Lower Neponset River
Milton, Quincy and Boston, Massachusetts

Lower Neponset River Dredge Feasibility Study

Milton, Massachusetts

May 2023

Tighe&Bond
Engineers | Environmental Specialists

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Section 1
Introduction

1.1 Project Purpose

The Town of Milton, partnering with the Cities of Quincy and Boston, received a Seaport Economic Council Grant for a feasibility study for maintenance dredging of a navigable channel in the Neponset River between the Milton Yacht Club and the Neponset Avenue (Route 3A) Bridge, immediately upstream of the Dorchester Bay Federal Navigation Channel. In addition, the following two areas were included in the study: the Squantum Channel between Squantum Point Park Pier and the Dorchester Bay Federal Navigation Channel, and the Columbia Point Channel between Columbia Point (John T. Fallon State Pier at the University of Massachusetts Boston) and the Dorchester Bay Federal Navigation Channel.

1.2 Project Summary and Scope

The goal of this feasibility study is to identify the limits of dredging, analyze sediment for potential contaminants that would influence disposal options, and develop a permitting pathway. Existing sedimentation restricts recreational boating, water taxis, and safety in police response in these areas. Dredging of these areas will improve boating access and help stimulate the "Blue Economy" in Milton.

This feasibility study includes the results of preliminary desktop mapping and data collection, a conceptual design for sediment removal, sediment management alternatives, a recommended permitting pathway, and preliminary Opinion of Probable Construction Cost (OPCC) for permitting and project implementation. The report will serve as a decision-making document as the project moves into the next steps of design, permitting and procurement for the project. The report was initiated to provide a realistic assessment of the costs, benefits, permit requirements, and associated environmental issues associated with dredging the Neponset River between Milton Yacht Club and the Neponset Avenue Bridge, the Squantum Channel, and the Columbia Point Channel.

1.2.1 Neponset River

A bathymetric survey (map of sediment depth) was completed in October 2021 by J.R. Cashman Marine Contractors of Quincy, Massachusetts. This data was used to estimate the volume of sediment to be removed to provide a navigable channel. Sediment cores were also collected, and sediment samples were submitted for laboratory analysis to determine texture (particle size distribution) and chemical quality of the deposited material. Based on the target depth of overlying water to be attained, the surface area to be dredged, the bathymetry data, and a target channel width of 100 feet at a depth of -6 feet at Mean Lower Low Water (MLLW), with a one (1) foot overdredge, it is estimated that approximately 50,000 cubic yards of sediment would need to be removed within the Neponset River. In addition, approximately 25,000 cubic yards of sediment would potentially be generated from channel dredging and improvement dredging in the immediate vicinity of Milton Landing for a total of 75,000 cubic yards of dredged material upstream of the Dorchester Bay Federal Navigation Channel.

A primary challenge for dredging projects is identifying appropriate areas for both sediment dewatering and disposal or reuse. Tighe & Bond's sediment sampling revealed the presence of polychlorinated biphenyls (PCBs) in sediment throughout the project area, eliminating many potential reuse options, and significantly increasing potential sediment disposal costs. The presence of PCBs in sediment is attributed to migration of these contaminants from sites located along the Lower Neponset River and Mother Brook, which are both located upstream of the project area and within the recently designated Lower Neponset River Superfund Site.

The Superfund Program is administered by the United States Environmental Protection Agency (EPA). EPA anticipated that the Remedial Investigation and Feasibility Study for the Lower Neponset River Superfund Site will commence in Spring 2023 and take several years to complete. EPA has not yet indicated when they anticipate Remedial Activities to Commence or achieve substantial completion.

A preliminary OPCC was developed as part of this report, based on our experience with similar projects, and consultation with industry experts in dredging and materials management. Our preliminary OPCC indicates that the total project for the Neponset River dredging could range from $25,000,000 to $37,500,000. The estimated sediment disposal costs for the alternatives range from approximately $15,000,000 to $22,500,000.

The preliminary estimated project costs above are based on a unit cost of $500 per cubic yard of dredge material. Significant additional coordination with Federal and State regulatory agencies will be necessary to satisfy the requirements established in the Toxic Substance Control Act (TSCA), which regulates management and disposal of materials contaminated with PCBs. It will be important to coordinate pre-permitting meetings with regulatory agencies early in the process to initiate discussions regarding any time of year restrictions (fisheries), project staging and support area constraints, and sediment management options.

Based on the significant costs associated with the proposed maintenance dredging project, the Town of Milton may elect to lobby EPA for the project area to be included as an Operable Unit (OU). During investigation and remediation, a Superfund Site can be divided into several distinct areas depending on the complexity of the problems associated with the site. These areas (OUs) may address geographic areas of a site, specific site problems, or areas where a specific action is required. Inclusion into the Superfund Site as an OU would likely allow the Town to realize significant cost savings over proceeding with the project independently, however, the timeline for EPA's investigation and remediation of the Superfund Site may result in the project extending into the late 2020s or 2030s.

1.2.2 Squantum Channel and Columbia Point Channel

Bathymetric survey of the Squantum Channel and the Columbia Point Channel was conducted in February 2023 by J.R. Cashman Marine Contractors of Quincy, Massachusetts. Tighe & Bond has requested the authorized channel widths and depths from the Army Corps of Engineers. At this time, the Corps has not provided Tighe & Bond with this information, and the anticipated dredge volumes have not been determined for the Squantum Channel and Columbia Point Channels.

1.3 Neponset River – Existing Conditions

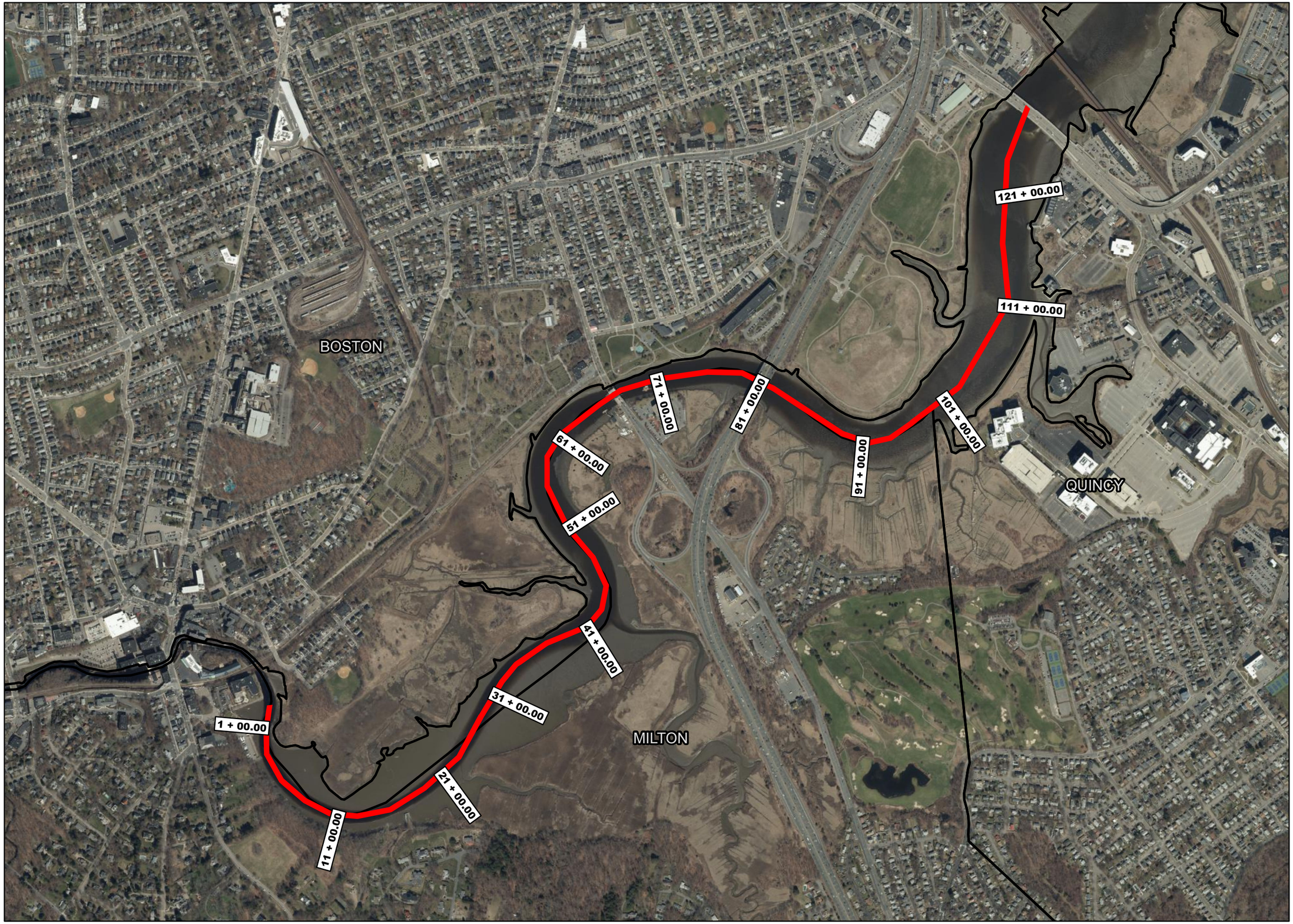
The Neponset River flows 27 miles (45 km) from the Neponset Reservoir in Foxboro to Dorchester Bay. The total drainage area of the watershed is 323 miles. The project area consists of the Lower Neponset River from the Milton Yacht Club to the Neponset Avenue (Route 3A) Bridge and shown on Figure 1-1. The proposed dredge area is shown in orange on Figure 1-2 and is located between stations 1+00.00 and 41+00.00 as depicted on Figure 1-1. The entire project area is located within the Neponset River Estuary, which is designated as an Area of Critical Environmental Concern (ACEC) and subject to a Resource Management Plan (RMP). The proposed dredge site is immediately upstream of the Dorchester Bay Federal Navigation Channel and immediately downstream of the Lower Neponset River Superfund Site.

Shoaling has significantly reduced the ability of recreational boats, water taxis, and police and fire boats to access Milton Landing, as well as areas within the Neponset River, the Squantum Channel, and the Columbia Point Channel. At Milton Landing, the existing boat ramp and floating dock are only usable during high tide. There is not enough depth within the channel to provide consistent adequate draft for water taxis that could support alternative transit and the Blue Economy within Milton, as well as the adjacent communities of Quincy and Boston. Furthermore, access by first responder boats is significantly restricted to the higher tide cycles by the shoaling.

Previously, the state dredged a channel from Milton Landing to the Neponset Avenue Bridge. This connects with the Dorchester Bay Federal Navigation Channel that is 100 feet wide by 15 feet deep. In 1982, the Massachusetts Department of Environmental Quality Engineering Division of Waterways commissioned a feasibility study for the dredging of this portion of the Neponset River that constitutes the project site. The study recommended the federal channel width of 100 feet be extended upstream to the Milton Town Landing with the following depths: -10 feet Mean Low Water (MLW) from the upstream terminus of the federal channel to the Granite Avenue Draw Bridge; a tapering depth of -10 to -6 feet MLW through the mooring area of the Neponset Valley Yacht Club to a point about 1,050 feet upstream of the Granite Avenue Bridge; and from this point to the Milton Town Landing, a proposed depth of -6 feet MLW. This project was not implemented as described due to lack of funding and permit concerns about dredging and disposal impacts, but maintenance dredging did take place in the area of Milton Yacht Club.

Figure 1-1 shows the proposed project area within the Neponset River.

FIGURE 1-1
STATIONING MAP



LEGEND

- Stationing Area
- Municipal Boundary

LOCUS MAP

N

0 400 800

Feet

1:9,600

NOTES

1. Based on MassGIS Color Orthophotography (2021)

Neponset River
Boston & Milton
Massachusetts

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FIGURE 1-2
DREDGING AREA

LEGEND

- Dredging Project Extent (Approx.)
- Municipal Boundary

LOCUS MAP

N

0 200 400
Feet
1:4,800

NOTES

1. Based on MassGIS Color Orthophotography (2021)

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1.3.1 Area of Critical Environmental Concern (ACEC)

The estuarine section of the river extends from Lower Mills Dam to its mouth at Commercial and Squantum Points, an area of approximately 1,300 acres. Among its resources are one of the two remaining salt marshes in Boston Harbor, fisheries and wildlife habitat, active and passive recreation, historic and anthropological sites, and natural and urban vistas. The estuary is also an economic resource. A variety of industrial, commercial, and residential uses and infrastructure exist within and alongside the natural resources. The value of these resources was found to be of regional significance in the ACEC designation for their outstanding and natural and cultural characteristics, and for the intrinsic value of the estuarine ecosystems.

In 1996, a Resource Management Plan (RMP) was developed for the Neponset River Estuary Area of Critical Environmental Concern (ACEC). One of the goals of the RMP was to preserve and encourage water dependent uses. The RMP recognizes that dredging is key for water-dependent uses and allows maintenance dredging, which is defined as the dredging of areas that have in the past been authorized for dredging regardless of whether dredging has ever been done.

The RMP identifies previous authorizations for dredging within the Project Area. These include:

- South of the Neponset Avenue Bridge to the Granite Avenue bridge, dredging was authorized at 100 feet wide, -6.0 MLW.
- From the Granite Avenue Bridge to Godfrey's Coal Wharf, dredging was authorized at 75 feet wide, -6.0 MLW.
- In front of Godfrey's Coal Wharf, dredging was authorized not less than 50 feet wide. The mooring basin in front of Vose's Grove was authorized to -6.0 MLW. In addition, dredging and maintenance of a 2-mile-wide channel between the Neponset Bridge and the Milton Mills to -6.0 MLW was required.
- Dredging was also required of the Commonwealth as a condition of ACOE dredging north of the Neponset Bridge in 1907.

This information can be found in the ACEC RMP and Table 1-1 below. The project aims to conduct maintenance dredging at the maximum limits previously authorized, which is a 100' wide channel from the Neponset Avenue Bridge to Milton's Landing to a depth of -6 MLW and within the limits of Milton's Landing.

The RMP defines improvement dredging as new dredging of an area that has not been authorized previously and prohibits improvement dredging in the ACEC, except for the sole purpose of fisheries or wildlife enhancement. As such, improvement dredging is not proposed for this project.

Table 1-1 lists areas previously authorized for dredging in the Neponset River from the ACEC RMP, which is included as Appendix B. Based on the previously authorized dredging areas, the Milton Landing area and a 100-foot-wide channel between Milton Landing and Neponset Avenue Bridge are authorized. Therefore, our feasibility study focused on these areas.

Table 1-1: Permits and Licenses for Previous Structures, Dredging and Fill in the Neponset Estuary ACEC

Location	Date	Permit	Permittee	Agency	Dredging	Conditions
Milton Yacht Club	May 1983	Contract No. 3002	DEQE - Division of Waterways		Maintenance dredge channel in Neponset River to -6.0 MLW (min width 100')	COE 404 permit prohibits dredging between March 1 through June 30 for protection of anadromous fishery
	July 1967	Contract No. 2585	DPW – Division of Waterways	DPW	Dredge channel and basin in Neponset River to -6.0 MLW (min width 100'; plan shows wider area)	
Neponset River south of Neponset Avenue Bridge	August 2023	Contract No. 84; Authorized by chapter 353 of the Acts of 1923			Neponset Avenue Bridge to Granite Ave bridge: 100' wide, -6.0 MLW Granite Ave. Bridge to Godfrey's Coal Wharf: 75' wide, -6.0 MLW In front of Godfrey's Coal Wharf: not less than 50' Mooring basin in front of Vose's Grove to -6.0 MLW Dredge and maintain a 2-mile reach of channel between the Neponset Bridge and Milton Mills to -6.0 MLW. (This dredging was required of the Commonwealth as a condition of ACOE dredging north of Neponset Bridge in 1907.)	Narrative with ACOE's condition survey of 1985 states this dredging was done and has been maintained since 1910.)
224 Adams Street, Milton	August 1984	C. 91 #1098	Marion R. Lynch	DEQE	Maintain a pier and float; construct and maintain a boat launching ramp and wall	
	December 1983	WQ Certification #83W-140	Marion R. Lynch	DEQE / DWPC	Maintain existing pier and float, construct and maintain a boat launching ramp	Remove unauthorized fill
	May 1976	C. 91 #125	Teresa L. Grogan	DEQE	Dredging 37' x 75' to depth of -4.0 MLW	Build and maintain a pier and float; asphalt boat launching ramp extending 95' into tideware
Neponset Valley Yacht Club	March 1956	Contract No. 1594	DPW- Division of Waterways	DPW	Dredge channel to -8.0 MLW (min width 200')	

1.3.2 Superfund Site Designation

On March 16, 2022, the EPA listed the Lower Neponset River on the National Priorities List. The Lower Neponset River Superfund Site currently consists of a 3.7-mile section of the Neponset River between its confluence with Mother Brook in Hyde Park and the Walter Baker Dam in Milton. Based on preliminary studies, this portion of the river contains sediment contaminated with elevated levels of PCBs. As PCBs are also present in sediment within the Project Area, the impacted sediment would likely be designated as a PCB remediation waste in accordance with Federal Regulations 40 CFR 761 (TSCA). Future coordination and correspondence with EPA representatives are necessary to determine if sediment generated by the project might be managed in conjunction with Superfund site restoration activities, or if the Project Area would be designated as an OU.

1.3.3 Mother Brook Remediation

Mother Brook is located at the upstream extent of the Lower Neponset River Superfund Site. Remediation of PCB-impacted sediment at Mother Brook from 2007 to 2011 included sediment sampling, diversion of stream flow, dredging, and bank restoration. Most of the removed sediment was managed as PCB remediation waste under TSCA.

In addition to the data provided in the 2014 USGS study, Tighe & Bond completed a file review of MassDEP records associated with the Mother Brook remedial effort to better understand potential requirements for dredging PCB-contaminated sediments. Several MassDEP Release Tracking Numbers (RTNs) are associated with Mother Brook, addressing different reporting conditions and discrete areas of contamination. The following RTNs are associated with the site and the surrounding area: 3-27168, 3-0730, 3-27067, 3-27790, 3-27791, 3-28336, and 3-28835. Two companies were primarily responsible for the Mother Brook remediation project, Thomas and Betts, and New Albertsons. A summary of remediation efforts and remedial waste disposal locations is provided for each of the RTNs below.

In October of 2007 MassDEP issued directives to require remediation of PCB impacted bank areas as a stand-alone project and eliminate the need to link RTN 3-27168 to multiple source area RTNs. The bank remediation project was conducted concurrently under RTN 3-0730 by Thomas and Betts. TSCA Hazardous Waste was transported under RTN 3-27168 to EQ Wayne's Disposal Inc. Landfill in Belleville, Michigan. Non-TSCA remediation waste was transported under a BOL to Waste Management of Northern New England's Turnkey Recycling and Environmental Enterprises (TREE) in Rochester, NH.

Under RTN 3-0730, TSCA and Non-TSCA Waste was excavated, and a site dewatering system operated under the Remediation General Permit (RGP) permit number MAG910251 to address contaminants including TPH, VOCs, and PCBs. Non-TSCA material was transported to TREE in Rochester, NH. TSCA material was transported to Wayne's Disposal Site Landfill in Michigan.

Under RTN 3-27791, TSCA waste was transported to Wayne's Disposal Landfill in Belleville, MI (6,446.39 Tons) and CWM Chemical Services LLC at 1550 Balmer Road in Model City, NY (4,207.42 tons). Non-TSCA waste was transported to Environmental Soil Management Inc. (ESMI) in Loudon, NH (7091.41 tons) and TREE in Rochester, NH (2,386.55 tons).

Under RTN 3-28835, approximately 8,720 tons of TSCA waste was transported to Wayne's Disposal Landfill in Belleville, MI and CWM Chemical Services in Model City, NY.

Approximately 5,563 tons of non-TSCA waste was transported as Non-TSCA to TREE in Rochester, NH and ESMI in Loudon, NH.

1.3.4 Potential PCB Contamination Sources

In 2014, the U.S. Geological Survey (USGS) released a detailed study of the PCBs present in the Neponset River and the Neponset River estuary to determine potential sources. The concentrations, loads, and sources of PCBs in the Neponset River and Neponset River Estuary were determined by collecting, analyzing, and interpreting sampling data from several different types of media, including bottom sediment, extracts from passive-water samplers, fish tissue, and directly collected water. Some bottom-sediment samples in the Neponset River and the Neponset River Estuary contained PCBs in concentrations well above sediment-quality guidelines (2,000 nanograms per gram [ng/g] or parts per billion [ppb]) and could be classified as moderately regulated waste (50 to 499 milligrams per kilogram [mg/kg]) according to the TSCA.

PCBs were commercially manufactured and sold as specific mixtures under the trade name Aroclor and are a group of organic compounds that consist of 209 distinctly different compounds (known as congeners) based on the number of attached chlorine atoms. The specific congeners present in environmental samples (i.e. sediment or water samples) provide a "fingerprint" of PCB-congener patterns. Data collected as part of the 2014 USGS study found that the PCB congeners present in sediment downstream of the Walter Baker Dam were consistent with those found in upstream areas, particularly those that originated from Mother Brook.

Data collected as part of the 2014 USGS study are consistent with the hypothesis that widespread PCB contamination of the lower Neponset River (originating from Mother Brook and other upstream sources) likely started prior to 1955, at which time the failure of several dams along the river released PCB-contaminated sediment downstream and into the estuary. Subsequently, all but one of the dams were rebuilt, but PCBs from upstream locations continue to act as a source area. The volume of PCBs being discharged to the Estuary varies throughout the year, increasing during periods of higher river flow, as determined by USGS through the collection of water samples at the Milton Village stream gage. PCBs either diffuse into water or are entrained back into the water column with suspended sediment, and are transported downstream by river water; PCBs also are taken up by fish and wildlife and transported in their tissue.

The sediment sampling conducted by Tighe & Bond in 2022 revealed that PCB contamination continues to be present downstream of the Walter Baker Dam, and that the Arocolor and congener makeup of those PCBs remains consistent with those found during the 2014 USGS study. Further details regarding the 2022 sediment sampling at the proposed project site can be found in Section 2 and attached in Appendix A.

1.4 Information Sources

Previous studies/information sources evaluated as part of the project include the following:

- Massachusetts Executive Office of Environmental Affairs. Neponset River Estuary Area of Critical Concern Resource Management Plan. March 1996.
- J.R. Cashman Marine Contractors of Quincy, Massachusetts. Bathymetric Survey of the Lower Neponset River. 2021.

- J.R. Cashman Marine Contractors of Quincy, Massachusetts. Bathymetric Survey of the Lower Neponset River. 2023.

- Lower Neponset River Boston / Milton Superfund Site website: www.epa.gov/superfund/lowerneponset

- U.S. Geologic Survey. Concentrations, Loads, and Sources of Polychlorinated Biphenyls, Neponset River and Neponset River Estuary, Eastern Massachusetts. Volume 1.1, June 2014.

Section 2
Sediment Quality and Quantity Evaluation

2.1 Methodology - Sediment Characterization

In July 2022, Tighe & Bond completed a preliminary sediment quality evaluation in the project area. Based on the urban watershed, the industrial history of the Neponset River upstream of the project area, and the recently designated Lower Neponset River Superfund Site, the presence of contaminants in sediment was not unexpected. Table 2-1 shows the summary sediment quality table for the eleven sediment samples taken from the proposed maintenance dredging area. Samples SED-101 through SED-109 were taken in the Neponset River. SED-110 was taken in the Squantum Point Channel and SED-111 was taken in the Columbia Point Channel. Sample locations are shown on Figure 2-1.

Table 2-1 Summary Sediment Quality Table

Sample ID	Date	Water Depth[1]	Penetration[1]	Recovery[1]	Total Chromium	Total Lead	TCLP Lead	Total PCBs
SED-101	6/28/2022	6.7	6	5.5	**122**	184	0.110	**1.95**
SED-102	6/28/2022	7.2	6	5.2	**115**	188	0.090	**2.07**
SED-103	6/28/2022	7.5	6	5.5	**113**	157	0.136	**7.46**
SED-104	6/28/2022	7.2	6	5.5	-	-	-	0.00
SED-105	6/28/2022	7.4	6	5.5	**105**	146	0.088	**2.38**
SED-106	6/28/2022	9.4	6	4.9	**114**	181	0.075	0.581
SED-107	6/28/2022	11.4	6		98.7	134	<0.050	0.698
SED-108	6/28/2022	11.8	6	5.5	90	134	0.067	**2.48**
SED-109	6/28/2022	11.2	6	5.4	**173**	**263**	0.069	**6.59**
SED-110	6/28/2022	20.8	6	5.5	**166**	112	0.072	0.189
SED-111	6/28/2022	13.9	5.3	4.6	45.6	34.9	-	0.0302

Laboratory analytical results were compared to the MassDEP RCS-1 and COMM 94-007 lined landfill acceptance criteria to aid in evaluating potential management options for the sediment. Laboratory results indicated that PCBs, total chromium, and total lead are present in sediment at concentrations greater than MassDEP RCS-1 values. The presence of these contaminants at concentrations above RCS-1 values eliminates the potential for unrestricted (upland) reuse of sediment during dredging activities (i.e. for beach nourishment). As previously mentioned, the presence of PCBs in sediment will likely require that the majority of sediment within the project area be managed as TSCA remediation waste, increasing sediment disposal costs due to the limited number of facilities that are permitted to accept TSCA remediation waste.

The full Sediment Sampling and Analysis Summary is included in Appendix A.

FIGURE 2-1
SEDIMENT SAMPLING LOCATIONS

LEGEND

- Sediment Sampling Location
- Federal Channel Area
- Dredging Project Extent (Approx.)
- Municipal Boundary

LOCUS MAP

Main Map

0 1,000 2,000 Feet

1 inch = 2,000 feet

Inset 1 & 2

0 200 400 Feet

1 inch = 400 feet

NOTES

1. Imagery provided by MassGIS (2019).
2. Federal Channel Area downloaded from USACE.
3. Data is reported in miligrams per kilogram (mg/kg).
4. Red Sample Concentrations: Indicates concentration exceedanced of MassDEP Reportable Concentrations (Category RCS-1).
5. Blue Sample Concentrations: Indicates concentrations exceedanced of the 20x Rule Screening Threshold but were below MassDEP Reportable Concentrations Category RCS-1

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Inset 1

SED-106
Total Chromium: 114
Hex Chromium: Data Pending
TCLP Chromium: Data Pending
Total Lead: 181
TCLP Lead: 0.075
Total PCBs: 0.58083

SED-103
Total Chromium: 113
Hex Chromium: <1.0
TCLP Chromium: <0.020
Total Lead: 157
TCLP Lead: 0.136
Total PCBs: 7.46498

SED-102
Total Chromium: 115
Hex Chromium: 2.8
TCLP Chromium: <0.020
Total Lead: 188
TCLP Lead: 0.09
Total PCBs: 2.06786

SED-101
Total Chromium: 122
Hex Chromium: 2
TCLP Chromium: <0.020
Total Lead: 184
TCLP Lead: 0.11
Total PCBs: 1.94543

SED-104
Total Chromium: -
Hex Chromium: -
TCLP Chromium: -
Total Lead: -
TCLP Lead: -
Total PCBs: 0

SED-105
Total Chromium: 105
Hex Chromium: <1.0
TCLP Chromium: <0.020
Total Lead: 146
TCLP Lead: 0.088
Total PCBs: 2.37908

SED-107
Total Chromium: 98.7
Hex Chromium: -
TCLP Chromium: -
Total Lead: 134
TCLP Lead: <0.050
Total PCBs: 0.69846

Inset 2

SED-109
Total Chromium: 173
Hex Chromium: <0.8
TCLP Chromium: 0.022
Total Lead: 263
TCLP Lead: 0.069
Total PCBs: 6.58508

SED-108
Total Chromium: 90
Hex Chromium: -
TCLP Chromium: -
Total Lead: 134
TCLP Lead: 0.067
Total PCBs: 2.47775

SED-111
Total Chromium: 45.6
Hex Chromium: -
TCLP Chromium: -
Total Lead: 34.9
TCLP Lead: -
Total PCBs: 0.03018

SED-110
Total Chromium: 166
Hex Chromium: <0.8
TCLP Chromium: <0.020
Total Lead: 112
TCLP Lead: 0.072
Total PCBs: 0.18935

Federal Channel

Neponset Avenue Bridge

Neponset River Channel

Adams Street

Milton Landing

See Inset 1

See Inset 2

Neponset River

BOSTON

MILTON

QUINCY

Main

3A

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2.2 Proposed Estimated Dredge Volume

In October 2021, J.R. Cashman Marine Contractors of Quincy, Massachusetts completed a bathymetric survey of the Neponset River project area on behalf of the Project Team. In accordance with Chapter 353 of the Act of 1923, the channel has a permitted width of 50 feet and depth of -6.0 feet at MLW. Previous authorizations indicate that dredging in a 100-foot-wide channel had been approved. Tighe & Bond utilized the 2021 bathymetric data and previously authorized channel width and depth to develop preliminary dredge volume estimates for the project area.

Based on preliminary calculations for the dredge areas assuming a 100-foot-wide channel to a depth of -6.0 feet MLW, approximately 50,000 cubic yards of sediment would be generated in the channel portion of the project area between Stations 1+00 and 41+00 on Figure 1-1. Downstream of Station 41+00, sufficient water column exists at MLW and maintenance dredging does not appear to necessary. In addition, approximately 25,000 cubic yards of sediment would potentially be generated from the channel dredging and improvement dredging in the immediate vicinity of Milton Landing, shown in orange on Figure 1-2. Cross sections of the dredge areas are provided in Appendix C. The preliminary calculations for the Milton Landing area are based on the approximate limits of an area previously authorized to be dredged, as shown in Figure 11A of the Neponset River Estuary ACEC RMP, and the dredge area proposed by Childs Engineering Corporation in their Results Summary Report for the Hydrographic Survey at Milton Landing and Proposed Site Improvements, dated May 18, 2018.

Bathymetric survey of the Squantum Channel and the Columbia Point Channel was conducted in February 2023 by J.R. Cashman Marine Contractors of Quincy, Massachusetts. Tighe & Bond has requested the authorized channel widths and depths from the Army Corps of Engineers. At this time, the Corps has not provided Tighe & Bond with this information, and the anticipated dredge volumes have not been determined for the Squantum Channel and Columbia Point Channels.

Section 3
Sediment Management Alternatives

3.1 Removal Methods

General construction industry practice is to allow construction contractors to establish the means and methods for undertaking the subject work. Dredging projects differ in that contractor means and methods can greatly affect the impact of the work on regulated resource areas, typically requiring the project to be planned and permitted based on the intended dredging method.

The main driver of the method of dredge that is best suited for a particular project is usually based on specific site constraints. There are few typical dredging methodologies in practice today and each methodology exhibits its own advantages and disadvantages. A general overview of dredging methodologies is summarized below.

3.1.1 Wet Mechanical Dredging

Wet mechanical dredging incorporates the use of heavy equipment such as excavators or cranes using clamshell buckets but deploying and operating this equipment from barges or from land. Downgradient siltation controls must be installed to prevent sediment migration outside the limits of work. However, the use of specialized environmental clamshell buckets can allow increased control of sediment suspension compared to hydraulic dredging, making this method preferred for dredging contaminated sediments where dry mechanical dredging is not feasible. In most cases, this methodology eliminates the need for cofferdam and dewatering of the work area, reducing water control costs on the project site. However, barge operations are costly and production rates can be slow when transfer of the sediment on-land is involved, adding to the cost.

A benefit of mechanical wet dredging is limiting impacts to aquatic habitat and the use of the remaining resource area during construction. Since the dredged sediment is saturated, the costs associated with dewatering of the dredge material are increased when compared to a dry dredge operation. Mechanical wet dredging is generally understood to result in a water to sediment ratio of approximately 1:1. A laydown area to allow excess water to drain off of the dredged material would be necessary, and excess water would need to be treated to remove any dissolved or suspended contaminants prior to discharge.

3.1.2 Hydraulic Dredging

Hydraulic dredging consists of using barges, pumps, and piping to create a slurry composed of sediment and water and pump it to a discharge location. Discharge sites often can consist of a series of detention/settling basins, geotextile tubes that retain sediment while releasing water, or mechanical dewatering equipment.

The cost effectiveness of hydraulic dredging increases in proportion to project size. Hydraulic dredging allows for the removal of large amounts of sediment very quickly, so projects that require the removal of large amounts of sediment are more likely to absorb more expensive mobilization costs presented by hydraulic dredging and realize savings through lower per unit costs. However, hydraulic dredging greatly increases the water content of sediment from in-situ levels, significantly increasing the volume of dredged

material that must be managed and dewatered. Hydraulic wet dredging is generally understood to result in a water to sediment ratio of approximately 10:1.

The ideal hydraulic dredging project is one in which dredging can continue unimpeded for extended durations without stopping and with a free discharge of the sediment slurry. Hydraulic dredging contractors will sometimes operate on a 24 hours per day, five to seven day per week basis to realize these savings.

If project constraints result in dredging downtime, such as discharging the sediment to mechanical dewatering equipment with limited throughput capacity or the need to selectively segregate sediments with differing contamination levels, the cost advantages of hydraulic dredging can be significantly reduced. Sunken logs, stumps, coarse rock, or significant vegetation can also cause significant delays in dredging production. Hydraulic dredging contractors may recommend that aquatic vegetation be harvested from weedy areas prior to dredging.

Feasibility concerns regarding the Neponset River include its location within the tidal zone, which may limit/impact hydraulic dredging options, and limited availability of upland areas where sediment dewatering could occur.

3.2 Dewatering Options

Technologies for the dewatering of dredged sediments are generally broken down into passive dewatering methods and mechanical dewatering technologies. Passive methods rely on natural evaporation and gravity to remove water from sediments and typically involve the pumping or trucking of dredged sediments to a centralized dewatering location consisting of settling basins or other means by which sediment particles settle out of the water for subsequent recovery and disposal. The discharged water is treated as necessary and returned to the water body. Chemical additives can be used at the front end of the dewatering process to enhance the initial separation of solids and reduce settling times or during the polishing processes to reduce turbidity of the final discharge.

Mechanical dewatering technologies rely on physical means to remove water from the sediment. These means involve various equipment technologies, such as belt filter presses, cyclones, or centrifuges to squeeze or spin or press water out of the sediment.

Passive dewatering approaches generally require larger land area and longer drying times to achieve the desired solids content prior to transporting off site for disposal. Drying times can be affected by local weather conditions at the time of the project. Additionally, measures must be incorporated into the final design of the dewatering area to reduce the risk of contamination of underlying soils and groundwater. To help conceptualize the area of land necessary to accommodate dewatering of 50,000 cubic yards of dredge material, the entire Squantum Point parking lot (approximately 750 feet long by 350 feet wide), would be covered in 5 feet of dredge material.

