIVE ACTION REQUIRED BY EPA

You must comply with any corrective actions required by EPA as a result of permit violations found during an inspection carried out under Part 4.8.

5.4 CORRECTIVE ACTION REPORT

For each corrective action taken in accordance with this Part, you must complete a report in accordance with the following:

- 5.4.1** Within 24 hours of identifying the corrective action condition, document the specific condition and the date and time it was identified.
- 5.4.2** Within 24 hours of completing the corrective action (in accordance with the deadlines in Part 5.2), document the actions taken to address the condition, including whether any SWPPP modifications are required.
- 5.4.3** Each corrective action report must be signed in accordance with Appendix I, Part I.11 of this permit.
- 5.4.4** You must keep a copy of all corrective action reports at the site or at an easily accessible location, so that it can be made available at the time of an on-site inspection or upon request by EPA.
- 5.4.5** You must retain all corrective action reports completed for this Part for at least three (3) years from the date that your permit coverage expires or is terminated.

6 STAFF TRAINING REQUIREMENTS

Each operator, or group of multiple operators, must assemble a "stormwater team" to carry out compliance activities associated with the requirements in this permit.

- 6.1** Prior to the commencement of construction activities, you must ensure that the following personnel⁵¹ on the stormwater team understand the requirements of this permit and their specific responsibilities with respect to those requirements:
 - a. Personnel who are responsible for the design, installation, maintenance, and/or repair of stormwater controls (including pollution prevention controls);
 - b. Personnel responsible for the application and storage of treatment chemicals (if applicable);
 - c. Personnel who are responsible for conducting inspections as required in Part 4.1; and
 - d. Personnel who are responsible for taking corrective actions as required in Part 5.
- 6.2** You are responsible for ensuring that all activities on the site comply with the requirements of this permit. You are not required to provide or document formal training for subcontractors or other outside service providers, but you must ensure that such personnel understand any requirements of this permit that may be affected by the work they are subcontracted to perform.

⁵¹ If the person requiring training is a new employee who starts after you commence construction activities, you must ensure that this person has the proper understanding as required above prior to assuming particular responsibilities related to compliance with this permit.

For emergency-related projects, the requirement to train personnel prior to commencement of construction activities does not apply, however, such personnel must have the required training prior to NOI submission.

- 6.3** At a minimum, members of the stormwater team must be trained to understand the following if related to the scope of their job duties (*e.g., only personnel responsible for conducting inspections need to understand how to conduct inspections*):
- a. The permit deadlines associated with installation, maintenance, and removal of stormwater controls and with stabilization;
 - b. The location of all stormwater controls on the site required by this permit and how they are to be maintained;
 - c. The proper procedures to follow with respect to the permit's pollution prevention requirements; and
 - d. When and how to conduct inspections, record applicable findings, and take corrective actions.
- 6.4** Each member of the stormwater team must have easy access to an electronic or paper copy of applicable portions of this permit, the most updated copy of your SWPPP, and other relevant documents or information that must be kept with the SWPPP.

7 STORMWATER POLLUTION PREVENTION PLAN (SWPPP)

7.1 GENERAL REQUIREMENTS

All operators associated with a construction site under this permit must develop a SWPPP consistent with the requirements in Part 7 prior to their submittal of the NOI.^{52, 53} The SWPPP must be kept up-to-date throughout coverage under this permit.

If a SWPPP was prepared under a previous version of this permit, the operator must review and update the SWPPP to ensure that this permit's requirements are addressed prior to submitting an NOI for coverage under this permit.

7.2 SWPPP CONTENTS

At a minimum, the SWPPP must include the information specified in this Part and as specified in other parts of this permit.

- 7.2.1 All Site Operators.** Include a list of all other operators who will be engaged in construction activities at the site, and the areas of the site over which each operator has control.
- 7.2.2 Stormwater Team.** Identify the personnel (by name or position) that are part of the stormwater team, as well as their individual responsibilities, including which members are responsible for conducting inspections.

⁵² The SWPPP does not establish the effluent limits and other permit terms and conditions that apply to your site's discharges; these limits, terms, and conditions are established in this permit.

Where there are multiple operators associated with the same site, they may develop a group SWPPP instead of multiple individual SWPPPs. Regardless of whether there is a group SWPPP or multiple individual SWPPPs, each operator is responsible for compliance with the permit's terms and conditions. In other words, if Operator A relies on Operator B to satisfy its permit obligations, Operator A does not have to duplicate those permit-related functions if Operator B is implementing them for both operators to be in compliance with the permit. However, Operator A remains responsible for permit compliance if Operator B fails to implement any measures necessary for Operator A to comply with the permit. In addition, all operators must ensure, either directly or through coordination with other operators, that their activities do not compromise any other operators' controls and/or any shared controls.

7.2.3 Nature of Construction Activities.⁵⁴ Include the following:

- a. A description of the nature of your construction activities, including the age or dates of past renovations for structures that are undergoing demolition;
- b. The size of the property (in acres or length in miles if a linear construction site);
- c. The total area expected to be disturbed by the construction activities (to the nearest quarter acre or nearest quarter mile if a linear construction site);
- d. A description of any on-site and off-site construction support activity areas covered by this permit (see Part 1.2.1c);
- e. The maximum area expected to be disturbed at any one time, including on-site and off-site construction support activity areas;
- f. A description and projected schedule for the following:
 - i. Commencement of construction activities in each portion of the site, including clearing and grubbing, mass grading, demolition activities, site preparation (*i.e.*, *excavating, cutting and filling*), final grading, and creation of soil and vegetation stockpiles requiring stabilization;
 - ii. Temporary or permanent cessation of construction activities in each portion of the site;
 - iii. Temporary or final stabilization of exposed areas for each portion of the site; and
 - iv. Removal of temporary stormwater controls and construction equipment or vehicles, and the cessation of construction-related pollutant-generating activities.
- g. A list and description of all pollutant-generating activities⁵⁵ on the site. For each pollutant-generating activity, include an inventory of pollutants or pollutant constituents (*e.g.*, *sediment, fertilizers, pesticides, paints, caulks, sealants, fluorescent light ballasts, contaminated substrates, solvents, fuels*) associated with that activity, which could be discharged in stormwater from your construction site. You must 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 or removed during construction;
- h. Business days and hours for the project;
- i. If you are conducting construction activities in response to a public emergency (see Part 1.4), a description of the cause of the public emergency (*e.g.*, *mud slides, earthquake, extreme flooding conditions, widespread disruption in essential public services*), information substantiating its occurrence (*e.g.*, *state disaster declaration or similar state or local declaration*), and a description of the construction necessary to reestablish affected public services.

7.2.4 Site Map. Include a legible map, or series of maps, showing the following features of the site:

- a. Boundaries of the property;

⁵⁴ If plans change due to unforeseen circumstances or for other reasons, the requirement to describe the sequence and estimated dates of construction activities is not meant to “lock in” the operator to meeting these dates. When departures from initial projections are necessary, this should be documented in the SWPPP itself, or in associated records, as appropriate.

⁵⁵ Examples of pollutant-generating activities include paving operations; concrete, paint, and stucco washout and waste disposal; solid waste storage and disposal; and dewatering operations.

- b. Locations where construction activities will occur, including:
 - i. Locations where earth-disturbing activities will occur (note any phasing), including any demolition activities;
 - ii. Approximate slopes before and after major grading activities (note any steep slopes (as defined in Appendix A));
 - iii. Locations where sediment, soil, or other construction materials will be stockpiled;
 - iv. Any water of the U.S. crossings;
 - v. Designated points where vehicles will exit onto paved roads;
 - vi. Locations of structures and other impervious surfaces upon completion of construction; and
 - vii. Locations of on-site and off-site construction support activity areas covered by this permit (see Part 1.2.1c).
- c. Locations of all waters of the U.S. within and one mile downstream of the site's discharge point. Also identify if any are listed as impaired, or are identified as a Tier 2, Tier 2.5, or Tier 3 water;
- d. Areas of federally listed critical habitat within the site and/or at discharge locations;
- e. Type and extent of pre-construction cover on the site (*e.g., vegetative cover, forest, pasture, pavement, structures*);
- f. Drainage patterns of stormwater and authorized non-stormwater before and after major grading activities;
- g. Stormwater and authorized non-stormwater discharge locations, including:
 - i. Locations where stormwater and/or authorized non-stormwater will be discharged to storm drain inlets;⁵⁶ and
 - ii. Locations where stormwater or authorized non-stormwater will be discharged directly to waters of the U.S.
- h. Locations of all potential pollutant-generating activities identified in Part 7.2.3g;
- i. Locations of stormwater controls, including natural buffer areas and any shared controls utilized to comply with this permit; and
- j. Locations where polymers, flocculants, or other treatment chemicals will be used and stored.

7.2.5 Non-Stormwater Discharges. Identify all authorized non-stormwater discharges in Part 1.2.2 that will or may occur.

7.2.6 Description of Stormwater Controls.

- a. For each of the Part 2.2 erosion and sediment control effluent limits, Part 2.3 pollution prevention effluent limits, and Part 2.4 construction dewatering effluent limits, as applicable to your site, you must include the following:
 - i. A description of the specific control(s) to be implemented to meet the effluent limit;

⁵⁶ The requirement to show storm drain inlets in the immediate vicinity of the site on your site map only applies to those inlets that are easily identifiable from your site or from a publicly accessible area immediately adjacent to your site.

- ii. Any applicable stormwater control design specifications (including references to any manufacturer specifications and/or erosion and sediment control manuals/ordinances relied upon);⁵⁷
 - iii. Routine stormwater control maintenance specifications; and
 - iv. The projected schedule for stormwater control installation/implementation.
- b. You must also include any of the following additional information as applicable.
- i. **Natural buffers and/or equivalent sediment controls** (see Part 2.2.1 and Appendix G). You must include the following:
 - (a) The compliance alternative to be implemented;
 - (b) If complying with alternative 2, the width of natural buffer retained;
 - (c) If complying with alternative 2 or 3, the erosion and sediment control(s) you will use to achieve an equivalent sediment reduction, and any information you relied upon to demonstrate the equivalency;
 - (d) If complying with alternative 3, a description of why it is infeasible for you to provide and maintain an undisturbed natural buffer of any size;
 - (e) For “linear construction sites” where it is infeasible to implement compliance alternative 1, 2, or 3, a rationale for this determination, and a description of any buffer width retained and/or supplemental erosion and sediment controls installed; and
 - (f) A description of any disturbances that are exempt under Part 2.2.1 that occur within 50 feet of a water of the U.S.
 - ii. **Perimeter controls for a “linear construction site”** (see Part 2.2.3). For areas where perimeter controls are not feasible, include documentation to support this determination and a description of the other practices that will be implemented to minimize discharges of pollutants in stormwater associated with construction activities.

Note: Routine maintenance specifications for perimeter controls documented in the SWPPP must include the Part 2.2.3a requirement that sediment be removed before it has accumulated to one-half of the above-ground height of any perimeter control.
 - iii. **Sediment track-out controls** (see Parts 2.2.4b and 2.2.4c). Document the specific stabilization techniques and/or controls that will be implemented to remove sediment prior to vehicle exit.
 - iv. **Sediment basins** (see Part 2.2.12). In circumstances where it is infeasible to utilize outlet structures that withdraw water from the surface, include documentation to support this determination, including the specific conditions or time periods when this exception will apply.
 - v. **Treatment chemicals** (see Part 2.2.13), you must include the following:
 - (a) A listing of the soil types that are expected to be exposed during construction in areas of the project that will drain to chemical treatment systems. Also include a listing of soil types expected to be found in fill material to be used in these same areas, to the extent you have this information prior to construction;

⁵⁷ Design specifications may be found in manufacturer specifications and/or in applicable erosion and sediment control manuals or ordinances. Any departures from such specifications must reflect good engineering practice and must be explained in the SWPPP.

- (b) A listing of all treatment chemicals to be used at the site and why the selection of these chemicals is suited to the soil characteristics of your site;
 - (c) If the applicable EPA Regional Office authorized you to use cationic treatment chemicals for sediment control, include the specific controls and implementation procedures designed to ensure that your use of cationic treatment chemicals will not lead to an exceedance of water quality standards;
 - (d) The dosage of all treatment chemicals to be used at the site or the methodology to be used to determine dosage;
 - (e) Information from any applicable Safety Data Sheet (SDS);
 - (f) Schematic drawings of any chemically enhanced stormwater controls or chemical treatment systems to be used for application of the treatment chemicals;
 - (g) A description of how chemicals will be stored consistent with Part 2.2.13c;
 - (h) 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; and
 - (i) A description of the training that personnel who handle and apply chemicals have received prior to permit coverage, or will receive prior to use of the treatment chemicals at your site.
- vi. **Stabilization measures** (see Part 2.2.14). You must include the following:
- (a) The specific vegetative and/or non-vegetative practices that will be used;
 - (b) The stabilization deadline that will be met in accordance with Part 2.2.14.a.i-ii;
 - (c) If complying with the deadlines for sites in arid, semi-arid, or drought-stricken areas, the beginning and ending dates of the seasonally dry period and the schedule you will follow for initiating and completing vegetative stabilization; and
 - (d) If complying with deadlines for sites affected by unforeseen circumstances that delay the initiation and/or completion of vegetative stabilization, document the circumstances and the schedule for initiating and completing stabilization.
- vii. **Spill prevention and response procedures** (see Part 1.3.5 and Part 2.3). You must include the following:
- (a) Procedures for expeditiously stopping, containing, and cleaning up spills, leaks, and other releases. Identify the name or position of the employee(s) responsible for detection and response of spills or leaks; and
 - (b) Procedures for notification of appropriate facility personnel, emergency response agencies, and regulatory agencies 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 consistent with Part 2.3.6 and established under either 40 CFR 110, 40 CFR 117, or 40 CFR 302, occurs during a 24-hour period. Contact information must be in locations that are readily accessible and available to all employees.

You may also reference the existence of Spill Prevention Control and

Countermeasure (SPCC) plans developed for the construction activity under Part 311 of the CWA, or spill control programs otherwise required by an NPDES permit for the construction activity, provided that you keep a copy of that other plan on site.⁵⁸

- viii. **Waste management procedures** (see Part 2.3.3). Describe the procedures you will follow for handling, storing and disposing of all wastes generated at your site consistent with all applicable federal, state, tribal, and local requirements, including clearing and demolition debris, sediment removed from the site, construction and domestic waste, hazardous or toxic waste, and sanitary waste.
- ix. **Application of fertilizers** (see Part 2.3.5). Document any departures from the manufacturer specifications where appropriate.

7.2.7 Procedures for Inspection, Maintenance, and Corrective Action. Describe the procedures you will follow for maintaining your stormwater controls, conducting site inspections, and, where necessary, taking corrective actions, in accordance with Part 2.1.4, Part 4, and Part 5 of this permit. Also include:

- a. The inspection schedule you will follow, which is based on whether your site is subject to Part 4.2 or Part 4.3, or whether your site qualifies for any of the reduced inspection frequencies in Part 4.4;
- b. If you will be conducting inspections in accordance with the inspection schedule in Part 4.2.2, Part 4.3, or Part 4.4.1b, the location of the rain gauge or the address of the weather station you will be using to obtain rainfall data;
- c. If you will be reducing your inspection frequency in accordance with Part 4.4.1b, the beginning and ending dates of the seasonally defined arid period for your area or the valid period of drought;
- d. If you will be reducing your inspection frequency in accordance with Part 4.4.3, the beginning and ending dates of frozen conditions on your site; and
- e. Any maintenance or inspection checklists or other forms that will be used.

7.2.8 Staff Training. Include documentation that the required personnel were, or will be, trained in accordance with Part 6.

7.2.9 Compliance with Other Requirements.

- a. **Threatened and Endangered Species Protection.** Include documentation required in Appendix D supporting your eligibility with regard to the protection of threatened and endangered species and designated critical habitat.
- b. **Historic Properties.** Include documentation required in Appendix E supporting your eligibility with regard to the protection of historic properties.
- c. **Safe Drinking Water Act Underground Injection Control (UIC) Requirements for Certain Subsurface Stormwater Controls.** If you are using any of the following stormwater controls at your site, document any contact you have had with the applicable state agency⁵⁹ or EPA Regional Office responsible for implementing the requirements for underground injection wells in the Safe Drinking Water Act and EPA's implementing

⁵⁸ Even if you already have an SPCC or other spill prevention plan in existence, your plans will only be considered adequate if they meet all of the requirements of this Part, either as part of your existing plan or supplemented as part of the SWPPP.

⁵⁹ For state UIC program contacts, refer to the following EPA website: <https://www.epa.gov/uic>.

regulations at 40 CFR 144 -147. Such controls would generally be considered Class V UIC wells:

- i. 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);
- ii. Commercially manufactured pre-cast or pre-built proprietary subsurface detention vaults, chambers, or other devices designed to capture and infiltrate stormwater flow; and
- iii. 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).

7.2.10 SWPPP Certification. You must sign and date your SWPPP in accordance with Appendix I, Part I.11.

7.2.11 Post-Authorization Additions to the SWPPP. Once you are authorized for coverage under this permit, you must include the following documents as part of your SWPPP:

- a. A copy of your NOI submitted to EPA along with any correspondence exchanged between you and EPA related to coverage under this permit;
- b. A copy of the acknowledgment letter you receive from NeT assigning your NPDES ID (*i.e.*, *permit tracking number*);
- c. A copy of this permit (an electronic copy easily available to the stormwater team is also acceptable).

7.3 ON-SITE AVAILABILITY OF YOUR SWPPP

You must keep a current copy of your SWPPP at the site or at an easily accessible location so that it can be made available at the time of an on-site inspection or upon request by EPA; a state, tribal, or local agency approving stormwater management plans; the operator of a storm sewer system receiving discharges from the site; or representatives of the U.S. Fish and Wildlife Service (USFWS) or the National Marine Fisheries Service (NMFS).

EPA may provide access to portions of your SWPPP to a member of the public upon request. Confidential Business Information (CBI) will be withheld from the public, but may not be withheld from EPA, USFWS, or NMFS.⁶⁰

If an on-site location is unavailable to keep the SWPPP when no personnel are present, notice of the plan's location must be posted near the main entrance of your construction site.

7.4 SWPPP MODIFICATIONS

⁶⁰ Information covered by a claim of confidentiality will be disclosed by EPA only to the extent of, and by means of, the procedures set forth in 40 CFR Part 2, Subpart B. In general, submitted information protected by a business confidentiality claim may be disclosed to other employees, officers, or authorized representatives of the United States concerned with implementing the CWA. The authorized representatives, including employees of other executive branch agencies, may review CBI during the course of reviewing draft regulations.

- 7.4.1** You must modify your SWPPP, including the site map(s), within seven (7) days of any of the following conditions:
- a. Whenever new operators become active in construction activities on your site, or you make changes to your construction plans, stormwater controls, or other activities at your site that are no longer accurately reflected in your SWPPP. This includes changes made in response to corrective actions triggered under Part 5. You do not need to modify your SWPPP if the estimated dates in Part 7.2.3f change during the course of construction;
 - b. To reflect areas on your site map where operational control has been transferred (and the date of transfer) since initiating permit coverage;
 - c. If inspections or investigations by EPA or its authorized representatives determine that SWPPP modifications are necessary for compliance with this permit;
 - d. Where EPA determines it is necessary to install and/or implement additional controls at your site in order to meet the requirements of this permit, the following must be included in your SWPPP:
 - i. A copy of any correspondence describing such measures and requirements; and
 - ii. A description of the controls that will be used to meet such requirements.
 - e. To reflect any revisions to applicable federal, state, tribal, or local requirements that affect the stormwater controls implemented at the site; and
 - f. If applicable, if a change in chemical treatment systems or chemically enhanced stormwater control is made, including use of a different treatment chemical, different dosage rate, or different area of application.
- 7.4.2** You must maintain records showing the dates of all SWPPP modifications. The records must include the name of the person authorizing each change (see Part 7.2.10 above) and a brief summary of all changes.
- 7.4.3** All modifications made to the SWPPP consistent with Part 7.4 must be authorized by a person identified in Appendix I, Part I.11.b.
- 7.4.4** Upon determining that a modification to your SWPPP is required, if there are multiple operators covered under this permit, you must immediately notify any operators who may be impacted by the change to the SWPPP.

8 HOW TO TERMINATE COVERAGE

Until you terminate coverage under this permit, you must comply with all conditions and effluent limitations in the permit. To terminate permit coverage, you must submit to EPA a complete and accurate Notice of Termination (NOT), which certifies that you have met the requirements for terminating in Part 8.

8.1 MINIMUM INFORMATION REQUIRED IN NOT

- 8.1.1** NPDES ID (*i.e.*, *permit tracking number*) provided by EPA when you received coverage under this permit;
- 8.1.2** Basis for submission of the NOT (see Part 8.2);
- 8.1.3** Operator contact information;
- 8.1.4** Name of site and address (or a description of location if no street address is available); and

8.1.5 NOT certification.

8.2 CONDITIONS FOR TERMINATING CGP COVERAGE

You must terminate CGP coverage only if one or more of the following conditions has occurred:

8.2.1 You have completed all construction activities at your site and, if applicable, construction support activities covered by this permit (see Part 1.2.1c), and you have met the following requirements:

- a. For any areas that (1) were disturbed during construction, (2) are not covered over by permanent structures, and (3) over which you had control during the construction activities, you have met the requirements for final vegetative or non-vegetative stabilization in Part 2.2.14b;
- b. You have removed and properly disposed of all construction materials, waste and waste handling devices, and have removed all equipment and vehicles that were used during construction, unless intended for long-term use following your termination of permit coverage;
- c. You have removed all stormwater controls that were installed and maintained during construction, except those that are intended for long-term use following your termination of permit coverage or those that are biodegradable; and
- d. You have removed all potential pollutants and pollutant-generating activities associated with construction, unless needed for long-term use following your termination of permit coverage; or

8.2.2 You have transferred control of all areas of the site for which you are responsible under this permit to another operator, and that operator has submitted an NOI and obtained coverage under this permit; or

8.2.3 Coverage under an individual or alternative general NPDES permit has been obtained.

8.3 HOW TO SUBMIT YOUR NOT

You must use EPA's NPDES eReporting Tool (NeT) to electronically prepare and submit your NOT for the 2017 CGP.

To access NeT, go to <https://www.epa.gov/npdes/stormwater-discharges-construction-activities#ereporting>.

Waivers from electronic reporting may be granted as specified in Part 1.4.1. If the EPA Regional Office grants you approval to use a paper NOT, and you elect to use it, you must complete the form in Appendix K.

8.4 DEADLINE FOR SUBMITTING THE NOT

You must submit your NOT within 30 calendar days after any one of the conditions in Part 8.2 occurs.

8.5 EFFECTIVE DATE OF TERMINATION OF COVERAGE

Your authorization to discharge under this permit terminates at midnight of the calendar day that a complete NOT is submitted to EPA.

9 PERMIT CONDITIONS APPLICABLE TO SPECIFIC STATES, INDIAN COUNTRY LANDS, OR TERRITORIES

The provisions in this Part provide modifications or additions to the applicable conditions of this permit to reflect specific additional conditions required as part of the state or tribal CWA Section 401 certification process, or the Coastal Zone Management Act (CZMA) certification process, or as otherwise established by the permitting authority. The specific additional revisions and requirements only apply to activities in those specific states, Indian country, and areas in certain states subject to construction projects by Federal Operators. States, Indian country, and areas subject to construction by Federal Operators not included in this Part do not have any modifications or additions to the applicable conditions of this permit.

9.1 EPA Region 1

9.1.1 NHR100000 State of New Hampshire

- a. If you disturb 100,000 square feet or more of contiguous area, you must also apply for an Alteration of Terrain (AoT) permit from DES pursuant to RSA 485- A:17 and Env-Wq 1500. This requirement also applies to a lower disturbance threshold of 50,000 square feet or more when construction occurs within the protected shoreline under the Shoreland Water Quality Protection Act (see RSA 483-B and Env-Wq 1400). A permit application must also be filed if your project disturbs an area of greater than 2,500 square feet, is within 50 feet of any surface water, and has a flow path of 50 feet or longer disturbing a grade of 25 percent or greater. Project sites with disturbances smaller than those discussed above, that have the potential to adversely affect state surface waters, are subject to the conditions of an AoT General Permit by Rule.
- b. You must determine that any excavation dewatering discharges are not contaminated before they will be authorized as an allowable non-stormwater discharge under this permit (see Part 1.2.2). The water is considered uncontaminated if there is no groundwater contamination within 1,000 feet of the groundwater dewatering location. Information on groundwater contamination can be generated over the Internet via the NHDES web site <http://des.nh.gov/> by using the One Stop Data Mapper at <http://des.nh.gov/onestop/gis.htm>. If it is determined that the groundwater to be dewatered is near a remediation or other waste site you must apply for the Remediation General Permit (see <https://www3.epa.gov/region1/npdes/rgp.html>.)
- c. You must treat any uncontaminated excavation dewatering discharges as necessary to remove suspended solids and turbidity. The discharges must be sampled at least once per week during weeks when discharges occur. Samples must be analyzed for total suspended solids (TSS) or turbidity and must meet monthly average and daily maximum limits of 50 milligrams per liter (mg/L) and 100 mg/L, respectively for TSS or 33 mg/l and 67 mg/l, respectively for turbidity. TSS (a.k.a. Residue, Nonfilterable) or turbidity sampling and analysis must be performed in accordance with Tables IB and II in 40 CFR 136.3 (http://www.ecfr.gov/cgi-bin/text-idx?SID=0243e3c4283cbd7d8257eb6afc7ce9a2&mc=true&node=se40.25.136_13&rgn=div8). Records of any sampling and analysis must be maintained and kept with the SWPPP for at least three years after final site stabilization.
- d. Construction site owners and operators must consider opportunities for post-construction groundwater recharge using infiltration best management practices

(BMPs) during site design and preparation of the SWPPP. If your construction site is in a town that is required to obtain coverage under the NPDES General Permit for discharges from Municipal Separate Storm Sewer Systems (MS4) you may be required to use such practices. The SWPPP must include a description of any on-site infiltration that will be installed as a post-construction stormwater management measure or reasons for not employing such measures such as 1) The facility is located in a wellhead protection area as defined in RSA 485- C:2; or 2) The facility is located in an area where groundwater has been reclassified to GAA, GAI or GA2 pursuant to RSA 485-C and Env-DW 901; or 3) Any areas that would be exempt from the groundwater recharge requirements contained in Env-Wq 1507.04, including all land uses or activities considered to be a "High-load Area" (see Env-Wq 1502.30). For design considerations for infiltration measures see Env-Wq 1508.06.

- e. Appendix F contains a list of Tier 2, or high quality waters. Although there is no official list of tier 2 waters, it can be assumed that all NH surface waters are tier 2 for turbidity unless 1) the surface water that you are proposing to discharge into is listed as impaired for turbidity in the states listing of impaired waters (see Surface Water Quality - Watershed Report Cards at http://des.nh.gov/organization/divisions/water/wmb/swqa/report_cards.htm) or 2) sampling upstream of the proposed discharge location shows turbidity values greater than 10 NTU. A single grab sample collected during dry weather (no precipitation within 48 hours) is acceptable.
- f. To ensure compliance with RSA 485-C, RSA 485-A, RSA 485-A:13, I(a), Env-Wq 1700 and Env-Wq 302, the following information may be requested by NHDES. This information must be kept on site unless you receive a written request from NHDES that it be sent to the address shown in Part 9.1.4 (g).
 - i. A site map required in Part 7.2.4, showing the type and location of all post-construction infiltration BMPs utilized at the facility or the reason(s) why none were installed;
 - ii. A list of all non-stormwater discharges that occur at the facility, including their source locations and the control measures being used (see Part 1.2.2).
 - iii. Records of sampling and analysis of TSS required for construction dewatering discharges (see Part 9.1.4 (c)).
- g. All required or requested documents must be sent to:

NH Department of Environmental Services, Wastewater Engineering Bureau,
Permits & Compliance Section
P.O. Box 95
Concord, NH 03302-0095

9.1.2 VTR10F000 Areas in the State of Vermont subject to construction by a Federal Operator

- a. Earth disturbance at any one time is limited to five acres.
- b. All areas of earth disturbance must have temporary or final stabilization within 14 days of the initial disturbance. After this time, disturbed areas must be temporarily or permanently stabilized in advance of any runoff producing event. A runoff producing event is an event that produces runoff from the construction site. Temporary stabilization is not required if the work is occurring in a self-contained

excavation (i.e. no outlet) with a depth of two feet or greater (e.g. house foundation excavation, utility trenches). Areas of a construction site that drain to sediment basins are not considered eligible for this exemption, and the exemption applies only to the excavated area itself.

- c. The use of the cationic polymers is prohibited unless approved under a site-specific plan.
- d. Site inspections on active construction sites shall be conducted daily during the period from October 15 – April 15.
- e. Any applicant under EPA's CGP shall allow authorized Agency representatives, at reasonable times and upon presentation of credentials, to enter upon the project site for purposes of inspecting the project and determining compliance with this Certification.
- f. The Agency may reopen and alter or amend the conditions of this Certification over the life of the project when such action is necessary to assure compliance with the VWQS.

9.2 EPA Region 3

9.2.1 DCR100000 District of Columbia

- a. The permittee must comply with the District of Columbia Water Pollution Control Act of 1984, as amended, (D.C. Official Code § 8-103.01 et seq.) and its implementing regulations in Title 21, Chapters 11 and 19 of the District of Columbia Municipal Regulations. Nothing in this permit will be construed to preclude the institution of any legal action or relieve the permittee from any responsibilities, liabilities, or penalties established pursuant to District of Columbia laws and regulations.
- b. The permittee must comply with the District of Columbia Stormwater Management, and Soil Erosion and Sediment Control in Chapter 5 of Title 21 of the District of Columbia Municipal Regulations.
- c. The permittee must comply with District of Columbia Flood Management control in Chapter 31 of Title 20 of the District of Columbia Municipal Regulations.
- d. The Department may request a copy of the Stormwater Pollution Prevention Plan (SWPPP) and the permittee is required to submit the SWPPP to the Department within 14 days of such request. The Department may conduct an inspection of any facility covered by this permit to ensure compliance with District's law requirements, including water quality standards. The Department may enforce its certification conditions.
- e. The Department may require the permittee to perform water quality monitoring during the permit term if monitoring is necessary for the protection of public health or the environment as designated under the authority in Chapter 19 of Title 21 of the District of Columbia Municipal Regulations.
- f. The Department may require the permittee to provide measurable verification of the effectiveness of Best Management Practices (BMPs) and other control measures used in the stormwater management program, including water quality monitoring.
- g. The Department has determined that compliance with this permit does not protect the permittee from enforcement actions deemed necessary by the Department

under its associated regulations to address an imminent threat to public health or a significant adverse environmental impact which results in a violation of the District of Columbia Water Pollution Control Act of 1984, as amended, (D.C. Official Code § 8-103.01 et seq.) and its implementing regulations.

- h. The Department reserves the right to modify this Section 401 Water Quality Certification if any changes, modifications, or deletions are made to this general permit. In addition, the Department reserves the right to add and/or alter the terms and conditions of this Section 401 Water Quality Certification to carry out its responsibilities during the term of this general permit with respect to water quality, including any revisions to District of Columbia Water Quality Standards in Chapter 11 of Title 21 of the District of Columbia Municipal Regulations.
- i. Should any violation of the District's Water Quality Standards, or the conditions of this Section 401 Water Quality Certification occur, the Department will direct the permittee to correct the violation(s). The Department has the right to take any action as authorized by the District laws and regulations to address the violations of this permit or the Water Pollution Control Act and implementing regulations. Substantial civil and criminal penalties are authorized for discharging into District waters in violation of an order or permit issued by the Department. This Section 401 Water Quality Certification does not relieve the permittee of the duty to comply with other applicable District's statutes and regulations.
- j. The permittee must submit copies of Notice of Intent (NOI) and Notice of Termination to DOEE at the same time these documents are submitted to EPA.
- k. The permittee shall allow DOEE to inspect any facilities, equipment, practices, or operations regulated or required under this permit and to access records maintained under the conditions of this permit.
- l. All required or requested documents shall be signed and sent to the: Department of Energy & Environment, 1200 First Street, N.E., 5th Floor, Washington, DC 20002, Attention: Associate Director, Inspection and Enforcement Division.

9.2.2 DER10F000 Areas in the State of Delaware subject to construction by a Federal Operator

- a. Federal agencies engaging in construction activities must submit, to DNREC, a sediment and stormwater management (S&S) plan and obtain approval from DNREC in accordance with 7 Del. C. §4010, 7 DE Admin. Code 5101, and 7 DE Admin. Code 7201.
- b. Federal agencies engaging in construction activities must provide for construction review by a certified construction reviewer in accordance with 7 Del. C. §§4010 & 4013 and 7 DE Admin. Code 5101, subsection 6.1.6.
- c. Federal agencies engaging in construction activities must certify that all responsible personnel involved in the construction project will have attended the blue card training prior to initiation of any land disturbing activity – see 7 Del. C. §§ 4002 & 4014 and 7 DE Admin. Code 5101.

9.3 EPA Region 5

9.3.1 MNR10I000 Indian country within the State of Minnesota

9.3.1.1 Fond du Lac Band of Lake Superior Chippewa. The following conditions apply only to discharges on the Fond du Lac Band of Lake Superior Chippewa Reservation:

- a. A copy of the Stormwater Pollution Prevention Plan (SWPPP) must be submitted to the Office of Water Protection at least fifteen (15) days in advance of sending the Notice of Intent (NOI) to EPA. The SWPPP can be submitted electronically to richardgitar@FDLREZ.com or by hardcopy sent to:

Fond du Lac Reservation
Office of Water Protection
1720 Big Lake Road
Cloquet, MN 55720

CGP applicants are encouraged to work with the FDL Office of Water Protection in the identification of all proposed receiving.

- b. Copies of the Notice of Intent (NOI) and the Notice of Termination (NOT) must be sent to the Fond du Lac Office of Water Protection at the same time they are submitted to EPA.
- c. The turbidity limit shall NOT exceed 10% of natural background within the receiving water(s) as determined by Office of Water Protection staff.
- d. Turbidity sampling must take place within 24 hours of a ½-inch or greater rainfall event. The results of the sampling must be reported to the Office of Water Protection within 7 days of the sample collection. All sample reporting must include the date and time, location (GPS: UTM/Zone 15), and NTU. CGP applicants are encouraged to work with the Office of Water Protection in determining the most appropriate location(s) for sampling.
- e. Receiving waters with open water must be sampled for turbidity prior to any authorized discharge as determined by Office of Water Protection staff. This requirement only applies to receiving waters in which no ambient turbidity data exists.
- f. This Certification does not pertain to any new discharge to Outstanding Reservation Resource Waters (ORRW) as described in §105 b.3. of the Fond du Lac Water Quality Standards (Ordinance #12/98, as amended). Although additional waters may be designated in the future, currently Perch Lake, Rice Portage Lake, Miller Lake, Deadfish Lake, and Jaskari Lake are designated as ORRWs. New dischargers wishing to discharge to an ORRW must obtain an individual permit from EPA for stormwater discharges from large and small construction activities.
- g. All work shall be carried out in such a manner as will prevent violations of water quality criteria as stated in the Water Quality Standards of the Fond du Lac Reservation, Ordinance 12/98, as amended. This includes, but is not limited to, the prevention of any discharge that causes a condition in which visible solids, bottom deposits, or turbidity impairs the usefulness of water of the Fond du Lac Reservation for any of the uses designated in the Water Quality Standards of the Fond du Lac Reservation. These uses include wildlife, aquatic life, warm water fisheries, cold water fisheries, subsistence fishing (netting), primary contact recreation, secondary

contact recreation, cultural, wild rice areas, aesthetic waters, agriculture, navigation, and commercial.

- h. Appropriate steps shall be taken to ensure that petroleum products or other chemical pollutants are prevented from entering waters of the Fond du Lac Reservation. All spills must be reported to the appropriate emergency management agency (National Response Center AND the State Duty Officer), and measures shall be taken immediately to prevent the pollution of waters of the Fond du Lac Reservation, including groundwater. The Fond du Lac Office of Water Protection must also be notified immediately of any spill regardless of size.
- i. This certification does not authorize impacts to cultural, historical, or archeological features or sites, or properties that may be eligible for such listing.

9.3.1.2 Grand Portage Band of Lake Superior Chippewa. The following conditions apply only to discharges on the Grand Portage Band of Lake Superior Chippewa Reservation:

- a. The CGP authorization is for construction activities that may occur within the exterior boundaries of the Grand Portage Reservation in accordance to the Grand Portage Land Use Ordinance. The CGP regulates stormwater discharges associated with construction sites of one acre or more in size. Only those activities specifically authorized by the CGP are authorized by this certification (the "Certification"). This Certification does not authorize impacts to cultural, historical, or archeological features or sites, or properties that may be eligible for listing as such.
- b. All construction stormwater discharges authorized by the CGP must comply with the Water Quality Standards and Water Resources Ordinance, as well as Applicable Federal Standards (as defined in the Water Resources Ordinance). As such, appropriate steps must be taken to ensure that petroleum products or other chemical pollutants are prevented from entering the Waters of the Reservation (as defined in the Water Resources Ordinance). All spills must be reported to the appropriate emergency-management agency, and measures must be taken to prevent the pollution of the Waters of the Reservation, including groundwater.
- c. The 2017 CGP requires inspections and monitoring reports of the construction site stormwater discharges by a qualified person. Monitoring and inspection reports must comply with the minimum requirements contained in the 2017 CGP. The monitoring plan must be prepared and incorporated into the Stormwater Pollution Prevention Plan (the "SWPPP"). A copy of the SWPPP must be submitted to the Board at least 30 days in advance of sending the requisite Notice of Intent to EPA. The SWPPP should be sent to:

Grand Portage Environmental Resources Board
P.O. Box 428
Grand Portage, MN 55605

Copies of the Notice of Intent and Notice of Termination required under the CGP must be submitted to the Board at the address above at the same time they are submitted to the EPA.

- d. If requested by the Grand Portage Environmental Department, the permittee must provide additional information necessary for a case-by-case eligibility determination to assure compliance with the Water Quality Standards and any Applicable Federal Standards.

- e. Discharges that the Board has determined to be or that may reasonably be expected to be contributing to a violation of Water Quality Standards or Applicable Federal Standards are not authorized by this Certification.
- f. The Board retains full authority provided by the Water Resources Ordinance to ensure compliance with and to enforce the provisions of the Water Resource Ordinance and Water Quality Standards, Applicable Federal Standards, and these Certification conditions.
- g. Appeals related to Board actions taken in accordance with any of the preceding conditions may be heard by the Grand Portage Tribal Court.

9.3.2 WIR10I000 Indian country within the State of Wisconsin, except the Sokaogon Chippewa (Mole Lake) Community

9.3.2.1 Bad River Band of Lake Superior Tribe of Chippewa Indians: The following conditions apply only to discharges on the Bad River Band of the Lake Superior Tribe of Chippewa Indians Reservation:

- a. Only those activities specifically authorized by the CGP are authorized by this Certification. This Certification does not authorize impacts to cultural properties, or historical sites, or properties that may be eligible for listing as such.^{61, 62}
- b. All projects which are eligible for coverage under the CGP and are located within the exterior boundaries of the Bad River Reservation shall be implemented in such a manner that is consistent with the Tribe's Water Quality Standards (WQS) in order to protect Reservations waters that may be impacted by stormwater discharge including embankments, outlets, adjacent streambanks, slopes, and downstream waters.⁶³
- c. Operators are not eligible to obtain authorization under the CGP for all new discharges to an Outstanding Tribal Resource Water (or Tier 3 water).⁶⁴ Outstanding Tribal Resource Waters, or Tier 3 waters, include the following: Kakagon Slough and the lower wetland reaches of its tributaries that support wild rice, Kakagon River, Bad River Slough, Honest John Lake, Bog Lake, a portion of Bad River, from where it enters the Reservation through the confluence with the White River, and Potato River.⁶⁵
- d. An operator proposing to discharge to an Outstanding Resource Water (or Tier 2.5 water) under the CGP must comply with the antidegradation provisions of the Tribe's WQS. Outstanding Resource Waters, or Tier 2.5 waters, include the following: a portion of Bad River, from downstream the confluence with the White River to Lake Superior, White River, Marengo River, Graveyard Creek, Bear Trap Creek, Wood Creek, Brunsweller River, Tyler Forks, Bell Creek, and Vaughn Creek.⁶⁶ The antidegradation demonstration materials described in provision E.4.iii. must be submitted to the following address:

⁶¹ Bad River Band of Lake Superior Tribe of Chippewa Indians Water Quality Standards adopted by Resolution No. 7-6-11-441 (hereafter, Tribe's WQS).

⁶² 36 C.F.R. § 800.16(l)(2).

⁶³ See footnote 61.

⁶⁴ Tribe's WQS: See provisions E.3.ii. and E.4.iv.

⁶⁵ Tribe's WQS: See provision E.2.iii.

⁶⁶ Tribe's WQS: See provision E.2.ii.

Bad River Tribe's Natural Resources Department
Attn: Water Resources Specialist
P.O. Box 39
Odanah, WI 54861

- e. An operator proposing to discharge to an Exceptional Resource Water (or Tier 2 water) under the CGP must comply with the antidegradation provisions of the Tribe's WQS. Exceptional Resource Waters, or Tier 2 waters, include the following: any surface water within the exterior boundaries of the Reservation that is not specifically classified as an Outstanding Resource Water (Tier 2.5 water) or an Outstanding Tribal Resource Water (Tier 3 water).⁶⁷ The antidegradation demonstration materials described in provision E.4.ii. must be submitted to the following address:

Bad River Tribe's Natural Resources Department
Attn: Water Resources Specialist
P.O. Box 39
Odanah, WI 54861

- f. Projects utilizing cationic treatment chemicals⁶⁸ within the Bad River Reservation boundaries are not eligible for coverage under the CGP.⁶⁹
- g. A discharge to a surface water within the Bad River Reservation boundaries shall not cause or contribute to an exceedance of the turbidity criterion included in the Tribe's WQS, which states: Turbidity shall not exceed 5 NTU over natural background turbidity when the background turbidity is 50 NTU or less, or turbidity shall not increase more than 10% when the background turbidity is more than 50 NTU.⁷⁰
- h. All projects which are eligible for coverage under the CGP within the exterior boundaries of the Bad River Reservation must comply with the Bad River Reservation Wetland and Watercourse Protection Ordinance, or Chapter 323 of the Bad River Tribal Ordinances, including the erosion and sedimentation control, natural buffer, and stabilization requirements. Questions regarding Chapter 323 and requests for permit applications can be directed to the Wetlands Specialist in the Tribe's Natural Resources Department at (715) 682-7123 or wetlands@badriver-nsn.gov.
- i. An operator of a project, which is eligible for coverage under the CGP, that would result in an allowable discharge under the CGP occurring within the exterior boundaries of the Bad River Reservation must notify the Tribe prior to the commencing earth-disturbing activities.⁷¹ ⁷² The operator must submit a copy of the Notice of Intent (NOI) to the following addresses at the same time it is submitted to the U.S. EPA:

⁶⁷ Tribe's WQS: See provision E.2.i.

⁶⁸ See definition of cationic treatment chemicals in Appendix A of the CGP.

⁶⁹ Tribe's WQS: See provisions E.6.ii.a. and E.6.ii.c.

⁷⁰ Tribe's WQS: See provision E.7.iii.

⁷¹ See footnote 61.

⁷² See footnote 62.

Bad River Tribe's Natural Resources Department
Attn: Water Resources Specialist
P.O. Box 39
Odanah, WI 54861

Bad River Tribe's Natural Resources Department
Attn: Tribal Historic Preservation Officer (THPO)
P.O. Box 39
Odanah, WI 54861

The operator must also submit a copy of the Notice of Termination (NOT) to the above addresses at the same time it is submitted to the U.S. EPA.

- j. The Tribal Historic Preservation Officer (THPO) must be provided 30 days to comment on the project.⁷³
- k. The operator must obtain THPO concurrence in writing. This written concurrence will outline measures to be taken to prevent or mitigate effects to historic properties. For more information regarding the specifics of the cultural resources process, see 36 CFR Part 800. A best practice for an operator is to consult with the THPO during the planning stages of an undertaking.⁷⁴
- l. An operator of a project, which is eligible for coverage under the CGP, that would result in an allowable discharge under the CGP occurring within the exterior boundaries of the Bad River Reservation must submit a copy of the Stormwater Pollution Prevention Plan (SWPPP) to the following address at the same time as submitting the NOI:⁷⁵

Bad River Tribe's Natural Resources Department
Attn: Water Resources Specialist
P.O. Box 39
Odanah, WI 54861

- m. Any corrective action reports that are required under the CGP must be submitted to the following address within one (1) working day of the report completion:⁷⁶

Bad River Tribe's Natural Resources Department
P.O. Box 39
Odanah, WI 54861

- n. An operator shall be responsible for meeting any additional permit requirements imposed by the U.S. EPA necessary to comply with the Tribe's antidegradation policies if the discharge point is located upstream of waters designated by the Tribe.⁷⁷

⁷³ 36 C.F.R. § 800.3(c)(4).

⁷⁴ 36 C.F.R. § 800.3(b).

⁷⁵ See footnote 61.

⁷⁶ See footnote 61.

⁷⁷ See footnote 61.

9.3.2.2 Lac du Flambeau Band of Lake Superior Tribe of Chippewa Indians: The following conditions apply only to discharges on the Lac du Flambeau Band of the Lake Superior Tribe of Chippewa Indians Reservation:

- a. A copy of the Stormwater Pollution Prevention Plan must be submitted to the following office, for the Tribal environmental review process, at least thirty (30) days in advance of sending the Notice of Intent (NOI) to EPA:

Lac du Flambeau
Tribal Land Management
P.O. Box 279
Lac du Flambeau, WI 54538

CGP applicants are encouraged to work with the LdF Water Resources Program in the identification of all proposed receiving waters.

- b. Copies of the NOI and the Notice of Termination (NOT) must be sent to the LdF Water Resources Program at the same time they are submitted to EPA.
- c. All work shall be carried out in such a manner as will prevent violations of water quality criteria as stated in the Water Quality Standards of the Lac du Flambeau Reservation. This includes, but is not limited to, the prevention of any discharge that cause a condition in which visible solids, bottom deposits, or turbidity impairs the usefulness of water of the Lac du Flambeau Reservation for any of the uses designated in the Water Quality Standards of the Lac du Flambeau Reservation.
- d. Appropriate steps shall be taken to ensure that petroleum products or other chemical pollutants are prevented from entering waters of the Lac du Flambeau Reservation. All spills must be reported to the appropriate emergency management agency, and measures shall be taken immediately to prevent the pollution of waters of the Lac du Flambeau reservation, including groundwater.
- e. This certification does not authorize impacts to cultural, historical, or archeological features or sites, or properties that may be eligible for such listing.
- f. Due to the significant ecological and cultural importance of the Lac du Flambeau Reservation, any operator requesting a permit for a point source discharge of pollutants (i.e., discharge) associated with the Stormwater Discharge will need a stormwater pollution prevention plan in place that does not violate Lac du Flambeau Water Quality Standards to protect Reservation Waters.

9.4 EPA Region 6

9.4.1 NMR100000 State of New Mexico, except Indian country

- a. If construction dewatering activities are anticipated at a site, permittees must complete the following steps:
 - i. Investigative information must be documented in the facility SWPPP.
 - ii. Refer to the GWQB Mapper at <https://gis.web.env.nm.gov/GWQB/> AND the PSTB Mapper (Go Mapper) at <https://gis.web.env.nm.gov/GoNM/>

and check if the following sources are located within the noted distance from your anticipated construct site groundwater dewatering activity:

Project Location Relative to a Source of Potential Groundwater Contamination	Constituents likely to be required for testing
<i>Within 0.5 mile of an open Leaking Underground Storage Tank (LUST) site</i>	<i>BTEX (Benzene, Toluene, Ethylbenzene, and Xylene) plus additional parameters depending on site conditions.*</i>
<i>Within 0.5 mile of an open Voluntary Remediation site</i>	<i>All parameters listed in Appendix A (or an alternate list approved by the NMED SWQB)**</i>
<i>Within 0.5 mile of an open RCRA Corrective Action Site</i>	
<i>Within 0.5 mile of an open Abatement Site</i>	
<i>Within 0.5 mile of an open Brownfield Site</i>	
<i>Within 1.0 mile or more of a Superfund site or National Priorities List (NPL) site with associated groundwater contamination.</i>	

**For further assistance determining whether dewatering may encounter impacted groundwater, the permittee may contact the NMED Ground Water Quality Bureau at: 505-827-2965.*

***EPA approved-sufficiently sensitive methods must be used - approved methods are listed in 40 CFR Part 136.3.*

- ii. Indicate on the NOI that dewatering activities are anticipated. Provide information on flow and potential to encounter impacted groundwater.
 - iii. Permittee must test the quality of the groundwater according to the chart above. Hardness and pH must also be measured.
 - iv. Permittee must send test result data to EPA Region 6 and the NMED Surface Water Quality Bureau. If the test data exceed standards, it cannot be discharged from the construction site into surface waters under this permit. Discharge to surface waters must be conducted under a separate NPDES individual permit to ensure proper treatment and disposal.
 - v. If disposal will be to the ground surface or in an unlined pond, the permittee must submit an NO/ to the NMED Ground Water Quality Bureau.
- b. Operators are not eligible to obtain authorization under this permit for all new and existing storm water discharges to outstanding national resource waters (ONRWs) (also referred to as "Tier 3" waters.)
- c. Operators who intend to obtain authorization under this permit for new and existing storm water discharges from construction sites must satisfy the following condition:
- i. The SWPPP must include site-specific interim and permanent stabilization, managerial, and structural solids, erosion and sediment control best management practices (BMPs) and/or other controls that are designed to prevent to the maximum extent practicable an increase in the sediment yield and flow velocity from pre-construction, pre-development conditions to assure that applicable standards in 20.6.4.NMAC, including the antidegradation policy, or TMDL waste load allocations (WLAs) are met. This requirement applies to discharges both during construction and after construction operations have been completed. The SWPPP must identify

and document the rationale for selecting these BMPs and/or other controls. The SWPPP must also describe design specifications, construction specifications, maintenance schedules (including a long term maintenance plan), criteria for inspections, and expected performance and longevity of these BMPs. For sites greater than 5 acres in size, BMP selection must be made based on the use of appropriate soil loss prediction models (i.e. SEDCAD, RUSLE, SEDIMOT, MULTISED, etc.) OR equivalent generally accepted (by professional erosion control specialists) soil loss prediction tools.

- ii. For all sites, the operator(s) must demonstrate, and include documentation in the SWPPP, that implementation of the site-specific practices will assure that the applicable standards or TMDL WLAs are met, and will result in sediment yields and flow velocities that, to the maximum extent practicable, will not be greater than the sediment yield levels and flow velocities from preconstruction, pre-development conditions.
 - iii. All SWPPPs must be prepared in accordance with good engineering practices by qualified (e.g. CPESC certified, engineers with appropriate training) erosion control specialists familiar with the use of soil loss prediction models and design of erosion and sediment control systems based on these models (or equivalent soil loss prediction tools). Qualifications of the preparer (e.g., professional certifications, description of appropriate training) must be documented in the SWPPP. The operator(s) must design, implement, and maintain BMPs in the manner specified in the SWPPP.
- d. Permittees can call 505-827-9329 for emergencies at any time and 505-476-6000 for non-emergencies during business hours from 5am-5pm, Monday through Friday.

9.4.2 NMR10I000 Indian country within the State of New Mexico, except Navajo Reservation Lands that are covered under Arizona permit AZR10I000 and Ute Mountain Reservation Lands that are covered under Colorado permit COR10I000.

9.4.2.1 Pueblo of Isleta. The following conditions apply only to discharges on the Pueblo of Isleta Reservation:

- a. CGP at 1.3 Prohibited discharges: Stormwater discharges associated with construction activity that EPA or the Pueblo of Isleta, prior to authorization under this permit, determines will cause, have the reasonable potential to cause, or may reasonably be expected to contribute to a violation or excursion of any applicable water quality standard, including the antidegradation policy, or the impairment of a designated use of receiving waters are not authorized by this permit.
- b. CGP at 1.4.1 How to Submit Your NOI: The operator shall provide a copy of the Notice of Intent ("NOI") to the Pueblo of Isleta at the same time it is submitted to the U.S. Environmental Protection Agency, for projects occurring within the exterior boundaries of the Pueblo of Isleta. The operator shall also notify the Pueblo of Isleta when it has submitted the Notice of Termination ("NOT"). The NOI and NOT shall be sent to the Pueblo of Isleta at the following address:

Water Quality Control Officer
Pueblo of Isleta
Environment Department
PO Box 1270

Isleta, NM 87022
(505) 869-9819
E-mail: POI36871@isletapueblo.com

Overnight/Express Mail Delivery
Pueblo of Isleta
Environment Department
6 Sagebrush St.
Albuquerque, NM 87105

- c. CGP at 1.5 Requirement to post a notice of your permit coverage: Amend to read: "You must post a sign or other notice of your permit coverage at a safe, publicly accessible location in close proximity to the construction site. The notice must be located so that it is visible from the public road or tribal road that is nearest to the active part of the construction site..."
- d. CGP at 7.2.6 Description of stormwater controls: The SWPPP will be considered to be incomplete if the operator has not coordinated requirements under this Part with the Pueblo of Isleta Environment Department.
- e. CGP I.12.6.1 at pg.1-6 of 8. The Pueblo of Isleta requests notification within 10 hours (rather than 24 hrs.) if health or the environment become endangered.
- f. CGP at I.12.2 Anticipated noncompliance: Amend to read: "You must give advance notice to EPA and the Pueblo of Isleta at the address indicated in 1.4.1(a) of any planned changes in the permitted facility or activity which may results in noncompliance with permit requirements."
- g. CGP at I.12.6.1: Any noncompliance for projects within the exterior boundaries of the Pueblo of Isleta which may endanger health or the environment shall be reported directly to the EPA Regional Office [(see contacts at <https://www2.epa.gov/national-pollutant-discharge-elimination-system-npdes/contact-us-stormwater#regional>)] and to the Pueblo of Isleta Water Quality Control Officer. Any information must be provided orally with n 12 hours of the time you become aware of the circumstances. Other requirements of this Part for a written submission apply. Electronic communication (E-mail) shall be provided as soon as practical. Verbal notice shall be provided to:

Water Quality Control Officer
Pueblo of Isleta
E-mail: POI36871@isletapueblo.com
(505) 869-9819
(505) 917-8346 mobile
(505) 869-3030 Police Dispatch

- h. CGP at 2.2 Erosion and sediment control requirements: Erosion and sediment controls shall be designed to retain sediment on-site.
- i. CGP at 2.2 Under Sediment control requirements, Standard Permit Condition Duty to Mitigate Volumes of sediment at or over (five) 5 cubic yards must be removed and placed for disposal within a tribally approved sediment Disposal Site, located on Pueblo of Isleta lands. CGP 2.2 at pg. 8.
- j. Under Minimize erosion, a permittee must secure permission from the Pueblo or affected Pueblo of Isleta land assignment owner if a dissipation device needs to

be placed up- or down- elevation of a given construction site. CGP 2.2.11 at pg. 11.

- k. CGP at 2.3.6 Emergency spill notification requirements: You must notify the Pueblo of Isleta Water Quality Control Officer and 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. Verbal and electronic notice shall be provided as specified in I.12.6.1
- l. CGP at C.3 Equivalent analysis waiver: Parties wishing to apply for an Equivalent Analysis Waiver (see Appendix D, Section C) must provide a copy of the waiver analysis to the Pueblo of Isleta Water Quality Control Officer at the address indicated in 1.4.1 (a).

9.4.2.2 Pueblo of Sandia. The following conditions apply only to discharges on the Pueblo of Sandia Reservation:

- a. Only those activities specifically authorized by the CGP are authorized by the Pueblo of Sandia's Water Quality certification. The Pueblo of Sandia's Water Quality Certification does not authorize impact to cultural properties, historical sites or properties that may be eligible as such.
- b. Copies of all Notices of Intent (NOI) submitted to the EPA must also be sent concurrently to the Pueblo of Sandia at the following address. Discharges are not authorized by this permit unless an accurate and complete NOI has been submitted to the Pueblo of Sandia, either by mail or electronically.

Regular U.S. Delivery Mail:

Pueblo of Sandia Environment Department
Attention: Scott Bulgrin, Water Quality Manager
481 Sandia Loop
Bernalillo, New Mexico 87004

Electronically:

sbulgrin@sandiapueblo.nsn.us

- c. Any correspondences between the applicant and EPA related to analytical data, written reports, corrective action, enforcement, monitoring, or an adverse incident written reports should likewise be routed to the Pueblo of Sandia at the above address.
- d. The Stormwater Pollution Prevention Plan (SWPPP) must be available to the Pueblo of Sandia Environment Department either electronically or hard copy upon request for review. The SWPPP must be made available at least fourteen (14) days before construction begins. The fourteen (14) day period will give Pueblo staff time to become familiar with the project site, prepare for construction site inspections, and determine compliance with the Pueblo of Sandia Water Quality Standards. Failure to provide a SWPPP to the Pueblo of Sandia may result in the delay or denial of the construction project.
- e. If requested by the Pueblo of Sandia Environment Department, the permittee must provide additional information necessary for a case-by-case eligibility determination to assure compliance with the Pueblo of Sandia Water Quality Standards and/or applicable Federal Standards not authorized by this certification.
- f. An "Authorization to Proceed Letter" with site specific mitigation requirements may

be sent out to the permittee when a review of the NOI and SWPPP, on a case- by- case basis is completed by the Pueblo of Sandia Environment Department. This approval will allow the application to proceed if all mitigation requirements are met.

- g. The Pueblo of Sandia will not allow Small construction Waivers (Appendix C) or the Rainfall Erosivity Waiver (Appendix C.1) to be granted for any small construction activities.
- h. Before submitting a Notice of Termination (NOT) to the EPA, permittees must clearly demonstrate to the Pueblo of Sandia Environment Department through a site visit or documentation that requirements for site stabilization have been met and any temporary erosion control structures have been removed. A short letter stating the NOT is acceptable and all requirements have been met will be sent to the permittee to add to the permittee's NOT submission to EPA.
- i. Copies of all NOT submitted to the EPA must also be sent concurrently to the Pueblo of Sandia through the mail or electronically.

Regular U.S. Delivery Mail:

Pueblo of Sandia Environment Department
Attention: Scott Bulgrin, Water Quality Manager
481 Sandia Loop
Bernalillo, New Mexico 87004

Electronically:

sbulgrin@sandiapueblo.nsn.us

- j. The Pueblo of Sandia may require the permittee to perform water quality monitoring for pH, turbidity, and total suspended solids (TSS) during the permit term if the discharge is to a surface water leading to the Rio Grande for the protection of public health and the environment.

9.4.2.3 Pueblo of Santa Ana. The following conditions apply only to discharges on the Pueblo of Santa Ana Reservation:

- a. The permittee shall provide a copy of the Notice of Intent (NOI) to the Pueblo of Santa Ana (the Pueblo), at the same time it is submitted to the U.S. Environmental Protection Agency (EPA), for projects with discharges onto the lands of the Pueblo as defined in the Pueblo's antidegradation policy within the Pueblo of Santa Ana Water Quality Standards.
- b. The permittee shall provide a final copy of the Stormwater Pollution Prevention Plan (SWPPP) to the Pueblo that is associated with any project identified in the NOI, at the same time that an NOI is submitted to the EPA. The SWPPP should include any projects with discharges onto the lands of the Pueblo as defined in

the antidegradation policy within the Pueblo of Santa Ana Water Quality Standards.

- c. The operator shall provide copies of inspections reports and of corrective action reports to the Pueblo at the address below for review, upon request.
- d. Upon completion of the project identified in the NOI, the permittee will submit a Notice of Termination (NOT) to the Pueblo.
- e. All required or requested permittee specific information identified above shall be submitted to the following address:

Pueblo of Santa Ana Department of Natural Resources,
Attention: Water Resources Division
2 Dove Road
Santa Ana Pueblo, NM 87004

- f. Discharges are not authorized by permittee unless an accurate and complete NOI and SWPPP have been submitted to the Pueblo. Failure to provide an accurate and complete NOI and SWPPP may result in a denial of the discharge permit or a delay in groundbreaking or construction.
- g. The permittee will not proceed with site work until authorized by the Pueblo. The Pueblo requires review of the complete and final SWPPP before authorization to proceed. The Pueblo will provide an "Authorization to Process" notice after review and approval of the SWPPP.
- h. The permittee could be required to perform water quality monitoring, sampling or analysis during the active permit dates for constituents determined by the Pueblo.
- i. Before submitting a NOT, permittees must certify to the Pueblo's Department of Natural Resources in writing that requirements for site stabilization have been met, and any temporary erosion control structures have been removed. Documentation of the Pueblo's review that such requirements have been reviewed and met will be provided for the permittee to add to the permittee's NOT submission to EPA. Copies of all NOT submitted to the EPA must also be sent to the Pueblo at the address provided above.

9.4.2.4 Pueblo of Santa Clara. The following conditions apply only to discharges on the Pueblo of Santa Clara Reservation:

- a. The operator must provide a copy of the Notice of Intent (NOI) and Notice of Termination (NOT) to the Santa Clara Pueblo Governor's Office at the same time it is provided to the US Environmental Protection Agency.
- b. A copy of the Storm water Pollution Prevention Plan shall be made available to the Pueblo of Santa Clara staff upon request.

9.4.2.5 Pueblo of Tesuque. The following conditions apply only to discharges on the Pueblo of Tesuque Reservation:

- a. Based on the Section 401 Certification provisions within the CWA, no discharges that will exceed or cause the exceedance of the Pueblo of Tesuque Water Quality Standards will be allowed within the boundaries of the Pueblo of Tesuque.
- b. The operator shall provide a copy of the Notice of Intent (NOI) to the Pueblo of Tesuque Governor's Office in care of the Department of Environmental and Natural Resources (DENR) at the same time it is submitted to the Environmental

Protection Agency, for projects occurring within the boundaries of Tesuque tribal lands. The operator shall also notify the Pueblo of Tesuque Governor's Office in care of the DENR when it submits the Notice of Termination (NOT), but not before the DENR post-construction inspection has been completed as described below. The NOI and NOT shall be sent to the following address:

Pueblo of Tesuque
Office of the Governor
Attn: DENR
20 TP828 Administration Bldg.
Santa Fe, NM 87506-5512

Alternatively, the operator may arrange with DENR to email the documents.

- c. The operator shall also provide a copy of the Stormwater Pollution Prevention Plan, copies of inspection reports, and copies of corrective action reports to the DENR.
- d. Construction requiring this permit will not commence until the above document submissions have been made and DENR provides the operator with notice to proceed. Operators will not demobilize until DENR personnel inspect the site for completion of stabilization. Once the inspection has taken place and all SWPPP-related work has been completed to the satisfaction of DENR, the operator will submit its NOT as described above and then demobilize.

9.4.2.6 Taos Pueblo. The following conditions apply only to discharges on the Taos Pueblo Reservation:

- a. The operator shall provide a copy of the Notice of Intent (NOI) to the Taos Pueblo Governor's Office, War Chief's Office and Environmental Office, at the same time it is submitted to the U.S. Environmental Protection Agency, for projects occurring within the exterior boundaries of Taos Pueblo. The operator shall also notify Taos Pueblo when it has submitted the Notice of Termination (NOT). The NOI and NOT shall be sent to the Taos Pueblo at the following addresses:

- i. Taos Pueblo Governor's Office
P.O. Box 1846
Taos NM 87571
- ii. Taos Pueblo War Chief's Office
P.O. Box 2596
Taos NM 87571
- iii. Environmental Office
Attn: Program Manger
P.O. Box 1846
Taos NM 87571

- b. Taos Pueblo requests that in the event Indian artifacts or human remains are inadvertently discovered on projects occurring near or on Taos Pueblo lands that consultation with the tribal Governor's Office occur at the earliest possible time.
- c. The operator shall provide a copy of the Stormwater Pollution Prevention Plan, copies of inspections reports, and copies of corrective action reports to staff in the Taos Pueblo Environmental Office for review and copy, upon request.

9.4.2.7 Ohkay Owingeh. The following conditions apply only to discharges on the Ohkay Owingeh Reservation:

- a. Prior to commencement of any construction activity on Ohkay Owingeh Lands requiring permit coverage under EPA's Construction General Permit, the operator(s) shall submit to Ohkay Owingeh Office of Environmental Affairs, a copy of the electronic "Notice of Intent," submitted to the Environmental Protection Agency, immediately following EPA's electronic notification that the NOI has been received. A copy of the Stormwater Pollution Prevention Plan(s) must be made available to the Ohkay Owingeh Office of Environmental Affairs upon the tribe's request either electronically or hard copy. Operator(s) shall also submit to Ohkay Owingeh Office of Environmental Affairs a copy of the electronic Notice of Termination (NOT) submitted to the Environmental Protection Agency. Documents shall be submitted to Ohkay Owingeh at the following address:

Ohkay Owingeh Office of Environment Affairs
Attention: Environmental Programs Manager
P.O. Box 717
Ohkay Owingeh, New Mexico 87566
Office # 505.852.4212
Fax # 505.852.1432
Electronic mail: naomi.archuleta@ohkay.org

- b. Ohkay Owingeh will not allow the Rainfall Erosivity Waivers (see Appendix C) to be granted for any small construction activities.
- c. All vegetation used to prevent soil loss, seeding or planting of the disturbed area(s) to meet the vegetative stabilization requirements must utilize native seeds/vegetation commonly known to the area. All temporary erosion control structures, such as silt fences must be removed as soon as stabilization requirements are met.

9.4.2.8 Pueblo of Laguna. The following conditions apply only to discharges on the Pueblo of Laguna Reservation:

- a. The operator must provide a paper and electronic copy of the Notice of Intent (NOI) and Notice of Termination (NOT) to the Pueblo of Laguna at the same time it is provided to the U.S. Environmental Protection Agency. The NOI and NOT should be provided to the following address:

Pueblo of Laguna, Office of the Governor
Attn: Environmental & Natural Resources Department
P.O. Box 194
Laguna, NM 87026
Email: setter@pol-nsn.gov

- b. The operator must provide an electronic copy of the Storm Water Pollution

Prevention Plan to the Pueblo of Laguna Environmental Program at the same time the NOI is submitted to the above listed email addresses. Any correspondences between the applicant and EPA related to analytical data, written reports, corrective action, enforcement, monitoring, or an adverse incident written reports threshold likewise be routed to the Pueblo of Laguna Environmental Program.

- c. Immediate initiation of consultation with the Pueblo of Laguna is required should any human remains or artifacts be unearthed during the project that fall under the Native American Graves Protection and Repatriation Act guidelines. If human remains are unearthed, contact the Pueblo of Laguna Police Department at 505.552.6666. If artifacts are unearthed, contact the Pueblo of Laguna Tribal Historic Preservation Office at 505.552.5033.

9.4.2.9 Picuris Pueblo. The following conditions apply only to discharges on the Picuris Pueblo Reservation:

- a. The operator, landowner and construction operators doing earth-disturbance work must meet the definition of "operator" under the Construction General Permit (CGP), and must provide an electronic and paper copy of the Notice of Intent (NOI) and Notice of Termination (NOT) to **both** The Office of the Picuris Pueblo Governor and the Picuris Pueblo Environmental Department at the same time it is provided to the U.S. Environmental Protection Agency (USEPA). The NOI and NOT should be provided to the following address:

Picuris Pueblo
The Office of the Governor
PO BOX 127
Penasco, NM 87553
575-587-2519
575-587-1071 (Fax)
Governor: governor@picurispueblo.org

Picuris Pueblo Environmental Department
PO BOX 158
Penasco, NM 87553
575-587-0110
575-587-0223 (Fax)
Environmental Director: environment@picurispueblo.org

- b. The operator must provide an electronic copy of the Storm Water Pollution Prevention Plan to the Picuris Pueblo Environmental Department at least 30 days prior to submitting the NOI to USEPA and the Picuris Pueblo by email to Picuris Pueblo Environmental Department: environment@picurispueblo.org.

9.4.2.10 Pueblo of Pojoaque. The following conditions apply only to discharges on the Pueblo of Pojoaque Reservation:

- a. The operator, landowner and construction operators doing earth-disturbance work must meet the definition of "operator" under the CGP and must provide a copy of the Notice of Intent (NOI) to the Pueblo of Pojoaque Governor's Office and Environmental Department within 3 days following U.S. Environmental Protection Agency's electronic confirmation that the NOI was certified and submitted and is undergoing its 14-day review period. Additionally, a copy of the Notice of Termination (NOT) must be provided the same day electronic confirmation is

received from the U.S. Environmental Protection Agency that the NOT has been accepted. The NOI and NOT should be provided to the following address:

Pueblo of Pojoaque
Office of the Governor
78 Cities of Gold Road
Santa Fe, NM 87506

Pueblo of Pojoaque
Environmental Department
39 Camino Del Rincon
Santa Fe, NM 87506

- b. The operator must provide an electronic copy of the Stormwater Pollution Prevention Plans to the Pueblo of Pojoaque Environmental Department by email to Adam L Duran (aduran@pojoaque.org) at least 30 days prior to submitting the NOI to EPA and the Pueblo of Pojoaque.

9.4.2.11 Nambe Pueblo. The following conditions apply only to discharges on Nambe Pueblo:

- a. The operator must provide a copy of the Notice of Intent (NOI) and Notice of Termination (NOT) to the Nambe Pueblo Governor's Office at the same time it is provided to the US Environmental Protection Agency. The NOI and NOT should be provided to the following address:

Office of the Governor
Nambe Pueblo
15A NP102 WEST
Nambe Pueblo, NM 87506

- b. The operator must provide a copy of the Stormwater Pollution Prevention Plan to Nambe Pueblo at the same time it is submitted to the EPA, either by email to srydeen@nambepueblo.org or mailed to the above address.

9.4.3 OKR10I000 Indian country within the State of Oklahoma

9.4.3.1 Pawnee Nation. The following conditions apply only to discharges within Pawnee Indian country:

- a. Copies of the Notice of Intent (NOI) and Notice of Termination (NOT) must be provided to the Pawnee Nation at the same time it is submitted to the Environmental Protection Agency to the following address:

Pawnee Nation Department of Environmental Conservation and Safety
P.O. Box 470
Pawnee, OK 74058
Or email to mmatlock@pawneenation.org

- b. The Storm Water Pollution Prevention Plan must be available to Departmental inspectors upon request.
- c. The Department must be notified at 918-762-3655 immediately upon discovery of any noncompliance with any provision of the permit conditions.

9.4.4 OKR10F000 Discharges in the State of Oklahoma that are not under the authority of the Oklahoma Department of Environmental Quality, including activities associated with oil and gas exploration, drilling, operations, and pipelines (includes SIC Groups 13 and 46, and SIC codes 492 and 5171), and point source discharges associated with agricultural production, services, and silviculture (includes SIC Groups 01, 02, 07, 08, 09).

- a. For activities located within the watershed of any Oklahoma Scenic River, including the Illinois River, Flint Creek, Barren Fork Creek, Upper Mountain Fork, Little Lee Creek, and Lee Creek or any water or watershed designated "ORW" in Oklahoma's Water Quality Standards, this permit may only be used to authorize discharges from temporary construction activities. Certification is denied for any on-going activities such as sand and gravel mining or any other mineral mining.
- b. For activities located within the watershed of any Oklahoma Scenic River, including the Illinois River, Flint Creek, Barren Fork Creek, Upper Mountain Fork, Little Lee Creek, and Lee Creek or any water or watershed designated "ORW" in Oklahoma's Water Quality Standards, certification is denied for any discharges originating from support activities, including concrete or asphalt batch plants, equipment staging yards, material storage areas, excavated material disposal areas, or borrow areas.
- c. In order to comply with Oklahoma's Water Quality Standards, these conditions and restrictions also apply to any construction projects located wholly or partially on Indian Country lands within the State of Oklahoma.

9.5 EPA Region 8

9.5.1 COR10I000 Indian country within the State of Colorado, as well as the portion of the Ute Mountain Reservation located in New Mexico.

9.5.1.1 The Ute Mountain Ute Tribe. The following conditions apply only to discharges on the Ute Mountain Ute Reservation.

- a. Permittees must send the Stormwater Pollution Prevention Plan (SWPPP) to the Tribal Environmental Department for review and approval at least 30 days before construction starts.
- b. Before submitting the Notice of Termination (NOT), permittees must clearly demonstrate to the Tribal Environmental Department during an on-site inspection that requirements for site stabilization have been met.
- c. The permittee must send a copy of the Notice of Intent (NOI) and the Tribal Environmental Department.
- d. Permittees may submit their SWPPPs and NOI and NOT requests electronically to: clarrick@utemountain.org.
- e. Written NOIs, SWPPPs, and NOTs may be mailed to:

Colin Larrick, Water Quality Program Manager
Ute Mountain Ute Tribe
Environmental Department
P.O. Box 448
Towaoc, CO 81334

9.5.2 MTR10I000 Indian country within the State of Montana

9.5.2.1 The Confederated Salish and Kootenai Tribes of the Flathead Nation. The following conditions apply only to discharges on the Confederated Salish and Kootenai Tribes of the Flathead Nation Reservation:

- a. Permittees must submit the Stormwater Pollution Prevention Plan (SWPPP) to the Confederated Salish and Kootenai Tribes at least 30 days before construction starts.
- b. Before submitting the Notice of Termination (NOT), permittees must clearly demonstrate to an appointed Tribal staff person during an onsite inspection that requirements for site stabilization have been met.
- c. The permittee must send a copy of the Notice of Intent (NOI) and the NOT to CSKT.
- d. Permittees may submit their SWPPPs, NOIs and NOTs electronically to: clintf@cskt.org.
- e. Written SWPPPs, NOIs and NOTs may be mailed to:

Clint Folden, Water Quality Regulatory Specialist
Confederated Salish and Kootenai Tribes
Natural Resources Department
P.O. Box 278
Pablo, MT 59855

9.6 EPA Region 9

9.6.1 AZR10I000 Indian Country within the state of Arizona, as well as Navajo Nation lands in New Mexico and Utah

9.6.1.1 Navajo Nation. The following conditions apply only to discharges on the Navajo Nation reservation:

- a. Courtesy copies of Notice of Intents and stormwater pollution prevention plans shall be made available to Navajo EPA.
- b. Copies of all monitoring reports must be provided to Navajo EPA.
- c. Facilities covered under the CGP will be subject to compliance inspections by Navajo EPA staff with active Federal Inspector Credentials under the authority of the Clean Water Act.
- d. Specific awareness and adherence to Sections 201 – Anti-degradation Policy, 203 – Narrative WQS, and 207.H - Turbidity.

9.6.2 CAR10I000 Indian country within the State of California

9.6.2.1 Twenty-Nine Palms Band of Mission Indians. The following conditions apply only to discharges on the Twenty-Nine Palms Band of Mission Indians Reservation:

- a. At the time the applicant submits its Notice of Intent (NOI) to the EPA, the applicant must concurrently submit written notification of the NOI and a copy of the Stormwater Pollution Prevention Plan (SWPPP) to the Twenty-Nine Palms Band of Mission Indians at the address below:

Tribal Environmental Coordinator
Twenty-Nine Palms Band of Mission Indians
46-200 Harrison Place

Coachella, CA 92236

- b. The applicant must also concurrently submit to the Tribal Environmental Coordinator written notification of any other forms or information submitted to the EPA, including waivers, reporting, and Notice of Termination (NOT).
- c. Permitted entities under the CGP must keep the Tribal EPA informed of authorized discharges under the CGP by submitting written information about the type, quantity, frequency and location, intended purpose, and potential human health and/or environmental effects of their activities. These requirements are pursuant to Section 4 of the Twenty-Nine Palms Band of Mission Indians Water Pollution Control Ordinance (022405A). This information may be submitted to Tribal EPA in the form of Stormwater Pollution Prevention Plans (SWPPPs), monitoring reports, or other reports as required under the CGP. Spills, leaks, or unpermitted discharges must be reported in writing to Tribal EPA within 24 hours of the incident.

9.6.2.2 Morongo Band of Mission Indians. The following conditions apply only to discharges on the Morongo Band of Mission Indians Reservation:

- a. This certification does not exempt, and is provisional upon compliance with, other applicable statutes and codes administered by federal and tribal agencies. Pursuant to the Morongo Band of Mission Indians Surface Water Quality Protection Ordinance (Ordinance 39), all unpermitted discharges must be reported to the Morongo Band of Mission Indians Environmental Protection Department (Morongo EPD) within 24 hours of the incident.
- b. Each operator shall submit a signed hard copy of the Notice of Intent (NOI) and stormwater pollution prevention plan (SWPPP) to the Morongo EPD at the same time it is submitted electronically to the EPA.
- c. The operator shall allow the Morongo EPD or its designee to inspect and sample at the construction site as needed.