Active methods are typically employed in areas where little upland area is available and where rapid dewatering of the sediment is necessary to remove the material from the site due to inadequate storage space. Integrated approaches to dewatering sediment can include various combinations of passive and active technologies to achieve project goals.

3.2.1 Dewatering Basins

The use of dewatering basins to dewater sediment has been implemented in a number of instances for inland and coastal dredging projects in Massachusetts using both hydraulic and mechanical dredging techniques.

Mechanical Dredging - Wet mechanical dredging processes may require the use of containment basins to allow the dredged sediment to dewater. The required basin volume may be smaller than for wet mechanical dredging since mechanically dredged sediment has a lower water content (approximately 1:1) and less dewatering time is needed to prepare the material for hauling. Additionally, there is likely to be less mixing of freshly dredged sediment with sediment that has been consolidating in the basin, allowing removal and hauling of the sediment to the disposal site while dredging is still occurring.

Hydraulic Dredging – When hydraulic dredging is used, the required basins tend to be quite large to accommodate the higher water content (approximately 10:1), with the typical design approach planned for the 'last day' of dredging. A typical basin treatment train would consist of a primary 'containment' basin, sized to store the dredged sediment, and one or more secondary 'clarifying' or 'polishing' basins to reduce turbidity levels in the containment basin effluent.

The volume of the containment basin is sized to hold the total volume of sediment to be dredged plus an additional factor to allow for bulking of the sediment. The sediment suspended in the water discharged from the hydraulic dredge settles in the basin, with excess water flowing over the basin's outlet weir. Sand and some fine material will settle in the basin, while the discharge from the basin may contain finer particles that contribute to turbidity. On the last day of dredging, given generally sandy sediment the interface between the bulked sediment and excess water would reach the crest of the basin's outlet structure, at which point the basin becomes non-functional. In the case of finer sediments, the turbidity level of the discharge may begin to increase more gradually before the basin nears capacity.

The effluent of the containment basin is treated in the polishing basin, often with a flocculant added to improve settleability. Flocculant can also be added upgradient to the containment basin to improve overall settling, although the flocculant consumption would be much higher.

After dredging is completed, the sediment sits in the basin for an extended period, allowing the sediment to consolidate. A provision in the basin's outlet structure, such as stoplogs, will allow the water level to be lowered gradually, ultimately dewatering the basin and allowing the sediment to be removed. The consolidation/drawdown period can take years for fine sediment. Sandy sediments may bulk less and consolidate more quickly.

Several acres of land area would be required for construction of a basin of this size, neglecting the need for an additional polishing basin. Sufficient free land has not been identified for such a basin. As such, this option is not likely to be feasible.

In some instances, smaller containment basins have been used. Smaller basins require performing the work in stages, over the course of several years. Doing so increases the overall cost of the project by adding contractor mobilization and demobilization cycles.

Alternatively, rather than allowing for consolidation at the end of each dredging cycle, the sediment could be mechanically removed from the basins while the hydraulic dredging is occurring. This method was used to dredge large underwater tunnels at a power facility since inadequate land area was available for a full containment basin and access for mechanical dredging was not possible. For the Neponset River project, however, there is little advantage to this approach, since the sediment dredged from the containment basin would then need to be dewatered prior to trucking, in the same manner that sediment mechanically dredged directly from the project area would be.

3.2.2 Geotextile Dewatering Systems

Geotextile tubes are constructed of polypropylene woven fabrics in various lengths with inlets designed to meet the specific project needs. They are generally used to dewater hydraulically dredged sediment, since sediment can be pumped directly into the tubes from the dredging barge. Large debris drawn in by the dredge must be screened before sediment can be introduced into the tubes.

Liquids pass through the tube wall while sediments are trapped inside. Polymers may be added to accelerate the precipitation of fine suspended particles from the water column. Filled tubes will require additional drying time before they are cut open and the contents removed for disposal. Alternatively, in some cases, the sediment remains in the filled tubes for disposal. Purchase and set-up of the tubes can be expensive and additional disposal costs will be incurred in the disposal of the tube materials. The use of tubes reduces dredging production rates as a result of the additional setup time and the additional head loss imposed on the dredging pipeline.

Since using the tubes accelerates dewatering, a reduced land area is typically required compared to the use of a containment basin. Tubes can also be stacked, filled and dewatered in phases to further reduce land area requirements. However, the quality of effluent discharged from geotubes can be too turbid to discharge directly to a receiving water. Additional treatment is typically required. As a project of this magnitude would take several months to complete, the availability of sufficient land areas that are in close proximity to the Project Area (i.e., Squantum Point parking lot) must be evaluated in advance of project permitting to determine viability in light of construction period impacts.

3.2.3 Mechanical Dewatering Systems

A number of mechanical systems are available to dewater sediment following dredging. These systems are typically used for hydraulic dredging processes but some have the potential to be used for mechanical dredging. The primary advantage of mechanical dewatering systems includes greatly reduced land area requirements and the flexibility to meet stringent turbidity standards. Mechanical dewatering systems can also be implemented in such a way to reduce the risk of contaminating the soils at the dewatering area through contact with the sediment or excess water. The primary disadvantages include decreased production rates and higher cost. Increased energy consumption may also be a factor. Systems may use a series of processes to separate progressively smaller particles from the dredged slurry.

Technologies include

- Shale shakers (course sediment and debris)
- Screens (debris, coarse sediment, available for fine sediment)

- Hydrocyclones/desanders (coarse sediment)
- Belt filter presses (fine sediment)
- Centrifuges (fine sediment)
- Other proprietary technologies (e.g. capillary dewatering systems)

It is not typically necessary to specify the required technology during the planning or permitting phases. The planning or permitting approach would include designating the area where staging and dewatering would occur, developing water quality requirements, and then allowing prospective contractors to bid competitively using their preferred technology given the constraints. Based on the limited staging areas along the Project Area and significant volume of dredge sediment, mechanical dewatering will likely be necessary.

3.3 Intermediate Facility Siting Requirements

An Intermediate Facility, as regulated by the Massachusetts Section 401 Water Quality Certification Regulations of 314 CMR 9.00 is defined as:

> *A site or location that is to be utilized, on either a project-specific temporary or permanent basis, to manage dredged material prior to its ultimate reuse or disposal (e.g., barge unloading, stockpiling or storage, dewatering, processing or treatment, truck or train loading or unloading).*

This definition would apply to locations to be used for dewatering or temporary stockpiling. The requirements for intermediate facilities are more restrictive than the typical dredge requirements recognizing the potential for contaminants to be present in dredged material. An intermediate facility cannot be located:

- Within a drinking water source area (310 CMR 40.0006: Terminology, Definitions, and Acronyms), which includes:
  - A public groundwater supply Zone II or interim wellhead protection area.
  - The Zone A of a surface water supply.
  - Within 500 feet of a private water supply well.
- Less than ¼ mile upgradient or 250 feet downgradient of a surface drinking water supply.
- Within 500 feet of a health care facility, prison, elementary school, middle school, high school, pre-school, licensed day care center, senior center, or youth center, excluding storage or maintenance areas.
- Where traffic impacts from the facility would constitute an unacceptable impact to the public.
- Proximity to Environmental Justice populations.
- Where there would be a permanent adverse impact on rare species, an ecologically significant natural community, the habitat of any Wildlife Management Area, or an Area of Critical Environmental Concern.
- In a location where emissions would not meet state and federal air quality standards or criteria or that would constitute and unacceptable risk to the public or the environment.

Additional requirements are placed on the intermediate facility to further limit the impact to underlying soils and off-site areas.

- Dredged material shall be secured and activities performed so as not to threaten public health or the environment.
- Soil erosion and sedimentation is minimized, and control issues addressed.
- Material contaminated above RCS-1 standards is stored in containers or placed on an impermeable liner and covered.

Staging in proximity to dense residential areas including Environmental Justice populations and within the ACEC likely is not permittable or feasible for the project. Due to these constraints, there is limited upland available for staging for a maintenance dredge.

3.4 Sediment Reuse or Disposal Alternatives

As discussed in Section 2, preliminary sediment sampling data indicates that the sediment in the Project Area contains PCBs, chromium, and lead. Based on these findings, a preliminary review of disposal alternatives in accordance with 314 CMR 9.07 (as well as other more "site-specific" options) is presented below. The remediation of the Mother Brook site upstream of the proposed project site has served as a model for potential sediment disposal options.

3.4.1 Overview of Disposal Options

3.4.1.1 Ocean Disposal – Not Feasible

This disposal location option was determined not likely to be feasible based on preliminary sediment sample results that include elevated levels of PCBs. In general, there are a few select ocean disposal locations, including MassBay. EPA has guidelines for sampling parameters. After a permit application / dredging plan is submitted to the Army Corps of Engineers, review is case by case and holistic, including contaminant history, likelihood of contamination sources, and development of the adjacent area. "Trace" elements above specific detection levels would likely lead to required biological testing.

3.4.1.2 Beach Nourishment – Not Feasible

This disposal location option was determined not likely to be feasible based on preliminary sediment sample results that include elevated levels of PCBs, chromium, and lead, which are not suitable in areas of public access.

3.4.1.3 RCS-1 Facility Reuse – Not Feasible

Based on the preliminary sediment quality results, it was determined that the sediment will likely not be able to be reused at a facility licensed to accept materials below RCS-1 thresholds. In 8 out of 10 sediment samples collected during Tighe & Bond's sediment sampling program, PCBs or other contaminants exceeded RCS-1 standards. Advantages with these options are that the facilities are already able to accept these types of re-use materials. Disadvantages include greater hauling distances, the need to pay tipping fees, and the need to perform much more intensive sediment sampling beyond what is required for the 401 Water Quality Certification regulations.

3.4.1.4 MCP Site – Not Feasible

Dredged material containing oil and/or hazardous materials and that is not otherwise a hazardous waste may be brought from another location to a disposal site and utilized as part of a comprehensive remedial action under the MCP, provided that the material is reused at a location with similar contaminants, and other limitations. This is likely not

feasible for this project due to the volume of dredging material and complications related to permitting for the contaminated sediment.

3.4.1.5 Management under TSCA – May be Feasible

Sediment disposal resulting from this dredging project will likely need to be managed as waste in accordance with Federal Regulations 40 CFR 761 (TSCA) due to PCB contamination. This was the method used upstream during the Mother Brook site cleanup in 2009. Additional coordination and correspondence with EPA representatives will be necessary to determine if sediment generated from the Project Area might be managed in conjunction with the Lower Neponset River Superfund Site restoration activities. Following the 2022 designation of the Lower Neponset River Superfund Site, EPA is in the very early stages of determining initial project parameters, including target restoration goals. Whether the Project Area will be included in the delineated extent of the Superfund Site also remains to be determined. The current downstream extent of the Superfund Site is the Walter Baker Dam, which represents the transition from a freshwater river to the tidally influenced estuary that the Project Area falls within.

3.4.2 Analytical Testing Requirements

Tighe & Bond's preliminary sediment sampling program identified the presence of PCBs and metals at concentrations above RCS-1 values, and therefore upland reuse options would be limited. The presence of PCBs in sediment within the Project Area can be attributed to the Lower Neponset River Superfund Site, based on the similar PCB profile and the Project Area's location immediately downstream of the Superfund Site. While an EPA determination of whether the Project Area will be included in the designated Superfund Site will likely not occur for some time, Tighe & Bond is of the opinion that any disposal of sediment from the Project will be subject to EPA review and approval. The review and approval process will require additional collection of sediment samples to supplement existing data and delineate PCB distribution across the project area. Disposal facilities will also require additional sediment quality data prior to disposal, typically on a sample per volume basis (i.e., one sediment sample per 500 cubic yards).

3.4.3 Beneficial Use Determination

If the sediment has potential to be reused as a secondary material in various applications, approval by MassDEP must occur to evaluate the potential risk to public health, safety and the environment. The Beneficial Use Determination (BUD) application process includes three phases: Determination of Applicability, Pre-Application and Application. The Determination of Applicability is typically a desktop evaluation of potential use for the secondary material based on available contamination level data.

In addition to the results of the physical and chemical composition analysis, narrative describing the proposed use of the secondary material, the material the secondary material is replacing, and a description of how the proposed facility will re-use the material will accompany a pre-application to MassDEP. Furthermore, risk management techniques to be used during the processing and use of the secondary material shall be identified. A formal application can then be submitted to MassDEP further detailing any items requiring additional information as identified during the pre-application process. The permit timeline is typically 60-90 days.

3.5 Constraints

Based on review of previous studies/information sources and field reconnaissance, the following constraints are anticipated for the Neponset River Maintenance Dredging Project:

- Public support / abutters
- Regulatory requirements
- Access/staging locations
- Property available for dewatering system
- Analytic results of elevated PCBs
- Fisheries Time of Year restrictions; Shellfish habitat

Section 4
Regulatory Compliance

4.1 Summary of Anticipated Permits

Table 4-1 contains a list of federal, state, and local agencies from which permits or other actions are or may be required for the proposed dredge activities.

TABLE 4-1
Summary of Anticipated Permits

Agency	Permit, Review, or Approval
Federal	
U.S. Army Corps of Engineers (Corps)	Authorization under Section 10 of the Rivers and Harbors Act of 1899, Section 404 Authorization under 33 USC 408 (Section 408) of the Clean Water Act may be required for dredge at Squantum Channel and Columbia Point Channel due to proximity to the Federal Navigation Channel
U.S. EPA	PCB Disposal Plan / Risk-Based Cleanup Plan National Pollutant Discharge Elimination System (NPDES) Construction General Permit
State	
Executive Office of Energy and Environmental Affairs (EEA)	MEPA Review/Certificate of the Secretary on the ENF and mandatory EIR
Massachusetts Department of Environmental Protection (MassDEP)	• 401 Water Quality Certification • Superseding Order of Conditions (only required upon appeal of local Order of Conditions) • Chapter 91 Permit
Massachusetts Historical Commission (MHC) & Massachusetts Board of Underwater Archaeological Resources (MA BUAR)	Determination of No Adverse Effect
Coastal Zone Management	Federal Consistency Review
Local	
	Massachusetts Wetlands Protection Act (WPA)
Milton Conservation Commission	Order of Conditions per MA WPA and Milton Wetland Bylaw
Quincy Conservation Commission	Order of Conditions per MA WPA and Quincy Wetlands Protection Ordinance (QWPO)
Boston Conservation Commission	Order of Conditions per MA WPA and Boston Wetlands Protection Ordinance (BWPO)

4.2 Local Permits

4.2.1 MA Wetlands Protection Act and Local Wetlands Protection

Milton Wetland Bylaw

An Order of Conditions will be required from the Milton Conservation Commission as the dredging project would entail temporary and permanent Land Under Water (LUW) impacts. A Notice of Intent (NOI) must be prepared to procure an Order of Conditions from the Milton Conservation Commission pursuant to the MA WPA and Milton Wetland Bylaw. It is important to note that copies of the NOI are also reviewed concurrently by the MassDEP regional office.

Quincy Wetlands Protection Ordinance

An Order of Conditions will be required from the Quincy Conservation Commission as the dredging project would likely entail temporary and permanent LUW impacts within Quincy City limits. An NOI must be prepared to procure an Order of Conditions from the Quincy Conservation Commission pursuant to the MA WPA and QWPO.

Boston Wetlands Protection Ordinance

An Order of Conditions will be required from the Boston Conservation Commission as the dredging project would likely entail temporary and permanent LUW impacts within Boston City limits. An NOI must be prepared to procure an Order of Conditions from the Boston Conservation Commission pursuant to the MA WPA and BWPO.

4.3 State Permits

4.3.1 MEPA Environmental Notification Form (ENF) & Mandatory Environmental Impact Report (EIR)

The MEPA review process provides for coordinated state agency and public review of projects that meet certain review thresholds at 301 CMR 11.03, and that require a state agency action (e.g., permit, financial assistance, or a land transfer). Through the MEPA process, relevant state agencies are required to identify any aspects of the proposed project that require additional analysis or mitigation prior to completion of the agency action.

The proposed project requires several state approvals, including MassDEP 401 Water Quality Certification (WQC) and Chapter 91 permit. MEPA review encompasses the entirety of the project. Based on our understanding of the proposed project, the mandatory EIR threshold of alteration of ten or more acres of land of any other wetland impacts will be exceeded as approximately 14 acres of LUW are proposed to be altered. The project also exceeds MEPA's ACEC threshold. Therefore, the project will require an Environmental Notification Form (ENF) and Mandatory Environmental Impact Report (EIR). As the project is in proximity to Environmental Justice populations, enhanced outreach is required.

4.3.2 Section 401 Water Quality Certification

The 401 Water Quality Certification (WQC) Program is a program administered by MassDEP under the regulations set forth at 314 CMR 9.00. A Section 401 WQC is triggered by the filing of a federal permit if the project results in a temporary or permanent loss of 5,000 square feet cumulatively of bordering or isolated vegetated wetlands and/or land under water, the amount of any proposed dredging is greater than 100 cubic yards, or if any of the other thresholds listed in 314 CMR 9.04 are met. The 401 WQC application largely mimics the Corps filing detailed below, which requires application forms, a detailed narrative describing the project, site photographs, site plans and details, resource and municipal maps, and other required information. The removal of accumulated sediment will trigger the need to file an individual 401 WQC application with MassDEP for review and approval. Sediment sampling for the project has already been conducted and has identified significantly high levels of PCBs in the sediment. Sediment removal and management will need to be conducted in a manner that ensures the protection of human health, public safety, public welfare and the environment [33 U.S.C. 1251].

4.3.3 Chapter 91 MA Public Waterfront Act

Specific activities in flowed or filled tidelands are regulated by MassDEP under Chapter 91 and the Waterways regulations at 310 CMR 9.00, including subaqueous disposal of dredged spoils and dredging activities in any waterway in the Commonwealth. Dredging activities require a Chapter 91 Permit.

4.3.4 Massachusetts Historical Commission/Underwater Archaeological Resources

Projects that involve state or federal funding and/or approvals require review by the Massachusetts Historical Commission (MHC) to determine potential impacts to historic and/or archaeological resources and to ensure compliance with MGL c.9 § 26-27(c) and Section 106 of the National Historic Preservation Act. Additionally, underwater projects must contact the Board of Underwater Archeological Resources (MA BUAR) to determine whether the project will disturb underwater archaeological resources. It is generally recommended that a copy of the Project Notification Form (PNF) be submitted to MHC, MA BUAR and Tribal Historic Preservation Officers (THPOs) early in the permitting process.

4.4 Federal Permits

4.4.1 US Army Corps of Engineers Section 10 & 404

Corps Authorization under Section 404 of the Federal Clean Water Act and Section 10 of the Rivers and Harbors Act of 1899 is anticipated due to work within waters of the United States. We have assumed the project qualifies as "maintenance dredging" and that the project requires review under General Permit (MA GP) Category 5 Dredging. Section 404 and Section 10 can be filed as one application.

A permit application will be prepared and submitted to MassDEP, the Corps, the Office of Coastal Zone Management (CZM), and will be concurrently reviewed by the U.S. Environmental Protection Agency, the National Oceanic and Atmospheric Administration (NOAA) National Marine Fisheries Service (NMFS) and the U.S. Fish & Wildlife Service (USFWS).

In addition to environmental factors, the MA GP requires notification of the State Historic Preservation Officer (SHPO, e.g. Massachusetts Historical Commission), Tribal Historic Preservation Officers (THPOs) and the MA Board of Underwater Archeological Resources (MA BUAR) per Section 106.

4.4.2 US Army Corps of Engineers, Section 408

Corps Authorization for work in proximity to a Federal Navigation Channel is required under 33 USC 408 (Section 408). Coordination with the Corps will be initiated as part of the permitting process to confirm Corps standards. An application will be submitted to the Corps for review and approval.

4.4.3 NPDES Construction General Permit

If terrestrial (i.e. access, staging) and dewatered aquatic project areas will result in impacts greater than one acre of ground disturbance, the contractor will be required to register under the CGP and prepare a Storm Water Pollution Prevention Plan (SWPPP).

4.4.4 CZM Federal Consistency Review

Massachusetts Coastal Zone Management (CZM) implements the federal CZM Act federal consistency review process in Massachusetts. Federal consistency review is required for project proposals that are in or can reasonably be expected to affect the resources or land or water uses of the Massachusetts coastal zone; and require a federal license or permit, are federally funded or are a direct activity of a federal agency. The Massachusetts Coastal Zone Management Plan includes enforceable CZM program policies and underlying statutory and regulatory authorities. The policies provide Massachusetts priorities for protection and management of its coastal resources. The project must demonstrate that the proposed activities are consistent with enforceable CZM program policies.

4.5 Regulatory Coordination

Based on the resources in the project area, the following regulatory concerns are anticipated for the Neponset River dredge:

- MA Department of Marine Fisheries Time of Year restrictions: Alewife and Blueback Herring, American shad, Rainbow Smelt, American eel, White Perch, Atlantic tomcod, Winter flounder, and shellfish
- Shellfish habitat
- 401 WQC Project Specific Sediment Sampling Plan
- Army Corps Section 10 – Mitigation
- Disposal Location restriction due to PCBs
- Minimization of impacts to ACEC resources

Section 5
Opinion of Probable Conceptual Cost

A Preliminary OPCC for the project was developed based on our current understanding of the project, including site investigation activities completed to date, survey conducted by others, and review of existing data. The data was reviewed and compared to projects with similar constraints (i.e. TSCA regulated waste disposal), and Tighe & Bond consulted with industry experts in dredging and materials management to determine current estimated costs. At this early stage in the project, the anticipated accuracy range is +/-30% of the given value, although it is important to note that unknown factors (unidentified site conditions, Superfund Site OU designation, permitting requirements) could increase costs beyond this range.

Based on a unit cost of $500 per cubic yard (cy) of dredge material, our preliminary OPCC indicates that the total project could range from $25,000,000 (50,000 cy) to $37,500,000 (75,000 cy). The estimated sediment disposal costs for the alternatives range from approximately $15,000,000 to $22,500,000. For comparison, if the dredge material were free of contaminants and eligible for open water disposal (i.e. Mass Bay, Foul Area), disposal costs would be expected to be in the range of $50 per cy ($2,500,000 to $3,750,000).

As we have identified throughout this summary report due to the PCBs in the sediment, significant additional coordination with Federal and State regulatory agencies will be necessary to satisfy TSCA requirements. It will be important to coordinate pre-permitting meetings with regulatory agencies early in the process to initiate discussions regarding any time of year restrictions (fisheries), project staging and support area constraints, and sediment management options.

Based on the significant costs associated with the proposed maintenance dredging project, the Town of Milton may elect to lobby EPA for the project area to be included as an OU under the Lower Neponset River Superfund Site. During investigation and remediation, a Superfund Site can be divided into several distinct areas depending on the complexity of the problems associated with the site. These areas (OUs) may address geographic areas of a site, specific site problems, or areas where a specific action is required. Inclusion into the Superfund Site as an OU would likely allow the Town to realize significant cost savings over proceeding with the project independently, however, the timeline for EPA's investigation and remediation of the Superfund Site may result in the project extending into the late 2020s or 2030s.

Section 6
Preliminary Project and Permitting Schedule

A Preliminary Project and Permitting Schedule is provided in Appendix D.

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Tighe&Bond

APPENDIX A

Neponset River Maintenance Dredging Project - Sediment Sampling and Analysis Summary

TO: Tim Czerwienski, AICP, Town of Milton

FROM: Gary Hedman, LSP, Tighe & Bond

COPY: Tracy Adamski, AICP, David A. Murphy, PE, Tighe & Bond

DATE: August 3, 2022

This memorandum describes the sediment sampling and laboratory analysis conducted as part of the Feasibility Study for the Lower Neponset River, Milton, Massachusetts, in accordance with our June 15, 2022 contract. The sediment sampling activities were completed to provide a baseline understanding of sediment quality in areas where the existing vessel channel has become more narrow/shallow than the permitted width and depth. The project area is located within an urban watershed environment with a complex history of industrial and manufacturing in areas upstream of the project area. The project area is located immediately downstream of the recently designated Neponset River Superfund Site. Our sediment sampling activities indicate that sediment within the project area is impacted by low levels of polychlorinated biphenyls ("PCBs") and other anthropogenic contaminants typical of urban watersheds.

To evaluate the sediment quality and the extent of possible PCB impacts, sediment sampling was conducted in several proposed dredge areas including:

- Milton Landing – In support of maintenance dredging of a channel and basin in the Neponset River downstream of Milton Landing and improvement dredging in the vicinity of Milton Landing
- Neponset River Channel – Maintenance dredging of a 50-foot channel to a depth of six feet at Mean Low Tide in accordance with the Chapter 353 of the Act of 1923
- Squantum Channel – Located between Squantum Ferry Dock and the Dorchester Bay Federal Navigation Channel
- Columbia Point Channel (UMass Ferry Channel) – Located between Columbia Point (John T. Fallon State Pier at UMass) and the Dorchester Bay Federal Navigation Channel

The project area, focus area described above, sediment sampling locations, and key information are provided in Figure 1 in Appendix A.

In October 2021, J.R. Cashman Marine Contractors of Quincy, Massachusetts completed a bathymetric survey of the project area on behalf of the Project Team. In accordance with the Chapter 353 of the Act of 1923, the channel has a permitted width of 50 feet and depth of six feet at Mean Low Tide. Tighe & Bond utilized the 2021 bathymetric data and permitted channel width and depth to develop preliminary dredge volume estimates for the project area. Draft stationing and channel cross section plans are provided in Figures 2 and 3 in Appendix A.

Based on our preliminary calculations for the dredge areas, approximately 10,000 cubic yards of sediment would need to be removed to return the Neponset River Channel to its width and depth. In addition, approximately 40,000 cubic yards of sediment would potentially be generated from channel dredging and improvement dredging in the immediate vicinity of Milton Landing. The preliminary calculations for the Milton Landing area are based the

approximate limits of an area previously authorized to be dredged, as shown of Figure 11A of the Neponset River Estuary Area of Critical Environmental Concern ("ACEC") Resource Management Plan (dated March 1996) and the dredge area proposed by Childs Engineering Corporation in their Results Summary Report for the Hydrographic Survey at Milton Landing and Proposed Site Improvements (dated May 18, 2018).

Estimated dredge volumes for the Squantum Channel and Columbia Point Channel will be completed once a bathymetric survey of these areas has been completed, and will be included in the final deliverable for the Feasibility Study.

As described in more detail below, sediment samples were collected from each of the proposed dredge areas and analyzed for the chemical parameters defined in the 401 Water Quality Certification parameters (314 CMR 3.07(2)(b)(6)). The data indicates that PCBs, chromium, and lead are present in sediment above the Massachusetts Department of Environmental Protection ("MassDEP") reportable concentrations for soil ("RCS-1") criteria, as defined in 310 CMR 40.0933: Identification of Applicable Soil Categories and 40.1600: Massachusetts Oil and Hazardous Material List.

Additionally, sediment quality data were compared to the COMM-97-01 acceptance criteria that regulates disposal of contaminated sediment at Massachusetts landfills. PCBs are present in the Milton Landing and Neponset River Channel dredge area at concentrations greater than the COMM 97-01 unlined and lined landfill acceptance criteria, indicating that, at a minimum, a portion of the dredge material will have to be managed at an out-of-state landfill licensed to accept PCB contaminated sediment.

Sediment Sampling and Analysis

On June 27, 2022, Tighe & Bond and CR Environmental of Falmouth, Massachusetts, collected 11 discrete sediment cores using a vessel-based vibracore sampling system. Each sediment core was advanced to six feet below the channel floor. At each sediment core location, Tighe & Bond collected information on water depth and recovery, and the location was recorded with a vessel-based GPS unit. The sediment core locations are shown on the Site Plan in Appendix A. Sediment core locations within the Neponset River channel were located in areas where deposition has resulted in a narrow or shallower channel than permitted, as identified by a bathymetric survey completed by J.R. Cashman Marine Contractors in October 2021 in support of preliminary project planning.

Sediment cores were field screened at 0.5 to 1 foot intervals using a photoionization detector (PID) and physically characterized prior to submittal for laboratory analysis. In general, proposed dredge material consisted of inorganic silt with varying amounts of sand, trace organic materials, and trace shells. Field screening results and sediment descriptions are provided in Appendix B.

Following characterization, a composite sediment sample from 10 of the 11 cores was submitted to ESS Laboratory of Cranston Rhode Island for the following parameters:

- Metals – Arsenic, Cadmium, Chromium, Copper, Lead, Mercury, Nickel, and Zinc
- Polycyclic Aromatic Hydrocarbons (PAHs)
- PCBs Congeners (PCB Aroclor Results Pending)
- Extractable Petroleum Hydrocarbons
- Volatile Organic Compounds (VOC) – Grab sample obtained from portion of each core with the highest PID reading

- Total Organic Carbon (TOC)
- Percent Water
- Grain Size Distribution
- Toxicity Characteristic Leaching Procedure (TCLP) as applicable

Laboratory analytical results were compared to the MassDEP RCS-1 and COMM 97-01 unlined and lined landfill acceptance criteria to determine potential management options for the sediment. Laboratory results indicated that PCBs, total chromium, and total lead are present in sediment at concentrations greater than MassDEP RCS-1 values. The presence of these contaminants at concentrations above RCS-1 values eliminates the potential for unrestricted (upland) reuse of sediment during dredging activities (i.e. for beach nourishment).

The exceedances are shown on Figure 1 in Appendix and are as follows:

- **PCBs** – Total PCB congeners exceeded the RCS-1 value of 1.0 milligram per kilogram (mg/kg) in samples SED-101, SED-102, SED-103, SED-105, SED-108, and SED-109 with total PCB concentrations in these samples ranging from 1.95 mg/kg to 7.46 mg/kg.
- **Chromium** – Total Chromium exceeded the RCS-1 value of 100 mg/kg in samples SED-101, SED-102, SED-103, SED-105, SED-109, and SED-110 with total chromium concentrations in these samples ranging from 105 to 173 mg/kg.

  Hexavalent chromium and TCLP testing were conducted on these samples. Hexavalent chromium was detected above method reporting limits (MRLs) but below the RCS-1 values of 100 mg/kg in SED-101 and SED-102 at concentrations of 2.0 mg/kg and 2.8 mg/kg, respectively. TCLP Chromium was detected slightly above the MRLs in SED-109 at a concentration of 0.022 milligrams per liter (mg/L), below the TCLP threshold of 5.0 mg/L. Please note that the Hexavalent chromium and TCLP Chromium data for sample SED-106 was not included in the initial laboratory report, and results are pending.
- **Lead** – Total Lead exceeded the RCS-1 value of 200 mg/kg in samples SED-109 at a concentration of 263 mg/kg. Lead was detected above the TCLP screening threshold of 100 mg/kg in samples SED-101 through SED-110 and, therefore, TCLP testing was conducted on these samples. TCLP Lead was detected slightly above the MRLs in SED-101, SED-102, SED-103, SED-105, SED-106, SED-108, SED-109, and SED-110 with concentrations ranging from of 0.067 mg/L to 0.137 mg/L, below the TCLP threshold of 5 mg/L.

Based on sediment sampling data collected to date, it appears that PCBs will be the limiting factor for determining sediment management options. With the recent designation of the Neponset River Superfund Site, a key component to advancing the lower Neponset River dredging project will be to determine whether PCB impacted sediment would be designated as a PCB remediation waste in accordance with Federal Regulations 40 CFR 761, the Toxic Substances Control Act ("TSCA"). Coordination and correspondence with United States Environmental Protection Agency ("EPA") representatives is recommended to determine if sediment generated during dredging of the lower Neponset River might be managed in conjunction with Superfund site restoration activities.

Next Steps

With the preliminary sediment sampling activities complete, the Project Team now has a baseline understanding of sediment quality within the project area. As noted previously, based

on the urban watershed and industrial history of the upper Neponset River, the presence of contaminants in sediment was expected.

With established sediment quality data, the following are recommended to advance the project through the next phases.

- Preliminary project coordination / outreach with MassDEP 401 WQC Program/Chapter 91, and Army Corps of Engineers (ACOE) personnel (August - September 2022)
- Project coordination with the Neponset River Watershed Association and other key stakeholders (August - September 2022)
- Outreach and coordination with U.S. EPA Superfund and EPA Region 1 personnel to determine applicability of TSCA regulations and identify potential sediment disposal options (August - September 2022)
- Initial outreach to sediment disposal facilities to determine potential sediment management alternatives and costs (September-October 2022)
- Identification of feasible dredge alternatives (i.e. hydraulic dredging, clamshell dredging) and sediment dewatering alternatives (September - October 2022)
- Preparation of preliminary Opinions of Probable Cost ("OPCs") for planning purposes (October – November 2022)
- Additional bathymetric survey of the Squantum and UMass Ferry Channels (to be determined)

Appendices

Appendix A – Aerial Map Showing Sampling Locations and Project Area Cross Sections

Appendix B – Summary Tables

Appendix C – Laboratory Report

Appendix D – Limitations

\\tighebond.com\data\Data\Projects\M\M5087 Town of Milton\003 Neponset Dredge\Reports\2022-08 Sediment Sampling Summary Memo\2022-08 Sediment Sampling Summary Memo.docx

Appendix A

FIGURE 1
SEDIMENT SAMPLING LOCATIONS

Inset 1

SED-106
Total Chromium: 114
Hex Chromium: Data Pending
TCLP Chromium: Data Pending
Total Lead: 181
TCLP Lead: 0.075
Total PCBs: 0.58083

SED-103
Total Chromium: 113
Hex Chromium: <1.0
TCLP Chromium: <0.020
Total Lead: 157
TCLP Lead: 0.136
Total PCBs: 7.46498

SED-102
Total Chromium: 115
Hex Chromium: 2.8
TCLP Chromium: <0.020
Total Lead: 188
TCLP Lead: 0.09
Total PCBs: 2.06786

SED-101
Total Chromium: 122
Hex Chromium: 2
TCLP Chromium: <0.020
Total Lead: 184
TCLP Lead: 0.11
Total PCBs: 1.94543

SED-105
Total Chromium: 105
Hex Chromium: <1.0
TCLP Chromium: <0.020
Total Lead: 146
TCLP Lead: 0.088
Total PCBs: 2.37908

SED-104
Sample not submitted for laboratory analysis

SED-107
Total Chromium: 98.7
Hex Chromium: -
TCLP Chromium: -
Total Lead: 134
TCLP Lead: <0.050
Total PCBs: 0.69846

SED-111
Total Chromium: 45.6
Hex Chromium: -
TCLP Chromium: -
Total Lead: 34.9
TCLP Lead: -
Total PCBs: 0.03018

SED-110
Total Chromium: 166
Hex Chromium: <0.8
TCLP Chromium: <0.020
Total Lead: 112
TCLP Lead: 0.072
Total PCBs: 0.18935

Inset 2

SED-109
Total Chromium: 173
Hex Chromium: <0.8
TCLP Chromium: 0.022
Total Lead: 263
TCLP Lead: 0.069
Total PCBs: 6.58508

SED-108
Total Chromium: 90
Hex Chromium: -
TCLP Chromium: -
Total Lead: 134
TCLP Lead: 0.067
Total PCBs: 2.47775

Federal Channel

Neponset Avenue Bridge

Neponset River Channel

Adams Street

Milton Landing

See Inset 1

See Inset 2

Neponset River

BOSTON

MILTON

QUINCY

LEGEND

- Sediment Sampling Location
- Federal Channel Area
- Dredging Project Extent (Approx.)
- Municipal Boundary

LOCUS MAP

Main Map

0 1,000 2,000
Feet

1 inch = 2,000 feet

Inset 1 & 2

0 200 400
Feet

1 inch = 400 feet

NOTES

1. Imagery provided by MassGIS (2019).
2. Federal Channel Area downloaded from USACE.
3. Data is reported in miligrams per kilogram (mg/kg).
4. Red Sample Concentrations: Indicates concentration exceedanced of MassDEP Reportable Concentrations (Category RCS-1).
5. Blue Sample Concentrations: Indicates concentrations exceedanced of the 20x Rule Screening Threshold but were below MassDEP Reportable Concentrations Category RCS-1

Neponset River
Boston, Milton & Quincy
Massachusetts

August 2022

Tighe&Bond

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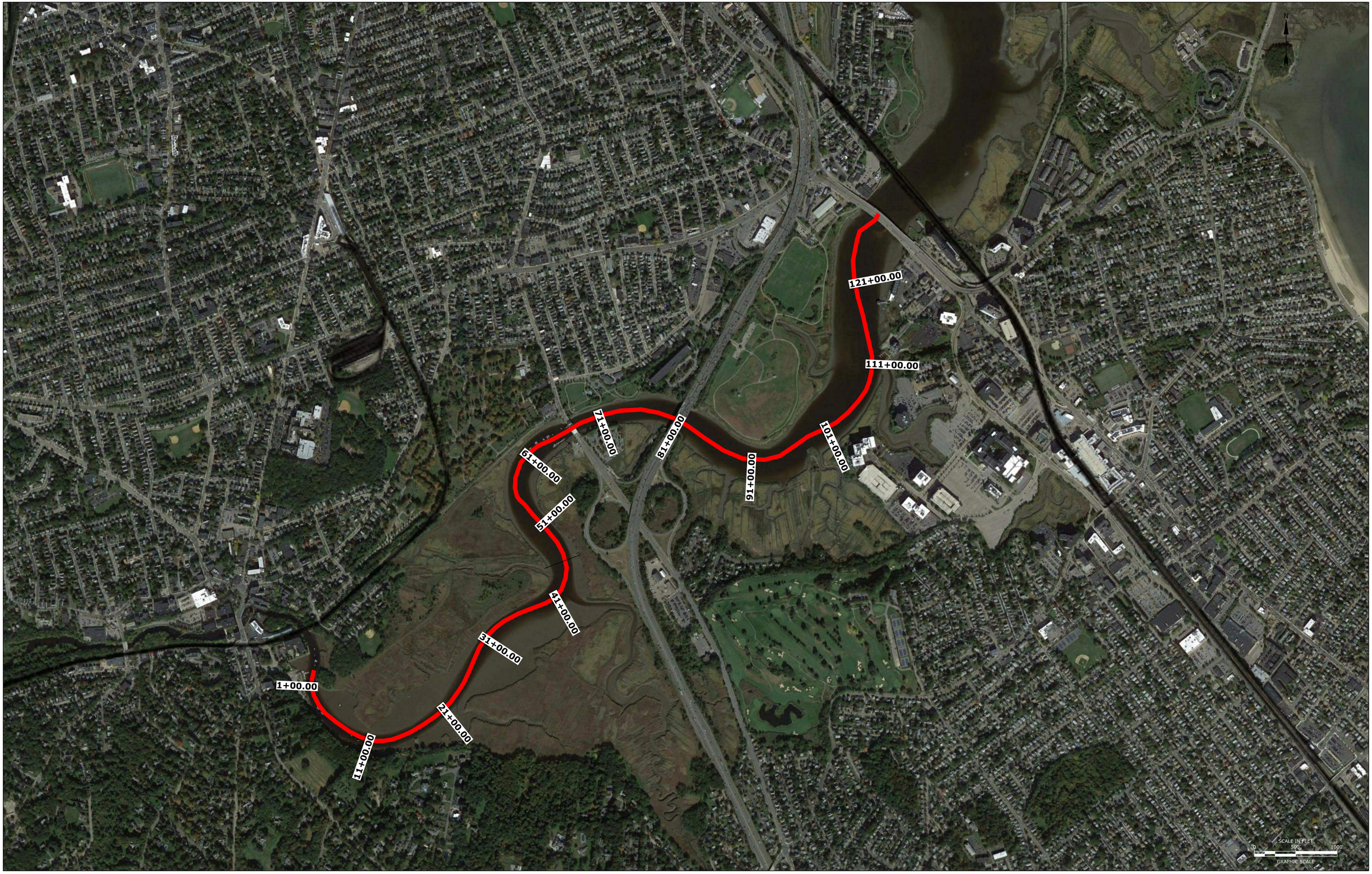
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SCALE IN FEET
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GRAPHIC SCALE

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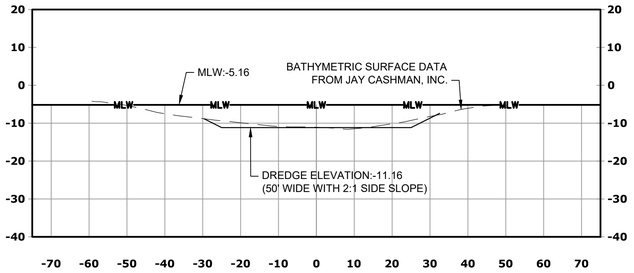

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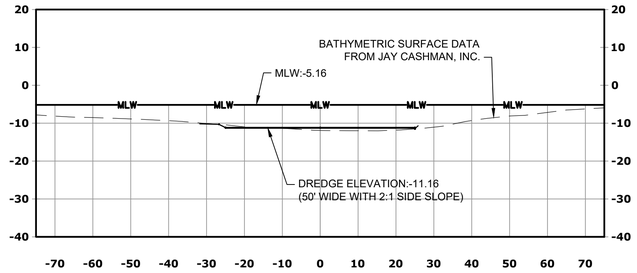

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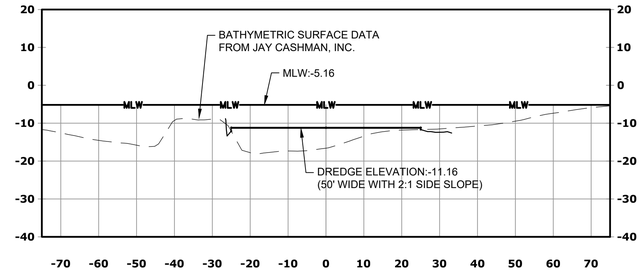

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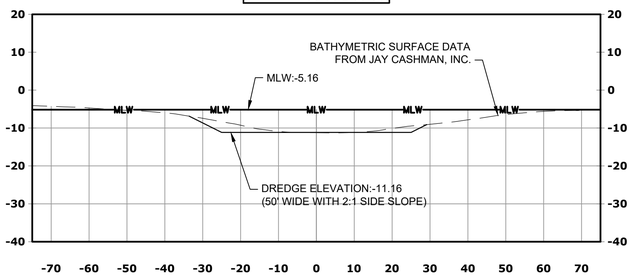

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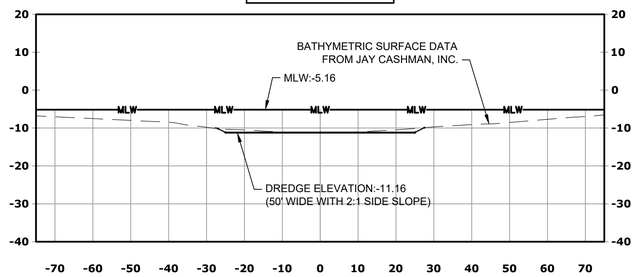

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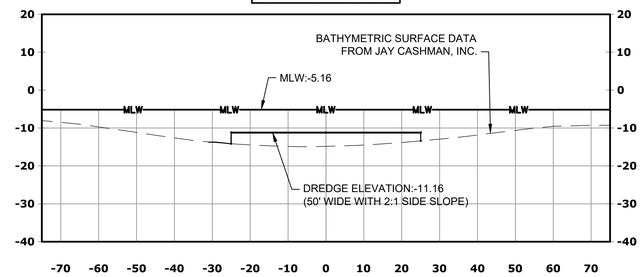

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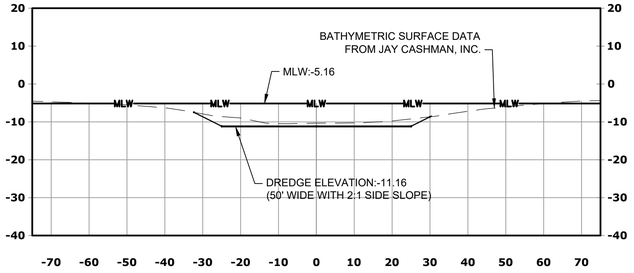

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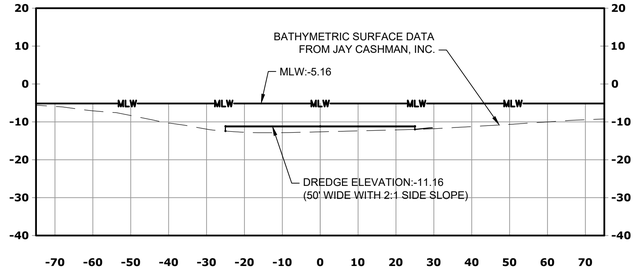

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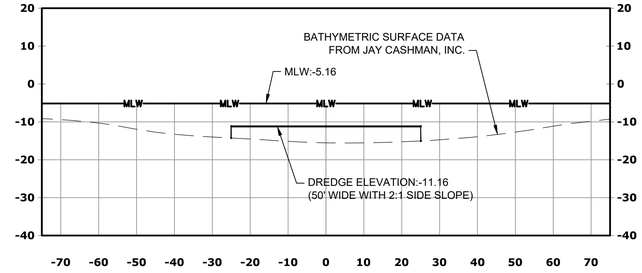

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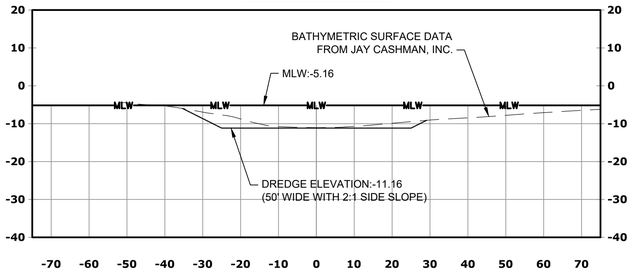

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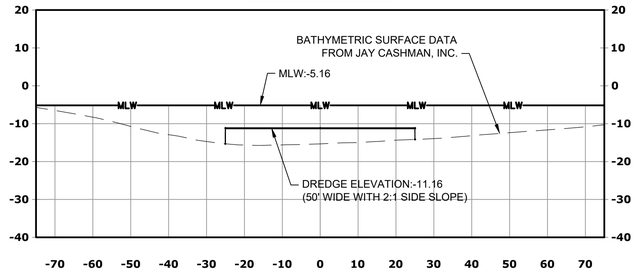

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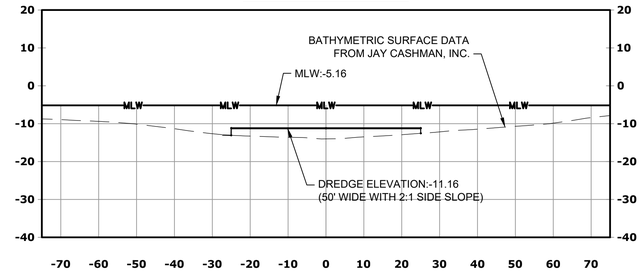

SCALE IN FEET
0 20' 40'
GRAPHIC SCALE

Appendix B

SITE INFORMATION: Neponset River Sediment Sampling June 2022

Field Screening Summary Table			
Composite Sample ID	**Depth (feet)**	**PID**	**Observations**
SED-101	0-1	0	0-5.5' Dark gray, ORGANIC SILT, some Sand Composite sample from 0-5.5' Grab sample from 0-1'
	1-2	0	
	2-3	0	
	3-4	0	
	4-5	0	
SED-102	0-1	0	0-5.25' Dark gray, ORGANIC SILT, some Sand, trace leaves Composite sample from 0-5.25' Grab sample from 0-1'
	1-2	0	
	2-3	0	
	3-4	0	
	4-5	0	
SED-103	0-1	0	0-5.5' Dark gray, ORGANIC SILT, and SAND, trace shells Composite sample from 0-5.5' Grab sample from 0-1'
	1-2	0	
	2-3	0	
	3-4	0	
	4-5	0	
SED-104	0-1	0	0-5.5' Dark gray, ORGANIC SILT, some Sand No sample submitted to Lab
	1-2	0	
	2-3	0	
	3-4	0	
	4-5	0	
SED-105	0-1	0	0-5.5' Dark gray, ORGANIC SILT, some Sand Composite sample from 0-5.5' Grab sample from 0-1'
	1-2	0	
	2-3	0	
	3-4	0	
	4-5	0	
SED-106	0-1	0	0-4.9' Black, ORGANIC SILT and SAND, trace leaves Composite sample from 0-3' Grab sample from 0-1'
	1-2	0	
	2-3	0	
	3-4	0	
	4-5	0	
SED-107	0-1	0	0-5.5' Black, ORGANIC SILT, little Sand, trace leaves Composite sample from 0-3' Grab sample from 0-1'
	1-2	0	
	2-3	0	
	3-4	0	
	4-5	0	
SED-108	0-1	0	0-2' Black, ORGANIC SILT, some Sand, trace wood, trace shells 2-2.5' Fibrous material 2.5-3.5' Black, ORGANIC SILT, some Sand 3.5-5.5' Gray/Brown CLAY Composite sample from 0-3' Grab sample from 0-1'
	1-2	0	
	2-3	0	
	3-4	0	
	4-5	0	

Field Screening Summary Table			
Composite Sample ID	**Depth (feet)**	**PID**	**Observations**
SED-109	0-0.5	0.6	0-3' Black, ORGANIC SILT, some Sand 3-3.5' Fibrous material 3.5-5.4' Brown SILT, trace Gravel Composite sample from 0-3.5' Grab sample from 1.5-2.0'
	0.5-1	0	
	1-1.5	1.2	
	1.5-2.0	1.6	
	2.0-2.5	0.8	
	2.5-3.0	0.5	
	3.0-3.5	0	
	3.5-4.0	0.3	
	4.0-4.5	0	
	4.5-5.0	0.2	
	5.0-5.5	0	
SED-110	0-1	0	0-5.5' Black, ORGANIC SILT, some SAND, trace shells Composite sample from 0-5.5' Grab sample from 0-1'
	1-2	0	
	2-3	0	
	3-4	0	
	4-5	0	
SED-111	0-0.5	2.5	0-3' Black, ORGANIC SILT, some SAND 3-4.6' Gray, fine to coarse SAND, trace Silt Composite sample from 0-3' Grab sample from 0-0.5'
	0.5-1	1.7	
	1-1.5	1.3	
	1.5-2.0	0.8	
	2.0-2.5	0.7	
	2.5-3.0	0	
	3.0-3.5	0	
	3.5-4.0	0	

TABLE 1
Summary of Sediment Analytical Data
Neponset Dredge Sampling
Milton, Massachusetts

Tighe&Bond

	RCS-1	TCLP Threshold (mg/L)	20x Rule Screening Threshold	COMM-94 Lined Landfill	Units	SED-101	SED-102	SED-103	SED-105	SED-106
Miscellaneous/Inorganics										
Percent Ash	NS	NS	NS	NS	%	-	-	-	-	-
Percent Moisture	NS	NS	NS	NS	%	59	60	56	56	63
Percent Solid	NS	NS	NS	NS	%	41	40	44	44	37
Total Organic Carbon (TOC)	NS	NS	NS	NS	mg/kg	63,300	63,100	61,400	50,000	55,200
Metals, Total										
Arsenic	20	NS	100	40	mg/Kg	6.82	6.61	8.08	7.36	10.3
Cadmium	70	NS	20	80	mg/Kg	2.87	3.11	2.64	2.96	1.71
Chromium	100	NS	100	1,000	mg/Kg	**122**	**115**	**113**	**105**	**114**
Chromium (VI)	100	NS	100	NS	mg/Kg	2	2.8	<1.0	<1.0	Pending
Copper	1000	NS	NS	NS	mg/Kg	117	109	110	102	138
Lead	200	NS	100	2,000	mg/Kg	184	188	157	146	181
Mercury	20	NS	4	10	mg/kg	1.62	1.58	1.40	1.31	1.30
Nickel	600	NS	NS	NS	mg/Kg	14.8	14.1	15.3	15.8	18.2
Zinc	1000	NS	NS	NS	mg/Kg	210	201	187	176	238
Metals, TCLP										
TCLP Chromium	NS	5	NS	NS	mg/L	<0.020	<0.020	<0.020	<0.020	Pending
TCLP Lead	NS	5	NS	NS	mg/L	0.110	0.090	0.136	0.088	0.075
Polynuclear Aromatic HC By SW8270D										
Acenaphthene	4	NS	NS	NS	mg/Kg	<0.020	<0.020	<0.019	<0.018	<0.018
Acenaphthylene	1	NS	NS	NS	mg/Kg	<0.020	<0.020	<0.019	0.028	0.019
Anthracene	1000	NS	NS	NS	mg/Kg	<0.020	<0.020	<0.019	0.046	0.044
Benz(a)anthracene	7	NS	NS	NS	mg/Kg	0.081	0.095	0.063	0.228	0.236
Benzo(a)pyrene	2	NS	NS	NS	mg/Kg	0.097	0.114	0.071	0.285	0.274
Benzo(b)fluoranthene	7	NS	NS	NS	mg/Kg	0.084	0.105	0.064	0.276	0.274
Benzo(ghi)perylene	1000	NS	NS	NS	mg/Kg	0.074	0.086	0.051	0.206	0.189
Benzo(k)fluoranthene	70	NS	NS	NS	mg/Kg	0.093	0.104	0.058	0.246	0.226
Chrysene	70	NS	NS	NS	mg/Kg	0.106	0.125	0.084	0.308	0.309
Dibenz(a,h)anthracene	0.7	NS	NS	NS	mg/Kg	<0.020	<0.020	<0.019	<0.018	<0.018
Fluoranthene	1000	NS	NS	NS	mg/Kg	0.178	0.209	0.125	0.463	0.468
Fluorene	1000	NS	NS	NS	mg/Kg	<0.020	<0.020	<0.019	<0.018	<0.018
Indeno(1,2,3-cd)pyrene	7	NS	NS	NS	mg/Kg	0.060	0.073	0.042	0.181	0.166
2-Methylnaphthalene	0.7	NS	NS	NS	mg/Kg	<0.020	<0.020	<0.019	<0.018	<0.018
Naphthalene	4	NS	NS	NS	mg/Kg	0.029	0.029	0.024	0.035	0.026
Phenanthrene	10	NS	NS	NS	mg/Kg	0.092	0.099	0.061	0.211	0.219
Pyrene	1000	NS	NS	NS	mg/Kg	0.188	0.229	0.139	0.543	0.560
Total PAHs	NS	NS	NS	100	mg/Kg	1.082	1.268	0.782	3.056	3.01
MA EPH Aliphatic/Aromatic Ranges By MA EPH 5/2004										
C11-C22 Aromatic Hydrocarbons*	1000	NS	NS	NS	mg/Kg	61.5	60.7	52.8	79.8	47.1
C9-C18 Aliphatic Hydrocarbons	1000	NS	NS	NS	mg/Kg	<36.9	<37.6	<35.9	<34.5	<33.3
C19-C36 Aliphatic Hydrocarbons	3000	NS	NS	NS	mg/Kg	65.4	69.9	79.1	196	93.4

TABLE 1
Summary of Sediment Analytical Data
Neponset Dredge Sampling
Milton, Massachusetts

	RCS-1	TCLP Threshold (mg/L)	20x Rule Screening Threshold	COMM-94 Lined Landfill	Units	SED-101	SED-102	SED-103	SED-105	SED-106
Polychlorinated Biphenyl (PCBs) Congeners										
PCB-8	NS	NS	NS	NS	mg/Kg	0.130	0.149	1.09	0.294	0.0472
PCB-18	NS	NS	NS	NS	mg/Kg	0.162	0.208	1.77	0.413	0.0857
PCB-28	NS	NS	NS	NS	mg/Kg	0.435	0.481	1.98	0.504	0.0869
PCB-44	NS	NS	NS	NS	mg/Kg	0.197	0.213	0.660	0.236	0.0512
PCB-52	NS	NS	NS	NS	mg/Kg	0.279	0.293	1.31	0.355	0.0688
PCB-66	NS	NS	NS	NS	mg/Kg	0.299	0.307	0.168	0.203	0.0535
PCB-101	NS	NS	NS	NS	mg/Kg	0.151	0.149	0.148	0.124	0.0521
PCB-105	NS	NS	NS	NS	mg/Kg	0.0358	0.0343	0.0361	0.0294	0.0101
PCB-118	NS	NS	NS	NS	mg/Kg	0.0943	0.0874	0.116	0.0784	0.0371
PCB-128	NS	NS	NS	NS	mg/Kg	0.0101	0.00804	0.0107	0.00770	0.00476
PCB-138	NS	NS	NS	NS	mg/Kg	0.0534	0.0490	0.0550	0.0469	0.0281
PCB-153	NS	NS	NS	NS	mg/Kg	0.0581	0.0531	0.0590	0.0485	0.0290
PCB-170	NS	NS	NS	NS	mg/Kg	0.00738	0.00689	0.0117	0.0105	0.00698
PCB-180	NS	NS	NS	NS	mg/Kg	0.0155	0.0129	0.0255	0.0132	0.00859
PCB-187	NS	NS	NS	NS	mg/Kg	0.00999	0.0094	0.0147	0.00901	0.00603
PCB-195	NS	NS	NS	NS	mg/Kg	0.00219	0.00203	0.0032	0.00181	0.00127
PCB-206	NS	NS	NS	NS	mg/Kg	0.00376	0.00351	0.00446	0.00292	0.00207
PCB 209	NS	NS	NS	NS	mg/Kg	0.00191	0.00129	0.00262	0.00174	0.00143
Total PCB Congeners	1	NS	NS	2	mg/Kg	**1.95**	**2.07**	**7.46**	**2.38**	0.581
PCB Aroclor										
Total PCB Aroclors	1	NS	NS	2	mg/Kg	Pending	Pending	Pending	Pending	Pending
Grain Size										
Gravel	NS	NS	NS	NS	%	0	0	0	0	0
Sand	NS	NS	NS	NS	%	23.4	22.8	42.8	31.7	37.1
	NS	NS	NS	NS	%	76.6	77.2	57.2	68.3	62.9
Silt/Clay	NS	NS	NS	NS	%					
VOCs by 8260B										
Acetone	6	NS	NS	NS	mg/Kg	0.223	0.390	0.203	0.213	0.527
Carbon disulfide	100	NS	NS	NS	mg/Kg	0.0128	0.0176	0.0206	0.0162	<0.0124
VOCs (Total)	NS	NS	NS	10	mg/Kg	0.236	0.408	0.224	0.229	0.527

1. S-1/GW-1, S-1/GW-2, and S-1/GW-3 (Method 1 Risk Values) found in Table 2 of the Massachusetts Contingency Plan (MCP; 2015) in Section 40.0975.
2. RCS-1: MCP RCS-1 2008 Reportable Concentrations Criteria current as of February 14, 2008
* C11-C22 Aromatic Hydrocarbons exclude the concentration of Target PAH analytes eluting in that range
Bold numbers indicates result detected above method detection limit (MDL)

TABLE 1
Summary of Sediment Analytical Data
Neponset Dredge Sampling
Milton, Massachusetts

Tighe&Bond

	RCS-1	TCLP Threshold (mg/L)	20x Rule Screening Threshold	COMM-94 Lined Landfill	Units	SED-107	SED-108	SED-109	SED-110	SED-111
Miscellaneous/Inorganics										
Percent Ash	NS	NS	NS	NS	%	-	-	-	-	-
Percent Moisture	NS	NS	NS	NS	%	66	59	49	50	40
Percent Solid	NS	NS	NS	NS	%	34	41	51	50	60
Total Organic Carbon (TOC)	NS	NS	NS	NS	mg/kg	55,900	57,100	46,800	32,300	13,700
Metals, Total										
Arsenic	20	NS	100	40	mg/Kg	9.6	7.98	10.2	5.79	3.09
Cadmium	70	NS	20	80	mg/Kg	1.31	1.72	5.86	2.13	0.27
Chromium	100	NS	100	1,000	mg/Kg	98.7	90	**173**	**166**	45.6
Chromium (VI)	100	NS	100	NS	mg/Kg	-	-	<0.8	<0.8	-
Copper	1000	NS	NS	NS	mg/Kg	109	94.3	180	128	35.7
Lead	200	NS	100	2,000	mg/Kg	134	134	**263**	112	34.9
Mercury	20	NS	4	10	mg/kg	1.09	1.29	1.45	1.54	0.366
Nickel	600	NS	NS	NS	mg/Kg	16.2	14.4	19.2	19.1	11.1
Zinc	1000	NS	NS	NS	mg/Kg	187	163	285	170	60.5
Metals, TCLP										
TCLP Chromium	NS	5	NS	NS	mg/L	-	-	0.022	<0.020	-
TCLP Lead	NS	5	NS	NS	mg/L	<0.050	0.067	0.069	0.072	-
Polynuclear Aromatic HC By SW8270D										
Acenaphthene	4	NS	NS	NS	mg/Kg	<0.019	<0.020	0.017	<0.016	<0.014
Acenaphthylene	1	NS	NS	NS	mg/Kg	<0.019	0.025	0.043	0.024	<0.014
Anthracene	1000	NS	NS	NS	mg/Kg	0.036	0.045	0.058	0.040	<0.014
Benz(a)anthracene	7	NS	NS	NS	mg/Kg	0.194	0.185	0.241	0.166	0.050
Benzo(a)pyrene	2	NS	NS	NS	mg/Kg	0.240	0.204	0.270	0.187	0.055
Benzo(b)fluoranthene	7	NS	NS	NS	mg/Kg	0.231	0.191	0.245	0.151	0.039
Benzo(ghi)perylene	1000	NS	NS	NS	mg/Kg	0.176	0.148	0.187	0.124	0.033
Benzo(k)fluoranthene	70	NS	NS	NS	mg/Kg	0.213	0.174	0.216	0.136	0.048
Chrysene	70	NS	NS	NS	mg/Kg	0.270	0.246	0.289	0.196	0.058
Dibenz(a,h)anthracene	0.7	NS	NS	NS	mg/Kg	<0.019	<0.020	<0.016	<0.016	<0.014
Fluoranthene	1000	NS	NS	NS	mg/Kg	0.438	0.361	0.509	0.296	0.088
Fluorene	1000	NS	NS	NS	mg/Kg	<0.019	0.021	0.023	<0.016	<0.014
Indeno(1,2,3-cd)pyrene	7	NS	NS	NS	mg/Kg	0.158	0.127	0.169	0.107	0.029
2-Methylnaphthalene	0.7	NS	NS	NS	mg/Kg	<0.019	<0.020	0.022	0.016	<0.014
Naphthalene	4	NS	NS	NS	mg/Kg	0.031	0.044	0.045	0.036	0.020
Phenanthrene	10	NS	NS	NS	mg/Kg	0.181	0.197	0.250	0.164	0.045
Pyrene	1000	NS	NS	NS	mg/Kg	0.468	0.477	0.553	0.361	0.100
Total PAHs	NS	NS	NS	100	mg/Kg	2.636	2.445	3.137	2.004	0.565
MA EPH Aliphatic/Aromatic Ranges By MA EPH 5/2004										
C11-C22 Aromatic Hydrocarbons*	1000	NS	NS	NS	mg/Kg	37.8	95.6	110	53.7	<25.7
C9-C18 Aliphatic Hydrocarbons	1000	NS	NS	NS	mg/Kg	<36.0	<37.4	31.2	<29.6	<25.5
C19-C36 Aliphatic Hydrocarbons	3000	NS	NS	NS	mg/Kg	76	222	262	116	<25.5

TABLE 1
Summary of Sediment Analytical Data
Neponset Dredge Sampling
Milton, Massachusetts

	RCS-1	TCLP Threshold (mg/L)	20x Rule Screening Threshold	COMM-94 Lined Landfill	Units	SED-107	SED-108	SED-109	SED-110	SED-111
Polychlorinated Biphenyl (PCBs) Congeners										
PCB-8	NS	NS	NS	NS	mg/Kg	0.0526	0.300	0.945	0.00359	0.00093
PCB-18	NS	NS	NS	NS	mg/Kg	0.0327	0.558	1.15	0.00699	0.00081
PCB-28	NS	NS	NS	NS	mg/Kg	0.127	0.605	1.89	0.0195	0.00198
PCB-44	NS	NS	NS	NS	mg/Kg	0.0747	0.178	0.536	0.0131	0.00145
PCB-52	NS	NS	NS	NS	mg/Kg	0.0983	0.423	1.05	0.0221	0.00256
PCB-66	NS	NS	NS	NS	mg/Kg	0.0814	0.182	0.492	0.0191	0.00211
PCB-101	NS	NS	NS	NS	mg/Kg	0.0713	0.0704	0.155	0.0274	0.00317
PCB-105	NS	NS	NS	NS	mg/Kg	0.0126	0.0340	0.0602	0.0111	0.00209
PCB-118	NS	NS	NS	NS	mg/Kg	0.0506	0.0563	0.135	0.0197	0.00328
PCB-128	NS	NS	NS	NS	mg/Kg	0.00593	0.00425	0.0105	0.00324	0.00088
PCB-138	NS	NS	NS	NS	mg/Kg	0.0318	0.0282	0.0563	0.0185	0.00364
PCB-153	NS	NS	NS	NS	mg/Kg	0.0304	0.0149	0.0553	0.0101	0.00360
PCB-170	NS	NS	NS	NS	mg/Kg	0.00514	0.00628	0.00965	0.0041	0.00108
PCB-180	NS	NS	NS	NS	mg/Kg	0.00973	0.00664	0.0226	0.00482	0.00141
PCB-187	NS	NS	NS	NS	mg/Kg	0.00783	0.00586	0.00930	0.00444	0.00119
PCB-195	NS	NS	NS	NS	mg/Kg	0.00248	0.00131	0.00243	0.00072	<0.00045
PCB-206	NS	NS	NS	NS	mg/Kg	0.00268	0.00235	0.00431	0.00085	<0.00045
PCB 209	NS	NS	NS	NS	mg/Kg	0.00127	0.00126	0.00149	<0.00053	<0.00045
Total PCB Congeners	1	NS	NS	2	mg/Kg	0.698	**2.48**	**6.59**	0.189	0.0302
PCB Aroclor										
Total PCB Aroclors	1	NS	NS	2	mg/Kg	Pending	Pending	Pending	Pending	Pending
Grain Size										
Gravel	NS	NS	NS	NS	%	0	0	0	0	0
Sand	NS	NS	NS	NS	%	13.9	31.7	20.9	29.9	34.5
	NS	NS	NS	NS	%	86.1	68.3	79.1	70.1	65.5
Silt/Clay	NS	NS	NS	NS	%					
VOCs by 8260B										
Acetone	6	NS	NS	NS	mg/Kg	0.666	0.186	<0.0963	0.211	0.296
Carbon disulfide	100	NS	NS	NS	mg/Kg	<0.0148	0.0230	<0.0096	0.0169	0.0109
VOCs (Total)	NS	NS	NS	10	mg/Kg	0.666	0.209	ND	0.228	0.307

1. S-1/GW-1, S-1/GW-2, and S-1/GW-3 (Method 1 Risk Values) found in Table 2 of the Massachusetts Contir
2. RCS-1: MCP RCS-1 2008 Reportable Concentrations Criteria current as of February 14, 2008
* C11-C22 Aromatic Hydrocarbons exclude the concentration of Target PAH analytes eluting in that range
Bold numbers indicates result detected above method detection limit (MDL)

Appendix C

CERTIFICATE OF ANALYSIS

Gary Hedman
Tighe & Bond
4 Barlows Landing Road, Unit 15
Pocasset, MA 02559

RE: Neponset Dredge (M5087-003)
ESS Laboratory Work Order Number: 22F1147

This signed Certificate of Analysis is our approved release of your analytical results. These results are only representative of sample aliquots received at the laboratory. ESS Laboratory expects its clients to follow all regulatory sampling guidelines. Beginning with this page, the entire report has been paginated. This report should not be copied except in full without the approval of the laboratory. Samples will be disposed of thirty days after the final report has been delivered. If you have any questions or concerns, please feel free to call our Customer Service Department.

Laurel Stoddard
Laboratory Director

REVIEWED
By ESS Laboratory at 4:16 pm, Jul 14, 2022

Analytical Summary
The project as described above has been analyzed in accordance with the ESS Quality Assurance Plan. This plan utilizes the following methodologies: US EPA SW-846, US EPA Methods for Chemical Analysis of Water and Wastes per 40 CFR Part 136, APHA Standard Methods for the Examination of Water and Wastewater, American Society for Testing and Materials (ASTM), and other recognized methodologies. The analyses with these noted observations are in conformance to the Quality Assurance Plan. In chromatographic analysis, manual integration is frequently used instead of automated integration because it produces more accurate results.

The test results present in this report are in compliance with TNI and relative state standards, and/or client Quality Assurance Project Plans (QAPP). The laboratory has reviewed the following: Sample Preservations, Hold Times, Initial Calibrations, Continuing Calibrations, Method Blanks, Blank Spikes, Blank Spike Duplicates, Duplicates, Matrix Spikes, Matrix Spike Duplicates, Surrogates and Internal Standards. Any results which were found to be outside of the recommended ranges stated in our SOPs will be noted in the Project Narrative.

Subcontracted Analyses

CTS - Cranston, RI	Grain Size Analysis

CERTIFICATE OF ANALYSIS

Client Name: Tighe & Bond
Client Project ID: Neponset Dredge

ESS Laboratory Work Order: 22F1147

SAMPLE RECEIPT

The following samples were received on June 30, 2022 for the analyses specified on the enclosed Chain of Custody Record.

Sample ID(s) 22F1147-01 through 22F1147-03 and 22F1147-05 through 22F1147-11 for Metals were oven dried at 60 degrees Celsius prior to digestion and relogged in as Sample ID(s)22F1147-12 through 22f1147-21. This was done to increase the dry weight of the sample digested which decreases variability of results and lowers the detection limits for samples with high water content.