Correspondence should be submitted to:

Morongo Band of Mission Indians
Environmental Protection Department
12700 Pumarra Road
Banning, CA 92220
Phone: (951) 755-5128
Email: epd@morongo-nsn.gov

9.6.3 GUR100000 Island of Guam. The following conditions apply only to discharges on the Island of Guam:

- a. Any earth-moving operations which require a permit must be obtained from the Department of Public Works (DPW) with clearance approval from various Government of Guam Agencies including Guam EPA prior to the start of any earth-moving activity.
- b. In the event that the construction sites are within the Guam Sole Source Aquifer, the construction site owner and operator must consider opportunities to facilitate groundwater recharge for construction and post-construction implementing infiltration Best Management Practices. Stormwater disposal systems shall be designed and operated within the boundaries of the project. Stormwater systems shall not be permitted within any Wellhead Protection Zone unless the discharge meets the Guam Water Quality Standards within the zone. Waters discharged

within the identified category G-2 recharge zone shall receive treatment to the degree required to protect the drinking water quality prior to it entering the category G-1 resource zone.

- c. All conditions and requirements set forth in the 22 Guam Administrative Rules and Regulations (GARR), Division II, Water Control, Chapter 10, Guam Soil Erosion and Sediment Control Regulations (GSESCR) that are more protective than the CGP regarding construction activities must be complied with.
- d. All standards and requirements set forth in the 22 GARR, Division II, Water Control, Chapter 5, *Guam Water Quality Standards (GWQS) 2001 Revisions*, must be complied with to include reporting GWQS exceedance to Guam EPA.
- e. All operators/owners of any property development or earth moving activities shall comply with the erosion control pre-construction and post-construction BMP design performance standards and criteria set forth in the 2006 CNMI and Guam Stormwater Management Manual.
- f. All conditions and requirements regarding dewatering activities set forth in 22 Guam Administrative Rules and Regulations Chapter 7, Water Resources Development and Operating Regulations must be complied with to include securing permits with Guam EPA prior to the start of any dewatering activities.
- g. If a project to be developed is covered under the Federal Stormwater Regulations (40 CFR Parts 122 & 123), a Notice of Intent (NOI) to discharge stormwater to the surface and marine waters of Guam must be submitted to the U.S. EPA and a copy furnished to Guam EPA, pursuant to Section 10, 104(B)(5)(d) 22GAR, Division II, Chapter 10.
- h. Guam EPA shall apply the Buffer Requirements listed in Appendix G of the CGP NPDES Permit for construction activities as it pertains to Waters of the U.S. in Guam. Guam EPA shall also apply the same buffer requirements for sinkholes in Guam.
- i. When Guam EPA, through its permit review process, identifies that the proposed construction activity is close proximity to marine waters, contractors and owners will be informed that any activity that may impair water quality are required to stop during peak coral spawning periods as per the Guam Coral Spawning Construction Moratoriums.
- j. The Proposed Construction General Permit must set appropriate measures and conditions to protect Guam's Threatened and Endangered Species and Outstanding Resource Waters of exceptional recreational or ecological significance as determined by the Guam EPA Administrator as per *Guam Water Quality Standards 2001 Revisions*, §5102, Categories of Waters, D. Outstanding Resource Waters.
- k. When Guam EPA through its permit review process identifies that proposed construction activity is in close proximity to any Section 303d impaired waters, which includes marine waters and surface waters, shall ensure that construction activity does not increase the impaired water's ambient parameters.
- l. When Rainfall Erosivity and TMDL Waivers reflected in the CGP, Appendix C, are submitted to the U.S. EPA, Guam EPA will review waivers on a project by project basis.
- m. Prior to submission of the Notice of Termination (NOT) to the U.S. EPA, permittees must clearly demonstrate to Guam EPA that the project site has met all soil

stabilization requirements and removal of any temporary erosion control as outlined in the GSESCR.

9.7 EPA Region 10

9.7.1 IDR100000 State of Idaho, except Indian country

a. Idaho's Antidegradation Policy. The WQS contain an antidegradation policy providing three levels of protection to water bodies in Idaho (IDAPA 58.01.02.051).

1. Tier I Protection. The first level of protection applies to all water bodies subject to Clean Water Act jurisdiction and ensures that existing uses of a water body and the level of water quality necessary to protect those existing uses will be maintained and protected (IDAPA 58.01.02.051.01; 58.01.02.052.01). Additionally, a Tier 1 review is performed for all new or reissued permits or licenses (IDAPA 58.01.02.052.05).
2. Tier II Protection. The second level of protection applies to those water bodies considered high quality and ensures that no lowering of water quality will be allowed unless deemed necessary to accommodate important economic or social development (IDAPA 58.01.02.051.02; 58.01.02.052.08).
3. Tier III Protection. The third level of protection applies to water bodies that have been designated outstanding resource waters and requires that activities not cause a lowering of water quality (IDAPA 58.01.02.051.03; 58.01.02.052.09).

DEQ is employing a water body by water body approach to implementing Idaho's antidegradation policy. This approach means that any water body fully supporting its beneficial uses will be considered high quality (IDAPA 58.01.02.052.05.a). Any water body not fully supporting its beneficial uses will be provided Tier I protection for that use, unless specific circumstances warranting Tier II protection are met (IDAPA 58.01.02.052.05.c). The most recent federally approved Integrated Report and supporting data are used to determine support status and the tier of protection (IDAPA 58.01.02.052.05).

b. Pollutants of Concern. The primary pollutants of concern associated with stormwater discharges from construction activities are sediment, typically measured as total suspended solids and turbidity. Other potential pollutants include the following: phosphorus, nitrogen, pesticides, organics, metals, PCBs, petroleum products, construction chemicals, and solid wastes.

c. Receiving Water Body Level of Protection. The CGP provides coverage to construction activities throughout the entire State of Idaho. Because of the statewide applicability, all of the jurisdictional waters within Idaho could potentially receive discharges either directly or indirectly from activities covered under the CGP. DEQ applies a water body by water body approach to determine the level of antidegradation a water body will receive.

All waters in Idaho that receive discharges from activities authorized under the CGP will receive, at minimum Tier I antidegradation protection because Idaho's antidegradation policy applies to all waters of the state. Water bodies that fully support their aquatic life or recreational uses are considered to be *high quality waters* and will receive Tier II antidegradation protection.

Although Idaho does not currently have any Tier III designated outstanding resource waters (ORWs) designated, it is possible for a water body to be designated as an ORW during the life of the CGP. Because of this potential, the antidegradation review also assesses whether the permit complies with the

outstanding resource water requirements of Idaho's antidegradation policy.

To determine the support status of the receiving water body, persons filing a Notice of Intent (NOI) for coverage under this general permit must use the most recent EPA-approved Integrated Report, available on Idaho DEQ's website:

<http://www.deq.idaho.gov/water-quality/surface-water/monitoring-assessment/integrated-report/>.

High quality waters are identified in Categories 1 and 2 of the Integrated Report. If a water body is in either Category 1 or 2, it is a Tier II water body.

Unassessed waters are identified as Category 3 of DEQ's Integrated Report. These waters require a case-by-case determination to be made by DEQ based on available information at the time of the application for permit coverage. If a water body is unassessed, the applicant is directed to contact DEQ for assistance in filing the NOI.

Impaired waters are identified in Categories 4 and 5 of the Integrated Report. Category 4(a) contains impaired waters for which a TMDL has been approved by EPA. Category 4(b) contains impaired waters for which controls other than a TMDL have been approved by EPA. Category 5 contains waters which have been identified as "impaired," for which a TMDL is needed. These waters are Tier I waters, for the use which is impaired. With the exception, if the aquatic life uses are impaired for any of these three pollutants—dissolved oxygen, pH, or temperature—and the biological or aquatic habitat parameters show a health, balanced biological community, then the water body shall receive Tier II protection, in addition to Tier I protection, for aquatic life uses (IDAPA 58.01.02.052.05.c.i.).

DEQ's webpage also has a link to the state's map-based Integrated Report which presents information from the Integrated Report in a searchable, map-based format: <http://www.deq.idaho.gov/assistance-resources/maps-data/>.

Water bodies can be in multiple categories for different causes. If assistance is needed in using these tools, or if additional information/clarification regarding the support status of the receiving water body is desired, the operator is directed to make contact with the appropriate DEQ regional office of the State office in the table below:

Regional and State Office	Address	Phone Number	Email
Boise	1445 N. Orchard Rd., Boise 83706	208-373-0550	Kati.carberry@deq.idaho.gov
Coeur d'Alene	2110 Ironwood Parkway, Coeur D'Alene 83814	208-769-1422	June.bergquist@deq.idaho.gov
Idaho Falls	900 N. Skyline, Suite B., Idaho Falls 83402	208-528-2650	Troy.saffle@deq.idaho.gov

Lewiston	1118 "F" St., Lewiston 83501	208-799- 4370	Mark.sellet@deq.idaho.gov
Pocatello	444 Hospital way, #300 Pocatello 83201	208-236- 6160	Lynn.vanevery@deq.idaho.gov
Twin Falls	650 Addison Ave., W., Suite 110, Twin Falls 83301	208-736- 2190	Balthasar.buhidar@deq.idaho.gov
State Office	1410 N. Hilton Rd., Boise 83706	208-373- 0502	Nicole.deinarowicz@deq.idaho.gov

- d. *Turbidity Monitoring*. The permittee must conduct turbidity monitoring during construction activities and thereafter on days where there is a direct discharge of pollutants from an unstabilized portion of the site which is causing a visible plume to a water of the U.S.

A properly and regularly calibrated turbidimeter is required for measurements analyzed in the field (preferred method), but grab samples may be collected and taken to a laboratory for analysis. If the permittee can demonstrate that there will be no direct discharge from the construction site, then turbidity monitoring is not required. When monitoring is required, a sample must be taken at an undisturbed area immediately upstream of the project area to establish background turbidity levels for the monitoring event. Background turbidity, location, date and time must be recorded prior to monitoring downstream of the project area. A sample must also be taken immediately downstream from any point of discharge and *within* any visible plume. The turbidity, location, date and time must be recorded. The downstream sample must be taken immediately following the upstream sample in order to obtain meaningful and representative results.

Results from the compliance point sampling or observation⁷⁸ must be compared to the background levels to determine whether project activities are causing an exceedance of state WQS. If the downstream turbidity is 50 NTUs or more than the upstream turbidity, then the project is causing an exceedance of WQS. *Any exceedance of the turbidity standard must be reporting to the appropriate DEQ regional office within 24 hours. The following six (6) steps should be followed to ensure compliance with the turbidity standard:*

1. If a visible plume is observed, quantify the plume by collecting turbidity measurements from within the plume and compare the results to Idaho's instantaneous numeric turbidity criterion (50 NTU over the background).

⁷⁸ A visual observation is only acceptable to determine whether BMPs are functioning properly. If a plume is observed, the project may be causing an exceedance of WQS and the permittee must collect turbidity data and inspect the condition of the projects BMPs. If the BMPs appear to be functioning to their fullest capability and the turbidity is 50 NTUs or more than the upstream turbidity, then the permittee must modify the activity or implement additional BMPs (this may also include modifying existing BMPs).

2. If turbidity is less than 50 NTU instantaneously over the background turbidity; continue monitoring as long as the plume is visible. If turbidity exceeds background turbidity by more than 50 NTU instantaneously then stop all earth disturbing construction activities and proceed to step 3.
3. Take immediate action to address the cause of the exceedance. That may include inspection the condition of project BMPs. If the BMPs are functioning to their fullest capability, then the permittee must modify project activities and/or BMPs to correct the exceedance.
4. Notify the appropriate DEQ regional office within 24 hours.
5. Possibly increase monitoring frequency until state water quality standards are met.
6. Continue earth disturbing construction activities once turbidity readings return to within 50 NTU instantaneously and 25 NTU for more than ten consecutive days over the background turbidity.

Copies of daily logs for turbidity monitoring must be available to DEQ upon request. The report must describe all exceedances and subsequent actions taken, including the effectiveness of the action.

- e. Reporting of Discharges Containing Hazardous Materials or Petroleum Products. All spills of hazardous material, deleterious material or petroleum products which may impact waters (ground and surface) of the state shall be immediately reported. Call 911 if immediate assistance is required to control, contain or clean up the spill. If no assistance is needed in cleaning up the spill, contact the appropriate DEQ regional office in the table below during normal working hours or Idaho State Communications Center after normal working hours. If the spilled volume is above federal reportable quantities, contact the National Repose Center.

For immediate assistance: Call 911

National Response Center: (800) 424-8802

Idaho State Communications Center: (208) 632-8000

Regional office	Toll Free Phone Number	Phone Number
Boise	888-800-3480	208-373-0321
Coeur d'Alene	877-370-0017	208-769-1422
Idaho Falls	800-232-4635	208-528-2650
Lewiston	977-547-3304	208-799-4370
Pocatello	888-655-6160	208-236-6160
Twin Falls	800-270-1663	208-736-2190

9.7.2 IDR10I000 Indian country within the State of Idaho, except Duck Valley Reservation lands (see Region 9)

9.7.2.1 Shoshone-Bannock Tribes. The following conditions apply only to discharges on the Shoshone-Bannock Reservation:

- f. Each operator shall submit a signed hard copy of the Notice of Intent (NOI) to the Shoshone-Bannock Tribes Water Resources Department at the same time it is

submitted electronically to the Environmental Protection Agency (EPA) and shall provide the Shoshone-Bannock Tribes Water Resources Department the acknowledgement of receipt of the NOI from the EPA within 7 calendar days of receipt from the EPA.

9.7.3 WAR10F000 Areas in the State of Washington, except those located on Indian country, subject to construction activity by a Federal Operator. The following conditions apply only to discharges on federal facilities in the State of Washington:

- a. Discharges shall not cause or contribute to a violation of surface water quality standards (Chapter 173-201A WAC), groundwater quality standards (Chapter 173-200 WAC), sediment management standards (Chapter 173-204 WAC), and human health-based criteria in the National Toxics Rule (40 CFR Part 131.36). Discharges that are not in compliance with these standards are not authorized.
- b. Prior to the discharge of stormwater and non-storm water to waters of the State, the Permittee must apply all known, available, and reasonable methods of prevention, control, and treatment (AKART). This includes the preparation and implementation of an adequate SWPPP, with all appropriate BMPs installed and maintained in accordance with the SWPPP and the terms and conditions of this permit.
- c. Permittees who discharge to segments of waterbodies listed as impaired by the State of Washington under Section 303(d) of the Clean Water Act for turbidity, fine sediment, phosphorus, or pH must comply with the following numeric effluent limits:

Parameter Identified in 303(d) Listing	Parameter Sampled	Unit	Analytical Method	Numeric Effluent Limit
<ul style="list-style-type: none"> • Turbidity • Fine Sediment • Phosphorus 	Turbidity	NTU	SM2130 or EPA 180.1	25 NTUs at the point where the stormwater is discharged from the site.
High pH	pH	Su	pH meter	In the range of 6.5 – 8.5

- d. All references and requirements associated with Section 303(d) of the Clean Water Act mean the most current EPA approved listing of impaired waters that exists on February 16, 2017, or the date when the operator's complete permit application is received by EPA, whichever is later.
- e. Discharges to waterbodies subject to an applicable Total Maximum Daily Load (TMDL) for turbidity, fine sediment, high pH, or phosphorus, shall be consistent with the assumptions and requirements of the TMDL.
 - i. Where an applicable TMDL sets specific waste load allocations or requirements for discharges covered by this permit, discharges shall be consistent with any specific waste load allocations or requirements established by the applicable TMDL.
 - ii. Where an applicable TMDL has established a general waste load allocation for construction stormwater discharges, but no specific requirements have been identified, compliance with this permit will be assumed to be consistent with the approved TMDL.

- iii. Where an applicable TMDL has not specified a waste load allocation for construction stormwater discharges, but has not excluded these discharges, compliance with this permit will be assumed to be consistent with the approved TMDL.
- iv. Where an applicable TMDL specifically precludes or prohibits discharges from construction activity, the operator is not eligible for coverage under this permit.
- v. Applicable TMDL means a TMDL for turbidity, fine sediment, high pH, or phosphorus, which has been completed and approved by EPA prior to February 16, 2017, or prior to the date the operator's complete NOI is received by EPA, whichever is later.

9.7.4 WAR10I000 Indian country within the State of Washington

9.7.4.1 Confederated Tribes of the Colville Reservation. The following conditions apply only to discharges on the Colville Indian Reservation (CIR) and on other Tribal trust lands or allotments of the Confederated Tribes of the Colville Reservation:

- a. A copy of the Stormwater Pollution Prevention Plan must be submitted to the following office at least thirty (30) days in advance of sending the Notice of Intent (NOI) to EPA:

Environmental Trust Department
Confederated Tribes of the Colville Reservation
PO Box 150
Nesepalem, WA 99155

- b. Copies of the Notice of Intent (NOI) and Notice of Termination (NOT) must be sent to the ETD at the same time they are submitted to EPA.
- c. Discharges to Omak Creek, the Okanogan River, and Columbia River downstream of Chief Joseph Dam may affect threatened or endangered species, and shall only be permitted in adherence with Appendix D of the CGP.
- d. All work shall be carried out in such a manner as will prevent violations of water quality criteria as stated in Chapter 4-8 Water Quality Standards of the Colville Law and Order Code, as amended.
- e. Appropriate steps shall be taken to ensure that petroleum products or other chemical pollutants are prevented from entering waters of the CIR. All spills must be reported to the appropriate emergency management agency and the ETD, and measures shall be taken immediately to prevent the pollution of waters of the CIR, including groundwater.
- f. Stormwater site inspections shall be conducted at least once every 7 calendar days, within 24-hours of the occurrence of a rain event of 0.25 inches or greater in a 24-hour period, and daily during periods of saturated ground surface or snowmelt with accompanying surface runoff.
- g. Results of discharge sampling must be reported to the ETD within 7 days of sample collection. All sample reporting must include the date and time, location, and individual performing the sampling.
- h. Any corrective action reports that are required under the CGP must be submitted to the ETD at the above address within one (1) working day of the report completion.

- i. This certification does not authorize impacts to cultural, historical, or archeological features or sites, or properties that may be eligible for such listing.

9.7.4.2 Lummi Nation. The following conditions apply only to discharges on the Lummi Reservation:

- a. The Lummi Nation reserves the right to modify this 401 certification if the final version of the NPDES General Permit for Storm Water Discharges Associated with Construction Activity (CGP) on tribal lands in the State of Washington (Permit No. WAR10I000) is substantively different than the draft version of the proposed permit that was made available for public comments during April 2016. The Lummi Nation will determine if the final version of the NPDES CGP is substantively different than the draft version following review of the final version once the EPA makes it available.
- b. This certification does not exempt and is provisional upon compliance with other applicable statutes and codes administered by federal and Lummi tribal agencies. Pursuant to Lummi Code of Laws (LCL) 17.05.020(a), the operator must also obtain a land use permit from the Lummi Planning Department as provided in Title 15 of the Lummi Code of Laws and regulations adopted thereunder.
- c. Pursuant to LCL 17.05.020(a), each operator shall develop and submit a Storm Water Pollution Prevention Plan to the Lummi Water Resources Division for review and approval by the Water Resources Manager prior to beginning any discharge activities.
- d. Pursuant to LCL Title 17, each operator shall be responsible for achieving compliance with the Water Quality Standards for Surface Waters of the Lummi Indian Reservation (Lummi Administrative Regulations [LAR] 17 LAR 07.010 through 17 LAR 07.210 together with supplements and amendments thereto).
- e. Each operator shall submit a signed hard copy of the Notice of Intent (NOI) to the Lummi Water Resources Division at the same time it is submitted electronically to the Environmental Protection Agency (EPA) and shall provide the Lummi Water Resources Division the acknowledgement of receipt of the NOI from the EPA and the associated NPDES tracking number provided by the EPA within 7 calendar days of receipt from the EPA.
- f. Each operator shall submit a signed hard copy of the Notice of Termination (NOT) to the Lummi Water Resources Division at the same time it is submitted electronically to the EPA and shall provide the Lummi Water Resources Division the EPA acknowledgement of receipt of the NOT.
- g. Storm Water Pollution Prevention Plans, Notice of Intent, Notice of Termination and associated correspondence with the EPA shall be submitted to:

Lummi Natural Resources Department
ATTN: Water Resources Manager
2665 Kwina Road
Bellingham, WA 98226-9298

9.7.4.3 Makah Tribe. The following conditions apply only to discharges on the Makah Reservation:

- a. The operator shall be responsible for achieving compliance with the Makah Tribe's Water Quality Standards.

- b. The operator shall submit a Storm Water Pollution Prevention Plan to the Makah Tribe Water Quality Program and Makah Fisheries Habitat Division for review and approval at least thirty (30) days prior to beginning any discharge activities.
- c. The operator shall submit a copy of the Notice of Intent to the Makah Tribe Water Quality Program and Makah Fisheries Habitat Division at the same time it is submitted to EPA.
- d. Storm Water Pollution Prevention Plans and Notices of Intent shall be submitted to:

Aaron Parker
Makah Fisheries Management Water Quality Specialist
(360) 645-3162
Cell 206-356-0319
Aaron.parker@makah.com
PO Box 115
Neah Bay WA 98357

9.7.4.4 Puyallup Tribe of Indians. The following conditions apply only to discharges on the Puyallup Tribe of Indians Reservation:

- a. Each permittee shall be responsible for achieving compliance with the Puyallup Tribe's Water Quality Standards, including antidegradation provisions. The Puyallup Natural Resources Department will conduct an antidegradation review for permitted activities that have the potential to lower water quality. The antidegradation review will be consistent with the Tribe's Antidegradation Implementation Procedures. The Tribe may also impose additional controls on a site-specific basis, or request EPA to require the operator obtain coverage under an individual permit, if information in the NOI or from other sources indicates that the operator's discharges are not controlled as necessary to meet applicable water quality standards.
- b. The permittee shall be responsible for meeting any additional permit requirements imposed by EPA necessary to comply with the Puyallup Tribe's antidegradation policies if the discharge point is located within 1 linear mile upstream of waters designated by the Tribe.
- c. Each permittee shall submit a copy of the Notice of Intent (NOI) to be covered by the general permit to Char Naylor (char.naylor@puyalluptribe.com) and Russ Ladley (russ.ladley@puyalluptribe.com) by email or at the address listed below at the same time it is submitted to EPA.

Puyallup Tribe of Indians
3009 E. Portland Avenue
Tacoma, WA 98404
ATTN: Russ Ladley and Char Naylor

- d. All supporting documentation and certifications in the NOI related to coverage under the general permit for Endangered Species Act purposes shall be submitted to the Tribe's Resource Protection Manager (russ.ladley@puyalluptribe.com) and Char Naylor (char.naylor@puyalluptribe.com) for review.
- e. If EPA requires coverage under an individual or alternative permit, the permittee shall submit a copy of the permit to Russ Ladley and Char Naylor at the address listed above.

- f. The permittee shall submit all stormwater pollution prevention plans to Char Naylor for review and approval prior to beginning any activities resulting in a discharge to tribal waters.
- g. The permittee shall conduct benchmark monitoring for turbidity (or transparency) and, in the event of significant concrete work or engineered soils, pH monitoring as well. Monitoring, benchmarks, and reporting requirements contained in Condition S.4. (pp.13-20) of the Washington State Construction Stormwater General Permit, effective January 1, 2016, shall apply, as applicable.
- h. The permittee shall notify Char Naylor (253-680-5520) and Russ Ladley (253-680-5560) prior to conducting inspections at construction sites generating storm water discharged to tribal waters.
- i. Treat dewatering discharges with controls necessary to minimize discharges of pollutants in order to minimize the discharge of pollutants to groundwater or surface waters from stormwater that is removed from excavations, trenches, foundations, vaults, or other storage areas. Examples of appropriate controls include sediment basins or sediment traps, sediment socks, dewatering tanks, tube settlers, weir tanks, and filtration systems (e.g., bag or sand filters) that are designed to remove sediment.

To the extent feasible, utilize vegetated, upland areas of the site to infiltrate dewatering water before discharge. At all points where dewatering water is discharged, comply with the velocity dissipation requirements of Part 2.2.11 of EPA's 2016 General Construction Stormwater Permit. Examples of velocity dissipation devices include check dams, sediment traps, riprap, and grouted riprap at outlets.

- j. The permittee shall provide and maintain natural buffers to the maximum extent possible (and/or equivalent erosion and sediment controls) when tribal waters are located within 100 feet of the site's earth disturbances. If infeasible to provide and maintain an undisturbed 100 foot natural buffer, erosion and sediment controls to achieve the sediment load reduction equivalent to a 100-foot undisturbed natural buffer shall be required.

9.7.4.5 Spokane Tribe of Indians. The following conditions apply only to discharges on the Spokane Tribe Reservation:

- a. Pursuant to Tribal Law and Order Code (TLOC) Chapter 30 each operator shall be responsible for achieving compliance with the Surface Water Quality Standards of the Spokane Tribe. The operator shall notify the Spokane Tribe, Water Control Board (WCB) of any spills of hazardous material and;
- b. Each operator shall submit a signed hard copy of the Notice of Intent (NOI) to the WCB at the same time it is submitted to EPA.
- c. The permittee shall allow the Tribal Water Control Board or its designee to inspect and sample at the construction site as needed.
- d. Each operator shall submit a signed copy of the Notice of Termination (NOT) to the WCB at the same time it is submitted to EPA.

The correspondence address for the Spokane Tribe Water Control Board is:

Water Control Board
c/o. Brian Crossley
PO Box 480
Wellpinit WA 99040

(509)626-4409
crossley@spokanetribe.com

9.7.4.6 Swinomish Indian Tribal Community. The following conditions apply only to discharges on the Swinomish Reservation:

- a. Owners and operators seeking coverage under this permit who intend to discharge to Regulated Surface Waters must submit a copy of the Notice of Intent (NOI) to the DEP at the same time the NOI is submitted to EPA.
- b. Owners and operators seeking coverage under this permit must also submit a Stormwater Pollution Prevention Plan to the DEP for review and approval by DEP prior to beginning any discharge activities.
- c. Owners and operators must also submit to the DEP Changes in NOI and/or Notices of Termination at the same time they are submitted to EPA.

9.7.4.7 Tulalip Tribes. The following conditions apply only to discharges on the Tulalip Reservation:

- a. This certification does not exempt and is provisional upon compliance with other applicable statutes and codes administered by federal and Tulalip tribal agencies. Pursuant to Tulalip Tribes code of law, the operator must also obtain a land use permit from the Tulalip Tribes Planning Department as provided in Title 7 of the Tulalip Tribal Code (<http://www.codepublishing.com/WA/Tulalip/?Tulalip02/Tulalip0205.html>).
- b. Each CGP operator shall be responsible for achieving compliance with Tulalip Tribes Water Quality Standards.
- c. Each CGP operator shall submit their Stormwater Pollution Prevention Plan (SWPPP) to the:

Tulalip Natural & Cultural Resources Department
Tulalip Tribes
6406 Marine Drive
Tulalip, WA 98271

Appendix A - Definitions and Acronyms

1. Definitions

"Action Area" – all areas to be affected directly or indirectly by the federal action and not merely the immediate area involved in the action. See 50 CFR 402. For the purposes of this permit and for application of the threatened and endangered species protection eligibility requirements, the following areas are included in the definition of action area:

- The areas on the construction site where stormwater discharges originate and flow toward the point of discharge into the receiving waters (including areas where excavation, site development, or other ground disturbance activities occur) and the immediate vicinity. (Example: Where bald eagles nest in a tree that is on or bordering a construction site and could be disturbed by the construction activity or where grading causes stormwater to flow into a small wetland or other habitat that is on the site that contains listed species.)
- The areas where stormwater discharges flow from the construction site to the point of discharge into receiving waters. (Example: Where stormwater flows into a ditch, swale, or gully that leads to receiving waters and where listed species (such as listed amphibians) are found in the ditch, swale, or gully.)
- The areas where stormwater from construction activities discharges into receiving waters and the areas in the immediate vicinity of the point of discharge. (Example: Where stormwater from construction activities discharges into a stream segment that is known to harbor listed aquatic species.)
- The areas where stormwater controls will be constructed and operated, including any areas where stormwater flows to and from the stormwater controls. (Example: Where a stormwater retention pond would be built.)
- The areas upstream and/or downstream from the stormwater discharge into a stream segment that may be affected by these discharges. (Example: Where sediment discharged to a receiving stream settles downstream and impacts a breeding area of a listed aquatic species.)

"Agricultural Land" - cropland, grassland, rangeland, pasture, and other agricultural land, on which agricultural and forest-related products or livestock are produced and resource concerns may be addressed. Agricultural lands include cropped woodland, marshes, incidental areas included in the agricultural operation, and other types of agricultural land used for the production of livestock.

"Antidegradation Policy" or "Antidegradation Requirements" - the water quality standards regulation that requires states and tribes to establish a three-tiered antidegradation program:

1. Tier 1 maintains and protects existing uses and water quality conditions necessary to support such uses. An existing use can be established by demonstrating that fishing, swimming, or other uses have actually occurred since November 28, 1975, or that the water quality is suitable to allow such uses to occur. Where an existing use is established, it must be protected even if it is not listed in the water quality standards as a designated use. Tier 1 requirements are applicable to all surface waters.
2. Tier 2 maintains and protects "high quality" waters -- waterbodies where existing conditions are better than necessary to support CWA § 101(a)(2) "fishable/swimmable" uses. Water quality can be lowered in such waters. However, state and tribal Tier 2 programs identify procedures that must be followed and questions that must be

answered before a reduction in water quality can be allowed. In no case may water quality be lowered to a level which would interfere with existing or designated uses.

3. Tier 3 maintains and protects water quality in outstanding national resource waters (ONRWs). Except for certain temporary changes, water quality cannot be lowered in such waters. ONRWs generally include the highest quality waters of the United States. However, the ONRW classification also offers special protection for waters of exceptional ecological significance, i.e., those which are important, unique, or sensitive ecologically. Decisions regarding which water bodies qualify to be ONRWs are made by states and authorized Indian tribes.

"Arid Areas" – areas with an average annual rainfall of 0 to 10 inches.

"Bank" (e.g., stream bank or river bank) – the rising ground bordering the channel of a water of the U.S.

"Bluff" – a steep headland, promontory, riverbank, or cliff.

"Borrow Areas" – the areas where materials are dug for use as fill, either onsite or off-site.

"Business day" – for the purposes of this permit, a business day is a calendar day on which construction activities will take place.

"Bypass" – the intentional diversion of waste streams from any portion of a treatment facility. See 40 CFR 122.41(m)(1)(i).

"Cationic Treatment Chemical" – polymers, flocculants, or other chemicals that contain an overall positive charge. Among other things, they are used to reduce turbidity in stormwater discharges by chemically bonding to the overall negative charge of suspended silts and other soil materials and causing them to bind together and settle out. Common examples of cationic treatment chemicals are chitosan and cationic PAM.

"Commencement of Construction Activities" – the initial disturbance of soils (or 'breaking ground') associated with clearing, grading, or excavating activities or other construction-related activities (e.g., stockpiling of fill material; placement of raw materials at the site).

"Common Plan of Development or Sale" – A contiguous area where multiple separate and distinct construction activities may be taking place at different times on different schedules under one common plan. The "common plan" of development or sale is broadly defined as any announcement or piece of documentation (including a sign, public notice or hearing, sales pitch, advertisement, drawing, permit application, zoning request, computer design, etc.) or physical demarcation (including boundary signs, lot stakes, surveyor markings, etc.) indicating construction activities may occur on a specific plot.

"Construction Activities" – earth-disturbing activities, such as the clearing, grading, and excavation of land, and other construction-related activities (e.g., stockpiling of fill material; placement of raw materials at the site) that could lead to the generation of pollutants. Some of the types of pollutants that are typically found at construction sites are:

- sediment;
- nutrients;
- heavy metals;
- pesticides and herbicides;
- oil and grease;
- bacteria and viruses;
- trash, debris, and solids;

- treatment polymers; and
- any other toxic chemicals.

“Construction and Development Effluent Limitations and New Source Performance Standards” (C&D Rule) – as published in 40 CFR § 450, the regulation requiring effluent limitations guidelines (ELGs) and new source performance standards (NSPS) for controlling the discharge of pollutants from construction sites.

“Construction Site” or “Site” – the land or water area where construction activities will occur and where stormwater controls will be installed and maintained. The construction site includes construction support activities, which may be located at a different part of the property from where the primary construction activity will take place, or on a different piece of property altogether.

“Construction Support Activity” – a construction-related activity that specifically supports the construction activity and involves earth disturbance or pollutant-generating activities of its own, and can include activities associated with concrete or asphalt batch plants, equipment staging yards, materials storage areas, excavated material disposal areas, and borrow areas.

“Construction Waste” – discarded material (such as packaging materials; scrap construction materials; masonry products; timber, steel, pipe, and electrical cuttings; plastics; and styrofoam).

“Conveyance Channel” – a temporary or permanent waterway designed and installed to safely convey stormwater flow within and out of a construction site.

“Critical Habitat” – as defined in the Endangered Species Act at 16 U.S.C. 1531 for a threatened or endangered species, (i) the specific areas within the geographical area occupied by the species, at the time it is listed in accordance with the provisions of section 4 of the Endangered Species Act, on which are found those physical or biological features essential to the conservation of the species and which may require special management considerations or protection; and (ii) specific areas outside the geographical area occupied by the species at the time it is listed in accordance with the provisions of section 4 of the Endangered Species Act, upon a determination by the Secretary that such areas are essential for the conservation of the species.

“CWA” – the Clean Water Act or the Federal Water Pollution Control Act, 33 U.S.C. section 1251 et seq.

“Dewatering” – the act of draining rainwater and/or ground water from building foundations, vaults, and trenches.

“Discharge” – when used without qualification, means the “discharge of a pollutant.”

“Discharge of a Pollutant” – any addition of any “pollutant” or combination of pollutants to “waters of the United States” from any “point source,” or any addition of any pollutant or combination of pollutants to the waters of the “contiguous zone” or the ocean from any point source other than a vessel or other floating craft which is being used as a means of transportation. This includes additions of pollutants into waters of the United States from: surface runoff which is collected or channeled by man; discharges through pipes, sewers, or other conveyances, leading into privately owned treatment works. See 40 CFR 122.2.

“Discharge Point” – for the purposes of this permit, the location where collected and concentrated stormwater flows are discharged from the construction site.

“Discharge-Related Activity” – activities that cause, contribute to, or result in stormwater and allowable non-stormwater point source discharges, and measures such as the siting, construction, and operation of stormwater controls to control, reduce, or prevent pollutants from being discharged.

“Discharge to an Impaired Water” – for the purposes of this permit, a discharge to an impaired water occurs if the first water of the U.S. to which you discharge is identified by a state, tribe, or EPA pursuant to Section 303(d) of the Clean Water Act as not meeting an applicable water quality standard and (1) requires development of a total maximum daily load (TMDL) (pursuant to section 303(d) of the CWA; or (2) is addressed by an EPA-approved or established TMDL; or (3) is not in either of the above categories but the waterbody is covered by a pollution control program that meets the requirements of 40 CFR 130.7(b)(1). For discharges that enter a storm sewer system prior to discharge, the water of the U.S. to which you discharge is the first water of the U.S. that receives the stormwater discharge from the storm sewer system.

“Domestic Waste” – for the purposes of this permit, typical household trash, garbage or rubbish items generated by construction activities.

“Drainageway” – an open linear depression, whether constructed or natural, that functions for the collection and drainage of surface water.

“Drought-Stricken Area” – for the purposes of this permit, an area in which the National Oceanic and Atmospheric Administration’s U.S. Seasonal Drought Outlook indicates for the period during which the construction will occur that any of the following conditions are likely: (1) “Drought to persist or intensify”, (2) “Drought ongoing, some improvement”, (3) “Drought likely to improve, impacts ease”, or (4) “Drought development likely”. See http://www.cpc.ncep.noaa.gov/products/expert_assessment/sdo_summary.php.

“Earth-Disturbing Activity” – actions taken to alter the existing vegetation and/or underlying soil of a site, such as clearing, grading, site preparation (e.g., excavating, cutting, and filling), soil compaction, and movement and stockpiling of top soils.

“Earth-Disturbing Activities Conducted Prior to Active Mining Activities” – Consists of two classes of earth-disturbing (i.e., clearing, grading and excavation) activities:

a. activities performed for purposes of mine site preparation, including: cutting new rights of way (except when related to access road construction); providing access to a mine site for vehicles and equipment (except when related to access road construction); other earth disturbances associated with site preparation activities on any areas where active mining activities have not yet commenced (e.g., for heap leach pads, waste rock facilities, tailings impoundments, wastewater treatment plants); and

b. construction of staging areas to prepare for erecting structures such as to house project personnel and equipment, mill buildings, etc., and construction of access roads.

Note: only earth-disturbing activities associated with the construction of staging areas and the construction of access roads conducted prior to active mining (see (b) above) are considered to be “construction” and therefore stormwater discharges from these activities are eligible for coverage under this permit. See Part 1.2.1.b. The activities described in (a) above are not considered to be “construction” and therefore stormwater discharges associated with this activity are not eligible for coverage under this permit.

“Effective Operating Condition” – for the purposes of this permit, a stormwater control is kept in effective operating condition if it has been implemented and maintained in such a manner that it is working as designed to minimize pollutant discharges.

“Effluent Limitations” – for the purposes of this permit, any of the Part 2 or Part 3 requirements.

“Effluent Limitations Guideline” (ELG) – defined in 40 CFR § 122.2 as a regulation published by the Administrator under section 304(b) of the CWA to adopt or revise effluent limitations.

“Eligible” – for the purposes of this permit, refers to stormwater and allowable non-stormwater discharges that are authorized for coverage under this general permit.

“Emergency-Related Project” – a project initiated in response to a public emergency (e.g., mud slides, earthquake, extreme flooding conditions, disruption in essential public services), for which the related work requires immediate authorization to avoid imminent endangerment to human health or the environment, or to reestablish essential public services.

“Endangered Species” – defined in the Endangered Species Act at 16 U.S.C. 1531 as any species which is in danger of extinction throughout all or a significant portion of its range other than a species of the Class Insecta determined by the Secretary to constitute a pest whose protection under the provisions of this Act would present an overwhelming and overriding risk to man.

“Excursion” – a measured value that exceeds a specified limit.

“Existing Site” – a site where construction activities commenced prior to February 16, 2017.

“Exit Points” – any points of egress from the construction site to be used by vehicles and equipment during construction activities.

“Exposed Soils” – for the purposes of this permit, soils that as a result of earth-disturbing activities are left open to the elements.

“Federal Operator” – an entity that meets the definition of “Operator” in this permit and is either any department, agency or instrumentality of the executive, legislative, and judicial branches of the Federal government of the United States, or another entity, such as a private contractor, performing construction activity for any such department, agency, or instrumentality.

“Final Stabilization” – on areas not covered by permanent structures, either (1) uniform, perennial vegetation (*e.g., evenly distributed, without large bare areas*) has been established, or for arid or semi-arid areas, will be established that provides 70 percent or more of the cover that is provided by vegetation native to local undisturbed areas, and/or (2) permanent non-vegetative stabilization measures (*e.g., riprap, gravel, gabions, and geotextiles*) have been implemented to provide effective cover for exposed portions of the site

“General Contractor” – for the purposes of this permit, the primary individual or company solely accountable to perform a contract. The general contractor typically supervises activities, coordinates the use of subcontractors, and is authorized to direct workers at a site to carry out activities required by the permit.

“Hazardous Substances” or “Hazardous or Toxic Waste” – for the purposes of this permit, any liquid, solid, or contained gas that contain properties that are dangerous or potentially harmful to human health or the environment. See also 40 CFR §261.2.

“Historic Property” – as defined in the National Historic Preservation Act regulations, means any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion in, the National Register of Historic Places maintained by the Secretary of the Interior. This term includes artifacts, records, and remains that are related to and located within such properties. The term includes properties of traditional religious and cultural importance to an Indian tribe or Native Hawaiian organization and that meet the National Register criteria.

“Impaired Water” – a water identified by the state, tribe, or EPA as not meeting an applicable water quality standard and (1) requires development of a TMDL (pursuant to section 303(d) of the CWA; or (2) is addressed by an EPA-approved or established TMDL; or (3) is not in either of the above categories but the waterbody is covered by a pollution control program that meets the requirements of 40 CFR 130.7(b)(1).

“Impervious Surface” – for the purpose of this permit, any land surface with a low or no capacity for soil infiltration including, but not limited to, pavement, sidewalks, parking areas and driveways, packed gravel or soil, or rooftops.

“Indian Country” or “Indian Country Lands” – defined at 40 CFR §122.2 as:

1. All land within the limits of any Indian reservation under the jurisdiction of the United States Government, notwithstanding the issuance of any patent, and, including rights-of-way running through the reservation;
2. All dependent Indian communities with the borders of the United States whether within the originally or subsequently acquired territory thereof, and whether within or without the limits of a state; and
3. All Indian allotments, the Indian titles to which have not been extinguished, including rights-of-ways running through the same.

“Infeasible” – for the purpose of this permit, infeasible means not technologically possible or not economically practicable and achievable in light of best industry practices. EPA notes that it does not intend for any permit requirement to conflict with state water rights law.

“Install” or “Installation” – when used in connection with stormwater controls, to connect or set in position stormwater controls to make them operational.

“Jar test” – a test designed to simulate full-scale coagulation/flocculation/sedimentation water treatment processes by taking into account the possible conditions.

“Landward” – positioned or located away from a waterbody, and towards the land.

“Large Construction Activity” – defined at 40 CFR § 122.26(b)(14)(x) and incorporated here by reference. Large construction activity includes clearing, grading, and excavating resulting in a land disturbance that will disturb equal to or greater than five acres of land or will disturb less than five acres of total land area but is part of a larger common plan of development or sale that will ultimately disturb equal to or greater than five acres. Large construction activity does not include routine maintenance that is performed to maintain the original line and grade, hydraulic capacity, or original purpose of the site.

“Linear Construction Site” – includes the construction of roads, bridges, conduits, substructures, pipelines, sewer lines, towers, poles, cables, wires, connectors, switching, regulating and transforming equipment and associated ancillary facilities in a long, narrow area.

“Minimize” – to reduce and/or eliminate to the extent achievable using stormwater controls that are technologically available and economically practicable and achievable in light of best industry practices.

“Mining Activity” – for the purposes of this permit, includes mining-related construction activities defined at 40 CFR 122.26(b)(14)(x) and 122.26(b)(15)(i), and active mining activities defined at 40 CFR 122.26(b)(14)(iii). Both of these sub categories of activities include earth-disturbing activities, with the latter also including such activities as: extraction, removal or recovery, and beneficiation of mined material from the earth; removal of overburden and waste rock to expose mineable material; and site reclamation and closure activities.

“Mining Operations” – for the purposes of this permit, mining operations are grouped into two distinct categories, with distinct effluent limits and requirements applicable to each: 1) earth-disturbing activities conducted prior to active mining activities; and 2) active mining activities, which includes reclamation.

“Municipal Separate Storm Sewer System” or “MS4” – defined at 40 CFR §122.26(b)(8) as a conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, manmade channels, or storm drains):

1. Owned and operated by a state, city, town, borough, county, parish, district, association, or other public body (created by or pursuant to State law) having jurisdiction over disposal of sewage, industrial wastes, stormwater, or other wastes, including special

districts under State law such as a sewer district, flood control district or drainage district, or similar entity, or an Indian tribe or an authorized Indian tribal organization, or a designated and approved management agency under section 208 of the CWA that discharges to waters of the United States;

2. Designed or used for collecting or conveying stormwater;
3. Which is not a combined sewer; and
4. Which is not part of a Publicly Owned Treatment Works (POTW) as defined at 40 CFR §122.2.

“National Pollutant Discharge Elimination System” (NPDES) – defined at 40 CFR §122.2 as the national program for issuing, modifying, revoking and reissuing, terminating, monitoring and enforcing permits, and imposing and enforcing pretreatment requirements, under sections 307, 402, 318, and 405 of CWA. The term includes an ‘approved program.’

“Native Topsoil” – the uppermost layer of naturally occurring soil for a particular area, and is often rich in organic matter, biological activity, and nutrients.

“Natural Buffer” – for the purposes of this permit, an area of undisturbed natural cover surrounding waters of the U.S. within which construction activities are restricted. Natural cover includes the vegetation, exposed rock, or barren ground that exists prior to commencement of earth-disturbing activities.

“Natural Vegetation” – vegetation that occurs spontaneously without regular management, maintenance, or species introductions or removals, and that generally has a strong component of native species.

“New Operator of a Permitted Site” – an operator that through transfer of ownership and/or operation replaces the operator of an already permitted construction site that is either a “new site” or an “existing site”.

“New Site” – a site where construction activities commenced on or after February 16, 2017.

“New Source” – for the purposes of this permit, a construction project that commenced construction activities after February 1, 2010.

“New Source Performance Standards (NSPS)” – for the purposes of this permit, NSPS are technology-based standards that apply to construction sites that are new sources under 40 CFR 450.24.

“Non-Stormwater Discharges” – discharges that do not originate from storm events. They can include, but are not limited to, discharges of process water, air conditioner condensate, non-contact cooling water, vehicle wash water, sanitary wastes, concrete washout water, paint wash water, irrigation water, or pipe testing water.

“Non-Turbid” – a discharge that does not cause or contribute to an exceedence of turbidity-related water quality standards.

“Notice of Intent” (NOI) – the form (electronic or paper) required for authorization of coverage under the Construction General Permit.

“Notice of Termination” (NOT) – the form (electronic or paper) required for terminating coverage under the Construction General Permit.

“NPDES eReporting Tool” (NeT) – EPA’s online system for submitting electronic Construction General Permit forms.

“Operational” – for the purposes of this permit, stormwater controls are made “operational” when they have been installed and implemented, are functioning as designed, and are properly maintained.

“Operator” – for the purposes of this permit and in the context of stormwater discharges associated with construction activity, any party associated with a construction project that meets either of the following two criteria:

1. The party has operational control over construction plans and specifications, including the ability to make modifications to those plans and specifications; or
2. The party has day-to-day operational control of those activities at a project that are necessary to ensure compliance with the permit conditions.

This definition is provided to inform permittees of EPA’s interpretation of how the regulatory definitions of “owner or operator” and “facility or activity” are applied to discharges of stormwater associated with construction activity. Subcontractors generally are not considered operators for the purposes of this permit.

“Ordinary High Water Mark” – the line on the shore established by fluctuations of water and indicated by physical characteristics such as a clear, natural line impressed on the bank, shelving, changes in the character of soil, destruction of terrestrial vegetation, and/or the presence of litter and debris.

“Permitting Authority” – for the purposes of this permit, EPA, a Regional Administrator of EPA, or an authorized representative.

“Point(s) of Discharge” – see “Discharge Point.”

“Point Source” – any discernible, confined, and discrete conveyance, including but not limited to, any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock concentrated animal feeding operation, landfill leachate collection system, vessel or other floating craft from which pollutants are or may be discharged. This term does not include return flows from irrigated agriculture or agricultural stormwater runoff.

“Pollutant” – defined at 40 CFR §122.2. A partial listing from this definition includes: dredged spoil, solid waste, sewage, garbage, sewage sludge, chemical wastes, biological materials, heat, wrecked or discarded equipment, rock, sand, cellar dirt, and industrial or municipal waste.

“Pollution Prevention Controls” – stormwater controls designed to reduce or eliminate the addition of pollutants to construction site discharges through analysis of pollutant sources, implementation of proper handling/disposal practices, employee education, and other actions.

“Polymers” – for the purposes of this permit, coagulants and flocculants used to control erosion on soil or to enhance the sediment removal capabilities of sediment traps or basins. Common construction site polymers include polyacrylamide (PAM), chitosan, alum, polyaluminum chloride, and gypsum.

“Prohibited Discharges” – discharges that are not allowed under this permit, including:

1. Wastewater from washout of concrete;
2. Wastewater from washout and cleanout of stucco, paint, form release oils, curing compounds and other construction materials;
3. Fuels, oils, or other pollutants used in vehicle and equipment operation and maintenance;
4. Soaps or solvents used in vehicle and equipment washing;
5. Toxic or hazardous substances from a spill or other release; and

6. Waste, garbage, floatable debris, construction debris, and sanitary waste.

“Provisionally Covered Under this Permit” – for the purposes of this permit, EPA provides temporary coverage under this permit for emergency-related projects prior to receipt of a complete and accurate NOI. Discharges from earth-disturbing activities associated with the emergency-related projects are subject to the terms and conditions of the permit during the period of temporary coverage.

“Qualified Person” – a person knowledgeable in the principles and practice of erosion and sediment controls and pollution prevention, who possesses the appropriate skills and training to assess conditions at the construction site that could impact stormwater quality, and the appropriate skills and training to assess the effectiveness of any stormwater controls selected and installed to meet the requirements of this permit.

“Receiving Water” – a “Water of the United States” as defined in 40 CFR §122.2 into which the regulated stormwater discharges.

“Run-On” – sources of stormwater that drain from land located upslope or upstream from the regulated site in question.

“Semi-Arid Areas” – areas with an average annual rainfall of 10 to 20 inches.

“Shared Control” - for the purposes of this permit, a stormwater control, such as a sediment basin or pond, used by two or more operators that is installed and maintained for the purpose of minimizing and controlling pollutant discharges from a construction site with multiple operators associated with a common plan of development or sale.

“Small Construction Activity” – defined at 40 CFR §122.26(b)(15) and incorporated here by reference. A small construction activity includes clearing, grading, and excavating resulting in a land disturbance that will disturb equal to or greater than one (1) acre and less than five (5) acres of land or will disturb less than one (1) acre of total land area but is part of a larger common plan of development or sale that will ultimately disturb equal to or greater than one (1) acre and less than five (5) acres. Small construction activity does not include routine maintenance that is performed to maintain the original line and grade, hydraulic capacity, or original purpose of the site.

“Small Residential Lot” – for the purpose of this permit, 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.

“Snowmelt” – the conversion of snow into overland stormwater and ground water flow as a result of warmer temperatures.

“Spill” – for the purpose of this permit, the release of a hazardous or toxic substance from its container or containment.

“Stabilization” – the use of vegetative and/or non-vegetative cover to prevent erosion and sediment loss in areas exposed through the construction process.

“Steep Slopes” – where a state, tribe, local government, or industry technical manual (e.g., stormwater BMP manual) has defined what is to be considered a “steep slope”, this permit’s definition automatically adopts that definition. Where no such definition exists, steep slopes are automatically defined as those that are 15 percent or greater in grade.

“Storm Sewer System” – a conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, manmade channels, or storm drains) designed or used for collecting or conveying stormwater.

“Stormwater” – stormwater runoff, snowmelt runoff, and surface runoff and drainage.

“Stormwater Control” - refers to any best management practice or other method (including narrative effluent limitations) used to prevent or reduce the discharge of pollutants to waters of the United States.

“Stormwater Discharge Associated with Construction Activity” – as used in this permit, a discharge of pollutants in stormwater to waters of the United States from areas where earth-disturbing activities (e.g., clearing, grading, or excavation) occur, or where construction materials or equipment storage or maintenance (e.g., fill piles, borrow area, concrete truck chute washdown, fueling), or other industrial stormwater directly related to the construction process (e.g., concrete or asphalt batch plants), are located.

“Stormwater Inlet” – a structure placed below grade to conduct water used to collect stormwater runoff for conveyance purposes.

“Stormwater Team” – the group of individuals responsible for oversight of the development and modifications of the SWPPP, and oversight of compliance with the permit requirements. The individuals on the “Stormwater Team” must be identified in the SWPPP.

“Storm Event” – a precipitation event that results in a measurable amount of precipitation.

“Storm Sewer” – a system of pipes (separate from sanitary sewers) that carries stormwater runoff from buildings and land surfaces.

“Subcontractor” – for the purposes of this permit, an individual or company that takes a portion of a contract from the general contractor or from another subcontractor.

“SWPPP” (Stormwater Pollution Prevention Plan) – a site-specific, written document that, among other things: (1) identifies potential sources of stormwater pollution at the construction site; (2) describes stormwater controls to reduce or eliminate pollutants in stormwater discharges from the construction site; and (3) identifies procedures the operator will implement to comply with the terms and conditions of this general permit.

“Temporary Stabilization” – a condition where exposed soils or disturbed areas are provided temporary vegetative and/or non-vegetative protective cover to prevent erosion and sediment loss. Temporary stabilization may include temporary seeding, geotextiles, mulches, and other techniques to reduce or eliminate erosion until either final stabilization can be achieved or until further construction activities take place to re-disturb this area.

“Thawing Conditions” – for the purposes of this permit, thawing conditions are expected based on the historical likelihood of two or more days with daytime temperatures greater than 32°F. This date can be determined by looking at historical weather data. Note: the estimation of thawing conditions is for planning purposes only. During construction the permittee will be required to conduct site inspections based upon actual conditions (i.e., if thawing conditions occur sooner than expected, the permittee will be required to conduct inspections at the regular frequency).

“Threatened Species” – defined in the Endangered Species Act at 16 U.S.C. 1531 as any species which is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range.

“Tier 2 Waters” – for antidegradation purposes, pursuant to 40 CFR 131.12(a)(2), those waters that are characterized as having water quality that exceeds the levels necessary to support propagation of fish, shellfish, and wildlife and recreation in and on the water.

“Tier 2.5 Waters” – for antidegradation purposes, those waters designated by states or tribes as requiring a level of protection equal to and above that given to Tier 2 waters, but less than that given Tier 3 waters. Some states have special requirements for these waters.

“Tier 3 Waters” – for antidegradation purposes, pursuant to 40 CFR 131.12(a)(3), Tier 3 waters are identified by states as having high quality waters constituting an Outstanding National Resource

Water (ONRW), such as waters of National Parks and State Parks, wildlife refuges, and waters of exceptional recreational or ecological significance.

“Total Maximum Daily Load” or “TMDL” – the sum of the individual wasteload allocations (WLAs) for point sources and load allocations (LAs) for nonpoint sources and natural background. If receiving water has only one point source discharger, the TMDL is the sum of that point source WLA plus the LAs for any nonpoint sources of pollution and natural background sources, tributaries, or adjacent segments. TMDLs can be expressed in terms of mass per time, toxicity, or other appropriate measure.

“Toxic Waste” – see “Hazardous Substances.”

“Treatment Chemicals” – polymers, flocculants, or other chemicals used to reduce turbidity in stormwater.

“Turbidity” – a condition of water quality characterized by the presence of suspended solids and/or organic material.

“Uncontaminated Discharge” – in the context of authorized non-stormwater discharges, a discharge that does not cause or contribute to an exceedance of applicable water quality standards.

“Upland” – the dry land area above and ‘landward’ of the ordinary high water mark.

“Upset” – Upset means an exceptional incident in which there is unintentional and temporary noncompliance with technology based permit effluent limitations because of factors beyond your reasonable control. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation. See 40 CFR 122.41(n)(1).

“Water-Dependent Structures” – structures or facilities that are required to be located directly adjacent to a waterbody or wetland, such as a marina, pier, boat ramp, etc.

“Water Quality Standards” – defined in 40 CFR § 131.3, and are provisions of state or federal law which consist of a designated use or uses for the waters of the United States, water quality criteria for such waters based upon such uses, and an antidegradation policy to protect high-quality waters. Water quality standards protect the public health or welfare, enhance the quality of water and serve the purposes of the Act.

“Waters of the United States” – see definition at 40 CFR 122.2.

“Wetland” – those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas. On-site evaluations are typically required to confirm the presence and boundaries of wetlands.

1. Acronyms

ACHP – Advisory Council on Historic Preservation

BMP – Best Management Practice

CBI – Confidential Business Information

CGP – Construction General Permit

CFR – Code of Federal Regulations

CWA – Clean Water Act

CZMA – Coastal Zone Management Act
ECHO – EPA Enforcement and Compliance History Online
ELG – Effluent Limitations Guideline
EPA – United States Environmental Protection Agency
ESA – Endangered Species Act
FR – Federal Register
MS4 – Municipal Separate Storm Sewer System
MSGP – Multi-Sector General Permit
NEPA – National Environmental Policy Act
NeT – NPDES eReporting Tool
NHPA – National Historic Preservation Act
NMFS – United States National Marine Fisheries Service
NPDES – National Pollutant Discharge Elimination System
NOI – Notice of Intent
NOT – Notice of Termination
NPDES – National Pollutant Discharge Elimination System
NRC – National Response Center
NRCS – National Resources Conservation Service
NSPS – New Source Performance Standards
ONRW – Outstanding National Resource Water
PAM – Polyacrylamide
POTW – Publicly Owned Treatment Works
RUSLE – Revised Universal Soil Loss Equation
SDS – Safety Data Sheet
SHPO – State Historic Preservation Office
SPCC – Spill Prevention Control and Countermeasure
SWPPP – Stormwater Pollution Prevention Plan
THPO – Tribal Historic Preservation Office
TMDL – Total Maximum Daily Load
TSS – Total Suspended Solids
UIC – Underground Injection Control
USDA – United States Department of Agriculture
USFWS – United States Fish and Wildlife Service
USGS – United States Geological Survey
WQS – Water Quality Standard

Appendix B - Permit Areas Eligible for Coverage and EPA Regional Addresses

Permit coverage for stormwater discharges from construction activity occurring within the following areas is provided by legally separate and distinctly numbered permits.

B.1 EPA Region 1

The permit offers coverage for stormwater discharges from construction activity from the following areas in EPA Region 1:

Permit No.	Areas of Coverage/Where EPA is Permitting Authority
CTR10I000	Indian country within the State of Connecticut
MAR100000	Commonwealth of Massachusetts (except Indian country)
MAR10I000	Indian country within the State of Massachusetts
NHR100000	State of New Hampshire
RIR10I000	Indian country within the State of Rhode Island
VTR10F000	Areas in the State of Vermont subject to construction by a Federal Operator
01R10I000	All areas of Indian country not identified above that are not already covered by an EPA-approved permitting program

For stormwater discharges in EPA Region 1 outside the areas of coverage identified above, please contact your state NPDES permitting authority to obtain coverage under a state-issued NPDES permit.

EPA Region 1 Address:

U.S. EPA Region 1
Office of Ecosystem Protection
Stormwater and Construction Permits Section
5 Post Office Square, Suite 100
(OEP 06-1)
Boston, MA 02109-3912

B.2 EPA Region 2

The permit offers coverage for stormwater discharges from construction activity from the following areas in EPA Region 2:

Permit No.	Areas of Coverage/Where EPA is Permitting Authority
NYR10I000	Indian country within the State of New York
PRR100000	Commonwealth of Puerto Rico
02R10I000	All areas of Indian country not identified above that are not already covered by an EPA-approved permitting program

For stormwater discharges in EPA Region 2 outside the areas of coverage identified above, please contact your state NPDES permitting authority to obtain coverage under a state-issued NPDES permit.

EPA Region 2 Address:

For Puerto Rico:

U.S. EPA Region 2
Caribbean Environmental Protection Division
NPDES Stormwater Program
City View Plaza II – Suite 7000
48 Rd. 165 Km 1.2
Guaynabo, PR 00968-8069

For New York:

U.S. EPA Region 2
NPDES Stormwater Program
290 Broadway, 24th Floor
New York, NY 10007-1866

B.3 EPA Region 3

The permit offers coverage for stormwater discharges from construction activity from the following areas in EPA Region 3:

<u>Permit No.</u>	<u>Areas of Coverage/Where EPA is Permitting Authority</u>
DCR100000	District of Columbia
DER10F000	Areas in the State of Delaware subject to construction by a Federal Operator
VAR10I000	Indian country within the State of Virginia
03R10I000	All areas of Indian country not identified above that are not already covered by an EPA-approved permitting program

For stormwater discharges in EPA Region 3 outside the areas of coverage identified above, please contact your state NPDES permitting authority to obtain coverage under a state-issued NPDES permit.

EPA Region 3 Address:

U.S. EPA Region 3
Office of NPDES Permits and Enforcement
NPDES Permits Branch, Mailcode 3WP41
1650 Arch Street
Philadelphia, PA 19103

B.4 EPA Region 4

The permit offers coverage for stormwater discharges from construction activity from the following areas in EPA Region 4:

<u>Permit No.</u>	<u>Areas of Coverage/Where EPA is Permitting Authority</u>
ALR10I000	Indian country within the State of Alabama
FLR10I000	Indian country within the State of Florida
MSR10I000	Indian country within the State of Mississippi
NCR10I000	Indian country within the State of North Carolina
04R10I000	All areas of Indian country not identified above that are not already covered by an EPA-approved permitting program (except Catawba lands in South Carolina)

For stormwater discharges in EPA Region 4 outside the areas of coverage identified above, please contact your state NPDES permitting authority to obtain coverage under a state-issued NPDES permit.

EPA Region 4 Address:

U.S. EPA Region 4
 Water Protection Division
 NPDES Stormwater Program
 Atlanta Federal Center
 61 Forsyth Street SW
 Atlanta, GA 30303-3104

B.5 EPA Region 5

The permit offers coverage for stormwater discharges from construction activity from the following areas in EPA Region 5:

<u>Permit No.</u>	<u>Areas of Coverage/Where EPA is Permitting Authority</u>
MIR10I000	Indian country within the State of Michigan
MNR10I000	Indian country within the State of Minnesota
WIR10I000	Indian country within the State of Wisconsin, except the Sokaogon Chippewa (Mole Lake) Community
05R10I000	All areas of Indian country not identified above that are not already covered by an EPA-approved permitting program

For stormwater discharges in EPA Region 5 outside the areas of coverage identified above, please contact your state NPDES permitting authority to obtain coverage under a state-issued NPDES permit.

EPA Region 5 Address:

U.S. EPA Region 5
 NPDES Program Branch
 77 W. Jackson Blvd.
 Mail Code WN16J
 Chicago, IL 60604-3507

B.6 EPA Region 6

The permit offers coverage for stormwater discharges from construction activity from the following areas in EPA Region 6:

<u>Permit No.</u>	<u>Areas of Coverage/Where EPA is Permitting Authority</u>
LAR10I000	Indian country within the State of Louisiana
NMR100000	State of New Mexico, except Indian country
NMR10I000	Indian country within the State of New Mexico, except Navajo Reservation Lands that are covered under Arizona permit AZR10I000 and Ute Mountain Reservation Lands that are covered under Colorado permit COR10I000.
OKR10I000	Indian country within the State of Oklahoma
OKR10F000	Discharges in the State of Oklahoma that are not under the authority of the Oklahoma Department of Environmental Quality, including activities associated with oil and gas exploration, drilling, operations, and

<u>Permit No.</u>	<u>Areas of Coverage/Where EPA is Permitting Authority</u>
TXR10F000	pipelines (includes SIC Groups 13 and 46, and SIC codes 492 and 5171), and point source discharges associated with agricultural production, services, and silviculture (includes SIC Groups 01, 02, 07, 08, 09). Discharges in the State of Texas that are not under the authority of the Texas Commission on Environmental Quality (formerly TNRCC), including activities associated with the exploration, development, or production of oil or gas or geothermal resources, including transportation of crude oil or natural gas by pipeline.
TXR10I000	Indian country within the State of Texas
06R10I000	All areas of Indian country not identified above that are not already covered by an EPA-approved permitting program

For stormwater discharges in EPA Region 6 outside the areas of coverage identified above, please contact your state NPDES permitting authority to obtain coverage under a state-issued NPDES permit.

EPA Region 6 Address:

U.S. EPA Region 6
 NPDES Stormwater Program (WQ-PP)
 1445 Ross Avenue, Suite 1200
 Dallas, TX 75202-2733

B.7 EPA Region 7

The permit offers coverage for stormwater discharges from construction activity from the following areas in EPA Region 7:

<u>Permit No.</u>	<u>Areas of Coverage/Where EPA is Permitting Authority</u>
IAR10I000	Indian country within the State of Iowa
KSR10I000	Indian country within the State of Kansas
NER10I000	Indian country within the State of Nebraska, except Pine Ridge Reservation lands (see Region 8)
07R10I000	All areas of Indian country not identified above that are not already covered by an EPA-approved permitting program

For stormwater discharges in EPA Region 7 outside the areas of coverage identified above, please contact your state NPDES permitting authority to obtain coverage under a state-issued NPDES permit.

EPA Region 7 Address:

U.S. EPA Region 7
 NPDES Stormwater Program
 11201 Renner Blvd
 Lenexa, KS 66219

B.8 EPA Region 8

The permit offers coverage for stormwater discharges from construction activity from the following areas in EPA Region 8:

<u>Permit No.</u>	<u>Areas of Coverage/Where EPA is Permitting Authority</u>
COR10F000	Areas in the State of Colorado, except those located on Indian country, subject to construction activity by a Federal Operator
COR10I000	Indian country within the State of Colorado, as well as the portion of the Ute Mountain Reservation located in New Mexico
MTR10I000	Indian country within the State of Montana
NDR10I000	Indian country within the State of North Dakota, as well as that portion of the Standing Rock Reservation located in South Dakota (except for the portion of the lands within the former boundaries of the Lake Traverse Reservation which is covered under South Dakota permit SDR10I000 listed below)
SDR10I000	Indian country within the State of South Dakota, as well as the portion of the Pine Ridge Reservation located in Nebraska and the portion of the lands within the former boundaries of the Lake Traverse Reservation located in North Dakota (except for the Standing Rock Reservation which is covered under North Dakota permit NDR10I000 listed above)
UTR10I000	Indian country within the State of Utah, except Goshute and Navajo Reservation lands (see Region 9)
WYR10I000	Indian country within the State of Wyoming
08R10I000	All areas of Indian country not identified above that are not already covered by an EPA-approved permitting program

For stormwater discharges in EPA Region 8 outside the areas of coverage identified above, please contact your state NPDES permitting authority to obtain coverage under a state-issued NPDES permit.

EPA Region 8 Address:

EPA Region 8 Storm Water Program
 Mailcode: 8P-W-WW
 1595 Wynkoop Street
 Denver, CO 80202-1129

B.9 EPA Region 9

The permit offers coverage for stormwater discharges from construction activity from the following areas in EPA Region 9:

<u>Permit No.</u>	<u>Areas of Coverage/Where EPA is Permitting Authority</u>
ASR100000	Island of American Samoa
AZR10I000	Indian country within the State of Arizona, as well as Navajo Reservation lands in New Mexico and Utah
CAR10I000	Indian country within the State of California
GUR100000	Island of Guam
JAR100000	Johnston Atoll
MPR100000	Commonwealth of the Northern Mariana Islands
MWR100000	Midway Island and Wake Island
NVR10I000	Indian country within the State of Nevada, as well as the Duck Valley Reservation in Idaho, the Fort McDermitt Reservation in Oregon and the Goshute Reservation in Utah
09R10I000	All areas of Indian country not identified above that are not already covered by an EPA-approved permitting program

For stormwater discharges in EPA Region 9 outside the areas of coverage identified above, please contact your state NPDES permitting authority to obtain coverage under a state-issued NPDES permit.

EPA Region 9 Address:

U.S. EPA Region 9
Water Division
NPDES Stormwater Program (WTR-2-3)
75 Hawthorne Street
San Francisco, CA 94105-3901

B.10 EPA Region 10

The permit offers coverage for stormwater discharges from construction activity from the following areas in EPA Region 10:

<u>Permit No.</u>	<u>Areas of Coverage/Where EPA is Permitting Authority</u>
AKR10I000	Indian country lands as defined in 18 U.S.C. 1151 within the State of Alaska
AKR10F000	Denali National Park and Preserve
IDR100000	State of Idaho, except Indian country
IDR10I000	Indian country within the State of Idaho, except Duck Valley Reservation lands (see Region 9)
ORR10I000	Indian country within the State of Oregon, except Fort McDermitt Reservation lands (see Region 9)
WAR10F000	Areas in the State of Washington, except those located on Indian country, subject to construction activity by a Federal Operator
WAR10I000	Indian country within the State of Washington

For stormwater discharges in EPA Region 10 outside the areas of coverage identified above, please contact your state NPDES permitting authority to obtain coverage under a state-issued NPDES permit.

EPA Region 10 Address:

U.S. EPA Region 10
NPDES Stormwater Program
1200 6th Avenue (OWW-191)
Seattle, WA 98101-3140

Appendix C - Small Construction Waivers and Instructions

These waivers are only available to stormwater discharges associated with small construction activities (i.e., 1-5 acres). As the operator of a small construction activity, you may be able to qualify for a waiver in lieu of needing to obtain coverage under this general permit based on: (A) a low rainfall erosivity factor, (B) a TMDL analysis, or (C) an equivalent analysis that determines allocations for small construction sites are not needed. Each operator, otherwise needing permit coverage, must notify EPA of its intention for a waiver. It is the responsibility of those individuals wishing to obtain a waiver from coverage under this general permit to submit a complete and accurate waiver certification as described below. Where the operator changes or another is added during the construction project, the new operator must also submit a waiver certification to be waived.

C.1 Rainfall Erosivity Waiver

Under this scenario the small construction project's rainfall erosivity factor calculation ("R" in the Revised Universal Soil Loss Equation) is less than five during the period of construction activity. The operator must certify to EPA that construction activity will occur only when the rainfall erosivity factor is less than five. The period of construction activity begins at initial earth disturbance and ends with final stabilization. Where vegetation will be used for final stabilization, the date of installation of a stabilization practice that will provide interim non-vegetative stabilization can be used for the end of the construction period, provided the operator commits (as a condition of waiver eligibility) to periodically inspect and properly maintain the area until the criteria for final stabilization as defined in the CGP have been met. If use of this interim stabilization eligibility condition was relied on to qualify for the waiver, signature on the waiver with its certification statement constitutes acceptance of and commitment to complete the final stabilization process. The operator must submit a waiver certification to EPA prior to commencing construction activities.

Note: The rainfall erosivity factor "R" is determined in accordance with Chapter 2 of Agriculture Handbook Number 703, Predicting Soil Erosion by Water: A Guide to Conservation Planning With the Revised Universal Soil Loss Equation (RUSLE), pages 21–64, dated January 1997; United States Department of Agriculture (USDA), Agricultural Research Service.

EPA has developed an online rainfall erosivity calculator to help small construction sites determine potential eligibility for the rainfall erosivity waiver. You can access the calculator from EPA's website at: <https://www.epa.gov/npdes/rainfall-erosivity-factor-calculator-small-construction-sites>. The R factor can easily be calculated by using the construction site latitude/longitude or address and estimated start and end dates of construction. This calculator may also be useful in determining the time periods during which construction activity could be waived from permit coverage. You may find that moving your construction activity by a few weeks or expediting site stabilization will allow you to qualify for the waiver. Use this online calculator or the Construction Rainfall Erosivity Waiver Fact Sheet (<https://www.epa.gov/sites/production/files/2015-10/documents/fact3-1.pdf>) to assist in determining the R Factor for your small construction site.

If you are the operator of the construction activity and eligible for a waiver based on low erosivity potential, you can submit a rainfall erosivity waiver electronically via EPA's NPDES eReporting Tool (NeT) (<https://www.epa.gov/npdes/stormwater-discharges-construction-activities#ereporting>), unless you received a waiver from your EPA Regional Office (see Part 1.4.1 of the CGP for information about receiving a waiver from electronic reporting).

Note: If the R factor is five or greater, you do not qualify for the rainfall erosivity waiver, and must obtain coverage under an NPDES permit (e.g., the CGP), unless you qualify for the Water Quality Waiver as described in section B below.

If your small construction project continues beyond the projected completion date given on the waiver certification, you must recalculate the rainfall erosivity factor for the new project duration. If the R factor is below five, you must update all applicable information on the waiver certification and retain a copy of the revised waiver as part of your records. The new waiver certification must be submitted prior to the projected completion date listed on the original waiver form to assure your exemption from permitting requirements is uninterrupted. If the new R factor is five or above, you must obtain NPDES permit coverage.

C.2 TMDL Waiver

This waiver is available if EPA has established or approved a TMDL that addresses the pollutant(s) of concern for the impaired water and has determined that controls on stormwater discharges from small construction activity are not needed to protect water quality. The pollutant(s) of concern include sediment (such as total suspended solids, turbidity or siltation) and any other pollutant that has been identified as a cause of impairment of any waterbody that will receive a discharge from the construction activity. Information on TMDLs that have been established or approved by EPA is available from EPA online at <https://www.epa.gov/tmdl> and from state and tribal water quality agencies.

If you are the operator of the construction activity and eligible for a waiver based on compliance with an EPA-established or approved TMDL, you must provide the following information in order to be waived from permitting requirements:

1. Name, address and telephone number of the construction site operator(s);
2. Name (or other identifier), address, county or similar governmental subdivision, and latitude/longitude of the construction project or site;
3. Estimated construction start and completion (i.e., final stabilization) dates, and total acreage (to the nearest quarter acre) to be disturbed;
4. The name of the waterbody(s) that would be receiving stormwater discharges from your construction project;
5. The name and approval date of the TMDL;
6. A statement, signed and dated by an authorized representative as provided in Appendix I, Subsection I.11, that certifies that the construction activity will take place and that the stormwater discharges will occur, within the drainage area addressed by the TMDL.

C.3 Equivalent Analysis Waiver

This waiver is available for discharges to non-impaired waters only. The operator can develop an equivalent analysis that determines allocations for his/her small construction site for the pollutant(s) of concern or determines that such allocations are not needed to protect water quality. This waiver requires a small construction operator to develop an equivalent analysis based on existing in-stream concentrations, expected growth in pollutant concentrations from all sources, and a margin of safety.

If you are a construction operator who wants to use this waiver, you must develop your equivalent analysis and provide the following information to be waived from permitting requirements:

1. Name, address and telephone number of the construction site operator(s);

2. Name (or other identifier), address, county or similar governmental subdivision, and latitude/longitude of the construction project or site;
3. Estimated construction start and completion (i.e., final stabilization) dates, and total acreage (to the nearest quarter acre) to be disturbed;
4. The name of the waterbody(s) that would be receiving stormwater discharges from your construction project;
5. Your equivalent analysis;
6. A statement, signed and dated by an authorized representative as provided in Appendix I, Subsection I.11, that certifies that the construction activity will take place and that the stormwater discharges will occur, within the drainage area addressed by the equivalent analysis.

C.4 Waiver Deadlines and Submissions

1. Waiver certifications must be submitted prior to commencement of construction activities.
2. If you submit a TMDL or equivalent analysis waiver request, you are not waived until EPA approves your request. As such, you may not commence construction activities until receipt of approval from EPA.
3. Late Notifications: Operators are not prohibited from submitting waiver certifications after initiating clearing, grading, excavation activities, or other construction activities. The Agency reserves the right to take enforcement for any unpermitted discharges that occur between the time construction commenced and waiver authorization is granted.

Submittal of a waiver certification is an optional alternative to obtaining permit coverage for discharges of stormwater associated with small construction activity, provided you qualify for the waiver. Any discharge of stormwater associated with small construction activity not covered by either a permit or a waiver may be considered an unpermitted discharge under the Clean Water Act. As mentioned above, EPA reserves the right to take enforcement for any unpermitted discharges that occur between the time construction commenced and either discharge authorization is granted or a complete and accurate waiver certification is submitted. EPA may notify any operator covered by a waiver that they must obtain NPDES permit coverage. EPA may notify any operator who has been in non-compliance with a waiver that they may no longer use the waiver for future projects. Any member of the public may petition EPA to take action under this provision by submitting written notice along with supporting justification.

Complete and accurate TMDL or equivalent analysis waiver requests must be sent to the applicable EPA Regional Office address specified in Appendix B.

Appendix D - Eligibility Procedures Relating to Threatened and Endangered Species Protection

In accordance with Part 1.1.5 of the CGP, you must follow the procedures in this appendix to determine your eligibility under one of the criteria in Part D.1 of this appendix with respect to the protection of federally listed threatened or endangered species and federally designated "critical habitat" [hereinafter "threatened and endangered species"] under the Endangered Species Act (ESA) from discharges and discharge-related activities authorized under this permit. If you do not meet one of these criteria, you are not eligible for coverage under this permit.

While coordination between you and the U.S. Fish and Wildlife Service (USFWS) and/or the National Marine Fisheries Service (NMFS) (together, the "Services") is not necessarily required in all cases, EPA encourages you to coordinate with the Services, to document that coordination, and to do so early in the planning process prior to submitting your NOI.

This appendix is organized as follows:

- **Part D.1:** Threatened and Endangered Species Protection Eligibility Criteria
- **Part D.2:** Procedures for Determining Which Threatened and Endangered Species Protection Criteria Applies

D.1 Threatened and Endangered Species Protection Eligibility Criteria

You must certify in your NOI that you meet one of the eligibility criteria listed below in order to be eligible for coverage under this permit. Once you determine the applicable eligibility criterion, you must:

- Specify the basis for your selection of the applicable eligibility criterion, and if required, provide documentation that is the basis for your determination with the NOI form; and
- Provide documentation in your SWPPP that is sufficient to support your determination that you satisfy the requirements of the applicable criterion.

The definition of "action area," which is contained in Appendix A, is repeated below for convenience.

"Action Area" – all areas to be affected directly or indirectly by the federal action and not merely the immediate area involved in the action. For the purposes of this permit and for application of the Endangered Species Act requirements, the following areas are included in the definition of action area:

- The areas on the construction site where stormwater discharges originate and flow toward the point of discharge into the receiving waters (including areas where excavation, site development, or other ground disturbance activities occur) and the immediate vicinity. (Example: Where bald eagles nest in a tree that is on or bordering a construction site and could be disturbed by the construction activity or where grading causes stormwater to flow into a small wetland or other habitat that is on the site that contains listed species.)
- The areas where stormwater discharges flow from the construction site to the point of discharge into receiving waters. (Example: Where stormwater flows into a ditch, swale, or gully that leads to receiving waters and where listed species (such as listed amphibians) are found in the ditch, swale, or gully.)
- The areas where stormwater from construction activities discharge into receiving waters and the areas in the immediate vicinity of the point of discharge. (Example: Where stormwater from construction activities discharges into a stream segment that is known to harbor listed aquatic species.)
- The areas where stormwater controls will be constructed and operated, including any areas where stormwater flows to and from the stormwater controls. (Example: Where a stormwater retention pond would be built.)

Criterion A. No ESA-listed species and/or designated critical habitat present in action area. Using the process outlined in Appendix D of this permit, 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 this permit.

Basis statement content: A basis statement supporting the selection of this criterion should identify the USFWS and NMFS information sources used. Attaching aerial image(s) of the site to this NOI is helpful to EPA, USFWS, and NMFS in confirming eligibility under this criterion. Please Note: NMFS' jurisdiction includes ESA-listed marine and estuarine species that spawn in inland rivers.

Criterion B. Eligibility requirements met by another operator under the 2017 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 2017 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 2017CGP operator's notification of authorization under this permit. If your certification is based on another 2017 CGP operator's certification under criterion C, you must provide EPA with the relevant supporting information required of existing dischargers in criterion C in your NOI form.

Basis statement content: A basis statement supporting the selection of this criterion should identify the eligibility criterion of the other CGP NOI, the authorization date, and confirmation that the authorization is effective.

Criterion C. Discharges not likely to adversely affect 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 adversely affect 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 adversely affect 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 adverse effects to ESA-listed species will be avoided from the discharges and discharge-related activities. You must also include a copy of your site map from your SWPPP showing the upland and in-water extent of your "action area" with this NOI.

Basis statement content: A basis statement supporting the selection of this criterion should identify the information resources and expertise (e.g., state or federal biologists) used to arrive at this conclusion. Any supporting documentation should explicitly state that both ESA-listed species and designated critical habitat under the jurisdiction of the USFWS and/or NMFS were considered in the evaluation.

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 concurrence from USFWS and/or NMFS that your site's discharges and discharge-related activities are not likely to adversely affect listed species and/or critical habitat. You must include copies of the correspondence with the participating agencies in your SWPPP and this NOI.

Basis statement content: A basis statement supporting the selection of this criterion should identify whether USFWS or NMFS or both agencies participated in coordination, the field office/regional office(s) providing that coordination, and the date that coordination concluded.

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. The consultation must have addressed the effects of the construction site's discharges and discharge-related activities on ESA-listed species and/or designated critical habitat under the jurisdiction of USFWS and/or NMFS. To certify eligibility under this criterion, Indicate the result of the consultation:

- I. biological opinion from USFWS and/or NMFS that concludes that the action in question (taking into account the effects of your site's discharges and discharge-related activities) is not likely to jeopardize the continued existence of listed species, nor the destruction or adverse modification of critical habitat; or
- II. written concurrence from USFWS and/or NMFS with a finding that the site's discharges and discharge-related activities are not likely to adversely affect ESA-listed species and/or designated critical habitat.

You must include copies of the correspondence between yourself and the USFWS and/or NMFS in your SWPPP and this NOI.

Basis statement content: A basis statement supporting the selection of this criterion should identify the federal action agency(ies) involved, the field office/regional office(s) providing that consultation, any tracking numbers of identifiers associated with that consultation (e.g., IPaC number, PCTS number), and the date the consultation was completed.

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.

Basis statement content: A basis statement supporting the selection of this criterion should identify whether USFWS or NMFS or both agencies provided a section 10 permit, the field office/regional office(s) providing permit(s), any tracking numbers of identifiers associated with that consultation (e.g., IPaC number, PCTS number), and the date the permit was granted.

You must comply with any applicable terms, conditions, or other requirements developed in the process of meeting the eligibility criteria in this section to remain eligible for coverage under this permit. Documentation of these requirements must be kept as part of your SWPPP (see Part 7.2.9.a).

NMFS will, within 14 days of submission of the NOI, advise EPA whether it believes the planned discharges meet the eligibility criteria of not likely to adversely affect NMFS Listed Resources of Concern, whether the eligibility criterion could be met with additional conditions; or whether the eligibility criterion is not met. With respects to ESA issues, EPA recognizes NMFS expertise and will carefully consider NMFS' determination in identifying eligibility for authorization, either with or without additional conditions. In the event NMFS has placed a hold on your NOI, EPA will notify you as to whether your discharges are authorized or whether an individual permit will be required. If you do not hear from EPA within 14 days, you may assume that your discharge is authorized without further conditions.

D.2 Procedures for Determining Which Threatened and Endangered Species Protection Criterion Applies

You must follow the procedures in this Part to determine the criterion listed above under which your site is eligible for permit coverage.

D.2.1 Step 1 - Determine if Your Discharges and Discharge-Related Activities Were Already Addressed in Another Operator's Valid Certification that Included Your Action Area.

- **If your discharges and discharge-related activities were already addressed in another operator's valid certification that included your action area** (e.g., a general contractor or developer may have completed and filed an NOI for the entire action area with the necessary ESA certifications (Criterion A, C, D, E, or F)), *you may select eligibility Criterion B on your NOI form.*

By certifying eligibility under Criterion B, you must comply with any terms and conditions imposed under the eligibility requirements of the criterion for which the other operator has established eligibility (either Criterion A, C, D, E, or F) to ensure that your discharges and discharge-related activities are protective of listed species and/or critical habitat.

Note: If you are unable to meet these eligibility requirements, then you may either establish eligibility under one of the other criterion, or you may consider applying to EPA for an individual permit.

Under Criterion B, you must provide documentation in your SWPPP of any of these terms and conditions, as well as the other operator's basis for establishing eligibility. You must also provide a description of the basis for your selection of Criterion B on your NOI form, including the eligibility criterion (A, C, D, E, or F) that was certified to by the other operator, and must provide the NPDES ID from the other operator's notification of authorization under this permit.

If your certification is based on another operator's certification under criterion C, you must provide the documentation required in the NOI for criterion C, namely: 1) what federally listed species and/or designated habitat are located in your "action area"; and 2) the distance between your site and the listed species or designated critical habitat (in miles).

- **If discharges and discharge-related activities from your site were not addressed in another operator's valid certification that included your action area**, you must follow the applicable procedures in Steps 2 through 5 below.

D.2.2 Step 2 - Determine if Listed Threatened or Endangered Species or their Designated Critical Habitat(s) are Likely to Occur in your Site's Action Area

You must determine, to the best of your knowledge, whether species listed as either threatened or endangered, or their critical habitat(s) (see definitions of these terms in Appendix A), are located in your site's action area. To make this determination, you should first determine if listed species and/or critical habitat are expected to exist in your county or township. The U.S. Fish and Wildlife Service and National Marine Fisheries Service maintain lists of federally listed endangered or threatened species on their internet sites.

- For National Marine Fisheries Service species and critical habitat information, use the following webpages, which provide up-to-date information on listed species (<http://www.nmfs.noaa.gov/pr/species/esa/>) and critical habitat (<http://www.nmfs.noaa.gov/pr/species/criticalhabitat.htm>). To determine the field office that corresponds to your site, go to <http://www.nmfs.noaa.gov/> (under the left tab for "Regions").

For National Marine Fisheries Service species in the Greater Atlantic Region, go to <https://www.greateratlantic.fisheries.noaa.gov/protected/index.html>.

- For Fish and Wildlife Service species information, use the on-line mapping tool IPaC (the Information, Planning, and Consultation System) located at <http://ecos.fws.gov/ipac/>, and follow these steps:
 - Select Get Started
 - Select Enter Project Location
 - Use an address, city name or other location to zoom into your project area
 - Use the zoom feature to see the entire extent of your action area on the screen
 - Use one of the mapping features (e.g., Polygon or line feature) to draw your action
- When you are done, press *Continue*.
- Select Request an Official Species List
- Complete the fields on the Official Species List Request page, and include "(CGP)" at the end of the project description. – For Classification, select "Water Quality Modification".
- Select the appropriate requesting agency/organization type (for most dischargers, this should be "Other").
- Submit the request to acquire an Official Species List, which should show both listed species as well as any designated critical habitat that are present in the action area in the previous step.
- *Note: If a link to an Official Species List is not available on the page, follow the web link of the office(s) indicated, or contact the office directly by mail or phone if a web link is not shown.*
- ***If listed species and/or critical habitat may exist in your action area, you must do one or more of the following:***
 - Conduct visual inspections. This method may be particularly suitable for construction sites that are smaller in size or located in non-natural settings such as highly urbanized areas or industrial parks where there is little or no natural habitat, or for construction activities that discharge directly into municipal stormwater collection systems.
 - Conduct a formal biological survey. In some cases, particularly for larger construction sites with extensive stormwater discharges, biological surveys may be an appropriate way to assess whether species are located in the action area and whether there are likely to be adverse effects to such species. Biological surveys are frequently performed by environmental consulting firms.
 - If required, conduct an environmental assessment under the National Environmental Policy Act (NEPA). Some construction activities might require review under NEPA for specific reasons, such as federal funding or other federal involvement in the project. Note: Coverage under the CGP does not trigger such a review for individual projects/sites. EPA has complied with NEPA in the issuance of the CGP.

and

- o Follow the instructions in Steps 3 – 5 below, as applicable. Note that many but not all measures imposed to protect listed species under these steps will also protect critical habitat. Thus, meeting the eligibility requirements of this CGP may require measures to protect critical habitat that are separate from those to protect listed species.
- ***If there are no listed species and no critical habitat areas in your action area, you may check eligibility criterion A on your NOI form.*** You must also provide a description of the basis for the criterion selected on your NOI form and provide documentation supporting the criterion selected in your SWPPP.

D.2.3 Step 3 - Determine if the Construction Activity's Discharges or Discharge-Related Activities Are Likely to Adversely Affect Listed Threatened or Endangered Species or Designated Critical Habitat

If in Step 2 you determine that listed species and/or critical habitat could exist in your action area, you must next assess whether your discharges or discharge-related activities are likely to adversely affect listed threatened or endangered species or designated critical habitat.

Potential adverse effects from discharges and discharge-related activities include:

- *Hydrological.* Stormwater discharges may cause siltation, sedimentation, or induce other changes in receiving waters such as temperature, salinity, or pH. These effects will vary with the amount of stormwater discharged and the volume and condition of the receiving water. Where a stormwater discharge constitutes a minute portion of the total volume of the receiving water, adverse hydrological effects are less likely. Construction activity itself may also alter drainage patterns on a site where construction occurs that can impact listed species or critical habitat.
- *Habitat.* Excavation, site development, grading, and other surface disturbance activities from construction activities, including the installation or placement of stormwater controls, may adversely affect listed species or their habitat. Stormwater may drain or inundate listed species habitat.
- *Toxicity.* In some cases, pollutants in stormwater may have toxic effects on listed species.

The scope of effects to consider will vary with each site. If you are having difficulty determining whether your project is likely to adversely affect listed species or critical habitat, or one of the Services has already raised concerns to you, you should contact the appropriate Services office for assistance.

- ***If adverse effects to listed threatened or endangered species or their critical habitat are not likely, then you may select eligibility criterion C on the NOI form.*** You must provide the following specific information on your NOI form: 1) the federally listed species and/or designated habitat are located in your "action area"; and 2) the distance between your site and the listed species or designated critical habitat (in miles). You must also provide a copy of your site map with your NOI.
- ***If adverse effects to listed threatened or endangered species or their critical habitat are likely, you must follow Step 4 below.***

D.2.4 Step 4 - Determine if Measures Can Be Implemented to Avoid Adverse Effects

If you make a preliminary determination in Step 3 that adverse effects from your construction activity's discharges or discharge-related activities are likely to occur, you can still receive coverage under eligibility criterion C of the CGP if appropriate measures are undertaken to avoid or eliminate the likelihood of adverse effects prior to applying for CGP coverage.

These measures may involve relatively simple changes to construction activities such as re-routing a stormwater discharge to bypass an area where species are located, relocating stormwater controls, or by modifying the "footprint" of the construction activity. If you are unable to ascertain which measures to implement to avoid the likelihood of adverse effects, you must coordinate or enter into consultation with the Fish and Wildlife Service and/or National Marine Fisheries Service, in which case you would not be eligible for coverage under eligibility criterion C, but may instead be eligible for coverage under eligibility criterion D, E, or F (described in more detail in Step 5).

- **If you are able to install and implement appropriate measures to avoid the likelihood of adverse effects, then you may check eligibility criterion C on the NOI form.** The measures you adopt to avoid or eliminate adverse effects must be implemented for the duration of the construction project and your coverage under the CGP. You must also provide a description of the basis for the criterion selected, and the following specific information on your NOI form: 1) the federally listed species and/or designated habitat are located in your "action area"; and 2) the distance between your site and the listed species or designated critical habitat (in miles).
- **If you cannot ascertain which measures to implement to avoid the likelihood of adverse effects, you must follow the procedures in Step 5.**

D.2.5 Step 5 - Determine if the Eligibility Requirements of Criterion D, E, or F Can Be Met

If in Step 4 you cannot ascertain which measures to implement to avoid the likelihood of adverse effects, you must contact the Fish and Wildlife Service and/or the National Marine Fisheries Service. You may still be eligible for CGP coverage if likely adverse effects can be addressed through meeting criterion D, E, or F.

- **Criterion D:** Coordination between you and the Services has concluded. The coordination must have addressed the effects of your site's discharges and discharge-related activities on federally-listed threatened or endangered species and federally-designated critical habitat, and resulted in a written concurrence from the relevant Service(s) that your site's discharges and discharge-related activities are not likely to adversely affect listed species or critical habitat.

If you have met the requirements of criterion D, *you may select eligibility criterion D on the NOI form.* You must provide a description of the basis for the criterion selected on your NOI form and must include copies of the correspondence between you and the applicable Service in your SWPPP.

- **Criterion E:** Consultation between a Federal Agency and the U.S. Fish and Wildlife Service and/or the National Marine Fisheries Service under section 7 of the ESA has concluded. The consultation must have addressed the effects of the construction site's discharges and discharge-related activities on federally-listed threatened or endangered species and federally-designated critical habitat. The result of this consultation must be either (1) a biological opinion that concludes that the action in question (taking into account the effects of your site's discharges and discharge-related activities) is not likely to jeopardize the

continued existence of listed species, nor the destruction or adverse modification of critical habitat; or (2) written concurrence from the applicable Service(s) with a finding that the site's discharges and discharge-related activities are not likely to adversely affect federally-listed species or federally-designated habitat.

For more information on section 7 consultation, see 50 CFR §402. If you receive a "jeopardy opinion," you may continue to work with the Fish and Wildlife Service and/or National Marine Fisheries Service and your permitting authority to modify your project so that it will not jeopardize listed species or designated critical habitat.

Note that most consultations are accomplished through informal consultation. When conducting informal ESA section 7 consultation as a non-federal representative, you must follow the procedures found in 50 CFR Part 402 of the ESA regulations. You must notify the Services of your intention and agreement to conduct consultation as a non-federal representative.

Consultation may also occur in the context of another federal action at the construction site (e.g., where ESA section 7 consultation was performed for issuance of a wetlands dredge and fill permit for the project or where a NEPA review is performed for the project that incorporates a section 7 consultation).

Any terms and conditions developed through consultations to protect listed species and critical habitat must be incorporated into the SWPPP. As noted above, operators may, if they wish, initiate consultation with the Services at Step Four.

Whether ESA section 7 consultation must be performed with either the Fish and Wildlife Service, National Marine Fisheries Service, or both Services depends on the listed species that may be affected by the operator's activity. In general, the National Marine Fisheries Service has jurisdiction over marine, estuarine, and anadromous species. Operators should also be aware that while formal section 7 consultation provides protection from incidental takings liability, informal consultation does not.

If you have met the requirements of criterion E, *you may select eligibility criterion E on the NOI form*. You must provide a description of the basis for the criterion selected on your NOI form and must include copies of the correspondence between yourself and the Services in your SWPPP.

- **Criterion F:** Your construction activities are authorized through the issuance of a permit under section 10 of the ESA, and this authorization addresses the effects of the site's discharges and discharge-related activities on federally-listed species and federally-designated critical habitat.

You must follow Fish and Wildlife Service and/or National Marine Fisheries Service procedures when applying for an ESA section 10 permit (see 50 CFR §17.22(b)(1) for Fish and Wildlife Service and §222.22 for National Marine Fisheries Service). Application instructions for section 10 permits can be obtained from <http://www.fws.gov> and <http://www.nmfs.noaa.gov> or by contacting the appropriate Service office.

If you have met the requirements of criterion F, *you may select eligibility criterion F on the NOI form*. You must provide a description of the basis for the criterion selected on your NOI form and must include copies of the correspondence between yourself and the Services in your SWPPP.

Appendix E – Historic Property Screening Process

Background

Section 106 of the National Historic Preservation Act (NHPA) requires Federal agencies to take into account the effects of Federal “undertakings”, such as the issuance of this permit, on historic properties that are either listed on, or eligible for listing on, the National Register of Historic Places. To address any issues relating to historic properties in connection with the issuance of this permit, EPA developed the screening process in this appendix that enables construction operators to appropriately consider the potential impacts, if any, of their installation of stormwater controls on historic properties and to determine whether actions can be taken, if applicable, to mitigate any such impacts. Although the coverages of individual construction sites under this permit do not constitute separate Federal undertakings, the screening process in this appendix provides an appropriate site-specific means of addressing historic property issues in connection with EPA’s issuance of the permit.

Key Terms

Historic property- prehistoric or historic districts, sites, buildings, structures, or objects that are included in or eligible for inclusion in the National Register of Historic Places, including artifacts, records, and remains that are related to and located within such properties

SHPO – The State Historic Preservation Officer for a particular state

THPO or Tribal representative – The Tribal Historic Preservation Officer for a particular tribe or, if there is no THPO, the representative designated by such tribe for NHPA purposes

Instructions for All Construction Operators

You are required to follow the screening process in this appendix to determine if your installation of stormwater controls on your site has the potential to cause effects to historic properties, and whether or not you need to contact your SHPO, THPO, or other tribal representative for further information. **You may not submit your NOI until you have completed this screening process.** The following four steps describe how applicants can meet the historic property requirements under this permit:

Step 1 *Are you installing any stormwater controls that require subsurface earth disturbance?*¹

The first step of the screening process is to determine if you will install stormwater controls that cause subsurface earth disturbance. The installation of the following types of stormwater controls require subsurface earth disturbance:²

- Dikes
- Berms
- Catch Basins
- Ponds
- Ditches

¹ You are only required to consider earth-disturbing activities related to the installation of stormwater controls in the NHPA screening process. You are not required to consider other earth-disturbing activities at the site. If you are installing one of the above stormwater controls or another type of control that requires subsurface earth disturbance, your stormwater controls have the potential to have an effect on historic properties. If this is the case, then you must proceed to Step 2.

² This list is not intended to be exhaustive. Other stormwater controls that are not on this list may involve earth-disturbing activities and must also be examined for the potential to affect historic properties.

- Trenches
- Culverts
- Channels
- Perimeter Drains
- Swales

If you are not installing one of the above stormwater controls or another type of control that requires subsurface earth disturbance, then you may indicate this on your NOI, and no further screening is necessary. During the 14-day waiting period after submitting your NOI, the SHPO, THPO, or other tribal representative may request that EPA hold up authorization based on concerns about potential adverse effects to historic properties. EPA will evaluate any such request and notify you if any additional controls to address adverse effects to historic properties are necessary.

Step 2 *Have prior professional cultural resource surveys or other evaluations determined that historic properties do not exist, or have prior disturbances precluded the existence of historic properties?*

If you are installing a stormwater control that requires subsurface earth disturbance, you must next determine if no historic properties exist on your site based on prior professional cultural resource surveys or other evaluations, or if the existence of historic properties has been precluded because of prior earth disturbances.

If prior to your project it has already been determined that no historic properties exist at your site based on available information, including information that may be provided by your applicable SHPO, THPO, or other tribal representative, then you may indicate this on your NOI, and no further screening steps are necessary. Similarly, if prior earth disturbances have eliminated the possibility that historic properties exist on your site, you may indicate this on your NOI, and no further screening steps are necessary. After submitting your NOI, and during the 14-day waiting period, the SHPO, THPO, or other tribal representative may request that EPA hold up authorization based on concerns about potential adverse effects to historic properties. EPA will evaluate any such request and notify you if any additional measures to address adverse effects to historic properties are necessary.

If neither of these circumstances exists for your project, you must proceed to Step 3.

Step 3 *If you are installing any stormwater controls that require subsurface earth disturbance, you must determine if these activities will have an effect on historic properties.*

If your answer to the question in Step 2 is "no", then you must assess whether your earth-disturbing activities related to the installation of stormwater controls will have an effect on historic properties. This assessment may be based on historical sources, knowledge of the area, an assessment of the types of earth-disturbing activities you are engaging in, considerations of any controls and/or management practices you will adopt to ensure that your stormwater control-related earth-disturbing activities will not have an effect on historic properties, and any other relevant factors. If you determine based on this assessment that earth disturbances related to the installation of your stormwater controls will have no effect on historic properties, you may indicate this on your NOI, and document the basis for your determination in your SWPPP, and no further screening steps are necessary. After submitting your NOI, and during the 14-day waiting period, the SHPO, THPO, or other tribal representative may request that EPA hold up authorization based on concerns about potential adverse effects to historic properties. EPA will evaluate any such request and notify you if any additional measures to address adverse effects to historic properties are necessary.

If none of the circumstances in Steps 1 - 3 exist for your project, you must proceed to Step 4.

Step 4: *If you are installing any stormwater controls that require subsurface earth disturbance and you have not satisfied the conditions in Steps 1 - 3, you must contact and consult with the appropriate historic preservation authorities.*

Where you are installing stormwater controls that require subsurface earth disturbance, and you cannot determine in Step 3 that these activities will have no effect on historic properties, then you must contact the relevant SHPO, THPO, or other tribal representative to request their views as to the likelihood that historic properties are potentially present on your site and may be impacted by the installation of these controls.

Note: Addresses for SHPOs and THPOs may be found on the Advisory Council on Historic Preservation's website (www.achp.gov/programs.html). If a tribe does not have a THPO, you should contact the appropriate tribal government office designated by the tribe for this purpose.

You must submit the following minimum information in order to properly initiate your request for information:

1. Project name (*i.e.*, the name or title most commonly associated with your project);
2. A narrative description of the project;
3. Name, address, phone and fax number, and email address (if available) of the operator;
4. Most recent U.S. Geological Survey (USGS) map section (7.5 minute quadrangle) showing actual project location and boundaries clearly indicated; and
5. Sections of the SWPPP site map (see Part 7.2.4) that show locations where stormwater controls that will cause subsurface earth disturbance will be installed (see Step 1).

Without submitting this minimum information, you will not have been considered to have properly initiated your request. You will need to provide the SHPO, THPO, or other tribal representative **a minimum of 15 calendar days** after they receive these materials to respond to your request for information about your project.

If you do not receive a response within 15 calendar days after receipt by the SHPO, THPO, or other tribal representative of your request, then you may indicate this on your NOI, and no further screening steps are necessary. Or, if the applicable SHPO, THPO, or other tribal representative responds to your request with an indication that no historic properties will be affected by the installation of stormwater controls at your site, then you may indicate this on your NOI, and no further screening steps are necessary. After submitting your NOI, and during the 14-day waiting period, the SHPO, THPO, or other tribal representative may request that EPA hold up authorization based on concerns about potential adverse effects to historic properties. EPA will evaluate any such request and notify you if any additional measures to address adverse effects to historic properties are necessary.

If within 15 calendar days of receipt of your request the applicable SHPO, THPO, or other tribal representative responds with a request for additional information or for further consultation regarding appropriate measures for treatment or mitigation of effects on historic properties caused by the installation of stormwater controls on your site, you must comply with this request and proceed to Step 5.

Step 5: *Consultation with your applicable SHPO, THPO, or other tribal representative.*

If, following your discussions with the appropriate historic preservation authorities in Step 4, the applicable SHPO, THPO, or tribal representative requests additional information or further consultation, you must respond with such information or consult to determine impacts to historic properties that may be caused by the installation of stormwater controls on your site and appropriate measures for treatment or mitigation of such impacts. If as a result of your

discussions with the applicable SHPO, THPO, or tribal representative, you enter into, and comply with, a written agreement regarding treatment and/or mitigation of impacts on your site, then you may indicate this on your NOI, and no further screening steps are necessary.

If, however, agreement on an appropriate treatment or mitigation plan cannot be reached between you and the SHPO, THPO, or other tribal representative within 30 days of your response to the SHPO, THPO, or other tribal representative's request for additional information or further consultation, you may submit your NOI, but you must indicate that you have not negotiated measures to avoid or mitigate such effects. You must also include in your SWPPP the following documentation:

1. Copies of any written correspondence between you and the SHPO, THPO, or other tribal representative; and
2. A description of any significant remaining disagreements as to mitigation measures between you and the SHPO, THPO, or other tribal representative.

After submitting your NOI, and during the 14-day waiting period, the SHPO, THPO, ACHP or other tribal representative may request that EPA place a hold on authorization based upon concerns regarding potential adverse effects to historic properties. EPA, in coordination with the ACHP, will evaluate any such request and notify you if any additional measures to address adverse effects to historic properties are necessary.

Appendix F - List of Tier 3, Tier 2, and Tier 2.5 Waters

EPA's CGP has special requirements for discharges to waters that receive Tier 2, Tier 2.5, or Tier 3 protections for antidegradation purposes. See Parts 1.1.8 and 3.2.

EPA's antidegradation regulation, at 40 CFR 131.12, provides a framework for maintaining and protecting water quality for: (1) existing uses (known as "Tier 1"); (2) high quality waters by establishing a process for authorizing the lowering of water quality where existing water quality exceeds levels needed to support propagation of fish, shellfish, and wildlife and recreation in and on the water (known as "Tier 2"); and (3) for Outstanding National Resource Waters (known as "Tier 3"). While EPA's antidegradation regulation only outlines three levels of antidegradation protection, some states and tribes include an additional level of antidegradation protection between Tier 2 and Tier 3 (sometimes known as "Tier 2.5").

High quality (Tier 2) waters may be identified on a parameter-by-parameter basis or on a water body-by-water body basis consistent with the requirements of 40 CFR 131.12(a)(2). States and tribes using a parameter-by-parameter basis (sometimes called a "pollutant-by-pollutant approach") do not maintain a list of Tier 2 waters, but instead identify a high quality water at the time an entity proposes an activity that would lower water quality. In contrast, states and tribes using a water body-by-water body basis typically identify high quality waters in advance on a list by weighing a variety of factors (e.g., chemical, physical, biological, and other information) to classify a water body's overall quality.

The list below is provided as a resource for operators who must determine whether they discharge to a Tier 2, Tier 2.5, or Tier 3 water. Where available, the table lists waters specifically identified for Tier 2, Tier 2.5, or Tier 3 protection by a water quality standard authority (e.g., a state or tribe). Operators should not assume that a water does not receive Tier 2, Tier 2.5, or Tier 3 protection solely based on the absence of information in this table. Evaluation regarding antidegradation protections for a specific water may need to be done on a case-by-case basis, especially where the state or tribe uses the parameter-by-parameter approach to identify whether water quality is better than necessary to support propagation of fish, shellfish, and wildlife and recreation in and on the water.

Permit Number	Areas of Coverage/Where EPA Is Permitting Authority	
MAR100000	Commonwealth of Massachusetts, except Indian Country lands	
	Tier 2, Tier 2.5, and 3 waters are identified and listed in the Massachusetts Water Quality Standards 314 CMR 4.00. Surface water qualifiers that correspond with Tier classifications are defined at 314 CMR 4.06(1)(d)m and listed in tables and figures at the end of 314 CMR 4.06. See MassDEP's web page at: http://www.mass.gov/eea/agencies/massdep/water/regulations/314-cmr-4-00-mass-surface-water-quality-standards.html . See also: https://www.epa.gov/wqs-tech/water-quality-standards-regulations-massachusetts	
	Tier 2	Listed as "High Quality Waters", and all wetlands that are not designated as an Outstanding Resource Water.
	Tier 2.5	Listed as "Outstanding Resource Water", "Public Water Supply", "Tributary to Public Water Supply", all wetlands bordering Outstanding Resource Waters, and vernal pools.
Tier 3	Defined as "Special Resource Water". Note: No waters have been identified as a Special Resource Water as of the issuance of this permit.	

Permit Number	Areas of Coverage/Where EPA Is Permitting Authority	
NHR100000	State of New Hampshire	
	<p>Tier 2 waters are identified on a parameter-by-parameter basis. Tier 2.5 and 3 waters are identified and listed in the New Hampshire Water Quality Standards CHAPTER Env-Wq 1700. Description of the antidegradation tiers are included at CHAPTER Env-Wq 1708 and listed in the tables at. New dischargers and new sources should contact EPA Region 1's stormwater coordinator found at https://www.epa.gov/npdes/contact-us-stormwater#regional. See also: https://www.epa.gov/wqs-tech/water-quality-standards-regulations-new-hampshire</p>	
	Tier 3	<p>Env-Ws 1708.05(a) Surface waters of national forests and surface waters designated as "natural" under RSA 483:7-a, I shall be considered outstanding resource waters (ORW). "Natural waters" are listed at http://www.gencourt.state.nh.us/rsa/html/L/483/483-15.htm. Surface waters of national forests are not included in an official list. For further questions, new dischargers and new sources should contact EPA Region 1's stormwater coordinator found at https://www.epa.gov/npdes/contact-us-stormwater#regional.</p>
NYR101000	Saint Regis Mohawk Tribe (NY)	
	<p>Tier 2 waters are identified on a parameter-by-parameter basis. There is not a Tier 2.5 classification identified in the Saint Regis Mohawk Tribe Water Quality Standards. New dischargers and new sources should contact EPA Region 2's stormwater coordinator found at https://www.epa.gov/npdes/contact-us-stormwater#regional. See: https://www.epa.gov/sites/production/files/2014-12/documents/stregis-tribe.pdf</p>	
	Tier 3	<p>Outstanding Resource Waters. Those waters designated as such by the Tribe. The Waters that may be considered for designation as Outstanding Resource Waters include, but are not limited to, water bodies that are recognized as: (i) Important because of protection through official action, such as Tribal, Federal or State law, Presidential or secretarial action, international treaty, or interstate compact; (ii) Having exceptional recreational significance; (iii) Having exceptional ecological significance; (iv) Having other special environmental, recreational, religious or ecological attributes; or waters whose designation as Outstanding Resource Waters is reasonably necessary for the protection of other waters so designated. New dischargers and new sources should contact EPA Region 2's stormwater coordinator found at https://www.epa.gov/npdes/contact-us-stormwater#regional.</p>

Permit Number	Areas of Coverage/Where EPA Is Permitting Authority	
PRR100000	Commonwealth of Puerto Rico	
	Tier 2 waters are identified on a parameter-by-parameter basis. There is not a Tier 2.5 classification identified in the Puerto Rico Water Quality Standards. New dischargers and new sources should contact EPA Region 2's stormwater coordinator found at https://www.epa.gov/npdes/contact-us-stormwater#regional . See: https://www.epa.gov/wqs-tech/water-quality-standards-regulations-puerto-rico	
	Tier 3	Tier III waters are those which are classified as either Class SA or Class SE. Class SA waters are defined as "Coastal waters and estuarine waters of high quality and/or exceptional ecological or recreational value whose existing characteristics shall not be altered, except by natural causes, in order to preserve the existing natural phenomena." Class SA waters include bioluminescent lagoons and bays such as La Parguera and Monsio José on the Southern Coast, Bahía de Mosquito in Vieques, and any other coastal or estuarine waters of exceptional quality of high ecological value or recreational which may be designated by Puerto Rico, through Resolution, as requiring this classification for protection of the waters. Class SE waters are defined as "Surface waters and wetlands of exceptional ecological value, whose existing characteristics should not be altered in order to preserve the existing natural phenomena." Class SE waters include Laguna Tortuguero, Laguna Cartagena and any other surface water bodies of exceptional ecological value as may be designated by Puerto Rico through Resolution.
DCR100000	District of Columbia	
	New dischargers and new sources should contact EPA Region 3's stormwater coordinator found at https://www.epa.gov/npdes/contact-us-stormwater#regional . Tier 2.5 waters are identified and listed in the District of Columbia Water Quality Standards. See: https://www.epa.gov/wqs-tech/water-quality-standards-regulations-washington-dc	
	Tier 2.5	Rule 1102.4 SPECIAL WATERS OF THE DISTRICT OF COLUMBIA (SWDC): Any segment or segments of the surface waters of the District that are of water quality better than needed for the current use or have scenic or aesthetic importance shall be designated as Special Waters of the District of Columbia (SWDC). Rock Creek and its tributaries and Battery Kemble Creek and its tributaries are considered Special Waters of the District of Columbia (SWDC) under its antidegradation program.
FLR10I000	Miccosukee Tribe (FL)	
	New dischargers and new sources should contact EPA Region 4's stormwater coordinator found at https://www.epa.gov/npdes/contact-us-stormwater#regional . The Miccosukee Tribe Water Quality Standards includes an additional tier of protection between Tier 2 and 3 that is referred as Tier 2 ¾ for Outstanding Miccosukee Waters. See: https://www.epa.gov/wqs-tech/water-quality-standards-regulations-miccosukee-tribe-indians-florida	

Permit Number	Areas of Coverage/Where EPA Is Permitting Authority	
	Tier 2 ³ / ₄	<p>Outstanding Miccosukee Waters (OMW): The Miccosukee Tribe recognizes that the waters of its Federal Reservation which are contained within Water Conservation Area 3-A and the Miccosukee Reserved Area constitute the Tribe's highest quality waters and must be preserved in as pristine a condition as possible while at the same time allowing for the activities of man. These ecologically important waters are essential to the survival of the Miccosukee Tribe, therefore: The Miccosukee Tribe hereby designates the waters of its Federal Reservation which are contained within Water Conservation Area 3-A (North Grass, South Grass, Gap) and Miccosukee Reserved Area as Class III-A and Outstanding Miccosukee waters (OMW). The North Grass is defined as that area bounded by the northern boundary of the reservation, the eastern edge of the L-28 levee (which is east of the L-28 canal), the southern edge of the C-60 Canal, and the eastern boundary of the reservation. The South Grass is defined as the area bounded by southern edge of the C-60 canal, the eastern boundary of the reservation, the southern boundary of the reservation, the eastern edge of the L-28 canal (which is south of the L-28 Tieback Canal), a line running north from the L-28 Canal (where the L-28 Canal turns northwest to become the L-28 Tieback Canal) until this line intersects the oil pipeline, the center of the oil pipeline until the oil pipeline intercepts the L-28 Interceptor Canal, and the eastern edge of the L-28 levee (which is east of the L-28 Canal). The Gap is defined as that area which is bounded by the southern boundary of the reservation, the western boundary of the reservation, the northeastern edge of the L-28 Interceptor Canal, the oil pipeline which runs generally south from the L-28 Interceptor Canal until the pipeline intercepts a line running north from the L-28 Canal where the L-28 canal turns northwest to become the L-28 Tieback Canal, and the eastern edge of the L-28 canal (which is south of the L-28 Tieback Canal).</p>
	Tier 3	<p>Tier 3: Outstanding Natural Resource Waters (ONRW): Where high quality waters constitute an Outstanding Tribal resource such as waters of parks and wildlife refuges and waters of exceptional ecological and recreational significance, that water quality shall be maintained and protected. These waters shall be designated as Outstanding Natural Resource Waters (ONRW). Currently, no Tribal waters are designated as ONRW.</p>
Seminole Tribe (FL)		
<p>New dischargers and new sources should contact EPA Region 4's stormwater coordinator found at https://www.epa.gov/npdes/contact-us-stormwater#regional. See also: https://www.epa.gov/sites/production/files/2014-12/documents/seminole_floridawqs.pdf</p>		

Permit Number	Areas of Coverage/Where EPA Is Permitting Authority	
MNR10I000	Fond du Lac Band of MN Chippewa	
	Tier 2 waters are identified on a parameter-by-parameter basis. There is not a Tier 2.5 classification identified in the Fond du Lac Band of MN Chippewa Water Quality Standards. New dischargers and new sources should contact EPA Region 5's stormwater coordinator found at https://www.epa.gov/npdes/contact-us-stormwater#regional . See: https://www.epa.gov/wqs-tech/water-quality-standards-regulations-fond-du-lac-band-minnesota-chippewa-tribe	
	Tier 3	Six Lakes are presently identified as Tier 3/Outstanding Reservation Resource Waters (ORRW): (1) Dead Fish Lake; (2) Jaskari Lake; (3) Miller (Mud) Lake; (4) Perch Lake; (5) Rice Portage Lake; (6) Wild Rice Lake.
	Grand Portage Band of MN Chippewa	
	Tier 2 waters are identified on a parameter-by-parameter basis. Two subcategories of protection (referred to as outstanding tribal water resource (OTWR)) exist in the Grand Portage Band of MN Chippewa Water Quality Standards as follows: (a) OTWR-Restricted (lowered water quality may be allowed under limited circumstances); (b) OTWR-Prohibited (Discharges and permanent lowering of water quality are prohibited). New dischargers and new sources should contact EPA Region 5's stormwater coordinator found at https://www.epa.gov/npdes/contact-us-stormwater#regional . See: https://www.epa.gov/wqs-tech/water-quality-standards-regulations-grand-portage-band-minnesota-chippewa-tribe	
	Tier 2	OTWR-Restricted: All waters, not already classified as Tier 3, are high quality Tier 2 waters (see Grand Portage Reservation Water Quality Standards, Section VI & VII, Pages 14-16).
Tier 3	OTWR-Prohibited: "The portion of Lake Superior north of latitude 47 degrees, 57 minutes, 13 seconds, east of Hat Point, south of the Minnesota-Ontario boundary, and west of the Minnesota-Michigan boundary" (see Section VII, Page 16).	
WIR10I000	Bad River Band of Lake Superior Chippewa (WI)	
	Tier 2 waters are identified on a water body-by-water body basis. Tier 2, 2.5, and 3 classifications are included in the Bad River Band of Lake Superior Chippewa Water Quality Standards. See: https://www.epa.gov/wqs-tech/water-quality-standards-regulations-bad-river-band-lake-superior-chippewa-tribe	
	Tier 2	Any surface water not specifically classified as Outstanding Tribal Resource Water or Outstanding Resource Water is classified as Exceptional Resource Water (Anishinaabosibiing).
Tier 2.5	Outstanding Resource Waters: a portion of Bad River, from downstream the confluence with the White River to Lake Superior, White River, Marengo River, Graveyard Creek, Bear Trap Creek, Wood Creek, Brunsweller River, Tyler Forks, Bell Creek, and Vaughn Creek.	

Permit Number	Areas of Coverage/Where EPA Is Permitting Authority	
	Tier 3	Outstanding Tribal Resource Waters: Kakagon Slough and the lower wetland reaches of its tributaries that support wild rice, Kakagon River, Bad River Slough, Honest John Lake, Bog Lake, a portion of Bad River, from where it enters the Reservation through the confluence with the White River, and Potato River.
	Lac du Flambeau Band of the Lake Superior Chippewa	
	Tier 2 waters are identified on a water body-by-water body basis. Tier 2, 2.5, and 3 classifications are included in the Lac du Flambeau Band of the Lake Superior Chippewa Water Quality Standards. See: https://www.epa.gov/wqs-tech/water-quality-standards-regulations-lac-du-flambeau-band-lake-superior-chippewa-tribe	
	Tier 2	All named waters, including wetlands, not specified under an Antidegradation classification are classified as Tribal Resource Water (Tier 2). Unclassified Named Waters (Tier 2): Buckskin Lake; Flambeau Lake; Long (Interlaken) Lake); Marland's Lake (Sec. 13, T40NR4E); Moss Lake; Pokegema Lake.
	Tier 2.5	Exceptional Tribal Resource Waters: Bills Lake, Birch Lake, Bobidosh Lake, Bog Lake (SE SE Sec. 31, T40NR6E), Bolton Lake, Broken Bow Lake, Chewalah Lake, Clear Lake (Sec. 2, T39NR4E), Corn Great, Great, Corn Lake, Little "Least/Lesser", Crawling Stone Lake, Big, Crawling Stone Lake, Little, Crescent Lake, Crooked Lake, Big, David Lake, Ellerson Lake, Middle, Ellerson Lake, West, Elsie Lake "Boundary Lake", Fat Lake, Fence Lake, Gresham Creek, Green Lake (NW NW Sec. 19, T41R6E), Grey Lake, Gunlock Lake, Haskell Lake, Headflyer Lake (Sec. 19, T41NR5E), Highway Lake (NW NW Sec. 19, T41NR5E), Horsehead Lake (SE SW Sec. 9, T40NR5E), Hutton's Creek, Ike Walton Lake, Lily Lake (SE SW Sec. 35, T40NR5E), Little Ten Lake, Lodge Lake "L. Rice" (NW NW Sec. 8, T41NR6E), Lucy Lake, Mindys Lake (Sec. 8, T40NR5E), Minette Lake, Mitten Lake, Monk's Lake (Sec. 13, T40NR5E), Moving Cloud Lake, Mud Creek, Muskesin Lake, Patterson Lake, Placid Twin Lake (North), Placid Twin Lake (South), Plummer Lake, Poupart Lake, Prairie Lake (NE SW Sec. 13, T40NR4E), Raven Lake, Ross Allen Lake, Sand Lake, Little, Scott Lake (Sec. 22, T40N, R4E), Shishebogama Lake, Signal Lake, Snort Lake (Sec. 5, T41N, R6E), Spring Lake "Jerms", Squirrel Lake, Statenaker Lake "Hollow", Stearns Lake "Hourglass", Sugarbush "Hidden Lake" (NW NW Sec. 17, T41NR5E), Sugarbush Creek, Sugarbush Lake, Little, Sugarbush Lake, Lower, Sugarbush Lake, Middle, Sugarbush Lake, Upper, Sunfish Lake, Tippecanoe Lake, Tomahawk River, To-To Tom Lake, Toulsh Lake, Trout River, Warrior Lake, White Sand Lake, Whitefish Lake "Cattail Lake" (Sec. 34, T40N5R), Wishow Lake, Wyandock Lake.
	Tier 3	Outstanding Tribal Resource Waters: Bear River (1st bridge to Reservation boundary), Big Springs (Sec. 25, T40NR4E), Black Lake, Cranberry Lake, Doud Lake, Eagle Lake, Gene Lake, Johnson Springs, Little Trout Lake, Lost Lake (Sect. 1, T41NR4E), Mishonagon Creek, Munnomin (Jesse, Duck) Lake, Negani (Hegani) Lake, Reservation Line Lake, Spring Creek, Tank Lake, Thomas Lake, Wild Rice Lake, Zee Lake.

Permit Number	Areas of Coverage/Where EPA Is Permitting Authority		
NMR100000	<p>State of New Mexico</p>		
	<p>Tier 2 waters are identified on a parameter-by-parameter basis. There is not a Tier 2.5 classification identified in the State of New Mexico Water Quality Standards. New dischargers and new sources should contact EPA Region 6’s stormwater coordinator found at https://www.epa.gov/npdes/contact-us-stormwater#regional. See: https://www.epa.gov/wqs-tech/water-quality-standards-regulations-new-mexico</p>		
	<table border="1"> <tr> <td>Tier 2</td> <td>If you need assistance determining if your discharge is to a Tier 2 waterbody, please contact the NMED Surface Water Quality Bureau’s Stormwater Program at https://www.env.nm.gov/swqb/StormWater/index.html.</td> </tr> </table>	Tier 2	If you need assistance determining if your discharge is to a Tier 2 waterbody, please contact the NMED Surface Water Quality Bureau’s Stormwater Program at https://www.env.nm.gov/swqb/StormWater/index.html .
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<table border="1"> <tr> <td>Tier 3</td> <td>See https://www.env.nm.gov/swqb/ONRW/ for current list of NMED’s Tier 3/Outstanding National Resource Waters. See also New Mexico’s Water Quality Standards at 20.6.4.9.D NMAC.</td> </tr> </table>	Tier 3	See https://www.env.nm.gov/swqb/ONRW/ for current list of NMED’s Tier 3/Outstanding National Resource Waters. See also New Mexico’s Water Quality Standards at 20.6.4.9.D NMAC.	
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NMR101000	<p>Ohkay Owingeh (NM) (formerly the Pueblo of San Juan)</p>		
	<p>New dischargers and new sources should contact EPA Region 6’s stormwater coordinator found at https://www.epa.gov/npdes/contact-us-stormwater#regional. See also: https://www.epa.gov/wqs-tech/water-quality-standards-regulations-ohkay-owingeh-pueblo-formerly-pueblo-san-juan</p>		
	<p>Pueblo of Acoma (NM)</p>		
	<p>New dischargers and new sources should contact EPA Region 6’s stormwater coordinator found at https://www.epa.gov/npdes/contact-us-stormwater#regional. See also: https://www.epa.gov/wqs-tech/water-quality-standards-regulations-pueblo-acoma</p>		
	<p>Pueblo of Isleta (NM)</p>		
	<p>New dischargers and new sources should contact EPA Region 6’s stormwater coordinator found at https://www.epa.gov/npdes/contact-us-stormwater#regional. See also: https://www.epa.gov/wqs-tech/water-quality-standards-regulations-pueblo-isleta</p>		
	<p>Pueblo of Nambe (NM)</p>		
	<p>New dischargers and new sources should contact EPA Region 6’s stormwater coordinator found at https://www.epa.gov/npdes/contact-us-stormwater#regional. See also: https://www.epa.gov/wqs-tech/water-quality-standards-regulations-pueblo-nambe</p>		
<p>Pueblo of Picuris (NM)</p>			
<p>New dischargers and new sources should contact EPA Region 6’s stormwater coordinator found at https://www.epa.gov/npdes/contact-us-stormwater#regional. Tier 2, 2.5, and 3 classifications are included in the Pueblo of Picuris Water Quality Standards. See: https://www.epa.gov/wqs-tech/water-quality-standards-regulations-pueblo-picuris</p>			

Permit Number	Areas of Coverage/Where EPA Is Permitting Authority
	Pueblo of Pojoaque (NM)
	New dischargers and new sources should contact EPA Region 6’s stormwater coordinator found at https://www.epa.gov/npdes/contact-us-stormwater#regional . See also: https://www.epa.gov/wqs-tech/water-quality-standards-regulations-pueblo-pojoaque
	Pueblo of Sandia (NM)
	New dischargers and new sources should contact EPA Region 6’s stormwater coordinator found at https://www.epa.gov/npdes/contact-us-stormwater#regional . See also: https://www.epa.gov/wqs-tech/water-quality-standards-regulations-pueblo-sandia
	Pueblo of Santa Ana (NM)
	New dischargers and new sources should contact EPA Region 6’s stormwater coordinator found at https://www.epa.gov/npdes/contact-us-stormwater#regional . See also: https://www.epa.gov/wqs-tech/water-quality-standards-regulations-pueblo-santa-ana
	Pueblo of Santa Clara (NM)
	New dischargers and new sources should contact EPA Region 6’s stormwater coordinator found at https://www.epa.gov/npdes/contact-us-stormwater#regional . See also: https://www.epa.gov/wqs-tech/water-quality-standards-regulations-pueblo-santa-clara
	Pueblo of Taos (NM)
	New dischargers and new sources should contact EPA Region 6’s stormwater coordinator found at https://www.epa.gov/npdes/contact-us-stormwater#regional . See also: https://www.epa.gov/wqs-tech/water-quality-standards-regulations-pueblo-taos
Tier 3 Outstanding Tribal Resource Waters: Mountain Lakes; Mountain Streams & Springs;	
Pueblo of Tesuque (NM)	
New dischargers and new sources should contact EPA Region 6’s stormwater coordinator found at https://www.epa.gov/npdes/contact-us-stormwater#regional . See also: https://www.epa.gov/wqs-tech/water-quality-standards-regulations-pueblo-tesuque	
COR10I000	Ute Mountain Ute Tribe Tier 2 waters are identified on a parameter-by-parameter basis. There is not a Tier 2.5 classification identified in the Ute Mountain Ute Tribe Water Quality Standards. New dischargers and new sources should contact EPA Region 8’s stormwater coordinator found at https://www.epa.gov/npdes/contact-us-stormwater#regional . See also:

Permit Number	Areas of Coverage/Where EPA Is Permitting Authority				
	<p>https://www.epa.gov/wqs-tech/water-quality-standards-regulations-ute-mountain-ute-tribe</p> <table border="1"> <tr> <td>Tier 3</td> <td>Outstanding Tribal Resource Waters: 1. Ute Spring and unnamed creek from Ute Spring downstream within Section 12, TWP35N R18W (Colorado). 2. Allen Canyon Creek, Sections 17, 20, 29, 30, 31, TWP 35S, R21E (Utah) 3. "Lopez" Spring and unnamed creek tributary to and downstream from the spring, within Section 35, TWP 34N, R18W</td> </tr> </table>	Tier 3	Outstanding Tribal Resource Waters: 1. Ute Spring and unnamed creek from Ute Spring downstream within Section 12, TWP35N R18W (Colorado). 2. Allen Canyon Creek, Sections 17, 20, 29, 30, 31, TWP 35S, R21E (Utah) 3. "Lopez" Spring and unnamed creek tributary to and downstream from the spring, within Section 35, TWP 34N, R18W		
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MTR10I000	<p>Assiniboine and Sioux Tribes of the Fort Peck Indian Reservation (MT)</p> <p>Tier 2 waters are identified on a water body-by-water body basis. There is not a Tier 2.5 classification identified in the Assiniboine and Sioux Tribes of the Fort Peck Indian Reservation Water Quality Standards. New dischargers and new sources should contact EPA Region 8's stormwater coordinator found at https://www.epa.gov/npdes/contact-us-stormwater#regional. See also: https://www.epa.gov/wqs-tech/water-quality-standards-regulations-assiniboine-and-sioux-tribes-fort-peck-indian</p> <table border="1"> <tr> <td>Tier 2</td> <td>Most Tribal Waters will qualify as Tier 2 waters. Unless the water body is not attaining the Clean Water Act Section 101(a)(2) goals, the water body has received an OTRW designation, or there is no assimilative capacity for pollutants to protect existing and designated uses, it is likely that the water body will receive Tier 2 protection.</td> </tr> </table> <p>Confederated Salish and Kootenai Tribes of the Flathead Reservation (MT)</p> <p>Tier 2 waters are identified on a water body-by-water body basis. There is not a Tier 2.5 classification identified in the Confederated Salish and Kootenai Tribes of the Flathead Reservation Water Quality Standards. New dischargers and new sources should contact EPA Region 8's stormwater coordinator found at https://www.epa.gov/npdes/contact-us-stormwater#regional. See also: https://www.epa.gov/wqs-tech/water-quality-standards-regulations-confederated-salish-and-kootenai-tribes-flathead</p> <table border="1"> <tr> <td>Tier 3</td> <td>The following are Tier 3 waters: All waters located within Tribally designated primitive or wilderness areas.</td> </tr> </table> <p>Northern Cheyenne (MT)</p> <p>Tier 2 waters are identified on a water body-by-water body basis. There is not a Tier 2.5 classification identified in the Northern Cheyenne Water Quality Standards. New dischargers and new sources should contact EPA Region 8's stormwater coordinator found at https://www.epa.gov/npdes/contact-us-stormwater#regional. See also: https://www.epa.gov/wqs-tech/water-quality-standards-regulations-northern-cheyenne-tribe-northern-cheyenne-reservation</p>	Tier 2	Most Tribal Waters will qualify as Tier 2 waters. Unless the water body is not attaining the Clean Water Act Section 101(a)(2) goals, the water body has received an OTRW designation, or there is no assimilative capacity for pollutants to protect existing and designated uses, it is likely that the water body will receive Tier 2 protection.	Tier 3	The following are Tier 3 waters: All waters located within Tribally designated primitive or wilderness areas.
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Tier 3	The following are Tier 3 waters: All waters located within Tribally designated primitive or wilderness areas.				
ASR100000	<p>Island of American Samoa</p> <p>New dischargers and new sources should contact EPA Region 9's stormwater coordinator found at https://www.epa.gov/npdes/contact-us-stormwater#regional. See also: https://www.epa.gov/sites/production/files/2014-12/documents/aswqs.pdf</p>				

Permit Number	Areas of Coverage/Where EPA Is Permitting Authority		
AZR10I000	<p>Hopi Tribe (AZ)</p>		
	<p>Tier 2 waters are identified on a parameter-by-parameter basis. There is not a Tier 2.5 classification identified in the Hopi Tribe Water Quality Standards. New dischargers and new sources should contact EPA Region 9's stormwater coordinator found at https://www.epa.gov/npdes/contact-us-stormwater#regional. See also: https://www.epa.gov/wqs-tech/water-quality-standards-regulations-hopi-tribe</p>		
	<table border="1"> <tr> <td>Tier 3</td> <td>Unique Waters: In the Moencopi Wash watershed, from Blue Canyon Springs to the confluence of Begashibito Wash.</td> </tr> </table>	Tier 3	Unique Waters: In the Moencopi Wash watershed, from Blue Canyon Springs to the confluence of Begashibito Wash.
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	<p>Hualapai Indian Tribe (AZ)</p>		
	<p>Tier 2 waters are identified on a parameter-by-parameter basis. There is not a Tier 2.5 classification identified in the Hualapai Indian Tribe Water Quality Standards. New dischargers and new sources should contact EPA Region 9's stormwater coordinator found at https://www.epa.gov/npdes/contact-us-stormwater#regional. See also: https://www.epa.gov/wqs-tech/water-quality-standards-regulations-hualapai-tribe</p>		
	<table border="1"> <tr> <td>Tier 3</td> <td>Segments assigned as Tier 3: Spencer; Meriwhitica; Willow Spring; Upper Milkweed Spring; Bridge Canyon; Travertine Spring; Travertine Falls; Diamond Creek; Diamond Creek Spring; Blue Mountain; Metuck; Peach Springs Spring; Westwater; Clay Tank; Hockey Puck; Pocamote Spring; Mohawk Spring; Granite Spring; Three Spring; Warm Spring; Honga Spring; National Canyon Spring; National Canyon; Moss Spring.</td> </tr> </table>	Tier 3	Segments assigned as Tier 3: Spencer; Meriwhitica; Willow Spring; Upper Milkweed Spring; Bridge Canyon; Travertine Spring; Travertine Falls; Diamond Creek; Diamond Creek Spring; Blue Mountain; Metuck; Peach Springs Spring; Westwater; Clay Tank; Hockey Puck; Pocamote Spring; Mohawk Spring; Granite Spring; Three Spring; Warm Spring; Honga Spring; National Canyon Spring; National Canyon; Moss Spring.
	Tier 3	Segments assigned as Tier 3: Spencer; Meriwhitica; Willow Spring; Upper Milkweed Spring; Bridge Canyon; Travertine Spring; Travertine Falls; Diamond Creek; Diamond Creek Spring; Blue Mountain; Metuck; Peach Springs Spring; Westwater; Clay Tank; Hockey Puck; Pocamote Spring; Mohawk Spring; Granite Spring; Three Spring; Warm Spring; Honga Spring; National Canyon Spring; National Canyon; Moss Spring.	
<p>Navajo Nation (AZ, NM, UT)</p>			
<p>New dischargers and new sources should contact EPA Region 9's stormwater coordinator found at https://www.epa.gov/npdes/contact-us-stormwater#regional. See also: https://www.epa.gov/wqs-tech/water-quality-standards-regulations-navajo-nation</p>			
<p>White Mountain Apache Tribe (AZ)</p>			
<p>Tier 2 waters are identified on a water body-by-water body basis. Tier classifications are identified in Appendix B of the White Mountain Apache Tribe Water Quality Standards. New dischargers and new sources should contact EPA Region 9's stormwater coordinator found at https://www.epa.gov/npdes/contact-us-stormwater#regional. See also: https://www.epa.gov/wqs-tech/water-quality-standards-regulations-white-mountain-apache-tribe</p>			

Permit Number	Areas of Coverage/Where EPA Is Permitting Authority	
	Tier 2	<p>High Quality Waters: East Fork White River, above R52 Road; Paradise Creek, above Wohlenberg; Ord Creek; Smith Cienega; Bull Cienega; Smith Creek; Big Bonito; Tonto Creek, below Y47 Crossing; Crooked Creek; Boggy Creek; Little Bonito Creek, above Y55 Crossing; Flash Creek; Squaw Creek; Hurricane Lake; Hurricane Creek; Hughey Creek; Bonito Cienega; West Fork Black River; Hall Cienega; Purcell Cienega; Thompson Creek; Cibecue Creek in Box Canyon to Salt river; Rock Springs Creek; Willow Creek (Lower Canyon Cr.).</p> <p>Sensitive Waters (treated the same manner as Tier 2): East Fork White River below R52 Road, above Rock Cr; Lofer Cienega Creek; Carrizo Creek above Corduroy; Cedar Creek; Big Canyon (E. Cedar Creek); Middle Cedar Creek; West Cedar Creek; Cibecue Creek, Box Canyon up to Confluence with Salt Creek; Spring Creek; Salt Creek; Cibecue Creek, from confluence w/Salt Cr. To Big Springs; Cibecue Creek, above Big Springs; Salt Draw; Canyon Creek S. of Chediski Farms; Oak Creek; Canyon Creek, N. of Chediski Farms.</p>
	Tier 3	<p>Outstanding Waters: East Fork White River, in Wilderness area; Pumpkin Lake.</p>
CAR10I000	Big Pine Band of Owens Valley (CA)	
	<p>New dischargers and new sources should contact EPA Region 9's stormwater coordinator found at https://www.epa.gov/npdes/contact-us-stormwater#regional. See also: https://www.epa.gov/wqs-tech/water-quality-standards-regulations-big-pine-paiute-tribe-owens-valley</p>	
	Hoop Valley Tribe (CA)	
	<p>New dischargers and new sources should contact EPA Region 9's stormwater coordinator found at https://www.epa.gov/npdes/contact-us-stormwater#regional. See also: https://www.epa.gov/wqs-tech/water-quality-standards-regulations-hoop-valley-tribe</p>	
	Paiute-Shoshone Indians of the Bishop Community (CA)	
<p>New dischargers and new sources should contact EPA Region 9's stormwater coordinator found at https://www.epa.gov/npdes/contact-us-stormwater#regional. See also: https://www.epa.gov/wqs-tech/water-quality-standards-regulations-bishop-paiute-tribe</p>		
Twenty-Nine Palms (CA)		
<p>New dischargers and new sources should contact EPA Region 9's stormwater coordinator found at https://www.epa.gov/npdes/contact-us-stormwater#regional. See also: https://www.epa.gov/wqs-tech/water-quality-standards-regulations-twenty-nine-palms-band-mission-indians</p>		

Permit Number	Areas of Coverage/Where EPA Is Permitting Authority	
GUR100000	Island of Guam	
	New dischargers and new sources should contact EPA Region 9's stormwater coordinator found at https://www.epa.gov/npdes/contact-us-stormwater#regional . See also: https://www.epa.gov/sites/production/files/2014-12/documents/aswqs.pdf	
JAR100000	Johnston Atoll	
	New dischargers and new sources should contact EPA Region 9's stormwater coordinator found at https://www.epa.gov/npdes/contact-us-stormwater#regional	
MPR100000	Commonwealth of the Northern Mariana Islands	
	New dischargers and new sources should contact EPA Region 9's stormwater coordinator found at https://www.epa.gov/npdes/contact-us-stormwater#regional . See also: https://www.epa.gov/sites/production/files/2014-12/documents/aswqs.pdf	
MWR100000	Midway Island and Wake Island	
	New dischargers and new sources should contact EPA Region 9's stormwater coordinator found at https://www.epa.gov/npdes/contact-us-stormwater#regional	
NVR100001	Pyramid Lake Paiute (NV)	
	New dischargers and new sources should contact EPA Region 9's stormwater coordinator found at https://www.epa.gov/npdes/contact-us-stormwater#regional . See also: https://www.epa.gov/wqs-tech/water-quality-standards-regulations-pyramid-lake-paiute-tribe	
IDR100000	State of Idaho	
	Tier 2 waters are identified on a water body-by-water body basis. There is not a Tier 2.5 classification identified in the State of Idaho Water Quality Standards. New dischargers and new sources should contact EPA Region 10's stormwater coordinator found at https://www.epa.gov/npdes/contact-us-stormwater#regional . See also: https://www.epa.gov/wqs-tech/water-quality-standards-regulations-idaho	
	<table border="1"> <tr> <td>Tier 2 and Tier 3</td> <td>For Tier 2 and Tier 3 waters, please consult the most recent approved version of Idaho's Idaho Integrated Report, available at: http://www.deq.idaho.gov/water-quality/surface-water/monitoring-assessment/integrated-report/ and the closest regional office of the Idaho Department of Environmental Quality: http://www.deq.idaho.gov/regional-offices-issues/.</td> </tr> </table>	Tier 2 and Tier 3
Tier 2 and Tier 3	For Tier 2 and Tier 3 waters, please consult the most recent approved version of Idaho's Idaho Integrated Report, available at: http://www.deq.idaho.gov/water-quality/surface-water/monitoring-assessment/integrated-report/ and the closest regional office of the Idaho Department of Environmental Quality: http://www.deq.idaho.gov/regional-offices-issues/ .	
IDR10I000	Coeur D'Alene Tribe (ID)	
	Tier 2 waters are identified on a water body-by-water body basis. There is not a Tier 2.5 classification identified in the Coeur D'Alene Tribe Water Quality Standards. New dischargers and new sources should contact EPA Region 10's stormwater coordinator found at https://www.epa.gov/npdes/contact-us-stormwater#regional . See also: https://www.epa.gov/wqs-tech/water-quality-standards-regulations-coeur-dalene-tribe-indians	

Permit Number	Areas of Coverage/Where EPA Is Permitting Authority
ORR10I000	<p>Confederated Tribes of the Warm Springs Reservation (OR)</p>
	<p>New dischargers and new sources should contact EPA Region 10's stormwater coordinator found at https://www.epa.gov/npdes/contact-us-stormwater#regional. See also: https://www.epa.gov/wqs-tech/water-quality-standards-regulations-confederated-tribes-warm-springs-indian-reservation</p>
	<p>Confederated Tribes of Umatilla (OR)</p>
	<p>New dischargers and new sources should contact EPA Region 10's stormwater coordinator found at https://www.epa.gov/npdes/contact-us-stormwater#regional. See also: https://www.epa.gov/wqs-tech/water-quality-standards-regulations-confederated-tribes-umatilla-indian-reservation-oregon</p>
WAR10I000	<p>Confederated Tribes of the Chehalis Reservation (WA)</p>
	<p>Tier 2 waters are identified on a parameter-by-parameter basis. There is not a Tier 2.5 classification identified in the Confederated Tribes of the Chehalis Reservation Water Quality Standards. New dischargers and new sources should contact EPA Region 10's stormwater coordinator found at https://www.epa.gov/npdes/contact-us-stormwater#regional. https://www.epa.gov/wqs-tech/water-quality-standards-regulations-confederated-tribes-chehalis-reservation</p>
	<p>Confederated Tribes of the Colville Reservation (WA)</p>
	<p>EPA established federal water quality standards for the Confederated Tribes of the Colville Reservation at 40 CFR 131.35. See: https://www.epa.gov/wqs-tech/water-quality-standards-regulations-confederated-tribes-colville-reservation</p>
	<p>Kalispel Indian Community (WA)</p>
	<p>New dischargers and new sources should contact EPA Region 10's stormwater coordinator found at https://www.epa.gov/npdes/contact-us-stormwater#regional. See also: https://www.epa.gov/wqs-tech/water-quality-standards-regulations-kalispel-indian-community-kalispel-reservation</p>
	<p>Lummi Tribe (WA)</p>
	<p>New dischargers and new sources should contact EPA Region 10's stormwater coordinator found at https://www.epa.gov/npdes/contact-us-stormwater#regional. See also: https://www.epa.gov/wqs-tech/water-quality-standards-regulations-lummi-nation</p>
<p>Makah Indian Nation (WA)</p>	
<p>New dischargers and new sources should contact EPA Region 10's stormwater coordinator found at https://www.epa.gov/npdes/contact-us-stormwater#regional. See also: https://www.epa.gov/wqs-tech/water-quality-standards-regulations-makah-indian-nation</p>	

Permit Number	Areas of Coverage/Where EPA Is Permitting Authority
	<p>Port Gamble S’Klallam (WA)</p>
	<p>New dischargers and new sources should contact EPA Region 10’s stormwater coordinator found at https://www.epa.gov/npdes/contact-us-stormwater#regional. See also: https://www.epa.gov/wqs-tech/water-quality-standards-regulations-port-gamble-sklallam-tribe</p>
	<p>Puyallup Tribe of Indians (WA)</p>
	<p>New dischargers and new sources should contact EPA Region 10’s stormwater coordinator found at https://www.epa.gov/npdes/contact-us-stormwater#regional. See also: https://www.epa.gov/wqs-tech/water-quality-standards-regulations-puyallup-tribe-indians</p>
	<p>Spokane Tribe of Indians (WA)</p>
	<p>New dischargers and new sources should contact EPA Region 10’s stormwater coordinator found at https://www.epa.gov/npdes/contact-us-stormwater#regional. See also: https://www.epa.gov/wqs-tech/water-quality-standards-regulations-spokane-tribe-indians</p>

Appendix G – Buffer Requirements

The purpose of this appendix is to assist you in complying with the requirements in Part 2.2.1 of the permit regarding the establishment of natural buffers and/or equivalent sediment controls. This appendix is organized as follows:

G.1 Sites That Are Required to Provide and Maintain Natural Buffers and/or Equivalent Erosion and Sediment controls	2
G.2 Compliance Alternatives and Exceptions	2
G.2.1 Compliance Alternatives	2
G.2.2 Exceptions to the Compliance Alternatives	3
G.2.3 Requirements for Providing and Maintaining Natural Buffers.....	4
G.2.4 Guidance for Providing the Equivalent Sediment Reduction as a 50-foot Buffer.....	7
G.3 Small Residential Lot Compliance Alternatives	11
G.3.1 Small Residential Lot Compliance Alternative Eligibility	11
G.3.2 Small Residential Lot Compliance Alternatives	11

G.1 SITES THAT ARE REQUIRED TO PROVIDE AND MAINTAIN NATURAL BUFFERS AND/OR EQUIVALENT EROSION AND SEDIMENT CONTROLS

The requirement in Part 2.2.1 to provide and maintain natural buffers and/or equivalent erosion and sediment controls applies for any discharges to waters of the U.S. located within 50 feet of your site's earth disturbances. If the water of the U.S. is not located within 50 feet of earth-disturbing activities, Part 2.2.1 does not apply. See Figure G-1.

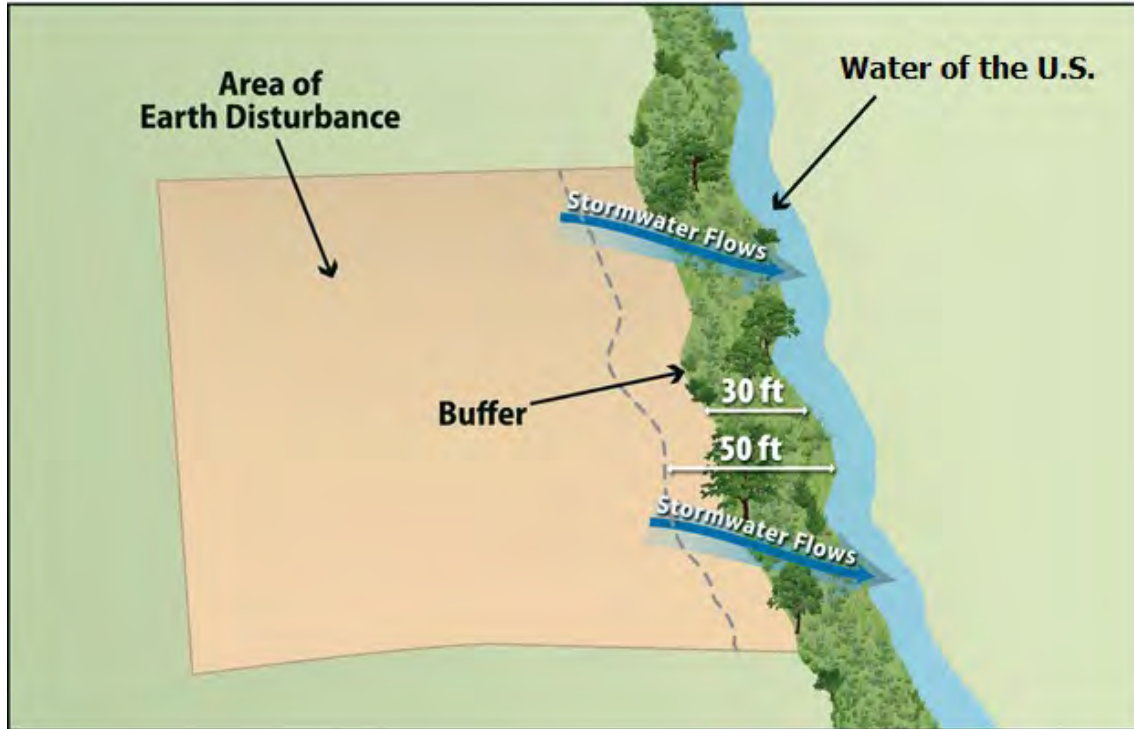


Figure G-1 Example of earth-disturbing activities within 50 feet of a water of the U.S.

G.2 COMPLIANCE ALTERNATIVES AND EXCEPTIONS

G.2.1 Compliance Alternatives

If Part 2.2.1 applies to your site, you have three compliance alternatives from which you can choose, unless you qualify for any of the exceptions (see below and Part 2.2.1.a):

1. Provide and maintain a 50-foot undisturbed natural buffer; or
2. Provide and maintain an undisturbed natural buffer that is less than 50 feet and is supplemented by erosion and sediment controls that achieve the sediment load reduction equivalent to a 50-foot undisturbed natural buffer; or
3. If infeasible to provide and maintain an undisturbed natural buffer of any size, implement erosion and sediment controls to achieve the sediment load reduction equivalent to a 50-foot undisturbed natural buffer. ¹

The compliance alternative selected must be maintained throughout the duration of permit coverage.

See Part G.2.2 below for exceptions to the compliance alternatives.

See Part G.2.3 for requirements applicable to providing and maintaining natural buffers under compliance alternatives 1 and 2 above.

See Part G.2.4 for requirements applicable to providing erosion and sediment controls that achieve the sediment load reduction equivalent to a 50-foot undisturbed natural buffer under compliance alternatives 2 and 3 above.

G.2.2 Exceptions to the Compliance Alternatives

The following exceptions apply to the requirement to implement one of the Part 2.2.1.a compliance alternatives (see also Part 2.2.1.b):

- The following disturbances within 50 feet of a water of the U.S. are exempt from the requirements Part 2.2.1 and this Appendix:
 - Construction approved under a CWA Section 404 permit; or
 - Construction of a water-dependent structure or water access areas (*e.g., pier, boat ramp, trail*).
- If 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, you are not required to comply with the requirements in Part 2.2.1 and this Appendix. This includes situations where you have implemented controls measures, such as a berm or other barrier, that will prevent such discharges.
- Where no natural buffer exists due to preexisting development disturbances (*e.g., structures, impervious surfaces*) that occurred prior to the initiation of planning for the current development of the site, you are not required to comply with the requirements in Part 2.2.1 and this Appendix.

Where some natural buffer exists but portions of the area within 50 feet of the water of the U.S. are occupied by preexisting development disturbances, you are required to comply with the requirements in Part 2.2.1 and this Appendix. For the purposes of calculating the sediment load reduction for either compliance alternative 2 or 3, you are not expected to compensate for the reduction in buffer function that would have resulted from the area covered by these preexisting disturbances. Clarity about how to implement the compliance alternatives for these situations is provided in G.2.3 and G.2.4 below.

If during your project, you will disturb any portion of these preexisting disturbances, the area removed will be deducted from the area treated as a "natural buffer."

- For "linear construction sites" (see Appendix A), you are not required to comply with this requirement if site constraints (*e.g., limited right-of-way*) make it infeasible to implement one of the Part 2.2.1.a compliance alternatives, provided that, to the extent feasible, you limit disturbances within 50 feet of any waters of the U.S. and/or you provide supplemental erosion and sediment controls to treat stormwater discharges from earth disturbances within 50 feet of the water of the U.S. You must also document in your SWPPP your rationale for why it is infeasible for you to implement one of the Part 2.2.1.a compliance alternatives, and describe any buffer width retained and supplemental erosion and sediment controls installed.
- For "small residential lot" construction (*i.e., 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), you have the option of complying with one of the “small residential lot” compliance alternatives in Part G.3 of this appendix.

Note that you must document in your SWPPP if any disturbances related to any of the above exceptions occurs within the buffer area on your site.

G.2.3 Requirements for Providing and Maintaining Natural Buffers

This part of the appendix applies to you if you choose compliance alternative 1 (50-foot buffer), compliance alternative 2 (a buffer of < 50 feet supplemented by additional erosion and sediment controls that achieve the equivalent sediment load reduction as the 50-foot buffer), or if you are providing a buffer in compliance with one of the “small residential lot” compliance alternatives in Part G.3.

Buffer Width Measurement

Where you are retaining a buffer of any size, the buffer should be measured perpendicularly from any of the following points, whichever is further landward from the water:

1. The ordinary high water mark of the water body, defined as the line on the shore established by fluctuations of water and indicated by physical characteristics such as a clear, natural line impressed on the bank, shelving, changes in the character of soil, destruction of terrestrial vegetation, and/or the presence of litter and debris; or
2. The edge of the stream or river bank, bluff, or cliff, whichever is applicable.

Refer to Figure G-2 and Figure G-3. You may find that specifically measuring these points is challenging if the flow path of the water of the U.S. changes frequently, thereby causing the measurement line for the buffer to fluctuate continuously along the path of the waterbody. Where this is the case, EPA suggests that rather than measuring each change or deviation along the water’s edge, it may be easier to select regular intervals from which to conduct your measurement. For instance, you may elect to conduct your buffer measurement every 5 to 10 feet along the length of the water.

Additionally, note that if earth-disturbing activities will take place on both sides of a water of the U.S. that flows through your site, to the extent that you are establishing a buffer around this water, it must be established on both sides. For example, if you choose compliance alternative 1, and your project calls for disturbances on both sides of a small stream, you would need to retain the full 50 feet of buffer on both sides of the water. However, if your construction activities will only occur on one side of the stream, you would only need to retain the 50-foot buffer on the side of the stream where the earth-disturbance will occur.

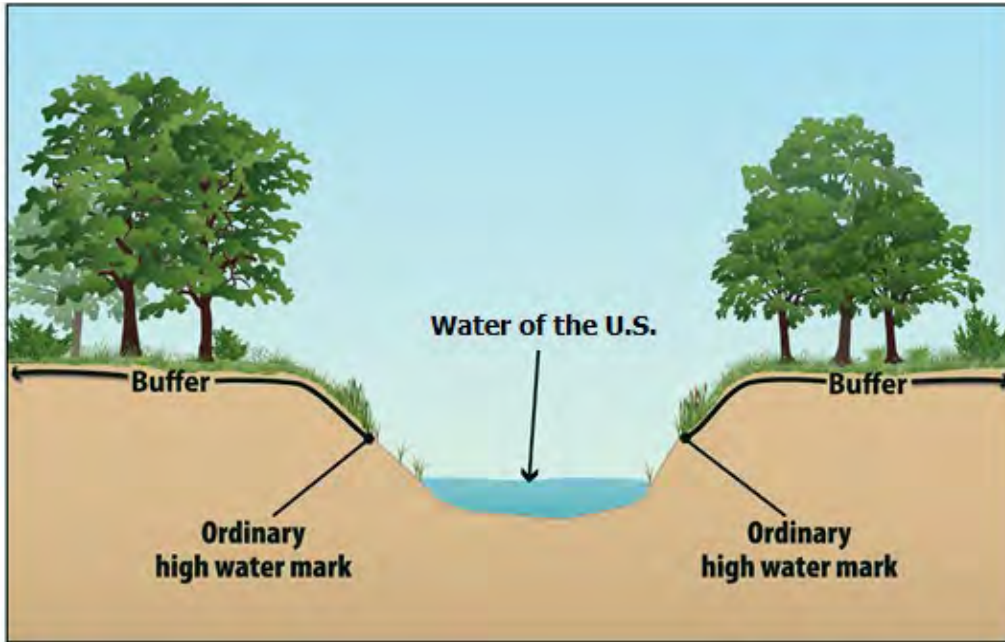


Figure G-2 Buffer measurement from the ordinary high water mark of the water body, as indicated by a clear natural line impressed on the bank, shelving, changes in the character of the soil, destruction of terrestrial vegetation, and/or the presence of litter/debris.