Low Level VOA vials were frozen by the client on June 29, 2022 at 14:00.

The following Volatile Organic compounds are reported to the MDL in order to reach <10% RCS-1 limits: 1,1,2,2-Tetrachloroethane, 1,4-Dioxane, cis-1,3-Dichloropropene, Dibromochloromethane and trans-1,3-Dichloropropene.

Lab Number	Sample Name	Matrix	Analysis
22F1147-01	SED-101	Sediment	1311, 1311/6010C, 2540G, 2580, 7196A, 8082A Cong, 8260B, 8260B Low, 9045, EPH8270, EPH8270SIM, LK, MADEP-EPH, SUB
22F1147-02	SED-102	Sediment	1311, 1311/6010C, 2540G, 2580, 7196A, 8082A Cong, 8260B, 8260B Low, 9045, EPH8270, EPH8270SIM, LK, MADEP-EPH, SUB
22F1147-03	SED-103	Sediment	1311, 1311/6010C, 2540G, 2580, 7196A, 8082A Cong, 8260B, 8260B Low, 9045, EPH8270, EPH8270SIM, LK, MADEP-EPH, SUB
22F1147-04	SED-104	Sediment	2540G
22F1147-05	SED-105	Sediment	1311, 1311/6010C, 2540G, 2580, 7196A, 8082A Cong, 8260B, 8260B Low, 9045, EPH8270, EPH8270SIM, LK, MADEP-EPH, SUB
22F1147-06	SED-106	Sediment	1311, 1311/6010C, 2540G, 8082A Cong, 8260B, 8260B Low, EPH8270, EPH8270SIM, LK, MADEP-EPH, SUB
22F1147-07	SED-107	Sediment	1311, 1311/6010C, 2540G, 8082A Cong, 8260B, 8260B Low, EPH8270, EPH8270SIM, LK, MADEP-EPH, SUB
22F1147-08	SED-108	Sediment	1311, 1311/6010C, 2540G, 8082A Cong, 8260B, 8260B Low, EPH8270, EPH8270SIM, LK, MADEP-EPH, SUB

CERTIFICATE OF ANALYSIS

Client Name: Tighe & Bond
Client Project ID: Neponset Dredge
ESS Laboratory Work Order: 22F1147

22F1147-09	SED-109	Sediment	1311, 1311/6010C, 2540G, 2580, 7196A, 8082A Cong, 8260B, 8260B Low, 9045, EPH8270, EPH8270SIM, LK, MADEP-EPH, SUB
22F1147-10	SED-110	Sediment	1311, 1311/6010C, 2540G, 2580, 7196A, 8082A Cong, 8260B, 8260B Low, 9045, EPH8270, EPH8270SIM, LK, MADEP-EPH, SUB
22F1147-11	SED-111	Sediment	2540G, 8082A Cong, 8260B, 8260B Low, EPH8270, EPH8270SIM, LK, MADEP-EPH, SUB
22F1147-12	SED-101 Oven Dried	Sediment	6010C, 7471B
22F1147-13	SED-102 Oven Dried	Sediment	6010C, 7471B
22F1147-14	SED-103 Oven Dried	Sediment	6010C, 7471B
22F1147-15	SED-105 Oven Dried	Sediment	6010C, 7471B
22F1147-16	SED-106 Oven Dried	Sediment	6010C, 7471B
22F1147-17	SED-107 Oven Dried	Sediment	6010C, 7471B
22F1147-18	SED-108 Oven Dried	Sediment	6010C, 7471B
22F1147-19	SED-109 Oven Dried	Sediment	6010C, 7471B
22F1147-20	SED-110 Oven Dried	Sediment	6010C, 7471B
22F1147-21	SED-111 Oven Dried	Sediment	6010C, 7471B

CERTIFICATE OF ANALYSIS

Client Name: Tighe & Bond
Client Project ID: Neponset Dredge

ESS Laboratory Work Order: 22F1147

PROJECT NARRATIVE

5035/8260B Volatile Organic Compounds / Low Level

D2G0047-CCV1 **Calibration required quadratic regression (Q).**
1,1,1,2-Tetrachloroethane (100% @ 80-120%), Bromoform (95% @ 80-120%), Carbon Tetrachloride (104% @ 80-120%), Dibromochloromethane (99% @ 80-120%), trans-1,3-Dichloropropene (102% @ 80-120%)

D2G0047-CCV1 **Continuing Calibration %Diff/Drift is above control limit (CD+).**
Bromomethane (28% @ 20%)

8082 Polychlorinated Biphenyls (PCB) / Congeners

22F1147-01 **Lower value is used due to matrix interferences (LC).**
BZ#105 , BZ#170 , BZ#195 [2C]

22F1147-01 **Percent difference between primary and confirmation results exceeds 40% (P).**
BZ#105 , BZ#170 , BZ#195 [2C]

22F1147-02 **Lower value is used due to matrix interferences (LC).**
BZ#105 , BZ#170 , BZ#195 [2C]

22F1147-02 **Percent difference between primary and confirmation results exceeds 40% (P).**
BZ#105 , BZ#170 , BZ#195 [2C]

22F1147-03 **Lower value is used due to matrix interferences (LC).**
BZ#105 , BZ#170

22F1147-03 **Percent difference between primary and confirmation results exceeds 40% (P).**
BZ#105 , BZ#170

22F1147-05 **Lower value is used due to matrix interferences (LC).**
BZ#105 , BZ#195 [2C]

22F1147-05 **Percent difference between primary and confirmation results exceeds 40% (P).**
BZ#105 , BZ#195 [2C]

22F1147-06 **Lower value is used due to matrix interferences (LC).**
BZ#105 , BZ#195 [2C] , BZ#66

22F1147-06 **Percent difference between primary and confirmation results exceeds 40% (P).**
BZ#105 , BZ#195 [2C] , BZ#66

22F1147-07 **Lower value is used due to matrix interferences (LC).**
BZ#105 , BZ#170 , BZ#209

22F1147-07 **Percent difference between primary and confirmation results exceeds 40% (P).**
BZ#105 , BZ#170 , BZ#209

22F1147-08 **Lower value is used due to matrix interferences (LC).**
BZ#101 [2C] , BZ#153 [2C] , BZ#209

22F1147-08 **Percent difference between primary and confirmation results exceeds 40% (P).**
BZ#101 [2C] , BZ#153 [2C] , BZ#209

22F1147-09 **Lower value is used due to matrix interferences (LC).**
BZ#101 [2C] , BZ#105 , BZ#170 , BZ#187 , BZ#209

22F1147-09 **Percent difference between primary and confirmation results exceeds 40% (P).**
BZ#101 [2C] , BZ#105 , BZ#170 , BZ#187 , BZ#209

22F1147-10 **Lower value is used due to matrix interferences (LC).**

CERTIFICATE OF ANALYSIS

Client Name: Tighe & Bond
Client Project ID: Neponset Dredge ESS Laboratory Work Order: 22F1147

BZ#153 [2C] , BZ#206

22F1147-10 **Percent difference between primary and confirmation results exceeds 40% (P).**
BZ#153 [2C] , BZ#206

22F1147-11 **Lower value is used due to matrix interferences (LC).**
BZ#18 [2C]

22F1147-11 **Percent difference between primary and confirmation results exceeds 40% (P).**
BZ#18 [2C]

Classical Chemistry

22F1147-01 **Test performed from a previously opened container**
Hexavalent Chromium

22F1147-02 **Test performed from a previously opened container**
Hexavalent Chromium

22F1147-03 **Test performed from a previously opened container**
Hexavalent Chromium

22F1147-05 **Test performed from a previously opened container**
Hexavalent Chromium

22F1147-09 **Test performed from a previously opened container**
Hexavalent Chromium

22F1147-10 **Test performed from a previously opened container**
Hexavalent Chromium

MADEP-EPH Extractable Petroleum Hydrocarbons

22F1147-05 **Present in Method Blank (B).**
Naphthalene

22F1147-06 **Present in Method Blank (B).**
Naphthalene

22F1147-07 **Present in Method Blank (B).**
Naphthalene

22F1147-08 **Present in Method Blank (B).**
Naphthalene

22F1147-09 **Present in Method Blank (B).**
Naphthalene

22F1147-10 **Present in Method Blank (B).**
Naphthalene

22F1147-11 **Present in Method Blank (B).**
Naphthalene

D2G0033-CCV4 **Continuing Calibration %Diff/Drift is above control limit (CD+).**
1-Chlorooctadecane (29% @ 25%)

No other observations noted.

End of Project Narrative.

CERTIFICATE OF ANALYSIS

Client Name: Tighe & Bond
Client Project ID: Neponset Dredge

ESS Laboratory Work Order: 22F1147

DATA USABILITY LINKS

To ensure you are viewing the most current version of the documents below, please clear your internet cookies for www.ESSLaboratory.com. Consult your IT Support personnel for information on how to clear your internet cookies.

Definitions of Quality Control Parameters

Semivolatile Organics Internal Standard Information

Semivolatile Organics Surrogate Information

Volatile Organics Internal Standard Information

Volatile Organics Surrogate Information

EPH and VPH Alkane Lists

CURRENT SW-846 METHODOLOGY VERSIONS

Analytical Methods

1010A - Flashpoint
6010C - ICP
6020A - ICP MS
7010 - Graphite Furnace
7196A - Hexavalent Chromium
7470A - Aqueous Mercury
7471B - Solid Mercury
8011 - EDB/DBCP/TCP
8015C - GRO/DRO
8081B - Pesticides
8082A - PCB
8100M - TPH
8151A - Herbicides
8260B - VOA
8270D - SVOA
8270D SIM - SVOA Low Level
9014 - Cyanide
9038 - Sulfate
9040C - Aqueous pH
9045D - Solid pH (Corrosivity)
9050A - Specific Conductance
9056A - Anions (IC)
9060A - TOC
9095B - Paint Filter
MADEP 04-1.1 - EPH
MADEP 18-2.1 - VPH

Prep Methods

3005A - Aqueous ICP Digestion
3020A - Aqueous Graphite Furnace / ICP MS Digestion
3050B - Solid ICP / Graphite Furnace / ICP MS Digestion
3060A - Solid Hexavalent Chromium Digestion
3510C - Separatory Funnel Extraction
3520C - Liquid / Liquid Extraction
3540C - Manual Soxhlet Extraction
3541 - Automated Soxhlet Extraction
3546 - Microwave Extraction
3580A - Waste Dilution
5030B - Aqueous Purge and Trap
5030C - Aqueous Purge and Trap
5035A - Solid Purge and Trap

SW846 Reactivity Methods 7.3.3.2 (Reactive Cyanide) and 7.3.4.1 (Reactive Sulfide) have been withdrawn by EPA. These methods are reported per client request and are not NELAP accredited.

CERTIFICATE OF ANALYSIS

Client Name: Tighe & Bond
Client Project ID: Neponset Dredge
Client Sample ID: SED-101
Date Sampled: 06/28/22 11:13
Percent Solids: 41

ESS Laboratory Work Order: 22F1147
ESS Laboratory Sample ID: 22F1147-01
Sample Matrix: Sediment
Units: mg/L

Extraction Method: 3005A TCLP

1311 TCLP Metals

Analyte	Results (MRL)	MDL	Method	TCLP Limit	DF	Analyst	Analyzed	I/V	F/V	Batch
Chromium	ND (0.020)		1311/6010C		1	KJK	07/13/22 18:17	50	50	DG21235
Lead	**0.110** (0.050)		1311/6010C		1	KJK	07/13/22 18:17	50	50	DG21235

CERTIFICATE OF ANALYSIS

Client Name: Tighe & Bond
Client Project ID: Neponset Dredge
Client Sample ID: SED-101
Date Sampled: 06/28/22 11:13
Percent Solids: 41
Initial Volume: 5.2
Final Volume: 10
Extraction Method: 5035

ESS Laboratory Work Order: 22F1147
ESS Laboratory Sample ID: 22F1147-01
Sample Matrix: Sediment
Units: mg/kg dry
Analyst: MEK

5035/8260B Volatile Organic Compounds / Low Level

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
1,1,1,2-Tetrachloroethane	ND (0.0119)		8260B Low		1	07/06/22 13:48	D2G0074	DG20621
1,1,1-Trichloroethane	ND (0.0119)		8260B Low		1	07/06/22 13:48	D2G0074	DG20621
1,1,2,2-Tetrachloroethane	ND (0.0036)		8260B Low		1	07/06/22 13:48	D2G0074	DG20621
1,1,2-Trichloroethane	ND (0.0119)		8260B Low		1	07/06/22 13:48	D2G0074	DG20621
1,1-Dichloroethane	ND (0.0119)		8260B Low		1	07/06/22 13:48	D2G0074	DG20621
1,1-Dichloroethene	ND (0.0119)		8260B Low		1	07/06/22 13:48	D2G0074	DG20621
1,1-Dichloropropene	ND (0.0119)		8260B Low		1	07/06/22 13:48	D2G0074	DG20621
1,2,3-Trichlorobenzene	ND (0.0119)		8260B Low		1	07/06/22 13:48	D2G0074	DG20621
1,2,3-Trichloropropane	ND (0.0119)		8260B Low		1	07/06/22 13:48	D2G0074	DG20621
1,2,4-Trichlorobenzene	ND (0.0119)		8260B Low		1	07/06/22 13:48	D2G0074	DG20621
1,2,4-Trimethylbenzene	ND (0.0119)		8260B Low		1	07/06/22 13:48	D2G0074	DG20621
1,2-Dibromo-3-Chloropropane	ND (0.0119)		8260B Low		1	07/06/22 13:48	D2G0074	DG20621
1,2-Dibromoethane	ND (0.0119)		8260B Low		1	07/06/22 13:48	D2G0074	DG20621
1,2-Dichlorobenzene	ND (0.0119)		8260B Low		1	07/06/22 13:48	D2G0074	DG20621
1,2-Dichloroethane	ND (0.0119)		8260B Low		1	07/06/22 13:48	D2G0074	DG20621
1,2-Dichloropropane	ND (0.0119)		8260B Low		1	07/06/22 13:48	D2G0074	DG20621
1,3,5-Trimethylbenzene	ND (0.0119)		8260B Low		1	07/06/22 13:48	D2G0074	DG20621
1,3-Dichlorobenzene	ND (0.0119)		8260B Low		1	07/06/22 13:48	D2G0074	DG20621
1,3-Dichloropropane	ND (0.0119)		8260B Low		1	07/06/22 13:48	D2G0074	DG20621
1,4-Dichlorobenzene	ND (0.0119)		8260B Low		1	07/06/22 13:48	D2G0074	DG20621
1,4-Dioxane	ND (0.0237)		8260B Low		1	07/06/22 13:48	D2G0074	DG20621
2,2-Dichloropropane	ND (0.0119)		8260B Low		1	07/06/22 13:48	D2G0074	DG20621
2-Butanone	ND (0.119)		8260B Low		1	07/06/22 13:48	D2G0074	DG20621
2-Chlorotoluene	ND (0.0119)		8260B Low		1	07/06/22 13:48	D2G0074	DG20621
2-Hexanone	ND (0.119)		8260B Low		1	07/06/22 13:48	D2G0074	DG20621
4-Chlorotoluene	ND (0.0119)		8260B Low		1	07/06/22 13:48	D2G0074	DG20621
4-Isopropyltoluene	ND (0.0119)		8260B Low		1	07/06/22 13:48	D2G0074	DG20621
4-Methyl-2-Pentanone	ND (0.119)		8260B Low		1	07/06/22 13:48	D2G0074	DG20621
Acetone	**0.223** (0.119)		8260B Low		1	07/06/22 13:48	D2G0074	DG20621
Benzene	ND (0.0119)		8260B Low		1	07/06/22 13:48	D2G0074	DG20621
Bromobenzene	ND (0.0119)		8260B Low		1	07/06/22 13:48	D2G0074	DG20621
Bromochloromethane	ND (0.0119)		8260B Low		1	07/06/22 13:48	D2G0074	DG20621

CERTIFICATE OF ANALYSIS

Client Name: Tighe & Bond
Client Project ID: Neponset Dredge
Client Sample ID: SED-101
Date Sampled: 06/28/22 11:13
Percent Solids: 41
Initial Volume: 5.2
Final Volume: 10
Extraction Method: 5035

ESS Laboratory Work Order: 22F1147
ESS Laboratory Sample ID: 22F1147-01
Sample Matrix: Sediment
Units: mg/kg dry
Analyst: MEK

5035/8260B Volatile Organic Compounds / Low Level

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Bromodichloromethane	ND (0.0119)		8260B Low		1	07/06/22 13:48	D2G0074	DG20621
Bromoform	ND (0.0119)		8260B Low		1	07/06/22 13:48	D2G0074	DG20621
Bromomethane	ND (0.0237)		8260B Low		1	07/06/22 13:48	D2G0074	DG20621
Carbon Disulfide	**0.0128** (0.0119)		8260B Low		1	07/06/22 13:48	D2G0074	DG20621
Carbon Tetrachloride	ND (0.0119)		8260B Low		1	07/06/22 13:48	D2G0074	DG20621
Chlorobenzene	ND (0.0119)		8260B Low		1	07/06/22 13:48	D2G0074	DG20621
Chloroethane	ND (0.0237)		8260B Low		1	07/06/22 13:48	D2G0074	DG20621
Chloroform	ND (0.0119)		8260B Low		1	07/06/22 13:48	D2G0074	DG20621
Chloromethane	ND (0.0237)		8260B Low		1	07/06/22 13:48	D2G0074	DG20621
cis-1,2-Dichloroethene	ND (0.0119)		8260B Low		1	07/06/22 13:48	D2G0074	DG20621
cis-1,3-Dichloropropene	ND (0.0040)		8260B Low		1	07/06/22 13:48	D2G0074	DG20621
Dibromochloromethane	ND (0.0038)		8260B Low		1	07/06/22 13:48	D2G0074	DG20621
Dibromomethane	ND (0.0119)		8260B Low		1	07/06/22 13:48	D2G0074	DG20621
Dichlorodifluoromethane	ND (0.0237)		8260B Low		1	07/06/22 13:48	D2G0074	DG20621
Diethyl Ether	ND (0.0119)		8260B Low		1	07/06/22 13:48	D2G0074	DG20621
Di-isopropyl ether	ND (0.0119)		8260B Low		1	07/06/22 13:48	D2G0074	DG20621
Ethyl tertiary-butyl ether	ND (0.0119)		8260B Low		1	07/06/22 13:48	D2G0074	DG20621
Ethylbenzene	ND (0.0119)		8260B Low		1	07/06/22 13:48	D2G0074	DG20621
Hexachlorobutadiene	ND (0.0119)		8260B Low		1	07/06/22 13:48	D2G0074	DG20621
Isopropylbenzene	ND (0.0119)		8260B Low		1	07/06/22 13:48	D2G0074	DG20621
Methyl tert-Butyl Ether	ND (0.0119)		8260B Low		1	07/06/22 13:48	D2G0074	DG20621
Methylene Chloride	ND (0.0237)		8260B Low		1	07/06/22 13:48	D2G0074	DG20621
Naphthalene	ND (0.0119)		8260B Low		1	07/06/22 13:48	D2G0074	DG20621
n-Butylbenzene	ND (0.0119)		8260B Low		1	07/06/22 13:48	D2G0074	DG20621
n-Propylbenzene	ND (0.0119)		8260B Low		1	07/06/22 13:48	D2G0074	DG20621
sec-Butylbenzene	ND (0.0119)		8260B Low		1	07/06/22 13:48	D2G0074	DG20621
Styrene	ND (0.0119)		8260B Low		1	07/06/22 13:48	D2G0074	DG20621
tert-Butylbenzene	ND (0.0119)		8260B Low		1	07/06/22 13:48	D2G0074	DG20621
Tertiary-amyl methyl ether	ND (0.0119)		8260B Low		1	07/06/22 13:48	D2G0074	DG20621
Tetrachloroethene	ND (0.0119)		8260B Low		1	07/06/22 13:48	D2G0074	DG20621
Tetrahydrofuran	ND (0.0119)		8260B Low		1	07/06/22 13:48	D2G0074	DG20621
Toluene	ND (0.0119)		8260B Low		1	07/06/22 13:48	D2G0074	DG20621

CERTIFICATE OF ANALYSIS

Client Name: Tighe & Bond
Client Project ID: Neponset Dredge
Client Sample ID: SED-101
Date Sampled: 06/28/22 11:13
Percent Solids: 41
Initial Volume: 5.2
Final Volume: 10
Extraction Method: 5035

ESS Laboratory Work Order: 22F1147
ESS Laboratory Sample ID: 22F1147-01
Sample Matrix: Sediment
Units: mg/kg dry
Analyst: MEK

5035/8260B Volatile Organic Compounds / Low Level

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
trans-1,2-Dichloroethene	ND (0.0119)		8260B Low		1	07/06/22 13:48	D2G0074	DG20621
trans-1,3-Dichloropropene	ND (0.0038)		8260B Low		1	07/06/22 13:48	D2G0074	DG20621
Trichloroethene	ND (0.0119)		8260B Low		1	07/06/22 13:48	D2G0074	DG20621
Trichlorofluoromethane	ND (0.0119)		8260B Low		1	07/06/22 13:48	D2G0074	DG20621
Vinyl Chloride	ND (0.0237)		8260B Low		1	07/06/22 13:48	D2G0074	DG20621
Xylene O	ND (0.0119)		8260B Low		1	07/06/22 13:48	D2G0074	DG20621
Xylene P,M	ND (0.0237)		8260B Low		1	07/06/22 13:48	D2G0074	DG20621
Xylenes (Total)	ND (0.00962)		8260B		1	07/06/22 13:48		[CALC]

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichloroethane-d4	*126 %*		*70-130*
Surrogate: 4-Bromofluorobenzene	*86 %*		*70-130*
Surrogate: Dibromofluoromethane	*112 %*		*70-130*
Surrogate: Toluene-d8	*103 %*		*70-130*

CERTIFICATE OF ANALYSIS

Client Name: Tighe & Bond
Client Project ID: Neponset Dredge
Client Sample ID: SED-101
Date Sampled: 06/28/22 11:13
Percent Solids: 41
Initial Volume: 30.1
Final Volume: 2
Extraction Method: 3540C

ESS Laboratory Work Order: 22F1147
ESS Laboratory Sample ID: 22F1147-01
Sample Matrix: Sediment
Units: mg/kg dry
Analyst: DMC
Prepared: 7/7/22 14:00

8082 Polychlorinated Biphenyls (PCB) / Congeners

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
BZ#8	**0.130** (0.00664)		8082A Cong		10	07/12/22 11:45	D2G0129	DG20701
BZ#18 [2C]	**0.162** (0.00664)		8082A Cong		10	07/12/22 11:45	D2G0129	DG20701
BZ#28 [2C]	**0.435** (0.0266)		8082A Cong		40	07/12/22 12:15	D2G0129	DG20701
BZ#44 [2C]	**0.197** (0.0266)		8082A Cong		40	07/12/22 12:15	D2G0129	DG20701
BZ#52	**0.279** (0.0266)		8082A Cong		40	07/12/22 12:15	D2G0129	DG20701
BZ#66 [2C]	**0.299** (0.0266)		8082A Cong		40	07/12/22 12:15	D2G0129	DG20701
BZ#101	**0.151** (0.00664)		8082A Cong		10	07/12/22 11:45	D2G0129	DG20701
BZ#105	**P, LC 0.0358** (0.00664)		8082A Cong		10	07/12/22 11:45	D2G0129	DG20701
BZ#118	**0.0943** (0.00664)		8082A Cong		10	07/12/22 11:45	D2G0129	DG20701
BZ#128 [2C]	**0.0101** (0.00066)		8082A Cong		1	07/11/22 14:13	D2G0129	DG20701
BZ#138 [2C]	**0.0534** (0.00664)		8082A Cong		10	07/12/22 11:45	D2G0129	DG20701
BZ#153	**0.0581** (0.00664)		8082A Cong		10	07/12/22 11:45	D2G0129	DG20701
BZ#170	**P, LC 0.00738** (0.00066)		8082A Cong		1	07/11/22 14:13	D2G0129	DG20701
BZ#180 [2C]	**0.0155** (0.00066)		8082A Cong		1	07/11/22 14:13	D2G0129	DG20701
BZ#187 [2C]	**0.00999** (0.00066)		8082A Cong		1	07/11/22 14:13	D2G0129	DG20701
BZ#195 [2C]	**P, LC 0.00219** (0.00066)		8082A Cong		1	07/11/22 14:13	D2G0129	DG20701
BZ#206	**0.00376** (0.00066)		8082A Cong		1	07/11/22 14:13	D2G0129	DG20701
BZ#209 [2C]	**0.00191** (0.00066)		8082A Cong		1	07/11/22 14:13	D2G0129	DG20701

	%Recovery	*Qualifier*	*Limits*
Surrogate: Tetrachloro-m-xylene	*69 %*		*30-150*
Surrogate: Tetrachloro-m-xylene [2C]	*70 %*		*30-150*

CERTIFICATE OF ANALYSIS

Client Name: Tighe & Bond
Client Project ID: Neponset Dredge
Client Sample ID: SED-101
Date Sampled: 06/28/22 11:13
Percent Solids: 41

ESS Laboratory Work Order: 22F1147
ESS Laboratory Sample ID: 22F1147-01
Sample Matrix: Sediment

Classical Chemistry

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Corrosivity (pH)	**7.53** (N/A)		9045		1	EAM	07/11/22 18:31	S.U.	DG21154
Corrosivity (pH) Sample Temp	**Soil pH measured in water at 20.4 ºC.**								
Eh (ORP)	**WL 126** (N/A)		2580		1	EAM	07/11/22 18:31	mv	DG21153
Hexavalent Chromium	**O 2.0** (1.1)		7196A		1	JLK	07/11/22 16:44	mg/kg dry	DG21146
Percent Moisture	**59** (1)		2540G		1	EAM	06/30/22 21:18	%	DF23056
Total Organic Carbon (Average)	**63300** (96.5)		LK		1	CCP	07/12/22 11:11	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: Tighe & Bond
Client Project ID: Neponset Dredge
Client Sample ID: SED-101
Date Sampled: 06/28/22 11:13
Percent Solids: 41
Initial Volume: 25.1
Final Volume: 1
Extraction Method: 3546

ESS Laboratory Work Order: 22F1147
ESS Laboratory Sample ID: 22F1147-01
Sample Matrix: Sediment
Units: mg/kg dry

Prepared: 7/1/22 10:25

MADEP-EPH Extractable Petroleum Hydrocarbons

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
C9-C18 Aliphatics1	ND (36.9)		MADEP-EPH		1	MJV	07/06/22 4:01	D2G0033	DF23021
C19-C36 Aliphatics1	**65.4** (36.9)		MADEP-EPH		1	MJV	07/06/22 4:01	D2G0033	DF23021
C11-C22 Unadjusted Aromatics1	**62.5** (36.9)		EPH8270		1	MJV	07/06/22 13:13	D2G0039	DF23021
C11-C22 Aromatics1,2	**61.5** (37.2)		EPH8270			TJ	07/06/22 13:13		[CALC]
2-Methylnaphthalene	ND (0.020)		EPH8270SIM		1	TJ	07/06/22 1:20	D2G0059	DF23021
Acenaphthene	ND (0.020)		EPH8270SIM		1	TJ	07/06/22 1:20	D2G0059	DF23021
Naphthalene	**0.029** (0.020)		EPH8270SIM		1	TJ	07/06/22 1:20	D2G0059	DF23021
Phenanthrene	**0.092** (0.020)		EPH8270SIM		1	TJ	07/06/22 1:20	D2G0059	DF23021
Acenaphthylene	ND (0.020)		EPH8270SIM		1	TJ	07/06/22 1:20	D2G0059	DF23021
Anthracene	ND (0.020)		EPH8270SIM		1	TJ	07/06/22 1:20	D2G0059	DF23021
Benzo(a)anthracene	**0.081** (0.020)		EPH8270SIM		1	TJ	07/06/22 1:20	D2G0059	DF23021
Benzo(a)pyrene	**0.097** (0.020)		EPH8270SIM		1	TJ	07/06/22 1:20	D2G0059	DF23021
Benzo(b)fluoranthene	**0.084** (0.020)		EPH8270SIM		1	TJ	07/06/22 1:20	D2G0059	DF23021
Benzo(g,h,i)perylene	**0.074** (0.020)		EPH8270SIM		1	TJ	07/06/22 1:20	D2G0059	DF23021
Benzo(k)fluoranthene	**0.093** (0.020)		EPH8270SIM		1	TJ	07/06/22 1:20	D2G0059	DF23021
Chrysene	**0.106** (0.020)		EPH8270SIM		1	TJ	07/06/22 1:20	D2G0059	DF23021
Dibenzo(a,h)Anthracene	ND (0.020)		EPH8270SIM		1	TJ	07/06/22 1:20	D2G0059	DF23021
Fluoranthene	**0.178** (0.020)		EPH8270SIM		1	TJ	07/06/22 1:20	D2G0059	DF23021
Fluorene	ND (0.020)		EPH8270SIM		1	TJ	07/06/22 1:20	D2G0059	DF23021
Indeno(1,2,3-cd)Pyrene	**0.060** (0.020)		EPH8270SIM		1	TJ	07/06/22 1:20	D2G0059	DF23021
Pyrene	**0.188** (0.020)		EPH8270SIM		1	TJ	07/06/22 1:20	D2G0059	DF23021

	%Recovery	Qualifier	Limits
Surrogate: 1-Chlorooctadecane	*74 %*		*40-140*
Surrogate: 2-Bromonaphthalene	*90 %*		*40-140*
Surrogate: 2-Fluorobiphenyl	*88 %*		*40-140*
Surrogate: O-Terphenyl	*82 %*		*40-140*

CERTIFICATE OF ANALYSIS

Client Name: Tighe & Bond
Client Project ID: Neponset Dredge
Client Sample ID: SED-101
Date Sampled: 06/28/22 11:13

ESS Laboratory Work Order: 22F1147
ESS Laboratory Sample ID: 22F1147-01
Sample Matrix: Sediment

Subcontracted Analysis

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Grain Size	**See Attached** (N/A)								

CERTIFICATE OF ANALYSIS

Client Name: Tighe & Bond
Client Project ID: Neponset Dredge
Client Sample ID: SED-101
Date Sampled: 06/28/22 11:13
Percent Solids: 41
Initial Volume: 100
Final Volume: 2000
Extraction Method: 1311

ESS Laboratory Work Order: 22F1147
ESS Laboratory Sample ID: 22F1147-01
Sample Matrix: Sediment
Units: °C
Analyst: NAR
Prepared: 7/11/22 17:00

TCLP Extraction by 1311

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Batch
Temperature (Min C)	**19.9** (N/A)		1311		1	NAR	07/12/22 13:00	DG21141
Temperature (Max C)	**21.7** (N/A)		1311		1	NAR	07/12/22 13:00	DG21141
Temperature (Range)	**Temperature is not within 23 +/-2 °C.** (N/A)							

CERTIFICATE OF ANALYSIS

Client Name: Tighe & Bond
Client Project ID: Neponset Dredge
Client Sample ID: SED-102
Date Sampled: 06/28/22 11:25
Percent Solids: 40

ESS Laboratory Work Order: 22F1147
ESS Laboratory Sample ID: 22F1147-02
Sample Matrix: Sediment
Units: mg/L

Extraction Method: 3005A TCLP

1311 TCLP Metals

Analyte	Results (MRL)	MDL	Method	TCLP Limit	DF	Analyst	Analyzed	I/V	F/V	Batch
Chromium	ND (0.020)		1311/6010C		1	KJK	07/13/22 18:19	50	50	DG21235
Lead	**0.090** (0.050)		1311/6010C		1	KJK	07/13/22 18:19	50	50	DG21235

CERTIFICATE OF ANALYSIS

Client Name: Tighe & Bond
Client Project ID: Neponset Dredge
Client Sample ID: SED-102
Date Sampled: 06/28/22 11:25
Percent Solids: 40
Initial Volume: 5.4
Final Volume: 10
Extraction Method: 5035

ESS Laboratory Work Order: 22F1147
ESS Laboratory Sample ID: 22F1147-02
Sample Matrix: Sediment
Units: mg/kg dry
Analyst: MD

5035/8260B Volatile Organic Compounds / Low Level

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
1,1,1,2-Tetrachloroethane	ND (0.0117)		8260B Low		1	07/05/22 12:10	D2G0047	DG20532
1,1,1-Trichloroethane	ND (0.0117)		8260B Low		1	07/05/22 12:10	D2G0047	DG20532
1,1,2,2-Tetrachloroethane	ND (0.0035)		8260B Low		1	07/05/22 12:10	D2G0047	DG20532
1,1,2-Trichloroethane	ND (0.0117)		8260B Low		1	07/05/22 12:10	D2G0047	DG20532
1,1-Dichloroethane	ND (0.0117)		8260B Low		1	07/05/22 12:10	D2G0047	DG20532
1,1-Dichloroethene	ND (0.0117)		8260B Low		1	07/05/22 12:10	D2G0047	DG20532
1,1-Dichloropropene	ND (0.0117)		8260B Low		1	07/05/22 12:10	D2G0047	DG20532
1,2,3-Trichlorobenzene	ND (0.0117)		8260B Low		1	07/05/22 12:10	D2G0047	DG20532
1,2,3-Trichloropropane	ND (0.0117)		8260B Low		1	07/05/22 12:10	D2G0047	DG20532
1,2,4-Trichlorobenzene	ND (0.0117)		8260B Low		1	07/05/22 12:10	D2G0047	DG20532
1,2,4-Trimethylbenzene	ND (0.0117)		8260B Low		1	07/05/22 12:10	D2G0047	DG20532
1,2-Dibromo-3-Chloropropane	ND (0.0117)		8260B Low		1	07/05/22 12:10	D2G0047	DG20532
1,2-Dibromoethane	ND (0.0117)		8260B Low		1	07/05/22 12:10	D2G0047	DG20532
1,2-Dichlorobenzene	ND (0.0117)		8260B Low		1	07/05/22 12:10	D2G0047	DG20532
1,2-Dichloroethane	ND (0.0117)		8260B Low		1	07/05/22 12:10	D2G0047	DG20532
1,2-Dichloropropane	ND (0.0117)		8260B Low		1	07/05/22 12:10	D2G0047	DG20532
1,3,5-Trimethylbenzene	ND (0.0117)		8260B Low		1	07/05/22 12:10	D2G0047	DG20532
1,3-Dichlorobenzene	ND (0.0117)		8260B Low		1	07/05/22 12:10	D2G0047	DG20532
1,3-Dichloropropane	ND (0.0117)		8260B Low		1	07/05/22 12:10	D2G0047	DG20532
1,4-Dichlorobenzene	ND (0.0117)		8260B Low		1	07/05/22 12:10	D2G0047	DG20532
1,4-Dioxane	ND (0.0234)		8260B Low		1	07/05/22 12:10	D2G0047	DG20532
2,2-Dichloropropane	ND (0.0117)		8260B Low		1	07/05/22 12:10	D2G0047	DG20532
2-Butanone	ND (0.117)		8260B Low		1	07/05/22 12:10	D2G0047	DG20532
2-Chlorotoluene	ND (0.0117)		8260B Low		1	07/05/22 12:10	D2G0047	DG20532
2-Hexanone	ND (0.117)		8260B Low		1	07/05/22 12:10	D2G0047	DG20532
4-Chlorotoluene	ND (0.0117)		8260B Low		1	07/05/22 12:10	D2G0047	DG20532
4-Isopropyltoluene	ND (0.0117)		8260B Low		1	07/05/22 12:10	D2G0047	DG20532
4-Methyl-2-Pentanone	ND (0.117)		8260B Low		1	07/05/22 12:10	D2G0047	DG20532
Acetone	**0.390** (0.117)		8260B Low		1	07/05/22 12:10	D2G0047	DG20532
Benzene	ND (0.0117)		8260B Low		1	07/05/22 12:10	D2G0047	DG20532
Bromobenzene	ND (0.0117)		8260B Low		1	07/05/22 12:10	D2G0047	DG20532
Bromochloromethane	ND (0.0117)		8260B Low		1	07/05/22 12:10	D2G0047	DG20532