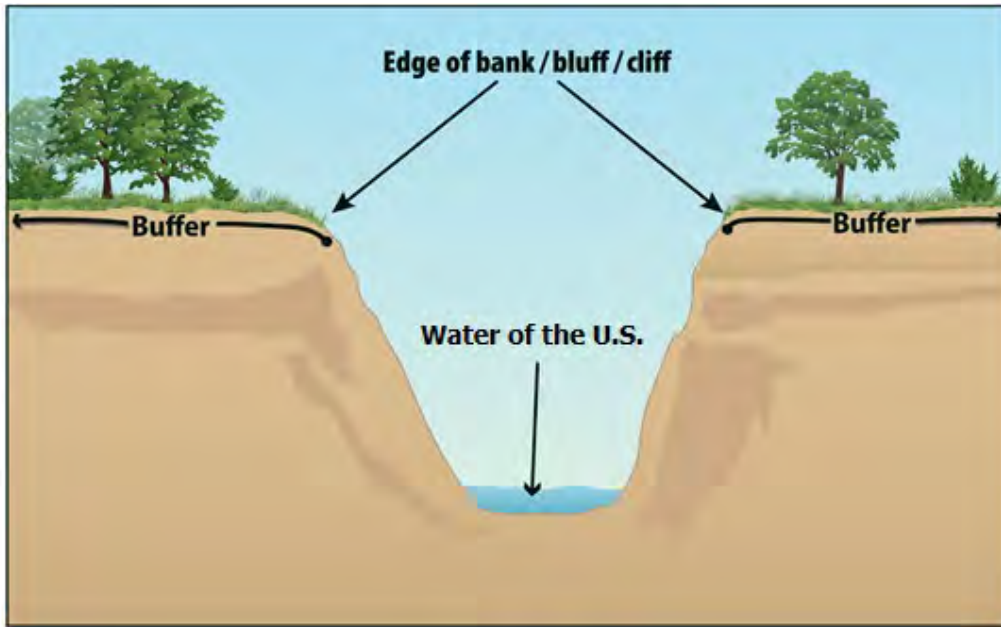


Figure G-3 Buffer measurement from the edge of the bank, bluff, or cliff, whichever is applicable.

Limits to Disturbance Within the Buffer

You are considered to be in compliance with the requirement to provide and maintain a natural buffer if you retain and protect from construction activities the natural buffer that existed prior to the commencement of construction. If the buffer area contains no vegetation prior to the commencement of construction (e.g., sand or rocky surface), you are not required to plant vegetation. As noted above, any preexisting structures or

impervious surfaces may occur in the natural buffer provided you retain and protect from disturbance the buffer areas outside of the preexisting disturbance.

To ensure that the water quality protection benefits of the buffer are retained during construction, you are prohibited from conducting any earth-disturbing activities within the buffer during permit coverage. In furtherance of this requirement, **prior to commencing earth-disturbing activities on your site, you must delineate, and clearly mark off, with flags, tape, or a similar marking device, the buffer area on your site.** The purpose of this requirement is to make the buffer area clearly visible to the people working on your site so that unintended disturbances are avoided.

While you are not required to enhance the quality of the vegetation that already exists within the buffer, you are encouraged to do so where such improvements will enhance the water quality protection benefits of the buffer. (Note that any disturbances within the buffer related to buffer enhancement are permitted and do not constitute construction disturbances.) For instance, you may want to target plantings where limited vegetation exists, or replace existing vegetation where invasive or noxious plant species (see <http://plants.usda.gov/java/noxiousDriver>) have taken over. In the case of invasive or noxious species, you may want to remove and replace them with a diversity of native trees, shrubs, and herbaceous plants that are well-adapted to the climatic, soil, and hydrologic conditions on the site. You are also encouraged to limit the removal of naturally deposited leaf litter, woody debris, and other biomass, as this material contributes to the ability of the buffer to retain water and filter pollutants.

If a portion of the buffer area adjacent to the water of the U.S. is owned by another party and is not under your control, you are only required to retain and protect from construction activities the portion of the buffer area that is under your control. For example, if you comply with compliance alternative 1 (provide and maintain a 50-foot buffer), but 10 feet of land immediately adjacent to the water of the U.S. is owned by a different party than the land on which your construction activities are taking place and you do not have control over that land, you must only retain and protect from construction activities the 40-foot buffer area that occurs adjacent to the property on which your construction activities are taking place. EPA would consider you to be in compliance with this requirement regardless of the activities that are taking place in the 10-foot area that is owned by a different party than the land on which your construction activities are taking place that you have no control over.

Discharges to the Buffer

You must ensure that all discharges from the area of earth disturbance to the natural buffer are first treated by the site's erosion and sediment controls (for example, you must comply with the Part 2.2.3 requirement to install sediment controls along any perimeter areas of the site that will receive pollutant discharges), **and if necessary to prevent erosion caused by stormwater flows within the buffer, you must use velocity dissipation devices.** The purpose of this requirement is to decrease the rate of stormwater flow and encourage infiltration so that the pollutant filtering functions of the buffer will be achieved. To comply with this requirement, construction operators typically will use devices that physically dissipate stormwater flows so that the discharge entering the buffer is spread out and slowed down.

SWPPP Documentation

You are required to document in your SWPPP the natural buffer width that is retained. For example, if you are complying with alternative 1, you must specify in your SWPPP that you are providing a 50-foot buffer. Or, if you will be complying with alternative 2, you must document the reduced width of the buffer you will be retaining (and you must also

describe the erosion and sediment controls you will use to achieve an equivalent sediment reduction, as required in Part G.2.4 below). Note that you must also show any buffers on your site map in your SWPPP consistent with Part 7.2.4.i. Additionally, if any disturbances related to the exceptions in Part G.2.2 occur within the buffer area, you must document this in the SWPPP.

G.2.4 Guidance for Providing the Equivalent Sediment Reduction as a 50-foot Buffer

This part of the appendix applies to you if you choose compliance alternative 2 (provide and maintain a buffer that is less than 50 feet that is supplemented by erosion and sediment controls that achieve the sediment load reduction equivalent to a 50-foot buffer) or compliance alternative 3 (implement erosion and sediment controls to achieve the sediment load reduction equivalent to a 50-foot buffer).

Determine Whether it is Feasible to Provide a Reduced Buffer

EPA recognizes that there will be a number of situations in which it will be infeasible to provide and maintain a buffer of any width. While some of these situations may exempt you from the buffer requirement entirely (see G.2.2), if you do not qualify for one of these exemptions, there still may be conditions or circumstances at your site that make it infeasible to provide a natural buffer. For example, there may be sites where a significant portion of the property on which the earth-disturbing activities will occur is located within the buffer area, thereby precluding the retention of natural buffer areas.

Therefore, you should choose compliance alternative 2 if it is feasible for you to retain some natural buffer on your site. (Note: For any buffer width retained, you are required to comply with the requirements in Part G.2.3, above, concerning the retention of vegetation and restricting earth disturbances.) Similarly, if you determine that it is infeasible to provide a natural buffer of any size during construction, you should choose alternative 3.

Design Controls That Provide Equivalent Sediment Reduction as 50-foot Buffer

You must next determine what additional controls must be implemented on your site that, alone or in combination with any retained natural buffer, achieve a reduction in sediment equivalent to that achieved by a 50-foot buffer.

Note that if only a portion of the natural buffer is less than 50 feet, you are only required to implement erosion and sediment controls that achieve the sediment load reduction equivalent to the 50-foot buffer for discharges through that area. You would not be required to provide additional treatment of stormwater discharges that flow through 50 feet or more of natural buffer. See Figure G-4.

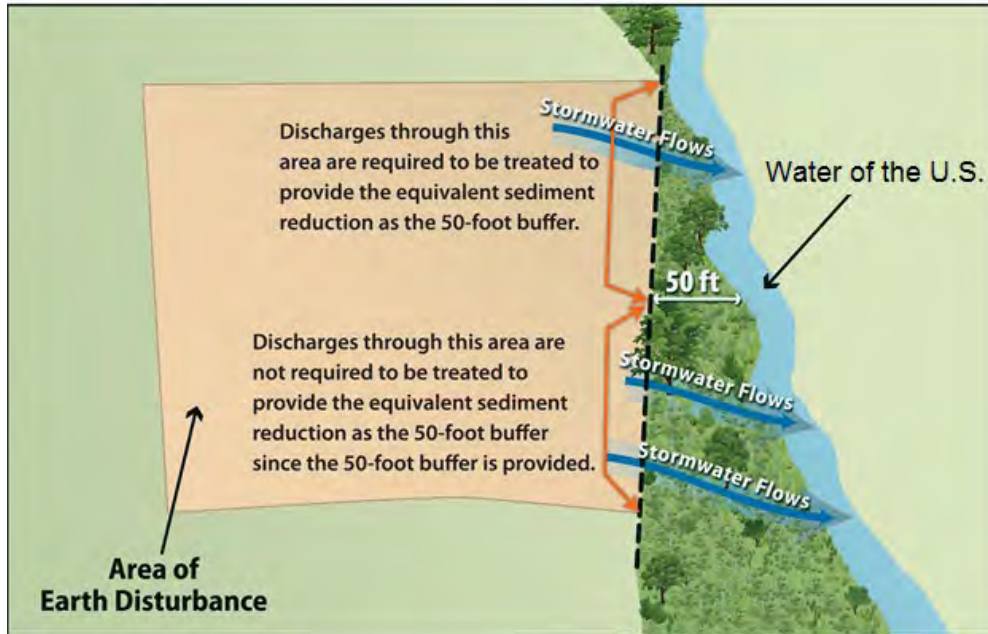


Figure G-4 Example of how to comply with the requirement to provide the equivalent sediment reduction when only a portion of your earth-disturbances discharge to a buffer of less than 50-feet.

Steps to help you meet compliance alternative 2 and 3 requirements are provided below.

Step 1 - Estimate the Sediment Reduction from the 50-foot Buffer

In order to design controls that match the sediment removal efficiency of a 50-foot buffer, you first need to know what this efficiency is for your site. The sediment removal efficiencies of natural buffers vary according to a number of site-specific factors, including precipitation, soil type, land cover, slope length, width, steepness, and the types of erosion and sediment controls used to reduce the discharge of sediment prior to the buffer. EPA has simplified this calculation by developing buffer performance tables covering a range of vegetation and soil types for the areas covered by the CGP. See Attachment 1 of this Appendix, Tables G-8 through G-15. Note: buffer performance values in Tables G-8 through G-15 represent the percent of sediment captured through the use of perimeter controls (e.g., silt fences) and 50-foot buffers at disturbed sites of fixed proportions and slopes.¹

¹ EPA used the following when developing the buffer performance tables:

- The sediment removal efficiencies are based on the U.S. Department of Agriculture's RUSLE2 ("Revised Universal Soil Loss Equation 2") model for slope profiles using a 100-foot long denuded slopes.
- Sediment removal was defined as the annual sediment delivered at the downstream end of the 50-foot natural buffer (tons/yr/acre) divided by the annual yield from denuded area (tons/yr/acre).
- As perimeter controls are also required by the CGP, sediment removal is in part a function of the reduction due to a perimeter control (i.e., silt fence) located between the disturbed portion of the site and the upstream edge of the natural buffer and flow traveling through a 50-foot buffer of undisturbed natural vegetation.
- It was assumed that construction sites have a relatively uniform slope without topographic features that accelerate the concentration for erosive flows.

Using Tables G-8 through G-15 (see Attachment 1 of this Appendix), you can determine the sediment removal efficiency of a 50-foot buffer for your geographic area by matching the vegetative cover type that best describes your buffer area and the type of soils that predominate at your site. For example, if your site is located in Massachusetts (Table G-9), and your buffer vegetation corresponds most closely with that of tall fescue grass, and the soil type at your site is best typified as sand, your site's sediment removal efficiency would be 81 percent.

In this step, you should choose the vegetation type in the tables that most closely matches the vegetation that would exist naturally in the buffer area on your site regardless of the condition of the buffer. However, because you are not required to plant any additional vegetation in the buffer area, in determining what controls are necessary to meet this sediment removal equivalency in Step 2 below, you will be able to take credit for this area as a fully vegetated "natural buffer."

Similarly, if a portion of the buffer area adjacent to the water of the U.S. is owned by another party and is not under your control, you can treat the area of land not under your control as having the equivalent vegetative cover and soil type that predominates on the portion of the property on which your construction activities are occurring.

For example, if your earth-disturbances occur within 50 feet of a water of the U.S., but the 10 feet of land immediately adjacent to the water of the U.S. is owned by a different party than the land on which your construction activities are taking place and you do not have control over that land, you can treat the 10 foot area adjacent to the stream as having the equivalent soil and vegetation type that predominates in the 40 foot area under your control. You would then make the same assumption in Step 2 for purposes of determining the equivalent sediment removal.

Alternatively, you may do your own calculation of the effectiveness of the 50-foot buffer based upon your site-specific conditions, and may use this number as your sediment removal equivalency standard to meet instead of using Tables G-8 through G-15. This calculation must be documented in your SWPPP.

Step 2 - Design Controls That Match the Sediment Removal Efficiency of the 50-foot Buffer

Once you determine the estimated sediment removal efficiency of a 50-foot buffer for your site in Step 1, you must next select stormwater controls that will provide an equivalent sediment load reduction. These controls can include the installation of a single control, such as a sediment pond or additional perimeter controls, or a combination of stormwater controls. Whichever control(s) you select, you must demonstrate in your SWPPP that the controls will provide at a minimum the same sediment removal capabilities as a 50-foot natural buffer (Step 1). You may take credit for the removal efficiencies of your required perimeter controls in your calculation of equivalency, because these were included in calculating the buffer removal efficiencies in Tables G-8 through G-15. (Note: You are reminded that the controls must be kept in effective operating condition until you complete final stabilization on the disturbed portions of the site discharging to the water of the U.S.)

- It was assumed that vegetation has been removed from the disturbed portion of the site and a combination of cuts and fills have resulted in a smooth soil surface with limited retention of near-surface root mass.

To represent the influence of soil, EPA analyzed 11 general soil texture classifications in its evaluation of buffer performance. To represent different types of buffer vegetation, EPA evaluated 4 or more common vegetative types for each state/territory covered under the permit. For each vegetation type evaluated, EPA considered only permanent, non-grazed, and non-harvested vegetation, on the assumption that a natural buffer adjacent to the water of the U.S. will typically be undisturbed. EPA also evaluated slope steepness and found that sediment removal efficiencies present in Tables G-8 through G-15 are achievable for slopes that are less than nine percent.

To make the determination that your controls and/or buffer area achieve an equivalent sediment load reduction as a 50-foot buffer, you should use a model or other type of calculation. As mentioned above, there are a variety of models available that can be used to support your calculation, including USDA's RUSLE-series programs and the WEPP erosion model, SEDCAD, SEDIMOT, or other models. A couple of examples are provided in Attachment 3 to help illustrate how this determination could be made.

If you retain a buffer of less than 50 feet, you may take credit for the removal that will occur from the reduced buffer and only need to provide additional controls to make up the difference between the removal efficiency of a 50 foot buffer and the removal efficiency of the narrower buffer. For example, if you retain a 30 foot buffer, you can account for the sediment removal provided by the 30 foot buffer retained, and you will only need to design controls to make up for the additional removal provided by the 20 feet of buffer that is not being provided. To do this, you would plug the width of the buffer that is retained into RUSLE or another model, along with other stormwater controls that will together achieve a sediment reduction equivalent to a natural 50-foot buffer.

As described in Step 1 above, you can take credit for the area you retained as a "natural buffer" as being fully vegetated, regardless of the condition of the buffer area.

For example, if your earth-disturbances occur 30 feet from a water of the U.S., but the 10 feet of land immediately adjacent to the water of the U.S. is owned by a different party than the land on which your construction activities are taking place and you do not have control over that land, you can treat the 10-foot area as a natural buffer, regardless of the activities that are taking place in the area. Therefore, you can assume (for purposes of your equivalency calculation) that your site is providing the sediment removal equivalent of a 30-foot buffer, and you will only need to design controls to make up for the additional removal provided by the 20-foot of buffer that is not being provided.

Step 3 - Document How Site-Specific Controls Will Achieve the Sediment Removal Efficiency of the 50-foot Buffer

In Steps 1 and 2, you determined both the expected sediment removal efficiency of a 50-foot buffer at your site, and you used this number as a performance standard to design controls to be installed at your site, which alone or in combination with any retained natural buffer, achieves the expected sediment removal efficiency of a 50-foot buffer at your site. The final step is to document in your SWPPP the information you relied on to calculate the equivalent sediment reduction as an undisturbed natural buffer.

EPA will consider your documentation to be sufficient if it generally meets the following:

- For Step 1, refer to the table in Attachment 1 that you used to derive your estimated 50-foot buffer sediment removal efficiency performance. Include information about the buffer vegetation and soil type that predominate at your site, which you used to select the sediment load reduction value in Tables G-8 through G-15. Or, if you conducted a site-specific calculation for sediment removal efficiency, provide the specific removal efficiency, and the information you relied on to make your site-specific calculation.
- For Step 2, (1) Specify the model you used to estimate sediment load reductions from your site; and (2) the results of calculations showing how your controls will meet or exceed the sediment removal efficiency from Step 1.

If you choose compliance alternative 3, you must also include in your SWPPP a description of why it is infeasible for you to provide and maintain an undisturbed natural buffer of any size.

G.3 SMALL RESIDENTIAL LOT COMPLIANCE ALTERNATIVES

EPA has developed two additional compliance alternatives applicable only to “small residential lots” that are unable to provide and maintain a 50 foot buffer.

A **small residential lot** is a lot or grouping of lots being developed for residential purposes that will disturb less than 1 acre of land, but that is part of a larger residential project that will ultimately disturb greater than or equal to 1 acre.

The following steps describe how a small residential lot operator would achieve compliance with one these 2 alternatives.

G.3.1 Small Residential Lot Compliance Alternative Eligibility

In order to be eligible for the small residential lot compliance alternatives, the following conditions must be met:

- a. The lot or grouping of lots meets the definition of “small residential lot”; and
- b. The operator must follow the guidance for providing and maintaining a natural buffer in Part G.2.3 of this Appendix, including:
 - i. Ensure that all discharges from the area of earth disturbance to the natural buffer are first treated by the site’s erosion and sediment controls, and use velocity dissipation devices if necessary to prevent erosion caused by stormwater within the buffer;
 - ii. Document in the SWPPP the natural buffer width retained on the property, and show the buffer boundary on your site plan; and
 - iii. Delineate, and clearly mark off, with flags, tape, or other similar marking device, all natural buffer areas.

G.3.2 Small Residential Lot Compliance Alternatives

You must next choose from one of two small residential lot compliance alternatives and implement the stormwater control practices associated with that alternative.

Note: The compliance alternatives provided below are not mandatory. Operators of small residential lots can alternatively choose to comply with the any of the options that are available to other sites in Part 2.2.1.a and G.2.1 of this Appendix.

Small Residential Lot Compliance Alternative 1

Alternative 1 is a straightforward tiered-technology approach that specifies the controls that a small residential lot must implement based on the buffer width retained. To meet the requirements of small residential lot compliance alternative 1, you must implement the controls specified in Table G-1 based on the buffer width to be retained. See footnote 3, below, for a description of the controls you must implement.

For example, if you are an operator of a small residential lot that will be retaining a 35-foot buffer and you choose Small Residential Lot Compliance Alternative 1, you must implement double perimeter controls between earth disturbances and the water of the U.S.

In addition to implementing the applicable control, you must also document in your SWPPP how you will comply with small residential lot compliance alternative 1.

Table G-1 Alternative 1 Requirements²

Retain 50-foot Buffer	Retain <50 and >30 foot Buffer	Retain ≤ 30 foot Buffer
No Additional Requirements	Double Perimeter Controls	Double Perimeter Controls and 7-Day Site Stabilization

Small Residential Lot Compliance Alternative 2

Alternative 2 specifies the controls that a builder of a small residential lot must implement based on both the buffer width retained and the site's sediment discharge risk. By incorporating the sediment risk, this approach may result in the implementation of controls that are more appropriate for the site's specific conditions.

Step 1 – Determine Your Site's Sediment Risk Level

To meet the requirements of Alternative 2, you must first determine your site's sediment discharge "risk level" based on the site's slope, location, and soil type. To help you to determine your site's sediment risk level, EPA developed five different tables for different slope conditions. You should select the table that most closely corresponds to your site's average slope.

For example, if your site's average slope is 7 percent, you should use Table G-4 to determine your site's sediment risk.

After you determine which table applies to your site, you must then use the table to determine the "risk level" (e.g., "low", "moderate", or "high") that corresponds to your site's location and predominant soil type.³

For example, based on Table G-3, a site located in New Hampshire with a 4 percent average slope and with predominately sandy clay loam soils would fall into the "moderate" risk level.

² Description of Additional Controls Applicable to Small Residential Lot Compliance Alternatives 1 and 2:

- **No Additional Requirements:** If you implement a buffer of 50 feet or greater, then you are not subject to any additional requirements. Note that you are required to install perimeter controls between the disturbed portions of your site and the buffer in accordance with Part 2.2.3.
- **Double Perimeter Control:** In addition to the reduced buffer width retained on your site, you must provide a double row of perimeter controls between the disturbed portion of your site and the water of the U.S. spaced a minimum of 5 feet apart.
- **Double Perimeter Control and 7-Day Site Stabilization:** In addition to the reduced buffer width retained on your site and the perimeter control implemented in accordance with Part 2.2.3, you must provide a double row of perimeter controls between the disturbed portion of your site and the water of the U.S. spaced a minimum of 5 feet apart, and you are required to complete the stabilization activities specified in Parts 2.2.14 within 7 calendar days of the temporary or permanent cessation of earth-disturbing activities.

³ One source for determining your site's predominant soil type is the USDA's Web Soil Survey located at <http://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx>.

Table G-2 Risk Levels for Sites with Average Slopes of ≤ 3 Percent

Soil Type \ Location	Clay	Silty Clay Loam or Clay-Loam	Sand	Sandy Clay Loam, Loamy Sand or Silty Clay	Loam, Silt, Sandy Loam or Silt Loam
CNMI / Guam	Moderate	Moderate	Moderate	Moderate	High
Puerto Rico	Moderate	Moderate	Moderate	Moderate	High
Virgin Islands	Low	Moderate	Low	Moderate	Moderate
American Samoa	Moderate	Moderate	Moderate	Moderate	High
Massachusetts and New Hampshire	Low	Moderate	Low	Low	Moderate
Idaho	Low	Low	Low	Low	Low
New Mexico	Low	Low	Low	Low	Low
Washington D.C.	Low	Moderate	Low	Low	Moderate

Table G-3 Risk Levels for Sites with Average Slopes of > 3 Percent and ≤ 6 Percent

Soil Type \ Location	Clay	Silty Clay Loam or Clay-Loam	Sand	Sandy Clay Loam, Loamy Sand or Silty Clay	Loam, Silt, Sandy Loam or Silt Loam
CNMI / Guam	Moderate	Moderate	Moderate	Moderate	High
Puerto Rico	Moderate	Moderate	Moderate	Moderate	High
Virgin Islands	Moderate	Moderate	Moderate	Moderate	High
American Samoa	High	High	Moderate	High	High
Massachusetts and New Hampshire	Moderate	Moderate	Low	Moderate	High
Idaho	Low	Low	Low	Low	Low
New Mexico	Low	Low	Low	Low	Moderate
Washington D.C.	Moderate	Moderate	Moderate	Moderate	High

Table G-4 Risk Levels for Sites with Average Slopes of > 6 Percent and ≤ 9 Percent

Soil Type \ Location	Clay	Silty Clay Loam or Clay-Loam	Sand	Sandy Clay Loam, Loamy Sand or Silty Clay	Loam, Silt, Sandy Loam or Silt Loam
CNMI / Guam	Moderate	High	Moderate	High	High
Puerto Rico	Moderate	High	Moderate	Moderate	High
Virgin Islands	Moderate	Moderate	Moderate	Moderate	High
American Samoa	High	High	High	High	High
Massachusetts and New Hampshire	Moderate	Moderate	Moderate	Moderate	High
Idaho	Low	Low	Low	Low	Low
New Mexico	Low	Low	Low	Low	Moderate
Washington D.C.	Moderate	Moderate	Moderate	Moderate	High

Table G-5 Risk Levels for Sites with Average Slopes of > 9 Percent and ≤ 15 Percent

Soil Type \ Location	Clay	Silty Clay Loam or Clay-Loam	Sand	Sandy Clay Loam, Loamy Sand or Silty Clay	Loam, Silt, Sandy Loam or Silt Loam
CNMI / Guam	High	High	High	High	High
Puerto Rico	High	High	High	High	High
Virgin Islands	Moderate	High	Moderate	High	High
American Samoa	High	High	High	High	High
Massachusetts and New Hampshire	Moderate	Moderate	Moderate	Moderate	High
Idaho	Low	Low	Low	Low	Low
New Mexico	Low	Moderate	Low	Moderate	Moderate
Washington D.C.	Moderate	High	Moderate	Moderate	High

Table G-6 Risk Levels for Sites with Average Slopes of > 15 Percent

Soil Type Location	Clay	Silty Clay Loam or Clay-Loam	Sand	Sandy Clay Loam, Loamy Sand or Silty Clay	Loam, Silt, Sandy Loam or Silt Loam
CNMI / Guam	High	High	High	High	High
Puerto Rico	High	High	High	High	High
Virgin Islands	High	High	High	High	High
American Samoa	High	High	High	High	High
Massachusetts and New Hampshire	High	High	Moderate	High	High
Idaho	Low	Low	Low	Low	Moderate
New Mexico	Moderate	Moderate	Moderate	Moderate	High
Washington D.C.	High	High	Moderate	High	High

Step 2 – Determine Which Additional Controls Apply

Once you determine your site’s “risk level”, you must next determine the additional controls you need to implement on your site, based on the width of buffer you plan to retain. Table G-7 specifies the requirements that apply based on the “risk level” and buffer width retained. See footnote 3, above, for a description of the additional controls that are required.

For example, if you are the operator of a small residential lot that falls into the “moderate” risk level, and you decide to retain a 20-foot buffer, using Table G-7 you would determine that you need to implement double perimeter controls to achieve compliance with small residential lot compliance alternative 2.

You must also document in your SWPPP your compliance with small residential lot compliance alternative 2.

Table G-7. Alternative 2 Requirements²

Risk Level Based on Estimated Soil Erosion	Retain ≥ 50' Buffer	Retain <50' and >30' Buffer	Retain ≤30' and >10' Buffer	Retain ≤ 10' Buffer
Low Risk	No Additional Requirements	No Additional Requirements	Double Perimeter Control	Double Perimeter Control
Moderate Risk	No Additional Requirements	Double Perimeter Control	Double Perimeter Control	Double Perimeter Control and 7-Day Site Stabilization
High Risk	No Additional Requirements	Double Perimeter Control	Double Perimeter Control and 7-Day Site Stabilization	Double Perimeter Control and 7-Day Site Stabilization

ATTACHMENT 1

Sediment Removal Efficiency Tables⁴

EPA recognizes that very high removal efficiencies, even where theoretically achievable by a 50-foot buffer, may be very difficult to achieve in practice using alternative controls. Therefore in the tables below, EPA has limited the removal efficiencies to a maximum of 90%. Efficiencies that were calculated at greater than 90% are shown as 90%, and this is the minimum percent removal that must be achieved by alternative controls.

Table G-8 Estimated 50-foot Buffer Performance in Idaho*

Type of Buffer Vegetation**	Estimated % Sediment Removal				
	Clay	Silty Clay Loam or Clay-Loam	Sand	Sandy Clay Loam, Loamy Sand or Silty Clay	Loam, Silt, Sandy Loam or Silt Loam
Tall Fescue Grass	42	52	44	48	85
Medium-density Weeds	28	30	28	26	60
Low-density Warm-season Native Bunchgrass (i.e., Grama Grass)	25	26	24	24	55
Northern Mixed Prairie Grass	28	30	28	26	50
Northern Range Cold Desert Shrubs	28	28	24	26	50

* Applicable for sites with less than nine percent slope

** Characterization focuses on the under-story vegetation

Table G-9 Estimated 50-foot Buffer Performance in Massachusetts and New Hampshire*

Type of Buffer Vegetation**	Estimated % Sediment Removal				
	Clay	Silty Clay Loam or Clay-Loam	Sand	Sandy Clay Loam, Loamy Sand or Silty Clay	Loam, Silt, Sandy Loam or Silt Loam
Warm-season Grass (i.e., Switchgrass, Lemongrass)	79	90	90	90	90
Cool-season Dense Grass (Kentucky Bluegrass, Smooth Bromegrass, Timothy)	78	90	90	90	90
Tall Fescue Grass	76	90	81	89	90
Medium-density Weeds	66	76	60	72	66

* Applicable for sites with less than nine percent slope

** Characterization focuses on the under-story vegetation

⁴ The buffer performances were calculated based on a denuded slope upgradient of a 50-foot buffer and a perimeter controls, as perimeter controls are a standard requirement (see Part 2.2.3).

Table G-10 Estimated 50-foot Buffer Performance in New Mexico*

Type of Buffer Vegetation **	Estimated % Sediment Removal				
	Clay	Silty Clay Loam or Clay-Loam	Sand	Sandy Clay Loam, Loamy Sand or Silty Clay	Loam, Silt, Sandy Loam or Silt Loam
Tall Fescue grass	71	85	80	86	90
Medium-density Weeds	56	73	55	66	78
Low-density Warm-season Native Bunchgrass (i.e., Grama Grass)	53	70	51	62	67
Southern Mixed Prairie Grass	53	71	52	63	50
Southern Range Cold Desert Shrubs	56	73	55	65	53

* Applicable for sites with less than nine percent slope

** Characterization focuses on the under-story vegetation

Table G-11 Estimated 50-foot Buffer Performance in Washington, DC*

Type of Buffer Vegetation **	Estimated % Sediment Removal				
	Clay	Silty Clay Loam or Clay-Loam	Sand	Sandy Clay Loam, Loamy Sand or Silty Clay	Loam, Silt, Sandy Loam or Silt Loam
Warm-season Grass (i.e., Switchgrass, Lemongrass)	82	90	90	90	90
Cool-season Dense Grass (Kentucky Bluegrass, Smooth Bromegrass, Timothy)	81	90	90	90	90
Tall Fescue Grass	79	90	83	89	90
Medium-density Weeds	71	79	66	75	74

* Applicable for sites with less than nine percent slope

** Characterization focuses on the under-story vegetation

Table G-12 Estimated 50-foot Buffer Performance in American Samoa*

Type of Buffer Vegetation **	Estimated % Sediment Removal				
	Clay	Silty Clay Loam or Clay-Loam	Sand	Sandy Clay Loam, Loamy Sand or Silty Clay	Loam, Silt, Sandy Loam or Silt Loam
Bahiagrass (Permanent cover)	82	90	90	90	83
Warm-season Grass (i.e., Switchgrass, Lemongrass)	82	90	90	90	85
Dense Grass	82	90	90	90	83
Tall Fescue Grass	82	89	82	89	79
Medium-density Weeds	70	73	62	75	59

* Applicable for sites with less than nine percent slope

** Characterization focuses on the under-story vegetation

Table G-13 Estimated 50-foot Buffer Performance in CNMI and Guam*

Type of Buffer Vegetation **	Estimated % Sediment Removal				
	Clay	Silty Clay Loam or Clay-Loam	Sand	Sandy Clay Loam, Loamy Sand or Silty Clay	Loam, Silt, Sandy Loam or Silt Loam
Bahiagrass (Permanent cover)	80	90	90	90	89
Warm-season Grass (i.e., Switchgrass, Lemongrass)	80	90	90	90	90
Dense Grass	79	90	90	90	89
Tall Fescue Grass	76	90	80	88	87
Medium-density Weeds	63	73	53	68	61

* Applicable for sites with less than nine percent slope

** Characterization focuses on the under-story vegetation

Table G-14 Estimated 50-foot Buffer Performance in Puerto Rico*

Type of Buffer Vegetation**	Estimated % Sediment Removal				
	Clay	Silty Clay Loam or Clay-Loam	Sand	Sandy Clay Loam, Loamy Sand or Silty Clay	Loam, Silt, Sandy Loam or Silt Loam
Bahiagrass (Permanent cover)	83	90	90	90	90
Warm-season Grass (i.e., Switchgrass, Lemongrass)	83	90	90	90	90
Dense Grass	83	90	90	90	90
Tall Fescue Grass	82	90	84	90	89
Medium-density Weeds	72	78	65	76	64

* Applicable for sites with less than nine percent slope

** Characterization focuses on the under-story vegetation

Table G-15 Estimated 50-foot Buffer Performance in Virgin Islands*

Type of Buffer Vegetation**	Estimated % Sediment Removal				
	Clay	Silty Clay Loam or Clay-Loam	Sand	Sandy Clay Loam, Loamy Sand or Silty Clay	Loam, Silt, Sandy Loam or Silt Loam
Bahiagrass (Permanent cover)	85	90	90	90	90
Warm-season Grass (i.e., Switchgrass, Lemongrass)	86	90	90	90	90
Dense Grass	85	90	90	90	90
Tall Fescue Grass	85	90	88	90	89
Medium-density Weeds	75	77	71	78	63

* Applicable for sites with less than nine percent slope

** Characterization focuses on the under-story vegetation

ATTACHMENT 2Using the Sediment Removal Efficiency Tables – Questions and Answers

- *What if my specific buffer vegetation is not represented in Tables G-8 through G-15?* Tables G - 8 through G - 15 provide a wide range of factors affecting buffer performance; however, there are likely instances where the specific buffer vegetation type on your site is not listed. If you do not see a description of the type of vegetation present at your site, you should choose the vegetation type that most closely matches the vegetation type on your site. You can contact your local Cooperative Extension Service Office (<http://nifa.usda.gov/partners-and-extension-map>) for assistance in determining the vegetation type in Tables G-8 through G-15 that most closely matches your site-specific vegetation.
- *What if there is high variability in local soils?* EPA recognizes that there may be a number of different soil type(s) on any given construction site. General soil information can be obtained from USDA soil survey reports (<http://websoilsurvey.nrcs.usda.gov>) or from individual site assessments performed by a certified soil expert. Tables G-8 through G-15 present eleven generic soil texture classes, grouping individual textures where EPA has determined that performance is similar. If your site contains different soil texture classes, you should use the soil type that best approximates the predominant soil type at your site.
- *What if my site slope is greater than 9 percent after final grade is reached?* As indicated in the buffer performance tables, the estimated sediment removal efficiencies are associated with disturbed slopes of up to 9 percent grade. Where your graded site has an average slope of greater than 9 percent, you should calculate a site-specific buffer performance.
- *How do I calculate my own estimates for sediment reduction at my specific site?* If you determine that it is necessary to calculate your own sediment removal efficiency using site-specific conditions (e.g., slopes at your site are greater than 9 percent), you can use a range of available models that are available to facilitate this calculation, including USDA's RUSLE-series programs and the WEPP erosion model, SEDCAD, SEDIMOT, or other equivalent models.
- *What is my estimated buffer performance if my site location is not represented by Tables G-8 through G-15?* If your site is located in an area not represented by Tables G-8 through G-15, you should use the table that most closely approximates conditions at your site. You may instead choose to conduct a site-specific calculation of the buffer performance.
- *What if only a portion of my site drains to the buffer area?* If only a portion of your site drains to a water of the U.S., where that water is within 50 feet of your earth disturbances, you are only required to meet the equivalency requirement for the stormwater flows corresponding to those portions of the site. See Example 2 below for an example of how this is expected to work.

ATTACHMENT 3

Examples of How to Use the Sediment Removal Efficiency Tables

Example 1. Comparatively Wet Location (7.5 acre site located in Massachusetts)

The operator of a 7.5-acre construction site in Massachusetts has determined that it is infeasible to establish a buffer of any size on the site, and is now required to select and install controls that will achieve an equivalent sediment load reduction as that estimated in G-9 for their site conditions. The first step is to identify what percentage of eroded sediment is estimated to be retained from a 50-foot buffer. For this example, it is assumed that the site has a relatively uniform gentle slope (3 percent), so Table G-9 can be used to estimate the 50-foot buffer sediment load reduction. If the site's buffer vegetation is best typified by cool-season dense grass and the underlying soil is of a type best described as loamy sand, the 50-foot buffer is projected to capture 90 percent of eroded sediment from the construction site.

The second step is to determine what sediment controls can be selected and installed in combination with the perimeter controls already required to be implemented at the site (see Part 2.2.3), which will achieve the 90 percent sediment removal efficiency from Table G-9. For this example, using the RUSLE2 profile model, it was determined that installing a pair of shallow-sloped diversion ditches to convey runoff to a well-designed and maintained sediment basin provides 99 percent sediment removal. Because the estimated sediment reduction is greater than the required 90 percent that a 50-foot buffer provides, the operator will have met the buffer requirements. See Figure G-5. The operator could also choose a different set of controls, as long as they achieve at least a 90 percent sediment removal efficiency.

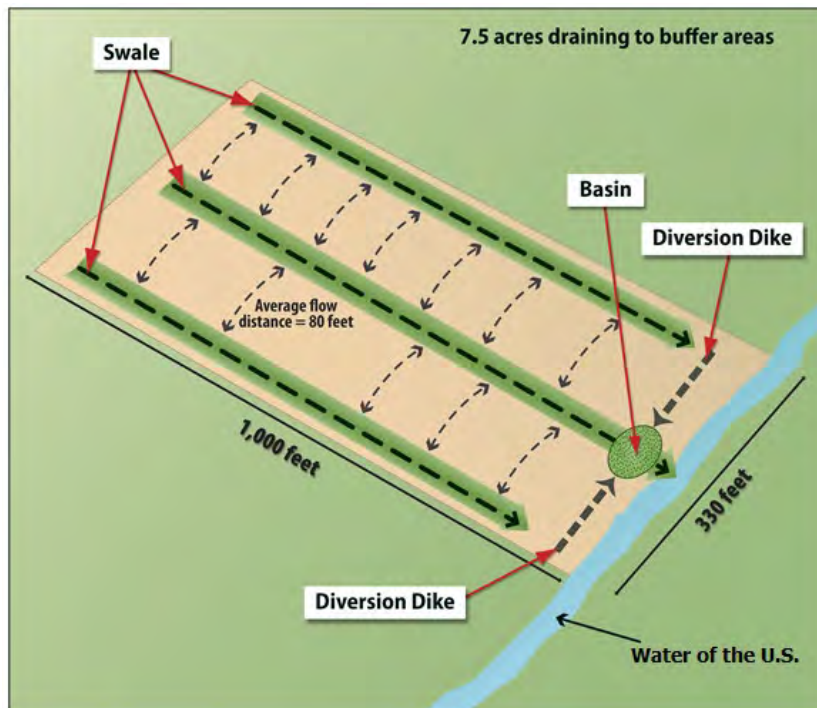


Figure G-5 Example 1 – Equivalent Sediment Load Reductions at a 7.5 ac Site in MA.

Example 2. Arid Location With Pre-existing Disturbances in the Natural Buffer (6.5 acre site located in New Mexico)

An operator of a site in New Mexico determines that it is not feasible to provide a 50-foot buffer, but a 28-foot buffer can be provided. Because the operator will provide a buffer that is less than

50 feet, the operator must determine which controls, in combination with the 28-foot buffer, achieve a sediment load reduction equivalent to the 50-foot buffer. In this example, the project will disturb 6.5 acres of land, but only 1.5 acres of the total disturbed area drains to the buffer area. Within the 28-foot buffer area is a preexisting concrete walkway. Similar to Example 1, the equivalence analysis starts with Step 1 in Part G.2.4 of this Appendix with a review of the New Mexico buffer performance (Table G-10). The operator determines that the predominate vegetation type in the buffer area is prairie grass, the soil type is similar to silt, and the site is of a uniform, shallow slope (e.g., 3 percent grade). Although the operator will take credit for the disturbance caused by the concrete walkway as a natural buffer in Step 2, here the operator can treat the entire buffer area as being naturally vegetated with prairie grass. Based on this information, the operator refers to Table G-10 to estimate that the 50-foot buffer would retain 50 percent of eroded soil.

The second step is to determine, based on the 50 percent sediment removal efficiency found in Table G-10, what sediment controls, in combination with the 28-foot buffer area, can be implemented to reduce sediment loads by 50 percent or more. The operator does not have to account the reduction in buffer function caused by the preexisting walkway, and can take credit for the entire 28-foot buffer being fully vegetated in the analysis. For this example, using the RUSLE2 profile model, the operator determined that installing a fiber roll barrier between the silt fence (already required by Part 2.2.3) and the 28-foot buffer will achieve an estimated 84 percent sediment removal efficiency. See Figure G-6. Note that this operator is subject to the requirement in Part G.2.3 of this Appendix to ensure that discharges through the silt fence, fiber roll barrier, and 28-foot buffer do not cause erosion within the buffer. The estimated sediment reduction is greater than the required 50 percent; therefore the operator will have met the buffer alternative requirement.

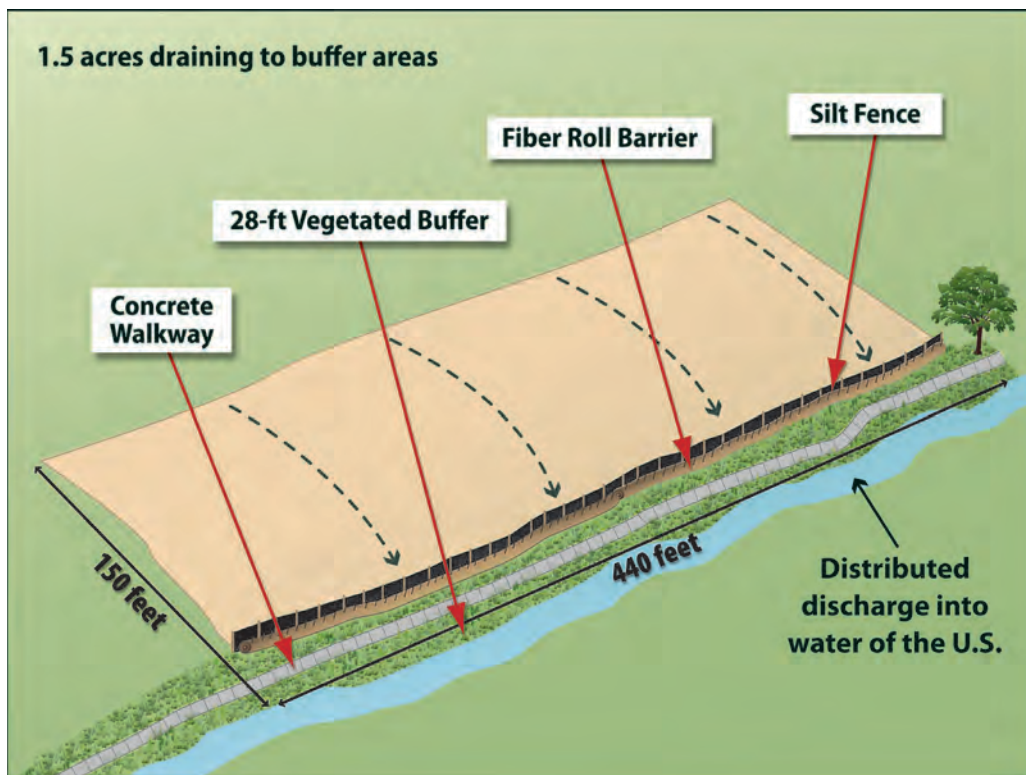


Figure G-6 Example 2 – Equivalent Sediment Load Reductions at a 6.5 ac Site in NM.

Appendix H – 2-Year, 24-Hour Storm Frequencies

Part 2.2.12 of the permit indicates that if you install a sediment basin, one of the design requirements is to provide storage for either (1) the calculated volume of runoff from a 2-year, 24-hour storm, or (2) 3,600 cubic feet per acre drained. This appendix is intended to provide a guide to permittees to determine the volume of precipitation associated with their local 2-year, 24-hour storm event.

The permittee should start out by determining their local 2-year, 24-hour storm volume. The rainfall frequency atlases, technical papers, and the Precipitation Frequency Data Server (PFDS) developed by the National Oceanic and Atmospheric Administration's (NOAA) National Weather Service (NWS) serve as national standards for rainfall intensity at specified frequencies and durations in the United States. Table H-1 identifies methods for determining precipitation frequency based on permit area. EPA notes that permittees may also use alternative peer-reviewed data sources not listed in Table H - 1 to determine the 2-year, 24-hour storm for their site.

Table H -1 – Method to Determine Precipitation Frequency Based on Permit Area

PERMIT AREA	METHOD TO DETERMINE PRECIPITATION FREQUENCY
District of Columbia	PFDS; NOAA Atlas 14, Vol. 2
Idaho	NOAA Atlas 2, Vol. 5; Technical Paper 40
Massachusetts	Technical Paper 40
New Hampshire	Technical Paper 40
New Mexico	PFDS; Technical Paper 40
Selected Pacific Islands	PFDS; Technical Paper 40
Puerto Rico and the U.S Virgin Islands	PFDS; Technical Paper 40
Other	PFDS; Technical Paper 40; NOAA Atlas 2 or 14

How to Determine Your Local 2-year, 24-hour Storm Size

Projects located in the **District of Columbia, Massachusetts, New Hampshire, New Mexico, Puerto Rico, U.S. Virgin Islands, or Pacific Islands** can use the PFDS at <http://hdsc.nws.noaa.gov/hdsc/pfds/index.html> or the appropriate NOAA's Atlas 14 Volume at <http://www.nws.noaa.gov/oh/hdsc/currentpf.htm> to determine their precipitation frequency.

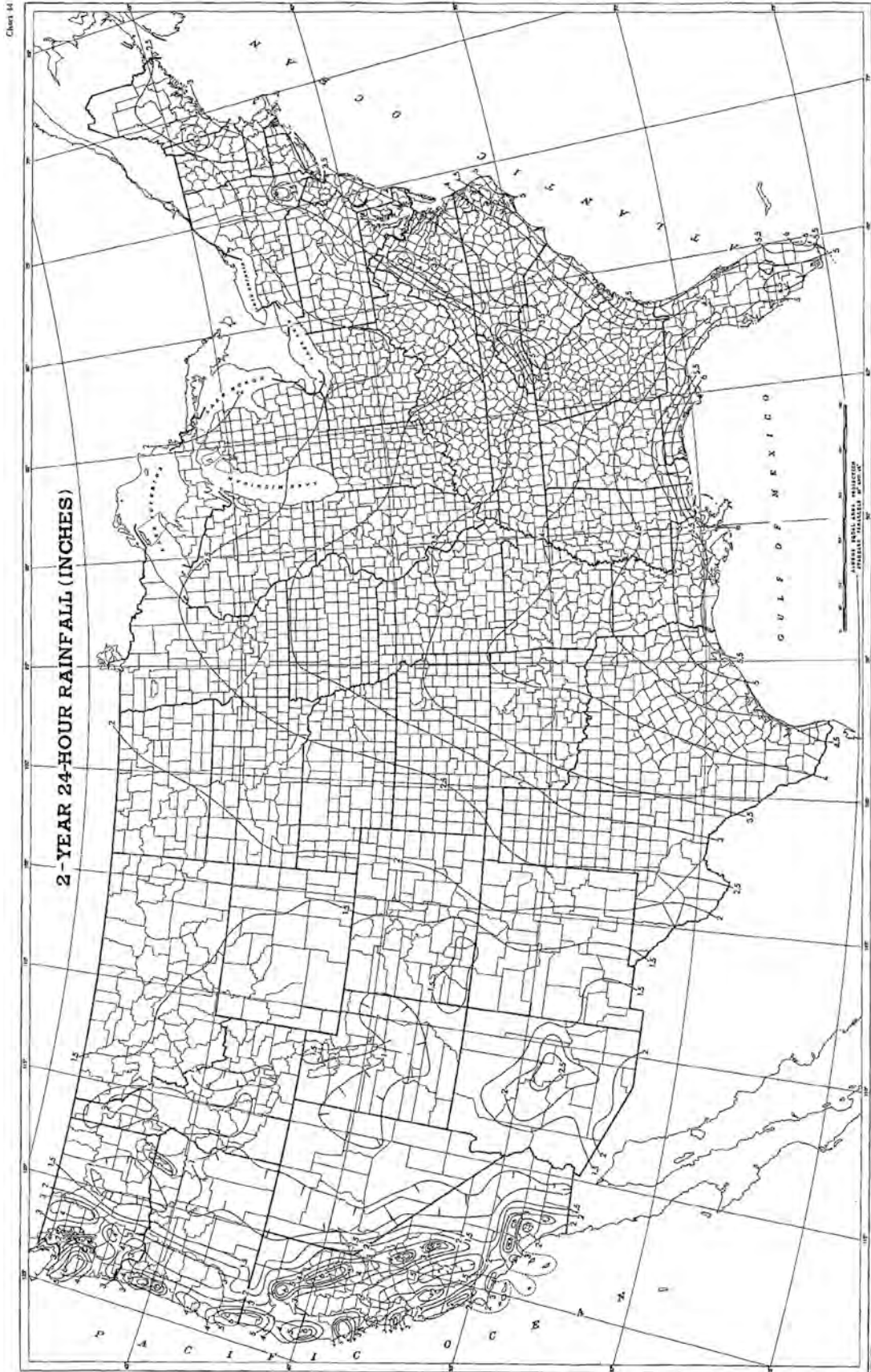
The PFDS is an easy to use, point-and-click interface to official U.S. precipitation frequency estimates and intensities. The opening PFDS screen is a clickable map of the United States. Upon clicking on a state, a state-specific interface appears. From this page the user selects the following:

- A location: Either via clicking on the map or manually entering a longitude/latitude coordinate;
- Data type: precipitation depth or precipitation intensity
- Units: english or metric; and
- Time series type: partial duration or annual maximum.

Additionally, PFDS also serves as a tool for providing references and other information for other current precipitation frequency standards that are not yet updated.

Projects located in **Idaho** can use the NOAA Atlas 2, Vol. 5 to determine their precipitation frequency. NOTE: Precipitation Frequencies on the NOAA Atlas 2, Vol. 5 are in tenths of an inch and will have to be converted to inches to determine precipitation frequency. NOAA Atlas 2, Vol. 5 can be accessed at http://www.nws.noaa.gov/oh/hdsc/PF_documents/Atlas2_Volume5.pdf. (See also attached map of NOAA Atlas 2, Vol. 5)

Projects located in areas not covered by the PFDS or NOAA Atlases will need to use TP-40 to identify the precipitation frequency. TP-40 provides a map of the continental U.S. for the 2-year, 24-hour rainfall. TP40 can be accessed at http://www.nws.noaa.gov/oh/hdsc/PF_documents/TechnicalPaper_No40.pdf. (See also attached map of TP-40)



Appendix I - Standard Permit Conditions

Standard permit conditions in Appendix I are consistent with the general permit provisions required under 40 CFR 122.41.

I.1 Duty To Comply.

You must comply with all conditions of this permit. Any permit noncompliance constitutes a violation of the Clean Water Act and is grounds for enforcement action; for permit termination, revocation and reissuance, or modification; or for denial of a permit renewal application.

I.1.1 You must comply with effluent standards or prohibitions established under Section 307(a) of the Clean Water Act for toxic pollutants within the time provided in the regulations that establish these standards, even if the permit has not yet been modified to incorporate the requirement.

I.1.2 Penalties for Violations of Permit Conditions: The Director will adjust the civil and administrative penalties listed below in accordance with the Civil Monetary Penalty Inflation Adjustment Rule (61 FR 252, December 31, 1996, pp. 69359-69366, as corrected in 62 FR 54, March 20, 1997, pp.13514-13517) as mandated by the Debt Collection Improvement Act of 1996 for inflation on a periodic basis. This rule allows EPA's penalties to keep pace with inflation. The Agency is required to review its penalties at least once every 4 years thereafter and to adjust them as necessary for inflation according to a specified formula. The civil and administrative penalties following were adjusted for inflation starting in 1996.

I.1.2.1 *Criminal Penalties.*

- a. *Negligent Violations.* The CWA provides that any person who negligently violates permit conditions implementing Sections 301, 302, 306, 307, 308, 318, or 405 of the Act is subject to criminal penalties of not less than \$2,500 nor more than \$25,000 per day of violation, or imprisonment of not more than one year, or both. In the case of a second or subsequent conviction for a negligent violation, a person shall be subject to criminal penalties of not more than \$50,000 per day of violation or by imprisonment of not more than two years, or both.
- b. *Knowing Violations.* The CWA provides that any person who knowingly violates permit conditions implementing Sections 301, 302, 306, 307, 308, 318, or 405 of the Act is subject to a fine of not less than \$5,000 nor more than \$50,000 per day of violation, or by imprisonment for not more than 3 years, or both. In the case of a second or subsequent conviction for a knowing violation, a person shall be subject to criminal penalties of not more than \$100,000 per day of violation, or imprisonment of not more than 6 years, or both.
- c. *Knowing Endangerment.* The CWA provides that any person who knowingly violates permit conditions implementing Sections 301, 302, 306, 307, 308, 318, or 405 of the Act and who knows at that time that he or she is placing another person in imminent danger of death or serious bodily injury shall upon conviction be subject to a fine of not more than \$250,000 or by imprisonment of not more than 15 years, or both. In the case of a second or subsequent conviction for a knowing endangerment violation, a person shall be subject to a fine of not more than \$500,000 or by imprisonment of not more than 30 years, or both. An organization, as defined in Section 309(c)(3)(B)(iii) of the Act, shall, upon conviction of violating the imminent danger provision be subject to a fine of not

more than \$1,000,000 and can be fined up to \$2,000,000 for second or subsequent convictions.

- d. *False Statement.* The CWA provides that any person who falsifies, tampers with, or knowingly renders inaccurate any monitoring device or method required to be maintained under this permit shall, upon conviction, be punished by a fine of not more than \$10,000, or by imprisonment for not more than 2 years, or both. If a conviction of a person is for a violation committed after a first conviction of such person under this paragraph, punishment is a fine of not more than \$20,000 per day of violation, or by imprisonment of not more than 4 years, or both. The Act further provides that any person who knowingly makes any false statement, representation, or certification in any record or other document submitted or required to be maintained under this permit, including monitoring reports or reports of compliance or non-compliance shall, upon conviction, be punished by a fine of not more than \$10,000 per violation, or by imprisonment for not more than 6 months per violation, or by both.

I.1.2.2 *Civil Penalties.* The CWA provides that any person who violates a permit condition implementing Sections 301, 302, 306, 307, 308, 318, or 405 of the Act is subject to a civil penalty not to exceed the maximum amount authorized by Section 309(d) of the Act, as adjusted pursuant to the Federal Civil Penalties Inflation Adjustment Act (28 U.S.C. § 2461 note) as amended (28 U.S.C. § 2461 note), and codified at 40 CFR § 19.4.

I.1.2.3 *Administrative Penalties.* The CWA provides that any person who violates a permit condition implementing Sections 301, 302, 306, 307, 308, 318, or 405 of the Act is subject to an administrative penalty, as follows

- a. *Class I Penalty.* Not to exceed the maximum amounts authorized by Section 309(g)(2)(A) of the Act, as adjusted pursuant to the Federal Civil Penalties Inflation Adjustment Act (28 U.S.C. § 2461 note), as amended (28 U.S.C. § 2461 note), and codified at 40 CFR § 19.4.
- b. *Class II Penalty.* Not to exceed the maximum amounts authorized by Section 309(g)(2)(B) of the Act, as adjusted pursuant to the Federal Civil Penalties Inflation Adjustment Act (28 U.S.C. § 2461 note), as amended, (28 U.S.C. § 2461 note), and codified at 40 CFR § 19.4.

I.2 Duty to Reapply.

If you wish to continue an activity regulated by this permit after the expiration date of this permit, you must apply for and obtain authorization as required by the new permit once EPA issues it.

I.3 Need to Halt or Reduce Activity Not a Defense.

It shall not be a defense for you in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.

I.4 Duty to Mitigate.

You must take all reasonable steps to minimize or prevent any discharge in violation of this permit which has a reasonable likelihood of adversely affecting human health or the environment.

I.5 Proper Operation and Maintenance.

You must at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) that are installed or used by you to achieve compliance with the conditions of this permit. Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures. This provision requires the operation of backup or auxiliary facilities or similar systems which are installed by you only when the operation is necessary to achieve compliance with the conditions of this permit.

I.6 Permit Actions.

This permit may be modified, revoked and reissued, or terminated for cause. Your filing of a request for a permit modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance does not stay any permit condition.

I.7 Property Rights.

This permit does not convey any property rights of any sort, or any exclusive privileges.

I.8 Duty to Provide Information.

You must furnish to EPA or an authorized representative (including an authorized contractor acting as a representative of EPA), within a reasonable time, any information that EPA may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit or to determine compliance with this permit. You must also furnish to EPA or an authorized representative upon request, copies of records required to be kept by this permit.

I.9 Inspection and Entry.

You must allow EPA or an authorized representative (including an authorized contractor acting as a representative of EPA), upon presentation of credentials and other documents as may be required by law, to:

- I.9.1** Enter upon your premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of this permit;
- I.9.2** Have access to and copy, at reasonable times, any records that must be kept under the conditions of this permit;
- I.9.3** Inspect at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this permit; and
- I.9.4** Sample or monitor at reasonable times, for the purposes of assuring permit compliance or as otherwise authorized by the Clean Water Act, any substances or parameters at any location.

I.10 Monitoring and Records.

- I.10.1** Samples and measurements taken for the purpose of monitoring must be representative of the volume and nature of the monitored activity.
- I.10.2** You must retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least three years from the date the permit expires or the date the permittee's authorization is terminated. This period may be extended by request of EPA at any time.

I.10.3 Records of monitoring information must include:

- I.10.3.1 The date, exact place, and time of sampling or measurements;
- I.10.3.2 The individual(s) who performed the sampling or measurements;
- I.10.3.3 The date(s) analyses were performed
- I.10.3.4 The individual(s) who performed the analyses;
- I.10.3.5 The analytical techniques or methods used; and
- I.10.3.6 The results of such analyses.

I.10.4 Monitoring must be conducted according to test procedures approved under 40 CFR Part 136, unless other test procedures have been specified in the permit.

I.10.5 The Clean Water Act provides that any person who falsifies, tampers with, or knowingly renders inaccurate any monitoring device or method required to be maintained under this permit shall, upon conviction, be punished by a fine of not more than \$10,000, or by imprisonment for not more than 2 years, or both. If a conviction of a person is for a violation committed after a first conviction of such person under this paragraph, punishment is a fine of not more than \$20,000 per day of violation, or by imprisonment of not more than 4 years, or both.

I.11 Signatory Requirements.

I.11.1 All applications, including NOIs, must be signed as follows:

I.11.1.1 For a corporation: By a responsible corporate officer. For the purpose of this subsection, a responsible corporate officer means: (i) a president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy- or decision-making functions for the corporation, or (ii) the manager of one or more manufacturing, production, or operating facilities, provided, the manager is authorized to make management decisions which govern the operation of the regulated facility including having the explicit or implicit duty of making major capital investment recommendations, and initiating and directing other comprehensive measures to assure long term environmental compliance with environmental laws and regulations; the manager can ensure that the necessary systems are established or actions taken to gather complete and accurate information for permit application requirements; and where authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures.

I.11.1.2 For a partnership or sole proprietorship: By a general partner or the proprietor, respectively; or

I.11.1.3 For a municipality, state, federal, or other public agency: By either a principal executive officer or ranking elected official. For purposes of this subsection, a principal executive officer of a federal agency includes (i) the chief executive officer of the agency, or (ii) a senior executive officer having responsibility for the overall operations of a principal geographic unit of the agency (e.g., Regional Administrator of EPA).

I.11.2 Your SWPPP, including changes to your SWPPP, inspection reports, and any other compliance documentation required under this permit, must be signed by a person described in Appendix I, Subsection I.11.1 above or by a duly authorized representative of that person. A person is a duly authorized representative only if:

I.11.2.1 The authorization is made in writing by a person described in Appendix I, Subsection I.11.1;

- I.11.2.2 The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity such as the position of plant manager, operator of a well or a well field, superintendent, position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters for the company. (A duly authorized representative may thus be either a named individual or any individual occupying a named position); and
- I.11.2.3 The signed and dated written authorization is included in the SWPPP. A copy must be submitted to EPA, if requested.
- I.11.3** Changes to Authorization. If an authorization under this permit is no longer accurate because a different operator has responsibility for the overall operation of the construction site, a new NOI must be submitted to EPA. See Table 1 in Part 1.4.2 of the permit. However, if the only change that is occurring is a change in contact information or a change in the facility's address, the operator need only make a modification to the existing NOI submitted for authorization.
- I.11.4** Any person signing documents in accordance with Appendix I, Subsections I.11.1 or I.11.2 above must include the following certification:
- "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 contained therein. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information contained 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."
- I.11.5** For persons signing NOIs electronically, in addition to meeting other applicable requirements in Appendix I, Subsection I.11, such signatures must meet the same signature, authentication, and identity-proofing standards set forth at 40 CFR § 3.2000(b) for electronic reports (including robust second-factor authentication).
- I.11.6** The CWA provides that any person who knowingly makes any false statement, representation, or certification in any record or other document submitted or required to be maintained under this permit, including monitoring reports or reports of compliance or non-compliance shall, upon conviction, be punished by a fine of not more than \$10,000 per violation, or by imprisonment for not more than 6 months per violation, or by both.
- I.12 Reporting Requirements.**
- I.12.1** Planned changes. You must give notice to EPA as soon as possible of any planned physical alterations or additions to the permitted facility. Notice is required only when:
- I.12.1.1 The alteration or addition to a permitted facility may meet one of the criteria for determining whether a facility is a new source in 40 CFR 122.29(b); or
- I.12.1.2 The alteration or addition could significantly change the nature or increase the quantity of pollutants discharged. This notification applies to pollutants which are subject neither to effluent limitations in the permit, nor to notification requirements under 40 CFR 122.42(a)(1).

- I.12.2** Anticipated noncompliance. You must give advance notice to EPA of any planned changes in the permitted facility or activity which may result in noncompliance with permit requirements.
- I.12.3** Transfers. This permit is not transferable to any person except after notice to EPA. Where a facility wants to change the name of the permittee, the original permittee (the first owner or operators) must submit a Notice of Termination pursuant to Part 8. The new owner or operator must submit a Notice of Intent in accordance with Part 1.7 and Table 1. See also requirements in Appendix I, Subsections I.11.1 and I.11.2.
- I.12.4** Monitoring reports. Monitoring results must be reported at the intervals specified elsewhere in this permit.
 - I.12.4.1** Monitoring results must be reported on a Discharge Monitoring Report (DMR) or forms provided or specified by EPA for reporting results of monitoring of sludge use or disposal practices.
 - I.12.4.2** If you monitor any pollutant more frequently than required by the permit using test procedures approved under 40 CFR Part 136 or, in the case of sludge use or disposal, approved under 40 CFR 136 unless otherwise specified in 40 CFR Part 503, or as specified in the permit, the results of this monitoring must be included in the calculation and reporting of the data submitted in the DMR or sludge reporting form specified by EPA.
- I.12.5** Compliance schedules. Reports of compliance or noncompliance with, or any progress reports on, interim and final requirements contained in any compliance schedule of this permit must be submitted no later than 14 days following each schedule date.
- I.12.6** Twenty-four hour reporting. In addition to reports required elsewhere in this permit:
 - I.12.6.1** You must report any noncompliance which may endanger health or the environment directly to the EPA Regional Office (see contacts at <https://www2.epa.gov/national-pollutant-discharge-elimination-system-npdes/contact-us-stormwater#regional>). Any information must be provided orally within 24 hours from the time you become aware of the circumstances. A written submission must also be provided within five days of the time you become aware of the circumstances. The written submission must contain a description of the noncompliance and its cause; the period of noncompliance, including exact dates and times, and if the noncompliance has not been corrected, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance.
 - I.12.6.2** The following shall be included as information which must be reported within 24 hours under this paragraph.
 - a. Any unanticipated bypass which exceeds any effluent limitation in the permit. (See 40 CFR 122.41(m)(3)(ii))
 - b. Any upset which exceeds any effluent limitation in the permit
 - c. Violation of a maximum daily discharge limit for any numeric effluent limitation. (See 40 CFR 122.44(g).)
 - I.12.6.3** EPA may waive the written report on a case-by-case basis for reports under Appendix I, Subsection I.12.6.2 if the oral report has been received within 24 hours.
- I.12.7** Other noncompliance. You must report all instances of noncompliance not reported under Appendix I, Subsections I.12.4, I.12.5, and I.12.6, at the time monitoring reports are submitted. The reports must contain the information listed in Appendix I, Subsection I.12.6.
- I.12.8** Other information. Where you become aware that you failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application

or in any report to the Permitting Authority, you must promptly submit such facts or information.

I.13 Bypass.

I.13.1 Definitions.

I.13.1.1 Bypass means the intentional diversion of waste streams from any portion of a treatment facility See 40 CFR 122.41(m)(1)(i).

I.13.1.2 Severe property damage means substantial physical damage to property, damage to the treatment facilities which causes them to become inoperable, or substantial and permanent loss of natural resources which can reasonably be expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production. See 40 CFR 122.41(m)(1)(ii).

I.13.2 Bypass not exceeding limitations. You may allow any bypass to occur which does not cause effluent limitations to be exceeded, but only if it also is for essential maintenance to assure efficient operation. These bypasses are not subject to the provisions of Appendix I, Subsections I.13.3 and I.13.4. See 40 CFR 122.41(m)(2).

I.13.3 Notice.

I.13.3.1 Anticipated bypass. If you know in advance of the need for a bypass, you must submit prior notice, if possible at least ten days before the date of the bypass. See 40 CFR 122.41(m)(3)(i).

I.13.3.2 Unanticipated bypass. You must submit notice of an unanticipated bypass as required in Appendix I, Subsection I.12.6 (24-hour notice). See 40 CFR 122.41(m)(3)(ii).

I.13.4 Prohibition of bypass. See 40 CFR 122.41(m)(4).

I.13.4.1 Bypass is prohibited, and EPA may take enforcement action against you for bypass, unless:

- a. Bypass was unavoidable to prevent loss of life, personal injury, or severe property damage;
- b. There were no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate back-up equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass which occurred during normal periods of equipment downtime or preventive maintenance; and
- c. You submitted notices as required under Appendix I, Subsection I.13.3.

I.13.4.2 EPA may approve an anticipated bypass, after considering its adverse effects, if EPA determines that it will meet the three conditions listed above in Appendix I, Subsection I.13.4.1.

I.14 Upset.

I.14.1 Definition. Upset means an exceptional incident in which there is unintentional and temporary noncompliance with technology based permit effluent limitations because of factors beyond your reasonable control. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation. See 40 CFR 122.41(n)(1).

I.14.2 Effect of an upset. An upset constitutes an affirmative defense to an action brought for noncompliance with such technology based permit effluent limitations if the requirements of Appendix I, Subsection I.14.3 are met. No determination made during administrative review of claims that noncompliance was caused by upset, and before an action for noncompliance, is final administrative action subject to judicial review. See 40 CFR 122.41(n)(2).

I.14.3 Conditions necessary for a demonstration of upset. See 40 CFR 122.41(n)(3). A permittee who wishes to establish the affirmative defense of upset must demonstrate, through properly signed, contemporaneous operating logs, or other relevant evidence that:

I.14.3.1 An upset occurred and that you can identify the cause(s) of the upset;

I.14.3.2 The permitted facility was at the time being properly operated; and

I.14.3.3 You submitted notice of the upset as required in Appendix I, Subsection I.12.6.2.b (24 hour notice).

I.14.3.4 You complied with any remedial measures required under Appendix I, Subsection I.4.

I.14.4 Burden of proof. In any enforcement proceeding, you, as the one seeking to establish the occurrence of an upset, have the burden of proof. See 40 CFR 122.41(n)(4).

I.15 Retention of Records.

Copies of the SWPPP and all documentation required by this permit, including records of all data used to complete the NOI to be covered by this permit, must be retained for at least three years from the date that permit coverage expires or is terminated. This period may be extended by request of EPA at any time.

I.16 Reopener Clause.

I.16.1 Procedures for modification or revocation. Permit modification or revocation will be conducted according to 40 CFR §122.62, §122.63, §122.64 and §124.5.

I.16.2 Water quality protection. If there is evidence indicating that the stormwater discharges authorized by this permit cause, have the reasonable potential to cause or contribute to an excursion above any applicable water quality standard, you may be required to obtain an individual permit, or the permit may be modified to include different limitations and/or requirements.

I.16.3 Timing of permit modification. EPA may elect to modify the permit prior to its expiration (rather than waiting for the new permit cycle) to comply with any new statutory or regulatory requirements, such as for effluent limitation guidelines that may be promulgated in the course of the current permit cycle.

I.17 Severability.

Invalidation of a portion of this permit does not necessarily render the whole permit invalid. EPA's intent is that the permit is to remain in effect to the extent possible; in the event that any part of this permit is invalidated, EPA will advise the regulated community as to the effect of such invalidation.

Appendix J - Notice of Intent (NOI) Form and Instructions

Part 1.4.1 requires you to use the NPDES eReporting Tool, or "NeT" system, to prepare and submit your NOI electronically. However, if the EPA Regional Office grants you a waiver to use a paper NOI form, and you elect to use it, you must complete and submit the following form.

Submission of this Notice of Intent (NOI) constitutes notice that the operator identified in Section III of this form requests authorization to discharge pursuant to the NPDES Construction General Permit (CGP) permit number identified in Section II of this form. Submission of this NOI also constitutes notice that the operator identified in Section III of this form meets the eligibility requirements of Part 1.1 CGP for the project identified in Section IV of this form. Permit coverage is required prior to commencement of construction activity until you are eligible to terminate coverage as detailed in Part 8 of the CGP. To obtain authorization, you must submit a complete and accurate NOI form. Discharges are not authorized if your NOI is incomplete or inaccurate or if you were never eligible for permit coverage. Refer to the instructions at the end of this form.

I. Approval to Use Paper NOI Form

Have you been granted a waiver from electronic reporting from the Regional Office *? YES NO

If yes, check which waiver you have been granted, the name of the EPA Regional Office staff person who granted the waiver, and the date of approval:

- Waiver granted: The owner/operator's headquarters is physically located in a geographic area (i.e., ZIP code or census tract) that is identified as under-served for broadband Internet access in the most recent report from the Federal Communications Commission.
- The owner/operator has issues regarding available computer access or computer capability.

Name of EPA staff person that granted the waiver:

Date approval obtained: / /

*** Note: You are required to obtain approval from the applicable Regional Office prior to using this paper NOI form. If you have not obtained a waiver, you must file this form electronically using the NPDES eReporting Tool (NeT).**

II. Permit Information NPDES ID (EPA Use Only):

Master Permit Number: (see Appendix B of the CGP for the list of eligible permit numbers)

III. Operator Information

Operator Information

Operator Name:

Are you requesting coverage under this NOI as a "federal operator" as defined in Appendix A? YES NO

Mailing Address:

Street:

City: State: ZIP Code: -

County or Similar Government Division:

Phone: - - Ext.

E-mail:

Operator Point of Contact Information:

First Name, Middle Initial, Last Name:

Title:

NOI Preparer (Complete if NOI was prepared by someone other than the certifier):

First Name, Middle Initial, Last Name:

Organization:

Phone: - - Ext.

E-mail:

Receiving Waters Information: (Attach a separate list if necessary)

Point of Discharge ID	For each point of discharge, provide the following receiving water information:		
	Provide the name of the first water of the U.S. that receives stormwater directly from the point of discharge and/or from the MS4 that the point of discharge discharges to:	If the receiving water is impaired (on the CWA 303(d) list), list the pollutants that are causing the impairment:	If a TMDL been completed for this receiving waterbody, providing the following information:
			TMDL Name and ID: Pollutant(s) for which there is a TMDL:
			TMDL Name and ID: Pollutant(s) for which there is a TMDL:
			TMDL Name and ID: Pollutant(s) for which there is a TMDL:
			TMDL Name and ID: Pollutant(s) for which there is a TMDL:

			TMDL Name and ID: Pollutant(s) for which there is a TMDL:
			TMDL Name and ID: Pollutant(s) for which there is a TMDL:

Are any of the waters of the U.S. to which you discharge designated by the state or tribal authority under its antidegradation policy as a Tier 2 (or Tier 2.5) water (water quality exceeds levels necessary to support propagation of fish, shellfish, and wildlife and recreation in and on the water) or as a Tier 3 water (Outstanding National Resource Water)? (See Appendix F).

YES NO

If yes, name(s) of receiving water(s) and its designation (Tier 2, Tier 2.5 or Tier 3):

VI. Chemical Treatment Information

Will you use polymers, flocculants, or other treatment chemicals at your construction site? YES NO

If yes, will you use cationic treatment chemicals at your construction site*? YES NO

If yes, have you been authorized to use cationic treatment chemicals by your applicable EPA Regional Office in advance of filing your NOI*?
 YES NO

If you have been authorized to use cationic treatment chemicals by your applicable EPA Regional Office, attach a copy of your authorization letter and include documentation of the appropriate controls and implementation procedures designed to ensure that your use of cationic treatment chemicals will not lead to a violation of water quality standards.

Please indicate the treatment chemicals that you will use:

* Note: You are ineligible for coverage under this permit unless you notify your applicable EPA Regional Office in advance and the EPA office authorizes coverage under this permit after you have included appropriate controls and implementation procedures designed to ensure that your use of cationic treatment chemicals will not lead to a violation of water quality standards.

VII. Stormwater Pollution Prevention Plan (SWPPP) Information

Has the SWPPP been prepared in advance of filing this NOI, as required? YES NO

SWPPP Contact Information:

First Name, Middle Initial Last Name:

Professional Title:

Phone: - - Ext.

E-mail:

VIII. Endangered Species Protection

Using the instructions in Appendix D of the CGP, under which criterion listed below are you eligible for coverage under this permit? Check only 1 box, include the required information and provide a sound basis for supporting the criterion selected. You must consider Endangered Species Act listed threatened or endangered species (ESA-listed) and/or designated critical habitat(s) under the jurisdiction of both the U.S. Fish and Wildlife Service (USFWS) and National Marine Fisheries Service (NMFS) and select the most conservative criterion that applies.

- A** No ESA-listed species and/or designated critical habitat present in action area. Using the process outlined in Appendix D of this permit, 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 this permit. **[Basis statement content: A basis statement supporting the selection of this criterion should identify the USFWS and NMFS information sources used. Attaching aerial image(s) of the site to this NOI is helpful to EPA, USFWS, and NMFS in confirming eligibility under this criterion. Please Note: NMFS' jurisdiction includes ESA-listed marine and estuarine species that spawn in inland rivers.]**
- B** Eligibility requirements met by another operator under the 2017 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 2017 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 2017CGP operator's notification of authorization under this permit. If your certification is based on another 2017 CGP operator's certification under criterion C, you must provide EPA with the relevant supporting information required of existing dischargers in criterion C in your NOI form. **[Basis statement content: A basis statement supporting the selection of this criterion should identify the eligibility criterion of the other CGP NOI, the authorization date, and confirmation that the authorization is effective.]**

If you select criterion B, provide the NPDES ID from the other operator's notification of authorization under this permit:

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- C** Discharges not likely to adversely affect 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 adversely affect 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 adversely affect 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 adverse effects to ESA-listed species will be avoided from the discharges and discharge-related activities. You must also include a copy of your site map from your SWPPP showing the upland and in-water extent of your "action area" with this NOI. **[Basis statement content: A basis statement supporting the selection of this criterion should identify the information resources and expertise (e.g., state or federal biologists) used to arrive at this conclusion. Any supporting documentation should explicitly state that both ESA-listed species and designated critical habitat under the jurisdiction of the USFWS and/or NMFS were considered in the evaluation.]**

What ESA-listed species and/or designated critical habitat are located in your "action area":

Distance between your site and the ESA-listed species and/or designated critical habitat within the action area (in miles, state "on site" if the ESA-listed species and/or designated critical habitat is within the area to be disturbed):

- 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 concurrence from USFWS and/or NMFS that your site's discharges and discharge-related activities are not likely to adversely affect listed species and/or critical habitat. You must include copies of the correspondence with the participating agencies in your SWPPP and this NOI. **[Basis statement content: A basis statement supporting the selection of this criterion should identify whether USFWS or NMFS or both agencies participated in coordination, the field office/regional office(s) providing that coordination, and the date that coordination concluded.]**
- 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. The consultation must have addressed the effects of the construction site's discharges and discharge-related activities on ESA-listed species and/or designated critical habitat under the jurisdiction of USFWS and/or NMFS. To certify eligibility under this criterion, Indicate the result of the consultation:
 - biological opinion from USFWS and/or NMFS that concludes that the action in question (taking into account the effects of your site's discharges and discharge-related activities) is not likely to jeopardize the continued existence of listed species, nor the destruction or adverse modification of critical habitat; or
 - written concurrence from USFWS and/or NMFS with a finding that the site's discharges and discharge-related activities are not likely to adversely affect ESA-listed species and/or designated critical habitat.

You must include copies of the correspondence between yourself and the USFWS and/or NMFS in your SWPPP and this NOI. **[Basis statement content: A basis statement supporting the selection of this criterion should identify the federal action agency(ies) involved, the field office/regional office(s) providing that consultation, any tracking numbers of identifiers associated with that consultation (e.g., IPaC number, PCTS number), and the date the consultation was completed.]**

- 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. **Basis statement content: A basis statement supporting the selection of this criterion should identify whether USFWS or NMFS or both agencies provided a section 10 permit, the field office/regional office(s) providing permit(s), any tracking numbers of identifiers associated with that consultation (e.g., IPaC number, PCTS number), and the date the permit was granted.**

Provide a brief summary of the basis for criterion selection listed above [the necessary content for a supportive basis statement is provided under the criterion you selected.].

IX. Historic Preservation

Are you installing any stormwater controls as described in Appendix E that require subsurface earth disturbance? (Appendix E, Step 1) YES NO

If yes, have prior surveys or evaluations conducted on the site have already determined historic properties do not exist, or that prior disturbances have precluded the existence of historic properties? (Appendix E, Step 2) YES NO

If no, have you determined that your installation of subsurface earth-disturbing stormwater controls will have no effect on historic properties? (Appendix E, Step 3) YES NO

If no, did the SHPO, THPO, or other tribal representative (whichever applies) respond to you within the 15 calendar days to indicate whether the subsurface earth disturbances caused by the installation of stormwater controls affect historic properties? (Appendix E, Step 4) 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:

X. Certification Information

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.

First Name, Middle Initial, Last Name:

Title:

Signature: _____

Date: / /

Email:

Notice of Intent for the 2017 NPDES Construction General Permit

NPDES Form Date (2/17)

This Form Replaces Form 3510-9 (02/12)

Form Approved OMB No. 2040-0004

Who Must File an NOI Form

Under the provisions of the Clean Water Act, as amended (33 U.S.C. 1251 et. seq.; the Act), federal law prohibits stormwater discharges from certain construction activities to waters of the U.S. unless that discharge is covered under a National Pollutant Discharge Elimination System (NPDES) permit. Operators of construction sites where one or more acres are disturbed, smaller sites that are part of a larger common plan of development or sale where there is a cumulative disturbance of at least one acre, or any other site specifically designated by the Director, must obtain coverage under an NPDES general permit. For coverage under the 2017 CGP, each person, firm, public organization, or any other entity that meets either of the following criteria must file a Notice of Intent form: (1) they have operational control over construction plans and specifications, including the ability to make modifications to those plans and specifications; or (2) they have day-to-day operational control of those activities at the project necessary to ensure compliance with the permit conditions. If you have questions about whether you need a NPDES stormwater permit, or if you need information to determine whether EPA or your state agency is the permitting authority, contact your EPA Regional Office.

Completing the Form

Obtain and read a copy of the 2017 CGP, viewable at <https://www.epa.gov/npdes/stormwater-discharges-construction-activities#cgp>. To complete this form, type or print uppercase letters, in the appropriate areas only. Please place each character between the marks (abbreviate if necessary to stay within the number of characters allowed for each item). Use one space for breaks between words, but not for punctuation marks unless they are needed to clarify your response. If you have any questions on this form, telephone EPA's NOI Processing Center at (866) 352-7755. **Please submit the original document with signature in ink - do not send a photocopied signature.**

Section I. Approval to Use Paper NOI Form

You must indicate whether you have been granted a waiver from electronic reporting from the EPA Regional Office. Note that you are not authorized to use this paper NOI form unless the EPA Regional Office has approved its use. Where you have obtained approval to use this form, indicate the waiver that you have been granted, the name of the EPA staff person who granted the waiver, and the date that approval was provided.

See <https://www.epa.gov/npdes/contact-us-stormwater#regional>

for a list of EPA Regional Office contacts.

Section II. Permit Number

Provide the master permit number of the permit under which you are applying for coverage (see Appendix B of the general permit for the list of eligible master permit numbers)

Section III. Operator Information

Provide the legal name of the person, firm, public organization, or any other entity that operates the project described in this NOI. Refer to Appendix A of the permit for the definition of "operator".

Indicate whether you are seeking coverage under this permit as a "federal operator" as defined in Appendix A.

Also provide a point of contact, the operator's mailing address, county, telephone number, and e-mail address (to be notified via e-mail of NOI approval when available). Correspondence for the NOI will be sent to this address.

If the NOI was prepared by someone other than the certifier (for example, if the NOI was prepared by the facility SWPPP contact or a consultant for the certifier's signature), include the full name, organization, phone number, and email address of the NOI preparer.

Section IV. Project/Site Information

Enter the official or legal name and complete street address, including city, state, ZIP code, and county or similar government subdivision of the project or site. If the project or site lacks a street address, indicate the general location of the site (e.g., Intersection of State Highways 61 and 34). Complete site information must be provided for permit coverage to be granted.

Provide the latitude and longitude of your facility in decimal degrees format. The latitude and longitude of your facility can be determined in several different ways, including through the use of global positioning system (GPS) receivers, U.S. Geological Survey (U.S.G.S.) topographic or quadrangle maps, and web-based siting tools, among others. For consistency, EPA requests that measurements be taken from the approximate center of the construction site. For linear construction sites, the measurement should be taken midpoint of the site. If known, enter the horizontal reference datum for your latitude and longitude. The horizontal reference datum is shown on the bottom left corner of USGS topographic maps; it is also available for GPS receivers.

Indicate whether the project is in Indian country lands or located on a property of religious or cultural significance to an Indian tribe, and if so, provide the name of the Indian tribe associated with the area of Indian country (including name of Indian reservation, if applicable), or if not in Indian country, provide the name of the Indian tribe associated with the property.

Enter the estimated construction start and completion dates using four digits for the year (i.e., 10/06/2012). Indicate to the nearest quarter acre the estimated area to be disturbed.

Indicate the type of construction site, if demolition is occurring, and if so, if the structure has at least 10,000 square feet of floor space. Indicate whether the pre-development land use of the site was used for agriculture Appendix A defines "agricultural land" as cropland, grassland, rangeland, pasture, and other agricultural land, on which agricultural and forest-related products or livestock are produced and resource concerns may be addressed. Agricultural lands include cropped woodland, marshes, incidental areas included in the agricultural operation, and other types of agricultural land used for the production of livestock.

Indicate whether earth-disturbing activities have already commenced on your project/site. If earth-disturbing activities have commenced on your site because stormwater discharges from the site have been previously covered under a NPDES permit, you must provide the 2012 CGP NPDES ID or the NPDES permit number if coverage was under an individual permit.

Section V. Discharge Information

You must confirm that you understand that the CGP only authorizes the allowable stormwater discharges listed in Part 1.2.1 and the allowable non-stormwater discharges listed in Part 1.2.2.

Notice of Intent for the 2017 NPDES Construction General Permit

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This Form Replaces Form 3510-9 (02/12)

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Any discharges not expressly authorized under the CGP are not covered by the CGP or the permit shield provision of the CWA Section 402(k) and they cannot become authorized or shielded by disclosure to EPA, state, or local authorities via the NOI to be covered by the permit or by any other means (e.g., in the SWPPP or during an inspection). If any discharges requiring NPDES permit coverage other than the allowable stormwater and non-stormwater discharges listed in Parts 1.2.1 and 1.2.2 will be discharged, they must either be eliminated or covered under another NPDES permit.

Indicate whether discharges from the site will enter into a municipal separate storm sewer system (MS4), as defined in Appendix A.

Also, indicate whether any waters of the U.S. exist within 50 feet from your site. Note that if "yes", you are required to comply with the requirement in Part 2.2.1 of the permit to provide natural buffers or equivalent erosion and sediment controls.

For each unique point of discharge you list, you must specify the name of the first water of the U.S. that receives stormwater directly from the point of discharge and/or from the MS4 that the point of discharge discharges to. You must specify whether any waters of the U.S. that you discharge to are listed as "impaired" as defined in Appendix A, and the pollutants for which the water is impaired. You must identify any Total Maximum Daily Loads (TMDL) that have been completed for any of the waters of the U.S. that you discharge to.

Indicate whether discharges from the site will enter into a water of the U.S. that is designated as a Tier 2, Tier 2.5, or Tier 3 water. A list of Tier 2, 2.5, and 3 waters is provided as Appendix F. If the answer is "yes", name all waters designated as Tier 2, Tier 2.5, or Tier 3 to which the site will discharge.

Section VI. Chemical Treatment Information

Indicate whether the site will use polymers, flocculants, or other treatment chemicals. Indicate whether the site will employ cationic treatment chemicals. If the answer is "yes" to either question, indicate which chemical(s) you will use. Note that you are not eligible for coverage under this permit to use cationic treatment chemicals unless you notify your applicable EPA Regional Office in advance and the EPA office authorizes coverage under this permit after you have included appropriate controls and implementation procedures designed to ensure that your use of cationic treatment chemicals will not lead to a violation of water quality standards. If you have been authorized to use cationic treatment chemicals by your applicable EPA Regional Office, attach a copy of your authorization letter and include documentation of the appropriate controls and implementation procedures designed to ensure that your use of cationic treatment chemicals will not lead to a violation of water quality standards. Examples of cationic treatment chemicals include, but are not limited to, cationic polyacrylamide (C-PAM), PolyDADMAC (POLYDIALLYLDIMETHYLAMMONIUM CHLORIDE), and chitosan.

Section VII. Stormwater Pollution Prevention Plan (SWPPP) Information

All sites eligible for coverage under this permit are required to prepare a SWPPP in advance of filing the NOI, in accordance with Part 7. Indicate whether the SWPPP has been prepared in advance of filing the NOI.

Indicate the street, city, state, and ZIP code where the SWPPP can be found. Indicate the contact information (name, organization, phone, and email) for the person who developed the SWPPP for this project.

Section VIII. Endangered Species Information

Using the instructions in Appendix D, indicate under which criterion (i.e., A, B, C, D, E, or F) of the permit the applicant is eligible with regard to protection of ESA-listed endangered and threatened species and designated critical habitat. A description of the basis for the criterion selected must also be provided.

If criterion B is selected, provide the NPDES Number for the other operator who had previously certified their eligibility for the CGP under criterion A, C, D, E, or F. The Tracking Number was assigned when the operator received coverage under this permit, and is included in the notice of authorization.

If criterion C is selected, you must attach copies of your site map. See Part 7.2.4 of the permit for information about what is required to be in your site map. You must also specify the federally-listed species and/or federally-designated critical habitat that are located in the "action area" of the project, and provide the distance between the construction site and any listed endangered species and/or their designated critical habitat.

If criterion D, E, or F is selected, attach copies of any communications between you and the U.S. Fish and Wildlife Service and National Marine Fisheries Service and identify the participating agencies and Field Offices/Regional Offices you worked with in the basis statement of this NOI.

Section IX. Historic Preservation

Use the instructions in Appendix E to complete the questions on the NOI form regarding historic preservation.

Section X. Certification Information

The NOI must be signed as follows:

For a corporation: By a responsible corporate officer. For the purpose of this Section, a responsible corporate officer means:

(i) a president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy- or decision-making functions for the corporation, or (ii) the manager of one or more manufacturing, production, or operating facilities, provided, the manager is authorized to make management decisions which govern the operation of the regulated facility including having the explicit or implicit duty of making major capital investment recommendations, and initiating and directing other comprehensive measures to assure long-term environmental compliance with environmental laws and regulations; the manager can ensure that the necessary systems are established or actions taken to gather complete and accurate information for permit application requirements; and where authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures.

For a partnership or sole proprietorship: By a general partner or the proprietor, respectively; or

For a municipality, state, federal, or other public agency: By either a principal executive officer or ranking elected official. For purposes of this Part, a principal executive officer of a federal agency includes (i) the chief executive officer of the agency, or

Instructions for Completing EPA Form 3510-9

Notice of Intent for the 2017 NPDES Construction General Permit

NPDES Form Date (2/17)

This Form Replaces Form 3510-9 (02/12)

Form Approved OMB No. 2040-0004

(ii) a senior executive officer having responsibility for the overall operations of a principal geographic unit of the agency (e.g., Regional Administrator of EPA). Include the name and title of the person signing the form and the date of signing. An unsigned or undated NOI form will not be considered eligible for permit coverage.

Modifying Your NOI

If you have been granted a waiver from your Regional Office from electronic reporting, and if after submitting your NOI you need to correct or update any fields on this NOI form, you may do so by indicating changes on this same form. Paperwork Reduction Act Notice

Public reporting burden for this NOI is estimated to average 3.7 hours. This estimate includes time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. An agency may not conduct or sponsor, and a person is not required to respond to, a collection of information unless it displays a currently valid OMB control number. Send comments regarding the burden estimate, any other aspect of the collection of information, or suggestions for improving this form, including any suggestions which may increase or reduce this burden to: Chief, Information Policy Branch 2136, U.S. Environmental Protection, Agency, 1200 Pennsylvania Avenue, NW, Washington, D.C. 20460. Include the OMB control number on

any correspondence. Do not send the completed form to this address.

Submitting Your Form

Submit your NOI form by mail to one of the following addresses:

For Regular U.S. Mail Delivery:

Stormwater Notice Processing Center
Mail Code 4203M, ATTN: 2017 CGP
U.S. EPA
1200 Pennsylvania Avenue, NW
Washington, DC 20460

For Overnight/Express Mail Delivery:

Stormwater Notice Processing Center
William Jefferson Clinton East Building - Room 7420
ATTN: 2017 CGP
U.S. EPA
1201 Constitution Avenue, NW
Washington, DC 20004

Visit this website for instructions on how to submit electronically:

<https://www.epa.gov/npdes/stormwater-discharges-construction-activities#ereporting>

Appendix K - Notice of Termination (NOT) Form and Instructions

Part 8.3 requires you to use the NPDES eReporting Tool, or "NeT" system, to prepare and submit your NOT electronically. However, if you are given a waiver by the EPA Regional Office to use a paper NOT form, and you elect to use it, you must complete and submit the following form.

**Notice of Termination for the 2017 NPDES
Construction General Permit**

NPDES Form Date (2/17)

This Form Replaces Form 3510-13 (02/12)

Form Approved OMB No. 2040-0004

Who May File an NOT Form

Permittees who are presently covered under the EPA-issued 2017 Construction General Permit (CGP) for Stormwater Discharges Associated with Construction Activity may submit an NOT form when: (1) earth-disturbing activities at the site are completed and the conditions in Parts 8.2.1.a through 8.2.1.b are met; or (2) the permittee has transferred all areas under its control to another operator, and that operator has submitted and obtained coverage under this permit; or (3) the permittee has obtained coverage under a different NPDES permit for the same discharges.

Completing the Form

Type or print, using uppercase letters, in the appropriate areas only. Please place each character between the marks. Abbreviate if necessary to stay within the number of characters allowed for each item. Use only one space for breaks between words, but not for punctuation marks unless they are needed to clarify your response. If you have any questions about this form, refer to <https://www.epa.gov/npdes/stormwater-discharges-construction-activities#cgp> or telephone EPA's NOI Processing Center at (866) 352-7755. Please submit original document with signature in ink - do not send a photocopied signature.

Section I. Approval to Use Paper NOT Form

You must indicate whether you have been granted a waiver from electronic reporting from the EPA Regional Office. Note that you are not authorized to use this paper NOT form unless the EPA Regional Office has approved its use. Where you have obtained approval to use this form, indicate the waiver that you have been granted, the name of the EPA staff person who granted the waiver, and the date that approval was provided.

See <https://www.epa.gov/npdes/contact-us-stormwater#regional> for a list of EPA Regional Office contacts.

Section II. Permit Information

Enter the existing NPDES ID assigned to the project. If you do not know the permit tracking number, or contact EPA's NOI Processing Center at (866) 352-7755.

Indicate your reason for submitting this Notice of Termination by checking the appropriate box. Check only one.

Section III. Operator Information

Provide the legal name of the person, firm, public organization, or any other entity that operates the project described in this NOT and is covered by the NPDES ID identified in Section II. Enter the complete mailing address, telephone number, and email address of the operator.

Section IV. Project/Site Information

Enter the official or legal name and complete street address, including city, state, ZIP code, and county or similar government subdivision of the project or site. If the project or site lacks a street address, indicate the general location of the site (e.g., Intersection of State Highways 61 and 34). Complete site information must be provided for termination of permit coverage to be valid.

Section V. Certification Information

The NOT, must be signed as follows:

For a corporation: By a responsible corporate officer. For the purpose of this Part, a responsible corporate officer means: (i) a president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy- or decision-making functions for the corporation, or (ii) the manager of one or more manufacturing,

production, or operating facilities, provided, the manager is authorized to make management decisions which govern the operation of the regulated facility including having the explicit or implicit duty of making major capital investment recommendations, and initiating and directing other comprehensive measures to assure long-term environmental compliance with environmental laws and regulations; the manager can ensure that the necessary systems are established or actions taken to gather complete and accurate information for permit application requirements; and where authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures.

For a partnership or sole proprietorship: By a general partner or the proprietor, respectively; or

For a municipality, state, federal, or other public agency: By either a principal executive officer or ranking elected official. For purposes of this Part, a principal executive officer of a federal agency includes (i) the chief executive officer of the agency, or (ii) a senior executive officer having responsibility for the overall operations of a principal geographic unit of the agency (e.g., Regional Administrator of EPA).

Include the name, title, and email address of the person signing the form and the date of signing. An unsigned or undated NOT form will not be considered valid termination of permit coverage.

Paperwork Reduction Act Notice

Public reporting burden for this NOT is estimated to average 0.5 hours per notice, including time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. An agency may not conduct or sponsor, and a person is not required to respond to, a collection of information unless it displays a currently valid OMB control number. Send comments regarding the burden estimate, any other aspect of the collection of information, or suggestions for improving this form including any suggestions which may increase or reduce this burden to: Chief, Information Policy Branch, 2136, U.S. Environmental Protection Agency, 1200 Pennsylvania Avenue, NW, Washington, DC 20460. Include the OMB number on any correspondence. Do not send the completed form to this address.

Submitting Your Form:

Submit your NOT form by mail to one of the following addresses:

For Regular U.S. Mail Delivery:

Stormwater Notice Processing Center
Mail Code 4203M, ATTN: 2017 CGP
U.S. EPA
1200 Pennsylvania Avenue, NW
Washington, DC 20460

For Overnight/Express Mail Delivery:

Stormwater Notice Processing Center
William Jefferson Clinton East Building - Room 7420
ATTN: 2017 CGP
U.S. EPA
1201 Constitution Avenue, NW
Washington, DC 20004

Visit this website for instructions on how to submit electronically:

<https://www.epa.gov/npdes/stormwater-discharges-construction-activities#ereporting>

Appendix L – Suggested Format for Request for Chemical Treatment

If you plan to add “cationic treatment chemicals” (as defined in Appendix A) to stormwater and/or authorized non-stormwater prior to discharge, Part 1.1.9 requires you to notify your applicable EPA Regional Office in advance of submitting your NOI. The EPA Regional Office will authorize coverage under this permit after you have included appropriate controls and implementation procedures designed to ensure that your use of cationic treatment chemicals will not lead to an exceedance of water quality standards. To notify your EPA Regional Office, you may use following form.



**UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, DC 20460
SUGGESTED FORMAT FOR NOTIFYING EPA ABOUT PROPOSED USE OF CATIONIC TREATMENT CHEMICALS
UNDER THE 2017 NPDES CONSTRUCTION GENERAL PERMIT**

Under Part 1.1.9 of the 2017 CGP, if you plan to add "cationic treatment chemicals" (as defined in Appendix A) to stormwater and/or authorized non-stormwater prior to discharge, you may not submit your Notice of Intent (NOI) until you notify your applicable EPA Regional Office in advance and the EPA Regional Office authorizes coverage under this permit after you have included appropriate controls and implementation procedures designed to ensure that your use of cationic treatment chemicals will not lead to a violation of water quality standards. You may use this suggested form to notify your EPA Regional Office about your proposed use of cationic treatment chemicals.

I. Operator Information

Operator Name:

Mailing Address:

Street:

City: State: ZIP Code: -

Phone: - - Ext.

E-mail:

II. Project/Site Information

Project/Site Name:

Project/Site Address:

Street/Location:

City: State: ZIP Code: -

County or Similar Government Subdivision:

Site contact name (if different from operator):

Site contact phone (if different from operator): - -

Name(s) of receiving waterbodies: _____

III. Map

Attach a map that illustrates the entire site including all of the below items. Include this map in your Stormwater Pollution Prevention Plan (SWPPP):

- All receiving waterbodies
- All proposed location(s) of chemical treatment system(s)
- All proposed point(s) of discharge to receiving waterbodies
- All soil types within areas to be disturbed
- All area of earth disturbance
- Sufficient indication of topography to indicate where stormwater flows

Attach a schematic drawing of the proposed treatment system(s). Include all components of the treatment train, sample points, and pipe configurations. In addition to sufficient holding capacity upstream of treatment, the system must have the capacity to hold water for testing and to re-treat water that does not meet water quality standards.

IV. Responsible Personnel

Treatment System Operator or Company Name (if subcontracted out):

Street/Location:

City: State: Zip Code: -

Responsible personnel. List personnel who will be responsible for operating the chemical treatment systems and application of the chemicals. Cite the training that the personnel have received in operation and maintenance of the treatment system(s) and use of the specific chemical(s) proposed.

V. Proposed Treatment

Check proposed treatment system.

- Chitosan enhanced sand filtration with discharge to infiltration (ground water)
- Chitosan enhanced sand filtration with discharge to temporary holding ponds (batch).
- Chitosan enhanced sand filtration with discharge to surface waters (flow-through).
- Other (describe below and submit documentation that the proposed system and chemical(s) demonstrate the ability to remove turbidity and produce non-toxic effluent/ discharge)

Check proposed cationic chemical(s) to be used:

- FlocClear™ (2% chitosan acetate solution)
- StormKlear™ LiquiFloc™ (1% chitosan acetate solution).
- ChitoVan™ (1% chitosan acetate solution).
- StormKlear™ LiquiFloc™ (3% Chitosan acetate solution)
- Other _____

Estimated Treatment Period Start Date: / /

Estimated Treatment Period End Date: / /

Describe sampling and recordkeeping schedule. Attach additional sheets as needed:

Explain why you have selected this proposed treatment system and chemicals. Include an explanation of why the use of cationic treatment chemicals is necessary at the site. Reference how the soil types on your site influenced your choices. Describe or provide an illustration of how the site of the discharge will be stabilized and why the discharge location will not cause erosion of the discharge water's bank or bed (please note that a permit from the Corps and state agencies may be necessary to place rock in the water body for this stabilization). Attach as many additional sheets as needed for a full explanation. If you have a report from a chemical treatment contractor describing their recommended approach you may attach that.

VI. Certification Information

I have documented and hereby certify that the following information is correct and has been documented in the SWPPP for this project:

- The SWPPP includes a complete site-specific description of the chemical treatment system herein proposed for use, including specifications, design, and Material Safety Data Sheets for all chemicals to be used.
- The controls to be used on the site are compatible with the safe and effective use of cationic chemical treatment.
- I verified through jar tests that the site soil is conducive to chemical treatment.
- I verified that the chemical treatment system operators for this project received training.
- I read, understand, and will follow all conditions and design criteria in the applicable use designation(s).
- If the discharge is to tribal waters, I notified the appropriate tribal government of the intent to use chemical treatment on a site located within that jurisdiction.
- I will keep the use level designation, operation and maintenance manual, and training certificate on site prior to and during use of chemical treatment.
- A licensed engineer designed the system for this project including system sizing, pond sizing, and flow requirements.
- I verify that the discharge will not adversely affect downstream conveyance systems or stream channels (e.g. cause erosion).

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 am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Authorized Official First Name, Middle Initial, Last Name:

Title:

Signature: _____ Date: / /

Email:

Instructions for Submitting This Form:

Submit your this form to your applicable EPA Regional Office. Contact information can be found at: <https://www.epa.gov/npdes/contact-us-stormwater#regional>

Appendix C – Copy of NOI and EPA Authorization email

Skulte, Karlis

From: donotreply@epa.gov
Sent: Monday, June 19, 2017 12:00 PM
To: Skulte, Karlis; marilyn@macdonald-industries.com
Cc: warner.suzanne@epa.gov
Subject: EPA Construction General Permit (CGP) Authorization is Active – Marilyn's Landing, NPDES ID: MAR1000NP
Attachments: MAR1000NPCopyOfRecord.pdf

2017-06-19

Your Notice of Intent (NOI) requesting coverage for Marilyn's Landing, Off Plymouth Street under EPA's Construction General Permit (CGP) has been accepted and authorization to discharge under the CGP became effective on 2017-06-19.

For tracking purposes, the following NPDES ID has been assigned to your NOI: MAR1000NP. To access your NOI in NeT, please visit: <https://cdxnodengn.epa.gov/oeca-cgp-web>.

As you know, the CGP requires you to have developed a Stormwater Pollution Prevention Plan (SWPPP) prior to submitting your NOI. The CGP also includes specific requirements for erosion and sediment controls, pollution prevention controls, conducting self-inspections, taking corrective actions, and conducting staff training. You must comply with any state, tribal, or territory-specific requirements in Part 9 (see <https://www.epa.gov/npdes/stormwater-discharges-construction-activities#cgp>).

Please note that this email does not represent a determination by EPA regarding the validity of the information you provided in your NOI. Your eligibility for coverage under this permit is based on the validity of the certification you provided. Your electronic signature on the NOI form certifies that you have read, understood, and are implementing all of the applicable requirements. An important aspect of this certification requires that you have correctly determined whether you are eligible for coverage under this permit.

The 2017 CGP and additional information are available at: <https://www.epa.gov/npdes/stormwater-discharges-construction-activities#cgp>.

If you have questions about this email or about NeT CGP, please refer to the NeT Help Center at <https://epanet.zendesk.com/hc/en-us> or e-mail NPDESreporting@epa.gov for assistance. If you have questions regarding the permit requirements of EPA's CGP, please contact EPA at warner.suzanne@epa.gov.

This is an automated notification; please do not reply to this email.



Submission of this Notice of Intent (NOI) constitutes notice that the operator identified in Section III of this form requests authorization to discharge pursuant to the NPDES Construction General Permit (CGP) permit number identified in Section II of this form. Submission of this NOI also constitutes notice that the operator identified in Section III of this form meets the eligibility requirements of Part 1.1 CGP for the project identified in Section IV of this form. Permit coverage is required prior to commencement of construction activity until you are eligible to terminate coverage as detailed in Part 8 of the CGP. To obtain authorization, you must submit a complete and accurate NOI form. Discharges are not authorized if your NOI is incomplete or inaccurate or if you were never eligible for permit coverage. Refer to the instructions at the end of this form.

Permit Information

NPDES ID: MAR1000NP

State where your construction site is located:
MA

Is your construction site located on Indian Country Lands? YES NO

Are you requesting coverage under this NOI as a "Federal Operator" as defined in Appendix A (https://www.epa.gov/sites/production/files/2017-02/documents/2017_cgp_final_appendix_a_-_definitions_508.pdf)?
 YES NO

Have stormwater discharges from your current construction site been covered previously under an NPDES permit? YES NO

Your most current NPDES ID: MAR12AN60

Will you use polymers, flocculants, or other treatment chemicals at your construction site? YES NO

Will you use cationic treatment chemicals at your construction site? YES NO

Has a Stormwater Pollution Prevention Plan (SWPPP) been prepared in advance of filling this NOI, as required? YES NO

Are you able to demonstrate that you meet one of the criteria listed in Appendix D (https://www.epa.gov/sites/production/files/2017-02/documents/2017_cgp_final_appendix_d_-_endangered_species_reqs_508.pdf) with respect to protection of threatened or endangered species listed under the Endangered Species Act (ESA) and federally designated critical habitat?
 YES NO

Have you completed the screening process in Appendix E (https://www.epa.gov/sites/production/files/2017-02/documents/2017_cgp_final_appendix_e_-_historic_properties_reqs_508.pdf) relating to the protection of historic properties?
 YES NO

Indicating "Yes" below, I confirm that I understand that CGP only authorized the allowable stormwater discharges in Part 1.2.1 and the allowable non-stormwater discharges listed in Part 1.2.2. Any discharges not expressly authorized in this permit cannot become authorized or shielded from liability under CWA section 402(k) by disclosure to EPA, state or local authorities after issuance of this permit via any means, including the Notice of Intent (NOI) to be covered by the permit, the Stormwater Pollution Prevention Plan (SWPPP), during an inspection, etc. If any discharges requiring NPDES permit coverage other than the allowable stormwater and non-stormwater discharges listed in Parts 1.2.1 and 1.2.2 will be discharged, they must be covered under another NPDES permit.
 YES NO

Operator Information

Operator Information

Operator Name: MacDonald Industries Corporation

Mailing Address:

Street/Location: 645 Walnut Street

City: Bridgewater

State: MA

Zip Code: 02324

County or Similar Government Subdivision: PLYMOUTH

Operator Point of Contact Information

First Name, Middle Initial, LastName: David MacDonald

Title: Operations Manager

Phone: 508-294-0174 Ext.

Email: marilynslanding@hotmail.com

Project/Site Information

Project/Site Name: Marilyn's Landing

Project/Site Address

Street/Location: Off Plymouth Street

City: Bridgewater

State: MA

Zip Code: 02324

County or Similar Government Subdivision: PLYMOUTH

Latitude/Longitude: 41.9906°N, 70.9012°W

Latitude/Longitude Data Source: Google Earth

Horizontal Reference Datum: WGS 84

Project Start Date: 07/01/2013

Project End Date: 12/31/2019

Estimated Area to be Disturbed: 7.25

Types of Construction Sites:

- Soil Placement

Will there be demolition of any structure built or renovated before January 1, 1980? YES NO

Was the pre-development land use used for agriculture? YES NO

Have earth-disturbing activities commenced on your project/site? YES NO

Is your project an "emergency-related project"? YES NO

Is your project located on a property of religious or cultural significance to an Indian tribe? YES NO

Discharge Information

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

Are any of the waters of the U.S. to which you discharge designated by the state or tribal authority under its antidegradation policy as a Tier 2 (or Tier 2.5) water (water quality exceeds levels necessary to support propagation of fish, shellfish, and wildlife and recreation in and on the water) or as a Tier 3 water (Outstanding National Resource Water)? See Appendix F (https://www.epa.gov/sites/production/files/2017-02/documents/2017_cgp_final_appendix_f_-_tier_3_tier_2_and_tier_2.5_waters_508.pdf)

YES NO

001: Wetland adjacent to Cross Street Pond Bordering Wetland adjacent to Cross Street Pond

Tier Designation: N/A

Is this receiving water impaired (on the CWA 303(d) list)? YES NO

Has a TMDL been completed for this receiving waterbody? YES NO

Stormwater Pollution Prevention Plan (SWPPP)

First Name, Middle Initial, LastName: David MacDonald

Title: Operations Manager

Phone: 508-294-0174 Ext.

Email: marilynslanding@hotmail.com

Endangered Species Protection

Using the Instructions in Appendix D of the CGP, under which criterion listed in Appendix D are you eligible for coverage under this permit?
Criterion C

Provide a brief summary of the basis for criterion selection listed above (the necessary content for a supportive basis statement is provided under the criterion you selected.):

Information was obtained from the US Fish and Wildlife - IPaCInformation for Planning and Consultation Website in accordance with Section 2 of the CGP. A review of the Natural Heritage & Endangered Species Program which is part of the Massachusetts Division of Fisheries and Wildlife was also performed indicating that the action area is located outside of any habitat areas and there will be no adverse effect on potential species habitat. Refer to Figure 3 for reference. The owner and its consultants have also completed federal, state and local environmental review process(s) required for Stormwater Management, Erosion, Drainage and Site Improvements. Any of these documents related to the Project are available upon request.

What federally-listed species or federally-designated critical habitat are located in your "action area"?

According to the USFWS letter, there are 2 species on the list: Northern Long-Eared Bat; and Plymouth Redbelly Turtle. The list identifies that our location is outside the designated critical habitat. Furthermore, there are no critical habitats within the project area. The owner and its consultants have completed federal, state and local environmental review process(s) required for Stormwater Management, Erosion, Drainage and Site Improvements.

What is the distance between your site and the listed species or critical habitat (miles)?

The Site is located 28.5 miles from identified Long-Eared Bat Habitat, and 13 miles from identified critical habitat for the Plymouth Redbelly turtle. Additionally, as part of local permitting, a comprehensive environmental review was performed and no habitat was found at the Site.

Copy of your Site Map:

Name	Created Date	Size
APP A - Fig 2 - Site Plans - 2017-03-23 - Reduced.pdf	06/02/2017 8:51 AM	1.59 MB

Historic Preservation

Are you installing any stormwater controls as described in Appendix E (https://www.epa.gov/sites/production/files/2017-02/documents/2017_cgp_final_appendix_e_-_historic_properties_reqs_508.pdf) that require subsurface earth disturbances? (Appendix E (https://www.epa.gov/sites/production/files/2017-02/documents/2017_cgp_final_appendix_e_-_historic_properties_reqs_508.pdf), Step 1)

YES NO

Have prior surveys or evaluations conducted on the site already determined historic properties do not exist, or that prior disturbances have precluded the existence of historic properties? (Appendix E (https://www.epa.gov/sites/production/files/2017-02/documents/2017_cgp_final_appendix_e_-_historic_properties_reqs_508.pdf), Step 2):

YES NO

Certification Information

Certified By: Marilyn A. MacDonald (MARILYNSLANDING2)

Certified On: 06/05/2017 11:26 AM

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. Signing an electronic document on behalf of another person is subject to criminal, civil, administrative, or other lawful action.

Appendix D – Copy of Inspection Form

2017 Construction General Permit Inspection Report Template – Field Version

Purpose

This Inspection Report Template (or “template”) is to assist you in preparing inspection reports for EPA's 2017 Construction General Permit (CGP). If you are covered under the 2017 CGP, you can use this template to create an inspection report form that is customized to the specific circumstances of your site and that complies with the minimum reporting requirements of Part 4.7 of the permit. Note that the use of this form is optional; you may use your own inspection report form provided it includes the minimum information required in Part 4.7 of the CGP.

If you are covered under a state CGP, this template may be helpful in developing a form that can be used for that permit; however, it will need to be modified to meet the specific requirements of that permit. If your permitting authority requires you to use a specific inspection report form, you should not use this form.

Notes:

While EPA has made every effort to ensure the accuracy of all instructions contained in the Inspection Report Template, it is the permit, not the template, that determines the actual obligations of regulated construction stormwater discharges. In the event of a conflict between the Inspection Report Template and any corresponding provision of the 2017 CGP, you must abide by the requirements in the permit. EPA welcomes comments on the Inspection Report Template at any time and will consider those comments in any future revision of this document. You may contact EPA for CGP-related inquiries at cgp@epa.gov.

Overview of Inspection Requirements (see CGP Part 4)

Construction operators covered under the 2017 CGP are subject to the following inspection requirements:

Person(s) Responsible for Inspecting the Site (see Part 4.1)

The person(s) inspecting your site must be a “qualified person” who may be either on your staff or a third party you hire to conduct such inspections.

- A “qualified person” is a person knowledgeable in the principles and practice of erosion and sediment controls and pollution prevention, who possesses the appropriate skills and training to assess conditions at the construction site that could impact stormwater quality, and the appropriate skills and training to assess the effectiveness of any stormwater controls selected and installed to meet the requirements of this permit.

Inspection Frequency (see Part 4.2)

You are required to conduct inspections either:

- Once every 7 calendar days; or
- Once every 14 calendar days and within 24 hours of a storm event of 0.25 inches or greater or the occurrence of runoff from snowmelt sufficient to cause a discharge.

Your inspection frequency is increased if the site discharges to a sensitive water. See Part 4.3. Your inspection frequency may be decreased to account for stabilized areas, or for arid, semi-arid, or drought-stricken conditions, or for frozen conditions. See Part 4.4.

Areas That Need to Be Inspected (see Part 4.5)

During each inspection, you must inspect the following areas of your site:

- Cleared, graded, or excavated areas of the site;
- Stormwater controls (e.g., perimeter controls, sediment basins, inlets, exit points etc.) and pollution prevention practices (e.g., pollution prevention practices for vehicle fueling/maintenance and washing, construction product storage, handling, and disposal, etc.) at the site;
- Material, waste, or borrow areas covered by the permit, and equipment storage and maintenance areas;
- Areas where stormwater flows within the site;
- Stormwater discharge points; and
- Areas where stabilization has been implemented.

What to Check For During Your Inspection (see Part 4.6)

During your site inspection, you are required to check:

- Whether stormwater controls or pollution prevention practices are properly installed, require maintenance or corrective action, or whether new or modified controls are required;
- For the presence of conditions that could lead to spills, leaks, or other pollutant accumulations and discharges;
- For locations where new or modified stormwater controls are necessary to meet requirements of the permit;

- Whether there are visible signs of erosion and sediment accumulation at points of discharge and to the channels and streambanks that are in the immediate vicinity of the discharge;
- If a stormwater discharge is occurring at the time of the inspection, whether there are obvious, visual signs of pollutant discharges; and
- If any permit violations have occurred on the site.

Inspection Reports (see Part 4.7)

Within 24 hours of completing each inspection, you are required to complete an inspection report that includes:

- Date of inspection;
- Names and titles of person(s) conducting the inspection;
- Summary of inspection findings;
- Rain gauge or weather station readings if your inspection is triggered by the 0.25-inch storm threshold; and
- If you determine that a portion of your site is unsafe to access for the inspection, documentation of what conditions prevented the inspection and where these conditions occurred on the site

Instructions for Using This Template

This Field Version of the Inspection Report Template is intended to be used in the field and filled out by hand. If you will be filling out the Inspection Report Template electronically (i.e., you will be typing in your findings), please use the Electronic Version of the Inspection Report Template available at <https://www.epa.gov/npdes/stormwater-discharges-construction-activities#resources>. The Electronic Version includes text fields with instructions for what to enter.

Keep in mind that this document is a template and not an "off-the-shelf" inspection report that is ready to use without some modification. You must first customize this form to include the specifics of your project in order for it to be useable for your inspection reports. Once you have entered all of your site-specific information into these fields, you may print out this form for use in the field to complete inspection reports.

The following tips for using this template will help you ensure that the minimum permit requirements are met:

- **Review the inspection requirements.** Before you start developing your inspection report form, read the CGP's Part 4 inspection requirements. This will ensure that you have a working understanding of the permit's underlying inspection requirements.
- **Complete all required text fields.** Fill out all text fields. Only by filling out all fields will the template be compliant with the requirements of the permit. (Note: Where you do not need the number of rows provided in the template form for your inspection, you may leave those rows blank. Or, if you need more space to document your findings, you may add an additional sheet.)
- **Use your site map to document inspection findings.** In several places in the template, you are directed to specify the location of certain features of your site, including where stormwater controls are installed and where you will be stabilizing exposed soil. You are also asked to fill in location information for unsafe conditions and the locations of any discharges occurring during your inspections. Where you are asked for location information, EPA encourages you to reference the point on your SWPPP site map that corresponds to the requested location on the inspection form. Using the site map as a tool in this way will help you conduct efficient inspections, will assist you in evaluating problems found, and will ensure proper documentation.
- **Sign and certify each inspection report.** The operator or a duly authorized representative (see Appendix I, Part I.11.2) must sign and certify each inspection report for it to be considered complete. Where a contractor or subcontractor carries out your inspections, it is recommended that you also have the inspector sign and certify the form, in addition to the signature and certification required of the permitted operator. The template includes a signature block for both parties.
- **Include the inspection form with your SWPPP.** Once your form is complete, make sure to include a copy of the inspection form in your SWPPP in accordance with Part 7.2.7.e of the CGP.
- **Retain copies of all inspection reports with your records.** You must also retain in your records copies of all inspection reports in accordance with the requirements in Part 4.7.3 of the 2017 CGP. These reports must be retained for at least 3 years from the date your permit coverage expires or is terminated.

Section-by-Section Instructions

You will find specific instructions corresponding to each section of the report form on the reverse side of each page. These instructions provide you with more details in terms of what EPA expects to be documented in these reports.

General Information
(see reverse for instructions)

Name of Project	Marilyn's Landing – Phase III	NPDES ID No.		Inspection Date	
Weather conditions during inspection		Inspection start time		Inspection end time	
Inspector Name, Title & Contact Information					
Present Phase of Construction					
Inspection Location (if multiple inspections are required, specify location where this inspection is being conducted)					
Inspection Frequency (Note: you may be subject to different inspection frequencies in different areas of the site. Check all that apply) Standard Frequency: <input checked="" type="checkbox"/> Every 7 days <input type="checkbox"/> Every 14 days and within 24 hours of a 0.25" rain or the occurrence of runoff from snowmelt sufficient to cause a discharge Increased Frequency: <input type="checkbox"/> Every 7 days and within 24 hours of a 0.25" rain (for areas of sites discharging to sediment or nutrient-impaired waters or to waters designated as Tier 2, Tier 2.5, or Tier 3) Reduced Frequency: <input type="checkbox"/> Twice during first month, no more than 14 calendar days apart; then once per month after first month; (for stabilized areas) <input type="checkbox"/> Twice during first month, no more than 14 calendar days apart; then once more within 24 hours of a 0.25" rain (for stabilized areas on "linear construction sites") <input type="checkbox"/> Once per month and within 24 hours of a 0.25" rain (for arid, semi-arid, or drought-stricken areas during seasonally dry periods or during drought) <input checked="" type="checkbox"/> Once per month (for frozen conditions where earth-disturbing activities are being conducted)					
Was this inspection triggered by a 0.25" storm event? <input type="checkbox"/> Yes <input type="checkbox"/> No If yes, how did you determined whether a 0.25" storm event has occurred? <input type="checkbox"/> Rain gauge on site <input type="checkbox"/> Weather station representative of site. Specify weather station source: Total rainfall amount that triggered the inspection (in inches):					
Was this inspection triggered by the occurrence of runoff from snowmelt sufficient to cause a discharge? <input type="checkbox"/> Yes <input type="checkbox"/> No					
Unsafe Conditions for Inspection Did you determine that any portion of your site was unsafe for inspection per CGP Part 4.5? <input type="checkbox"/> Yes <input type="checkbox"/> No If "yes", complete the following: - Describe the conditions that prevented you from conducting the inspection in this location: - Location(s) where conditions were found:					

Instructions for Filling Out “General Information” Section

Name of Project

Enter the name for the project.

NPDES ID No.

Enter the NPDES ID number that was assigned to your NOI for permit coverage.

Inspection Date

Enter the date you conducted the inspection.

Weather Conditions During Inspection

Enter the weather conditions occurring during the inspection, e.g., sunny, overcast, light rain, heavy rain, snowing, icy, windy.

Inspection start and end times

Enter the time you started and ended the inspection.

Inspector Name, Title & Contact Information

Provide the name of the person(s) (either a member of your company's staff or a contractor or subcontractor) that conducted this inspection. Provide the inspector's name, title, and contact information as directed in the form.

Present Phase of Construction

If this project is being completed in more than one phase, indicate which phase it is currently in.

Inspection Location

If your project has multiple locations where you conduct separate inspections, specify the location where this inspection is being conducted. If only one inspection is conducted for your entire project, enter “Entire Site.” If necessary, complete additional inspection report forms for each separate inspection location.

Inspection Frequency

Check the box that describes the inspection frequency that applies to you. Note that you may be subject to different inspection frequencies in different areas of your site. If your project does not discharge to a “sensitive water” (i.e., a water impaired for sediment or nutrients, or listed as Tier 2, 2.5, or 3 by your state or tribe) and you are not affected by any of the circumstances described in CGP Part 4.4, then you can choose your frequency based on CGP Part 4.2 – either every 7 calendar days, or every 14 calendar days and within 24 hours of a 0.25-inch storm event. For any portion of your site that discharges to a sensitive water, your inspection frequency for that area is fixed under CGP Part 4.3 at every 7 calendar days and within 24 hours of a 0.25-inch storm event. If portions of your site are stabilized, are located in arid, semi-arid, or drought-stricken areas, or are subject to frozen conditions, consult CGP Part 4.4 for the applicable inspection frequency. Check all the inspection frequencies that apply to your project.

Was This Inspection Triggered by a 0.25 Inch Storm Event or the occurrence of runoff from snowmelt sufficient to cause a discharge?

If you were required to conduct this inspection because of a 0.25-inch (or greater) rain event, indicate whether you relied on an on-site rain gauge or a nearby weather station (and where the weather station is located). Also, specify the total amount of rainfall for this specific storm event. If you were required to conduct this inspection because of the occurrence of runoff from snowmelt, then check the appropriate box.

Unsafe Conditions for Inspection

Inspections are not required where a portion of the site or the entire site is subject to unsafe conditions. See CGP Part 4.5. These conditions should not regularly occur, and should not be consistently present on a site. Generally, unsafe conditions are those that render the site (or a portion of it) inaccessible or that would pose a significant probability of injury to applicable personnel. Examples could include severe storm or flood conditions, high winds, and downed electrical wires.

If your site, or a portion of it, is affected by unsafe conditions during the time of your inspection, provide a description of the conditions that prevented you from conducting the inspection and what parts of the site were affected. If the entire site was considered unsafe, specify the location as “Entire site”

Condition and Effectiveness of Erosion and Sediment (E&S) Controls (CGP Part 2.2)

(see reverse for instructions)

Type/Location of E&S Control [Add an additional sheet if necessary]	Maintenance Needed?*	Corrective Action Required?*	Date on Which Maintenance or Corrective Action First Identified?	Notes
1. Natural buffer	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No		
2. Straw bales with silt fences	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No		
3. Silt sock	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No		
4. Diversion berm	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No		
5. Gravel construction exit	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No		
6. Erosion control blanket	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No		
7. Vegetative stabilization	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No		
8. Stone check dams	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No		
9. Sediment control basins	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No		
10. Rip Rap Downdrain	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No		
11. Outlet stone protection	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No		

* **Note:** The permit differentiates between conditions requiring routine maintenance, and those requiring corrective action. The permit requires maintenance in order to keep controls in effective operating condition. Corrective actions are triggered only for specific conditions, which include: 1) A stormwater control needs repair or replacement (beyond routine maintenance) if it is not operating as intended; 2) A stormwater control necessary to comply with the permit was never installed or was installed incorrectly; 3) You become aware that the stormwater controls you have installed and are maintaining are not effective enough for the discharge to meet applicable water quality standards or applicable requirements in Part 3.1; 4) One of the prohibited discharges in Part 1.3 is occurring or has occurred; or 5) EPA requires corrective actions as a result of a permit violation found during an inspection carried out under Part 4.8. If a condition on your site requires a corrective action, you must also fill out a corrective action form found at <https://www.epa.gov/npdes/stormwater-discharges-construction-activities#resources>. See Part 5 of the permit for more information.

Instructions for Filling Out the “Erosion and Sediment Control” Table

Type and Location of E&S Controls

Provide a list of all erosion and sediment (E&S) controls that your SWPPP indicates will be installed and implemented at your site. This list must include at a minimum all E&S controls required by CGP Part 2.2. Include also any natural buffers established under CGP Part 2.2.1. Buffer requirements apply if your project's earth-disturbing activities will occur within 50 feet of a water of the U.S. You may group your E&S controls on your form if you have several of the same type of controls (e.g., you may group “Inlet Protection Measures”, “Perimeter Controls”, and “Stockpile Controls” together on one line), but if there are any problems with a specific control, you must separately identify the location of the control, whether maintenance or corrective action is necessary, and in the notes section you must describe the specifics about the problem you observed.

Maintenance Needed?

Answer “yes” if the E&S control requires maintenance due to normal wear and tear in order for the control to continue operating effectively. At a minimum, maintenance is required in the following specific instances: (1) for perimeter controls, whenever sediment has accumulated to half or more the above-ground height of the control (CGP Part 2.2.3.a); (2) where sediment has been tracked-out onto the surface of off-site streets or other paved areas (CGP Part 2.2.4); (3) for inlet protection measures, when sediment accumulates, the filter becomes clogged, and/or performance is compromised (CGP Part 2.2.10); and (4) for sediment basins, as necessary to maintain at least half of the design capacity of the basin (CGP Part 2.2.12.f). Note: In many cases, “yes” answers are expected and indicate a project with an active operation and maintenance program. You should also answer “yes” if work to fix the problem is still ongoing from the previous inspection.

Corrective Action Needed?

Answer “yes” if during your inspection you found any of the following conditions to be present (CGP, Part 5.1): (1) a required E&S control needs repair or replacement (beyond routine maintenance required under Part 2.1.4); (2) a required E&S control was never installed or was installed incorrectly; (3) you become aware that the inadequacy of the E&S control has led to an exceedance of an applicable water quality standard; (4) one of the prohibited discharges in Part 1.3 is occurring or has occurred; or (5) EPA requires corrective action for an E&S control as a result of a permit violation found during an inspection carried out under Part 4.8. If you answer “yes”, you must take corrective action and complete a corrective action report, found at <https://www.epa.gov/npdes/stormwater-discharges-construction-activities#resources>. Note: You should answer “yes” if work to fix the problem from a previous inspection is still ongoing.

Date on Which Maintenance or Corrective Action First Identified?

Provide the date on which the condition that triggered the need for maintenance or corrective action was first identified. If the condition was just discovered during this inspection, enter the inspection date. If the condition is a carryover from a previous inspection, enter the original date of the condition's discovery.

Notes

For each E&S control and the area immediately surrounding it, note whether the control is properly installed and whether it appears to be working to minimize sediment discharge. Describe any problem conditions you observed such as the following, and why you think they occurred as well as actions (e.g., maintenance or corrective action) you will take or have taken to fix the problem:

1. Failure to install or to properly install a required E&S control
2. Damage or destruction to an E&S control caused by vehicles, equipment, or personnel, a storm event, or other event
3. Mud or sediment deposits found downslope from E&S controls
4. Sediment tracked out onto paved areas by vehicles leaving construction site
5. Noticeable erosion at discharge outlets or at adjacent streambanks or channels
6. Erosion of the site's sloped areas (e.g., formation of rills or gullies)
7. E&S control is no longer working due to lack of maintenance

For buffer areas, make note of whether they are marked off as required, whether there are signs of construction disturbance within the buffer, which is prohibited under the CGP, and whether there are visible signs of erosion resulting from discharges through the area.

If maintenance or corrective action is required, briefly note the reason. If maintenance or corrective action have been completed, make a note of the date it was completed and what was done. *If corrective action is required, note that you will need to complete a separate corrective action report describing the condition and your work to fix the problem.*

Condition and Effectiveness of Pollution Prevention (P2) Practices (CGP Part 2.3)				
(see reverse for instructions)				
Type/Location of P2 Practices [Add an additional sheet if necessary]	Maintenance Needed?*	Corrective Action Required?*	Date on Which Maintenance or Corrective Action First Identified?	Notes
1. Equipment or vehicle fueling and maintenance area	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No		
2. Equipment washing area	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No		
3. Pesticides, herbicides, insecticides, fertilizers, and landscape materials storage area.	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No		
4. Diesel fuel, oil, hydraulic fluids, other petroleum products, and other chemicals	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No		
5. Dumpsters	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No		
6. Sanitary facilities	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No		
7.	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No		
8.	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No		
9.	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No		
10.	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No		

* **Note:** The permit differentiates between conditions requiring routine maintenance, and those requiring corrective action. The permit requires maintenance in order to keep controls in effective operating condition. Corrective actions are triggered only for specific conditions, which include: 1) A stormwater control needs repair or

replacement (beyond routine maintenance) if it is not operating as intended; 2) A stormwater control necessary to comply with the permit was never installed or was installed incorrectly; 3) You become aware that the stormwater controls you have installed and are maintaining are not effective enough for the discharge to meet applicable water quality standards or applicable requirements in Part 3.1; 4) One of the prohibited discharges in Part 1.3 is occurring or has occurred; or 5) EPA requires corrective actions as a result of a permit violation found during an inspection carried out under Part 4.8. If a condition on your site requires a corrective action, you must also fill out a corrective action form found at <https://www.epa.gov/npdes/stormwater-discharges-construction-activities#resources>. See Part 5 of the permit for more information.

Instructions for Filling Out the “Pollution Prevention (P2) Practice” Table

Type and Location of P2 Controls

Provide a list of all pollution prevention (P2) practices that are implemented at your site. This list must include all P2 practices required by Part 2.3, and those that are described in your SWPPP.

Maintenance Needed?

Answer “yes” if the P2 practice requires maintenance due to normal wear and tear in order for the control to continue operating effectively. Note: In many cases, “yes” answers are expected and indicate a project with an active operation and maintenance program.

Corrective Action Needed?

Answer “yes” if during your inspection you found any of the following conditions to be present (CGP, Part 5.1): (1) a required P2 practice needs repair or replacement (beyond routine maintenance required under Part 2.1.4); (2) a required P2 practice was never installed or was installed incorrectly; (3) you become aware that the inadequacy of the P2 practice has led to an exceedance of an applicable water quality standard; (4) one of the “prohibited discharges” listed in CGP Part 1.3 is occurring or has occurred, or (5) EPA requires corrective action for a P2 practice as a result of a permit violation found during an inspection carried out under Part 4.8. If you answer “yes”, you must take corrective action and complete a corrective action report (see <https://www.epa.gov/npdes/stormwater-discharges-construction-activities#resources>). Note: You should answer “yes” if work to fix the problem from a previous inspection is still ongoing.

Date on Which Maintenance or Corrective Action First Identified?

Provide the date on which the condition that triggered the need for maintenance or corrective action was first identified. If the condition was just discovered during this inspection, enter the inspection date. If the condition is a carryover from a previous inspection, enter the original date of the condition's discovery.

Notes

For each P2 control and the area immediately surrounding it, note whether the control is properly installed, whether it appears to be working to minimize or eliminate pollutant discharges, and whether maintenance or corrective action is required. Describe problem conditions you observed such as the following, and why you think they occurred, as well as actions you will take or have taken to fix the problem:

1. Failure to install or to properly install a required P2 control
2. Damage or destruction to a P2 control caused by vehicles, equipment, or personnel, or a storm event
3. Evidence of a spill, leak, or other type of pollutant discharge, or failure to have properly cleaned up a previous spill, leak, or other type of pollutant discharge
4. Spill response supplies are absent, insufficient, or not where they are supposed to be located
5. Improper storage, handling, or disposal of chemicals, building materials or products, fuels, or wastes
6. P2 practice is no longer working due to lack of maintenance

If maintenance or corrective action is required, briefly note the reason. If maintenance or corrective action have been completed, make a note of the date it was completed and what was done. *If corrective action is required, note that you will need to complete a separate corrective action report describing the condition and your work to fix the problem.*

Stabilization of Exposed Soil (CGP Part 2.2.14)

(see reverse for instructions)

Stabilization Area [Add an additional sheet if necessary]	Stabilization Method	Have You Initiated Stabilization?	Notes
1.		<input type="checkbox"/> YES <input type="checkbox"/> NO If yes, provide date:	
2.		<input type="checkbox"/> YES <input type="checkbox"/> NO If yes, provide date:	
3.		<input type="checkbox"/> YES <input type="checkbox"/> NO If yes, provide date:	
4.		<input type="checkbox"/> YES <input type="checkbox"/> NO If yes, provide date:	
5.		<input type="checkbox"/> YES <input type="checkbox"/> NO If yes, provide date:	

Description of Discharges (CGP Part 4.6.6)

(see reverse for instructions)

Was a stormwater discharge or other discharge occurring from any part of your site at the time of the inspection? Yes No

If "yes", provide the following information for each point of discharge:

Discharge Location [Add an additional sheet if necessary]	Observations
1.	Describe the discharge: At points of discharge and the channels and banks of waters of the U.S. in the immediate vicinity, are there any visible signs of erosion and/or sediment accumulation that can be attributed to your discharge? <input type="checkbox"/> Yes <input type="checkbox"/> No If yes, describe what you see, specify the location(s) where these conditions were found, and indicate whether modification, maintenance, or corrective action is needed to resolve the issue:
2.	Describe the discharge: At points of discharge and the channels and banks of waters of the U.S. in the immediate vicinity, are there any visible signs of erosion and/or sediment accumulation that can be attributed to your discharge? <input type="checkbox"/> Yes <input type="checkbox"/> No If yes, describe what you see, specify the location(s) where these conditions were found, and indicate whether modification, maintenance, or corrective action is needed to resolve the issue:

Instructions for Filling Out the “Stabilization of Exposed Soil” Table

Stabilization Area

List all areas where soil stabilization is required to begin because construction work in that area has permanently stopped or temporarily stopped (i.e., work will stop for 14 or more days), and all areas where stabilization has been implemented.

Stabilization Method

For each area, specify the method of stabilization (e.g., hydroseed, sod, planted vegetation, erosion control blanket, mulch, rock).

Have You Initiated Stabilization

For each area, indicate whether stabilization has been initiated.

Notes

For each area where stabilization has been initiated, describe the progress that has been made, and what additional actions are necessary to complete stabilization. Note the effectiveness of stabilization in preventing erosion. If stabilization has been initiated but not completed, make a note of the date it is to be completed. If stabilization has been completed, make a note of the date it was completed. If stabilization has not yet been initiated, make a note of the date it is to be initiated, and the date it is to be completed.

Instructions for Filling Out the “Description of Discharges” Table

You are only required to complete this section if a discharge is occurring at the time of the inspection.

Was a Stormwater Discharge Occurring From Any Part of Your Site At The Time of the Inspection?

During your inspection, examine all points of discharge from your site, and determine whether a discharge is occurring. If there is a discharge, answer “yes” and complete the questions below regarding the specific discharge. If there is not a discharge, answer “no” and skip to the next page.

Discharge Location (repeat as necessary if there are multiple points of discharge)

Location of discharge. Specify the location on your site where the discharge is occurring. The location may be an outlet from a stormwater control or constructed stormwater channel, a discharge into a storm sewer inlet, or a specific point on the site. Be as specific as possible; it is recommended that you refer to a precise point on your site map.

Describe the discharge. Include a specific description of any noteworthy characteristics of the discharge such as color; odor; floating, settled, or suspended solids; foam; oil sheen; and other obvious pollution indicators.

Are there visible signs of erosion or sediment accumulation? At each point of discharge and the channel and streambank in the immediate vicinity, visually assess whether there are any obvious signs of erosion and/or sediment accumulation that can be attributed to your discharge. If you answer “yes”, include a description in the space provided of the erosion and sediment deposition that you have found, specify where on the site or in the water of the U.S. it is found, and indicate whether modification, maintenance, or corrective action is needed to resolve the issue.

Contractor or Subcontractor Signature and Certification

(see reverse for instructions)

"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."

Signature of Contractor or Subcontractor: _____ **Date:** _____

Printed Name and Affiliation: _____

Operator Signature and Certification

(see reverse for instructions)

"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."

Signature of Operator or "Duly Authorized Representative": _____ **Date:** _____

Printed Name and Affiliation: _____

Instructions for Signature/Certification

Each inspection report must be signed and certified to be considered complete.

Contractor or Subcontractor Signature and Certification

Where you rely on a contractor or subcontractor to carry out the inspection and complete the inspection report, you should require the inspector to sign and certify each report. Note that this does not relieve you, the permitted operator, of the requirement to sign and certify the inspection report as well.

Operator Signature and Certification

At a minimum, the inspection report must be signed by either (1) the person who signed the NOI, or (2) a duly authorized representative of that person. The following requirements apply to scenarios (1) and (2):

If the signatory will be the person who signed the NOI for permit coverage, as a reminder, that person must be one of the following types of individuals:

- *For a corporation:* A responsible corporate officer. For the purpose of this subsection, a responsible corporate officer means: (i) a president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy- or decision-making functions for the corporation, or (ii) the manager of one or more manufacturing, production, or operating facilities, provided, the manager is authorized to make management decisions which govern the operation of the regulated facility including having the explicit or implicit duty of making major capital investment recommendations, and initiating and directing other comprehensive measures to assure long term environmental compliance with environmental laws and regulations; the manager can ensure that the necessary systems are established or actions taken to gather complete and accurate information for permit application requirements; and where authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures.
- *For a partnership or sole proprietorship:* A general partner or the proprietor, respectively.
- *For a municipality, state, federal, or other public agency:* Either a principal executive officer or ranking elected official. For purposes of this subsection, a principal executive officer of a federal agency includes (i) the chief executive officer of the agency, or (ii) a senior executive officer having responsibility for the overall operations of a principal geographic unit of the agency (e.g., Regional Administrator of EPA).

If the signatory will be a duly authorized representative, the following requirements must be met:

- The authorization is made in writing by the person who signed the NOI (see above);
- The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity such as the position of plant manager, operator of a well or a well field, superintendent, position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters for the company. (A duly authorized representative may thus be either a named individual or any individual occupying a named position); and
- The signed and dated written authorization is included in the SWPPP. A copy must be submitted to EPA, if requested.

Appendix E – Copy of Corrective Action Form

2017 Construction General Permit Corrective Action Report Form – Field Version

Purpose

This Corrective Action Report Form is to assist you in preparing corrective action reports for EPA's 2017 Construction General Permit (CGP). If you are covered under EPA's 2017 CGP, you can use this form to create a corrective action report that complies with the minimum reporting requirements of Part 5.4 of the permit.

You are only required to fill out this form if one of the conditions triggering corrective action in Part 5.1 or 5.3 occurs on your site. Routine maintenance is generally not considered to trigger corrective action. Corrective actions are triggered only for specific conditions that are identified below in the "Overview of Corrective Action Requirements."

If you are covered under a state CGP, this form may be helpful in developing a report that can be used for that permit; however, it will need to be modified to meet the specific requirements of the permit. If your permitting authority requires you to use a specific corrective action report form, you should not use this form.

Notes

While EPA has made every effort to ensure the accuracy of all instructions contained in the Corrective Action Report Form, it is the permit, not the form, that determines the actual obligations of regulated construction stormwater discharges. In the event of a conflict between the Corrective Action Report Form and any corresponding provision of the 2017 CGP, you must abide by the requirements in the permit. EPA welcomes comments on the Corrective Action Report Form at any time and will consider those comments in any future revision of this document. You may contact EPA for CGP-related inquiries at cgp@epa.gov.

Overview of Corrective Action Requirements

Construction operators covered under the 2017 CGP are required to conduct corrective actions and report on progress made in correcting the problem condition(s) in accordance with the following requirements:

Conditions Triggering Corrective Action (Parts 5.1 and 5.3)

Corrective action is required whenever any of the following conditions occur at your site:

- A stormwater control needs repair or replacement (beyond routine maintenance required under Part 2.1.4); or
- A stormwater control necessary to comply with the requirements of this permit was never installed, or was installed incorrectly; or
- Discharges are causing an exceedance of applicable water quality standards; or
- A Part 1.3 prohibited discharge has occurred; or
- EPA requires corrective action as a result of permit violations found during an inspection carried out under Part 4.8.

Deadlines for Completing Corrective Actions (Part 5.2)

For any condition triggering corrective action:

- You must immediately take all reasonable steps to address the condition (e.g. cleaning up contaminated surfaces so the material(s) is not discharged in subsequent storm events);
- If the problem does not require a new or replacement control or significant repair, you must complete the corrective action by the close of the next business day
- If the problem does require a new or replacement control or significant repair, you must complete corrective action (e.g., installing and making operational any new or modified control, completing repairs) by no later than 7 calendar days from the time of discovery of the condition. If infeasible to complete the installation or repair within 7 calendar days, you must document why it is infeasible and document your schedule for completing the corrective action as soon as practicable. If any of these actions result in changes to the stormwater controls documented in your SWPPP, you must modify your SWPPP within 7 calendar days.

Deadlines for Documenting Corrective Actions in a Report (Part 5.4)

You are required to complete a corrective action report for each corrective action you take in accordance with the following deadlines.

- Within 24 hours of *identifying* the corrective action condition, you must document the following:
 - The condition identified at your site; and
 - The date and time you identified the condition
- Within 24 hours of completing the corrective action, you must document the following:
 - The actions you took to address the condition, and
 - Whether any SWPPP modifications are required.

Instructions for Using This Report Form

This Field Version of the Corrective Action Report Form is intended to be used in the field and filled out by hand. If you will be filling out the Corrective Action Report Form electronically (i.e., you will be typing in your findings), please use the Electronic Version of the Corrective Action Report Form available at <https://www.epa.gov/npdes/stormwater-discharges-construction-activities#resources>. The Electronic Version includes text fields with instructions for what to enter.

The following tips for using this form will help you ensure that the minimum permit requirements are met:

- **Review the corrective action requirements.** Before you fill out this corrective action report form, read the CGP's Part 5 corrective action requirements. This will ensure that you have a working understanding of the permit's underlying corrective action requirements.
- **Complete a separate report for each condition that triggers corrective action.** For each triggering condition on your site, you will need to fill out a separate corrective action report form.
- **Complete all required text fields.** Fill out all text fields. Only by filling out all fields will the form be compliant with the requirements of the permit. (Note: Where you do not need the number of rows provided in the corrective action report form, you may leave those rows blank. Or, if you need more space to document your findings, you may add an additional sheet.)
- **Sign and certify each corrective action report.** The operator or a duly authorized representative (see Appendix I, Part I.11.2) must sign and certify each corrective action report form for it to be considered complete. Where a contractor or subcontractor carries out your corrective actions, it is recommended that you also have that individual sign and certify the form, in addition to the signature and certification required of the permitted operator. The form includes a signature block for both parties.
- **Include the corrective action report form with your SWPPP.** Once your form is complete, make sure to include a copy of the corrective action report form in your SWPPP in accordance with Part 7.2.7.e of the CGP.
- **Retain copies of all corrective action reports with your records.** You must retain copies of your corrective action reports in your records in accordance with the requirements in Part 5.4.4 of the 2017 CGP. These reports must be retained for at least 3 years from the date your permit coverage expires or is terminated.

Section-by-Section Instructions

You will find specific instructions corresponding to each section of the report form on the reverse side of each page. These instructions were written in order to provide you with more details in terms of what EPA expects to be documented in these reports

Section A – Initial Report (CGP Part 5.4.1)

(Complete this section within 24 hours of identifying the condition that triggered corrective action)

Name of Project	Marilyn's Landing – Phase III	NPDES ID No.		Today's Date	
Date Problem First Discovered		Time Problem First Discovered			
Name and Contact Information of Individual Completing this Form					

What site conditions triggered the requirement to conduct corrective action (*check the box that applies*):

- A stormwater control needs repair or replacement (beyond routine maintenance required under Part 2.1.4)
- A stormwater control necessary to comply with the requirements of this permit was never installed, or was installed incorrectly
- A discharge is causing an exceedance of applicable water quality standards
- A Part 1.3 prohibited discharge has occurred
- EPA requires corrective action as a result of permit violations found during an EPA inspection carried out under Part 4.8

Provide a description of the problem:

Deadline for completing corrective action (*check the box that applies*):

- Immediately take all reasonable steps to address the condition, including cleaning up any contaminated surfaces so the material will not discharge in subsequent storm events
- Complete by close of the next business day when problem does not require a new or replacement control or significant repair
- No later than 7 calendar days from the time of discovery for problems that require a new or replacement control or significant repair
- Infeasible to complete the installation or repair within 7 calendar days. Explain why it is infeasible and document schedule for installing control:

Enter date of corrective action completion: _____

Section B – Corrective Action Completion (CGP Part 5.4.2)

(Complete this section no later than 24 hours after completing the corrective action)

Section B.1 – Why the Problem Occurred

Cause(s) of Problem (Add an additional sheet if necessary)	How You Determined the Cause and the Date You Determined the Cause
1.	1.
2.	2.

Section B.2 – Stormwater Control Modifications Implemented to Correct the Problem

List of Stormwater Control Modification(s) Needed to Correct Problem (Add an additional sheet if necessary)	Date of Completion	SWPPP Update Necessary?	Notes
1.		<input type="checkbox"/> Yes <input type="checkbox"/> No If yes, provide date SWPPP modified:	
2.		<input type="checkbox"/> Yes <input type="checkbox"/> No If yes, provide date SWPPP modified:	

Instructions for Filling Out the Initial Report (Section A)

You must complete Section A of the report form within 24 hours of discovering the condition that triggered corrective action

Name of Project

Enter the name for the project.

NPDES ID No.

Enter the NPDES ID number that was assigned to your NOI for permit coverage.

Today's Date

Enter the date you completed this form.

Date/Time Problem First Discovered

Specify the date on which the triggering condition was first discovered. Also specify the time of the discovery.

Name/Contact Information

Provide the individual's name, title, and contact information as directed in the form.

Site Condition That Triggered Corrective Action

Under the CGP, corrective action is required when one of 4 triggering conditions occurs at your site or when EPA requires a corrective action as a result of a permit violation found during an EPA inspection. See CGP Parts 5.1 and 5.3. Check the box that corresponds to the condition that triggered this corrective action.

Description of the Site Condition

Provide a summary description of the condition you found that triggered corrective action under CGP Part 5.1 and the specific location where it was found. Be as specific as possible about the location; it is recommended that you refer to a precise point on your site map. If you have already provided this explanation in an inspection report, you can refer to that report.

Deadline for Completing Corrective Action

This deadline is fixed in CGP Part 5.2. For all projects, the deadlines are: (1) immediately take all reasonable steps; (2) by the close of the next business day when the problem does not require significant repair or replacement; (3) no more than 7 calendar days after the date you discovered the problem when the problem does require significant repair or replacement, or (4) if it is infeasible to complete work within the first 7 days, as soon as practicable following the 7th day. If your estimated date of completion falls after the 7-day deadline consistent with (3), above, explain (a) why you believe it is infeasible to complete work within 7 days, and (b) why the date you have established for making the new or modified stormwater control operational is the soonest practicable timeframe.

Instructions for Filling Out the Corrective Action Completion Table (Section B)

You must complete Section B of the report form no later than 24 hours after completing the correction action.

Section B.1 – Why the Problem Occurred

After you have had the opportunity to examine the problem more closely, provide details as to what you believe to be the cause of the problem, and specify the follow-up actions you took (along with the dates of such actions) to diagnose the problem. This is consistent with CGP Part 5.4.2.

Section B.2 – Stormwater Control Modifications Implemented

Provide a list of modifications you made to your stormwater controls to correct the problem and the date you completed such work. Keep in mind that your work must be completed within the timeline specified in Section A for the completion of corrective action work.

Also, if a SWPPP modification is necessary consistent with Part 7.4.1.a in order to reflect changes implemented at your site, indicate the date you modified your SWPPP. Keep in mind that SWPPP changes must be made within 7 days of discovering the problem that triggered this corrective action.

Space is provided for you to include additional notes or observations regarding the change that you implemented at your site to correct the problem.

Section C –Signature and Certification (CGP Part 5.4.3)

Section C.1 – Contractor or Subcontractor Signature and Certification

"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."

Signature of Contractor or Subcontractor: _____

Date:

Printed Name and Affiliation: _____

Section C.2 – Operator Signature and Certification

"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."

Signature of Operator or "Duly Authorized Representative": _____

Date:

Printed Name and Affiliation: _____

Instructions for Signature and Certification (Section C)

Each corrective action report must be signed and certified to be considered complete.

Section C.1 – Contractor or Subcontractor Signature and Certification

Where you rely on a contractor or subcontractor to complete this report and the associated corrective action, you should require the individual(s) to sign and certify each report. Note that this does not relieve you, the permitted operator, of the requirement to sign and certify the report as well.

Section C.2 – Operator Signature and Certification

At a minimum, the corrective action report form must be signed by either (1) the person who signed the NOI, or (2) a duly authorized representative of that person. The following requirements apply to scenarios (1) and (2):

If the signatory will be the person who signed the NOI for permit coverage, as a reminder, that person must be one of the following types of individuals:

- *For a corporation:* A responsible corporate officer. For the purpose of this subsection, a responsible corporate officer means: (i) a president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy- or decision-making functions for the corporation, or (ii) the manager of one or more manufacturing, production, or operating facilities, provided, the manager is authorized to make management decisions which govern the operation of the regulated facility including having the explicit or implicit duty of making major capital investment recommendations, and initiating and directing other comprehensive measures to assure long term environmental compliance with environmental laws and regulations; the manager can ensure that the necessary systems are established or actions taken to gather complete and accurate information for permit application requirements; and where authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures.
- *For a partnership or sole proprietorship:* A general partner or the proprietor, respectively.
- *For a municipality, state, federal, or other public agency:* Either a principal executive officer or ranking elected official. For purposes of this subsection, a principal executive officer of a federal agency includes (i) the chief executive officer of the agency, or (ii) a senior executive officer having responsibility for the overall operations of a principal geographic unit of the agency (e.g., Regional Administrator of EPA).

If the signatory will be a duly authorized representative, the following requirements must be met:

- The authorization is made in writing by the person who signed the NOI (see above);
- The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity such as the position of plant manager, operator of a well or a well field, superintendent, position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters for the company. (A duly authorized representative may thus be either a named individual or any individual occupying a named position); and
- The signed and dated written authorization is included in the SWPPP. A copy must be submitted to EPA, if requested.

Appendix F – SWPPP Amendment Log

No.	Description of the Amendment	Date of Amendment	Amendment Prepared by [Name(s) and Title]

Appendix G – Subcontractor Certifications/Agreements

SUBCONTRACTOR CERTIFICATION
STORMWATER POLLUTION PREVENTION PLAN

Project Number: _____

Project Title: Marilyn's Landing – Phase III

Operator(s): _____

As a subcontractor, you are required to comply with the Stormwater Pollution Prevention Plan (SWPPP) for any work that you perform on-site. Any person or group who violates any condition of the SWPPP may be subject to substantial penalties or loss of contract. You are encouraged to advise each of your employees working on this project of the requirements of the SWPPP. A copy of the SWPPP is available for your review at the office trailer.

Each subcontractor engaged in activities at the construction site that could impact stormwater must be identified and sign the following certification statement:

I certify under the penalty of law that I have read and understand the terms and conditions of the SWPPP for the above designated project and agree to follow the practices described in the SWPPP.

This certification is hereby signed in reference to the above named project:

Company: _____

Address: _____

Telephone Number: _____

Type of construction service to be provided: _____

Signature: _____

Title: _____

Date: _____

Appendix H – Grading and Stabilization Activities Log

Date Grading Activity Initiated	Description of Grading Activity	Description of Stabilization Measure and Location	Date Grading Activity Ceased (Indicate Temporary or Permanent)	Date When Stabilization Measures Initiated
			___/___/___ <input type="checkbox"/> Temporary <input type="checkbox"/> Permanent	
			___/___/___ <input type="checkbox"/> Temporary <input type="checkbox"/> Permanent	
			___/___/___ <input type="checkbox"/> Temporary <input type="checkbox"/> Permanent	
			___/___/___ <input type="checkbox"/> Temporary <input type="checkbox"/> Permanent	
			___/___/___ <input type="checkbox"/> Temporary <input type="checkbox"/> Permanent	
			___/___/___ <input type="checkbox"/> Temporary <input type="checkbox"/> Permanent	
			___/___/___ <input type="checkbox"/> Temporary <input type="checkbox"/> Permanent	
			___/___/___ <input type="checkbox"/> Temporary <input type="checkbox"/> Permanent	

Appendix I – SWPPP Training Log

Stormwater Pollution Prevention Training Log

Project Name: Phase III

Project Location: Marilyn's Landing

Instructor's Name(s): _____

Instructor's Title(s): _____

Course Location: _____ Date: _____

Course Length (hours): _____

Stormwater Training Topic: *(check as appropriate)*

- Sediment and Erosion Controls
- Stabilization Controls
- Pollution Prevention Measures
- Emergency Procedures
- Inspections/Corrective Actions

Specific Training Objective: _____

Attendee Roster: *(attach additional pages as necessary)*

No.	Name of Attendee	Company
1		
2		
3		
4		
5		
6		
7		
8		

Appendix J – Delegation of Authority Form

Delegation of Authority

I, _____ (name), hereby designate the person or specifically described position below to be a duly authorized representative for the purpose of overseeing compliance with environmental requirements, including the Construction General Permit (CGP), at the _____ construction site. The designee is authorized to sign any reports, stormwater pollution prevention plans and all other documents required by the permit.

_____ (name of person or position)
_____ (company)
_____ (address)
_____ (city, state, zip)
_____ (phone)

By signing this authorization, I confirm that I meet the requirements to make such a designation as set forth in Appendix I of EPA's CGP, and that the designee above meets the definition of a "duly authorized representative" as set forth in Appendix I.

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: _____

Company: _____

Title: _____

Signature: _____

Date: _____

Appendix K – Endangered Species Documentation



United States Department of the Interior



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

In Reply Refer To:

March 20, 2020

Consultation Code: 05E1NE00-2020-SLI-1794

Event Code: 05E1NE00-2020-E-05307

Project Name: BFI-Halifax & Marilyn's Landing

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

To Whom It May Concern:

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

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

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

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

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

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

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

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

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

Attachment(s):

- Official Species List
-

Official Species List

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

This species list is provided by:

New England Ecological Services Field Office

70 Commercial Street, Suite 300

Concord, NH 03301-5094

(603) 223-2541

Project Summary

Consultation Code: 05E1NE00-2020-SLI-1794

Event Code: 05E1NE00-2020-E-05307

Project Name: BFI-Halifax & Marilyn's Landing

Project Type: DEVELOPMENT

Project Description: This project involves work on 27.3-acres of two adjacent properties, BFI-Halifax Landfill located on Laurel Street in Halifax, Massachusetts and Marilyn's Landing located off Plymouth Street in Bridgewater, Massachusetts. The sites are proposed for the placement of soil to a certain level consistent with agreed upon local requirements to ultimately support a solar development 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.