CERTIFICATE OF ANALYSIS

Client Name: Tighe & Bond
Client Project ID: Neponset Dredge
Client Sample ID: SED-102
Date Sampled: 06/28/22 11:25
Percent Solids: 40
Initial Volume: 5.4
Final Volume: 10
Extraction Method: 5035

ESS Laboratory Work Order: 22F1147
ESS Laboratory Sample ID: 22F1147-02
Sample Matrix: Sediment
Units: mg/kg dry
Analyst: MD

5035/8260B Volatile Organic Compounds / Low Level

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Bromodichloromethane	ND (0.0117)		8260B Low		1	07/05/22 12:10	D2G0047	DG20532
Bromoform	ND (0.0117)		8260B Low		1	07/05/22 12:10	D2G0047	DG20532
Bromomethane	ND (0.0234)		8260B Low		1	07/05/22 12:10	D2G0047	DG20532
Carbon Disulfide	**0.0176** (0.0117)		8260B Low		1	07/05/22 12:10	D2G0047	DG20532
Carbon Tetrachloride	ND (0.0117)		8260B Low		1	07/05/22 12:10	D2G0047	DG20532
Chlorobenzene	ND (0.0117)		8260B Low		1	07/05/22 12:10	D2G0047	DG20532
Chloroethane	ND (0.0234)		8260B Low		1	07/05/22 12:10	D2G0047	DG20532
Chloroform	ND (0.0117)		8260B Low		1	07/05/22 12:10	D2G0047	DG20532
Chloromethane	ND (0.0234)		8260B Low		1	07/05/22 12:10	D2G0047	DG20532
cis-1,2-Dichloroethene	ND (0.0117)		8260B Low		1	07/05/22 12:10	D2G0047	DG20532
cis-1,3-Dichloropropene	ND (0.0040)		8260B Low		1	07/05/22 12:10	D2G0047	DG20532
Dibromochloromethane	ND (0.0037)		8260B Low		1	07/05/22 12:10	D2G0047	DG20532
Dibromomethane	ND (0.0117)		8260B Low		1	07/05/22 12:10	D2G0047	DG20532
Dichlorodifluoromethane	ND (0.0234)		8260B Low		1	07/05/22 12:10	D2G0047	DG20532
Diethyl Ether	ND (0.0117)		8260B Low		1	07/05/22 12:10	D2G0047	DG20532
Di-isopropyl ether	ND (0.0117)		8260B Low		1	07/05/22 12:10	D2G0047	DG20532
Ethyl tertiary-butyl ether	ND (0.0117)		8260B Low		1	07/05/22 12:10	D2G0047	DG20532
Ethylbenzene	ND (0.0117)		8260B Low		1	07/05/22 12:10	D2G0047	DG20532
Hexachlorobutadiene	ND (0.0117)		8260B Low		1	07/05/22 12:10	D2G0047	DG20532
Isopropylbenzene	ND (0.0117)		8260B Low		1	07/05/22 12:10	D2G0047	DG20532
Methyl tert-Butyl Ether	ND (0.0117)		8260B Low		1	07/05/22 12:10	D2G0047	DG20532
Methylene Chloride	ND (0.0234)		8260B Low		1	07/05/22 12:10	D2G0047	DG20532
Naphthalene	ND (0.0117)		8260B Low		1	07/05/22 12:10	D2G0047	DG20532
n-Butylbenzene	ND (0.0117)		8260B Low		1	07/05/22 12:10	D2G0047	DG20532
n-Propylbenzene	ND (0.0117)		8260B Low		1	07/05/22 12:10	D2G0047	DG20532
sec-Butylbenzene	ND (0.0117)		8260B Low		1	07/05/22 12:10	D2G0047	DG20532
Styrene	ND (0.0117)		8260B Low		1	07/05/22 12:10	D2G0047	DG20532
tert-Butylbenzene	ND (0.0117)		8260B Low		1	07/05/22 12:10	D2G0047	DG20532
Tertiary-amyl methyl ether	ND (0.0117)		8260B Low		1	07/05/22 12:10	D2G0047	DG20532
Tetrachloroethene	ND (0.0117)		8260B Low		1	07/05/22 12:10	D2G0047	DG20532
Tetrahydrofuran	ND (0.0117)		8260B Low		1	07/05/22 12:10	D2G0047	DG20532
Toluene	ND (0.0117)		8260B Low		1	07/05/22 12:10	D2G0047	DG20532

CERTIFICATE OF ANALYSIS

Client Name: Tighe & Bond
Client Project ID: Neponset Dredge
Client Sample ID: SED-102
Date Sampled: 06/28/22 11:25
Percent Solids: 40
Initial Volume: 5.4
Final Volume: 10
Extraction Method: 5035

ESS Laboratory Work Order: 22F1147
ESS Laboratory Sample ID: 22F1147-02
Sample Matrix: Sediment
Units: mg/kg dry
Analyst: MD

5035/8260B Volatile Organic Compounds / Low Level

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
trans-1,2-Dichloroethene	ND (0.0117)		8260B Low		1	07/05/22 12:10	D2G0047	DG20532
trans-1,3-Dichloropropene	ND (0.0037)		8260B Low		1	07/05/22 12:10	D2G0047	DG20532
Trichloroethene	ND (0.0117)		8260B Low		1	07/05/22 12:10	D2G0047	DG20532
Trichlorofluoromethane	ND (0.0117)		8260B Low		1	07/05/22 12:10	D2G0047	DG20532
Vinyl Chloride	ND (0.0234)		8260B Low		1	07/05/22 12:10	D2G0047	DG20532
Xylene O	ND (0.0117)		8260B Low		1	07/05/22 12:10	D2G0047	DG20532
Xylene P,M	ND (0.0234)		8260B Low		1	07/05/22 12:10	D2G0047	DG20532
Xylenes (Total)	ND (0.00926)		8260B		1	07/05/22 12:10		[CALC]

	%Recovery	*Qualifier*	*Limits*
Surrogate: 1,2-Dichloroethane-d4	*107 %*		*70-130*
Surrogate: 4-Bromofluorobenzene	*81 %*		*70-130*
Surrogate: Dibromofluoromethane	*102 %*		*70-130*
Surrogate: Toluene-d8	*110 %*		*70-130*

CERTIFICATE OF ANALYSIS

Client Name: Tighe & Bond
Client Project ID: Neponset Dredge
Client Sample ID: SED-102
Date Sampled: 06/28/22 11:25
Percent Solids: 40
Initial Volume: 30
Final Volume: 2
Extraction Method: 3540C

ESS Laboratory Work Order: 22F1147
ESS Laboratory Sample ID: 22F1147-02
Sample Matrix: Sediment
Units: mg/kg dry
Analyst: DMC
Prepared: 7/7/22 14:00

8082 Polychlorinated Biphenyls (PCB) / Congeners

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
BZ#8 [2C]	**0.149** (0.00682)		8082A Cong		10	07/12/22 12:45	D2G0129	DG20701
BZ#18 [2C]	**0.208** (0.0273)		8082A Cong		40	07/12/22 13:16	D2G0129	DG20701
BZ#28 [2C]	**0.481** (0.0273)		8082A Cong		40	07/12/22 13:16	D2G0129	DG20701
BZ#44 [2C]	**0.213** (0.0273)		8082A Cong		40	07/12/22 13:16	D2G0129	DG20701
BZ#52	**0.293** (0.0273)		8082A Cong		40	07/12/22 13:16	D2G0129	DG20701
BZ#66 [2C]	**0.307** (0.0273)		8082A Cong		40	07/12/22 13:16	D2G0129	DG20701
BZ#101	**0.149** (0.00682)		8082A Cong		10	07/12/22 12:45	D2G0129	DG20701
BZ#105	**P, LC 0.0343** (0.00682)		8082A Cong		10	07/12/22 12:45	D2G0129	DG20701
BZ#118	**0.0874** (0.00682)		8082A Cong		10	07/12/22 12:45	D2G0129	DG20701
BZ#128 [2C]	**0.00804** (0.00068)		8082A Cong		1	07/11/22 14:44	D2G0129	DG20701
BZ#138	**0.0490** (0.00682)		8082A Cong		10	07/12/22 12:45	D2G0129	DG20701
BZ#153	**0.0531** (0.00682)		8082A Cong		10	07/12/22 12:45	D2G0129	DG20701
BZ#170	**P, LC 0.00689** (0.00068)		8082A Cong		1	07/11/22 14:44	D2G0129	DG20701
BZ#180 [2C]	**0.0129** (0.00068)		8082A Cong		1	07/11/22 14:44	D2G0129	DG20701
BZ#187 [2C]	**0.00940** (0.00068)		8082A Cong		1	07/11/22 14:44	D2G0129	DG20701
BZ#195 [2C]	**P, LC 0.00203** (0.00068)		8082A Cong		1	07/11/22 14:44	D2G0129	DG20701
BZ#206	**0.00351** (0.00068)		8082A Cong		1	07/11/22 14:44	D2G0129	DG20701
BZ#209 [2C]	**0.00129** (0.00068)		8082A Cong		1	07/11/22 14:44	D2G0129	DG20701

	%Recovery	Qualifier	Limits
Surrogate: Tetrachloro-m-xylene	*61 %*		*30-150*
Surrogate: Tetrachloro-m-xylene [2C]	*57 %*		*30-150*

CERTIFICATE OF ANALYSIS

Client Name: Tighe & Bond
Client Project ID: Neponset Dredge
Client Sample ID: SED-102
Date Sampled: 06/28/22 11:25
Percent Solids: 40

ESS Laboratory Work Order: 22F1147
ESS Laboratory Sample ID: 22F1147-02
Sample Matrix: Sediment

Classical Chemistry

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Corrosivity (pH)	**7.80** (N/A)		9045		1	EAM	07/11/22 18:31	S.U.	DG21154
Corrosivity (pH) Sample Temp	**Soil pH measured in water at 20.9 ºC.**								
Eh (ORP)	**WL 4** (N/A)		2580		1	EAM	07/11/22 18:31	mv	DG21153
Hexavalent Chromium	**O 2.8** (1.1)		7196A		1	JLK	07/11/22 16:44	mg/kg dry	DG21146
Percent Moisture	**60** (1)		2540G		1	EAM	06/30/22 21:18	%	DF23056
Total Organic Carbon (Average)	**63100** (98.0)		LK		1	CCP	07/12/22 12:17	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: Tighe & Bond
Client Project ID: Neponset Dredge
Client Sample ID: SED-102
Date Sampled: 06/28/22 11:25
Percent Solids: 40
Initial Volume: 25.2
Final Volume: 1
Extraction Method: 3546

ESS Laboratory Work Order: 22F1147
ESS Laboratory Sample ID: 22F1147-02
Sample Matrix: Sediment
Units: mg/kg dry

Prepared: 7/1/22 10:25

MADEP-EPH Extractable Petroleum Hydrocarbons

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
C9-C18 Aliphatics1	ND (37.6)		MADEP-EPH		1	MJV	07/06/22 4:36	D2G0033	DF23021
C19-C36 Aliphatics1	**69.9** (37.6)		MADEP-EPH		1	MJV	07/06/22 4:36	D2G0033	DF23021
C11-C22 Unadjusted Aromatics1	**61.9** (37.6)		EPH8270		1	MJV	07/06/22 13:52	D2G0039	DF23021
C11-C22 Aromatics1,2	**60.7** (37.9)		EPH8270			TJ	07/06/22 13:52		[CALC]
2-Methylnaphthalene	ND (0.020)		EPH8270SIM		1	TJ	07/06/22 1:42	D2G0059	DF23021
Acenaphthene	ND (0.020)		EPH8270SIM		1	TJ	07/06/22 1:42	D2G0059	DF23021
Naphthalene	**0.029** (0.020)		EPH8270SIM		1	TJ	07/06/22 1:42	D2G0059	DF23021
Phenanthrene	**0.099** (0.020)		EPH8270SIM		1	TJ	07/06/22 1:42	D2G0059	DF23021
Acenaphthylene	ND (0.020)		EPH8270SIM		1	TJ	07/06/22 1:42	D2G0059	DF23021
Anthracene	ND (0.020)		EPH8270SIM		1	TJ	07/06/22 1:42	D2G0059	DF23021
Benzo(a)anthracene	**0.095** (0.020)		EPH8270SIM		1	TJ	07/06/22 1:42	D2G0059	DF23021
Benzo(a)pyrene	**0.114** (0.020)		EPH8270SIM		1	TJ	07/06/22 1:42	D2G0059	DF23021
Benzo(b)fluoranthene	**0.105** (0.020)		EPH8270SIM		1	TJ	07/06/22 1:42	D2G0059	DF23021
Benzo(g,h,i)perylene	**0.086** (0.020)		EPH8270SIM		1	TJ	07/06/22 1:42	D2G0059	DF23021
Benzo(k)fluoranthene	**0.104** (0.020)		EPH8270SIM		1	TJ	07/06/22 1:42	D2G0059	DF23021
Chrysene	**0.125** (0.020)		EPH8270SIM		1	TJ	07/06/22 1:42	D2G0059	DF23021
Dibenzo(a,h)Anthracene	ND (0.020)		EPH8270SIM		1	TJ	07/06/22 1:42	D2G0059	DF23021
Fluoranthene	**0.209** (0.020)		EPH8270SIM		1	TJ	07/06/22 1:42	D2G0059	DF23021
Fluorene	ND (0.020)		EPH8270SIM		1	TJ	07/06/22 1:42	D2G0059	DF23021
Indeno(1,2,3-cd)Pyrene	**0.073** (0.020)		EPH8270SIM		1	TJ	07/06/22 1:42	D2G0059	DF23021
Pyrene	**0.229** (0.020)		EPH8270SIM		1	TJ	07/06/22 1:42	D2G0059	DF23021

	%Recovery	Qualifier	Limits
Surrogate: 1-Chlorooctadecane	*76 %*		*40-140*
Surrogate: 2-Bromonaphthalene	*92 %*		*40-140*
Surrogate: 2-Fluorobiphenyl	*91 %*		*40-140*
Surrogate: O-Terphenyl	*86 %*		*40-140*

CERTIFICATE OF ANALYSIS

Client Name: Tighe & Bond
Client Project ID: Neponset Dredge
Client Sample ID: SED-102
Date Sampled: 06/28/22 11:25

ESS Laboratory Work Order: 22F1147
ESS Laboratory Sample ID: 22F1147-02
Sample Matrix: Sediment

Subcontracted Analysis

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Grain Size	**See Attached** (N/A)								

CERTIFICATE OF ANALYSIS

Client Name: Tighe & Bond
Client Project ID: Neponset Dredge
Client Sample ID: SED-102
Date Sampled: 06/28/22 11:25
Percent Solids: 40
Initial Volume: 100
Final Volume: 2000
Extraction Method: 1311

ESS Laboratory Work Order: 22F1147
ESS Laboratory Sample ID: 22F1147-02
Sample Matrix: Sediment
Units: °C
Analyst: NAR
Prepared: 7/11/22 17:00

TCLP Extraction by 1311

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Batch
Temperature (Min C)	**19.9** (N/A)		1311		1	NAR	07/12/22 13:00	DG21141
Temperature (Max C)	**21.7** (N/A)		1311		1	NAR	07/12/22 13:00	DG21141
Temperature (Range)	**Temperature is not within 23 +/-2 °C.** (N/A)							

CERTIFICATE OF ANALYSIS

Client Name: Tighe & Bond
Client Project ID: Neponset Dredge
Client Sample ID: SED-103
Date Sampled: 06/28/22 11:37
Percent Solids: 44

ESS Laboratory Work Order: 22F1147
ESS Laboratory Sample ID: 22F1147-03
Sample Matrix: Sediment
Units: mg/L

Extraction Method: 3005A TCLP

1311 TCLP Metals

Analyte	Results (MRL)	MDL	Method	TCLP Limit	DF	Analyst	Analyzed	I/V	F/V	Batch
Chromium	ND (0.020)		1311/6010C		1	KJK	07/13/22 18:21	50	50	DG21235
Lead	**0.136** (0.050)		1311/6010C		1	KJK	07/13/22 18:21	50	50	DG21235

CERTIFICATE OF ANALYSIS

Client Name: Tighe & Bond
Client Project ID: Neponset Dredge
Client Sample ID: SED-103
Date Sampled: 06/28/22 11:37
Percent Solids: 44
Initial Volume: 4.7
Final Volume: 10
Extraction Method: 5035

ESS Laboratory Work Order: 22F1147
ESS Laboratory Sample ID: 22F1147-03
Sample Matrix: Sediment
Units: mg/kg dry
Analyst: MD

5035/8260B Volatile Organic Compounds / Low Level

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
1,1,1,2-Tetrachloroethane	ND (0.0122)		8260B Low		1	07/05/22 12:35	D2G0047	DG20532
1,1,1-Trichloroethane	ND (0.0122)		8260B Low		1	07/05/22 12:35	D2G0047	DG20532
1,1,2,2-Tetrachloroethane	ND (0.0037)		8260B Low		1	07/05/22 12:35	D2G0047	DG20532
1,1,2-Trichloroethane	ND (0.0122)		8260B Low		1	07/05/22 12:35	D2G0047	DG20532
1,1-Dichloroethane	ND (0.0122)		8260B Low		1	07/05/22 12:35	D2G0047	DG20532
1,1-Dichloroethene	ND (0.0122)		8260B Low		1	07/05/22 12:35	D2G0047	DG20532
1,1-Dichloropropene	ND (0.0122)		8260B Low		1	07/05/22 12:35	D2G0047	DG20532
1,2,3-Trichlorobenzene	ND (0.0122)		8260B Low		1	07/05/22 12:35	D2G0047	DG20532
1,2,3-Trichloropropane	ND (0.0122)		8260B Low		1	07/05/22 12:35	D2G0047	DG20532
1,2,4-Trichlorobenzene	ND (0.0122)		8260B Low		1	07/05/22 12:35	D2G0047	DG20532
1,2,4-Trimethylbenzene	ND (0.0122)		8260B Low		1	07/05/22 12:35	D2G0047	DG20532
1,2-Dibromo-3-Chloropropane	ND (0.0122)		8260B Low		1	07/05/22 12:35	D2G0047	DG20532
1,2-Dibromoethane	ND (0.0122)		8260B Low		1	07/05/22 12:35	D2G0047	DG20532
1,2-Dichlorobenzene	ND (0.0122)		8260B Low		1	07/05/22 12:35	D2G0047	DG20532
1,2-Dichloroethane	ND (0.0122)		8260B Low		1	07/05/22 12:35	D2G0047	DG20532
1,2-Dichloropropane	ND (0.0122)		8260B Low		1	07/05/22 12:35	D2G0047	DG20532
1,3,5-Trimethylbenzene	ND (0.0122)		8260B Low		1	07/05/22 12:35	D2G0047	DG20532
1,3-Dichlorobenzene	ND (0.0122)		8260B Low		1	07/05/22 12:35	D2G0047	DG20532
1,3-Dichloropropane	ND (0.0122)		8260B Low		1	07/05/22 12:35	D2G0047	DG20532
1,4-Dichlorobenzene	ND (0.0122)		8260B Low		1	07/05/22 12:35	D2G0047	DG20532
1,4-Dioxane	ND (0.0245)		8260B Low		1	07/05/22 12:35	D2G0047	DG20532
2,2-Dichloropropane	ND (0.0122)		8260B Low		1	07/05/22 12:35	D2G0047	DG20532
2-Butanone	ND (0.122)		8260B Low		1	07/05/22 12:35	D2G0047	DG20532
2-Chlorotoluene	ND (0.0122)		8260B Low		1	07/05/22 12:35	D2G0047	DG20532
2-Hexanone	ND (0.122)		8260B Low		1	07/05/22 12:35	D2G0047	DG20532
4-Chlorotoluene	ND (0.0122)		8260B Low		1	07/05/22 12:35	D2G0047	DG20532
4-Isopropyltoluene	ND (0.0122)		8260B Low		1	07/05/22 12:35	D2G0047	DG20532
4-Methyl-2-Pentanone	ND (0.122)		8260B Low		1	07/05/22 12:35	D2G0047	DG20532
Acetone	**0.203** (0.122)		8260B Low		1	07/05/22 12:35	D2G0047	DG20532
Benzene	ND (0.0122)		8260B Low		1	07/05/22 12:35	D2G0047	DG20532
Bromobenzene	ND (0.0122)		8260B Low		1	07/05/22 12:35	D2G0047	DG20532
Bromochloromethane	ND (0.0122)		8260B Low		1	07/05/22 12:35	D2G0047	DG20532

CERTIFICATE OF ANALYSIS

Client Name: Tighe & Bond
Client Project ID: Neponset Dredge
Client Sample ID: SED-103
Date Sampled: 06/28/22 11:37
Percent Solids: 44
Initial Volume: 4.7
Final Volume: 10
Extraction Method: 5035

ESS Laboratory Work Order: 22F1147
ESS Laboratory Sample ID: 22F1147-03
Sample Matrix: Sediment
Units: mg/kg dry
Analyst: MD

5035/8260B Volatile Organic Compounds / Low Level

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Bromodichloromethane	ND (0.0122)		8260B Low		1	07/05/22 12:35	D2G0047	DG20532
Bromoform	ND (0.0122)		8260B Low		1	07/05/22 12:35	D2G0047	DG20532
Bromomethane	ND (0.0245)		8260B Low		1	07/05/22 12:35	D2G0047	DG20532
Carbon Disulfide	**0.0206** (0.0122)		8260B Low		1	07/05/22 12:35	D2G0047	DG20532
Carbon Tetrachloride	ND (0.0122)		8260B Low		1	07/05/22 12:35	D2G0047	DG20532
Chlorobenzene	ND (0.0122)		8260B Low		1	07/05/22 12:35	D2G0047	DG20532
Chloroethane	ND (0.0245)		8260B Low		1	07/05/22 12:35	D2G0047	DG20532
Chloroform	ND (0.0122)		8260B Low		1	07/05/22 12:35	D2G0047	DG20532
Chloromethane	ND (0.0245)		8260B Low		1	07/05/22 12:35	D2G0047	DG20532
cis-1,2-Dichloroethene	ND (0.0122)		8260B Low		1	07/05/22 12:35	D2G0047	DG20532
cis-1,3-Dichloropropene	ND (0.0042)		8260B Low		1	07/05/22 12:35	D2G0047	DG20532
Dibromochloromethane	ND (0.0039)		8260B Low		1	07/05/22 12:35	D2G0047	DG20532
Dibromomethane	ND (0.0122)		8260B Low		1	07/05/22 12:35	D2G0047	DG20532
Dichlorodifluoromethane	ND (0.0245)		8260B Low		1	07/05/22 12:35	D2G0047	DG20532
Diethyl Ether	ND (0.0122)		8260B Low		1	07/05/22 12:35	D2G0047	DG20532
Di-isopropyl ether	ND (0.0122)		8260B Low		1	07/05/22 12:35	D2G0047	DG20532
Ethyl tertiary-butyl ether	ND (0.0122)		8260B Low		1	07/05/22 12:35	D2G0047	DG20532
Ethylbenzene	ND (0.0122)		8260B Low		1	07/05/22 12:35	D2G0047	DG20532
Hexachlorobutadiene	ND (0.0122)		8260B Low		1	07/05/22 12:35	D2G0047	DG20532
Isopropylbenzene	ND (0.0122)		8260B Low		1	07/05/22 12:35	D2G0047	DG20532
Methyl tert-Butyl Ether	ND (0.0122)		8260B Low		1	07/05/22 12:35	D2G0047	DG20532
Methylene Chloride	ND (0.0245)		8260B Low		1	07/05/22 12:35	D2G0047	DG20532
Naphthalene	ND (0.0122)		8260B Low		1	07/05/22 12:35	D2G0047	DG20532
n-Butylbenzene	ND (0.0122)		8260B Low		1	07/05/22 12:35	D2G0047	DG20532
n-Propylbenzene	ND (0.0122)		8260B Low		1	07/05/22 12:35	D2G0047	DG20532
sec-Butylbenzene	ND (0.0122)		8260B Low		1	07/05/22 12:35	D2G0047	DG20532
Styrene	ND (0.0122)		8260B Low		1	07/05/22 12:35	D2G0047	DG20532
tert-Butylbenzene	ND (0.0122)		8260B Low		1	07/05/22 12:35	D2G0047	DG20532
Tertiary-amyl methyl ether	ND (0.0122)		8260B Low		1	07/05/22 12:35	D2G0047	DG20532
Tetrachloroethene	ND (0.0122)		8260B Low		1	07/05/22 12:35	D2G0047	DG20532
Tetrahydrofuran	ND (0.0122)		8260B Low		1	07/05/22 12:35	D2G0047	DG20532
Toluene	ND (0.0122)		8260B Low		1	07/05/22 12:35	D2G0047	DG20532

CERTIFICATE OF ANALYSIS

Client Name: Tighe & Bond
Client Project ID: Neponset Dredge
Client Sample ID: SED-103
Date Sampled: 06/28/22 11:37
Percent Solids: 44
Initial Volume: 4.7
Final Volume: 10
Extraction Method: 5035

ESS Laboratory Work Order: 22F1147
ESS Laboratory Sample ID: 22F1147-03
Sample Matrix: Sediment
Units: mg/kg dry
Analyst: MD

5035/8260B Volatile Organic Compounds / Low Level

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
trans-1,2-Dichloroethene	ND (0.0122)		8260B Low		1	07/05/22 12:35	D2G0047	DG20532
trans-1,3-Dichloropropene	ND (0.0039)		8260B Low		1	07/05/22 12:35	D2G0047	DG20532
Trichloroethene	ND (0.0122)		8260B Low		1	07/05/22 12:35	D2G0047	DG20532
Trichlorofluoromethane	ND (0.0122)		8260B Low		1	07/05/22 12:35	D2G0047	DG20532
Vinyl Chloride	ND (0.0245)		8260B Low		1	07/05/22 12:35	D2G0047	DG20532
Xylene O	ND (0.0122)		8260B Low		1	07/05/22 12:35	D2G0047	DG20532
Xylene P,M	ND (0.0245)		8260B Low		1	07/05/22 12:35	D2G0047	DG20532
Xylenes (Total)	ND (0.0106)		8260B		1	07/05/22 12:35		[CALC]

	%Recovery	*Qualifier*	*Limits*
Surrogate: 1,2-Dichloroethane-d4	*108 %*		*70-130*
Surrogate: 4-Bromofluorobenzene	*82 %*		*70-130*
Surrogate: Dibromofluoromethane	*103 %*		*70-130*
Surrogate: Toluene-d8	*110 %*		*70-130*

CERTIFICATE OF ANALYSIS

Client Name: Tighe & Bond
Client Project ID: Neponset Dredge
Client Sample ID: SED-103
Date Sampled: 06/28/22 11:37
Percent Solids: 44
Initial Volume: 30.2
Final Volume: 2
Extraction Method: 3540C

ESS Laboratory Work Order: 22F1147
ESS Laboratory Sample ID: 22F1147-03
Sample Matrix: Sediment
Units: mg/kg dry
Analyst: DMC
Prepared: 7/7/22 14:00

8082 Polychlorinated Biphenyls (PCB) / Congeners

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
BZ#8	**1.09** (0.123)		8082A Cong		200	07/12/22 14:47	D2G0129	DG20701
BZ#18 [2C]	**1.77** (0.123)		8082A Cong		200	07/12/22 14:47	D2G0129	DG20701
BZ#28 [2C]	**1.98** (0.123)		8082A Cong		200	07/12/22 14:47	D2G0129	DG20701
BZ#44 [2C]	**0.660** (0.123)		8082A Cong		200	07/12/22 14:47	D2G0129	DG20701
BZ#52	**1.31** (0.123)		8082A Cong		200	07/12/22 14:47	D2G0129	DG20701
BZ#66	**0.168** (0.0123)		8082A Cong		20	07/12/22 14:16	D2G0129	DG20701
BZ#101	**0.148** (0.0123)		8082A Cong		20	07/12/22 14:16	D2G0129	DG20701
BZ#105	**P, LC 0.0361** (0.00308)		8082A Cong		5	07/12/22 13:46	D2G0129	DG20701
BZ#118	**0.116** (0.0123)		8082A Cong		20	07/12/22 14:16	D2G0129	DG20701
BZ#128 [2C]	**0.0107** (0.00062)		8082A Cong		1	07/11/22 15:14	D2G0129	DG20701
BZ#138 [2C]	**0.0550** (0.00308)		8082A Cong		5	07/12/22 13:46	D2G0129	DG20701
BZ#153	**0.0590** (0.00308)		8082A Cong		5	07/12/22 13:46	D2G0129	DG20701
BZ#170	**P, LC 0.0117** (0.00062)		8082A Cong		1	07/11/22 15:14	D2G0129	DG20701
BZ#180 [2C]	**0.0255** (0.00308)		8082A Cong		5	07/12/22 13:46	D2G0129	DG20701
BZ#187 [2C]	**0.0147** (0.00062)		8082A Cong		1	07/11/22 15:14	D2G0129	DG20701
BZ#195	**0.00320** (0.00062)		8082A Cong		1	07/11/22 15:14	D2G0129	DG20701
BZ#206 [2C]	**0.00446** (0.00062)		8082A Cong		1	07/11/22 15:14	D2G0129	DG20701
BZ#209 [2C]	**0.00262** (0.00062)		8082A Cong		1	07/11/22 15:14	D2G0129	DG20701

	%Recovery	*Qualifier*	*Limits*
Surrogate: Tetrachloro-m-xylene	*86 %*		*30-150*
Surrogate: Tetrachloro-m-xylene [2C]	*59 %*		*30-150*

CERTIFICATE OF ANALYSIS

Client Name: Tighe & Bond
Client Project ID: Neponset Dredge
Client Sample ID: SED-103
Date Sampled: 06/28/22 11:37
Percent Solids: 44

ESS Laboratory Work Order: 22F1147
ESS Laboratory Sample ID: 22F1147-03
Sample Matrix: Sediment

Classical Chemistry

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Corrosivity (pH)	**7.64** (N/A)		9045		1	EAM	07/11/22 18:31	S.U.	DG21154
Corrosivity (pH) Sample Temp	**Soil pH measured in water at 20.5 ºC.**								
Eh (ORP)	**WL 150** (N/A)		2580		1	EAM	07/11/22 18:31	mv	DG21153
Hexavalent Chromium	**O** ND (1.0)		7196A		1	JLK	07/11/22 16:44	mg/kg dry	DG21146
Percent Moisture	**56** (1)		2540G		1	EAM	06/30/22 21:18	%	DF23056
Total Organic Carbon (Average)	**61400** (96.2)		LK		1	CCP	07/12/22 13:09	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: Tighe & Bond
Client Project ID: Neponset Dredge
Client Sample ID: SED-103
Date Sampled: 06/28/22 11:37
Percent Solids: 44
Initial Volume: 24
Final Volume: 1
Extraction Method: 3546

ESS Laboratory Work Order: 22F1147
ESS Laboratory Sample ID: 22F1147-03
Sample Matrix: Sediment
Units: mg/kg dry

Prepared: 7/1/22 10:25

MADEP-EPH Extractable Petroleum Hydrocarbons

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
C9-C18 Aliphatics1	ND (35.9)		MADEP-EPH		1	MJV	07/06/22 5:11	D2G0033	DF23021
C19-C36 Aliphatics1	**79.1** (35.9)		MADEP-EPH		1	MJV	07/06/22 5:11	D2G0033	DF23021
C11-C22 Unadjusted Aromatics1	**53.6** (35.9)		EPH8270		1	MJV	07/06/22 14:32	D2G0039	DF23021
C11-C22 Aromatics1,2	**52.8** (36.2)		EPH8270			TJ	07/06/22 14:32		[CALC]
2-Methylnaphthalene	ND (0.019)		EPH8270SIM		1	TJ	07/06/22 2:03	D2G0059	DF23021
Acenaphthene	ND (0.019)		EPH8270SIM		1	TJ	07/06/22 2:03	D2G0059	DF23021
Naphthalene	**0.024** (0.019)		EPH8270SIM		1	TJ	07/06/22 2:03	D2G0059	DF23021
Phenanthrene	**0.061** (0.019)		EPH8270SIM		1	TJ	07/06/22 2:03	D2G0059	DF23021
Acenaphthylene	ND (0.019)		EPH8270SIM		1	TJ	07/06/22 2:03	D2G0059	DF23021
Anthracene	ND (0.019)		EPH8270SIM		1	TJ	07/06/22 2:03	D2G0059	DF23021
Benzo(a)anthracene	**0.063** (0.019)		EPH8270SIM		1	TJ	07/06/22 2:03	D2G0059	DF23021
Benzo(a)pyrene	**0.071** (0.019)		EPH8270SIM		1	TJ	07/06/22 2:03	D2G0059	DF23021
Benzo(b)fluoranthene	**0.064** (0.019)		EPH8270SIM		1	TJ	07/06/22 2:03	D2G0059	DF23021
Benzo(g,h,i)perylene	**0.051** (0.019)		EPH8270SIM		1	TJ	07/06/22 2:03	D2G0059	DF23021
Benzo(k)fluoranthene	**0.058** (0.019)		EPH8270SIM		1	TJ	07/06/22 2:03	D2G0059	DF23021
Chrysene	**0.084** (0.019)		EPH8270SIM		1	TJ	07/06/22 2:03	D2G0059	DF23021
Dibenzo(a,h)Anthracene	ND (0.019)		EPH8270SIM		1	TJ	07/06/22 2:03	D2G0059	DF23021
Fluoranthene	**0.125** (0.019)		EPH8270SIM		1	TJ	07/06/22 2:03	D2G0059	DF23021
Fluorene	ND (0.019)		EPH8270SIM		1	TJ	07/06/22 2:03	D2G0059	DF23021
Indeno(1,2,3-cd)Pyrene	**0.042** (0.019)		EPH8270SIM		1	TJ	07/06/22 2:03	D2G0059	DF23021
Pyrene	**0.139** (0.019)		EPH8270SIM		1	TJ	07/06/22 2:03	D2G0059	DF23021