(CGP)

Project Location:

Approximate location of the project can be viewed in Google Maps: <https://www.google.com/maps/place/41.98929258225109N70.89785840217124W>



Counties: Plymouth, MA

Endangered Species Act Species

There is a total of 2 threatened, endangered, or candidate species on this species list.

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

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries¹, as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

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

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

Mammals

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

Reptiles

NAME	STATUS
Plymouth Redbelly Turtle <i>Pseudemys rubriventris bangsi</i> There is final critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/451	Endangered

Critical habitats

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

Appendix L – Excerpt of Soil Re-Use Management Plan

Full Soil Re-Use Management Plan available upon request.

Appendix M – Regulatory Approvals



Commonwealth of Massachusetts
Executive Office of Energy & Environmental Affairs

Department of Environmental Protection

Southeast Regional Office • 20 Riverside Drive, Lakeville MA 02347 • 508-946-2700

Charles D. Baker
Governor

Karyn E. Polito
Lieutenant Governor

Kathleen A. Theoharides
Secretary

Martin Suuberg
Commissioner

January 24, 2020

MacDonald Industries, Inc.
645 Walnut Street
Bridgewater, MA 02324
Attention: David MacDonald

RE: FINAL APPROVAL WITH CONDITIONS
Application for: BWP SW 36 Landfill Post-Closure Use- Major
Landfill Grading
Accella # 19-SW36-000007-APP
Authorization # SW36-0000019

AT: Browning-Ferris Industries Halifax Landfill
Laurel Street
Halifax, MA 02338
Facility ID#: 39324, Regulated Object#: 172563

Dear Mr. MacDonald;

The Massachusetts Department of Environmental Protection, Solid Waste Management Section (the "MassDEP"), has completed its Administrative Review and Technical Review of the referenced Post-Closure Use - Major application (the "Application") for the Browning Ferris Industries Halifax Landfill. Browning Ferris Industries ("BFI") the owner of the closed and capped BFI Halifax Landfill, has authorized MacDonald Industries Corporation (the "MacDonald") to submit the Application and access the BFI Halifax Landfill to implement the Post-Closure Use. The BFI Halifax Landfill shares a western property boundary with a Site Assigned 7.65 acres parcel in Bridgewater owned by the Applicant doing business as Marilyn's Landing. The Marilyn's Landing 7.65-acre parcel was site assigned by the Town of Bridgewater Board of Health for a sanitary landfill and/or solid waste transfer station. The Marilyn's Landing site was not used for the disposal of solid waste.

MacDonald has proposed the reuse of imported soils as fill in the area between the closed BFI Halifax Landfill and Marilyn's Landing Site. The final elevation and surface grades of the soils will be carried out to facilitate the future development of a solar photovoltaic (PV) array on the BFI Halifax Landfill and the abutting Marilyn's Landing Site. MassDEP has determined the Application is administratively and technically complete and hereby **Approves** the landfill post-closure use for

the reuse of imported soils. Please note a separate post-closure use permit is required for the installation of the PV array.

Phase I and II - Marilyn's Landing Soils Project, Bridgewater:

In November 2017, the MacDonald Industries Corporation and MassDEP entered into an Administrative Consent Order to facilitate the importation and reuse of soils at Marilyn's Landing site, an approximately 7.65-acre parcel adjacent to the closed and capped BFI Halifax Landfill.

MacDonald is currently conducting soil fill activities under Phase II to achieve an elevation of 88 feet in accordance with the latest Soil Reuse Management Plan Revision 1, dated February 26, 2019 ("SRMP Rev- 1"). Soils imported to the Marilyn's Landing site are required to meet several elements of COMM 15-01, MassDEP's *Interim Policy on the Re-Use of Soil for Large Reclamation Projects* ("COMM 15") including implementation of a site-specific Administrative Consent Order and Fill Management Plan (i.e., SRMP) to ensure soil fill activities do not result in any new releases or threats of release (i.e., below reportable concentrations). Additionally, COMM 15 proponents are required to implement a public outreach program designed to inform appropriate public officials and abutting residents of the details of project and provide opportunities for meaningful input throughout implementation of the project. SRMPs are required to provide a comprehensive plan for the importation of soils including, but not limited to, criteria for soil acceptance, (i.e., soil acceptance criteria), monitoring, and reporting requirements.

Phase III- BFI Halifax Landfill and Marilyn's Landing Site:

BFI and MacDonald have reached an agreement to fill the area between the BFI Landfill and the Marilyn's Landing site soil mound hereinafter referred to as "swale" or "Phase III". Phase III, the subject of this permit application, will involve the importation and reuse of additional soils in the area between Marilyn's Landing and the Landfill, to reach final grades and facilitate a plateau area of approximately 13.5 acres which will then be available for the future development a PV array.

Similar to Phase II, the Phase III soil fill activities requires a stand-alone Administrative Consent Order between the owners of the two properties, MacDonald Industries Inc. and Browning Ferris Industries, Inc. and MassDEP. Unlike Phase II, a Post-closure use permit application approval, the subject of this approval, is required for the use of the BFI Halifax Landfill during the post-closure use period.

I. SUBMITTALS:

The following documents were submitted on behalf of and represent the complete Application reviewed by MassDEP under 310 CMR 19.000 Solid Waste Management Regulations:

- 1) a completed BWP SW36 application form,
- 2) a completed Proof of Record form,

- 3) a Project Narrative,
- 4) Site Plans.
- 5) a Copy of most recent biannual report; and
- 6) a copy of Corrective Action Design Approval.

The Application was submitted electronically via the Massachusetts Executive Office of Energy and Environmental Affairs ePlace Portal at <https://permitting.state.ma.us/CitizenAccess/> on June 18, 2019. The Application was submitted by Civil & Environmental Consultants, Inc., of Raynham, Massachusetts (“CEC Inc.” or the “Consultant” or the “Engineer”) on behalf of MacDonald Industries (“MacDonald”).

Additional information was submitted on August 15, 2019 via email to MassDEP by Bill Goodman of CEC Inc.

The Application may be reviewed on line at <https://eeaonline.eea.state.ma.us/EEA/PublicApp/> using the “advanced search” link with an “approved” authorization status and the “solid waste” category.

II. PROJECT BACKGROUND:

The BFI Halifax Landfill is an inactive unlined landfill that underwent final closure construction between 1992 and 1996. The final closure included the installation of a 40 mil High Density Polyethylene (“HDPE”) geomembrane cap, the placement of drainage layer sand and topsoil and the construction of stormwater controls such as a drainage channels and retention basins. The landfill footprint is approximately forty-four (44) acres in size.

The final landfill closure also included the installation of a landfill gas collection system complete with drilled extraction wells along with lateral and header piping to convey the collected gas to an enclosed flare for combustion. A landfill gas to energy facility was operated at this site for the period when landfill gas generation was sufficient to support that operation. The gas to energy operation has since been discontinued and the facilities for the electrical power generation have been completely dismantled and removed from the Landfill property. Active landfill gas extraction does however continue at the Landfill with the use of a skid mounted candlestick flare unit that is equipped with a blower to provide vacuum on the existing well field to reduce landfill gas emissions, odors and subsurface landfill soil-gas migration.

Approved Plateau Area Repairs: On October 12, 2018, MassDEP approved a Landfill Major Modification Permit application to repair areas of the BFI Halifax Landfill that had settled and replace seven landfill gas extraction wells. In addition to addressing the landfill settlement the restoration of surface grades was to facilitate a post-closure use such as solar array that was being considered by BFI. The approved permit application included the acceptance of 70,000 cubic yards of soils to increase the existing grades from 0 -10 feet to re-establish a final top slope not less than 5% consistent with MassDEP solid waste requirement for *Landfill Final Cover Systems*: 310 CMR 19.112(2)a. BFI proposed to accept RCS-2 and RCS-1 soils in accordance with a Soil Reuse Management Plan. BFI has not begun construction to repair the Landfill final covers system as of the date of this letter.

III. PROPOSED POST CLOSURE USE:

The Landfill proposes to accept soils from outside generators managed by MacDonald Industries ("MacDonald"). The soils will be placed on the west side of the slope of the Landfill and incorporated into the MacDonald soil filling operation that is occupying the abutting parcel in Bridgewater. The general proposed use will consist of placing soils with concentrations of contaminants less than the Reportable Category applicable to the Landfill and Marilyn's Landing which is RCS-2. A site-specific Soil Reuse Management Plan will be submitted to MassDEP (refer to permit condition A). The Soils will be placed over the west side slope of the Landfill and the upper area of the existing Landfill on the eastern slope and upper area of the Phase II area at Marilyn's Landing.

The proposed project will be located on approximately 20.4 acres of the previously capped BFI Halifax Landfill. The approximate fill depth on the landfill side slope will range from zero to eighty-six (86) feet above current existing elevations, and the proposed slope will be a minimum of five percent (5%). 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 MacDonald property, totaling 832,900 cubic yards (approximately 1,250,000 tons). The finished grades will result in approximately 13.5-acre area suitable for a solar field capable of generating approximately 3.8 megawatts of power.

As the part of Post closure use BFI-Republic will also replace several vertical landfill gas collection wells and certain sections of gas header and lateral piping as part of this project to improve the performance of the existing landfill gas collection system (LGCS). Preliminary analysis of the LGCS indicates that seven (7) wells EW-8, EW-10, EW-19, EW-21, EW-28, EW-30 and EW-31 will be replaced. The gas vent replacement will be conducted as per the BWP -SW11 Major Modification permit approved by MassDEP on October 12, 2018 (Transmittal No. X277645). The gas vents will be extended to adjust with the final grades of the Landfill, the extension of gas vents is being approved as the part of this permit Application.

Settlement and Stability Analysis:

A settlement and stability analysis were completed for the west side slope and plateau of the BFI Halifax Landfill. The final cover system located with the post-closure use area may be subject to stresses resulting from the settlement of the underlying existing waste. The type of settlement is influenced by the weight of future soils and the compaction of the underlying waste. The BFI Halifax Landfill was filled with Municipal Solid Waste to an elevation of 141 feet prior to the commencement of construction of the final cover system in 1992. Most of the consolidation has already occurred, and minimal consolidation is expected. The Engineer calculated the maximum strain in the final cover system due to overall settlement was calculated to be less than the allowable strain of the HDPE membrane.

Stability Analysis was conducted for three cross-sections located in the soil fill areas and included a combination of the existing MSW waste mass, existing and proposed soil fill, final cover system design and foundation soils. The calculated factor of safety ("FS") indicate the overall stability of the BFI Halifax Landfill will be stable under both static ($FS > 1.5$) and seismic conditions ($FS > 1$) for the conditions modeled.

Stormwater Management:

The Landfill was initially designed to direct stormwater from the plateau area toward the north or south stormwater basin by the way of the diversion berms. But recent site visit by MassDEP in June 2019 indicated that the stormwater basin on the North was not functional and only the stormwater basin on the South was functional.

As per the BWP - SW11 Major Modification permit approved by MassDEP on October 12, 2018 (Transmittal No. X277645), additional diversion swales are proposed on the east and west side slopes at the southerly end of the Site. Proposed stormwater and sedimentation controls include maintaining the exiting diversion berms and swales as well as adding a stormwater basin to the MacDonald property, a diversion berm to the north slope to direct the stormwater toward the north basin, and a diversion berm to the south berm to direct waster from the south slope toward the proposed stormwater basin. Additionally, siltation barriers will be added along the wetland limits. During the construction activity all the storm water controls including all the drainage swales and drainage channels will be checked for proper functionality and if required shall be constructed to be fixed and match the new grades.

IV. APPLICATION REVIEW AND DECISION PROCESS:

The Application was submitted and reviewed pursuant to the provisions of 310 CMR 19.029(2): Applicable Permit Procedures and 310 CMR 19.033: *Permit Procedure for an Application for a Permit Modification or Other Approval*. According to these review procedures, MassDEP's decision regarding the proposed activities shall be either: a "Provisional Decision" pursuant to 310 CMR 19.033(4)(a); or a non-provisional decision pursuant to 310 CMR 19.033(4)(b).

MassDEP determined that a "Provisional Decision" was appropriate for this Application. MassDEP issued a Provisional Permit Decision for Public comment on December 9, 2019, and established a twenty-one (21) day public comment period that ended on December 31, 2019. MassDEP received no comments on the Application or the Provisional Permit Decision during the public comment period.

MassDEP reviewed the Application pursuant to 310 CMR 19.000: *Solid Waste Regulations* and MassDEP's *Landfill Technical Guidance Manual, May 1997* (the "Manual").

V. APPROVAL:

MassDEP has determined, the proposed permit application for Major Post-Closure Use of the Landfill is satisfactory and in accordance with the authority granted pursuant to Massachusetts General Laws, Chapter 111, Section 150A, hereby approves the Major Post-Closure Use subject to the following conditions:

VI. PERMIT CONDITIONS:

- A. Revised Soil Management Plan and Administrative Consent Order: Prior to initiating soil fill activities under this approval, the Applicant shall complete the following:
- a. Submit a revised Soil Reuse Management Plan for Phase III to MassDEP for review and approval that includes, but is not limited to:
 - i. Documentation that appropriate officials and public have been made aware of the project and have been/will be provided opportunities for meaningful input throughout the project consistent with MassDEP Policy # COMM-15-001 and Section III, Disposition and Order, paragraphs 27. K. of the Administrative Consent Order (Document Number 00003451) as amended.
 - ii. soil and groundwater reportable concentrations,
 - iii. soil testing and acceptance criteria,
 - iv. soil placement and handling,
 - v. third party inspections and reporting,
 - vi. hours of operation,
 - vii. expected project duration,
 - viii. number of trucks deliveries per day (inbound),
 - ix. a groundwater monitoring network that is capable of being used to monitor any contaminant releases that may occur within the entire fill area at the Site.
 - b. The Applicant, MacDonald Industries, LLC, and the owner of the Landfill, BFI shall enter into an Administrative Consent Order ("ACO") with MassDEP to document approved soil fill activities to ensure these activities do not pose a significant threat to public safety, health and the environment or cause any releases or threats of releases. Execution of the ACO is contingent upon approval of a SRMP referenced in Condition A.a. above.
- B. Permit Limitations: The issuance of this approval is limited to the proposed post-closure use of the Landfill as detailed in the Application and does not relieve the Applicant and Owner from the responsibility to comply with all other regulatory or permitting requirements. Construction shall proceed in complete compliance with the approved plans, MassDEP's regulations and requirements, the Manual or as required by this Approval. This approval does not relieve BFI, as the owner of the Landfill, from its responsibility from the monitoring and maintenance requirements for the entire Landfill.
- C. Construction Precautions: All construction shall be supervised by a Massachusetts Registered Professional Engineer. All necessary precautions shall be taken to protect the Landfill final cover system, storm water control system, environmental monitoring network and the Landfill gas extraction wells. All operators of vehicles entering the area should be clearly instructed by the on-site engineer and/or the Applicant's Contractors of the permit requirements to avoid damage to the Landfill components. Prior to the commencement of construction activities, all Landfill gas vents located in the plateau area shall be flagged for visibility to minimize the potential for damage by vehicles during construction. If any damage occurs to any Landfill components, the Applicant shall notify MassDEP within 24 hours and provide a written plan with a schedule for repairs.

D. Construction: The proposed construction shall proceed in compliance with MassDEP regulations, requirements, MassDEP's Landfill Technical Guidance Manual, revised May 1997, or as required by this permit application approval. There shall be no deviation from this Approval without prior consent from MassDEP. MassDEP shall be consulted prior to any deviation from the approved design. MassDEP may require a permit modification application for significant design modifications.

A detail specific plan for geomembrane cap repair after drilling for LGCS modification shall be submitted to MassDEP before any drilling activity into Geomembrane.

E. Health and Safety: The Applicant is responsible to ensure all necessary precautions are taken to protect the health and safety of workers.

A site-specific Health and Safety Plan shall be developed prior to the beginning of any construction work. The Health and Safety Plan shall include as a minimum;

- Protocols for monitoring of landfill gas as needed,
- Protocols for modifying work practices if landfill gas is detected at levels deemed unsuitable, and
- Training for all workers conducting investigation activities at the Landfill regarding hazards associated with the landfill gas.

F. Completion Report: Within sixty (60) days of completion of all construction activity (i.e., landfill gas extraction well repair and/or replacement), approved herein, a Completion Report shall be prepared by a Massachusetts registered Professional Engineer and submitted to MassDEP stating that the construction has been completed in accordance with the approved plan.

G. Personnel Training: The Applicant shall instruct or give on-the-job training to all personnel involved in any activity authorized by this permit. Such instruction or on-the-job training shall teach personnel how to comply with the conditions of the permit and to carry out the authorized activity in a manner that is not hazardous to public health, safety, welfare, or the environment.

H. Reservation of Rights: MassDEP reserves the right to require additional assessment(s) or action(s), including but not limited to, modifying said corrective measures or operating techniques in order to maintain the environment free from objectionable nuisance conditions and/or dangers or threats to the public health or safety, or the environment.

I. Transfer of Permits. Pursuant to 310 CMR 19.044, for a transferred permit to remain effective, the transferee must, within thirty (30) days of the effective date of the transfer, complete the required Certification for Transfer of a Permit, form BWP SW-49 and submit to MassDEP.

J. One copy of the Application and supplemental submittals, and a copy of this permit approval must always be available for review at the Site.

K. Failure to comply with this permit approval shall be grounds for enforcement action including without limitation, permit suspension and revocation.

RIGHT TO APPEAL

Public Review of Provisional Decision: MassDEP issued a Provisional Permit Decision on December 9, 2019 for the purpose of obtaining and reviewing public comments prior to issuing a final decision. The effective date of the decision was deferred to accommodate a public comment period and time for MassDEP to review any comments received. In accordance with 310 CMR 19.033(4)(a), notice was given in the Provisional Permit Decision that MassDEP would accept written comments on the Provisional Permit Decision for a period of twenty-one (21) days from December 9, 2019, through the close of business on December 31, 2019. MassDEP received no comments on the Application or the Provisional Permit Decision during the public comment period.

Right to Appeal: This Final Permit decision has been issued pursuant to M.G.L. Chapter 111, Section 150A, and 310 CMR 19.033: *Permit Procedure for an Application for a Permit Modification or Other Approval, of the "Solid Waste Management Regulations*. Pursuant to 310 CMR 19.033(5), any person aggrieved by the final permit decision, except as provided for under 310 CMR 19.033(4)(b), may file an appeal for judicial review of said permit decision in accordance with the provisions of M.G.L. Chapter 111, Section 150A and M.G.L. Chapter 30A no later than thirty days following the date of issuance of the final permit decision to the applicant. The standing of a person to file an appeal and the procedures for filing such an appeal shall be governed by the provisions of M.G.L. c. 30A. Unless the person requesting an appeal requests and is granted a stay of the terms and conditions of the permit decision by a court of competent jurisdiction, the final permit decision shall be effective in accordance with the terms of 310 CMR 19.033(3).

Notice of Appeal: Any aggrieved person intending to appeal a final permit decision to the Superior Court shall first provide notice of intention to commence such action. Said notices of intention shall include MassDEP Authorization No. SW36-0000019 and shall identify with particularity the issues and reason why it is believed the final permit decision was not proper. Such notice shall be provided to the Office of General Counsel of MassDEP and the Regional Director for the regional office which processed the permit application, if applicable, at least five days prior to filing of an appeal. The appropriate addresses to send such notices are:

Office of General Counsel
Department of Environmental Protection
One Winter Street
Boston, MA 02108

Regional Director
Department of Environmental Protection
20 Riverside Drive
Lakeville, MA 02347

No allegation shall be made in any judicial appeal of a final permit decision unless the matter complained of was raised at the appropriate point in the administrative review procedures established in 310 CMR 19.000, provided that a matter may be raised upon showing that it is material and that it was not reasonably possible with due diligence to have been raised during such procedures or that matter sought to be raised is of critical importance to the environmental impact of the permitted activity.

If you have any questions or comments regarding this approval letter, please contact me at (508) 946-2847 at the letterhead address. In any correspondence regarding this approval, please reference Permit Authorization # SW36-0000019.

Very truly yours,



Mark Dakers, Chief
Solid Waste Management Section

D/HT

W:\BAW\Solid Waste\MUNICIPALITIES\Halifax\BFI Landfill\Post Closure Use 2019\FINAL - BFI LF Post Closure Use 01-23-20.doc

cc: BFI Industries, Inc.
CFord2@republicservices.com

CEC, Inc.
bgoodman@cecinc.com

Town of Halifax, Health Agent
cdrinan@town.halifax.ma.us

Town of Bridgewater, Health Agent
ebadger@bridgewaterma.org

DEP-Boston
ATTN: J. Fischer

DEP- Lakeville
ATTN: S. Pickering
M. Dakers



Commonwealth of Massachusetts
Executive Office of Energy & Environmental Affairs

Department of Environmental Protection

Southeast Regional Office • 20 Riverside Drive, Lakeville MA 02347 • 508-946-2700

Charles D. Baker
Governor

Karyn E. Polito
Lieutenant Governor

Matthew A. Beaton
Secretary

Martin Suuberg
Commissioner

March 4, 2019

David MacDonald
MacDonald Industries Corporation
645 Walnut Street
Boston, MA 02118

RE: Amendment No. 1 to Enforcement Document # 00003451
Enforcement Document No.00006711

AT: Marilyn's Landing
Plymouth Street
Bridgewater, MA 02324
FMF No. 40000

Dear Mr. MacDonald:

In connection with the referenced matter, enclosed is a copy of the fully executed Amendment No. 1 Enforcement Document No. 00006711 (Amendment No. 1) to the referenced Administrative Consent Order Enforcement Document No. 00003451 (Consent Order) with the Massachusetts Department of Environmental Protection (MassDEP). Amendment No. 1 constitutes MassDEP approval for modifications to Marilyn's Landing Soil Reuse Management Plan (SRMP) associated with the importation of soils at Plymouth Street in Bridgewater including changes to the SRMP's soil acceptance criteria. These modifications are consistent with MassDEP's Policy #COMM-15-001, Interim Policy on the Re-Use of Soil for Large Reclamation Projects which governs the acceptance of soils for large soil reclamation projects. The terms and conditions of this Amendment No. 1 to the referenced Consent Order now apply and are binding.

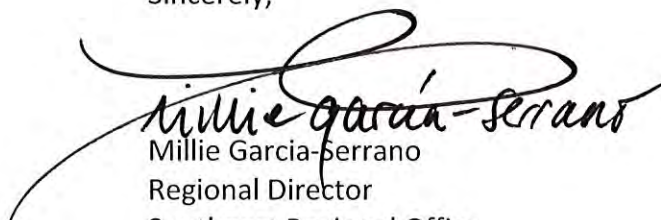
This information is available in alternate format. Contact Michelle Waters-Ekanem, Director of Diversity/Civil Rights at 617-292-5751.

TTY# MassRelay Service 1-800-439-2370
MassDEP Website: www.mass.gov/dep

Printed on Recycled Paper

Thank you for your cooperation in this matter, and if you have any questions please contact Mark Dakers at (508) 946-2847.

Sincerely,



Millie Garcia-Serrano
Regional Director
Southeast Regional Office

MG/MD

W:\BAW\Solid Waste\Soils\COMM 15-01\Marilyn's Landing\ACO Amendment 1 With All Assoc. Docs\ACO Amendment\Cover Ltr - ML ACO Amend 1.docx

Enclosure

CERTIFIED MAIL # 7014 2120 0002 1170 5892

ec: Don Nagle
nagle@dpnaglelaw.com

Bridgewater Board of Health
ebadger@bridgewaterma.org

DEP- Boston
ATTN: R.Blanchet
P.Locke


DEP-SERO
ATTN: L. Ramos
G. Martin
M. Dakers
M. Garcia-Serrano

revised Draft SRMP, entitled "SRMP – Revision No. 1" which includes changes to the criteria for the acceptance of soil at the approximately 7.65 acre site assigned property known as Marilyn's Landing, located on Plymouth Street, Bridgewater, Massachusetts. The MassDEP received a letter, dated December 12, 2018 from the Town of Bridgewater Board of Health indicating their approval of the proposed modifications to the SRMP. The Respondent submitted a Final SRMP – Revision No. 1 on February 26, 2019 which was approved by the Department and supersedes prior versions and is attached to Amendment No. 1 to the Consent Order.

The revised SRMP includes; new Licensed Site Professional ("LSP") contact information, updated soil acceptance criteria and other pertinent project information.

3. The undersigned certify that they are fully authorized to enter into the terms and conditions of this Consent Order and to legally bind the party on whose behalf they are signing this Consent Order.
4. In all other respects, the terms and conditions of the original Consent Order, effective on November 30, 2017 that are not affected by Amendment No. 1 shall remain and continue in full force and effect as deemed applicable. To the extent that there may be a conflict between the compliance schedule of the original Consent Order, this Amendment No. 1 shall prevail.
5. There may be one or more original counterparts of this Amendment No. 1 to the Consent Order as signed by all parties hereto, one (I) of which will be kept in the files at MassDEP's Southeast Regional Office, 20 Riverside Drive, Lakeville, Massachusetts 02347.
6. This Amendment No. 1 to the Consent Order shall be effective on the date that it is executed by MassDEP.


Consented To By:
MacDonald Industries Corporation



David MacDonald
MacDonald Industries Corporation
645 Walnut Street
Bridgewater, MA 02324
Federal Employer Identification No.: 04-2925422

Date: 3-1-19

Issued By:
DEPARTMENT OF ENVIRONMENTAL PROTECTION



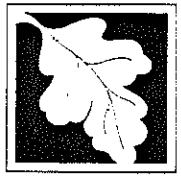
Millie Garcia-Serrano
Regional Director
MassDEP – Southeast Regional Office
20 Riverside Drive
Lakeville, MA 02347

Date: 3-4-19

Marilyn
 Marilyn Mac Donald
 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



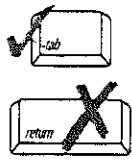
Massachusetts Department of Environmental Protection
 Bureau of Resource Protection - Wetlands
WPA Form 5 – Order of Conditions
 Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Provided by MassDEP:
 SE116-1344
 MassDEP File #
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 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.



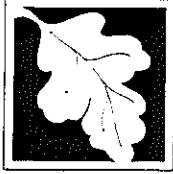
1. From: Town of Bridgewater Conservation Commission
 Conservation Commission
 2. This issuance is for (check one):
 a. Order of Conditions b. Amended Order of Conditions

3. To: Applicant:
David and Marilyn MacDonald
 a. First Name b. Last Name
Marilyn's Landing
 c. Organization
P.O. Box 431, 645 Walnut Street
 d. Mailing Address
Bridgewater MA 02324
 e. City/Town f. State 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 Bridgewater
 a. Street Address b. City/Town
40 9, 16, and 17
 c. Assessors Map/Plat Number d. Parcel/Lot Number

Latitude and Longitude, if known: d m s d m s
 d. Latitude e. Longitude



Massachusetts Department of Environmental Protection
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A. General Information (cont.)

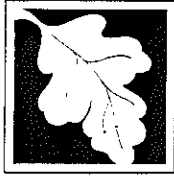
6. Property recorded at the Registry of Deeds for (attach additional information if more than one parcel):
 Plymouth
 a. County Plymouth b. Certificate Number (if registered land) 319-2
 7400
 c. Book 7400 d. Page 319-2
7. Dates: June 9, 2015 July 14, 2015 July 14, 2015
 a. Date Notice of Intent Filed b. Date Public Hearing Closed 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 EBI Consulting Karlis Skulte, P.E., #47703
 b. Prepared By c. Signed and Stamped by
 June 5, 2015 June 5, 2015 1"=40"
 d. Final Revision Date 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.



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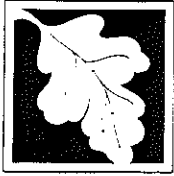
B. Findings (cont.)

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. <input type="checkbox"/> Bank	_____ a. linear feet	_____ b. linear feet	_____ c. linear feet	_____ d. linear feet
5. <input type="checkbox"/> Bordering Vegetated Wetland	_____ a. square feet	_____ b. square feet	_____ c. square feet	_____ d. square feet
6. <input type="checkbox"/> 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. <input type="checkbox"/> Bordering Land Subject to Flooding	_____ a. square feet	_____ b. square feet	_____ c. square feet	_____ d. square feet
	_____ e. cubic feet	_____ f. cubic feet	_____ g. cubic feet	_____ h. cubic feet
8. <input type="checkbox"/> Isolated Land Subject to Flooding	_____ a. square feet	_____ b. square feet		
	_____ c. cubic feet	_____ d. cubic feet	_____ e. cubic feet	_____ f. cubic feet
9. <input type="checkbox"/> 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



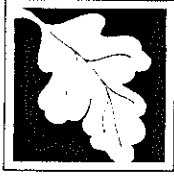
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B. Findings (cont.)

Coastal Resource Area Impacts: Check all that apply below. (For Approvals Only)

	Proposed Alteration	Permitted Alteration	Proposed Replacement	Permitted Replacement
10. <input type="checkbox"/> Designated Port Areas	Indicate size under Land Under the Ocean, below			
11. <input type="checkbox"/> Land Under the Ocean	_____	_____		
	a. square feet	b. square feet		
	_____	_____		
	c. c/y dredged	d. c/y dredged		
12. <input type="checkbox"/> Barrier Beaches	Indicate size under Coastal Beaches and/or Coastal Dunes below			
13. <input type="checkbox"/> Coastal Beaches	_____	_____	_____ cu yd	_____ cu yd
	a. square feet	b. square feet	c. nourishment	d. nourishment
14. <input type="checkbox"/> Coastal Dunes	_____	_____	_____ cu yd	_____ cu yd
	a. square feet	b. square feet	c. nourishment	d. nourishment
15. <input type="checkbox"/> Coastal Banks	_____	_____		
	a. linear feet	b. linear feet		
16. <input type="checkbox"/> Rocky Intertidal Shores	_____	_____		
	a. square feet	b. square feet		
17. <input type="checkbox"/> Salt Marshes	_____	_____	_____	_____
	a. square feet	b. square feet	c. square feet	d. square feet
18. <input type="checkbox"/> Land Under Salt Ponds	_____	_____		
	a. square feet	b. square feet		
	_____	_____		
	c. c/y dredged	d. c/y dredged		
19. <input type="checkbox"/> Land Containing Shellfish	_____	_____	_____	_____
	a. square feet	b. square feet	c. square feet	d. square feet
20. <input type="checkbox"/> 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. <input type="checkbox"/> Land Subject to Coastal Storm Flowage	_____	_____		
	a. square feet	b. square feet		



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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.



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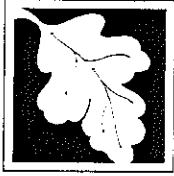
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C. General Conditions Under Massachusetts Wetlands Protection Act (cont.)

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 than 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.



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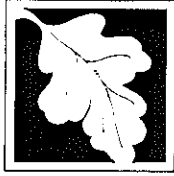
C. General Conditions Under Massachusetts Wetlands Protection Act (cont.)

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.

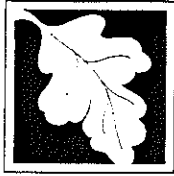


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C. General Conditions Under Massachusetts Wetlands Protection Act (cont.)

- 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.



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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.

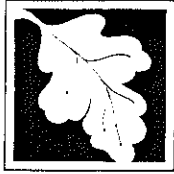
- h) All sediment or other contaminants removed from stormwater BMPs shall be disposed of in accordance with all applicable federal, state, and local laws and regulations.
- i) Illicit discharges to the stormwater management system as defined in 310 CMR 10.04 are prohibited.
- j) The stormwater management 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).



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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 _____

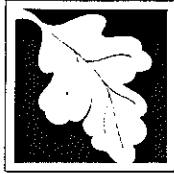
Therefore, work on this project may not go forward unless and until a revised Notice of Intent is submitted which provides measures which are adequate to meet these standards, and a final Order of Conditions is issued.

- 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):



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 Bridgewater
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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:

Dave Matell
Melissa
Doug E. Bailey

by hand delivery on

by certified mail, return receipt requested, on

Date

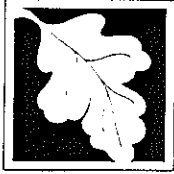
Date

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.



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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 SE116-1344
 Project Location 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



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

City/Town

MA

State

02324

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

10/08/2013

Consultants

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

40

Assessors Map/Plat Number

Bridgewater, MA

City/Town

16 and 17

Parcel/Lot Number



WPA Form 2 – Determination of Applicability

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

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



WPA Form 2 – Determination of Applicability

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

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.



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

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 statutory/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:

Eric E. Boyd
[Signature]
[Signature]
[Signature]

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.

Terra Nova Survey Consultants
1685 South Street
Bridgewater, MA 02324

Peter McManus PLS d/b/a
508 631 2069 cell
email: prmcme@comcast.net

October 8, 2013

MacDonald Industries Corporation
645 Walnut St.
Bridgewater, MA 02324

RE: ILSF Volume Computation

Marilyn and David:

In response to your request, we have performed a concentrated evaluation of the topography within the area surrounded by the BVW flagging, currently designated as ILSF, that was previously located and plotted. This was done to ascertain the volume of water that might be retained within the area in question.

To obtain a more accurate model we took several dozen elevation readings at an approximate spacing of 20 feet within the subject area on October 1, 2013. These observations were added to the existing information, and a more detailed model was created in AutoCAD using a contour interval of two tenths of a foot (0.20 ft). This was done because of the very slight variance in the elevations throughout this area.

Included with this report is a plot of the 0.20 ft. contours with a 20 ft. grid spacing of grade sampling generated by the CAD program. Also included is a screen shot of the resultant site volume report. The volume computed is from a low point elevation of 49.4 ft., to a limit of elevation 50.0 ft. This 0.60 ft (7¼ in.) range more than covers the 6 inch guideline mentioned in the code requirement. It is unlikely that an elevation of water could reach the 50.0 ft. level because it would be over-topping the subject area to the southeast.

As can be seen in the screen shot of the volume report the "fill" volume is computed as 298 cubic yards, CY. This represents the amount of water that would be retained within the ILSF area which measures 46,400 square feet (1.06 Ac). The code states that an ILSF parcel should contain a volume of at least 1/4 acre-foot, which converts to a volume of 403 CY. Therefore, the subject area does not meet the volume criteria stated in the regulation: 310 CMR 10.57 (2).

Please contact us if you have any questions regarding these results.

Thank you,



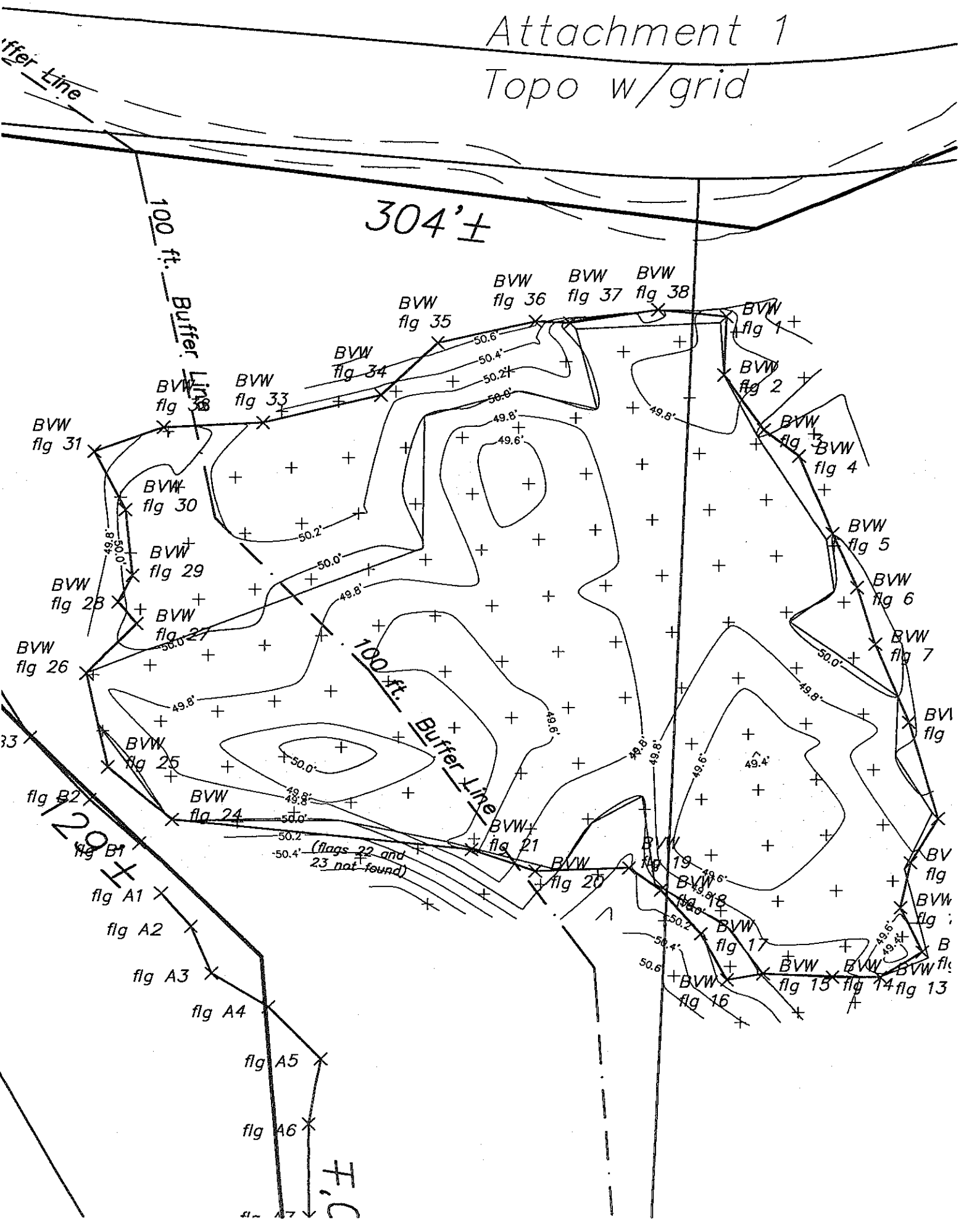
Peter McManus, PLS



attachments - (2)

Attachment 1

Topo w/grid



Appendix N – Buffer Zone Calculations

Civil & Environmental Consultants, Inc.



Project: MARILYN'S LANDING

Date: 06/01/2017

Prepared by: CHRIS DOHNER

Job#: 17Z-470

Revised by: _____

DETERMINE: Equivalent sediment removal efficiency with areas of "natural buffer" within the 50 foot buffer zone.

GIVEN: 50 foot buffer performance (in MA and NH) = 90% (from 2017 Construction General Permit, Appendix G, Table G-9)
long slope = 2%
natural buffer 1 = 7ft
natural buffer 2 = 15ft

$$\% R_7 = \left(\frac{43}{50}\right)(.90) = 0.77 \text{ (77\%)}$$

$$\% R_{15} = \left(\frac{35}{50}\right)(.90) = 0.63 \text{ (63\%)}$$

CONCLUSION: Areas with a natural buffer of 7' require an equivalent removal rate of 77% and areas with a 15' natural buffer require an equivalent removal rate of 63%.

DETERMINE: Maximum "natural buffer" length to meet sediment removal rate when utilizing one silt fence/hay bale

GIVEN: silt fence removal rate = 72% (from "sediment and phosphorus removal from simulated storm runoff with compost filter socks and silt fence")

$$0.72 = \left(\frac{x}{50}\right)(.90)$$

$$x = 40 \text{ ft}$$

$$\text{Maximum buffer length} = 50 - 40 = 10 \text{ ft}$$

CONCLUSION: one silt fence can be used as long as the natural buffer length is greater than ten feet.

INSTRUCTIONS:

1. Sheet is nonautomated. Print sheet and complete using hand calculations. Column A and B: See MassDEP Structural BMP Table
2. The calculations must be completed using the Column Headings specified in Chart and Not the Excel Column Headings
3. To complete Chart Column D, multiple Column B value within Row x Column C value within Row
4. To complete Chart Column E value, subtract Column D value within Row from Column C within Row
5. Total TSS Removal = Sum All Values in Column D

Location: MARLYN'S LANDING (BRIDGEWATER, MA)

A BMP ¹	B TSS Removal Rate ¹	C Starting TSS Load*	D Amount Removed (B*C)	E Remaining Load (C-D)
Silt Fence	0.72 ²	1.00	0.72	0.28
Silt Fence	0.72 ²	0.28	0.20	0.08

Total TSS Removal =

0.92³

Separate Form Needs to be Completed for Each Outlet or BMP Train

Project: 172-740
 Prepared By: CSD
 Date: 06/01/2017

*Equals remaining load from previous BMP (E) which enters the BMP

TSS Removal Calculation Worksheet

Non-automated TSS Calculation Sheet must be used if Proprietary BMP Proposed

1. From MassDEP Stormwater Handbook Vol. 1
2. Refer to white paper titled "sediment and phosphorus removal from simulated stormwater runoff with compost filter socks and silt fence."
3. Equivalent removal rate for 7' natural buffer = 77% (w/w.)

Sediment and phosphorus removal from simulated storm runoff with compost filter socks and silt fence

L.B. Faucette, K.A. Sefton, A.M. Sadeghi, and R.A. Rowland

Abstract: In 2005, the US Environmental Protection Agency National Menu of Stormwater Best Management Practices, National Pollutant Discharge Elimination System Phase II for Construction Sites, listed compost filter socks as an approved best management practice for controlling storm runoff and sediment on construction sites. Like most new technologies used to control sediment on construction sites, little has been done to evaluate their performance relative to conventional sediment control barriers, such as silt fences. The objectives of this study were (1) to determine and compare the sediment removal efficiency of silt fence and compost filter socks, (2) to determine if the addition of polymers to compost filter socks could reduce sediment and phosphorus loads, (3) to determine relationships between compost filter media particle size distribution and pollutant removal efficiency and hydraulic flow rate. Simulated rainfall was applied to soil chambers packed with Hatboro silt loam on a 10% slope. All runoff was collected and analyzed for hydraulic flow rate, volume, total suspended solids (TSS) concentration and load, turbidity, and total and soluble P concentration and load. Based on 7.45 cm h^{-1} (2.9 in hr^{-1}) of simulated rainfall-runoff for 30 minutes duration, bare soil (control) runoff TSS concentrations were between 48,820 and 70,400 mg L^{-1} (6.5 oz gal^{-1} and 9.4 oz gal^{-1}), and turbidity was between 19343 and 36688 Nephelometric Turbidity Units. Compost filter sock and silt fence removal efficiencies for TSS concentration (62% to 87% and 71% to 87%), TSS load (68% to 90% and 72% to 89%), and turbidity (53% to 78% and 54% to 76%) were nearly identical; however with the addition of polymers to the compost filter socks sediment removal efficiencies ranged from 91% to 99%. Single event support practice factors (P factor) for silt fence were between 0.11 and 0.29, for compost filter socks between 0.10 and 0.32, and for compost filter socks + polymer between 0.02 and 0.06. Total and soluble P concentration and load removal efficiencies were similar for compost filter socks (59% to 65% and 14% to 27%) and silt fence (63% and 23%). Although when polymers were added to the filter socks and installed on phosphorus fertilized soils, removal efficiencies increased to 92% to 99%. Compost filter socks restricted hydraulic flow rate between 2% and 22%, while the silt fence restricted between 5% and 29%. Significant correlations ($p < 0.05$) were found between middle range particle sizes of compost filter media used in the filter socks and reduction of turbidity in runoff; however, hydraulic flow rate was a better indicator (stronger correlation) of total pollutant removal efficiency performance for compost filter socks and should be considered as a new parameter for federal and state standard specifications for this pollution prevention technology.

Key words: best management practice—compost filter socks—phosphorus—sediment

Due to Phase II enforcement of the National Pollutant Discharge Elimination System for storm water discharge from construction activities in 2003, evaluating the effectiveness and performance of sediment control devices has become increasingly important. As states begin to

revise their erosion and sediment control manuals to reflect new information on best management practices (BMPs), many are requiring that erosion and sediment control practices meet a minimum performance standard (South Carolina Department of Health and Environmental Control 2005).

Silt fence is the current industry standard used for sediment control in construction activities; therefore, its performance has been widely evaluated (Wyant 1981; Fisher and Jarret 1984; US Environmental Protection Agency [USEPA] 1993; Barrett et al. 1998; Britton et al. 2000). In a study evaluating the sediment trapping efficiency of silt fence, Wishowski et al. (1998) observed that as sediment particle sizes decrease, trapping efficiency declines. Barrett et al. (1998) adds that most studies reporting sediment removal efficiencies for silt fence are somewhat overstated since many have used a disproportionately large fraction of sand particles with relatively low sediment-laden concentrations of storm water runoff. They observed that 92% of the total suspended solids (TSS) were clay and silt, grain sizes an order of magnitude smaller than the openings in the silt fence fabric, and due to very low settling velocities were normally not removed by sedimentation (Barrett et al. 1998). Barrett et al. (1995) reported that silt fence sediment removal efficiency is a result of increased ponding behind the silt fence. A similar study by Kouwen (1990) concluded that excessive ponding of runoff is due to eroded sediment clogging the silt fence filter fabric. Barrett et al. (1998) later discovered that sediment removal efficiency by silt fence was correlated to runoff detention behind the silt fence, not the filtration of the fabric. Because there is no standard test method to evaluate sediment control barriers, the investigators have chosen to compare experimental treatments to silt fence since it is widely accepted as a sediment control BMP.

In 2005, the USEPA National Menu of BMPs for National Pollutant Discharge Elimination System Phase II listed compost filter socks as an approved BMP for controlling storm runoff on construction sites (USEPA 2006). In a study conducted at the University of Georgia using three simulated storm events, on a 10% slope, filter berms reduced total solids loads by 35% and exhibited 21% greater runoff flow rates

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compared to silt fence on a disturbed sandy clay loam subsoil (Faucette et al. 2005). The compost filter socks used for this study may be considered contained filter berms. Under bench scale conditions on a 3:1 slope, using simulated runoff with a total sediment concentration of 3,000 mg L⁻¹ (3,000 ppm), Faucette and Tyler (2006) reported an average sediment removal efficiency of 98% for 10 compost filter socks. Suspended solids concentration and turbidity (Nephelometric Turbidity Units [NTUs]) reduction averaged 70% and 55%, respectively, over three runoff events. Table 1 summarizes selected studies on sediment removal performance of silt fence and compost filter socks.

All federal and state agency standard specifications for compost filter socks (and filter berms) include a parameter for filter media particle size distribution. It has been assumed that this particle size distribution represents the optimum characteristic that predicts affective removal of pollutants from storm runoff and allows for sufficient hydraulic flow through and permissivity of the filter sock. It is the particle size distribution within these sediment control barriers that create macro- and micro-pores that likely influence flow through and sediment trapping mechanisms.

In a study that surveyed 45 different compost filter media used in filter socks, Faucette et al. (2006) reported that under bench scale conditions there was a linear relationship in hydraulic flow through rate and percent of pollutants passing through the filter media. Investigators reported the lower the flow through rate of the filter media, the higher the resultant suspended solids removal and turbidity reduction efficiency. This may be due to sediment deposition generated by runoff flow restriction or perhaps fewer pores and smaller pore spaces led to an increased ability to physically trap small sediments in runoff.

Faucette et al. (2006) reported a correlation in percent of compost filter media particle sizes over 9.5 mm (0.375 in) and under 6.3 mm (0.25 in) and hydraulic flow through rate, under bench scale conditions using synthetic runoff. The greater the percent of particle sizes over 9.5 mm (0.375 in), the higher the flow through rate; conversely the greater the percent of particle sizes below 6.3 mm (0.25 in) the lower the flow through rate. This was likely because the greater the amount of small particle sizes in the filter media matrix, the lower the porosity (or number of pores) and the smaller the pore spaces. Additionally, more small particles gen-

Table 1

Sediment removal efficiencies for silt fence and compost filter socks.

Sediment control barriers	Sediment removal efficiency	Reference
Silt fence	3% turbidity	Horner et al. 1990
Silt fence	0% turbidity	Barrett et al. 1998
Silt fence	0% to 20% clay	USEPA 1993
Silt fence	50% silt	USEPA 1993
Silt fence	80% + sand	USEPA 1993
Compost filter sock	98% total solids	Faucette and Tyler 2006
Compost filter sock	70% suspended solids	Faucette and Tyler 2006
Compost filter sock	55% turbidity	Faucette and Tyler 2006

erally means more surface area, which may increase friction on the runoff water passing through the filter media, thereby slowing aqueous movement through the media.

In a similar study evaluating hydraulic flow through rate and sediment removal efficiency of silt fence and filter socks, Keener et al. (2006) reported that average hydraulic flow-through rates for filter socks were 50% higher, although suspended solids removal efficiency was not significantly different. This implies that filter socks do not rely on flow restriction and sediment deposition to remove suspended solids from storm runoff to the extent that silt fence does. Due to the heterogeneous porous matrix and greater surface area within the filter sock, this device functions more like a water filter relative to silt fence, which functions more like a small sediment detention pond due to its reliance on blinding, flow restriction, and sediment deposition.

In 1998, the USEPA national water quality assessment reported 35% of streams were found to be severely impaired, and nutrient loading was identified as the principle cause for 30% listed (USEPA 2000). Mineral fertilizers are commonly applied to establish specified erosion control grasses on construction sites and can lead to significant nutrient loading of storm runoff (Glanville et al. 2004; Faucette et al. 2005). Additionally, on disturbed construction site soils, where soil becomes detached, sediment bound P can become desorbed transforming into soluble P (Westermann et al. 2001). Where sedimentation is minimal due to effective erosion control practices, sediment bound P is typically much lower, and soluble P can be more than 80% of total P (Berg and Carter 1980). Soluble P is more reactive, or bioavailable to aquatic plants, than sediment-bound P and is thereby more likely to cause algae blooms and eutrophic conditions in receiving waters.

While compost filter socks have been used primarily for controlling sediment, there is

evidence in the literature that compost filter socks have the ability to filter soluble nutrients through chemical adsorption (Faucette and Tyler 2006; Faucette et al. 2006). The humus fraction of compost has the ability to chemically adsorb free ions such as soluble phosphorus (P) and ammonium nitrogen (N) (Brady and Weil 1996). Minor reduction for nitrate-N and total P from runoff water between 1 and 7 mg L⁻¹ were reported (Faucette and Tyler 2006; Faucette et al. 2006).

Sediment barriers are typically poor at targeting turbidity and suspended solids in runoff and often do little to reduce soluble nutrient concentrations (Leytem and Bjorneberg 2005). In recent years, polymers have been used on construction sites to improve water quality by targeting turbidity, suspended solids, and nutrients. Anionic polymer coagulants and flocculants may be added to compost filter socks to target these pollutants in storm water runoff. Hayes et al (2005) found that polymers can reduce average turbidity on disturbed soils characteristic to construction sites. Leytem and Bjorneberg (2005) reported a 98% reduction in soluble P concentration in sediment ponds using polymer flocculants, while Moore (1999) and Harper et al. (1999) found total phosphorus in storm runoff could be reduced by as much as 75% to 90%. These new applications may be of critical importance on highly disturbed silt and clay soils, soils recently fertilized for vegetation establishment, or near total maximum daily load (TMDL) listed receiving waters and watersheds. Additionally, sediment control barriers that can remove soluble pollutants from storm runoff, in addition to sediment, should be considered by environmental regulators and design engineers specifying structural sediment control practices.

The objectives of this study were (1) to compare the sediment removal efficiency of silt fence and compost filter socks, (2) to determine if the addition of polymers to

Figure 1

Experimental setup with rainfall simulator and soil chambers.



compost filter socks can reduce sediment and phosphorus loads, and (3) to determine relationships between compost filter media particle size distribution, hydraulic flow-through rate and pollutant removal efficiency.

Materials and Methods

Experimental Setup. Four (1 to 4) experiments were conducted in 2005 at the Environmental Quality Laboratory, USDA Agricultural Research Service, Beltsville, Maryland. The objective of experiment 1 and 2 was to determine and compare silt fence and compost filter sock performance on sediment removal efficiency and hydraulic flow rate; the objective of experiment 3 was to evaluate the effect of adding sediment-targeted polymers to the compost filter sock on these performance parameters; and the objective of experiment 4 was to evaluate the effect of adding phosphorus-targeted polymers to the compost filter socks on these parameters in addition to phosphorus removal efficiency. A 10:27:5 (N:P:K) commercial fertilizer was added to the soil boxes in experiment 4 by broadcasting on the soil surface at 28 kg ha^{-1} (150 lb ac^{-1}) of ortho-P ($5.88 \text{ g chamber}^{-1}$ [0.2 oz]).

All soil chambers were elevated at a 10% slope and exposed to a mean 7.45 cm h^{-1} (2.93 in hr^{-1}) simulated rainfall event for 30 minutes, to simulate a worst case scenario under bench scale conditions. All runs within experiments were completed within 48 hours. Each experiment tested five treatments, including one control (bare soil), all replicated in triplicate. Each treatment was

installed into a soil chamber, with four soil chambers installed on a rainfall turntable per experimental run (figure 1). A total of 15 treatment replicates were randomly assigned and tested during four runs per experiment (the last run only contained three soil treatments). Currently, no standard test methodology exists for evaluating sediment control barriers.

Rainfall Simulation and Soil Chamber System. The experimental design was set up to simulate rainfall-runoff and collect and analyze storm runoff from soil chambers installed with various sediment control barrier treatments. The rainfall-runoff simulation system used in this study has been previously described in detail by Isensee and Sadeghi (1999). The rainfall-runoff simulation system consists of an adjustable rainfall simulator (two oscillating linear dripping units that provide simulated rain at 0° and 180° over the raintable), a peristaltic pump to supply water to the dripper units, a 2.4-m (7.9-ft) diameter, 1-rpm turntable (that supports and rotates four soil chambers under oscillating dripping units), four chamber elevation platforms (to support the soil chambers at the desired slope of 0% to 20%), and 15 soil chambers. The soil chambers used in this experiment are constructed of 15-mm (0.6-in) thick marine plywood, with inside dimensions of 100 cm length by 35 cm width by 25 cm depth (39 in length by 14 in width by 10 in depth), and are described in detail in Sadeghi and Isensee (2001).

Soil chambers were prepared by packing a Hatboro silt loam (Ap horizon) into each of the 15 chambers. The soil was added in small

increments to the chambers and packed with a pressure of approximately 0.15 kg cm^{-2} (2.1 lb in^{-2}) before the next incremental addition (Sadeghi and Isensee 2001). Soil was packed until the chambers contained 7.62-cm (3-in) depth of soil. Twenty-four to 48 hours before the runoff simulation, the chamber drains were plugged, and chambers were placed on the raintable and exposed to fifteen minutes of simulated rainfall at a rate of 5.4 cm h^{-1} (2.1 in hr^{-1}), to pre-wet the soil. The adjustable runoff drain was then unplugged and the gate was positioned so the runoff drain was level with the soil surface. Silicone was used to seal the gate to prevent leaks during the simulation.

Treatment Description and Installation. All treatments for the four experiments (19 total treatments) are described in table 2. Compost filter media, derived from composted yard debris, used within the filter sock was supplied by erosion control contractors currently using the compost filter sock technology for sediment control on construction activities. No processing of compost filter media was conducted once received at the experimental laboratory from the erosion control contractors. Compost filter sock treatments with same numbers came from the same erosion control contractor. For treatments requiring polymer addition, pre-weighed polymers were added and thoroughly mixed with 5 kg (11 lb) of compost filter media by combining materials in a 18.9 L (5 gal) bucket and vigorously shaking and rolling the sealed bucket for 2 minutes. Polymer inclusion rate to compost filter media was 20 g kg^{-1} (0.3 oz lb^{-1}). After mixing, the mixed materials were filled and compacted into a 20.3-cm (8-in) diameter high density polyethylene photodegradable mesh (9.5-mm [0.4-in] openings) containment sock system ('filter sock'). Filter socks were then placed at the down slope end of the soil chamber and were slightly compacted. Compost filter media was used to backfill the filter sock and soil interface on the upslope side of the filter sock, according to federal standard specifications (American Association of State Highway and Transportation Officials 2006).

Particle size distribution of all compost filter media treatments was determined. Particle size distribution of the filter media may affect pollutant removal efficiency and hydraulic flow-through rate of the filter sock (Faucette et al. 2006). A composite sub-sample of the filter media was taken prior to runoff analysis and analyzed for particle size distribution (Test Methods for the

Table 2
Experimental treatments.

Treatment	Experiment 1	Experiment 2	Experiment 3	Experiment 4
1	Silt fence	Silt fence	Silt fence	Silt fence
2	Compost filter sock 1	Compost filter sock 4	Compost filter sock 5 + BioFloxx	Compost filter sock 5 + PhosLoxx1
3	Compost filter sock 2	Compost filter sock 2	Compost filter sock 5 + PAM	Compost filter sock 5 + PhosLoxx2
4	Compost filter sock 3	Compost filter sock 5	Compost filter sock 5 + Silt Stop	Bare soil
5	Bare soil	Bare soil	Bare soil	

Examination of Composting and Compost (02.02 B) using test methods described by the Test Methods for the Examination of Composting and Compost (US Composting Council 1997). Particle size distribution standard specifications for compost filter socks used for runoff-sediment control applications are 99% passing 50 mm (2 in), 30% to 50% passing 10 mm (3/8 in) (American Association of State Highway Transportation Officials 2006; USEPA 2006). Particle size distributions for each filter media treatment are presented in table 3.

Various polymers were added to the filter sock for experiment 3 and 4. Experiment 3 added coagulant and flocculent polymers designed to reduce TSS and turbidity in surface runoff flowing through the filter sock. The BioFloxx polymer is a water soluble anionic chitosan acetate powder (≤ 1 mm [≤ 0.04 in]) derived from shellfish. The PAM is a water soluble anionic polyacrylamide powder with a paper fiber (5 mm [0.2 in]) carrier used for field application purposes. The Silt-Stop is a water soluble anionic polyacrylamide co-polymer blended powder (≤ 1 mm). All three anionic polymers are flocculants and coagulants commonly used to flocculate and settle suspended solids in sediment and

storm water detention ponds and stabilize disturbed soils through coagulation on construction sites.

Experiment 4 added polymers designed to reduce phosphorus in detained water systems to the filter sock system in order to target soluble phosphorus in runoff. Both polymers (PhosLoxx1 and PhosLoxx2) were a proprietary blend that partially utilizes alum (aluminum sulfate) and/or gypsum (calcium sulfate) materials in granular forms (≤ 2 mm [≤ 0.08 in]).

All experiments used 900-mm (36-in) tall geosynthetic silt fence adhering to a minimum tensile strength of 118 kg (260 lb) (ASTM-D4632), #30 apparent opening size (maximum sieve size) (ASTM-D4751), and a maximum elongation of 40% (ASTM-D4751). Silt fence was installed in a V-formation (so ends were positioned upslope), at the down-slope end of the soil chamber. Six inches of the silt fence were trenched into the soil, 6.4 cm (2.5 in) deep and 8.9 cm (3.5 in) upslope. The soil displaced by trenching was replaced and thoroughly compacted around the silt fence prior to rainfall-runoff simulation. The top 30.5 cm (12 in) of the silt fence was cut off after installation (sediment accumulation and

flow rates did not require the extra material). Polymers were not added to the silt fence as the researchers assumed it would readily leach through the fabric.

Runoff Sampling and Analysis. All runoff was collected in 500 mL (16.9 oz) pre-weighed glass jars. A runoff sample was collected once the sample jar reached volumetric capacity. After sample collection, all jars were weighed to calculate total runoff volume. This data was combined with the elapsed time data to develop runoff hydrographs for each treatment.

All runoff samples were processed for soluble P, total P, TSS, and turbidity. Using a 20-mL (0.7-oz) syringe (BD Luer-Lok #305617), sampled aliquots were passed through a 0.45- μ m (0.000018-in) syringe filter (Pall IC Acrodisc #AP-4585). Filtered samples were processed for ortho-P by flow injection analysis (Lachat QuikChem #10-115-01-1-A). For total P quantification persulfate digestion was used to oxidize organic and particulate matter using 50-mL (1.7-oz) sample aliquots (Pierzynski 2000). Once oxidized, these samples were processed using flow injection analysis for orthophosphate (Lachat QuikChem #10-115-01-1-A). A LaMotte 2020 Turbidimeter was used to

Table 3
Particle size distribution for compost filter media for all compost filter sock treatments.

Treatment	Particle size distribution of compost filter media						
	>25 mm	16 to 25 mm	9.5 to 16.0 mm	6.3 to 9.5 mm	4 to 6.3 mm	2 to 4 mm	<2 mm
Filter sock 1	2.7%	12.3%	13.7%	14.9%	11.2%	11.2%	34%
Filter sock 2*	0%	16.1%	39.6%	13%	6.3%	7.2%	17.8%
Filter sock 3*	12.4%	14.1%	28.2%	21.8%	9.8%	4.7%	9%
Filter sock 4	0%	0%	22.1%	28.2%	22.3%	12.4%	15%
Filter sock 2*	0%	16.1%	39.6%	13%	6.3%	7.2%	17.8%
Filter sock 5*	0%	14.9%	44.8%	13.4%	7%	6.9%	13.1%
Filter sock 5** BioFloxx	0%	14.9%	44.8%	13.4%	7%	6.9%	13.1%
Filter sock 5** PAM	0%	14.9%	44.8%	13.4%	7%	6.9%	13.1%
Filter sock 5** Silt-Stop	0%	14.9%	44.8%	13.4%	7%	6.9%	13.1%
Filter sock 5* + PhosLoxx1	0%	14.9%	44.8%	13.4%	7%	6.9%	13.1%
Filter sock 5* + PhosLoxx2	0%	14.9%	44.8%	13.4%	7%	6.9%	13.1%

* Compost filter media meets particle size distribution standard specification (American Association of State Highway and Transportation Officials 2006). Note: Compost filter media that did not meet particle size distribution specification was too fine.

Table 4

Mean pollutant concentration values, flow rate, and percent removal or reduction for all experimental treatments.

Treatment	Experiment	TSS		Turbidity		Total P		Soluble P		Total P w/ fertilizer added		Soluble P w/ fertilizer added		Flow rate	Difference (%)
		g L ⁻¹	Removal (%)	NTU	Reduction (%)	mg L ⁻¹	Removal (%)	mg L ⁻¹	Removal (%)	mg L ⁻¹	Removal (%)	mg L ⁻¹	Removal (%)	(linear ft) ⁻¹ gal min ⁻¹	
Bare soil (control)	1	70.40b	ND	36,688b	ND	31.18b	ND	0.438b	ND	ND	ND	ND	ND	0.0727a	ND
Silt fence	1	9.34a	87	8,805a	76	11.46a	63	0.337a	23	ND	ND	ND	ND	0.0515b	29
Filter sock 1	1	9.21a	87	8,165a	78	10.94a	65	0.317a	28	ND	ND	ND	ND	0.0633ab	13
Filter sock 2	1	13.9a	80	10,884a	70	12.93a	59	0.377ab	14	ND	ND	ND	ND	0.0715a	2
Filter sock 3	1	13.38a	81	10,234a	72	12.86a	59	0.359ab	18	ND	ND	ND	ND	0.0710a	2
Bare soil (control)	2	49.34b	ND	31,504b	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.0977a	ND
Silt fence	2	14.30a	71	14,508a	54	ND	ND	ND	ND	ND	ND	ND	ND	0.0924a	5
Filter sock 2	2	18.60a	62	14,954a	53	ND	ND	ND	ND	ND	ND	ND	ND	0.0856ab	13
Filter sock 4	2	16.30a	67	14,128a	55	ND	ND	ND	ND	ND	ND	ND	ND	0.0785b	20
Filter sock 5	2	11.05a	78	12,205a	61	ND	ND	ND	ND	ND	ND	ND	ND	0.0763b	22
Bare soil (control)	3	61.56c	ND	32,793c	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.1126a	ND
Silt fence	3	20.85b	66	16,371b	50	ND	ND	ND	ND	ND	ND	ND	ND	0.1074a	5
Filter sock 5 + BioFloxx	3	1.87	97	2,003a	94	ND	ND	ND	ND	ND	ND	ND	ND	0.0747b	34
Filter sock 5 + PAM	3	5.41a	91	6,835a	79	ND	ND	ND	ND	ND	ND	ND	ND	0.0782b	31
Filter sock 5 + Silt-Stop	3	1.88	97	659a	98	ND	ND	ND	ND	ND	ND	ND	ND	0.0598c	47
Bare soil (control)	4	48.82c	ND	19,343c	ND	ND	ND	ND	ND	81.56b	ND	36.58b	ND	0.1098a	ND
Silt fence	4	18.25b	63	10,687b	45	ND	ND	ND	ND	37.02a	55	16.10a	56	0.0859b	22
Filter sock 5 + PhosLoxx1	4	6.61a	87	5,588a	71	ND	ND	ND	ND	34.99a	57	0.17a	99	0.0882b	20
Filter sock 5 + PhosLoxx2	4	5.47a	89	4,428a	77	ND	ND	ND	ND	30.07a	63	2.61a	93	0.0923b	16

Notes: TSS = total suspended solids. ND = data were not collected for this parameter and/or treatment. Means with same letter were not significantly different at $p < 0.05$.

quantify turbidity for each sample. Total suspended solids were processed by filtering 100 mL (3.4 oz) of raw sample through a glass microfiber filter (Whatman #934-AH), using a Buchner funnel and light vacuum. Pre-weighed filters were dried at 104°C (219°F) for one hour and weighed to determine TSS (g L⁻¹).

Analysis of Results. Total mass loads were determined for TSS, total P, and soluble P. Loads were determined by multiplying sample concentration means by the runoff volume. Flow rates were converted from mL s⁻¹ to L min⁻¹ linear cm⁻¹ and gal min⁻¹ linear ft⁻¹ by correcting for box width (35 cm [14 in]) to a standard linear length of sediment control barrier (cm or ft). Single event support practice (P factor) is defined as the soil loss ratio from a given treatment relative to a bare soil (control) under the same set of environmental conditions (Demars et al. 2000; Clopper et al. 2001; Erosion Control Technology Council 2004). Single event P factors were determined for each treatment using TSS loads.

Statistical analysis for means separation was performed using Proc Mixed, SAS

Institute version 9.1, on the effect of filter sock, filter sock + polymer, and silt fence treatments on TSS, turbidity, total P, soluble P, and hydraulic flow rate. Separation of means was determined to be significantly different at the $p < 0.05$ level. A regression analysis was performed to determine the strength of correlation relationships between compost filter media particle size, hydraulic flow rates, and removal efficiency of the pollutants described above. Regression analysis was determined significant if the relationship had an r value > 0.70 at the $p < 0.05$ level.

Results and Discussion

Suspended Solids and Turbidity. During experiment 1 and 2, all treatments were significantly different from the control, as compost filter socks reduced TSS concentration between 80% and 87%, and the silt fence reduced TSS by 87% (table 4). During experiment 2, the filter socks reduced runoff TSS concentration between 62% and 78%, and the silt fence reduced TSS by 71%. This supports Faucette and Tyler's (2006) and Faucette et al. (2006) findings that filter socks can reduce runoff TSS between

59% and 82%, and between 58% and 70%, respectively. Experiment 3 utilized sediment-reducing polymers within the filter sock to target suspended solids and turbidity in runoff. Total suspended solids removal efficiency for these filter socks was between 91% and 97%, and 66% for the silt fence. Faucette et al. (2006) similarly reported polymers added to filter socks reduced TSS between 88% and 90%. Total suspended solid removal efficiency for the chitosan- and polyacrylamide-based polymers used within the filter socks were nearly identical. Although experiment 4 was designed to reduce runoff phosphorus, all filter socks with polymer significantly reduced TSS relative to silt fence and the control. Total suspended solid removal efficiencies were between 84% and 89% for the filter sock treatments with alum and gypsum, and were 63% for the silt fence. These results show that polymers typically used to remove P when added to the filter socks do not contribute TSS to runoff and may be used to reduce TSS in runoff.

Total suspended solid loads from bare soil (control) for experiment 1 through 3 ranged from 17,300 to 23,517 kg ha⁻¹ (7.6 tn ac⁻¹

Table 5

Total pollutant load and percent reduction or removal for all experimental treatments.

Treatment	Experiment	Total suspended solids		P factor	Total P w/ fertilizer added		Soluble P w/ fertilizer added	
		kg ha ⁻¹	Removal (%)	reduction (%)	mg	Removal (%)	mg	Removal (%)
Bare soil (control)	1	21,514b	ND	ND	ND	ND	ND	ND
Silt fence	1	2,340a	89%	0.11	ND	ND	ND	ND
Filter sock 1	1	2,209a	90	0.10	ND	ND	ND	ND
Filter sock 2	1	3,706a	83	0.17	ND	ND	ND	ND
Filter sock 3	1	3,857a	82	0.18	ND	ND	ND	ND
Bare soil (control)	2	17,300b	ND	ND	ND	ND	ND	ND
Silt fence	2	4,440a	74	0.26	ND	ND	ND	ND
Filter sock 2	2	5,491a	68	0.32	ND	ND	ND	ND
Filter sock 4	2	4,634a	73	0.27	ND	ND	ND	ND
Filter sock 5	2	2,960a	83	0.17	ND	ND	ND	ND
Bare soil (control)	3	23,517b	ND	ND	ND	ND	ND	ND
Silt fence	3	6,703a	72	0.29	ND	ND	ND	ND
Filter sock 5 + BioFloxx	3	509a	98	0.02	ND	ND	ND	ND
Filter sock 5 + PAM	3	1,423a	94	0.06	ND	ND	ND	ND
Filter sock 5 + Silt-Stop	3	417a	98	0.02	ND	ND	ND	ND
Bare soil (control)	4	ND	ND	ND	676.1b	ND	229.9b	ND
Silt fence	4	ND	ND	ND	323.8a	52	120.9a	47
Filter sock 5 + PhosLoxx1	4	ND	ND	ND	261.7a	61	1.5 a	99
Filter sock 5 + PhoxLoxx2	4	ND	ND	ND	233.1a	66	18.6 a	92

Notes: ND = data were not collected for this parameter and/or treatment. Means with same letter were not significantly different at $p < 0.05$.

and 10.4 tn ac⁻¹). During experiment 1, the filter socks reduced TSS loads between 82% and 90%, and the silt fence reduced TSS loads by 89% (table 5). During experiment 2, all of the treatments significantly reduced TSS loads relative to the control; the compost filter socks reduced TSS loads between 68% and 83%, and the silt fence reduced TSS loads by 74%. During experiment 3, filter socks with polymers reduced TSS loads between 94% and 98%, and the silt fence reduced TSS loads by 72%. There was no quantifiable difference between the PAM and chitosan polymers.

All treatments significantly reduced turbidity in runoff relative to the control during experiment 1 and 2 (table 4). Filter socks reduced turbidity between 53% and 78%, while silt fence reduced turbidity between 54% and 76%. Where flocculants were added to the filter socks in experiment 3, turbidity was reduced between 79% and 98%, and only 50% for the silt fence treatment. Faucette et al. (2006) similarly reported turbidity reduction by filter socks with flocculants between 77% and 90%. In experiment 4, all filter socks with polymers (intended to target phosphorus) significantly reduced turbidity relative to silt fence and the control. Turbidity reduction for the filter sock treatments were between 71% and 77%, and 45% for the silt

fence. These results show that the polymers added to the filter socks do not contribute turbidity to runoff and may be used to target turbidity reduction in runoff.

Support Practice Factor. Single event support practice (P) factors used in the USLE soil prediction model are often used by erosion and sediment control planners to evaluate between sediment control practices and to estimate the potential erosion reduction a given practice may provide under a given set of field conditions for single event storm scenarios. P factors for silt fence for experiments 1 through 3 were between 0.11 and 0.29 (table 5). These P factors are considerably better than the silt fence P factor reported by Fifield (2001), 0.60, but worse than 0.048 silt fence P factors (reported as sediment loss ratio) reported by Faucette et al. (2005). The P factors for filter socks without polymers were between 0.10 and 0.32, and with sediment-reducing polymers between 0.02 and 0.06. Kelsey et al. (2006) reported P factor values for straw wattles between 0.66 and 0.81, and excelsior fiber logs between 0.29 and 0.45; while Faucette et al. (2005) reported a P factor (reported as sediment loss ratio) of 0.041 for compost filter berms. Variability for reported P factors between these studies is likely

due to the experimental conditions to which each sediment control barrier was exposed.

Total and Soluble Phosphorus. During experiment 1, all treatments significantly reduced total P relative to bare soil. The filter socks reduced total P between 59% and 65%, and the silt fence reduced total P by 63% (table 4). Results were similar for soluble P, as one of the filter socks and the silt fence significantly reduced soluble P from runoff, while the remaining filter socks were not significantly different. Soluble P removal efficiency from runoff for the filter socks was between 14% and 27%, and 23% for the silt fence. These results are likely because most of the total P in runoff was sediment-bound (99%); therefore, effective control of sediment had the same affect on P. This provides further evidence that filter socks do not contribute P to runoff water, which is similar to results from Faucette and Tyler (2006), and may have the ability to reduce soluble P in runoff as reported by Faucette et al. (2006).

Experiment 4 included polymers within the matrices of the filter socks to target runoff P, particularly soluble P. Soils in this experiment were amended with 28 kg ha⁻¹ (150 lb ac⁻¹) of ortho-P fertilizer (a typical application for establishing erosion control grasses). Due to the addition of fertilizer, 45% of total P in

the runoff was in soluble P form (compared to 1% in the previous experiment). Soluble P concentration and load from the fertilized bare soil was 37 mg L⁻¹ and 230 mg (0.008 oz), respectively. Soluble P reduction by the filter socks with polymers was between 93% and 99%, while the silt fence was 56%. Loading of soluble P was reduced by the filter socks with polymers between 92 and 99%, while the silt fence reduced soluble P loading by 47%. Faucette et al. (2006) similarly reported, with runoff soluble P concentrations of 100 mg L⁻¹, phosphorus-reducing polymers added to filter socks at 4.2 to 25.4 g kg⁻¹, reduced soluble P in runoff between 67% and 93%. The high soluble P removal efficiency by the compost sock with polymers is likely due to chemical ionic adsorption of soluble P to exchange sites on the polymer. Moderate soluble P removal efficiency of the silt fence is likely due to ionic adsorption of the soluble P to sediments held behind the silt fence. Filter socks with polymers also reduced total P loading, between 61% and 66%, while silt fence reduced total P loading by 52%.

Hydraulic Flow Rate. Hydraulic flow rates of sediment control barriers can provide needed information for erosion and sediment control planning and design. Flow-through rates can be used to determine spacing requirements, maximum allowable slope lengths and/or drainage areas contributing to sediment control barriers, and potential for overflow during rainfall-runoff events. In experiment 1, only the silt fence significantly restricted flow rate relative to the bare soil and was significantly different from two of the filter socks (table 4). The compost socks restricted flow rate between 2% and 13%, while the silt fence restricted flow by 29%. Keener et al. (2006) similarly reported that silt fence flow rates were approximately 50% slower relative filter socks. In experiment 2, relative hydraulic flow rates were lower in the compost sock treatments, as two of the filter socks were significantly slower than the control and the silt fence. During this experiment, filter socks restricted flow rates between 12% and 22%, while the silt fence reduced flow by 5%.

There are two plausible explanations for the reversal in hydraulic flow rate pattern between silt fence and filter socks relative to the control. Suspended solids and turbidity levels were greater during experiment 1 relative to experiment 2, and it is possible that higher runoff sediment concentrations act to restrict flow through the silt fence (through blinding) in greater relative proportion than

to filter socks. Alternatively, the filter socks in experiment 1 had a higher percent of large particles, relative to the filter socks in experiment 2, increasing the porosity in the filter sock allowing water to move through at a faster rate. This supports results presented by Faucette et al. (2006) where compost filter media particle size distribution is the best predictor of flow through rate.

During experiment 3, polymers in the filter socks significantly restricted flow-through rates, relative to silt fence, whereas, compost socks with polymers reduced flow rates between 31% and 47%, silt fence reduced flow rate by only 5%. Because these polymers are coagulants once they react with water, flow friction and physical clogging of pores is typical within the filter sock. It is unclear whether flow restriction, flocculation, or coagulation was most responsible for sediment reduction in these treatments.

During experiment 4, all flow rates were significantly lower than the control. Silt fence reduced flow rate by 22%, while the filter socks reduced flow between 16% and 20%. Addition of phosphorus-targeting polymers to filter socks did not reduce flow through rate, as the polymers in experiment 3 did. This is likely because these polymers do not coagulate as the sediment-targeting polymers do.

Particle Size Distribution, Hydraulic Flow Rate, and Pollutant Removal Efficiency. Results from experiment 1 showed that the filter sock with the highest percentage of small particles had the greatest reduction in runoff TSS concentration, turbidity, and total and soluble P concentration. Still, results from regression analysis ($\alpha < 0.05$) did not show a strong relationship with only a moderate relationship between particle sizes distributed between 6.3 mm (0.25 in) and 16 mm (0.63 in) and reduction in turbidity ($\alpha = 0.0395$; $r^2 = 0.477$). Regression analysis did not show a significant correlation between particle size distribution and hydraulic flow rate.

Results from experiment 1, 2, and 3 showed that filter socks that exhibited the greatest hydraulic flow rate restriction had the greatest reduction of runoff TSS concentration and load, turbidity, total P, and soluble P. Experiment 3 supports manufacturers' claims that coagulating polymers, such as those used in this experiment, reduce sediment transport by slowing or restricting the flow of runoff. Results from regression analysis ($\alpha < 0.05$) showed a significant relationship between hydraulic flow rate restriction and reduction in turbidity ($\alpha = 0.01$; $r^2 = 0.765$), TSS (α

$= 0.0177$; $r^2 = 0.642$), total P ($\alpha = 0.0005$; $r^2 = 0.624$), and soluble P ($\alpha = 0.0483$; $r^2 = 0.473$) in runoff; although the strength of these relationships were only moderate.

This data demonstrates that hydraulic flow-through rate may be a better predictor for pollutant removal efficiency of compost filter media, rather than particle size distribution, and although specifications for particle size distribution are still a useful tool to predict performance, inclusion of hydraulic flow-through rate specifications for compost filter socks (and filter berms) should be seriously considered by specifiers and regulators.

Summary and Conclusions

Under bench scale conditions, 7.45 cm h⁻¹ (2.9 in hr⁻¹) of simulated rainfall-runoff for 30 minute durations on bare soil conditions generated runoff TSS loads between 17,300 kg ha⁻¹ and 23,517 kg ha⁻¹ (7.6 tn ac⁻¹ and 10.4 tn ac⁻¹), TSS concentrations between 48.8 and 70.4 g L⁻¹ (6.5 oz gal⁻¹ and 9.4 oz gal⁻¹), and turbidity between 19343 and 36688 NTUs. Compost filter socks, compost filter socks with polymers, and silt fence treatments significantly reduced TSS concentrations, TSS loads, and turbidity NTUs, relative to bare soil. Compost filter socks reduced TSS concentration in runoff between 62% and 87% (68% to 90% for TSS load), when polymers were added to the filter socks TSS removal efficiency increased to between 91% and 98% (94% and 98% for TSS load), while silt fence reduced TSS concentration between 63% and 87% (68% to 89% for TSS load). Similarly, silt fence reduced turbidity in runoff between 45% and 76%, filter socks reduced turbidity between 53% and 78%, and filter sock + polymers increased turbidity reduction to between 79% to 98%. Similarly, single-event support practice (P factor) for silt fence were between 0.11 and 0.27 and for filter socks between 0.10 and 0.32.

Filter socks and silt fence significantly reduced total P and soluble P in runoff. Polymers added to filter socks significantly reduced soluble P loads relative to silt fence. Filter socks reduced total P concentrations between 55% and 65% (59% to 66% for total P loads), and silt fence reduced total P concentrations between 55% and 63% (52% for loads). Filter socks reduced soluble P loading between 14% and 27%, while silt fence reduced soluble P loading by 23%. When 28 kg ha⁻¹ (150 lb ac⁻¹) of ortho-P fertilizer was applied to bare soil polymers added to the filter socks reduced soluble P concentrations between 93% and 99% (92% to 99% for sol-

uble P loads). Soluble P runoff concentration and load from the fertilized bare soil was 37 mg L⁻¹ and 230 mg (0.008 oz), respectively, 45% of total P.

Compost filter socks and silt fence significantly restricted hydraulic flow rate relative to bare soil. The filter socks reduced flow rate between 2% and 22%, while silt fence reduced flow rate between 5% and 29%. Sediment polymers added to the filter socks reduced flow rate between 31% and 47%, likely due to their coagulation characteristics. A moderate correlation was observed for compost filter media particle sizes distributed between 6.3 mm (0.25 in) and 16 mm (0.63 in) and reduction in turbidity; however, regression analysis did not show a significant correlation between particle size distribution and hydraulic flow rate. A significant correlation was observed between hydraulic flow rate restriction and reduction in runoff turbidity, TSS, total P, and soluble P.

These results show that compost filter socks are effective at reducing turbidity and TSS from runoff and are similar to silt fence in sediment removal efficiency; however, if polymers are added to the filter socks removal efficiencies may be increased to 98%. Silt fence and filter socks have similar total P and soluble P removal efficiencies; however, if flocculants are added to filter socks, soluble P may be reduced up to 99%. Filter socks and silt fence had similar effects on hydraulic flow rates. However, if polymers used for targeting sediment are added to filter socks, hydraulic flow rate may be restricted. Particle size distribution specifications for compost filter media are a valuable tool for predicting performance of filter socks (and filter berms). However, hydraulic flow through rate is a better predictor of pollutant removal efficiency performance for this technology. In conclusion, filter socks are highly effective as sediment control barriers and can be customized to target specific storm water runoff pollutants such as turbidity, TSS, and soluble P. Targeting these pollutants in storm runoff will likely reduce their transport to, and pollution of sensitive receiving waters and TMDL listed water bodies. Additionally, federal and state standard specifications should consider inclusion of hydraulic flow rate parameters to increase prediction of compost filter sock (and filter berm) performance.

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ATTACHMENT 1

Sediment Removal Efficiency Tables⁴

EPA recognizes that very high removal efficiencies, even where theoretically achievable by a 50-foot buffer, may be very difficult to achieve in practice using alternative controls. Therefore in the tables below, EPA has limited the removal efficiencies to a maximum of 90%. Efficiencies that were calculated at greater than 90% are shown as 90%, and this is the minimum percent removal that must be achieved by alternative controls.

Table G-8 Estimated 50-foot Buffer Performance in Idaho*

Type of Buffer Vegetation**	Estimated % Sediment Removal				
	Clay	Silty Clay Loam or Clay-Loam	Sand	Sandy Clay Loam, Loamy Sand or Silty Clay	Loam, Silt, Sandy Loam or Silt Loam
Tall Fescue Grass	42	52	44	48	85
Medium-density Weeds	28	30	28	26	60
Low-density Warm-season Native Bunchgrass (i.e., Grama Grass)	25	26	24	24	55
Northern Mixed Prairie Grass	28	30	28	26	50
Northern Range Cold Desert Shrubs	28	28	24	26	50

* Applicable for sites with less than nine percent slope

** Characterization focuses on the under-story vegetation

Table G-9 Estimated 50-foot Buffer Performance in Massachusetts and New Hampshire*

Type of Buffer Vegetation**	Estimated % Sediment Removal				
	Clay	Silty Clay Loam or Clay-Loam	Sand	Sandy Clay Loam, Loamy Sand or Silty Clay	Loam, Silt, Sandy Loam or Silt Loam
Warm-season Grass (i.e., Switchgrass, Lemongrass)	79	90	90	90	90
Cool-season Dense Grass (Kentucky Bluegrass, Smooth Bromegrass, Timothy)	78	90	90	90	90
Tall Fescue Grass	76	90	81	89	90
Medium-density Weeds	66	76	60	72	66

* Applicable for sites with less than nine percent slope

** Characterization focuses on the under-story vegetation

⁴ The buffer performances were calculated based on a denuded slope upgradient of a 50-foot buffer and a perimeter controls, as perimeter controls are a standard requirement (see Part 2.2.3).

Appendix O – Impaired and High Quality Waters Information

Appendix 1

Assessment units and integrated list categories presented alphabetically by major watershed

Water Body	Segment ID	Description	Size	Units	Category
Assonet River	MA62-20	From Tisdale Pond Dam (NATID: MA03049) (north of Route 79/Elm Street intersection), Freetown to mouth at confluence with the Taunton River, Freetown/Berkley.	0.82	Square Miles	4a
Barrowsville Pond	MA62007	Norton.	31.00	Acres	3
Beaumont Pond	MA62009	Foxborough.	24.00	Acres	3
Beaver Brook	MA62-09	Outlet Cleveland Pond, Abington to mouth at confluence with Salisbury Plain River forming headwaters Matfield River, East Bridgewater.	6.80	Miles	4a
Beaver Brook	MA62-30	Headwaters, perennial portion, just west of Bay Road, Easton to mouth at inlet of Old Pond, Easton.	1.40	Miles	3
Big Bearhole Pond	MA62011	Taunton.	38.00	Acres	5
Briggs Pond	MA62021	Sharon.	19.00	Acres	3
Broad Cove	MA62-50	Dighton/Somerset (formerly reported as lake segment MA62022).	0.13	Square Miles	4a
Brockton Reservoir	MA62023	Avon.	89.00	Acres	4c
Cain Pond	MA62030	Taunton.	3.00	Acres	5
Canoe River	MA62-64	Headwaters in wetland east of Cow Hill, Sharon to inlet Beaumont Pond, Foxborough (formerly part of segment MA62-27).	3.10	Miles	2
Canoe River	MA62-65	From outlet of Beaumont Pond, Foxborough to inlet of Hartwell School Pond, Mansfield (formerly part of segment MA62-27).	3.80	Miles	2
Canoe River	MA62-66	From outlet of Hartwell School Pond, Mansfield to mouth at inlet Winnecunnet Pond, Norton (formerly part of segment MA62-27).	6.90	Miles	2
Carpenter Pond	MA62032	Foxborough.	29.00	Acres	3
Carver Pond	MA62033	Bridgewater.	29.00	Acres	4c
Cedar Swamp River	MA62-44	Headwaters south of Freetown Street, Lakeville to inlet Forge Pond, Freetown (stream name changes to Assonet River at Lakeville/Freetown corporate boundary).	5.80	Miles	2
Chaffin Reservoir	MA62035	Pembroke.	13.00	Acres	3
Chartley Pond	MA62038	Norton/Attleboro.	57.00	Acres	3
Clear Pond	MA62041	Lakeville.	18.00	Acres	3
Cleveland Pond	MA62042	Abington.	98.00	Acres	4c
Cobb Brook	MA62-43	Headwaters south of Dunbar Street (in Crapo Bog), Taunton to mouth at confluence with the Taunton River, Taunton (approximately 0.1mile culverted at mouth).	3.50	Miles	3
Cocasset Lake	MA62043	Foxborough.	32.00	Acres	3
Cooper Pond	MA62046	Carver.	22.00	Acres	3
Cotley River	MA62-41	From outlet of cranberry bog south of Seekell Street, Taunton to mouth at confluence with the Taunton River, Taunton.	5.70	Miles	3
Coweaset Brook	MA62-22	Headwaters, perennial portion, southwest of Route24/Route 123 interchange (north of Mill Street), Brockton to mouth at confluence with Hockomock River, West Bridgewater.	3.90	Miles	3
Crocker Pond	MA62051	Wrentham.	17.00	Acres	4c
Cross Pond	MA62052	Brockton.	2.00	Acres	3
Cross Street Pond	MA62053	Bridgewater.	27.00	Acres	3
Cushing Pond	MA62056	Abington.	6.00	Acres	4c



Appendix 1

Assessment units and integrated list categories presented alphabetically by major watershed

Water Body	Segment ID	Description	Size	Units	Category
East Freetown Pond	MA62063	Freetown.	11.00	Acres	4c
Elm Street Pond	MA62066	Halifax/Hanson.	19.00	Acres	3
Forge Pond	MA62072	Freetown.	56.00	Acres	3
Forge River	MA62-37	Headwaters, outlet Kings Pond, Raynham to mouth at confluence with the Taunton River, Raynham.	2.50	Miles	3
Fuller Street Pond	MA62234	Middleborough/Carver (formerly reported as MA95058).	20.00	Acres	4c
Furnace Lake	MA62076	Foxborough.	15.00	Acres	3
Gavins Pond	MA62077	Sharon/Foxborough.	18.00	Acres	4c
Glue Factory Pond	MA62078	Foxborough (formerly a portion of MA62-39).	7.00	Acres	5
Great Quittacas Pond	MA62083	Lakeville/Middleborough/Rochester.	1125.00	Acres	3
Gushee Pond	MA62084	Raynham.	27.00	Acres	4c
Hartwell School Pond	MA62086	Mansfield (formerly a portion of MA62-27).	8.00	Acres	3
Hewitt Pond	MA62088	Raynham.	14.00	Acres	3
Hockomock River	MA62-35	Headwaters, perennial portion, west of Route 24, West Bridgewater to mouth at confluence with Town River, Bridgewater.	4.30	Miles	3
Island Grove Pond	MA62094	Abington.	31.00	Acres	5
Johns Pond	MA62096	Carver.	21.00	Acres	3
Johnson Pond	MA62097	Raynham.	14.00	Acres	4c
Kings Pond	MA62101	Raynham.	13.00	Acres	3
Lake Mirimichi	MA62118	Plainville/Foxborough.	175.00	Acres	4c
Lake Nippenicket	MA62131	Bridgewater/Raynham.	375.00	Acres	4a
Lake Rico	MA62148	Taunton.	188.00	Acres	4c
Lake Sabbatia	MA62166	Taunton.	265.00	Acres	5
Leach Pond	MA62103	Easton/Sharon.	111.00	Acres	3
Little Cedar Swamp	MA62106	Easton.	91.00	Acres	3
Little Quittacas Pond	MA62107	Lakeville/Rochester.	295.00	Acres	3
Long Pond	MA62108	Lakeville/Freetown.	1728.00	Acres	4c
Longwater Pond	MA62109	Easton.	8.00	Acres	4c
Lovett Brook	MA62-46	Headwaters, perennial portion, north of Oak Street, Brockton to mouth at inlet Elis Brett Pond, Brockton.	1.50	Miles	3
Lower Porter Pond	MA62111	Brockton.	8.00	Acres	4c
Matfield River	MA62-32	Headwaters, confluence Beaver Brook and Salisbury Plain River, East Bridgewater to mouth at confluence with Town River forming headwaters Taunton River, Bridgewater.	6.30	Miles	5
Meadow Brook	MA62-38	Headwaters north of Pine Street, Whitman (through Forge Pond, East Bridgewater) to the confluence with the Matfield River, East Bridgewater.	6.00	Miles	4a
Meadow Brook Pond	MA62113	Norton.	13.00	Acres	3
Middle Pond	MA62115	Taunton.	26.00	Acres	4c
Mill River	MA62-29	Headwaters, outlet Lake Sabbatia, Taunton to mouth at confluence with the Taunton River, Taunton (through Whittenton Impoundment, formerly segment MA62228).	4.20	Miles	4c



Appendix 1

Assessment units and integrated list categories presented alphabetically by major watershed

Water Body	Segment ID	Description	Size	Units	Category
Monponsett Pond, East Basin	MA62218	[East Basin] Halifax.	247.00	Acres	5
Monponsett Pond, West Basin	MA62119	[West Basin] Halifax/Hanson.	283.00	Acres	5
Mount Hope Mill Pond	MA62122	Taunton/Dighton (includes Three Mile River Impoundment formerly reported as MA62231).	45.00	Acres	4c
Muddy Cove Brook	MA62-51	From the outlet of the small impoundment behind 333 Main Street (Zeneca Inc.), Dighton to mouth at confluence with the Taunton River, Dighton (formerly part of MA62-23).	0.01	Square Miles	4a
Muddy Cove Brook	MA62-58	Headwaters, south of Hart Street, Dighton to inlet Muddy Cove Brook Pond, Dighton (formerly part of MA62-52 and MA62-23 (2004)).	1.40	Miles	3
Muddy Cove Brook	MA62-59	From outlet Muddy Cove Brook Pond, Dighton to outlet of small impoundment behind 333 Main Street (Zeneca Inc.), Dighton (formerly part of MA62-52 and MA62-23 (2004)).	0.20	Miles	3
Muddy Cove Brook Pond	MA62124	Dighton.	23.00	Acres	5
Muddy Pond	MA62125	Carver.	61.00	Acres	4c
Muddy Pond	MA62126	Halifax.	13.00	Acres	3
Muddy Pond	MA62233	Kingston (formerly reported as MA94104).	42.00	Acres	3
Mulberry Meadow Brook	MA62-31	Headwaters, outlet New Pond, Easton to mouth at inlet of Winneconnet Pond, Norton (through former segments; Ward Pond MA62203 and Reservoir MA62158).	4.60	Miles	3
Mullein Hill Chapel Pond	MA62127	Lakeville.	23.00	Acres	3
Nemasket River	MA62-25	Headwaters, outlet Assawompset Pond, Lakeville/Middleborough to Middleborough WWTP (NPDES: MA0101591) discharge, Middleborough.	6.20	Miles	2
Nemasket River	MA62-26	From the Middleborough WWTP (NPDES: MA0101591) discharge, Middleborough to mouth at confluence with the Taunton River, Middleborough.	5.10	Miles	3
New Pond	MA62130	Easton.	18.00	Acres	4c
North Center Street Pond	MA62132	Carver.	12.00	Acres	3
Norton Reservoir	MA62134	Norton/Mansfield.	557.00	Acres	5
Oakland Pond	MA62136	Taunton.	38.00	Acres	3
Plymouth Street Pond	MA62141	Halifax/East Bridgewater.	165.00	Acres	3
Pocksha Pond	MA62145	Lakeville/Middleborough.	592.00	Acres	3
Poor Meadow Brook	MA62-34	Headwaters, from wetland near County Street, Hanson to mouth at confluence with Satucket River, East Bridgewater.	6.90	Miles	3
Poquoy Pond	MA62147	Lakeville.	10.00	Acres	3
Prospect Hill Pond	MA62149	Taunton.	42.00	Acres	3
Puds Pond	MA62151	Sharon/Easton.	23.00	Acres	3
Queset Brook	MA62-67	Headwaters, outlet Ames Long Pond, Easton to inlet Longwater Pond, Easton (through Shovelshop Pond formerly segment MA62172) (formely part of segment MA62-21).	1.50	Miles	4c
Queset Brook	MA62-68	From outlet Longwater Pond, Easton to mouth at confluence with Coweeset Brook, West Bridgewater (formely part of segment MA62-21).	3.30	Miles	3
Rattlesnake Brook	MA62-45	Headwaters east of Riggerbach Road, Fall River to mouth at confluence with Assonet River, Freetown.	3.20	Miles	2
Reservoir (White Oak Reservoir)	MA62157	Hanson.	13.00	Acres	5



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Water Body	Segment ID	Description	Size	Units	Category
Richmond Pond	MA62159	Taunton.	6.00	Acres	4c
Robbins Pond	MA62162	East Bridgewater.	124.00	Acres	3
Robinson Brook	MA62-14	Headwaters, outlet Hersey Pond, Foxborough to mouth at confluence with Rumford River, Mansfield.	1.90	Miles	5
Route One Pond, West	MA62165	Wrentham.	10.00	Acres	3
Rumford River	MA62-40	From outlet Norton Reservoir, Norton to mouth at confluence with Wading River forming headwaters Threemile River, Norton (formerly part of segment MA62-15).	4.50	Miles	2
Rumford River	MA62-62	Headwaters, outlet Gavins Pond, Sharon to inlet Glue Factory Pond, Foxborough (through former segment Vandys Pond MA62112) (formerly part of MA62-39 and MA62-15 (2004)).	2.80	Miles	5
Rumford River	MA62-63	From outlet Glue Factory Pond, Foxborough to inlet Norton Reservoir, Norton (through former pond segments; Fulton Pond MA62075, Hodges Pond MA62091 and Cabot Pond MA62029) (formerly part of segment MA62-39 and MA62-15 (2004)).	5.10	Miles	5
Salisbury Brook	MA62-08	Headwaters, outlet Cross Pond, Brockton to mouth at confluence with Trout Brook forming headwaters Salibury Plain River, Brockton.	2.50	Miles	5
Salisbury Plain River	MA62-05	Headwaters, confluence of Trout and Salisbury brooks, Brockton to the Brockton Advanced Water Reclamation Facility (AWRF) discharge (NPDES: MA0101010), Brockton.	2.40	Miles	5
Salisbury Plain River	MA62-06	From the Brockton Advanced Water Reclamation Facility (AWRF) discharge (NPDES: MA0101010), Brockton to mouth at confluence with Beaver Brook forming headwaters Matfield River, East Bridgewater.	2.30	Miles	5
Sassaquin Pond	MA62232	New Bedford (formerly reported as MA95129).	36.00	Acres	5
Satucket River	MA62-10	Headwaters, outlet Robbins Pond, East Bridgewater to mouth at confluence with the Matfield River, East Bridgewater.	5.60	Miles	2
Savery Pond	MA62167	Middleborough.	24.00	Acres	4c
Sawmill Brook	MA62-36	Headwaters, outlet Ice Pond, Bridgewater to mouth at confluence with the Taunton River, Bridgewater.	1.90	Miles	3
Segreganset River	MA62-53	Source in wetland north of Glebe Street, Taunton to the Montaup Pond Dam (NATID: MA02104), Dighton (formerly part of segment MA62-18) (through Segreganset River Ponds formerly segment MA62169) .	7.80	Miles	4c
Segreganset River	MA62-54	From Montaup Pond Dam (NATID: MA02104), Dighton to approximately 250 feet north of Brook Street, Dighton (formerly part of segment MA62-18).	0.30	Miles	4c
Segreganset River	MA62-55	From approximately 250 feet north of Brook Street, Dighton to mouth at confluence with the Taunton River, Dighton (formerly part of segment MA62-18).	0.02	Square Miles	4a
Shumatuscacant River	MA62-33	Headwaters, from wetland northwest of Vineyard Road, Abington to mouth at confluence with Poor Meadow Brook, Hanson (through Hobart Pond formerly segment MA62090) (excluding 0.5 mile through Island Grove Pond MA62094).	8.00	Miles	5
Snake River	MA62-28	Headwaters, outlet Winnecunnet Pond, Norton to mouth at inlet of Lake Sabbatia, Taunton.	3.30	Miles	3
Somerset Reservoir	MA62174	Somerset.	164.00	Acres	4a
Stetson Pond	MA62182	Pembroke.	88.00	Acres	5
Sunset Lake	MA62184	Foxborough.	13.00	Acres	3



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Water Body	Segment ID	Description	Size	Units	Category
Taunton River	MA62-01	Headwaters, confluence of Town and Matfield rivers, Bridgewater to Route 24 bridge, Taunton/Raynham.	19.50	Miles	5
Taunton River	MA62-02	From Route 24 bridge, Taunton/Raynham to Berkley Bridge, Dighton/Berkley.	0.28	Square Miles	4a
Taunton River	MA62-03	From Berkley Bridge, Dighton/Berkley to confluence with Assonet River at a line from Sandy Point, Somerset northeasterly to the southwestern tip of Assonet Neck, Berkley.	0.92	Square Miles	5
Taunton River	MA62-04	From confluence with Assonet River at a line from Sandy Point, Somerset northeasterly to the southwestern tip of Assonet Neck, Berkley to mouth just upstream of the Braga Bridge, Somerset/Fall River.	2.60	Square Miles	5
The Reservoir	MA62189	Lakeville.	23.00	Acres	3
Thirtyacre Pond	MA62190	Brockton.	26.00	Acres	4c
Three Mile River	MA62-56	Confluence of Wading and Rumford rivers, Norton to dam (NATID: MA03083) behind 66 South Street (Harodite Finishing Co.), Taunton (excluding the approximately 0.5 mile through Oakland Pond segment MA62136 and the approximately 1.0 mile through Mount Hope Mill Pond segment MA62122) (formerly part of segment MA62-16).	10.50	Miles	2
Three Mile River	MA62-57	From dam (NATID: MA03083) behind 66 South Street (Harodite Finishing Co.), Taunton/Dighton to mouth at confluence with the Taunton River, Taunton/Dighton (formerly part of segment MA62-16).	0.02	Square Miles	4a
Thurston Street Pond	MA62192	Wrentham.	7.00	Acres	3
Tispaquin Pond	MA62195	Middleborough.	195.00	Acres	3
Town River	MA62-11	Headwaters, outlet Lake Nippenicket, Bridgewater to Route 28 bridge, West Bridgewater.	4.50	Miles	3
Town River	MA62-12	Route 28 bridge, West Bridgewater to Bridgewater WWTP (NPDES: MA0100641) discharge, Bridgewater.	3.90	Miles	3
Town River	MA62-13	From Bridgewater WWTP (NPDES: MA0100641) discharge, Bridgewater to mouth at confluence with the Matfield River forming headwaters Taunton River, Bridgewater.	2.30	Miles	3
Trout Brook	MA62-07	Headwaters, perennial portion, northeast of Argyle Avenue and west of Conrail Line, Avon to mouth at confluence with Salisbury Brook forming headwaters Salisbury Plain River, Brockton.	3.40	Miles	5
Turnpike Lake	MA62198	Plainville.	99.00	Acres	4c
Unnamed Tributary	MA62-42	Headwaters, south of Slab Bridge Road (in Cedar Swamp portion of Freetown-Fall River State Forest), Freetown to mouth at confluence with Cedar Swamp River, Lakeville.	4.00	Miles	5
Unnamed Tributary	MA62-48	Channel from Taunton Municipal Lighting Plant, Taunton to mouth at confluence with the Taunton River, Taunton.	0.002	Square Miles	5
Upper Leach Pond	MA62123	(Mountain Street Pond) Sharon.	28.00	Acres	3
Upper Porter Pond	MA62200	Brockton.	11.00	Acres	4c
Wading River	MA62-47	Headwaters, outlet Furnace Lake, Foxborough to Balcolm Street, Mansfield (through former pond segments; Robinson Pond MA62163 and Blakes Pond MA62221) (formerly part of segment MA62-17) (1987 Wrentham quad depicts river incorrectly) .	5.00	Miles	5



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Assessment units and integrated list categories presented alphabetically by major watershed

Water Body	Segment ID	Description	Size	Units	Category
Wading River	MA62-60	From Balcolm Street, Mansfield to inlet Barrowsville Pond, Norton (through Sweets Pond formerly segment MA62185) (formerly part of segment MA62-49 and MA62-17 (2004)).	5.80	Miles	4c
Wading River	MA62-61	From outlet Barrowsville Pond, Norton to mouth at confluence with Rumford River, forming headwaters Threemile River, Norton (formely part of segment MA62-49 and MA62-17(2004)).	3.30	Miles	2
Waldo Lake	MA62201	Avon/Brockton.	72.00	Acres	4c
Watson Pond	MA62205	Taunton.	78.00	Acres	5
West Meadow Pond	MA62208	West Bridgewater.	104.00	Acres	4c
Whiteville Pond	MA62211	Mansfield.	14.00	Acres	3
Winnecunnet Pond	MA62213	Norton.	150.00	Acres	4c
Winnetuxet River	MA62-24	Headwaters, confluence of Muddy Pond Brook and Doten Brook, Carver to mouth at confluence with the Taunton River, Halifax.	12.10	Miles	3
Wolomolopoag Pond	MA62216	Sharon.	13.00	Acres	3
Woods Pond	MA62220	Middleborough.	51.00	Acres	5
Ten Mile					
Bungay River	MA52-06	Headwaters, outlet Greenwood Lake, North Attleborough to confluence with Ten Mile River, Attleboro.	5.10	Miles	5
Cargill Pond	MA52004	Plainville.	2.00	Acres	5
Central Pond	MA52006	Seekonk,MA/Pawtucket,RI/Providence,RI (size indicates portion in Massachusetts).	6.00	Acres	5
Coles Brook	MA52-11	Headwaters, Grassie Swamp west of Allens Lane, Rehoboth to inlet Central Pond, Seekonk.	4.20	Miles	5
Falls Pond, North Basin	MA52013	North Attleborough.	54.00	Acres	5
Falls Pond, South Basin	MA52014	North Attleborough.	50.00	Acres	4c
Fourmile Brook	MA52-10	Headwaters, outlet Manchester Pond Reservoir, Attleboro to inlet Orrs Pond, Attleboro.	1.00	Miles	5
Greenwood Lake	MA52017	Mansfield/North Attleborough.	96.00	Acres	3
Hoppin Hill Reservoir	MA52021	North Attleborough.	22.00	Acres	3
James V. Turner Reservoir	MA52022	Seekonk,MA/E. Providence,RI (size indicates portion in Massachusetts).	28.00	Acres	5
Lake Como	MA52010	Attleboro.	5.00	Acres	5
Manchester Pond Reservoir	MA52026	Attleboro.	238.00	Acres	3
Orrs Pond	MA52029	Attleboro.	58.00	Acres	4c
Plain Street Pond	MA52032	Mansfield.	12.00	Acres	5
Scotts Brook	MA52-09	Headwaters, north of High Street, North Attleborough to confluence with Ten Mile River, North Attleborough.	2.10	Miles	5
Sevenmile River	MA52-07	Headwaters, outlet Hoppin Hill Reservoir, North Attleborough to inlet Orrs Pond, Attleboro (thru Luther Reservoir formerly segment MA52025).	3.20	Miles	5
Sevenmile River	MA52-08	Outlet Orrs Pond, Attleboro to confluence with Ten Mile River, Pawtucket, Rhode Island.	3.40	Miles	5
Speedway Brook	MA52-05	(locally known as Thatcher Brook) Headwaters, Attleboro to inlet of Dodgeville Pond (a Ten Mile River impoundment), Attleboro.	0.90	Miles	5



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Water Body	Segment ID	Description	Size	Units	Category
West Gulf Brook	MA35-24	From headwaters west of Paine Swamp Road, Athol to confluence with Millers River, Athol.	0.80	Miles	5
Wheeler's Pond	MA35097	Warwick.	28.00	Acres	3
Whetstone Brook	MA35-18	Headwaters northeast of Orcutt Hill near New Salem Rd, Wendell to confluence with Millers River, Wendell.	4.90	Miles	5
White Pond	MA35098	Athol.	63.00	Acres	4c
Whites Mill Pond	MA35099	Winchendon.	42.00	Acres	4a
Whitney Pond	MA35101	Winchendon.	97.00	Acres	5
Wickett Pond	MA35102	Wendell.	30.00	Acres	3
Wrights Reservoir	MA35104	Gardner/Westminster.	131.00	Acres	3
Mount Hope Bay (Shore)					
Cole River	MA61-03	Wood Street, Swansea to Route 6, Swansea.	1.60	Miles	4c
Cole River	MA61-04	Route 6, Swansea to the mouth at Mount Hope Bay at old railway grade, Swansea.	0.35	Square Miles	5
Cole River	MA61-10	Headwaters, south of Wellington Street, Dighton to Wood Street, Swansea.	6.40	Miles	2
Cook Pond	MA61001	Fall River, MA/Tiverton, RI.	157.00	Acres	3
Kickamuit River	MA61-08	Headwaters, outlet Warren Reservoir, Swansea, to state line, Swansea, MA/Warren, RI.	2.80	Miles	4a
Lee River	MA61-01	From confluence with Lewin Brook, Swansea to Route 6, Swansea/Somerset.	0.02	Square Miles	5
Lee River	MA61-02	Route 6, Swansea/Somerset to mouth at Mount Hope Bay, Swansea/Somerset.	0.51	Square Miles	5
Lewin Brook	MA61-09	Headwaters, west of Sharps Lot Road, Swansea to the inlet of the unnamed impoundment north of Lewin Lane, Swansea (impoundment upstream of dam, NAT ID# MA03247).	1.90	Miles	5
Lewin Brook Pond	MA61011	Swansea.	11.00	Acres	4a
Mount Hope Bay	MA61-06	The Massachusetts portion just upstream of the Braga Bridge, Fall River/Somerset to the state border Fall River, MA/Tiverton, RI to the line from Braton Point Somerset to MA/RI border approximately 3/4 of a mile due east of Spar Island, RI.	2.32	Square Miles	5
Mount Hope Bay	MA61-07	the Massachusetts portion from mouth of Cole River (at old railway grade), Swansea to state border Swansea, MA/Warren, RI to the line from Brayton Point, Somerset to MA/RI border approximately 3/4 of a mile due east of Spar Island, RI to the line between Bay Point, Swansea and Brayton Point, Somerset (the mouth of the Lee River).	1.84	Square Miles	5
North Watuppa Pond	MA61004	Fall River/Westport.	1728.00	Acres	4a
Quequechan River	MA61-05	Outlet South Watuppa Pond, Fall River to confluence with Mt. Hope Bay at mouth of Taunton River (just upstream of the Braga Bridge), Fall River.	2.40	Miles	5
Sawdy Pond	MA61005	Westport/Fall River.	369.00	Acres	4a
South Watuppa Pond	MA61006	Fall River/Westport.	1473.00	Acres	3
Narragansett Bay (Shore)					
Bad Luck Brook	MA53-11	Headwaters, outlet Warren Upper Reservoir, Rehoboth to confluence with East Branch Palmer River, Rehoboth.	1.70	Miles	2
Beaverdam Brook	MA53-10	Headwaters, southeast of Chestnut Street, Rehoboth to confluence with Palmer River, Rehoboth.	2.90	Miles	3



**Category 5 waters listed alphabetically by major watershed
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Water Body	Segment ID	Description	Size	Units	Impairment	EPA TMDL No.
Russell Millpond	MA94132	Plymouth.	42.00	Acres	(Fish Passage Barrier*)	
					Algae	
Savery Pond	MA94136	Plymouth.	29.00	Acres	Harmful Algal Blooms	
Studleys Pond	MA94151	Rockland.	25.00	Acres	Fecal Coliform	
Wampatuck Pond	MA94168	Hanson.	63.00	Acres	(Non-Native Aquatic Plants*)	
					Chlorophyll-a	
					Dissolved Oxygen Supersaturation	
					Harmful Algal Blooms	
					Phosphorus, Total	
Transparency / Clarity						
Taunton						
Ames Long Pond	MA62001	Stoughton/Easton.	88.00	Acres	(Non-Native Aquatic Plants*)	
					Aquatic Plants (Macrophytes)	
					Turbidity	
Big Bearhole Pond	MA62011	Taunton.	38.00	Acres	(Non-Native Aquatic Plants*)	
					Dissolved Oxygen	
Cain Pond	MA62030	Taunton.	3.00	Acres	Dissolved Oxygen	
					Turbidity	
Glue Factory Pond	MA62078	Foxborough (formerly a portion of MA62-39).	7.00	Acres	(Physical substrate habitat alterations*)	
					Benthic Macroinvertebrates	
					Fish Bioassessments	
					Sedimentation/Siltation	
Island Grove Pond	MA62094	Abington.	31.00	Acres	(Non-Native Aquatic Plants*)	
					Algae	
					Turbidity	
Lake Sabbatia	MA62166	Taunton.	265.00	Acres	(Non-Native Aquatic Plants*)	
					Dissolved Oxygen	
Matfield River	MA62-32	Headwaters, confluence Beaver Brook and Salisbury Plain River, East Bridgewater to mouth at confluence with Town River forming headwaters Taunton River, Bridgewater.	6.30	Miles	Algae	
					Benthic Macroinvertebrates	
					Dissolved Oxygen	
					Escherichia Coli (E. Coli)	40308
					Fecal Coliform	40308
					Odor	
Phosphorus, Total						



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Water Body	Segment ID	Description	Size	Units	Impairment	EPA TMDL No.
Monponsett Pond, East Basin	MA62218	[East Basin] Halifax.	247.00	Acres	(Non-Native Aquatic Plants*)	33880
					Chlorophyll-a	
					Harmful Algal Blooms	
					Mercury in Fish Tissue	
Monponsett Pond, West Basin	MA62119	[West Basin] Halifax/Hanson.	283.00	Acres	(Non-Native Aquatic Plants*)	
					Chlorophyll-a	
					Harmful Algal Blooms	
					Phosphorus, Total	
Muddy Cove Brook Pond	MA62124	Dighton.	23.00	Acres	Algae	
					Turbidity	
Norton Reservoir	MA62134	Norton/Mansfield.	557.00	Acres	(Non-Native Aquatic Plants*)	
					Algae	
					Dioxin (including 2,3,7,8-TCDD)	
					Pentachlorophenol (PCP)	
					Phosphorus, Total	
Reservoir (White Oak Reservoir)	MA62157	Hanson.	13.00	Acres	Nutrient/Eutrophication Biological Indicators	
Robinson Brook	MA62-14	Headwaters, outlet Hersey Pond, Foxborough to mouth at confluence with Rumford River, Mansfield.	1.90	Miles	(Physical substrate habitat alterations*)	
					Benthic Macroinvertebrates	
Rumford River	MA62-62	Headwaters, outlet Gavins Pond, Sharon to inlet Glue Factory Pond, Foxborough (through former segment Vandys Pond MA62112) (formerly part of MA62-39 and MA62-15 (2004)).	2.80	Miles	(Non-Native Aquatic Plants*)	
					(Physical substrate habitat alterations*)	
					Benthic Macroinvertebrates	
					Fish Bioassessments	
Rumford River	MA62-63	From outlet Glue Factory Pond, Foxborough to inlet Norton Reservoir, Norton (through former pond segments; Fulton Pond MA62075, Hodges Pond MA62091 and Cabot Pond MA62029) (formerly part of segment MA62-39 and MA62-15 (2004)).	5.10	Miles	(Physical substrate habitat alterations*)	
					Benthic Macroinvertebrates	
					Dioxin (including 2,3,7,8-TCDD)	
					Fish Bioassessments	
					Pentachlorophenol (PCP)	
					Sedimentation/Siltation	



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Water Body	Segment ID	Description	Size	Units	Impairment	EPA TMDL No.
Salisbury Brook	MA62-08	Headwaters, outlet Cross Pond, Brockton to mouth at confluence with Trout Brook forming headwaters Salisbury Plain River, Brockton.	2.50	Miles	(Debris*)	
					(Physical substrate habitat alterations*)	
					(Trash*)	
					Algae	
					Escherichia Coli (E. Coli)	40308
					Fecal Coliform	40308
Salisbury Plain River	MA62-05	Headwaters, confluence of Trout and Salisbury brooks, Brockton to the Brockton Advanced Water Reclamation Facility (AWRF) discharge (NPDES: MA0101010), Brockton.	2.40	Miles	(Debris*)	
					(Physical substrate habitat alterations*)	
					(Trash*)	
					Dissolved Oxygen	
					Escherichia Coli (E. Coli)	40308
					Fecal Coliform	40308
Salisbury Plain River	MA62-06	From the Brockton Advanced Water Reclamation Facility (AWRF) discharge (NPDES: MA0101010), Brockton to mouth at confluence with Beaver Brook forming headwaters Matfield River, East Bridgewater.	2.30	Miles	Algae	
					Benthic Macroinvertebrates	
					Dissolved Oxygen	
					Escherichia Coli (E. Coli)	40308
					Fecal Coliform	40308
					Odor	
Sassaquin Pond	MA62232	New Bedford (formerly reported as MA95129).	36.00	Acres	Algae	
					Fecal Coliform	
					Harmful Algal Blooms	
					Odor	
Shumatuscasant River	MA62-33	Headwaters, from wetland northwest of Vineyard Road, Abington to mouth at confluence with Poor Meadow Brook, Hanson (through Hobart Pond formerly segment MA62090) (excluding 0.5 mile through Island Grove Pond MA62094).	8.00	Miles	(Non-Native Aquatic Plants*)	
					(Physical substrate habitat alterations*)	
					Dissolved Oxygen	
					Fecal Coliform	40308
					Sedimentation/Siltation	
Stetson Pond	MA62182	Pembroke.	88.00	Acres	(Non-Native Aquatic Plants*)	
					Dissolved Oxygen	
					Harmful Algal Blooms	
					Phosphorus, Total	
Taunton River	MA62-01	Headwaters, confluence of Town and Matfield rivers, Bridgewater to Route 24 bridge, Taunton/Raynham.	19.50	Miles	Escherichia Coli (E. Coli)	



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Water Body	Segment ID	Description	Size	Units	Impairment	EPA TMDL No.
Taunton River	MA62-03	From Berkley Bridge, Dighton/Berkley to confluence with Assonet River at a line from Sandy Point, Somerset northeasterly to the southwestern tip of Assonet Neck, Berkley.	0.92	Square Miles	Dissolved Oxygen	40310
					Fecal Coliform	
Taunton River	MA62-04	From confluence with Assonet River at a line from Sandy Point, Somerset northeasterly to the southwestern tip of Assonet Neck, Berkley to mouth just upstream of the Braga Bridge, Somerset/Fall River.	2.60	Square Miles	Dissolved Oxygen	40310
					Enterococcus	
					Fecal Coliform	
					Fish Bioassessments	
Trout Brook	MA62-07	Headwaters, perennial portion, northeast of Argyle Avenue and west of Conrail Line, Avon to mouth at confluence with Salisbury Brook forming headwaters Salisbury Plain River, Brockton.	3.40	Miles	Dissolved Oxygen	40308
					Escherichia Coli (E. Coli)	
					Fecal Coliform	
Unnamed Tributary	MA62-42	Headwaters, south of Slab Bridge Road (in Cedar Swamp portion of Freetown-Fall River State Forest), Freetown to mouth at confluence with Cedar Swamp River, Lakeville.	4.00	Miles	Benthic Macroinvertebrates	
					Fish Bioassessments	
Unnamed Tributary	MA62-48	Channel from Taunton Municipal Lighting Plant, Taunton to mouth at confluence with the Taunton River, Taunton.	0.002	Square Miles	(Flow Regime Modification*)	
					(Physical substrate habitat alterations*)	
					Benthic Macroinvertebrates	
					Fish Bioassessments	
					Temperature	
Wading River	MA62-47	Headwaters, outlet Furnace Lake, Foxborough to Balcolm Street, Mansfield (through former pond segments; Robinson Pond MA62163 and Blakes Pond MA62221) (formerly part of segment MA62-17) (1987 Wrentham quad depicts river incorrectly) .	5.00	Miles	Algae	
					Dissolved Oxygen	
Watson Pond	MA62205	Taunton.	78.00	Acres	(Non-Native Aquatic Plants*)	
					Algae	
					Dissolved Oxygen	
					Enterococcus	
					Phosphorus, Total	
Transparency / Clarity						
Woods Pond	MA62220	Middleborough.	51.00	Acres	(Non-Native Aquatic Plants*)	
					Turbidity	



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Water Body	Segment ID	Description	Size	Units	Impairment	EPA TMDL No.
Ten Mile						
Bungay River	MA52-06	Headwaters, outlet Greenwood Lake, North Attleborough to confluence with Ten Mile River, Attleboro.	5.10	Miles	Benthic Macroinvertebrates Dissolved Oxygen	
Cargill Pond	MA52004	Plainville.	2.00	Acres	Turbidity	
Central Pond	MA52006	Seekonk, MA/Pawtucket, RI/Providence, RI (size indicates portion in Massachusetts).	6.00	Acres	Algae Aquatic Plants (Macrophytes) Dissolved Oxygen Dissolved Oxygen Supersaturation Organic Enrichment (Sewage) Biological Indicators Phosphorus, Total	
Coles Brook	MA52-11	Headwaters, Grassie Swamp west of Allens Lane, Rehoboth to inlet Central Pond, Seekonk.	4.20	Miles	(Dewatering*) Dissolved Oxygen Escherichia Coli (E. Coli)	
Falls Pond, North Basin	MA52013	North Attleborough.	54.00	Acres	Algae Dissolved Oxygen Nutrient/Eutrophication Biological Indicators Phosphorus, Total	
Fourmile Brook	MA52-10	Headwaters, outlet Manchester Pond Reservoir, Attleboro to inlet Orrs Pond, Attleboro.	1.00	Miles	Sedimentation/Siltation	
James V. Turner Reservoir	MA52022	Seekonk, MA/E. Providence, RI (size indicates portion in Massachusetts).	28.00	Acres	Algae Aquatic Plants (Macrophytes) Dissolved Oxygen Supersaturation Harmful Algal Blooms Organic Enrichment (Sewage) Biological Indicators Phosphorus, Total	
Lake Como	MA52010	Attleboro.	5.00	Acres	(Non-Native Aquatic Plants*) Algae Turbidity	
Plain Street Pond	MA52032	Mansfield.	12.00	Acres	(Non-Native Aquatic Plants*) Algae	
Scotts Brook	MA52-09	Headwaters, north of High Street, North Attleborough to confluence with Ten Mile River, North Attleborough.	2.10	Miles	(Dewatering*) Escherichia Coli (E. Coli)	
Sevenmile River	MA52-07	Headwaters, outlet Hoppin Hill Reservoir, North Attleborough to inlet Orrs Pond, Attleboro (thru Luther Reservoir formerly segment MA52025).	3.20	Miles	Escherichia Coli (E. Coli)	



**Category 5 waters listed alphabetically by major watershed
The 303(d) List – "Waters requiring a TMDL"**

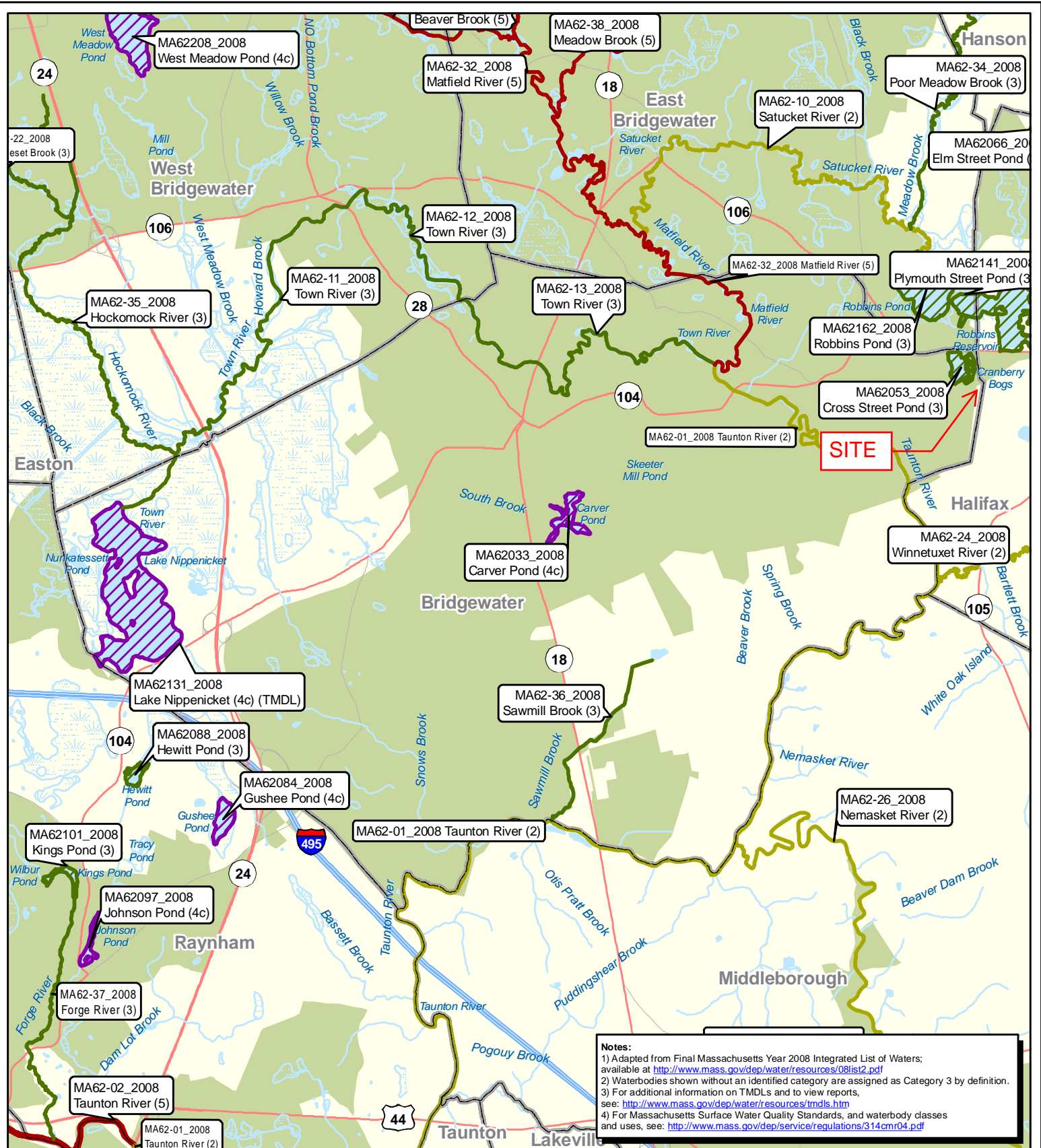
Water Body	Segment ID	Description	Size	Units	Impairment	EPA TMDL No.
Sevenmile River	MA52-08	Outlet Orrs Pond, Attleboro to confluence with Ten Mile River, Pawtucket, Rhode Island.	3.40	Miles	Escherichia Coli (E. Coli)	
					Fecal Coliform	
Speedway Brook	MA52-05	(locally known as Thacher Brook) Headwaters, Attleboro to inlet of Dodgeville Pond (a Ten Mile River impoundment), Attleboro.	0.90	Miles	(Alteration in stream-side or littoral vegetative covers*)	
					(Habitat Assessment*)	
					Benthic Macroinvertebrates	
					Dissolved Oxygen	
					Escherichia Coli (E. Coli)	
					Fecal Coliform	
					Metals	
Sedimentation/Siltation						
Ten Mile River	MA52-01	Headwaters, outlet Cargill Pond, Plainville to West Bacon Street, Plainville (through Fuller Pond formerly segment MA52016).	1.50	Miles	Metals	
Ten Mile River	MA52-02	West Bacon Street, Plainville to North Attleborough WWTP discharge (NPDES: MA0101036), Attleboro (excluding 0.9 miles thru Falls Pond segment MA52013, but including thru Wetherells Pond formerly segment MA52041) (HQW qualifier applies to portion of river upstream of Whiting Pond Dam (NATID: MA00859)).	4.10	Miles	Escherichia Coli (E. Coli)	
					Fecal Coliform	
					Metals	
Ten Mile River	MA52-03	North Attleborough WWTP discharge (NPDES: MA0101036), Attleboro to the MA/RI border near Central Avenue, Seekonk, MA/Pawtucket, RI (thru former segments; Farmers Pond MA52015, Mechanics Pond MA52027, Dodgeville Pond MA52011, and Hebronville Pond MA52020).	9.10	Miles	(Aquatic Plants (Macrophytes)*)	
					Algae	
					Benthic Macroinvertebrates	
					Chlordane in Fish Tissue	
					Dissolved Oxygen	
					Escherichia Coli (E. Coli)	
					Fecal Coliform	
					Nutrient/Eutrophication Biological Indicators	
					Organic Enrichment (Sewage) Biological Indicators	
					Phosphorus, Total	
Unspecified Metals in Sediment						
Westfield						
Ashley Brook	MA32-37	Headwaters (perennial portion), south of Hillside Road, Westfield to mouth at confluence with Jacks Brook, Westfield.	0.50	Miles	Escherichia Coli (E. Coli)	



**Category 5 waters listed alphabetically by major watershed
The 303(d) List – "Waters requiring a TMDL"**

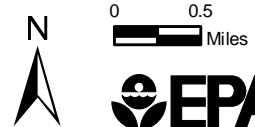
Water Body	Segment ID	Description	Size	Units	Impairment	EPA TMDL No.
West Gulf Brook	MA35-24	From headwaters west of Paine Swamp Road, Athol to confluence with Millers River, Athol.	0.80	Miles	PCBs In Fish Tissue	
Whetstone Brook	MA35-18	Headwaters northeast of Orcutt Hill near New Salem Rd, Wendell to confluence with Millers River, Wendell.	4.90	Miles	PCBs In Fish Tissue	
Whitney Pond	MA35101	Winchendon.	97.00	Acres	(Aquatic Plants (Macrophytes)*)	
					Mercury in Fish Tissue	
					Turbidity	4145
Mount Hope Bay (Shore)						
Cole River	MA61-04	Route 6, Swansea to the mouth at Mount Hope Bay at old railway grade, Swansea.	0.35	Square Miles	Chlorophyll-a	
					Dissolved Oxygen	
					Fecal Coliform	38907
					Nitrogen, Total	
Lee River	MA61-01	From confluence with Lewin Brook, Swansea to Route 6, Swansea/Somerset.	0.02	Square Miles	Fecal Coliform	38905
					Nutrient/Eutrophication Biological Indicators	
Lee River	MA61-02	Route 6, Swansea/Somerset to mouth at Mount Hope Bay, Swansea/Somerset.	0.51	Square Miles	Chlorophyll-a	
					Dissolved Oxygen	
					Fecal Coliform	38906
					Nitrogen, Total	
Lewin Brook	MA61-09	Headwaters, west of Sharps Lot Road, Swansea to the inlet of the unnamed impoundment north of Lewin Lane, Swansea (impoundment upstream of dam, NAT ID# MA03247).	1.90	Miles	Escherichia Coli (E. Coli)	
Mount Hope Bay	MA61-06	The Massachusetts portion just upstream of the Braga Bridge, Fall River/Somerset to the state border Fall River, MA/Tiverton, RI to the line from Braton Point Somerset to MA/RI border approximately 3/4 of a mile due east of Spar Island, RI.	2.32	Square Miles	Chlorophyll-a	
					Enterococcus	38908
					Fecal Coliform	38908
					Fish Bioassessments	
					Nitrogen, Total	
					Temperature	





Notes:
 1) Adapted from Final Massachusetts Year 2008 Integrated List of Waters, available at <http://www.mass.gov/dep/water/resources/08list2.pdf>
 2) Waterbodies shown without an identified category are assigned as Category 3 by definition.
 3) For additional information on TMDLs and to view reports, see: <http://www.mass.gov/dep/water/resources/tmdl.htm>
 4) For Massachusetts Surface Water Quality Standards, and waterbody classes and uses, see: <http://www.mass.gov/dep/service/regulations/314cmr04.pdf>

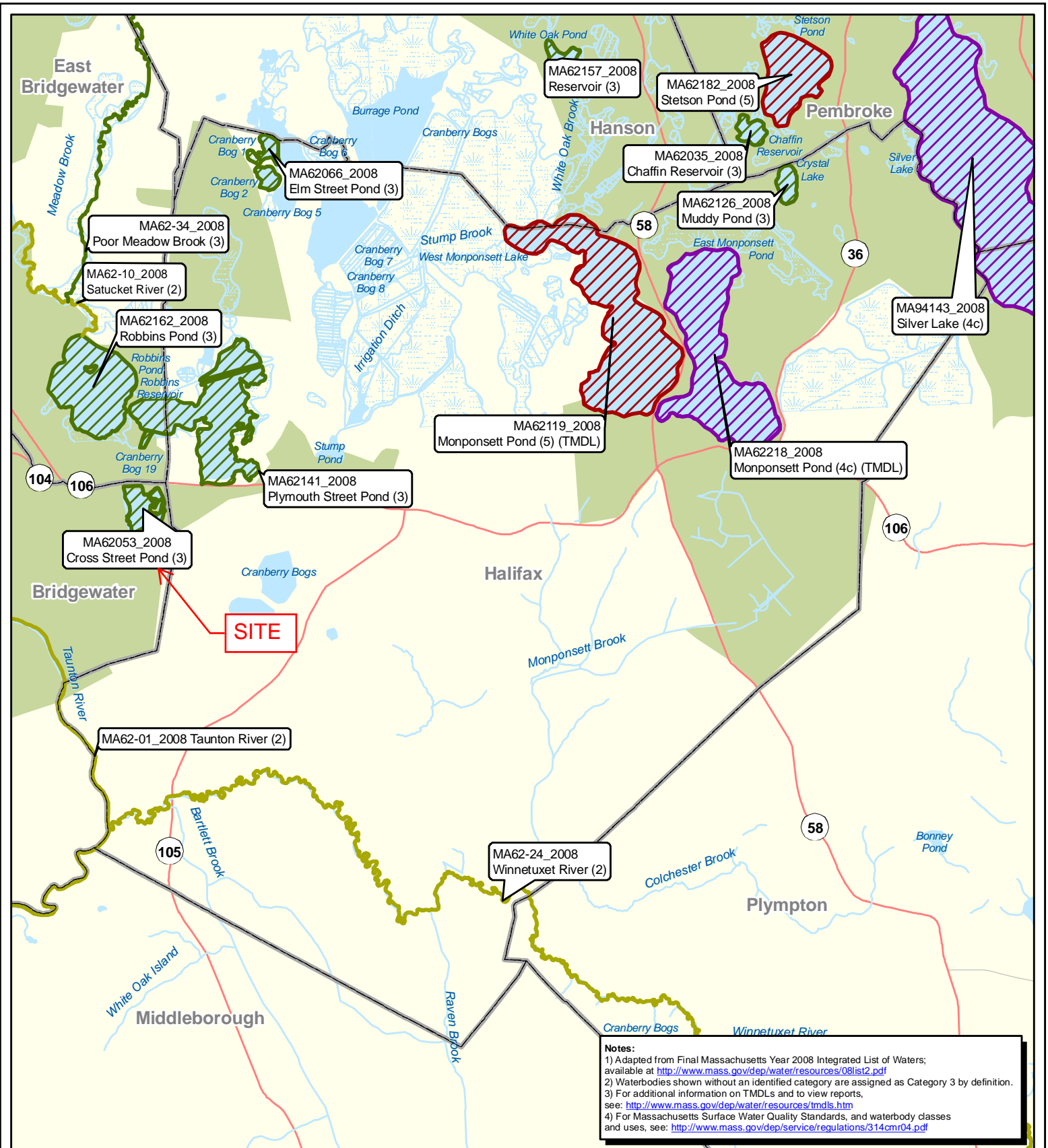
Waterbody Assessment and TMDL Status Bridgewater, MA



Map produced by EPA Region I GIS Center
 Map Tracker ID 6678, February 25, 2010
 Data Sources: TeleAtlas, Census Bureau, USGS, MassDEP

<p>Waterbody Label State ID, Waterbody Name (Category) (TMDL(s) approved for this waterbody)</p>	<p>Assessment of Waterbody Segment</p> <ul style="list-style-type: none"> Category 2: Attaining some uses; other uses not assessed Category 3: Insufficient information to make assessments for any use. 	<ul style="list-style-type: none"> Category 4a: TMDL is completed and approved for one or more pollutants Category 4c: Impairment not caused by a pollutant. Category 5: Impaired or threatened for one or more uses and requiring a TMDL. 	<ul style="list-style-type: none"> Waterbodies Swamp/Marsh MS4 Urbanized Areas (2000 Census) Municipal Boundaries
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See companion table for a listing of pollutants, non-pollutants, and TMDLs for each waterbody



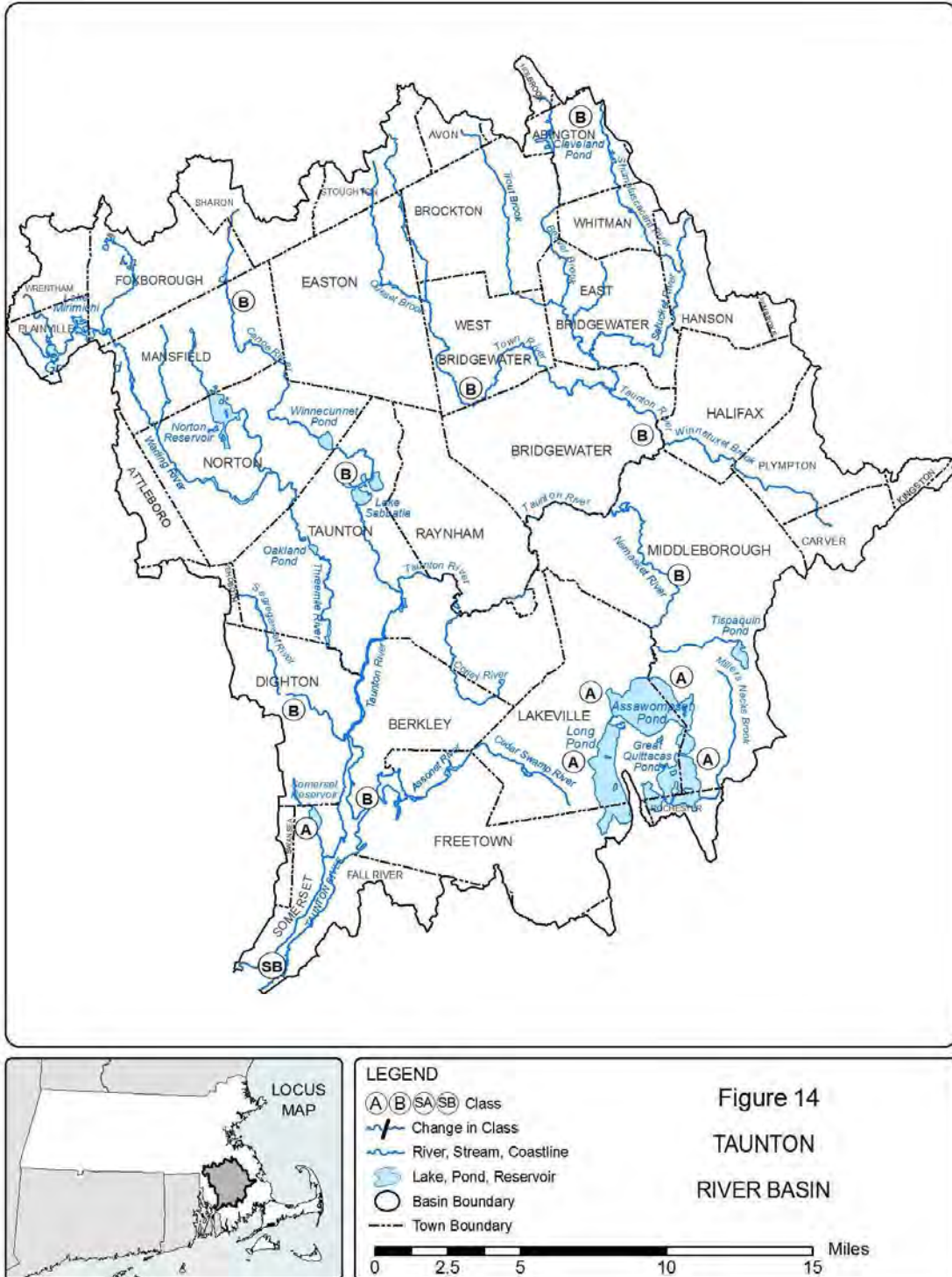
Waterbody Assessment and TMDL Status Halifax, MA



Map produced by EPA Region I GIS Center
 Map Tracker ID 6678, February 25, 2010
 Data Sources: TeleAtlas, Census Bureau, USGS, MassDEP

See companion table for a listing of pollutants, non-pollutants, and TMDLs for each waterbody

4.06: continued



314 CMR: DIVISION OF WATER POLLUTION CONTROL

4.06: continued

TABLE 14
TAUNTON RIVER BASIN

<u>BOUNDARY</u>	<u>MILE POINT</u>	<u>CLASS</u>	<u>QUALIFIERS</u>
<u>Taunton River</u>			
Source to Rt. 24 Bridge	40.8 - 21.2	B	Warm Water
Rt. 24 Bridge to mouth	21.2 - 0.0	SB	Shellfishing CSO
<u>Salisbury Plain & Matfield Rivers</u>			
Brockton WWTF to confluence	-	B	Warm Water
<u>Town River</u>			
Bridgewater WWTF to confluence	2.4 - 0.0	B	Warm Water
<u>Nemasket River</u>			
Middleborough WWTF to confluence	-	B	Warm Water
<u>Saw Mill Brook</u>			
Entire Length	1.5 - 0.0	B	Warm Water
<u>Mill River</u>			
Outlet Lake Sabbatia, Taunton to confluence with Taunton River	3.4 - 0.0	B	Warm Water
<u>Three Mile River</u>			
Source to confluence	15.8 - 0.0	B	Warm Water
<u>Wading River (Attleboro Reservoir)</u>			
Source to water supply intake in Mansfield and tributaries thereto		A	Public Water Supply
From water supply intake, Mansfield to confluence with Three Mile River		B	Warm Water
<u>Assawompset Pond</u>			
Source to outlet in Lakeville and those tributaries thereto	-	A	Public Water Supply
<u>Great Quittacas Pond</u>			
Source to outlet in Lakeville and those tributaries thereto	-	A	Public Water Supply

4.06: continued

TABLE 14
TAUNTON RIVER BASIN (continued)

<u>BOUNDARY</u>	<u>MILE POINT</u>	<u>CLASS</u>	<u>QUALIFIERS</u>
<u>Little Quittacas Pond</u>			
Source to outlet in Lakeville and those tributaries thereto	-	A	Public Water Supply
<u>Long Pond</u>			
Source to outlet in Lakeville and those tributaries thereto	-	A	Public Water Supply
<u>Pocksha Pond</u>			
Source to outlet in Lakeville and those tributaries thereto	-	A	Public Water Supply
<u>Somerset Reservoir</u>			
Source to outlet in Somerset and those tributaries thereto including Segreganset River from pumping station, Dighton to source	-	A	Public Water Supply
<u>Monponsett Pond</u>			
Source to outlet in Halifax and those tributaries thereto	-	A	Public Water Supply
<u>Elders Pond</u>			
Source to outlet in Lakeville and those tributaries thereto	-	A	Public Water Supply
<u>Brockton Reservoir (Avon Reservoir, Salisbury Brook Reservoir)</u>			
Reservoir to outlet in Avon and those tributaries thereto	-	A	Public Water Supply

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.



Mr. Mark Dakers, Chief
MassDEP Solid Waste Management Section
20 Riverside Drive
Lakeville, Massachusetts
March 13, 2019

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,

A handwritten signature in black ink, appearing to read "Richard Stromberg".

Richard Stromberg, CPG, LSP
Senior Project Manager

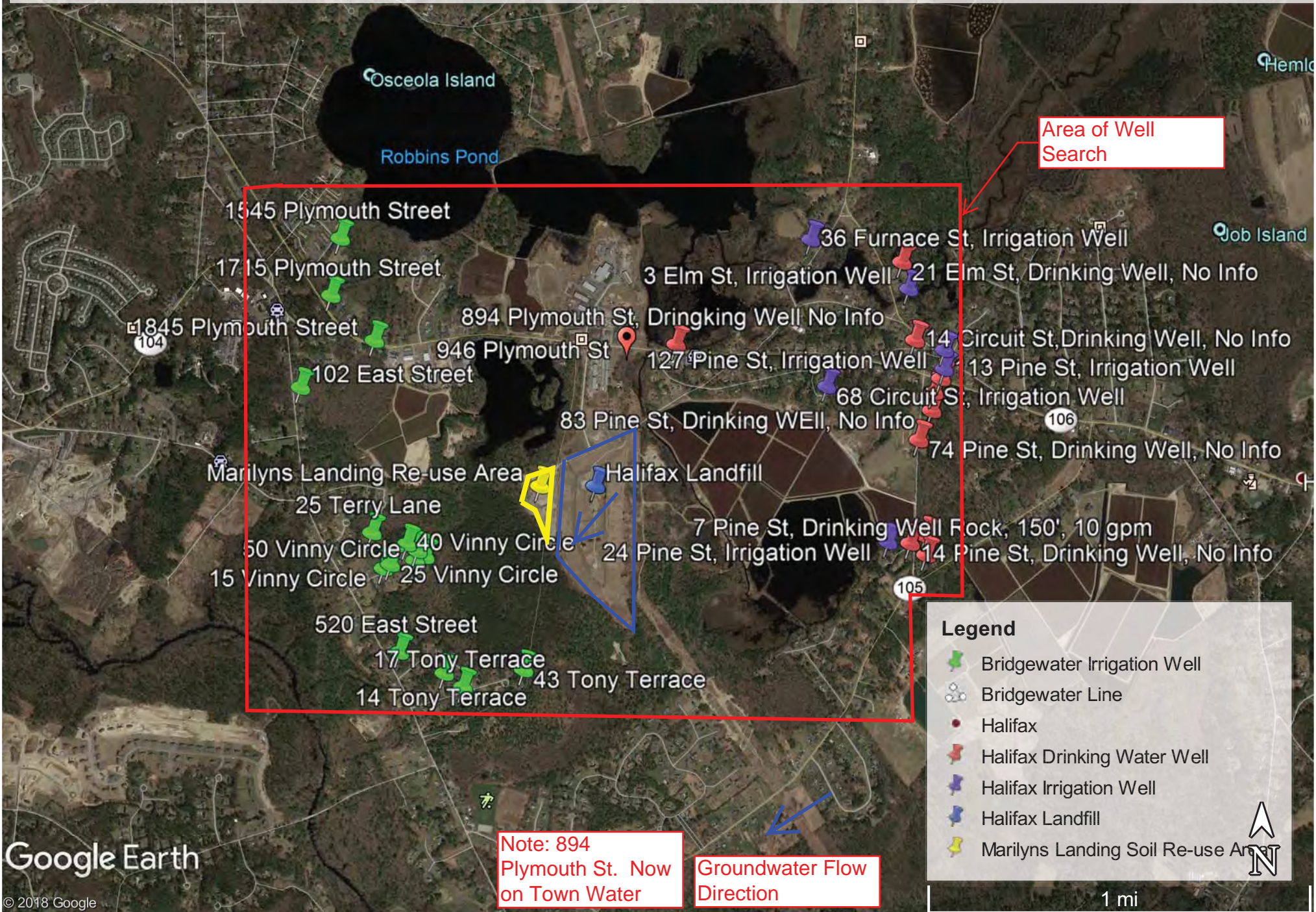
CC: M. MacDonald
R. Stromberg, LSP (BEC)
D. Nagle, Esq. (Donald P. Nagle, P.C.)

Attachments



Figure

Private Irrigation/Drinking Wells, Bridgewater & Halifax Near Marilyn's Soil Re-use Site





Tables

* - Verified by Board of Health/Water Department
 D - Domestic - No Town Water

As of March 12, 2018

No "D" for domestic well indicated.

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

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					
350	Industrial Drive	47-5A	Industrial Dr.					
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	59-1	none known					
746	Plymouth Street	59-6	none known					
749	Plymouth Street	59-2	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-3 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	none known					
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 Records, 200' well, 95 feet Sand over Bedrock. Well in Bedrock. 15 gpm. In 1996 tested "Suitable for Drinking" except aesthetic 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	69-4	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.



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

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Figures:

Figure 1 Groundwater Monitoring Well Network

Tables:

Table 1 Monitoring Well Elevations
Table 2 Groundwater Quality Results (MLCRA Wells to Date)

Appendices:

Appendix A BFI Well Construction Logs
Appendix B BFI/ES&S Semi-annual Water Quality Monitoring Report (May 2020)

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 additional 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.