	%Recovery	Qualifier	Limits
Surrogate: 1-Chlorooctadecane	*68 %*		*40-140*
Surrogate: 2-Bromonaphthalene	*91 %*		*40-140*
Surrogate: 2-Fluorobiphenyl	*91 %*		*40-140*
Surrogate: O-Terphenyl	*80 %*		*40-140*

CERTIFICATE OF ANALYSIS

Client Name: Tighe & Bond
Client Project ID: Neponset Dredge
Client Sample ID: SED-103
Date Sampled: 06/28/22 11:37

ESS Laboratory Work Order: 22F1147
ESS Laboratory Sample ID: 22F1147-03
Sample Matrix: Sediment

Subcontracted Analysis

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Grain Size	**See Attached** (N/A)								

CERTIFICATE OF ANALYSIS

Client Name: Tighe & Bond
Client Project ID: Neponset Dredge
Client Sample ID: SED-103
Date Sampled: 06/28/22 11:37
Percent Solids: 44
Initial Volume: 100
Final Volume: 2000
Extraction Method: 1311

ESS Laboratory Work Order: 22F1147
ESS Laboratory Sample ID: 22F1147-03
Sample Matrix: Sediment
Units: °C
Analyst: NAR
Prepared: 7/11/22 17:00

TCLP Extraction by 1311

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Batch
Temperature (Min C)	**19.9** (N/A)		1311		1	NAR	07/12/22 13:00	DG21141
Temperature (Max C)	**21.7** (N/A)		1311		1	NAR	07/12/22 13:00	DG21141
Temperature (Range)	**Temperature is not within 23 +/-2 °C.** (N/A)							

CERTIFICATE OF ANALYSIS

Client Name: Tighe & Bond
Client Project ID: Neponset Dredge
Client Sample ID: SED-104
Date Sampled: 06/28/22 11:55
Percent Solids: 40

ESS Laboratory Work Order: 22F1147
ESS Laboratory Sample ID: 22F1147-04
Sample Matrix: Sediment

Classical Chemistry

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Percent Moisture	**60** (1)		2540G		1	EAM	06/30/22 21:18	%	DF23056

CERTIFICATE OF ANALYSIS

Client Name: Tighe & Bond
Client Project ID: Neponset Dredge
Client Sample ID: SED-105
Date Sampled: 06/28/22 12:10
Percent Solids: 44

ESS Laboratory Work Order: 22F1147
ESS Laboratory Sample ID: 22F1147-05
Sample Matrix: Sediment
Units: mg/L

Extraction Method: 3005A TCLP

1311 TCLP Metals

Analyte	Results (MRL)	MDL	Method	TCLP Limit	DF	Analyst	Analyzed	I/V	F/V	Batch
Chromium	ND (0.020)		1311/6010C		1	KJK	07/13/22 18:23	50	50	DG21235
Lead	**0.088** (0.050)		1311/6010C		1	KJK	07/13/22 18:23	50	50	DG21235

CERTIFICATE OF ANALYSIS

Client Name: Tighe & Bond
Client Project ID: Neponset Dredge
Client Sample ID: SED-105
Date Sampled: 06/28/22 12:10
Percent Solids: 44
Initial Volume: 7.2
Final Volume: 10
Extraction Method: 5035

ESS Laboratory Work Order: 22F1147
ESS Laboratory Sample ID: 22F1147-05
Sample Matrix: Sediment
Units: mg/kg dry
Analyst: MD

5035/8260B Volatile Organic Compounds / Low Level

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
1,1,1,2-Tetrachloroethane	ND (0.0079)		8260B Low		1	07/05/22 13:01	D2G0047	DG20532
1,1,1-Trichloroethane	ND (0.0079)		8260B Low		1	07/05/22 13:01	D2G0047	DG20532
1,1,2,2-Tetrachloroethane	ND (0.0024)		8260B Low		1	07/05/22 13:01	D2G0047	DG20532
1,1,2-Trichloroethane	ND (0.0079)		8260B Low		1	07/05/22 13:01	D2G0047	DG20532
1,1-Dichloroethane	ND (0.0079)		8260B Low		1	07/05/22 13:01	D2G0047	DG20532
1,1-Dichloroethene	ND (0.0079)		8260B Low		1	07/05/22 13:01	D2G0047	DG20532
1,1-Dichloropropene	ND (0.0079)		8260B Low		1	07/05/22 13:01	D2G0047	DG20532
1,2,3-Trichlorobenzene	ND (0.0079)		8260B Low		1	07/05/22 13:01	D2G0047	DG20532
1,2,3-Trichloropropane	ND (0.0079)		8260B Low		1	07/05/22 13:01	D2G0047	DG20532
1,2,4-Trichlorobenzene	ND (0.0079)		8260B Low		1	07/05/22 13:01	D2G0047	DG20532
1,2,4-Trimethylbenzene	ND (0.0079)		8260B Low		1	07/05/22 13:01	D2G0047	DG20532
1,2-Dibromo-3-Chloropropane	ND (0.0079)		8260B Low		1	07/05/22 13:01	D2G0047	DG20532
1,2-Dibromoethane	ND (0.0079)		8260B Low		1	07/05/22 13:01	D2G0047	DG20532
1,2-Dichlorobenzene	ND (0.0079)		8260B Low		1	07/05/22 13:01	D2G0047	DG20532
1,2-Dichloroethane	ND (0.0079)		8260B Low		1	07/05/22 13:01	D2G0047	DG20532
1,2-Dichloropropane	ND (0.0079)		8260B Low		1	07/05/22 13:01	D2G0047	DG20532
1,3,5-Trimethylbenzene	ND (0.0079)		8260B Low		1	07/05/22 13:01	D2G0047	DG20532
1,3-Dichlorobenzene	ND (0.0079)		8260B Low		1	07/05/22 13:01	D2G0047	DG20532
1,3-Dichloropropane	ND (0.0079)		8260B Low		1	07/05/22 13:01	D2G0047	DG20532
1,4-Dichlorobenzene	ND (0.0079)		8260B Low		1	07/05/22 13:01	D2G0047	DG20532
1,4-Dioxane	ND (0.0158)		8260B Low		1	07/05/22 13:01	D2G0047	DG20532
2,2-Dichloropropane	ND (0.0079)		8260B Low		1	07/05/22 13:01	D2G0047	DG20532
2-Butanone	ND (0.0790)		8260B Low		1	07/05/22 13:01	D2G0047	DG20532
2-Chlorotoluene	ND (0.0079)		8260B Low		1	07/05/22 13:01	D2G0047	DG20532
2-Hexanone	ND (0.0790)		8260B Low		1	07/05/22 13:01	D2G0047	DG20532
4-Chlorotoluene	ND (0.0079)		8260B Low		1	07/05/22 13:01	D2G0047	DG20532
4-Isopropyltoluene	ND (0.0079)		8260B Low		1	07/05/22 13:01	D2G0047	DG20532
4-Methyl-2-Pentanone	ND (0.0790)		8260B Low		1	07/05/22 13:01	D2G0047	DG20532
Acetone	**0.213** (0.0790)		8260B Low		1	07/05/22 13:01	D2G0047	DG20532
Benzene	ND (0.0079)		8260B Low		1	07/05/22 13:01	D2G0047	DG20532
Bromobenzene	ND (0.0079)		8260B Low		1	07/05/22 13:01	D2G0047	DG20532
Bromochloromethane	ND (0.0079)		8260B Low		1	07/05/22 13:01	D2G0047	DG20532

CERTIFICATE OF ANALYSIS

Client Name: Tighe & Bond
Client Project ID: Neponset Dredge
Client Sample ID: SED-105
Date Sampled: 06/28/22 12:10
Percent Solids: 44
Initial Volume: 7.2
Final Volume: 10
Extraction Method: 5035

ESS Laboratory Work Order: 22F1147
ESS Laboratory Sample ID: 22F1147-05
Sample Matrix: Sediment
Units: mg/kg dry
Analyst: MD

5035/8260B Volatile Organic Compounds / Low Level

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Bromodichloromethane	ND (0.0079)		8260B Low		1	07/05/22 13:01	D2G0047	DG20532
Bromoform	ND (0.0079)		8260B Low		1	07/05/22 13:01	D2G0047	DG20532
Bromomethane	ND (0.0158)		8260B Low		1	07/05/22 13:01	D2G0047	DG20532
Carbon Disulfide	**0.0162** (0.0079)		8260B Low		1	07/05/22 13:01	D2G0047	DG20532
Carbon Tetrachloride	ND (0.0079)		8260B Low		1	07/05/22 13:01	D2G0047	DG20532
Chlorobenzene	ND (0.0079)		8260B Low		1	07/05/22 13:01	D2G0047	DG20532
Chloroethane	ND (0.0158)		8260B Low		1	07/05/22 13:01	D2G0047	DG20532
Chloroform	ND (0.0079)		8260B Low		1	07/05/22 13:01	D2G0047	DG20532
Chloromethane	ND (0.0158)		8260B Low		1	07/05/22 13:01	D2G0047	DG20532
cis-1,2-Dichloroethene	ND (0.0079)		8260B Low		1	07/05/22 13:01	D2G0047	DG20532
cis-1,3-Dichloropropene	ND (0.0027)		8260B Low		1	07/05/22 13:01	D2G0047	DG20532
Dibromochloromethane	ND (0.0025)		8260B Low		1	07/05/22 13:01	D2G0047	DG20532
Dibromomethane	ND (0.0079)		8260B Low		1	07/05/22 13:01	D2G0047	DG20532
Dichlorodifluoromethane	ND (0.0158)		8260B Low		1	07/05/22 13:01	D2G0047	DG20532
Diethyl Ether	ND (0.0079)		8260B Low		1	07/05/22 13:01	D2G0047	DG20532
Di-isopropyl ether	ND (0.0079)		8260B Low		1	07/05/22 13:01	D2G0047	DG20532
Ethyl tertiary-butyl ether	ND (0.0079)		8260B Low		1	07/05/22 13:01	D2G0047	DG20532
Ethylbenzene	ND (0.0079)		8260B Low		1	07/05/22 13:01	D2G0047	DG20532
Hexachlorobutadiene	ND (0.0079)		8260B Low		1	07/05/22 13:01	D2G0047	DG20532
Isopropylbenzene	ND (0.0079)		8260B Low		1	07/05/22 13:01	D2G0047	DG20532
Methyl tert-Butyl Ether	ND (0.0079)		8260B Low		1	07/05/22 13:01	D2G0047	DG20532
Methylene Chloride	ND (0.0158)		8260B Low		1	07/05/22 13:01	D2G0047	DG20532
Naphthalene	ND (0.0079)		8260B Low		1	07/05/22 13:01	D2G0047	DG20532
n-Butylbenzene	ND (0.0079)		8260B Low		1	07/05/22 13:01	D2G0047	DG20532
n-Propylbenzene	ND (0.0079)		8260B Low		1	07/05/22 13:01	D2G0047	DG20532
sec-Butylbenzene	ND (0.0079)		8260B Low		1	07/05/22 13:01	D2G0047	DG20532
Styrene	ND (0.0079)		8260B Low		1	07/05/22 13:01	D2G0047	DG20532
tert-Butylbenzene	ND (0.0079)		8260B Low		1	07/05/22 13:01	D2G0047	DG20532
Tertiary-amyl methyl ether	ND (0.0079)		8260B Low		1	07/05/22 13:01	D2G0047	DG20532
Tetrachloroethene	ND (0.0079)		8260B Low		1	07/05/22 13:01	D2G0047	DG20532
Tetrahydrofuran	ND (0.0079)		8260B Low		1	07/05/22 13:01	D2G0047	DG20532
Toluene	ND (0.0079)		8260B Low		1	07/05/22 13:01	D2G0047	DG20532

CERTIFICATE OF ANALYSIS

Client Name: Tighe & Bond
Client Project ID: Neponset Dredge
Client Sample ID: SED-105
Date Sampled: 06/28/22 12:10
Percent Solids: 44
Initial Volume: 7.2
Final Volume: 10
Extraction Method: 5035

ESS Laboratory Work Order: 22F1147
ESS Laboratory Sample ID: 22F1147-05
Sample Matrix: Sediment
Units: mg/kg dry
Analyst: MD

5035/8260B Volatile Organic Compounds / Low Level

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
trans-1,2-Dichloroethene	ND (0.0079)		8260B Low		1	07/05/22 13:01	D2G0047	DG20532
trans-1,3-Dichloropropene	ND (0.0025)		8260B Low		1	07/05/22 13:01	D2G0047	DG20532
Trichloroethene	ND (0.0079)		8260B Low		1	07/05/22 13:01	D2G0047	DG20532
Trichlorofluoromethane	ND (0.0079)		8260B Low		1	07/05/22 13:01	D2G0047	DG20532
Vinyl Chloride	ND (0.0158)		8260B Low		1	07/05/22 13:01	D2G0047	DG20532
Xylene O	ND (0.0079)		8260B Low		1	07/05/22 13:01	D2G0047	DG20532
Xylene P,M	ND (0.0158)		8260B Low		1	07/05/22 13:01	D2G0047	DG20532
Xylenes (Total)	ND (0.00694)		8260B		1	07/05/22 13:01		[CALC]

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichloroethane-d4	*110 %*		*70-130*
Surrogate: 4-Bromofluorobenzene	*82 %*		*70-130*
Surrogate: Dibromofluoromethane	*104 %*		*70-130*
Surrogate: Toluene-d8	*109 %*		*70-130*

CERTIFICATE OF ANALYSIS

Client Name: Tighe & Bond
Client Project ID: Neponset Dredge
Client Sample ID: SED-105
Date Sampled: 06/28/22 12:10
Percent Solids: 44
Initial Volume: 30.4
Final Volume: 2
Extraction Method: 3540C

ESS Laboratory Work Order: 22F1147
ESS Laboratory Sample ID: 22F1147-05
Sample Matrix: Sediment
Units: mg/kg dry
Analyst: DMC
Prepared: 7/7/22 14:00

8082 Polychlorinated Biphenyls (PCB) / Congeners

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
BZ#8	**0.294** (0.0242)		8082A Cong		40	07/12/22 18:19	D2G0129	DG20701
BZ#18 [2C]	**0.413** (0.0242)		8082A Cong		40	07/12/22 18:19	D2G0129	DG20701
BZ#28 [2C]	**0.504** (0.0242)		8082A Cong		40	07/12/22 18:19	D2G0129	DG20701
BZ#44 [2C]	**0.236** (0.0242)		8082A Cong		40	07/12/22 18:19	D2G0129	DG20701
BZ#52	**0.355** (0.0242)		8082A Cong		40	07/12/22 18:19	D2G0129	DG20701
BZ#66 [2C]	**0.203** (0.0242)		8082A Cong		40	07/12/22 18:19	D2G0129	DG20701
BZ#101	**0.124** (0.00606)		8082A Cong		10	07/12/22 17:49	D2G0129	DG20701
BZ#105	**P, LC 0.0294** (0.00606)		8082A Cong		10	07/12/22 17:49	D2G0129	DG20701
BZ#118	**0.0784** (0.00606)		8082A Cong		10	07/12/22 17:49	D2G0129	DG20701
BZ#128 [2C]	**0.00770** (0.00061)		8082A Cong		1	07/11/22 15:44	D2G0129	DG20701
BZ#138 [2C]	**0.0469** (0.00606)		8082A Cong		10	07/12/22 17:49	D2G0129	DG20701
BZ#153	**0.0485** (0.00606)		8082A Cong		10	07/12/22 17:49	D2G0129	DG20701
BZ#170 [2C]	**0.0105** (0.00061)		8082A Cong		1	07/11/22 15:44	D2G0129	DG20701
BZ#180 [2C]	**0.0132** (0.00061)		8082A Cong		1	07/11/22 15:44	D2G0129	DG20701
BZ#187 [2C]	**0.00901** (0.00061)		8082A Cong		1	07/11/22 15:44	D2G0129	DG20701
BZ#195 [2C]	**P, LC 0.00181** (0.00061)		8082A Cong		1	07/11/22 15:44	D2G0129	DG20701
BZ#206	**0.00292** (0.00061)		8082A Cong		1	07/11/22 15:44	D2G0129	DG20701
BZ#209 [2C]	**0.00174** (0.00061)		8082A Cong		1	07/11/22 15:44	D2G0129	DG20701

	%Recovery	Qualifier	Limits
Surrogate: Tetrachloro-m-xylene	*63 %*		*30-150*
Surrogate: Tetrachloro-m-xylene [2C]	*55 %*		*30-150*

CERTIFICATE OF ANALYSIS

Client Name: Tighe & Bond
Client Project ID: Neponset Dredge
Client Sample ID: SED-105
Date Sampled: 06/28/22 12:10
Percent Solids: 44

ESS Laboratory Work Order: 22F1147
ESS Laboratory Sample ID: 22F1147-05
Sample Matrix: Sediment

Classical Chemistry

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Corrosivity (pH)	**7.53** (N/A)		9045		1	EAM	07/11/22 18:31	S.U.	DG21154
Corrosivity (pH) Sample Temp	**Soil pH measured in water at 20.7 ºC.**								
Eh (ORP)	**WL 151** (N/A)		2580		1	EAM	07/11/22 18:31	mv	DG21153
Hexavalent Chromium	**O** ND (1.0)		7196A		1	JLK	07/11/22 16:44	mg/kg dry	DG21146
Percent Moisture	**56** (1)		2540G		1	EAM	06/30/22 21:18	%	DF23056
Total Organic Carbon (Average)	**50000** (95.9)		LK		1	CCP	07/12/22 13:42	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: Tighe & Bond
Client Project ID: Neponset Dredge
Client Sample ID: SED-105
Date Sampled: 06/28/22 12:10
Percent Solids: 44
Initial Volume: 24.7
Final Volume: 1
Extraction Method: 3546

ESS Laboratory Work Order: 22F1147
ESS Laboratory Sample ID: 22F1147-05
Sample Matrix: Sediment
Units: mg/kg dry

Prepared: 7/1/22 14:33

MADEP-EPH Extractable Petroleum Hydrocarbons

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
C9-C18 Aliphatics1	ND (34.5)		MADEP-EPH		1	MJV	07/05/22 17:37	D2G0031	DG20126
C19-C36 Aliphatics1	**196** (34.5)		MADEP-EPH		1	MJV	07/05/22 17:37	D2G0031	DG20126
C11-C22 Unadjusted Aromatics1	**82.8** (34.5)		EPH8270		1	MJV	07/05/22 19:13	D2G0039	DG20126
C11-C22 Aromatics1,2	**79.8** (34.8)		EPH8270			TJ	07/06/22 23:52		[CALC]
2-Methylnaphthalene	ND (0.018)		EPH8270SIM		1	TJ	07/06/22 23:52	D2G0078	DG20126
Acenaphthene	ND (0.018)		EPH8270SIM		1	TJ	07/06/22 23:52	D2G0078	DG20126
Naphthalene	**B 0.035** (0.018)		EPH8270SIM		1	TJ	07/06/22 23:52	D2G0078	DG20126
Phenanthrene	**0.211** (0.018)		EPH8270SIM		1	TJ	07/06/22 23:52	D2G0078	DG20126
Acenaphthylene	**0.028** (0.018)		EPH8270SIM		1	TJ	07/06/22 23:52	D2G0078	DG20126
Anthracene	**0.046** (0.018)		EPH8270SIM		1	TJ	07/06/22 23:52	D2G0078	DG20126
Benzo(a)anthracene	**0.228** (0.018)		EPH8270SIM		1	TJ	07/06/22 23:52	D2G0078	DG20126
Benzo(a)pyrene	**0.285** (0.018)		EPH8270SIM		1	TJ	07/06/22 23:52	D2G0078	DG20126
Benzo(b)fluoranthene	**0.276** (0.018)		EPH8270SIM		1	TJ	07/06/22 23:52	D2G0078	DG20126
Benzo(g,h,i)perylene	**0.206** (0.018)		EPH8270SIM		1	TJ	07/06/22 23:52	D2G0078	DG20126
Benzo(k)fluoranthene	**0.246** (0.018)		EPH8270SIM		1	TJ	07/06/22 23:52	D2G0078	DG20126
Chrysene	**0.308** (0.018)		EPH8270SIM		1	TJ	07/06/22 23:52	D2G0078	DG20126
Dibenzo(a,h)Anthracene	ND (0.018)		EPH8270SIM		1	TJ	07/06/22 23:52	D2G0078	DG20126
Fluoranthene	**0.463** (0.018)		EPH8270SIM		1	TJ	07/06/22 23:52	D2G0078	DG20126
Fluorene	ND (0.018)		EPH8270SIM		1	TJ	07/06/22 23:52	D2G0078	DG20126
Indeno(1,2,3-cd)Pyrene	**0.181** (0.018)		EPH8270SIM		1	TJ	07/06/22 23:52	D2G0078	DG20126
Pyrene	**0.543** (0.018)		EPH8270SIM		1	TJ	07/06/22 23:52	D2G0078	DG20126

	%Recovery	*Qualifier*	*Limits*
Surrogate: 1-Chlorooctadecane	*69 %*		*40-140*
Surrogate: 2-Bromonaphthalene	*93 %*		*40-140*
Surrogate: 2-Fluorobiphenyl	*93 %*		*40-140*
Surrogate: O-Terphenyl	*83 %*		*40-140*

CERTIFICATE OF ANALYSIS

Client Name: Tighe & Bond
Client Project ID: Neponset Dredge
Client Sample ID: SED-105
Date Sampled: 06/28/22 12:10

ESS Laboratory Work Order: 22F1147
ESS Laboratory Sample ID: 22F1147-05
Sample Matrix: Sediment

Subcontracted Analysis

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Grain Size	**See Attached** (N/A)								

CERTIFICATE OF ANALYSIS

Client Name: Tighe & Bond
Client Project ID: Neponset Dredge
Client Sample ID: SED-105
Date Sampled: 06/28/22 12:10
Percent Solids: 44
Initial Volume: 100
Final Volume: 2000
Extraction Method: 1311

ESS Laboratory Work Order: 22F1147
ESS Laboratory Sample ID: 22F1147-05
Sample Matrix: Sediment
Units: °C
Analyst: NAR
Prepared: 7/11/22 17:00

TCLP Extraction by 1311

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Batch
Temperature (Min C)	**19.9** (N/A)		1311		1	NAR	07/12/22 13:00	DG21141
Temperature (Max C)	**21.7** (N/A)		1311		1	NAR	07/12/22 13:00	DG21141
Temperature (Range)	**Temperature is not within 23 +/-2 °C.** (N/A)							

CERTIFICATE OF ANALYSIS

Client Name: Tighe & Bond
Client Project ID: Neponset Dredge
Client Sample ID: SED-106
Date Sampled: 06/28/22 09:51
Percent Solids: 37

ESS Laboratory Work Order: 22F1147
ESS Laboratory Sample ID: 22F1147-06
Sample Matrix: Sediment
Units: mg/L

Extraction Method: 3005A TCLP

1311 TCLP Metals

Analyte	Results (MRL)	MDL	Method	TCLP Limit	DF	Analyst	Analyzed	I/V	F/V	Batch
Lead	**0.075** (0.050)		1311/6010C		1	KJK	07/13/22 18:25	50	50	DG21235

CERTIFICATE OF ANALYSIS

Client Name: Tighe & Bond
Client Project ID: Neponset Dredge
Client Sample ID: SED-106
Date Sampled: 06/28/22 09:51
Percent Solids: 37
Initial Volume: 5.4
Final Volume: 10
Extraction Method: 5035

ESS Laboratory Work Order: 22F1147
ESS Laboratory Sample ID: 22F1147-06
Sample Matrix: Sediment
Units: mg/kg dry
Analyst: MD

5035/8260B Volatile Organic Compounds / Low Level

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
1,1,1,2-Tetrachloroethane	ND (0.0124)		8260B Low		1	07/05/22 13:26	D2G0047	DG20532
1,1,1-Trichloroethane	ND (0.0124)		8260B Low		1	07/05/22 13:26	D2G0047	DG20532
1,1,2,2-Tetrachloroethane	ND (0.0037)		8260B Low		1	07/05/22 13:26	D2G0047	DG20532
1,1,2-Trichloroethane	ND (0.0124)		8260B Low		1	07/05/22 13:26	D2G0047	DG20532
1,1-Dichloroethane	ND (0.0124)		8260B Low		1	07/05/22 13:26	D2G0047	DG20532
1,1-Dichloroethene	ND (0.0124)		8260B Low		1	07/05/22 13:26	D2G0047	DG20532
1,1-Dichloropropene	ND (0.0124)		8260B Low		1	07/05/22 13:26	D2G0047	DG20532
1,2,3-Trichlorobenzene	ND (0.0124)		8260B Low		1	07/05/22 13:26	D2G0047	DG20532
1,2,3-Trichloropropane	ND (0.0124)		8260B Low		1	07/05/22 13:26	D2G0047	DG20532
1,2,4-Trichlorobenzene	ND (0.0124)		8260B Low		1	07/05/22 13:26	D2G0047	DG20532
1,2,4-Trimethylbenzene	ND (0.0124)		8260B Low		1	07/05/22 13:26	D2G0047	DG20532
1,2-Dibromo-3-Chloropropane	ND (0.0124)		8260B Low		1	07/05/22 13:26	D2G0047	DG20532
1,2-Dibromoethane	ND (0.0124)		8260B Low		1	07/05/22 13:26	D2G0047	DG20532
1,2-Dichlorobenzene	ND (0.0124)		8260B Low		1	07/05/22 13:26	D2G0047	DG20532
1,2-Dichloroethane	ND (0.0124)		8260B Low		1	07/05/22 13:26	D2G0047	DG20532
1,2-Dichloropropane	ND (0.0124)		8260B Low		1	07/05/22 13:26	D2G0047	DG20532
1,3,5-Trimethylbenzene	ND (0.0124)		8260B Low		1	07/05/22 13:26	D2G0047	DG20532
1,3-Dichlorobenzene	ND (0.0124)		8260B Low		1	07/05/22 13:26	D2G0047	DG20532
1,3-Dichloropropane	ND (0.0124)		8260B Low		1	07/05/22 13:26	D2G0047	DG20532
1,4-Dichlorobenzene	ND (0.0124)		8260B Low		1	07/05/22 13:26	D2G0047	DG20532
1,4-Dioxane	ND (0.0248)		8260B Low		1	07/05/22 13:26	D2G0047	DG20532
2,2-Dichloropropane	ND (0.0124)		8260B Low		1	07/05/22 13:26	D2G0047	DG20532
2-Butanone	ND (0.124)		8260B Low		1	07/05/22 13:26	D2G0047	DG20532
2-Chlorotoluene	ND (0.0124)		8260B Low		1	07/05/22 13:26	D2G0047	DG20532
2-Hexanone	ND (0.124)		8260B Low		1	07/05/22 13:26	D2G0047	DG20532
4-Chlorotoluene	ND (0.0124)		8260B Low		1	07/05/22 13:26	D2G0047	DG20532
4-Isopropyltoluene	ND (0.0124)		8260B Low		1	07/05/22 13:26	D2G0047	DG20532
4-Methyl-2-Pentanone	ND (0.124)		8260B Low		1	07/05/22 13:26	D2G0047	DG20532
Acetone	**0.527** (0.124)		8260B Low		1	07/05/22 13:26	D2G0047	DG20532
Benzene	ND (0.0124)		8260B Low		1	07/05/22 13:26	D2G0047	DG20532
Bromobenzene	ND (0.0124)		8260B Low		1	07/05/22 13:26	D2G0047	DG20532
Bromochloromethane	ND (0.0124)		8260B Low		1	07/05/22 13:26	D2G0047	DG20532

CERTIFICATE OF ANALYSIS

Client Name: Tighe & Bond
Client Project ID: Neponset Dredge
Client Sample ID: SED-106
Date Sampled: 06/28/22 09:51
Percent Solids: 37
Initial Volume: 5.4
Final Volume: 10
Extraction Method: 5035

ESS Laboratory Work Order: 22F1147
ESS Laboratory Sample ID: 22F1147-06
Sample Matrix: Sediment
Units: mg/kg dry
Analyst: MD

5035/8260B Volatile Organic Compounds / Low Level

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Bromodichloromethane	ND (0.0124)		8260B Low		1	07/05/22 13:26	D2G0047	DG20532
Bromoform	ND (0.0124)		8260B Low		1	07/05/22 13:26	D2G0047	DG20532
Bromomethane	ND (0.0248)		8260B Low		1	07/05/22 13:26	D2G0047	DG20532
Carbon Disulfide	ND (0.0124)		8260B Low		1	07/05/22 13:26	D2G0047	DG20532
Carbon Tetrachloride	ND (0.0124)		8260B Low		1	07/05/22 13:26	D2G0047	DG20532
Chlorobenzene	ND (0.0124)		8260B Low		1	07/05/22 13:26	D2G0047	DG20532
Chloroethane	ND (0.0248)		8260B Low		1	07/05/22 13:26	D2G0047	DG20532
Chloroform	ND (0.0124)		8260B Low		1	07/05/22 13:26	D2G0047	DG20532
Chloromethane	ND (0.0248)		8260B Low		1	07/05/22 13:26	D2G0047	DG20532
cis-1,2-Dichloroethene	ND (0.0124)		8260B Low		1	07/05/22 13:26	D2G0047	DG20532
cis-1,3-Dichloropropene	ND (0.0042)		8260B Low		1	07/05/22 13:26	D2G0047	DG20532
Dibromochloromethane	ND (0.0040)		8260B Low		1	07/05/22 13:26	D2G0047	DG20532
Dibromomethane	ND (0.0124)		8260B Low		1	07/05/22 13:26	D2G0047	DG20532
Dichlorodifluoromethane	ND (0.0248)		8260B Low		1	07/05/22 13:26	D2G0047	DG20532
Diethyl Ether	ND (0.0124)		8260B Low		1	07/05/22 13:26	D2G0047	DG20532
Di-isopropyl ether	ND (0.0124)		8260B Low		1	07/05/22 13:26	D2G0047	DG20532
Ethyl tertiary-butyl ether	ND (0.0124)		8260B Low		1	07/05/22 13:26	D2G0047	DG20532
Ethylbenzene	ND (0.0124)		8260B Low		1	07/05/22 13:26	D2G0047	DG20532
Hexachlorobutadiene	ND (0.0124)		8260B Low		1	07/05/22 13:26	D2G0047	DG20532
Isopropylbenzene	ND (0.0124)		8260B Low		1	07/05/22 13:26	D2G0047	DG20532
Methyl tert-Butyl Ether	ND (0.0124)		8260B Low		1	07/05/22 13:26	D2G0047	DG20532
Methylene Chloride	ND (0.0248)		8260B Low		1	07/05/22 13:26	D2G0047	DG20532
Naphthalene	ND (0.0124)		8260B Low		1	07/05/22 13:26	D2G0047	DG20532
n-Butylbenzene	ND (0.0124)		8260B Low		1	07/05/22 13:26	D2G0047	DG20532
n-Propylbenzene	ND (0.0124)		8260B Low		1	07/05/22 13:26	D2G0047	DG20532
sec-Butylbenzene	ND (0.0124)		8260B Low		1	07/05/22 13:26	D2G0047	DG20532
Styrene	ND (0.0124)		8260B Low		1	07/05/22 13:26	D2G0047	DG20532
tert-Butylbenzene	ND (0.0124)		8260B Low		1	07/05/22 13:26	D2G0047	DG20532
Tertiary-amyl methyl ether	ND (0.0124)		8260B Low		1	07/05/22 13:26	D2G0047	DG20532
Tetrachloroethene	ND (0.0124)		8260B Low		1	07/05/22 13:26	D2G0047	DG20532
Tetrahydrofuran	ND (0.0124)		8260B Low		1	07/05/22 13:26	D2G0047	DG20532
Toluene	ND (0.0124)		8260B Low		1	07/05/22 13:26	D2G0047	DG20532

CERTIFICATE OF ANALYSIS

Client Name: Tighe & Bond
Client Project ID: Neponset Dredge
Client Sample ID: SED-106
Date Sampled: 06/28/22 09:51
Percent Solids: 37
Initial Volume: 5.4
Final Volume: 10
Extraction Method: 5035

ESS Laboratory Work Order: 22F1147
ESS Laboratory Sample ID: 22F1147-06
Sample Matrix: Sediment
Units: mg/kg dry
Analyst: MD

5035/8260B Volatile Organic Compounds / Low Level

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
trans-1,2-Dichloroethene	ND (0.0124)		8260B Low		1	07/05/22 13:26	D2G0047	DG20532
trans-1,3-Dichloropropene	ND (0.0040)		8260B Low		1	07/05/22 13:26	D2G0047	DG20532
Trichloroethene	ND (0.0124)		8260B Low		1	07/05/22 13:26	D2G0047	DG20532
Trichlorofluoromethane	ND (0.0124)		8260B Low		1	07/05/22 13:26	D2G0047	DG20532
Vinyl Chloride	ND (0.0248)		8260B Low		1	07/05/22 13:26	D2G0047	DG20532
Xylene O	ND (0.0124)		8260B Low		1	07/05/22 13:26	D2G0047	DG20532
Xylene P,M	ND (0.0248)		8260B Low		1	07/05/22 13:26	D2G0047	DG20532
Xylenes (Total)	ND (0.00926)		8260B		1	07/05/22 13:26		[CALC]

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichloroethane-d4	*110 %*		*70-130*
Surrogate: 4-Bromofluorobenzene	*85 %*		*70-130*
Surrogate: Dibromofluoromethane	*104 %*		*70-130*
Surrogate: Toluene-d8	*107 %*		*70-130*

CERTIFICATE OF ANALYSIS

Client Name: Tighe & Bond
Client Project ID: Neponset Dredge
Client Sample ID: SED-106
Date Sampled: 06/28/22 09:51
Percent Solids: 37
Initial Volume: 30.1
Final Volume: 2
Extraction Method: 3540C

ESS Laboratory Work Order: 22F1147
ESS Laboratory Sample ID: 22F1147-06
Sample Matrix: Sediment
Units: mg/kg dry
Analyst: DMC
Prepared: 7/7/22 14:00

8082 Polychlorinated Biphenyls (PCB) / Congeners

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
BZ#8 [2C]	**0.0472** (0.00360)		8082A Cong		5	07/12/22 15:17	D2G0129	DG20701
BZ#18	**0.0857** (0.00360)		8082A Cong		5	07/12/22 15:17	D2G0129	DG20701
BZ#28 [2C]	**0.0869** (0.00360)		8082A Cong		5	07/12/22 15:17	D2G0129	DG20701
BZ#44 [2C]	**0.0512** (0.00360)		8082A Cong		5	07/12/22 15:17	D2G0129	DG20701
BZ#52	**0.0688** (0.00360)		8082A Cong		5	07/12/22 15:17	D2G0129	DG20701
BZ#66	**P, LC 0.0535** (0.00360)		8082A Cong		5	07/12/22 15:17	D2G0129	DG20701
BZ#101	**0.0521** (0.00360)		8082A Cong		5	07/12/22 15:17	D2G0129	DG20701
BZ#105	**P, LC 0.0101** (0.00072)		8082A Cong		1	07/11/22 16:15	D2G0129	DG20701
BZ#118	**0.0371** (0.00360)		8082A Cong		5	07/12/22 15:17	D2G0129	DG20701
BZ#128 [2C]	**0.00476** (0.00072)		8082A Cong		1	07/11/22 16:15	D2G0129	DG20701
BZ#138 [2C]	**0.0281** (0.00360)		8082A Cong		5	07/12/22 15:17	D2G0129	DG20701
BZ#153	**0.0290** (0.00360)		8082A Cong		5	07/12/22 15:17	D2G0129	DG20701
BZ#170 [2C]	**0.00698** (0.00072)		8082A Cong		1	07/11/22 16:15	D2G0129	DG20701
BZ#180 [2C]	**0.00859** (0.00072)		8082A Cong		1	07/11/22 16:15	D2G0129	DG20701
BZ#187 [2C]	**0.00603** (0.00072)		8082A Cong		1	07/11/22 16:15	D2G0129	DG20701
BZ#195 [2C]	**P, LC 0.00127** (0.00072)		8082A Cong		1	07/11/22 16:15	D2G0129	DG20701
BZ#206 [2C]	**0.00207** (0.00072)		8082A Cong		1	07/11/22 16:15	D2G0129	DG20701
BZ#209 [2C]	**0.00143** (0.00072)		8082A Cong		1	07/11/22 16:15	D2G0129	DG20701

	%Recovery	*Qualifier*	*Limits*
Surrogate: Tetrachloro-m-xylene	*42 %*		*30-150*
Surrogate: Tetrachloro-m-xylene [2C]	*39 %*		*30-150*

CERTIFICATE OF ANALYSIS

Client Name: Tighe & Bond
Client Project ID: Neponset Dredge
Client Sample ID: SED-106
Date Sampled: 06/28/22 09:51
Percent Solids: 37

ESS Laboratory Work Order: 22F1147
ESS Laboratory Sample ID: 22F1147-06
Sample Matrix: Sediment

Classical Chemistry

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Percent Moisture	**63** (1)		2540G		1	EAM	06/30/22 21:18	%	DF23056
Total Organic Carbon (Average)	**55200** (95.7)		LK		1	CCP	07/12/22 13:58	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: Tighe & Bond
Client Project ID: Neponset Dredge
Client Sample ID: SED-106
Date Sampled: 06/28/22 09:51
Percent Solids: 37
Initial Volume: 30.1
Final Volume: 1
Extraction Method: 3546

ESS Laboratory Work Order: 22F1147
ESS Laboratory Sample ID: 22F1147-06
Sample Matrix: Sediment
Units: mg/kg dry

Prepared: 7/1/22 14:33

MADEP-EPH Extractable Petroleum Hydrocarbons

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
C9-C18 Aliphatics1	ND (33.3)		MADEP-EPH		1	MJV	07/05/22 18:11	D2G0031	DG20126
C19-C36 Aliphatics1	**93.4** (33.3)		MADEP-EPH		1	MJV	07/05/22 18:11	D2G0031	DG20126
C11-C22 Unadjusted Aromatics1	**50.1** (33.3)		EPH8270		1	MJV	07/05/22 19:53	D2G0039	DG20126
C11-C22 Aromatics1,2	**47.1** (33.6)		EPH8270			TJ	07/07/22 0:13		[CALC]
2-Methylnaphthalene	ND (0.018)		EPH8270SIM		1	TJ	07/07/22 0:13	D2G0078	DG20126
Acenaphthene	ND (0.018)		EPH8270SIM		1	TJ	07/07/22 0:13	D2G0078	DG20126
Naphthalene	**B 0.026** (0.018)		EPH8270SIM		1	TJ	07/07/22 0:13	D2G0078	DG20126
Phenanthrene	**0.219** (0.018)		EPH8270SIM		1	TJ	07/07/22 0:13	D2G0078	DG20126
Acenaphthylene	**0.019** (0.018)		EPH8270SIM		1	TJ	07/07/22 0:13	D2G0078	DG20126
Anthracene	**0.044** (0.018)		EPH8270SIM		1	TJ	07/07/22 0:13	D2G0078	DG20126
Benzo(a)anthracene	**0.236** (0.018)		EPH8270SIM		1	TJ	07/07/22 0:13	D2G0078	DG20126
Benzo(a)pyrene	**0.274** (0.018)		EPH8270SIM		1	TJ	07/07/22 0:13	D2G0078	DG20126
Benzo(b)fluoranthene	**0.274** (0.018)		EPH8270SIM		1	TJ	07/07/22 0:13	D2G0078	DG20126
Benzo(g,h,i)perylene	**0.189** (0.018)		EPH8270SIM		1	TJ	07/07/22 0:13	D2G0078	DG20126
Benzo(k)fluoranthene	**0.226** (0.018)		EPH8270SIM		1	TJ	07/07/22 0:13	D2G0078	DG20126
Chrysene	**0.309** (0.018)		EPH8270SIM		1	TJ	07/07/22 0:13	D2G0078	DG20126
Dibenzo(a,h)Anthracene	ND (0.018)		EPH8270SIM		1	TJ	07/07/22 0:13	D2G0078	DG20126
Fluoranthene	**0.468** (0.018)		EPH8270SIM		1	TJ	07/07/22 0:13	D2G0078	DG20126
Fluorene	ND (0.018)		EPH8270SIM		1	TJ	07/07/22 0:13	D2G0078	DG20126
Indeno(1,2,3-cd)Pyrene	**0.166** (0.018)		EPH8270SIM		1	TJ	07/07/22 0:13	D2G0078	DG20126
Pyrene	**0.560** (0.018)		EPH8270SIM		1	TJ	07/07/22 0:13	D2G0078	DG20126

	%Recovery	Qualifier	Limits
Surrogate: 1-Chlorooctadecane	*72 %*		*40-140*
Surrogate: 2-Bromonaphthalene	*98 %*		*40-140*
Surrogate: 2-Fluorobiphenyl	*96 %*		*40-140*
Surrogate: O-Terphenyl	*83 %*		*40-140*

CERTIFICATE OF ANALYSIS

Client Name: Tighe & Bond
Client Project ID: Neponset Dredge
Client Sample ID: SED-106
Date Sampled: 06/28/22 09:51

ESS Laboratory Work Order: 22F1147
ESS Laboratory Sample ID: 22F1147-06
Sample Matrix: Sediment

Subcontracted Analysis

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Grain Size	**See Attached** (N/A)								

CERTIFICATE OF ANALYSIS

Client Name: Tighe & Bond
Client Project ID: Neponset Dredge
Client Sample ID: SED-106
Date Sampled: 06/28/22 09:51
Percent Solids: 37
Initial Volume: 100
Final Volume: 2000
Extraction Method: 1311

ESS Laboratory Work Order: 22F1147
ESS Laboratory Sample ID: 22F1147-06
Sample Matrix: Sediment
Units: °C
Analyst: NAR
Prepared: 7/11/22 17:00

TCLP Extraction by 1311

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Batch
Temperature (Min C)	**19.9** (N/A)		1311		1	NAR	07/12/22 13:00	DG21141
Temperature (Max C)	**21.7** (N/A)		1311		1	NAR	07/12/22 13:00	DG21141
Temperature (Range)	**Temperature is not within 23 +/-2 °C.** (N/A)							

CERTIFICATE OF ANALYSIS

Client Name: Tighe & Bond
Client Project ID: Neponset Dredge
Client Sample ID: SED-107
Date Sampled: 06/28/22 10:06
Percent Solids: 34

ESS Laboratory Work Order: 22F1147
ESS Laboratory Sample ID: 22F1147-07
Sample Matrix: Sediment
Units: mg/L

Extraction Method: 3005A TCLP

1311 TCLP Metals

Analyte	Results (MRL)	MDL	Method	TCLP Limit	DF	Analyst	Analyzed	I/V	F/V	Batch
Lead	ND (0.050)		1311/6010C		1	KJK	07/13/22 18:28	50	50	DG21235

CERTIFICATE OF ANALYSIS

Client Name: Tighe & Bond
Client Project ID: Neponset Dredge
Client Sample ID: SED-107
Date Sampled: 06/28/22 10:06
Percent Solids: 34
Initial Volume: 4.9
Final Volume: 10
Extraction Method: 5035

ESS Laboratory Work Order: 22F1147
ESS Laboratory Sample ID: 22F1147-07
Sample Matrix: Sediment
Units: mg/kg dry
Analyst: MEK

5035/8260B Volatile Organic Compounds / Low Level

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
1,1,1,2-Tetrachloroethane	ND (0.0148)		8260B Low		1	07/06/22 14:39	D2G0074	DG20621
1,1,1-Trichloroethane	ND (0.0148)		8260B Low		1	07/06/22 14:39	D2G0074	DG20621
1,1,2,2-Tetrachloroethane	ND (0.0045)		8260B Low		1	07/06/22 14:39	D2G0074	DG20621
1,1,2-Trichloroethane	ND (0.0148)		8260B Low		1	07/06/22 14:39	D2G0074	DG20621
1,1-Dichloroethane	ND (0.0148)		8260B Low		1	07/06/22 14:39	D2G0074	DG20621
1,1-Dichloroethene	ND (0.0148)		8260B Low		1	07/06/22 14:39	D2G0074	DG20621
1,1-Dichloropropene	ND (0.0148)		8260B Low		1	07/06/22 14:39	D2G0074	DG20621
1,2,3-Trichlorobenzene	ND (0.0148)		8260B Low		1	07/06/22 14:39	D2G0074	DG20621
1,2,3-Trichloropropane	ND (0.0148)		8260B Low		1	07/06/22 14:39	D2G0074	DG20621
1,2,4-Trichlorobenzene	ND (0.0148)		8260B Low		1	07/06/22 14:39	D2G0074	DG20621
1,2,4-Trimethylbenzene	ND (0.0148)		8260B Low		1	07/06/22 14:39	D2G0074	DG20621
1,2-Dibromo-3-Chloropropane	ND (0.0148)		8260B Low		1	07/06/22 14:39	D2G0074	DG20621
1,2-Dibromoethane	ND (0.0148)		8260B Low		1	07/06/22 14:39	D2G0074	DG20621
1,2-Dichlorobenzene	ND (0.0148)		8260B Low		1	07/06/22 14:39	D2G0074	DG20621
1,2-Dichloroethane	ND (0.0148)		8260B Low		1	07/06/22 14:39	D2G0074	DG20621
1,2-Dichloropropane	ND (0.0148)		8260B Low		1	07/06/22 14:39	D2G0074	DG20621
1,3,5-Trimethylbenzene	ND (0.0148)		8260B Low		1	07/06/22 14:39	D2G0074	DG20621
1,3-Dichlorobenzene	ND (0.0148)		8260B Low		1	07/06/22 14:39	D2G0074	DG20621
1,3-Dichloropropane	ND (0.0148)		8260B Low		1	07/06/22 14:39	D2G0074	DG20621
1,4-Dichlorobenzene	ND (0.0148)		8260B Low		1	07/06/22 14:39	D2G0074	DG20621
1,4-Dioxane	ND (0.0297)		8260B Low		1	07/06/22 14:39	D2G0074	DG20621
2,2-Dichloropropane	ND (0.0148)		8260B Low		1	07/06/22 14:39	D2G0074	DG20621
2-Butanone	ND (0.148)		8260B Low		1	07/06/22 14:39	D2G0074	DG20621
2-Chlorotoluene	ND (0.0148)		8260B Low		1	07/06/22 14:39	D2G0074	DG20621
2-Hexanone	ND (0.148)		8260B Low		1	07/06/22 14:39	D2G0074	DG20621
4-Chlorotoluene	ND (0.0148)		8260B Low		1	07/06/22 14:39	D2G0074	DG20621
4-Isopropyltoluene	ND (0.0148)		8260B Low		1	07/06/22 14:39	D2G0074	DG20621
4-Methyl-2-Pentanone	ND (0.148)		8260B Low		1	07/06/22 14:39	D2G0074	DG20621
Acetone	**0.666** (0.148)		8260B Low		1	07/06/22 14:39	D2G0074	DG20621
Benzene	ND (0.0148)		8260B Low		1	07/06/22 14:39	D2G0074	DG20621
Bromobenzene	ND (0.0148)		8260B Low		1	07/06/22 14:39	D2G0074	DG20621
Bromochloromethane	ND (0.0148)		8260B Low		1	07/06/22 14:39	D2G0074	DG20621

CERTIFICATE OF ANALYSIS

Client Name: Tighe & Bond
Client Project ID: Neponset Dredge
Client Sample ID: SED-107
Date Sampled: 06/28/22 10:06
Percent Solids: 34
Initial Volume: 4.9
Final Volume: 10
Extraction Method: 5035

ESS Laboratory Work Order: 22F1147
ESS Laboratory Sample ID: 22F1147-07
Sample Matrix: Sediment
Units: mg/kg dry
Analyst: MEK

5035/8260B Volatile Organic Compounds / Low Level

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Bromodichloromethane	ND (0.0148)		8260B Low		1	07/06/22 14:39	D2G0074	DG20621
Bromoform	ND (0.0148)		8260B Low		1	07/06/22 14:39	D2G0074	DG20621
Bromomethane	ND (0.0297)		8260B Low		1	07/06/22 14:39	D2G0074	DG20621
Carbon Disulfide	ND (0.0148)		8260B Low		1	07/06/22 14:39	D2G0074	DG20621
Carbon Tetrachloride	ND (0.0148)		8260B Low		1	07/06/22 14:39	D2G0074	DG20621
Chlorobenzene	ND (0.0148)		8260B Low		1	07/06/22 14:39	D2G0074	DG20621
Chloroethane	ND (0.0297)		8260B Low		1	07/06/22 14:39	D2G0074	DG20621
Chloroform	ND (0.0148)		8260B Low		1	07/06/22 14:39	D2G0074	DG20621
Chloromethane	ND (0.0297)		8260B Low		1	07/06/22 14:39	D2G0074	DG20621
cis-1,2-Dichloroethene	ND (0.0148)		8260B Low		1	07/06/22 14:39	D2G0074	DG20621
cis-1,3-Dichloropropene	ND (0.0050)		8260B Low		1	07/06/22 14:39	D2G0074	DG20621
Dibromochloromethane	ND (0.0047)		8260B Low		1	07/06/22 14:39	D2G0074	DG20621
Dibromomethane	ND (0.0148)		8260B Low		1	07/06/22 14:39	D2G0074	DG20621
Dichlorodifluoromethane	ND (0.0297)		8260B Low		1	07/06/22 14:39	D2G0074	DG20621
Diethyl Ether	ND (0.0148)		8260B Low		1	07/06/22 14:39	D2G0074	DG20621
Di-isopropyl ether	ND (0.0148)		8260B Low		1	07/06/22 14:39	D2G0074	DG20621
Ethyl tertiary-butyl ether	ND (0.0148)		8260B Low		1	07/06/22 14:39	D2G0074	DG20621
Ethylbenzene	ND (0.0148)		8260B Low		1	07/06/22 14:39	D2G0074	DG20621
Hexachlorobutadiene	ND (0.0148)		8260B Low		1	07/06/22 14:39	D2G0074	DG20621
Isopropylbenzene	ND (0.0148)		8260B Low		1	07/06/22 14:39	D2G0074	DG20621
Methyl tert-Butyl Ether	ND (0.0148)		8260B Low		1	07/06/22 14:39	D2G0074	DG20621
Methylene Chloride	ND (0.0297)		8260B Low		1	07/06/22 14:39	D2G0074	DG20621
Naphthalene	ND (0.0148)		8260B Low		1	07/06/22 14:39	D2G0074	DG20621
n-Butylbenzene	ND (0.0148)		8260B Low		1	07/06/22 14:39	D2G0074	DG20621
n-Propylbenzene	ND (0.0148)		8260B Low		1	07/06/22 14:39	D2G0074	DG20621
sec-Butylbenzene	ND (0.0148)		8260B Low		1	07/06/22 14:39	D2G0074	DG20621
Styrene	ND (0.0148)		8260B Low		1	07/06/22 14:39	D2G0074	DG20621
tert-Butylbenzene	ND (0.0148)		8260B Low		1	07/06/22 14:39	D2G0074	DG20621
Tertiary-amyl methyl ether	ND (0.0148)		8260B Low		1	07/06/22 14:39	D2G0074	DG20621
Tetrachloroethene	ND (0.0148)		8260B Low		1	07/06/22 14:39	D2G0074	DG20621
Tetrahydrofuran	ND (0.0148)		8260B Low		1	07/06/22 14:39	D2G0074	DG20621
Toluene	ND (0.0148)		8260B Low		1	07/06/22 14:39	D2G0074	DG20621

CERTIFICATE OF ANALYSIS

Client Name: Tighe & Bond
Client Project ID: Neponset Dredge
Client Sample ID: SED-107
Date Sampled: 06/28/22 10:06
Percent Solids: 34
Initial Volume: 4.9
Final Volume: 10
Extraction Method: 5035

ESS Laboratory Work Order: 22F1147
ESS Laboratory Sample ID: 22F1147-07
Sample Matrix: Sediment
Units: mg/kg dry
Analyst: MEK

5035/8260B Volatile Organic Compounds / Low Level

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
trans-1,2-Dichloroethene	ND (0.0148)		8260B Low		1	07/06/22 14:39	D2G0074	DG20621
trans-1,3-Dichloropropene	ND (0.0047)		8260B Low		1	07/06/22 14:39	D2G0074	DG20621
Trichloroethene	ND (0.0148)		8260B Low		1	07/06/22 14:39	D2G0074	DG20621
Trichlorofluoromethane	ND (0.0148)		8260B Low		1	07/06/22 14:39	D2G0074	DG20621
Vinyl Chloride	ND (0.0297)		8260B Low		1	07/06/22 14:39	D2G0074	DG20621
Xylene O	ND (0.0148)		8260B Low		1	07/06/22 14:39	D2G0074	DG20621
Xylene P,M	ND (0.0297)		8260B Low		1	07/06/22 14:39	D2G0074	DG20621
Xylenes (Total)	ND (0.0102)		8260B		1	07/06/22 14:39		[CALC]

	%Recovery	*Qualifier*	*Limits*
Surrogate: 1,2-Dichloroethane-d4	*119 %*		*70-130*
Surrogate: 4-Bromofluorobenzene	*90 %*		*70-130*
Surrogate: Dibromofluoromethane	*108 %*		*70-130*
Surrogate: Toluene-d8	*100 %*		*70-130*

CERTIFICATE OF ANALYSIS

Client Name: Tighe & Bond
Client Project ID: Neponset Dredge
Client Sample ID: SED-107
Date Sampled: 06/28/22 10:06
Percent Solids: 34
Initial Volume: 30.4
Final Volume: 2
Extraction Method: 3540C

ESS Laboratory Work Order: 22F1147
ESS Laboratory Sample ID: 22F1147-07
Sample Matrix: Sediment
Units: mg/kg dry
Analyst: DMC
Prepared: 7/7/22 14:00

8082 Polychlorinated Biphenyls (PCB) / Congeners

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
BZ#8 [2C]	**0.0526** (0.00775)		8082A Cong		10	07/12/22 22:22	D2G0165	DG20701
BZ#18 [2C]	**0.0327** (0.00155)		8082A Cong		2	07/12/22 21:52	D2G0165	DG20701
BZ#28 [2C]	**0.127** (0.00775)		8082A Cong		10	07/12/22 22:22	D2G0165	DG20701
BZ#44 [2C]	**0.0747** (0.00775)		8082A Cong		10	07/12/22 22:22	D2G0165	DG20701
BZ#52	**0.0983** (0.00775)		8082A Cong		10	07/12/22 22:22	D2G0165	DG20701
BZ#66 [2C]	**0.0814** (0.00775)		8082A Cong		10	07/12/22 22:22	D2G0165	DG20701
BZ#101	**0.0713** (0.00775)		8082A Cong		10	07/12/22 22:22	D2G0165	DG20701
BZ#105	**P, LC 0.0126** (0.00078)		8082A Cong		1	07/12/22 11:14	D2G0165	DG20701
BZ#118	**0.0506** (0.00775)		8082A Cong		10	07/12/22 22:22	D2G0165	DG20701
BZ#128 [2C]	**0.00593** (0.00078)		8082A Cong		1	07/12/22 11:14	D2G0165	DG20701
BZ#138 [2C]	**0.0318** (0.00155)		8082A Cong		2	07/12/22 21:52	D2G0165	DG20701
BZ#153	**0.0304** (0.00155)		8082A Cong		2	07/12/22 21:52	D2G0165	DG20701
BZ#170	**P, LC 0.00514** (0.00078)		8082A Cong		1	07/12/22 11:14	D2G0165	DG20701
BZ#180 [2C]	**0.00973** (0.00078)		8082A Cong		1	07/12/22 11:14	D2G0165	DG20701
BZ#187 [2C]	**0.00783** (0.00078)		8082A Cong		1	07/12/22 11:14	D2G0165	DG20701
BZ#195	**0.00248** (0.00078)		8082A Cong		1	07/12/22 11:14	D2G0165	DG20701
BZ#206 [2C]	**0.00268** (0.00078)		8082A Cong		1	07/12/22 11:14	D2G0165	DG20701
BZ#209	**P, LC 0.00127** (0.00078)		8082A Cong		1	07/12/22 11:14	D2G0165	DG20701

	%Recovery	*Qualifier*	*Limits*
Surrogate: Tetrachloro-m-xylene	*78 %*		*30-150*
Surrogate: Tetrachloro-m-xylene [2C]	*79 %*		*30-150*

CERTIFICATE OF ANALYSIS

Client Name: Tighe & Bond
Client Project ID: Neponset Dredge
Client Sample ID: SED-107
Date Sampled: 06/28/22 10:06
Percent Solids: 34

ESS Laboratory Work Order: 22F1147
ESS Laboratory Sample ID: 22F1147-07
Sample Matrix: Sediment

Classical Chemistry

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Percent Moisture	**66** (1)		2540G		1	EAM	06/30/22 21:18	%	DF23056
Total Organic Carbon (Average)	**55900** (98.2)		LK		1	CCP	07/12/22 14:15	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: Tighe & Bond
Client Project ID: Neponset Dredge
Client Sample ID: SED-107
Date Sampled: 06/28/22 10:06
Percent Solids: 34
Initial Volume: 30.3
Final Volume: 1
Extraction Method: 3546

ESS Laboratory Work Order: 22F1147
ESS Laboratory Sample ID: 22F1147-07
Sample Matrix: Sediment
Units: mg/kg dry

Prepared: 7/1/22 14:33

MADEP-EPH Extractable Petroleum Hydrocarbons

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
C9-C18 Aliphatics1	ND (36.0)		MADEP-EPH		1	MJV	07/05/22 18:46	D2G0031	DG20126
C19-C36 Aliphatics1	**76.0** (36.0)		MADEP-EPH		1	MJV	07/05/22 18:46	D2G0031	DG20126
C11-C22 Unadjusted Aromatics1	**40.4** (36.0)		EPH8270		1	MJV	07/05/22 20:32	D2G0039	DG20126
C11-C22 Aromatics1,2	**37.8** (36.3)		EPH8270			TJ	07/07/22 0:35		[CALC]
2-Methylnaphthalene	ND (0.019)		EPH8270SIM		1	TJ	07/07/22 0:35	D2G0078	DG20126
Acenaphthene	ND (0.019)		EPH8270SIM		1	TJ	07/07/22 0:35	D2G0078	DG20126
Naphthalene	**B 0.031** (0.019)		EPH8270SIM		1	TJ	07/07/22 0:35	D2G0078	DG20126
Phenanthrene	**0.181** (0.019)		EPH8270SIM		1	TJ	07/07/22 0:35	D2G0078	DG20126
Acenaphthylene	ND (0.019)		EPH8270SIM		1	TJ	07/07/22 0:35	D2G0078	DG20126
Anthracene	**0.036** (0.019)		EPH8270SIM		1	TJ	07/07/22 0:35	D2G0078	DG20126
Benzo(a)anthracene	**0.194** (0.019)		EPH8270SIM		1	TJ	07/07/22 0:35	D2G0078	DG20126
Benzo(a)pyrene	**0.240** (0.019)		EPH8270SIM		1	TJ	07/07/22 0:35	D2G0078	DG20126
Benzo(b)fluoranthene	**0.231** (0.019)		EPH8270SIM		1	TJ	07/07/22 0:35	D2G0078	DG20126
Benzo(g,h,i)perylene	**0.176** (0.019)		EPH8270SIM		1	TJ	07/07/22 0:35	D2G0078	DG20126
Benzo(k)fluoranthene	**0.213** (0.019)		EPH8270SIM		1	TJ	07/07/22 0:35	D2G0078	DG20126
Chrysene	**0.270** (0.019)		EPH8270SIM		1	TJ	07/07/22 0:35	D2G0078	DG20126
Dibenzo(a,h)Anthracene	ND (0.019)		EPH8270SIM		1	TJ	07/07/22 0:35	D2G0078	DG20126
Fluoranthene	**0.438** (0.019)		EPH8270SIM		1	TJ	07/07/22 0:35	D2G0078	DG20126
Fluorene	ND (0.019)		EPH8270SIM		1	TJ	07/07/22 0:35	D2G0078	DG20126
Indeno(1,2,3-cd)Pyrene	**0.158** (0.019)		EPH8270SIM		1	TJ	07/07/22 0:35	D2G0078	DG20126
Pyrene	**0.468** (0.019)		EPH8270SIM		1	TJ	07/07/22 0:35	D2G0078	DG20126

	%Recovery	Qualifier	Limits
Surrogate: 1-Chlorooctadecane	*79 %*		*40-140*
Surrogate: 2-Bromonaphthalene	*94 %*		*40-140*
Surrogate: 2-Fluorobiphenyl	*93 %*		*40-140*
Surrogate: O-Terphenyl	*81 %*		*40-140*

CERTIFICATE OF ANALYSIS

Client Name: Tighe & Bond
Client Project ID: Neponset Dredge
Client Sample ID: SED-107
Date Sampled: 06/28/22 10:06

ESS Laboratory Work Order: 22F1147
ESS Laboratory Sample ID: 22F1147-07
Sample Matrix: Sediment

Subcontracted Analysis

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Grain Size	**See Attached** (N/A)								

CERTIFICATE OF ANALYSIS

Client Name: Tighe & Bond
Client Project ID: Neponset Dredge
Client Sample ID: SED-107
Date Sampled: 06/28/22 10:06
Percent Solids: 34
Initial Volume: 100
Final Volume: 2000
Extraction Method: 1311

ESS Laboratory Work Order: 22F1147
ESS Laboratory Sample ID: 22F1147-07
Sample Matrix: Sediment
Units: °C
Analyst: NAR
Prepared: 7/11/22 17:00

TCLP Extraction by 1311

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Batch
Temperature (Min C)	**19.9** (N/A)		1311		1	NAR	07/12/22 13:00	DG21141
Temperature (Max C)	**21.7** (N/A)		1311		1	NAR	07/12/22 13:00	DG21141
Temperature (Range)	**Temperature is not within 23 +/-2 °C.** (N/A)							

CERTIFICATE OF ANALYSIS

Client Name: Tighe & Bond
Client Project ID: Neponset Dredge
Client Sample ID: SED-108
Date Sampled: 06/28/22 13:25
Percent Solids: 41

ESS Laboratory Work Order: 22F1147
ESS Laboratory Sample ID: 22F1147-08
Sample Matrix: Sediment
Units: mg/L

Extraction Method: 3005A TCLP

1311 TCLP Metals

Analyte	Results (MRL)	MDL	Method	TCLP Limit	DF	Analyst	Analyzed	I/V	F/V	Batch
Lead	**0.067** (0.050)		1311/6010C		1	KJK	07/13/22 18:37	50	50	DG21235

CERTIFICATE OF ANALYSIS

Client Name: Tighe & Bond
Client Project ID: Neponset Dredge
Client Sample ID: SED-108
Date Sampled: 06/28/22 13:25
Percent Solids: 41
Initial Volume: 5.7
Final Volume: 10
Extraction Method: 5035

ESS Laboratory Work Order: 22F1147
ESS Laboratory Sample ID: 22F1147-08
Sample Matrix: Sediment
Units: mg/kg dry
Analyst: MEK

5035/8260B Volatile Organic Compounds / Low Level

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
1,1,1,2-Tetrachloroethane	ND (0.0106)		8260B Low		1	07/06/22 15:05	D2G0074	DG20621
1,1,1-Trichloroethane	ND (0.0106)		8260B Low		1	07/06/22 15:05	D2G0074	DG20621
1,1,2,2-Tetrachloroethane	ND (0.0032)		8260B Low		1	07/06/22 15:05	D2G0074	DG20621
1,1,2-Trichloroethane	ND (0.0106)		8260B Low		1	07/06/22 15:05	D2G0074	DG20621
1,1-Dichloroethane	ND (0.0106)		8260B Low		1	07/06/22 15:05	D2G0074	DG20621
1,1-Dichloroethene	ND (0.0106)		8260B Low		1	07/06/22 15:05	D2G0074	DG20621
1,1-Dichloropropene	ND (0.0106)		8260B Low		1	07/06/22 15:05	D2G0074	DG20621
1,2,3-Trichlorobenzene	ND (0.0106)		8260B Low		1	07/06/22 15:05	D2G0074	DG20621
1,2,3-Trichloropropane	ND (0.0106)		8260B Low		1	07/06/22 15:05	D2G0074	DG20621
1,2,4-Trichlorobenzene	ND (0.0106)		8260B Low		1	07/06/22 15:05	D2G0074	DG20621
1,2,4-Trimethylbenzene	ND (0.0106)		8260B Low		1	07/06/22 15:05	D2G0074	DG20621
1,2-Dibromo-3-Chloropropane	ND (0.0106)		8260B Low		1	07/06/22 15:05	D2G0074	DG20621
1,2-Dibromoethane	ND (0.0106)		8260B Low		1	07/06/22 15:05	D2G0074	DG20621
1,2-Dichlorobenzene	ND (0.0106)		8260B Low		1	07/06/22 15:05	D2G0074	DG20621
1,2-Dichloroethane	ND (0.0106)		8260B Low		1	07/06/22 15:05	D2G0074	DG20621
1,2-Dichloropropane	ND (0.0106)		8260B Low		1	07/06/22 15:05	D2G0074	DG20621
1,3,5-Trimethylbenzene	ND (0.0106)		8260B Low		1	07/06/22 15:05	D2G0074	DG20621
1,3-Dichlorobenzene	ND (0.0106)		8260B Low		1	07/06/22 15:05	D2G0074	DG20621
1,3-Dichloropropane	ND (0.0106)		8260B Low		1	07/06/22 15:05	D2G0074	DG20621
1,4-Dichlorobenzene	ND (0.0106)		8260B Low		1	07/06/22 15:05	D2G0074	DG20621
1,4-Dioxane	ND (0.0213)		8260B Low		1	07/06/22 15:05	D2G0074	DG20621
2,2-Dichloropropane	ND (0.0106)		8260B Low		1	07/06/22 15:05	D2G0074	DG20621
2-Butanone	ND (0.106)		8260B Low		1	07/06/22 15:05	D2G0074	DG20621
2-Chlorotoluene	ND (0.0106)		8260B Low		1	07/06/22 15:05	D2G0074	DG20621
2-Hexanone	ND (0.106)		8260B Low		1	07/06/22 15:05	D2G0074	DG20621
4-Chlorotoluene	ND (0.0106)		8260B Low		1	07/06/22 15:05	D2G0074	DG20621
4-Isopropyltoluene	ND (0.0106)		8260B Low		1	07/06/22 15:05	D2G0074	DG20621
4-Methyl-2-Pentanone	ND (0.106)		8260B Low		1	07/06/22 15:05	D2G0074	DG20621
Acetone	**0.186** (0.106)		8260B Low		1	07/06/22 15:05	D2G0074	DG20621
Benzene	ND (0.0106)		8260B Low		1	07/06/22 15:05	D2G0074	DG20621
Bromobenzene	ND (0.0106)		8260B Low		1	07/06/22 15:05	D2G0074	DG20621
Bromochloromethane	ND (0.0106)		8260B Low		1	07/06/22 15:05	D2G0074	DG20621

CERTIFICATE OF ANALYSIS

Client Name: Tighe & Bond
Client Project ID: Neponset Dredge
Client Sample ID: SED-108
Date Sampled: 06/28/22 13:25
Percent Solids: 41
Initial Volume: 5.7
Final Volume: 10
Extraction Method: 5035

ESS Laboratory Work Order: 22F1147
ESS Laboratory Sample ID: 22F1147-08
Sample Matrix: Sediment
Units: mg/kg dry
Analyst: MEK