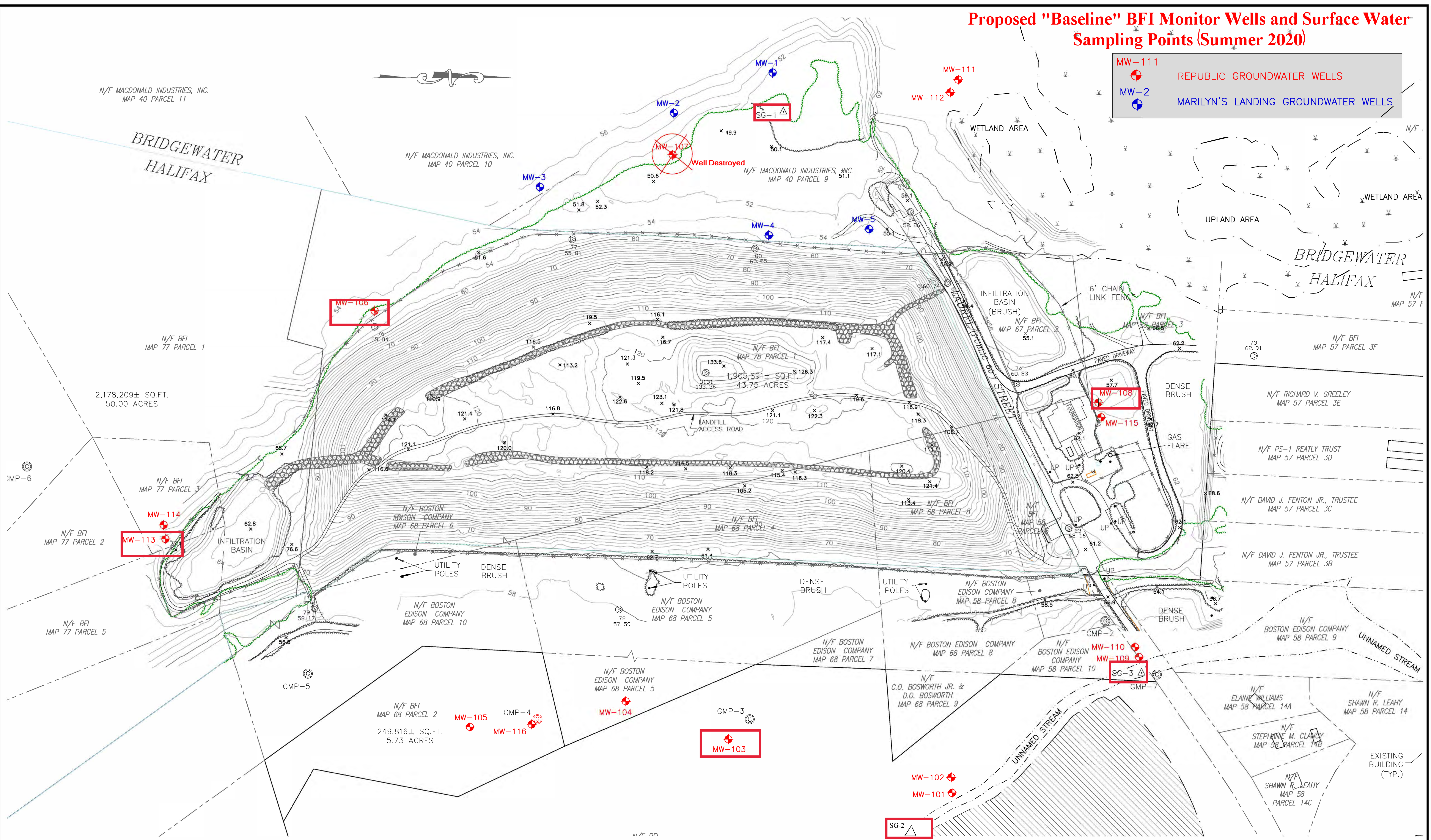
1.7 Coordination and Reporting

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



SITEC ENVIRONMENTAL
 Civil and Environmental Engineering
 Hazardous and Solid Waste Consultants
 789 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'	No.	Date	Chkd.	Aprvd.
date: MAY 22, 2019				
drawn:				
checked:				
approved:				
drawing number: S-1				

LEGEND

	SURVEYED PROPERTY LINE		EXISTING CONTOUR
	ASSESSORS LINE (APPROXIMATE)		EXISTING SPOT GRADE
	GAS MONITORING PROBE		CHAIN LINK FENCE
	GROUNDWATER MONITORING WELL		UTILITY POLE
	SURFACE WATER MONITORING LOCATION		SURVEY CONTROL POINT
	BRUSH LINE		RIP RAP AREA
	TREELINE		

NOTES:

- SURVEYED PROPERTY LINES SHOWN ON THIS DRAWING TAKEN FROM "PLAN OF LAND IN HALIFAX, MA SHOWING PARCELS OF LAND OWNED BY BROWNING-FERRIS INDUSTRIES, INC." PREPARED BY SAIC ENGINEERING, INC., DATED NOVEMBER 25, 1996.
- 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

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**

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Figure 3 - Site Monitoring Location and Contour Map

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Table 2 - Groundwater Data – Most Recent 9 Events

Table 3 - Surface Water Data – Most Recent 9 Events

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 – Site Locus Map

Figure 2 - Groundwater Levels – April 6-7, 2020

Figure 3 – Site Monitoring Location and Contour Map

FIGURE 1

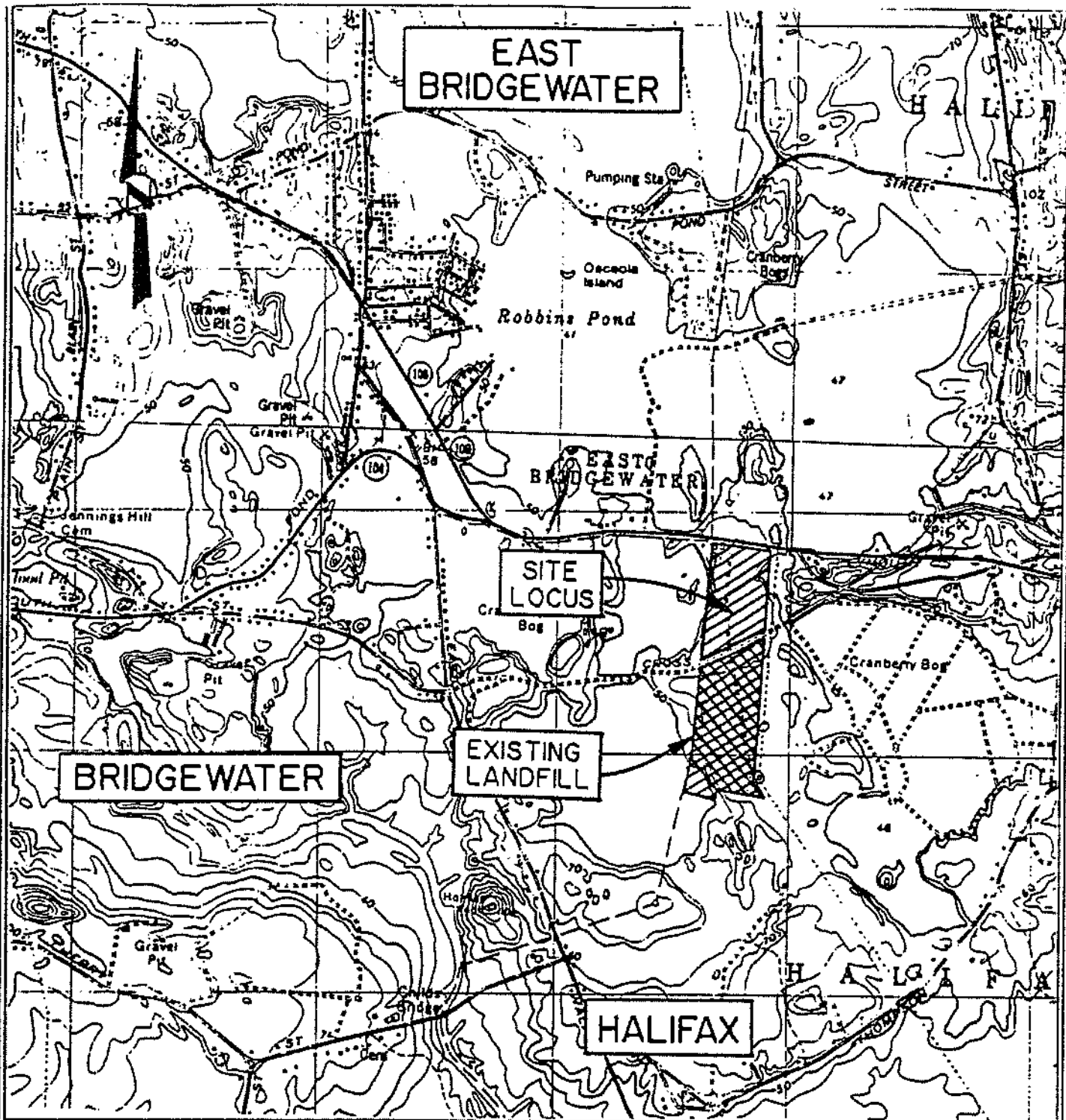


FIGURE 1

SITE LOCUS MAP

SCALE: 1:25,000

BASE MAP: U.S.G.S. BRIDGEWATER, MASSACHUSETTS
 U.S.G.S. WHITMAN, MASSACHUSETTS

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

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
HALIFAX LANDFILL**

**DRINKING WATER STANDARD EXCEEDENCES
APRIL 2020**

<u>MONITORING LOCATION</u>	<u>PARAMETER</u>	<u>ANALYTICAL RESULT</u>	<u>MCL</u>	<u>MMCL</u>
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
HALIFAX LANDFILL**

**DRINKING WATER STANDARD EXCEEDENCES
APRIL 2020**

<u>MONITORING LOCATION</u>	<u>PARAMETER</u>	<u>ANALYTICAL RESULT</u>	<u>MCL</u>	<u>MMCL</u>
MW-114 DUP	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
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-chloropropane	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
Trichloroethylene	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-chloropropane	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
Trichloroethylene	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-chloropropane	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
Trichloroethylene	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-chloropropane	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
Trichloroethylene	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-chloropropane	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
Trichloroethylene	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-chloropropane	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
Trichloroethylene	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

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
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
Trichloroethylene	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-chloropropane	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
Trichloroethylene	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-chloropropane	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
Trichloroethylene	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-chloropropane	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
Trichloroethylene	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-chloropropane	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
Trichloroethylene	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-chloropropane	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
Trichloroethylene	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-chloropropane	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
Trichloroethylene	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-chloropropane	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
Trichloroethylene	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-chloropropane	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
Trichloroethylene	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-chloropropane	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
Trichloroethylene	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

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
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
Trichloroethylene	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
Trichloroethylene	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
Trichloroethylene	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 #: 142 B301
 JOB #: MW-116 89-32 Page 1 of 1
 DATUM: MSL *Behind well*

Casing	Core Barrel	Sampler	GROUNDWATER LEVELS						Drilling Co:	Geo Logic, Inc.
Type	—	HQ	split spoon	DATE	TIME	DEPTH TO			Driller:	D. Green
Size (ID)	6"/5"	—	—			BOTTOM CASING	BOTTOM OF HOLE	WATER	Inspector:	P. Dillon
Augers	Bit:			02-19-92	10:54	78.4	80'	10.35	Start Date:	02-04-92
Hammer Wt: 140#/300#	Hammer Fall:		30'						End Date:	02-10-92

Depth (Ft)	SAMPLE				Sample Description	Stratum Description	Equipment Installed	PID	Rm
	No.	Depth	Pen/Rec	Blows/6"					
5	S-1	4-8	24*	3/10/10/12	Gray-Brown M-C SAND and GRAVEL				0
10	S-2	9-11	24*	6/10/10/12	Brown F-M SAND; Some SILT				0
15	S-3	14-18	18*	27/31/27	Gray-Brown M-C SAND; Some Fine Gravel; Trace SILT				10
20	S-4	19-21	24*	5/10/9/11					12
25	S-5	24-26	24*	6/12/12/13					5
30	S-6	29-31	18*	20/15/12/30					2

REMARKS:

- NOTES:**
- o Stratification lines represent approximate boundary between soil types; transitions may be gradual.
 - o 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

BORING #: 292 B3
 JOB #: 89-
 MW-116 Page 2 of

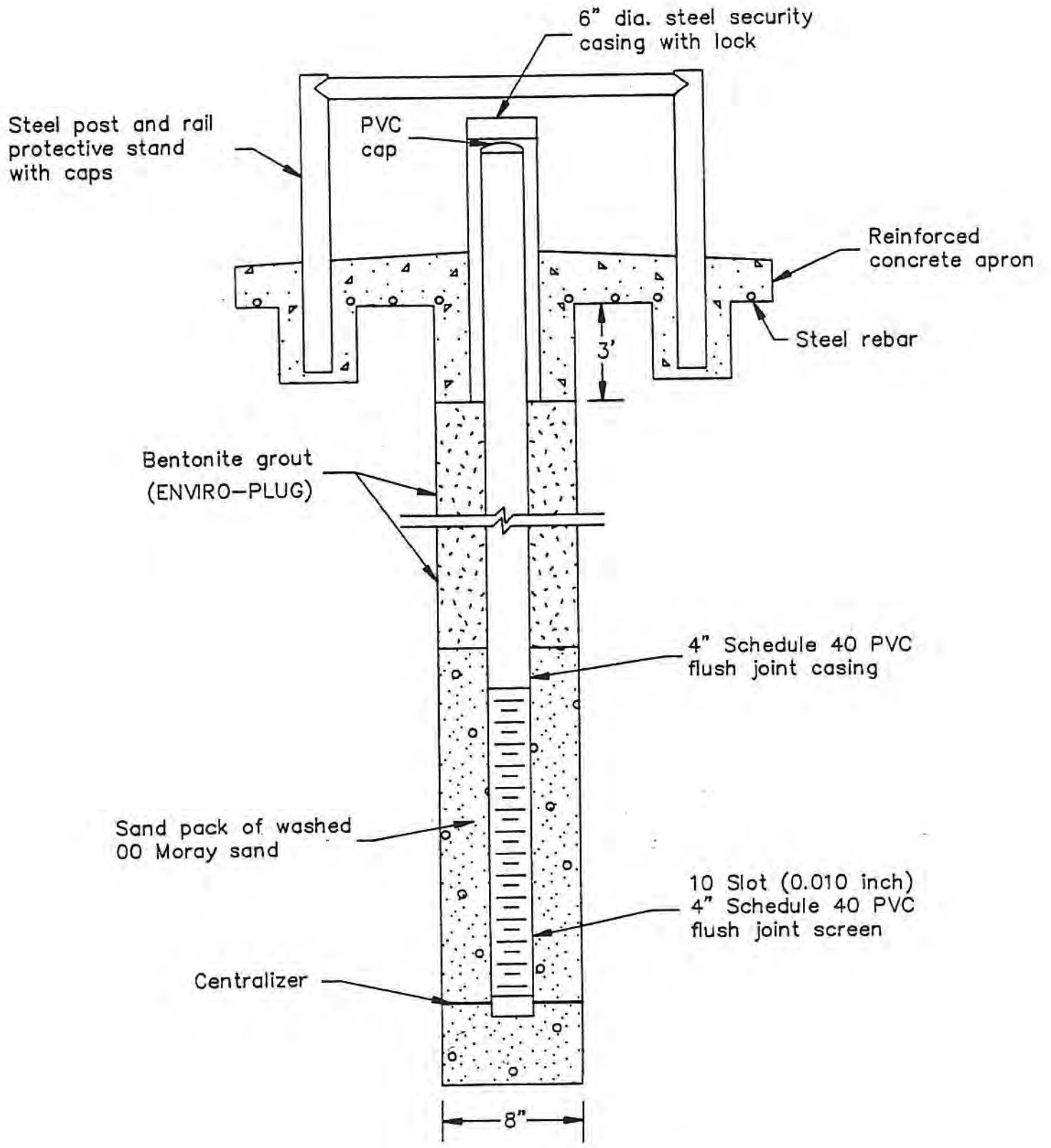
SURFACE ELEVATION:

DATUM: Bench well

Depth (Ft)	SAMPLE				Sample Description	Stratum Description	Equipment Installed	PID ppm	Rr
	No.	Depth	Pen/Rec	Blows/6"					
35									
	S-7	34-36	20"	6/12/12/15	Brown Fine Silty SAND; Some M-C SAND				
40									
	S-8		24"	31/50/49/41	Dense Gray Medium SILT; Some F-M SAND; Trace GRAVEL; TILL				
45									
	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: Gray Shale RQD = 75%				
60									
65									
70					Core Run #2: Gray Shale RQD = 93%				
75					Bottom of Hole 80'				

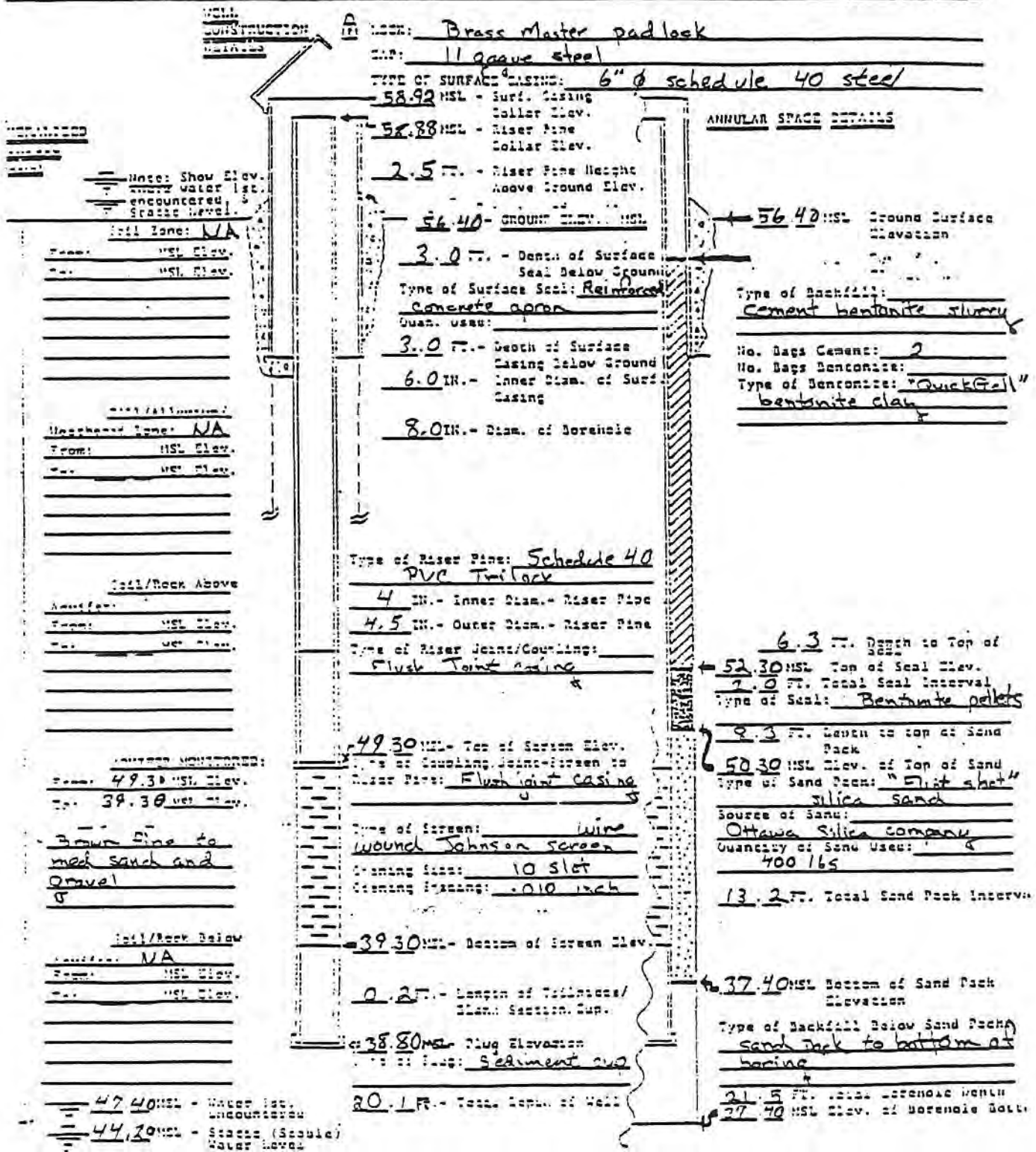
REMARKS: *300 lb. Hammer

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

PROJECT NAME: <u>GROUND WATER MONITORING WELL</u>	WELL NO.: <u>101</u>
Location of Site: <u>RFT Halifax</u>	Workings: _____
Well Drilling Contractor: <u>Hydro Gravo</u>	Casing: _____
Driller: <u>Darrell Leam</u>	Collar Elevation: <u>58.92</u>
Supervisor: <u>Mark Lewis</u>	Date Completed: <u>3/21/88</u>
Purpose of Well: <u>Ground water monitoring</u>	Well Depth: <u>20.1</u>



WELL CONSTRUCTION DETAILS

Lock: Brass Master pad lock
 Cap: 11 gauge steel
 Type of Surface Casing: 6" Ø 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
 Quant. 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 IN. - Inner Diam. - Riser Pipe
 4.5 IN. - Outer Diam. - Riser Pipe
 Type of Riser Joints/Couplings: Flush Joint casing

49.30 MSL - Top of Screen Elev.
 Type of Coupling Joints: Flush joint casing
 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.
 2.2 FT. - Length of Test/Seal Section, Cap.
 38.80 MSL - Plug Elevation
 Type of Plug: Sediment plug
 20.1 FT. - Total Depth of Well

47.40 MSL - Water lvs. encountered
 44.20 MSL - Static (Sealed) Water Level

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: "QuickFall" 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
 Type of Sand Pack: "Flint shot" silica sand
 Source of Sand: _____
Ottawa Silica company
 Quantity of Sand Used: 4
400 lbs

13.2 FT. - Total Sand Pack Interval

37.40 MSL - Bottom of Sand Pack Elevation

Type of Backfill Below Sand Pack: sand pack to bottom of borehole

21.5 FT. - Total Annular Space Depth
 27.70 MSL Elev. of Borehole Bottom

LOCATION: GROUND WATER MONITORING WELL WELL NO.: 102
 REGION OF USE: BFI Halifax Manufacturer:
 Well Drilling Contractor: Hydra Group Casing:
 Name: Darrell Leach Well ID: Mark Lewis Installation: 58.63
 Purpose of Well: Ground Water Monitoring Date: 3/22/88
 Comments: 60.8

WELL CONSTRUCTION
 Method:

1st FLOOR: Brass Master Padlock
 CAP: 11 gauge steel
 TYPE OF SURFACE CASING: 6 inch diameter Schedule 40 steel

ANNULAR SPACE DETAILS

58.63 NSL - Surf. Casing Collar Elev.
58.55 NSL - Riser Pipe Collar Elev.
3.0 Ft. - Riser Pipe Height Above Ground Elev.
56.08 - GROUND SURF. ELEV. NSL
3.0 Ft. - Depth of Surface Seal Below Ground
 Type of Surface Seal: Reinforced Concrete apron
 Quant. Used:
3.0 Ft. - Depth of Surface Casing Below Ground
60 IN. - Inner Diam. of Surf. Casing
8.0 IN. - Diam. of Borehole

56.08 NSL Ground Surface Elevation
 Type of Backfill: Cement-bentonite slurry
 No. Bags Cement: 12
 No. Bags Bentonite: 12
 Type of Bentonite: "Quick Gell" Bentonite clay

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 Joints/Couplings: Trilock flush joint casing

39.0 Ft. Depth to top of initial seal
2.5 Ft. Total sand pack interval
42.5 Ft. Depth to Top of Seal
15.87 NSL Top of Seal Elev.
2.0 Ft. Total Seal Interval
 Type of Seal: bentonite pellets

8.33 NSL - Top of Screen Elev.
 Type of Coupling Joint-Screen to Riser Pipe: flush joint

44.5 Ft. Depth to top of Sand Pack
13.87 NSL Elev. at Top of Sand Pack
 Type of Sand Pack: 1/2" slot Silica Sand
 Source of Sand: Ottawa Silica Company
 Quantity of Sand Used: 1 550 lbs

Type of Screen: Wire wound Johnson screen
 Screening Size: 10 slot
 Screening Spacing: .010 inch

17.5 Ft. Total Sand Pack Interval
3.37 NSL Bottom of Sand Pack Elevation
 Type of Backfill Below Sand Pack: Sand pack to bottom of boring

1.67 NSL - Bottom of Screen Elev.
0.2 Ft. - Length of Tailpiece/Blind Section/Cup

2.17 NSL - Plug Elevation
 Type of Plug: Sediment Cup
60.8 Ft. - Total Depth of Well

62.0 Ft. Total Borehole Depth
3.37 NSL Elev. of Borehole Bottom

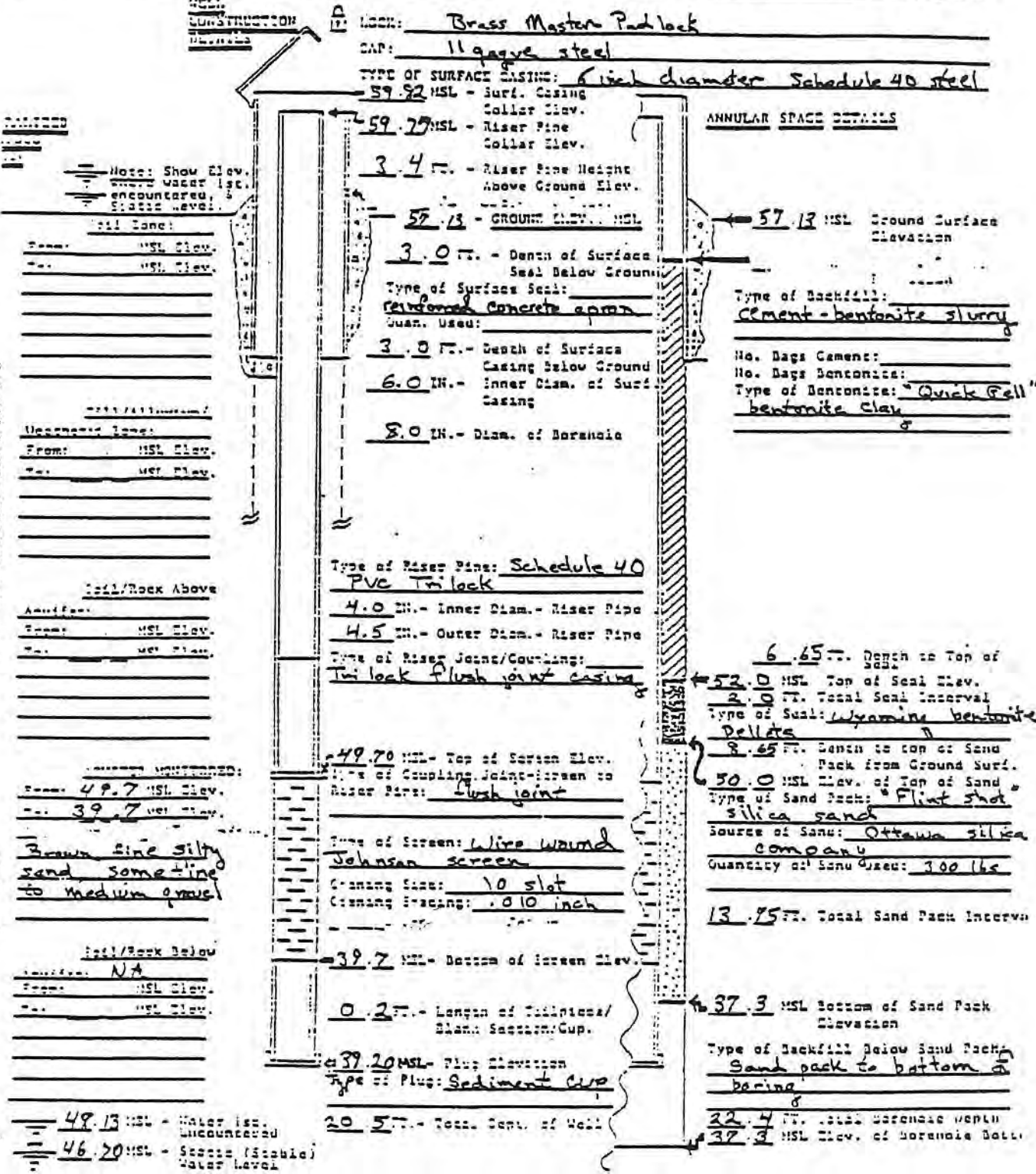
WATER LEVEL

Note: Snow Elev. where water lgt. encountered, & static level.

Well Zone:	From: NSL Elev.	To: NSL Elev.
Water Level	<u>47.80</u>	<u>45.93</u>
Water Level (Uncountered)	<u>47.80</u>	
Screen (Stable) Water Level	<u>45.93</u>	
Zone 1		
Zone 2		
Zone 3		
Zone 4		
Zone 5		
Zone 6		
Zone 7		
Zone 8		
Zone 9		
Zone 10		
Zone 11		
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Zone 98		
Zone 99		
Zone 100		

47.80 NSL - Water lgt. uncountered
45.93 NSL - Screen (Stable) Water Level

PROJECT NAME: <u>GROUND WATER MONITORING WELL</u>	WELL NO.: <u>103</u>
Location of Well: <u>RFI Halifax</u>	Drilling: _____
Driller/Contractor: <u>Hydra Group</u>	Casing: _____
Client: <u>Darrell Learn & Associates</u>	Completion: <u>59.82</u>
Use of Well: <u>Ground Water Monitoring</u>	Date Completed: <u>3/18/88</u>
Notes: _____	Cost: <u>20.5</u>



WELL CONSTRUCTION DETAILS

Note: Show Elev. of water encountered, static level.

Well Zone:

From: MSL Elev. _____

To: MSL Elev. _____

Unconsolidated Sand:

From: MSL Elev. _____

To: MSL Elev. _____

Well/Rock Above:

From: MSL Elev. _____

To: MSL Elev. _____

Well/Rock Below:

From: MSL Elev. _____

To: MSL Elev. _____

Water Encountered:

From: 49.7 MSL Elev.

To: 39.7 MSL Elev.

Brown fine silty sand some fine to medium gravel

Well/Rock Below:

From: NA

To: MSL Elev. _____

Water Encountered:

From: 48.13 MSL - Water Encountered

To: 46.20 MSL - Static (Stable) Water Level

WELL DATA

WELL NO.: 103

LOCATION: Brass Master Padlock

CAP: 11 gauge steel

TYPE OF SURFACE CASING: Quick diameter Schedule 40 steel

59.92 MSL - Surf. Casing Collar Elev.

59.25 MSL - Riser Pipe Collar Elev.

3.4 ft. - Riser Pipe Height Above Ground Elev.

57.13 - GROUND SURFACE ELEV. MSL

3.0 ft. - Depth of Surface Seal Below Ground

Type of Surface Seal: Random 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 Joints/Couplings: Tri lock 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

Screening Size: 10 slot

Casing Spacing: 0.10 inch

39.7 MSL - Bottom of screen Elev.

0.2 ft. - Length of Tailpiece/Blind Section: Cup.

37.20 MSL - Plug Elevation

Type of Plug: Sediment Cup

20.5 ft. - Total Dept. 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 Fall" bentonite clay

6.65 ft. - Depth to Top of Seal

52.0 MSL - Top of Seal Elev.

2.0 ft. - Total Seal Interval

Type of Seal: Wyamine bentonite pellets

8.65 ft. - Depth to top of Sand Pack from Ground Surf.

50.0 MSL Elev. of Top of Sand

Type of Sand Pack: "Flint shot" silica sand

Source of Sand: Ottawa silica company

Quantity of Sand Used: 300 lbs

13.25 ft. - Total Sand Pack Interval

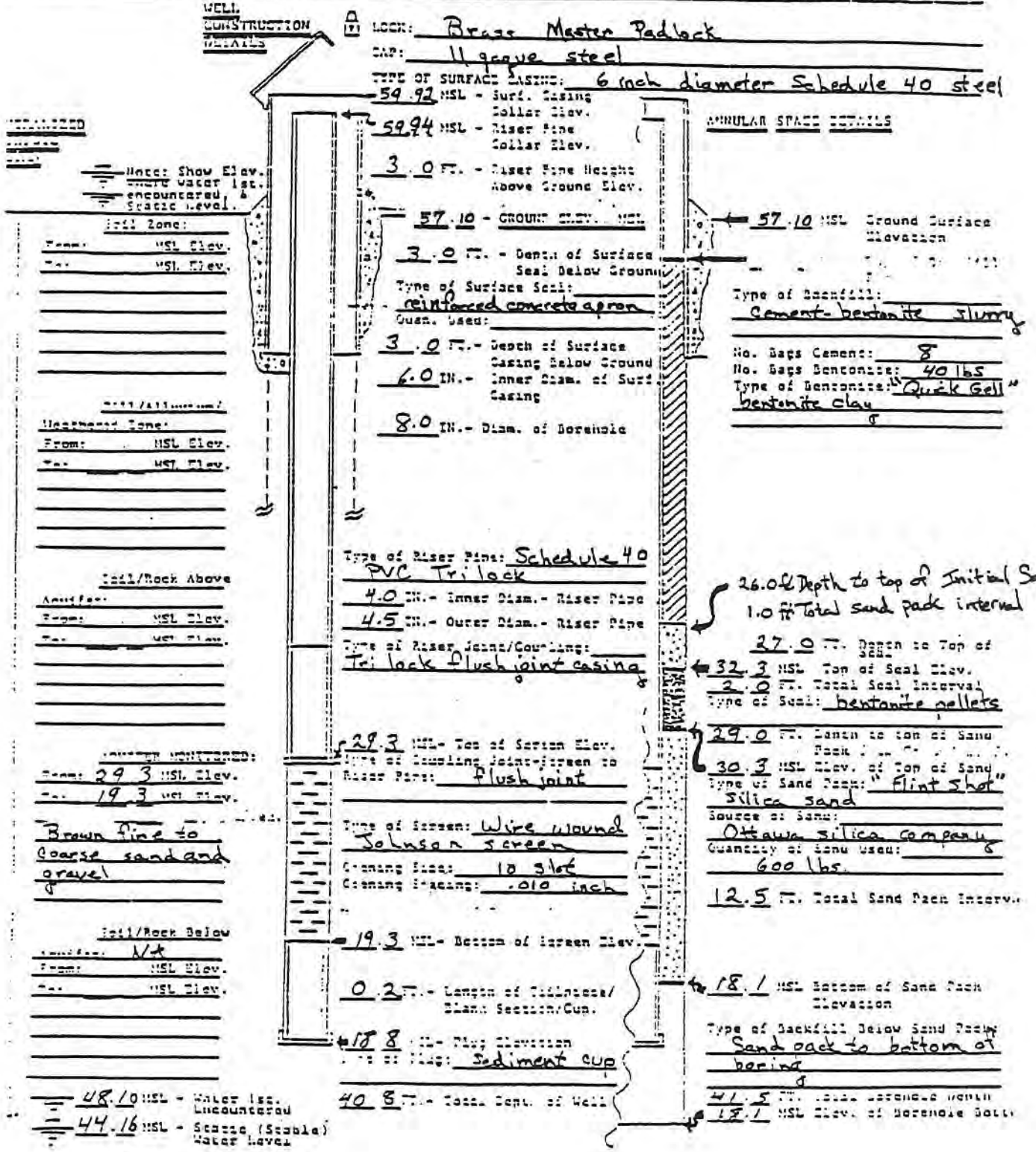
37.3 MSL - Bottom of Sand Pack Elevation

Type of Backfill Below Sand Pack: Sand pack to bottom of boring

22.4 ft. - Total borehole depth

37.3 MSL Elev. of Borehole Bottom

COMPLETION STATUS: <u>GROUND WATER MONITORING WELL</u>	WELL NO. <u>104</u>
LOCATION OF WELL: <u>BFI Halifax</u>	Marking:
DRILLING CONTRACTOR: <u>Hydra Group</u>	Casting:
PROJECT: <u>Darrell Leach</u> Geologist: <u>Mark Lewis</u>	Completion: <u>59.92</u>
PURPOSE OF WELL: <u>Ground Water Monitoring</u>	Completed: <u>3/23/88</u>
REMARKS:	Well Depth: <u>40.8</u>



REMARKS:

Notes: Show Elev. where water first encountered & static level.

Well Zone:

From:	MSL Elev.
To:	MSL Elev.

Heightened Zone:

From:	MSL Elev.
To:	MSL Elev.

Soil/Rock Above:

WATER MONITORED:

From:	29.3 MSL Elev.
To:	19.3 MSL Elev.

Brown fine to coarse sand and gravel

Soil/Rock Below:

48.10 MSL	- Water 1st. Encountered
44.16 MSL	- Seepage (Seable) Water Level

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 SURF. MSL
 3.0 FT. - Depth of Surface Seal Below Ground
 Type of Surface Seal: reinforced concrete apron
 Ques. 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 Joints/Couplings: Tri lock flush joint casing
 29.3 MSL - Top of Screen Elev. Type of Coupling Joint-Joism to Riser Pipe: flush joint
 Type of Screen: Wire wound Johnson screen
 Screening Size: 10 slot
 Screening Spacing: .010 inch
 19.3 MSL - Bottom of Screen Elev.
 0.2 FT. - Length of Tailpiece/Blank Section/Cup.
 18.8 MSL - Ring Elevation
 Type of Ring: 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 Interval

18.1 MSL Bottom of Sand Pack Elevation

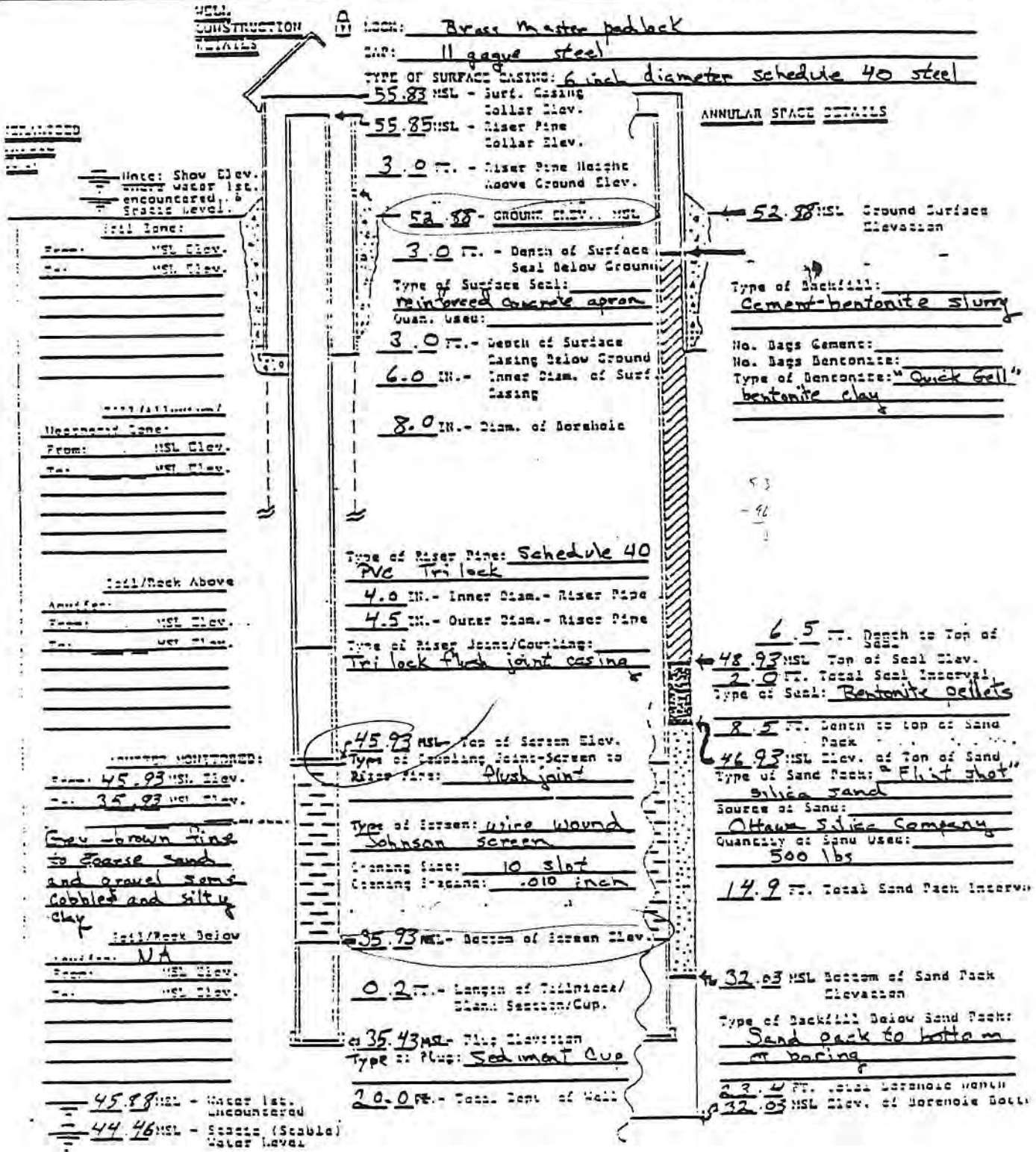
Type of Backfill Below Sand Pack: Sand pack to bottom of boring

41.5 FT. Total Borehole Depth
 18.1 MSL Elev. of Borehole Bottom

53 MSL head
 36 MSL Bottom of screen

17' BG to bottom of screen 10' screen 7-17' BG

COMPLETION POINTS: GROUND WATER MONITORING WELL	WELL NO.: 105
Location of Site: BFI Halifax	Northings:
Well Drilling Contractor: Hydro Group	Eastings:
Driller: Darrell Learn	Coordinates: 55.83
Supervisor: Mark Lewis	Installed: 3/17/88
Purpose of Well: Ground Water Monitoring	Well Depth: 20.0



WELL CONSTRUCTION DETAILS

APPROX: Brass master padlock
 11 gauge 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 SURF. MSL

3.0 FT. - Depth of Surface Seal Below Ground

Type of Surface Seal: reinforced concrete apron
 Quant. 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 Joints/Couplings: Tri lock flush joint casing

45.93 MSL - Top of Screen Elev.

Type of Coupling Joints-Screen to Riser Pipe: Flush joint

Type of Screen: wire wound Johnson screen

Screening Size: 10 slot
 Screening Openings: .010 inch

35.93 MSL - Bottom of Screen Elev.

0.2 FT. - Length of Triangular/Quadr. Section/Cup

35.43 MSL - Filter Elevation
 Type of Filter: Sediment Cup

20.0 FT. - Total Depth of Well

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 Gall 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 or boring

20.0 FT. - Total Borehole Depth
 32.03 MSL Elev. of Borehole Bottom

REMARKS

Note: Show Elev. where water 1st. encountered, & Static Level.

Well Zone:	MSL Elev.
From:	MSL Elev.
To:	MSL Elev.

Nearest Zone:	MSL Elev.
From:	MSL Elev.
To:	MSL Elev.

Well/Back Above:	MSL Elev.
From:	MSL Elev.
To:	MSL Elev.

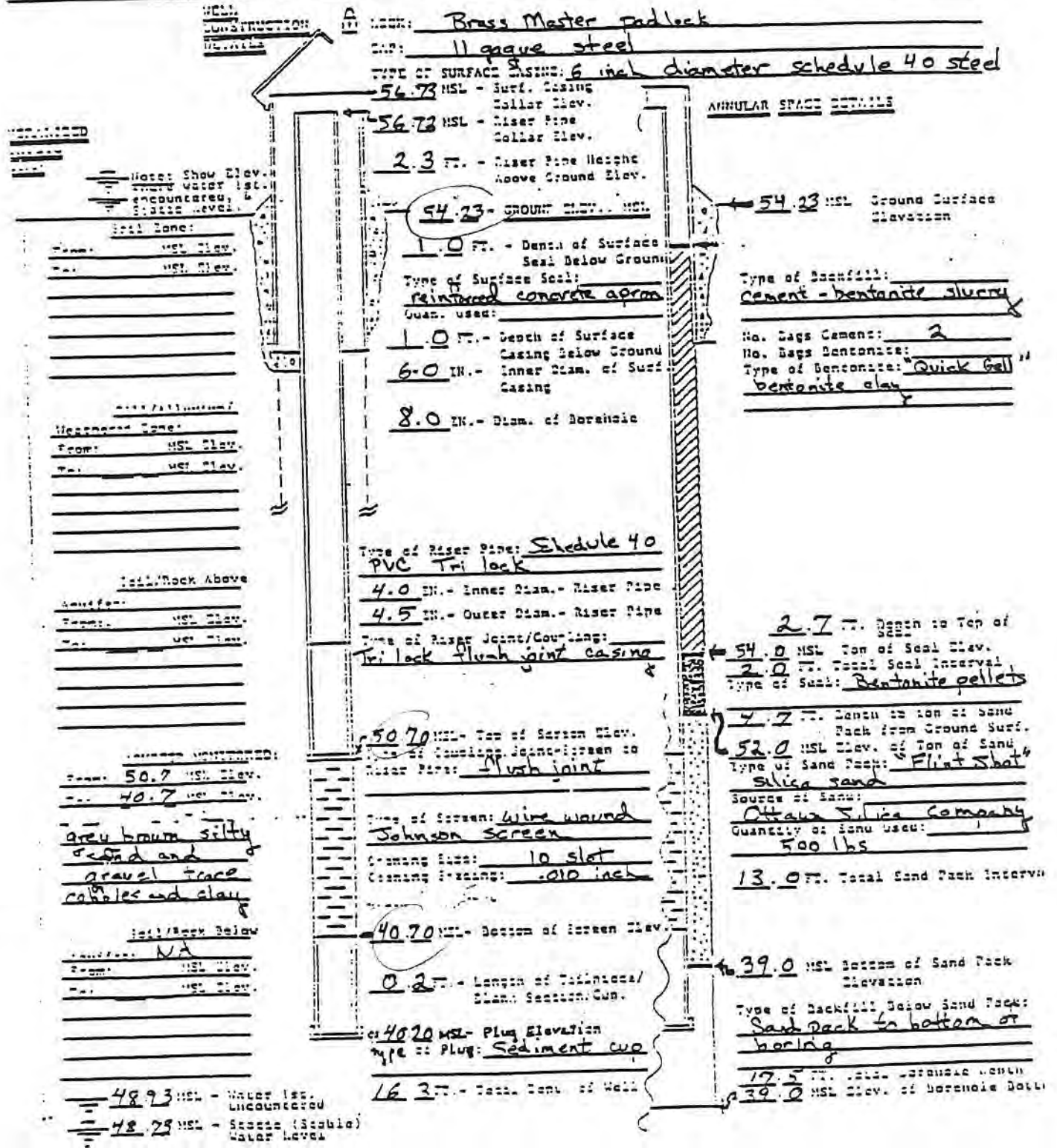
Water Monitored:	MSL Elev.
From:	MSL Elev.
To:	MSL Elev.

Well/Back Below:	MSL Elev.
From:	MSL Elev.
To:	MSL Elev.

Water 1st. Encountered:	MSL Elev.
Static Water Level:	MSL Elev.

Area: 3.5 - 13.5' BG

WELL LOCATION: GROUND WATER MONITORING WELL	WELL NO.: 106
Location of Site: BFI Halifax	
Site Owner/Manufacturer: Hydre Group	
Contractor: Darrell Leach	Well Elevation: 56.73
Project: Ground Water Monitoring	Date: 3/15/85
	Well Depth: 16.3



WELL CONSTRUCTION DETAILS

Notes: Show Elev. where water encountered, static level.

Soil Zone:

From:	MSL Elev.
To:	MSL Elev.
From:	MSL Elev.
To:	MSL Elev.
From:	MSL Elev.
To:	MSL Elev.
From:	MSL Elev.
To:	MSL Elev.

Weathered Zone:

From:	MSL Elev.
To:	MSL Elev.
From:	MSL Elev.
To:	MSL Elev.

Soil/Rock Above:

From:	MSL Elev.
To:	MSL Elev.
From:	MSL Elev.
To:	MSL Elev.

Soil/Rock Below:

From:	MSL Elev.
To:	MSL Elev.
From:	MSL Elev.
To:	MSL Elev.

WATER MONITORED:

From:	50.7 MSL Elev.
To:	40.7 MSL Elev.

grey brown silty sand and gravel trace cobbles and clay

WATER MONITORED:

From:	48.93 MSL - Water 1st. encountered
To:	48.25 MSL - Seepage (leakage) water level

WELL NO.: 106

LOCK: Brass Master padlock

CAP: 11 gauge steel

TYPE OF SURFACE CASING: 6 inch diameter schedule 40 steel

56.73 NSL - Surf. Casing Collar Elev.

56.73 NSL - Riser Pipe Collar Elev.

2.3 FT. - Riser Pipe Height Above Ground Elev.

54.23 GROUND SURF. ELEV. NSL

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 NSL - Top of Screen Elev.

Type of Coupling: Flush joint

Type of Screen: Wire wound Johnson screen

Screening Size: 10 slot

Screening Spacing: .010 inch

40.70 NSL - Bottom of Screen Elev.

0.2 FT. - Length of Test/Seal Section: Cup

40.20 NSL - Plug Elevation

Type of Plug: Sediment cup

16.3 FT. - Total Depth of Well

ANNULAR SPACE DETAILS

54.23 NSL Ground Surface Elevation

Type of Backfill: Cement-bentonite slurry

No. Bags Cement: 2

No. Bags Bentonite: _____

Type of Bentonite: "Quick Set" bentonite clay

2.7 FT. Depth to Top of Seal

54.0 NSL Top of Seal Elev.

2.0 FT. Total Seal Interval

Type of Seal: Bentonite pellets

4.2 FT. Depth to top of sand pack from Ground Surf.

52.0 NSL Elev. of Top of Sand Pack

Type of Sand Pack: Flint Slat silica sand

Source of Sand: Ottawa Silica Company

Quantity of Sand Used: 500 lbs

13.0 FT. Total Sand Pack Interval

39.0 NSL 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 NSL Elev. of Borehole Bottom

CONSTRUCTION TYPE: <u>GROUND WATER MONITORING WELL</u>	WELL NO.: <u>108</u>
Location of Well: <u>BFT Halifax</u>	Drilling: _____
Drilling Contractor: <u>Hydro Group</u>	Casing: _____
Operator: <u>Danell Learn</u>	Completion: <u>63.63</u>
Supervisor: <u>Mark Lewis</u>	Completed: <u>3/16/88</u>
Purpose of Well: <u>Ground Water Monitoring</u>	Test Type: <u>25.3</u>
Remarks: _____	

WELL CONSTRUCTION DETAILS

LOCK: Brass Master pad lock
 CAP: 11 gauge steel

TYPE OF SURFACE CASING: 6 inch diam schedule 40 steel

63.63 NSL - Surf. Casing Collar Elev.
63.51 NSL - Riser Pipe Collar Elev.

3.0 FT. - Riser Pipe Height Above Ground Elev.

60.63 - GROUND SURF. NSL

3.0 FT. - Depth of Surface Seal Below Ground

Type of Surface Seal: reinforced concrete apron
 Quant. 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 Joints/Couplings: Tri lock - flush joint casing

48.85 NSL - Top of Screen Elev.

Type of Coupling Joints: flush joint

Type of Screen: wire wound Johnson screen

Screening Size: 10 slot

Screening Opening: .010 inch

38.85 NSL - Bottom of Screen Elev.

0.2 FT. - Length of Tailpiece/Blank Section/Cup

38.35 NSL - Plug Elevation

Type of Plug: Sediment cup

25.3 FT. - Total Depth of Well

ANNULAR SPACE DETAILS

60.63 NSL - Ground Surface Elevation

Type of Backfill: cement-bentonite slurry

No. Bags Cement: 1

No. Bags Bentonite: _____

Type of Bentonite: "Quick Bell" bentonite clay

11.8 FT. - Depth to Top of Seal

51.85 NSL - 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 NSL Elev. of Top of Sand Pack

Type of Sand Pack: 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 NSL - 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 NSL Elev. of Borehole Bottom

GENERAL NOTES

Notes: Show Elev. where water first encountered Static Level.

Test Logs:

From: _____	NSL Elev.
To: _____	NSL Elev.

From: _____	NSL Elev.
To: _____	NSL Elev.

From: _____	NSL Elev.
To: _____	NSL Elev.

From: _____	NSL Elev.
To: _____	NSL Elev.

From: _____	NSL Elev.
To: _____	NSL Elev.

From: _____	NSL Elev.
To: _____	NSL Elev.

Soil/Rock Above

From: _____	NSL Elev.
To: _____	NSL Elev.

From: _____	NSL Elev.
To: _____	NSL Elev.

From: _____	NSL Elev.
To: _____	NSL Elev.

From: <u>48.85</u> NSL Elev.	NSL Elev.
To: <u>38.85</u> NSL Elev.	NSL Elev.

brackish coarse gravel fine to coarse sand, silt and fine clay

Soil/Rock Below

From: <u>NA</u>	NSL Elev.
To: _____	NSL Elev.

From: _____	NSL Elev.
To: _____	NSL Elev.

From: _____	NSL Elev.
To: _____	NSL Elev.

From: <u>46.63</u> NSL - Water 1st. encountered	NSL Elev.
To: <u>44.15</u> NSL - Static / Stable Water Level	NSL Elev.

GROUNDWATER OBSERVATION WELL REPORT

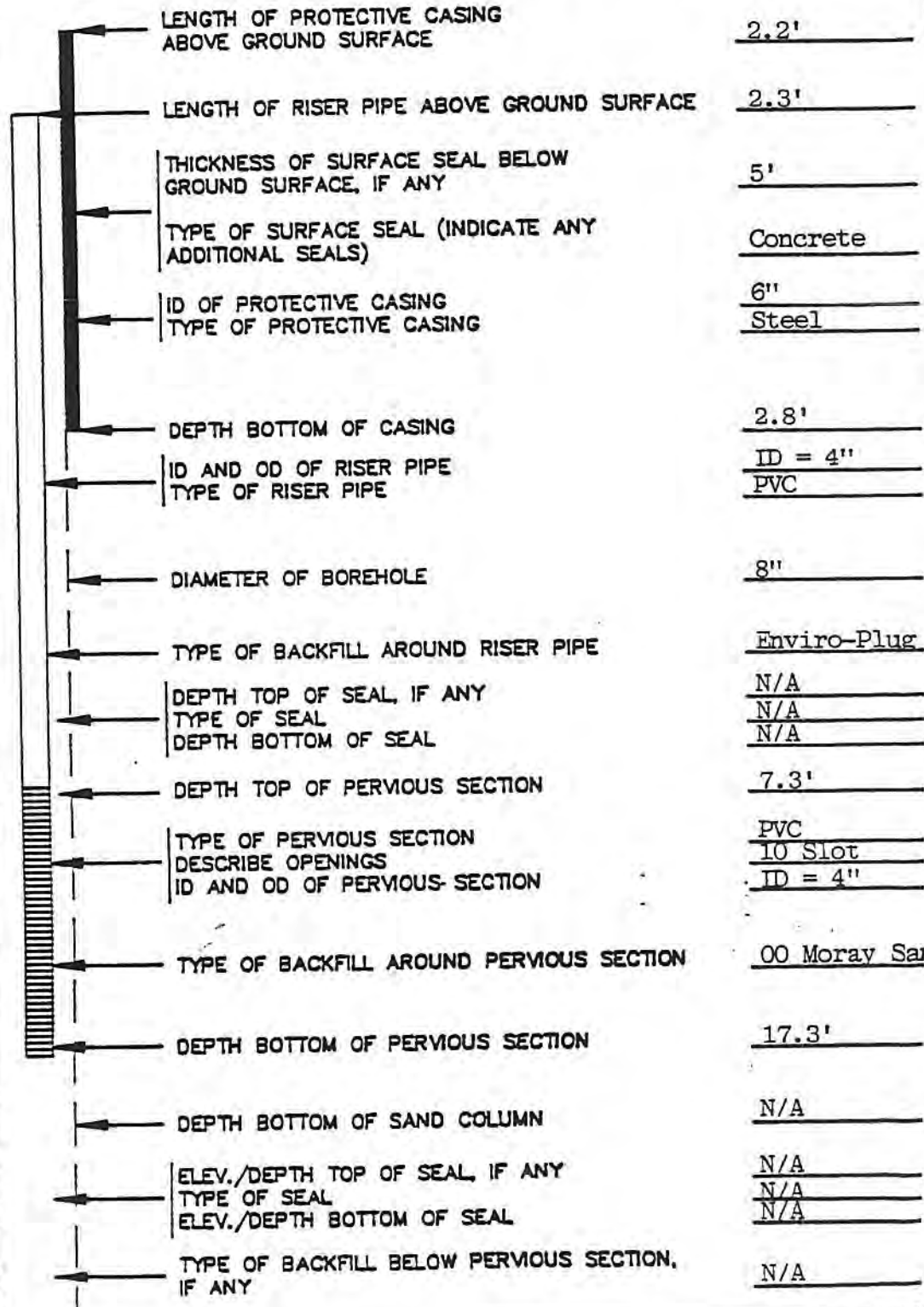
PROJECT: <u>BFI - Halifax Landfill</u>	PAGE <u>1</u> OF <u>1</u>
LOCATION: <u>Halifax</u>	WELL NO.: <u>109</u>
CLIENT: <u>BFI</u>	BORING NO.: _____
CONTRACTOR: <u>-</u> DRILLER: <u>F. G. Sullivan</u>	LOCATION: _____
LOGGED BY: <u>DIM</u> DATE: <u>11-29-90 - 11-30-90</u>	PROJECT NO.: _____
CHECKED BY: <u>PMD</u> DATE: _____	

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)



GROUNDWATER OBSERVATION WELL REPORT

PROJECT: <u>BFI - Halifax Landfill</u>	PAGE <u>1</u> OF <u>1</u>
LOCATION: <u>Halifax</u>	WELL NO.: <u>110</u>
CLIENT: <u>BFI</u>	BORING NO.: _____
CONTRACTOR: <u>-</u> DRILLER: <u>F. G. Sullivan</u>	LOCATION: _____
LOGGED BY: <u>DIM</u> DATE: <u>11-27-90 - 11-29-90</u>	PROJECT NO.: _____
CHECKED BY: <u>PMD</u> DATE: _____	

ELEV. TOP OF PROTECTIVE CASING <u>54.58</u> SURVEY DATUM <u>M.S.L.</u> GROUND ELEVATION <u>52.2 Con Pad</u> <u>51.8</u>			LENGTH OF PROTECTIVE CASING ABOVE GROUND SURFACE <u>2.8'</u> LENGTH OF RISER PIPE ABOVE GROUND SURFACE <u>2.9'</u> THICKNESS OF SURFACE SEAL BELOW GROUND SURFACE, IF ANY <u>5'</u> TYPE OF SURFACE SEAL (INDICATE ANY ADDITIONAL SEALS) <u>Concrete</u> ID OF PROTECTIVE CASING <u>6"</u> TYPE OF PROTECTIVE CASING <u>Steel</u> DEPTH BOTTOM OF CASING <u>2.2'</u> ID AND OD OF RISER PIPE <u>ID = 4"</u> TYPE OF RISER PIPE <u>PVC</u> DIAMETER OF BOREHOLE <u>8"</u> TYPE OF BACKFILL AROUND RISER PIPE <u>Enviro-Plug</u> DEPTH TOP OF SEAL, IF ANY <u>N/A</u> TYPE OF SEAL <u>N/A</u> DEPTH BOTTOM OF SEAL <u>N/A</u> DEPTH TOP OF PERVIOUS SECTION <u>37.9'</u> TYPE OF PERVIOUS SECTION <u>PVC</u> DESCRIBE OPENINGS <u>10 Slot</u> ID AND OD OF PERVIOUS SECTION <u>ID = 4"</u> TYPE OF BACKFILL AROUND PERVIOUS SECTION <u>00 Moray Sand</u> DEPTH BOTTOM OF PERVIOUS SECTION <u>47.9'</u> DEPTH BOTTOM OF SAND COLUMN <u>N/A</u> ELEV./DEPTH TOP OF SEAL, IF ANY <u>N/A</u> TYPE OF SEAL <u>N/A</u> ELEV./DEPTH BOTTOM OF SEAL <u>N/A</u> TYPE OF BACKFILL BELOW PERVIOUS SECTION, IF ANY <u>N/A</u>
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GENERAL SOIL CONDITIONS (Not to Scale)

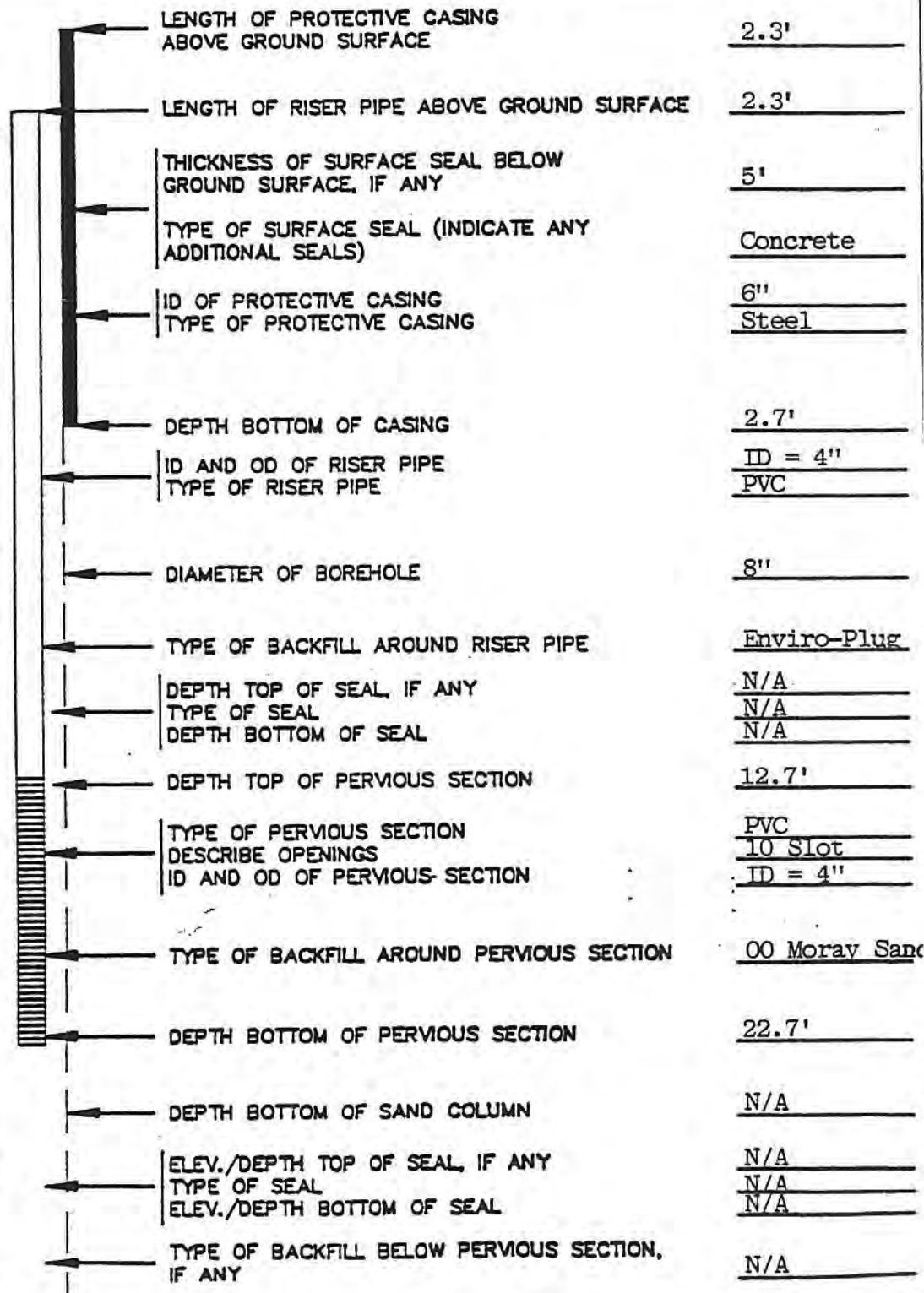
GROUNDWATER OBSERVATION WELL REPORT

PROJECT: <u>BFI - Halifax Landfill</u>	PAGE <u>1</u> OF <u>1</u>
LOCATION: <u>Halifax</u>	WELL NO.: <u>111</u>
CLIENT: <u>BFI</u>	BORING NO.: _____
CONTRACTOR: <u>-</u> DRILLER: <u>F. G. Sullivan</u>	LOCATION: _____
LOGGED BY: <u>DIM</u> DATE: <u>9-12-90 - 9-17-90</u>	PROJECT NO.: _____
CHECKED BY: <u>PMD</u> DATE: _____	

ELEV. TOP OF PROTECTIVE CASING 66.00

SURVEY DATUM M.S.L.

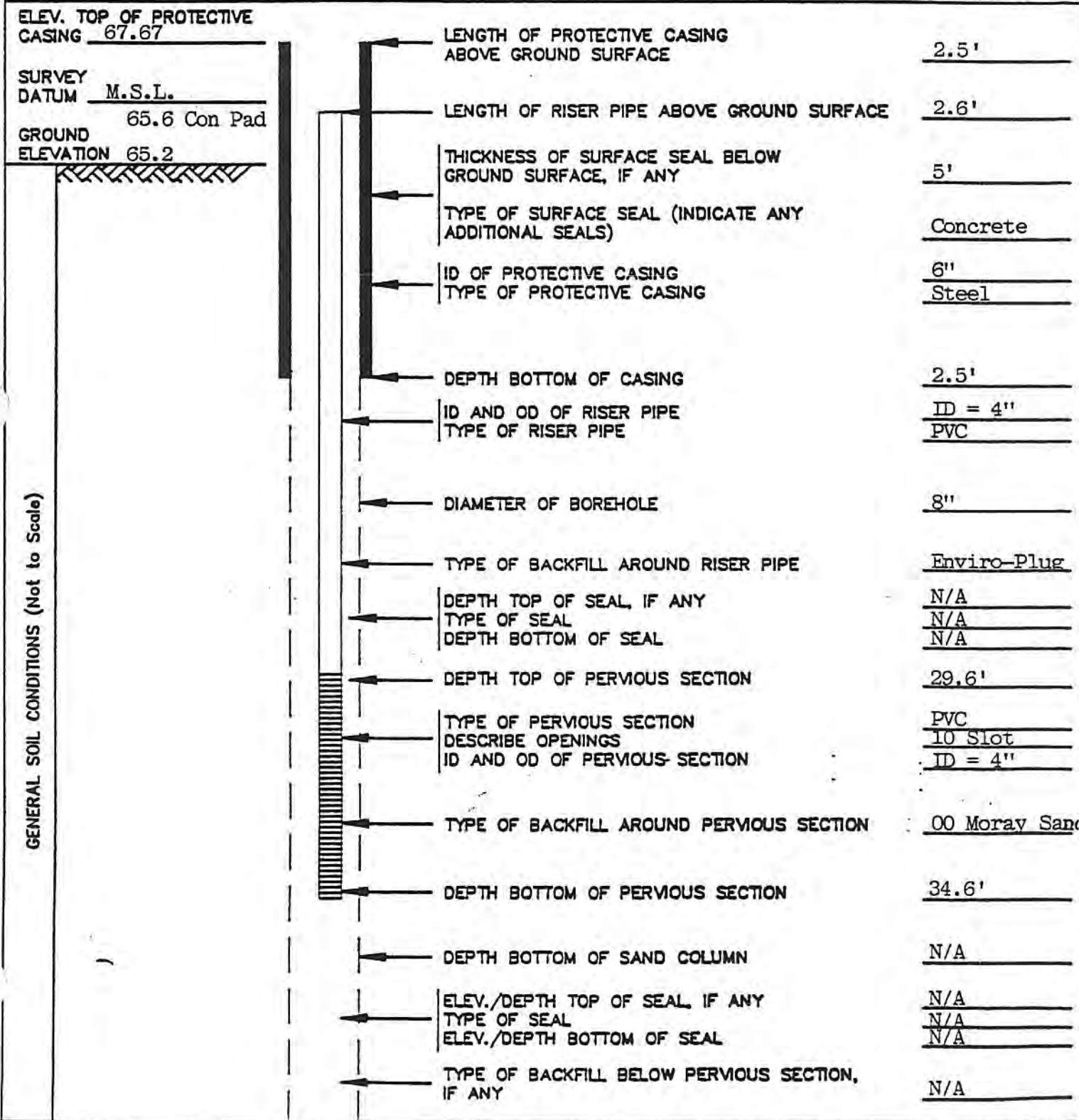
GROUND ELEVATION 65.1 Con Pad
64.7



GENERAL SOIL CONDITIONS (Not to Scale)

GROUNDWATER OBSERVATION WELL REPORT

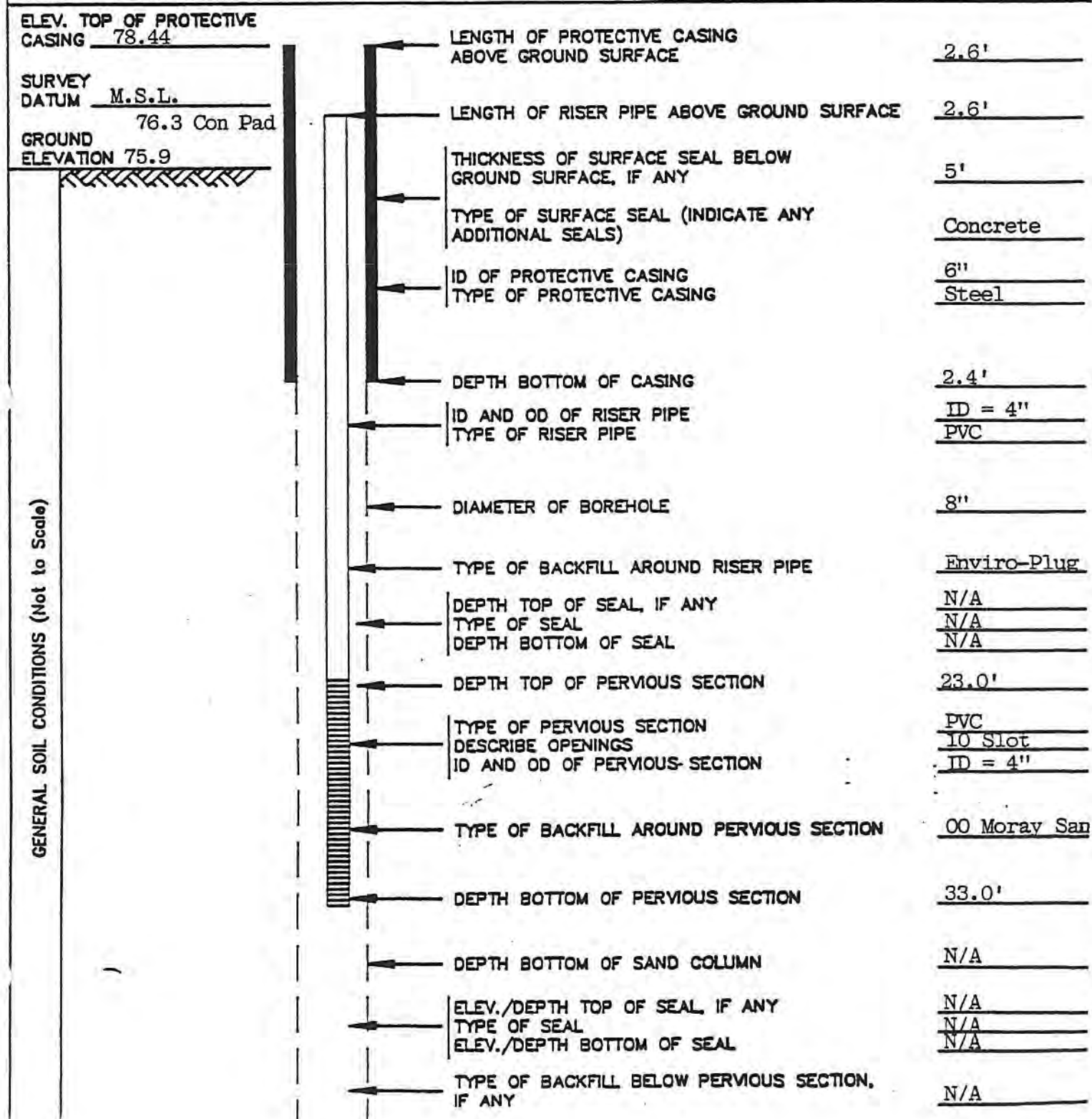
PROJECT: <u>BFI - Halifax Landfill</u>	PAGE <u>1</u> OF <u>1</u>
LOCATION: <u>Halifax</u>	WELL NO.: <u>112</u>
CLIENT: <u>BFI</u>	BORING NO.: _____
CONTRACTOR: <u>-</u> DRILLER: <u>F. G. Sullivan</u>	LOCATION: _____
LOGGED BY: <u>DIM</u> DATE: <u>9-17-90 - 9-21-90</u>	PROJECT NO.: _____
CHECKED BY: <u>PMD</u> DATE: _____	



DEFEO, WAIT HYDROGEOLOGIC SERVICES, INC.

GROUNDWATER OBSERVATION WELL REPORT

PROJECT: <u>BFI - Halifax Landfill</u>	PAGE <u>1</u> OF <u>1</u>
LOCATION: <u>Halifax</u>	WELL NO.: <u>113</u>
CLIENT: <u>BFI</u>	BORING NO.: _____
CONTRACTOR: <u>-</u> DRILLER: <u>F. G. Sullivan</u>	LOCATION: _____
LOGGED BY: <u>DTM</u> DATE: <u>10-01-90 - 10-02-90</u>	PROJECT NO.: _____
CHECKED BY: <u>PMD</u> DATE: _____	



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	<u>2.6'</u>
LENGTH OF RISER PIPE ABOVE GROUND SURFACE	<u>2.6'</u>
THICKNESS OF SURFACE SEAL BELOW GROUND SURFACE, IF ANY	<u>5'</u>
TYPE OF SURFACE SEAL (INDICATE ANY ADDITIONAL SEALS)	<u>Concrete</u>
ID OF PROTECTIVE CASING TYPE OF PROTECTIVE CASING	<u>6"</u> <u>Steel</u>
DEPTH BOTTOM OF CASING	<u>2.4'</u>
ID AND OD OF RISER PIPE TYPE OF RISER PIPE	<u>ID = 4"</u> <u>PVC</u>
DIAMETER OF BOREHOLE	<u>8"</u>
TYPE OF BACKFILL AROUND RISER PIPE	<u>Enviro-Plug</u>
DEPTH TOP OF SEAL, IF ANY	<u>N/A</u>
TYPE OF SEAL	<u>N/A</u>
DEPTH BOTTOM OF SEAL	<u>N/A</u>
DEPTH TOP OF PERVIOUS SECTION	<u>23.0'</u>
TYPE OF PERVIOUS SECTION DESCRIBE OPENINGS ID AND OD OF PERVIOUS-SECTION	<u>PVC</u> <u>10 Slot</u> <u>ID = 4"</u>
TYPE OF BACKFILL AROUND PERVIOUS SECTION	<u>00 Moray San</u>
DEPTH BOTTOM OF PERVIOUS SECTION	<u>33.0'</u>
DEPTH BOTTOM OF SAND COLUMN	<u>N/A</u>
ELEV./DEPTH TOP OF SEAL, IF ANY	<u>N/A</u>
TYPE OF SEAL	<u>N/A</u>
ELEV./DEPTH BOTTOM OF SEAL	<u>N/A</u>
TYPE OF BACKFILL BELOW PERVIOUS SECTION, IF ANY	<u>N/A</u>

GENERAL SOIL CONDITIONS (Not to Scale)

DEFEO, WAIT HYDROGEOLOGIC SERVICES, INC.

GROUNDWATER OBSERVATION WELL REPORT

PROJECT: BFI - Halifax Landfill
 LOCATION: Halifax
 CLIENT: BFI
 CONTRACTOR: - DRILLER: F. G. Sullivan
 LOGGED BY: DIM DATE: 9-25-90 - 9-28-90
 CHECKED BY: PMD DATE: _____

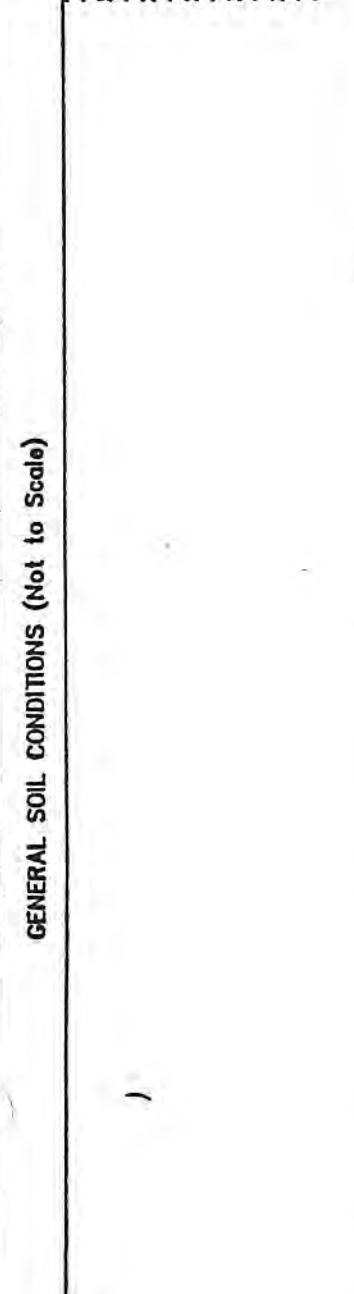
PAGE 1 OF 1
 WELL NO.: 114
 BORING NO.: _____
 LOCATION: _____
 PROJECT NO.: _____

ELEV. TOP OF PROTECTIVE CASING 78.30

SURVEY DATUM M.S.L.

76.3 Con Pad

GROUND ELEVATION 75.90



GENERAL SOIL CONDITIONS (Not to Scale)

LENGTH OF PROTECTIVE CASING ABOVE GROUND SURFACE	<u>2.4'</u>
LENGTH OF RISER PIPE ABOVE GROUND SURFACE	<u>2.5'</u>
THICKNESS OF SURFACE SEAL BELOW GROUND SURFACE, IF ANY	<u>5'</u>
TYPE OF SURFACE SEAL (INDICATE ANY ADDITIONAL SEALS)	<u>Concrete</u>
ID OF PROTECTIVE CASING TYPE OF PROTECTIVE CASING	<u>6"</u> <u>Steel</u>
DEPTH BOTTOM OF CASING	<u>2.6'</u>
ID AND OD OF RISER PIPE TYPE OF RISER PIPE	<u>ID = 4"</u> <u>PVC</u>
DIAMETER OF BOREHOLE	<u>8"</u>
TYPE OF BACKFILL AROUND RISER PIPE	<u>Enviro-Plug</u>
DEPTH TOP OF SEAL, IF ANY	<u>N/A</u>
TYPE OF SEAL	<u>N/A</u>
DEPTH BOTTOM OF SEAL	<u>N/A</u>
DEPTH TOP OF PERVIOUS SECTION	<u>37.3'</u>
TYPE OF PERVIOUS SECTION DESCRIBE OPENINGS ID AND OD OF PERVIOUS-SECTION	<u>PVC</u> <u>10 Slot</u> <u>ID = 4"</u>
TYPE OF BACKFILL AROUND PERVIOUS SECTION	<u>00 Moray Sand</u>
DEPTH BOTTOM OF PERVIOUS SECTION	<u>47.3'</u>
DEPTH BOTTOM OF SAND COLUMN	<u>N/A</u>
ELEV./DEPTH TOP OF SEAL, IF ANY	<u>N/A</u>
TYPE OF SEAL	<u>N/A</u>
ELEV./DEPTH BOTTOM OF SEAL	<u>N/A</u>
TYPE OF BACKFILL BELOW PERVIOUS SECTION, IF ANY	<u>N/A</u>

GROUNDWATER OBSERVATION WELL REPORT

PROJECT: BFI - Halifax Landfill
 LOCATION: Halifax
 CLIENT: BFI
 CONTRACTOR: - DRILLER: F. G. Sullivan
 LOGGED BY: DIM 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	<u>2.5'</u>
LENGTH OF RISER PIPE ABOVE GROUND SURFACE	<u>2.7'</u>
THICKNESS OF SURFACE SEAL BELOW GROUND SURFACE, IF ANY	<u>5'</u>
TYPE OF SURFACE SEAL (INDICATE ANY ADDITIONAL SEALS)	<u>Concrete</u>
ID OF PROTECTIVE CASING TYPE OF PROTECTIVE CASING	<u>6"</u> <u>Steel</u>
DEPTH BOTTOM OF CASING	<u>2.5'</u>
ID AND OD OF RISER PIPE TYPE OF RISER PIPE	<u>ID = 4"</u> <u>PVC</u>
DIAMETER OF BOREHOLE	<u>8"</u>
TYPE OF BACKFILL AROUND RISER PIPE	<u>Enviro-Plug</u>
DEPTH TOP OF SEAL, IF ANY TYPE OF SEAL DEPTH BOTTOM OF SEAL	<u>N/A</u> <u>N/A</u> <u>N/A</u>
DEPTH TOP OF PERVIOUS SECTION	<u>36.3'</u>
TYPE OF PERVIOUS SECTION DESCRIBE OPENINGS ID AND OD OF PERVIOUS SECTION	<u>PVC</u> <u>10 Slot</u> <u>ID = 4"</u>
TYPE OF BACKFILL AROUND PERVIOUS SECTION	<u>00 Moray Sand</u>
DEPTH BOTTOM OF PERVIOUS SECTION	<u>46.3'</u>
DEPTH BOTTOM OF SAND COLUMN	<u>N/A</u>
ELEV./DEPTH TOP OF SEAL, IF ANY TYPE OF SEAL ELEV./DEPTH BOTTOM OF SEAL	<u>N/A</u> <u>N/A</u> <u>N/A</u>
TYPE OF BACKFILL BELOW PERVIOUS SECTION, IF ANY	<u>N/A</u>

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 see 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)

68
 ↓
78' BA

Length of Surface Casing Above Ground Surface	<u>1.7'</u>
Length of Riser Pipe Above Ground Surface	<u>1.6'</u>
Thickness of Surface Seal Below Ground Surface, if any	<u>6'</u>
Type of Surface Seal (Indicate any additional seals)	<u>Concrete</u>
ID of Surface Casing	<u>6"</u>
Type of Surface Casing	<u>Steel</u>
Depth of Bottom of Casing	<u>3.3'</u>
ID of Riser Pipe	<u>4"</u>
Type of Riser Pipe	<u>PVC</u>
Diameter of Borehole	<u>6"</u>
Type of Backfill Around Riser Pipe	<u>Bentonit Slurry</u>
Depth Top of Seal, if any	<u>N/A</u>
Type of Seal	<u>Bentonit</u>
Depth Bottom of Seal	<u>66.4"</u>
Depth Top of Pervious Section	<u>68.4'</u>
Type of Pervious Section	<u>PVC</u>
Describe Openings	<u>10-Slot</u>
ID of Pervious Section	<u>4"</u>
Type of Backfill Around Pervious Section	<u>Moray S:</u>
Depth Bottom of Pervious Section	<u>78.4'</u>
Depth Bottom of Sand Column	<u>N/A</u>
Elev./Depth Top of Seal, if any	<u>N/A</u>
Type of Seal	<u>N/A</u>
Elev./Depth botom of Seal	<u>N/A</u>

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 • 205B 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

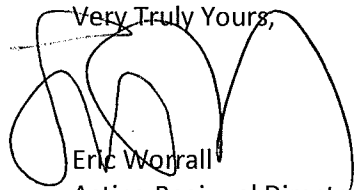
Under the Consent Order, concentrations of Nickel in soil shipments must be at or below 20 mg/kg, which is the current Reportable Concentration for this contaminant in residential (S-1) areas. You have indicated that detections of this metal have been reported up to 40 mg/kg in soils generated at construction 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 be “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