5035/8260B Volatile Organic Compounds / Low Level

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Bromodichloromethane	ND (0.0106)		8260B Low		1	07/06/22 15:05	D2G0074	DG20621
Bromoform	ND (0.0106)		8260B Low		1	07/06/22 15:05	D2G0074	DG20621
Bromomethane	ND (0.0213)		8260B Low		1	07/06/22 15:05	D2G0074	DG20621
Carbon Disulfide	**0.0230** (0.0106)		8260B Low		1	07/06/22 15:05	D2G0074	DG20621
Carbon Tetrachloride	ND (0.0106)		8260B Low		1	07/06/22 15:05	D2G0074	DG20621
Chlorobenzene	ND (0.0106)		8260B Low		1	07/06/22 15:05	D2G0074	DG20621
Chloroethane	ND (0.0213)		8260B Low		1	07/06/22 15:05	D2G0074	DG20621
Chloroform	ND (0.0106)		8260B Low		1	07/06/22 15:05	D2G0074	DG20621
Chloromethane	ND (0.0213)		8260B Low		1	07/06/22 15:05	D2G0074	DG20621
cis-1,2-Dichloroethene	ND (0.0106)		8260B Low		1	07/06/22 15:05	D2G0074	DG20621
cis-1,3-Dichloropropene	ND (0.0036)		8260B Low		1	07/06/22 15:05	D2G0074	DG20621
Dibromochloromethane	ND (0.0034)		8260B Low		1	07/06/22 15:05	D2G0074	DG20621
Dibromomethane	ND (0.0106)		8260B Low		1	07/06/22 15:05	D2G0074	DG20621
Dichlorodifluoromethane	ND (0.0213)		8260B Low		1	07/06/22 15:05	D2G0074	DG20621
Diethyl Ether	ND (0.0106)		8260B Low		1	07/06/22 15:05	D2G0074	DG20621
Di-isopropyl ether	ND (0.0106)		8260B Low		1	07/06/22 15:05	D2G0074	DG20621
Ethyl tertiary-butyl ether	ND (0.0106)		8260B Low		1	07/06/22 15:05	D2G0074	DG20621
Ethylbenzene	ND (0.0106)		8260B Low		1	07/06/22 15:05	D2G0074	DG20621
Hexachlorobutadiene	ND (0.0106)		8260B Low		1	07/06/22 15:05	D2G0074	DG20621
Isopropylbenzene	ND (0.0106)		8260B Low		1	07/06/22 15:05	D2G0074	DG20621
Methyl tert-Butyl Ether	ND (0.0106)		8260B Low		1	07/06/22 15:05	D2G0074	DG20621
Methylene Chloride	ND (0.0213)		8260B Low		1	07/06/22 15:05	D2G0074	DG20621
Naphthalene	ND (0.0106)		8260B Low		1	07/06/22 15:05	D2G0074	DG20621
n-Butylbenzene	ND (0.0106)		8260B Low		1	07/06/22 15:05	D2G0074	DG20621
n-Propylbenzene	ND (0.0106)		8260B Low		1	07/06/22 15:05	D2G0074	DG20621
sec-Butylbenzene	ND (0.0106)		8260B Low		1	07/06/22 15:05	D2G0074	DG20621
Styrene	ND (0.0106)		8260B Low		1	07/06/22 15:05	D2G0074	DG20621
tert-Butylbenzene	ND (0.0106)		8260B Low		1	07/06/22 15:05	D2G0074	DG20621
Tertiary-amyl methyl ether	ND (0.0106)		8260B Low		1	07/06/22 15:05	D2G0074	DG20621
Tetrachloroethene	ND (0.0106)		8260B Low		1	07/06/22 15:05	D2G0074	DG20621
Tetrahydrofuran	ND (0.0106)		8260B Low		1	07/06/22 15:05	D2G0074	DG20621
Toluene	ND (0.0106)		8260B Low		1	07/06/22 15:05	D2G0074	DG20621

CERTIFICATE OF ANALYSIS

Client Name: Tighe & Bond
Client Project ID: Neponset Dredge
Client Sample ID: SED-108
Date Sampled: 06/28/22 13:25
Percent Solids: 41
Initial Volume: 5.7
Final Volume: 10
Extraction Method: 5035

ESS Laboratory Work Order: 22F1147
ESS Laboratory Sample ID: 22F1147-08
Sample Matrix: Sediment
Units: mg/kg dry
Analyst: MEK

5035/8260B Volatile Organic Compounds / Low Level

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
trans-1,2-Dichloroethene	ND (0.0106)		8260B Low		1	07/06/22 15:05	D2G0074	DG20621
trans-1,3-Dichloropropene	ND (0.0034)		8260B Low		1	07/06/22 15:05	D2G0074	DG20621
Trichloroethene	ND (0.0106)		8260B Low		1	07/06/22 15:05	D2G0074	DG20621
Trichlorofluoromethane	ND (0.0106)		8260B Low		1	07/06/22 15:05	D2G0074	DG20621
Vinyl Chloride	ND (0.0213)		8260B Low		1	07/06/22 15:05	D2G0074	DG20621
Xylene O	ND (0.0106)		8260B Low		1	07/06/22 15:05	D2G0074	DG20621
Xylene P,M	ND (0.0213)		8260B Low		1	07/06/22 15:05	D2G0074	DG20621
Xylenes (Total)	ND (0.00877)		8260B		1	07/06/22 15:05		[CALC]

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichloroethane-d4	*130 %*		*70-130*
Surrogate: 4-Bromofluorobenzene	*88 %*		*70-130*
Surrogate: Dibromofluoromethane	*114 %*		*70-130*
Surrogate: Toluene-d8	*103 %*		*70-130*

CERTIFICATE OF ANALYSIS

Client Name: Tighe & Bond
Client Project ID: Neponset Dredge
Client Sample ID: SED-108
Date Sampled: 06/28/22 13:25
Percent Solids: 41
Initial Volume: 30.3
Final Volume: 2
Extraction Method: 3540C

ESS Laboratory Work Order: 22F1147
ESS Laboratory Sample ID: 22F1147-08
Sample Matrix: Sediment
Units: mg/kg dry
Analyst: DMC
Prepared: 7/7/22 14:00

8082 Polychlorinated Biphenyls (PCB) / Congeners

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
BZ#8	**0.300** (0.0130)		8082A Cong		20	07/12/22 19:20	D2G0129	DG20701
BZ#18 [2C]	**0.558** (0.0648)		8082A Cong		100	07/12/22 19:50	D2G0129	DG20701
BZ#28 [2C]	**0.605** (0.0648)		8082A Cong		100	07/12/22 19:50	D2G0129	DG20701
BZ#44 [2C]	**0.178** (0.0130)		8082A Cong		20	07/12/22 19:20	D2G0129	DG20701
BZ#52	**0.423** (0.0648)		8082A Cong		100	07/12/22 19:50	D2G0129	DG20701
BZ#66 [2C]	**0.182** (0.0130)		8082A Cong		20	07/12/22 19:20	D2G0129	DG20701
BZ#101 [2C]	**P, LC 0.0704** (0.00324)		8082A Cong		5	07/12/22 18:50	D2G0129	DG20701
BZ#105 [2C]	**0.0340** (0.00324)		8082A Cong		5	07/12/22 18:50	D2G0129	DG20701
BZ#118	**0.0563** (0.00324)		8082A Cong		5	07/12/22 18:50	D2G0129	DG20701
BZ#128 [2C]	**0.00425** (0.00065)		8082A Cong		1	07/11/22 17:15	D2G0129	DG20701
BZ#138 [2C]	**0.0282** (0.00324)		8082A Cong		5	07/12/22 18:50	D2G0129	DG20701
BZ#153 [2C]	**P, LC 0.0149** (0.00065)		8082A Cong		1	07/11/22 17:15	D2G0129	DG20701
BZ#170 [2C]	**0.00628** (0.00065)		8082A Cong		1	07/11/22 17:15	D2G0129	DG20701
BZ#180 [2C]	**0.00664** (0.00065)		8082A Cong		1	07/11/22 17:15	D2G0129	DG20701
BZ#187 [2C]	**0.00586** (0.00065)		8082A Cong		1	07/11/22 17:15	D2G0129	DG20701
BZ#195	**0.00131** (0.00065)		8082A Cong		1	07/11/22 17:15	D2G0129	DG20701
BZ#206 [2C]	**0.00235** (0.00065)		8082A Cong		1	07/11/22 17:15	D2G0129	DG20701
BZ#209	**P, LC 0.00126** (0.00065)		8082A Cong		1	07/11/22 17:15	D2G0129	DG20701

	%Recovery	Qualifier	Limits
Surrogate: Tetrachloro-m-xylene	*63 %*		*30-150*
Surrogate: Tetrachloro-m-xylene [2C]	*54 %*		*30-150*

CERTIFICATE OF ANALYSIS

Client Name: Tighe & Bond
Client Project ID: Neponset Dredge
Client Sample ID: SED-108
Date Sampled: 06/28/22 13:25
Percent Solids: 41

ESS Laboratory Work Order: 22F1147
ESS Laboratory Sample ID: 22F1147-08
Sample Matrix: Sediment

Classical Chemistry

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Percent Moisture	**59** (1)		2540G		1	EAM	06/30/22 21:18	%	DF23056
Total Organic Carbon (Average)	**57100** (97.6)		LK		1	CCP	07/12/22 15:05	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: Tighe & Bond
Client Project ID: Neponset Dredge
Client Sample ID: SED-108
Date Sampled: 06/28/22 13:25
Percent Solids: 41
Initial Volume: 24.3
Final Volume: 1
Extraction Method: 3546

ESS Laboratory Work Order: 22F1147
ESS Laboratory Sample ID: 22F1147-08
Sample Matrix: Sediment
Units: mg/kg dry

Prepared: 7/1/22 14:33

MADEP-EPH Extractable Petroleum Hydrocarbons

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
C9-C18 Aliphatics1	ND (37.4)		MADEP-EPH		1	MJV	07/05/22 19:21	D2G0031	DG20126
C19-C36 Aliphatics1	**222** (37.4)		MADEP-EPH		1	MJV	07/05/22 19:21	D2G0031	DG20126
C11-C22 Unadjusted Aromatics1	**98.1** (37.4)		EPH8270		1	MJV	07/05/22 21:12	D2G0039	DG20126
C11-C22 Aromatics1,2	**95.6** (37.7)		EPH8270			TJ	07/07/22 0:56		[CALC]
2-Methylnaphthalene	ND (0.020)		EPH8270SIM		1	TJ	07/07/22 0:56	D2G0078	DG20126
Acenaphthene	ND (0.020)		EPH8270SIM		1	TJ	07/07/22 0:56	D2G0078	DG20126
Naphthalene	**B 0.044** (0.020)		EPH8270SIM		1	TJ	07/07/22 0:56	D2G0078	DG20126
Phenanthrene	**0.197** (0.020)		EPH8270SIM		1	TJ	07/07/22 0:56	D2G0078	DG20126
Acenaphthylene	**0.025** (0.020)		EPH8270SIM		1	TJ	07/07/22 0:56	D2G0078	DG20126
Anthracene	**0.045** (0.020)		EPH8270SIM		1	TJ	07/07/22 0:56	D2G0078	DG20126
Benzo(a)anthracene	**0.185** (0.020)		EPH8270SIM		1	TJ	07/07/22 0:56	D2G0078	DG20126
Benzo(a)pyrene	**0.204** (0.020)		EPH8270SIM		1	TJ	07/07/22 0:56	D2G0078	DG20126
Benzo(b)fluoranthene	**0.191** (0.020)		EPH8270SIM		1	TJ	07/07/22 0:56	D2G0078	DG20126
Benzo(g,h,i)perylene	**0.148** (0.020)		EPH8270SIM		1	TJ	07/07/22 0:56	D2G0078	DG20126
Benzo(k)fluoranthene	**0.174** (0.020)		EPH8270SIM		1	TJ	07/07/22 0:56	D2G0078	DG20126
Chrysene	**0.246** (0.020)		EPH8270SIM		1	TJ	07/07/22 0:56	D2G0078	DG20126
Dibenzo(a,h)Anthracene	ND (0.020)		EPH8270SIM		1	TJ	07/07/22 0:56	D2G0078	DG20126
Fluoranthene	**0.361** (0.020)		EPH8270SIM		1	TJ	07/07/22 0:56	D2G0078	DG20126
Fluorene	**0.021** (0.020)		EPH8270SIM		1	TJ	07/07/22 0:56	D2G0078	DG20126
Indeno(1,2,3-cd)Pyrene	**0.127** (0.020)		EPH8270SIM		1	TJ	07/07/22 0:56	D2G0078	DG20126
Pyrene	**0.477** (0.020)		EPH8270SIM		1	TJ	07/07/22 0:56	D2G0078	DG20126

	%Recovery	*Qualifier*	*Limits*
Surrogate: 1-Chlorooctadecane	*71 %*		*40-140*
Surrogate: 2-Bromonaphthalene	*95 %*		*40-140*
Surrogate: 2-Fluorobiphenyl	*94 %*		*40-140*
Surrogate: O-Terphenyl	*83 %*		*40-140*

CERTIFICATE OF ANALYSIS

Client Name: Tighe & Bond
Client Project ID: Neponset Dredge
Client Sample ID: SED-108
Date Sampled: 06/28/22 13:25

ESS Laboratory Work Order: 22F1147
ESS Laboratory Sample ID: 22F1147-08
Sample Matrix: Sediment

Subcontracted Analysis

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Grain Size	**See Attached** (N/A)								

CERTIFICATE OF ANALYSIS

Client Name: Tighe & Bond
Client Project ID: Neponset Dredge
Client Sample ID: SED-108
Date Sampled: 06/28/22 13:25
Percent Solids: 41
Initial Volume: 100
Final Volume: 2000
Extraction Method: 1311

ESS Laboratory Work Order: 22F1147
ESS Laboratory Sample ID: 22F1147-08
Sample Matrix: Sediment
Units: °C
Analyst: NAR
Prepared: 7/11/22 17:00

TCLP Extraction by 1311

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Batch
Temperature (Min C)	**19.9** (N/A)		1311		1	NAR	07/12/22 13:00	DG21141
Temperature (Max C)	**21.7** (N/A)		1311		1	NAR	07/12/22 13:00	DG21141
Temperature (Range)	**Temperature is not within 23 +/-2 °C.** (N/A)							

CERTIFICATE OF ANALYSIS

Client Name: Tighe & Bond
Client Project ID: Neponset Dredge
Client Sample ID: SED-109
Date Sampled: 06/28/22 10:55
Percent Solids: 51

ESS Laboratory Work Order: 22F1147
ESS Laboratory Sample ID: 22F1147-09
Sample Matrix: Sediment
Units: mg/L

Extraction Method: 3005A TCLP

1311 TCLP Metals

Analyte	Results (MRL)	MDL	Method	TCLP Limit	DF	Analyst	Analyzed	I/V	F/V	Batch
Chromium	**0.022** (0.020)		1311/6010C		1	KJK	07/13/22 18:39	50	50	DG21235
Lead	**0.069** (0.050)		1311/6010C		1	KJK	07/13/22 18:39	50	50	DG21235

CERTIFICATE OF ANALYSIS

Client Name: Tighe & Bond
Client Project ID: Neponset Dredge
Client Sample ID: SED-109
Date Sampled: 06/28/22 10:55
Percent Solids: 51
Initial Volume: 5.1
Final Volume: 10
Extraction Method: 5035

ESS Laboratory Work Order: 22F1147
ESS Laboratory Sample ID: 22F1147-09
Sample Matrix: Sediment
Units: mg/kg dry
Analyst: MEK

5035/8260B Volatile Organic Compounds / Low Level

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
1,1,1,2-Tetrachloroethane	ND (0.0096)		8260B Low		1	07/06/22 15:30	D2G0074	DG20621
1,1,1-Trichloroethane	ND (0.0096)		8260B Low		1	07/06/22 15:30	D2G0074	DG20621
1,1,2,2-Tetrachloroethane	ND (0.0029)		8260B Low		1	07/06/22 15:30	D2G0074	DG20621
1,1,2-Trichloroethane	ND (0.0096)		8260B Low		1	07/06/22 15:30	D2G0074	DG20621
1,1-Dichloroethane	ND (0.0096)		8260B Low		1	07/06/22 15:30	D2G0074	DG20621
1,1-Dichloroethene	ND (0.0096)		8260B Low		1	07/06/22 15:30	D2G0074	DG20621
1,1-Dichloropropene	ND (0.0096)		8260B Low		1	07/06/22 15:30	D2G0074	DG20621
1,2,3-Trichlorobenzene	ND (0.0096)		8260B Low		1	07/06/22 15:30	D2G0074	DG20621
1,2,3-Trichloropropane	ND (0.0096)		8260B Low		1	07/06/22 15:30	D2G0074	DG20621
1,2,4-Trichlorobenzene	ND (0.0096)		8260B Low		1	07/06/22 15:30	D2G0074	DG20621
1,2,4-Trimethylbenzene	ND (0.0096)		8260B Low		1	07/06/22 15:30	D2G0074	DG20621
1,2-Dibromo-3-Chloropropane	ND (0.0096)		8260B Low		1	07/06/22 15:30	D2G0074	DG20621
1,2-Dibromoethane	ND (0.0096)		8260B Low		1	07/06/22 15:30	D2G0074	DG20621
1,2-Dichlorobenzene	ND (0.0096)		8260B Low		1	07/06/22 15:30	D2G0074	DG20621
1,2-Dichloroethane	ND (0.0096)		8260B Low		1	07/06/22 15:30	D2G0074	DG20621
1,2-Dichloropropane	ND (0.0096)		8260B Low		1	07/06/22 15:30	D2G0074	DG20621
1,3,5-Trimethylbenzene	ND (0.0096)		8260B Low		1	07/06/22 15:30	D2G0074	DG20621
1,3-Dichlorobenzene	ND (0.0096)		8260B Low		1	07/06/22 15:30	D2G0074	DG20621
1,3-Dichloropropane	ND (0.0096)		8260B Low		1	07/06/22 15:30	D2G0074	DG20621
1,4-Dichlorobenzene	ND (0.0096)		8260B Low		1	07/06/22 15:30	D2G0074	DG20621
1,4-Dioxane	ND (0.0193)		8260B Low		1	07/06/22 15:30	D2G0074	DG20621
2,2-Dichloropropane	ND (0.0096)		8260B Low		1	07/06/22 15:30	D2G0074	DG20621
2-Butanone	ND (0.0963)		8260B Low		1	07/06/22 15:30	D2G0074	DG20621
2-Chlorotoluene	ND (0.0096)		8260B Low		1	07/06/22 15:30	D2G0074	DG20621
2-Hexanone	ND (0.0963)		8260B Low		1	07/06/22 15:30	D2G0074	DG20621
4-Chlorotoluene	ND (0.0096)		8260B Low		1	07/06/22 15:30	D2G0074	DG20621
4-Isopropyltoluene	ND (0.0096)		8260B Low		1	07/06/22 15:30	D2G0074	DG20621
4-Methyl-2-Pentanone	ND (0.0963)		8260B Low		1	07/06/22 15:30	D2G0074	DG20621
Acetone	ND (0.0963)		8260B Low		1	07/06/22 15:30	D2G0074	DG20621
Benzene	ND (0.0096)		8260B Low		1	07/06/22 15:30	D2G0074	DG20621
Bromobenzene	ND (0.0096)		8260B Low		1	07/06/22 15:30	D2G0074	DG20621
Bromochloromethane	ND (0.0096)		8260B Low		1	07/06/22 15:30	D2G0074	DG20621

CERTIFICATE OF ANALYSIS

Client Name: Tighe & Bond
Client Project ID: Neponset Dredge
Client Sample ID: SED-109
Date Sampled: 06/28/22 10:55
Percent Solids: 51
Initial Volume: 5.1
Final Volume: 10
Extraction Method: 5035

ESS Laboratory Work Order: 22F1147
ESS Laboratory Sample ID: 22F1147-09
Sample Matrix: Sediment
Units: mg/kg dry
Analyst: MEK

5035/8260B Volatile Organic Compounds / Low Level

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Bromodichloromethane	ND (0.0096)		8260B Low		1	07/06/22 15:30	D2G0074	DG20621
Bromoform	ND (0.0096)		8260B Low		1	07/06/22 15:30	D2G0074	DG20621
Bromomethane	ND (0.0193)		8260B Low		1	07/06/22 15:30	D2G0074	DG20621
Carbon Disulfide	ND (0.0096)		8260B Low		1	07/06/22 15:30	D2G0074	DG20621
Carbon Tetrachloride	ND (0.0096)		8260B Low		1	07/06/22 15:30	D2G0074	DG20621
Chlorobenzene	ND (0.0096)		8260B Low		1	07/06/22 15:30	D2G0074	DG20621
Chloroethane	ND (0.0193)		8260B Low		1	07/06/22 15:30	D2G0074	DG20621
Chloroform	ND (0.0096)		8260B Low		1	07/06/22 15:30	D2G0074	DG20621
Chloromethane	ND (0.0193)		8260B Low		1	07/06/22 15:30	D2G0074	DG20621
cis-1,2-Dichloroethene	ND (0.0096)		8260B Low		1	07/06/22 15:30	D2G0074	DG20621
cis-1,3-Dichloropropene	ND (0.0033)		8260B Low		1	07/06/22 15:30	D2G0074	DG20621
Dibromochloromethane	ND (0.0031)		8260B Low		1	07/06/22 15:30	D2G0074	DG20621
Dibromomethane	ND (0.0096)		8260B Low		1	07/06/22 15:30	D2G0074	DG20621
Dichlorodifluoromethane	ND (0.0193)		8260B Low		1	07/06/22 15:30	D2G0074	DG20621
Diethyl Ether	ND (0.0096)		8260B Low		1	07/06/22 15:30	D2G0074	DG20621
Di-isopropyl ether	ND (0.0096)		8260B Low		1	07/06/22 15:30	D2G0074	DG20621
Ethyl tertiary-butyl ether	ND (0.0096)		8260B Low		1	07/06/22 15:30	D2G0074	DG20621
Ethylbenzene	ND (0.0096)		8260B Low		1	07/06/22 15:30	D2G0074	DG20621
Hexachlorobutadiene	ND (0.0096)		8260B Low		1	07/06/22 15:30	D2G0074	DG20621
Isopropylbenzene	ND (0.0096)		8260B Low		1	07/06/22 15:30	D2G0074	DG20621
Methyl tert-Butyl Ether	ND (0.0096)		8260B Low		1	07/06/22 15:30	D2G0074	DG20621
Methylene Chloride	ND (0.0193)		8260B Low		1	07/06/22 15:30	D2G0074	DG20621
Naphthalene	ND (0.0096)		8260B Low		1	07/06/22 15:30	D2G0074	DG20621
n-Butylbenzene	ND (0.0096)		8260B Low		1	07/06/22 15:30	D2G0074	DG20621
n-Propylbenzene	ND (0.0096)		8260B Low		1	07/06/22 15:30	D2G0074	DG20621
sec-Butylbenzene	ND (0.0096)		8260B Low		1	07/06/22 15:30	D2G0074	DG20621
Styrene	ND (0.0096)		8260B Low		1	07/06/22 15:30	D2G0074	DG20621
tert-Butylbenzene	ND (0.0096)		8260B Low		1	07/06/22 15:30	D2G0074	DG20621
Tertiary-amyl methyl ether	ND (0.0096)		8260B Low		1	07/06/22 15:30	D2G0074	DG20621
Tetrachloroethene	ND (0.0096)		8260B Low		1	07/06/22 15:30	D2G0074	DG20621
Tetrahydrofuran	ND (0.0096)		8260B Low		1	07/06/22 15:30	D2G0074	DG20621
Toluene	ND (0.0096)		8260B Low		1	07/06/22 15:30	D2G0074	DG20621

CERTIFICATE OF ANALYSIS

Client Name: Tighe & Bond
Client Project ID: Neponset Dredge
Client Sample ID: SED-109
Date Sampled: 06/28/22 10:55
Percent Solids: 51
Initial Volume: 5.1
Final Volume: 10
Extraction Method: 5035

ESS Laboratory Work Order: 22F1147
ESS Laboratory Sample ID: 22F1147-09
Sample Matrix: Sediment
Units: mg/kg dry
Analyst: MEK

5035/8260B Volatile Organic Compounds / Low Level

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
trans-1,2-Dichloroethene	ND (0.0096)		8260B Low		1	07/06/22 15:30	D2G0074	DG20621
trans-1,3-Dichloropropene	ND (0.0031)		8260B Low		1	07/06/22 15:30	D2G0074	DG20621
Trichloroethene	ND (0.0096)		8260B Low		1	07/06/22 15:30	D2G0074	DG20621
Trichlorofluoromethane	ND (0.0096)		8260B Low		1	07/06/22 15:30	D2G0074	DG20621
Vinyl Chloride	ND (0.0193)		8260B Low		1	07/06/22 15:30	D2G0074	DG20621
Xylene O	ND (0.0096)		8260B Low		1	07/06/22 15:30	D2G0074	DG20621
Xylene P,M	ND (0.0193)		8260B Low		1	07/06/22 15:30	D2G0074	DG20621
Xylenes (Total)	ND (0.00980)		8260B		1	07/06/22 15:30		[CALC]

	%Recovery	*Qualifier*	*Limits*
Surrogate: 1,2-Dichloroethane-d4	*123 %*		*70-130*
Surrogate: 4-Bromofluorobenzene	*96 %*		*70-130*
Surrogate: Dibromofluoromethane	*109 %*		*70-130*
Surrogate: Toluene-d8	*100 %*		*70-130*

CERTIFICATE OF ANALYSIS

Client Name: Tighe & Bond
Client Project ID: Neponset Dredge
Client Sample ID: SED-109
Date Sampled: 06/28/22 10:55
Percent Solids: 51
Initial Volume: 30.4
Final Volume: 2
Extraction Method: 3540C

ESS Laboratory Work Order: 22F1147
ESS Laboratory Sample ID: 22F1147-09
Sample Matrix: Sediment
Units: mg/kg dry
Analyst: DMC
Prepared: 7/7/22 14:00

8082 Polychlorinated Biphenyls (PCB) / Congeners

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
BZ#8 [2C]	**0.945** (0.105)		8082A Cong		200	07/13/22 9:01	D2G0129	DG20701
BZ#18	**1.15** (0.105)		8082A Cong		200	07/13/22 9:01	D2G0129	DG20701
BZ#28 [2C]	**1.89** (0.105)		8082A Cong		200	07/13/22 9:01	D2G0129	DG20701
BZ#44 [2C]	**0.536** (0.105)		8082A Cong		200	07/13/22 9:01	D2G0129	DG20701
BZ#52	**1.05** (0.105)		8082A Cong		200	07/13/22 9:01	D2G0129	DG20701
BZ#66	**0.492** (0.105)		8082A Cong		200	07/13/22 9:01	D2G0129	DG20701
BZ#101 [2C]	**P, LC 0.155** (0.0105)		8082A Cong		20	07/12/22 20:51	D2G0129	DG20701
BZ#105	**P, LC 0.0602** (0.00262)		8082A Cong		5	07/12/22 20:21	D2G0129	DG20701
BZ#118	**0.135** (0.0105)		8082A Cong		20	07/12/22 20:51	D2G0129	DG20701
BZ#128 [2C]	**0.0105** (0.00052)		8082A Cong		1	07/11/22 17:46	D2G0129	DG20701
BZ#138 [2C]	**0.0563** (0.00262)		8082A Cong		5	07/12/22 20:21	D2G0129	DG20701
BZ#153	**0.0553** (0.00262)		8082A Cong		5	07/12/22 20:21	D2G0129	DG20701
BZ#170	**P, LC 0.00965** (0.00052)		8082A Cong		1	07/11/22 17:46	D2G0129	DG20701
BZ#180 [2C]	**0.0226** (0.00262)		8082A Cong		5	07/12/22 20:21	D2G0129	DG20701
BZ#187	**P, LC 0.00930** (0.00052)		8082A Cong		1	07/11/22 17:46	D2G0129	DG20701
BZ#195	**0.00243** (0.00052)		8082A Cong		1	07/11/22 17:46	D2G0129	DG20701
BZ#206 [2C]	**0.00431** (0.00052)		8082A Cong		1	07/11/22 17:46	D2G0129	DG20701
BZ#209	**P, LC 0.00149** (0.00052)		8082A Cong		1	07/11/22 17:46	D2G0129	DG20701

	%Recovery	*Qualifier*	*Limits*
Surrogate: Tetrachloro-m-xylene	*83 %*		*30-150*
Surrogate: Tetrachloro-m-xylene [2C]	*65 %*		*30-150*

CERTIFICATE OF ANALYSIS

Client Name: Tighe & Bond
Client Project ID: Neponset Dredge
Client Sample ID: SED-109
Date Sampled: 06/28/22 10:55
Percent Solids: 51

ESS Laboratory Work Order: 22F1147
ESS Laboratory Sample ID: 22F1147-09
Sample Matrix: Sediment

Classical Chemistry

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Corrosivity (pH)	**8.00** (N/A)		9045		1	EAM	07/11/22 18:31	S.U.	DG21154
Corrosivity (pH) Sample Temp	**Soil pH measured in water at 20.8 ºC.**								
Eh (ORP)	**WL 191** (N/A)		2580		1	EAM	07/11/22 18:31	mv	DG21153
Hexavalent Chromium	**O** ND (0.8)		7196A		1	JLK	07/11/22 16:44	mg/kg dry	DG21146
Percent Moisture	**49** (1)		2540G		1	EAM	06/30/22 21:18	%	DF23056
Total Organic Carbon (Average)	**46800** (96.6)		LK		1	CCP	07/12/22 15:21	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: Tighe & Bond
Client Project ID: Neponset Dredge
Client Sample ID: SED-109
Date Sampled: 06/28/22 10:55
Percent Solids: 51
Initial Volume: 24.5
Final Volume: 1
Extraction Method: 3546

ESS Laboratory Work Order: 22F1147
ESS Laboratory Sample ID: 22F1147-09
Sample Matrix: Sediment
Units: mg/kg dry

Prepared: 7/1/22 14:33

MADEP-EPH Extractable Petroleum Hydrocarbons

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
C9-C18 Aliphatics1	**31.2** (30.1)		MADEP-EPH		1	MJV	07/05/22 19:55	D2G0031	DG20126
C19-C36 Aliphatics1	**262** (30.1)		MADEP-EPH		1	MJV	07/05/22 19:55	D2G0031	DG20126
C11-C22 Unadjusted Aromatics1	**113** (30.1)		EPH8270		1	MJV	07/05/22 21:52	D2G0039	DG20126
C11-C22 Aromatics1,2	**110** (30.3)		EPH8270			TJ	07/07/22 1:18		[CALC]
2-Methylnaphthalene	**0.022** (0.016)		EPH8270SIM		1	TJ	07/07/22 1:18	D2G0078	DG20126
Acenaphthene	**0.017** (0.016)		EPH8270SIM		1	TJ	07/07/22 1:18	D2G0078	DG20126
Naphthalene	**B 0.045** (0.016)		EPH8270SIM		1	TJ	07/07/22 1:18	D2G0078	DG20126
Phenanthrene	**0.250** (0.016)		EPH8270SIM		1	TJ	07/07/22 1:18	D2G0078	DG20126
Acenaphthylene	**0.043** (0.016)		EPH8270SIM		1	TJ	07/07/22 1:18	D2G0078	DG20126
Anthracene	**0.058** (0.016)		EPH8270SIM		1	TJ	07/07/22 1:18	D2G0078	DG20126
Benzo(a)anthracene	**0.241** (0.016)		EPH8270SIM		1	TJ	07/07/22 1:18	D2G0078	DG20126
Benzo(a)pyrene	**0.270** (0.016)		EPH8270SIM		1	TJ	07/07/22 1:18	D2G0078	DG20126
Benzo(b)fluoranthene	**0.245** (0.016)		EPH8270SIM		1	TJ	07/07/22 1:18	D2G0078	DG20126
Benzo(g,h,i)perylene	**0.187** (0.016)		EPH8270SIM		1	TJ	07/07/22 1:18	D2G0078	DG20126
Benzo(k)fluoranthene	**0.216** (0.016)		EPH8270SIM		1	TJ	07/07/22 1:18	D2G0078	DG20126
Chrysene	**0.289** (0.016)		EPH8270SIM		1	TJ	07/07/22 1:18	D2G0078	DG20126
Dibenzo(a,h)Anthracene	ND (0.016)		EPH8270SIM		1	TJ	07/07/22 1:18	D2G0078	DG20126
Fluoranthene	**0.509** (0.016)		EPH8270SIM		1	TJ	07/07/22 1:18	D2G0078	DG20126
Fluorene	**0.023** (0.016)		EPH8270SIM		1	TJ	07/07/22 1:18	D2G0078	DG20126
Indeno(1,2,3-cd)Pyrene	**0.169** (0.016)		EPH8270SIM		1	TJ	07/07/22 1:18	D2G0078	DG20126
Pyrene	**0.553** (0.016)		EPH8270SIM		1	TJ	07/07/22 1:18	D2G0078	DG20126

	%Recovery	*Qualifier*	*Limits*
Surrogate: 1-Chlorooctadecane	*66 %*		*40-140*
Surrogate: 2-Bromonaphthalene	*91 %*		*40-140*
Surrogate: 2-Fluorobiphenyl	*92 %*		*40-140*
Surrogate: O-Terphenyl	*78 %*		*40-140*

CERTIFICATE OF ANALYSIS

Client Name: Tighe & Bond
Client Project ID: Neponset Dredge
Client Sample ID: SED-109
Date Sampled: 06/28/22 10:55

ESS Laboratory Work Order: 22F1147
ESS Laboratory Sample ID: 22F1147-09
Sample Matrix: Sediment

Subcontracted Analysis

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Grain Size	**See Attached** (N/A)								

CERTIFICATE OF ANALYSIS

Client Name: Tighe & Bond
Client Project ID: Neponset Dredge
Client Sample ID: SED-109
Date Sampled: 06/28/22 10:55
Percent Solids: 51
Initial Volume: 100
Final Volume: 2000
Extraction Method: 1311

ESS Laboratory Work Order: 22F1147
ESS Laboratory Sample ID: 22F1147-09
Sample Matrix: Sediment
Units: °C
Analyst: NAR
Prepared: 7/11/22 17:00

TCLP Extraction by 1311

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Batch
Temperature (Min C)	**19.9** (N/A)		1311		1	NAR	07/12/22 13:00	DG21141
Temperature (Max C)	**21.7** (N/A)		1311		1	NAR	07/12/22 13:00	DG21141
Temperature (Range)	**Temperature is not within 23 +/-2 °C.** (N/A)							

CERTIFICATE OF ANALYSIS

Client Name: Tighe & Bond
Client Project ID: Neponset Dredge
Client Sample ID: SED-110
Date Sampled: 06/28/22 13:38
Percent Solids: 50

ESS Laboratory Work Order: 22F1147
ESS Laboratory Sample ID: 22F1147-10
Sample Matrix: Sediment
Units: mg/L

Extraction Method: 3005A TCLP

1311 TCLP Metals

Analyte	Results (MRL)	MDL	Method	TCLP Limit	DF	Analyst	Analyzed	I/V	F/V	Batch
Chromium	ND (0.020)		1311/6010C		1	KJK	07/13/22 18:42	50	50	DG21235
Lead	**0.072** (0.050)		1311/6010C		1	KJK	07/13/22 18:42	50	50	DG21235

CERTIFICATE OF ANALYSIS

Client Name: Tighe & Bond
Client Project ID: Neponset Dredge
Client Sample ID: SED-110
Date Sampled: 06/28/22 13:38
Percent Solids: 50
Initial Volume: 5.8
Final Volume: 10
Extraction Method: 5035

ESS Laboratory Work Order: 22F1147
ESS Laboratory Sample ID: 22F1147-10
Sample Matrix: Sediment
Units: mg/kg dry
Analyst: MEK

5035/8260B Volatile Organic Compounds / Low Level

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
1,1,1,2-Tetrachloroethane	ND (0.0085)		8260B Low		1	07/06/22 15:56	D2G0074	DG20621
1,1,1-Trichloroethane	ND (0.0085)		8260B Low		1	07/06/22 15:56	D2G0074	DG20621
1,1,2,2-Tetrachloroethane	ND (0.0026)		8260B Low		1	07/06/22 15:56	D2G0074	DG20621
1,1,2-Trichloroethane	ND (0.0085)		8260B Low		1	07/06/22 15:56	D2G0074	DG20621
1,1-Dichloroethane	ND (0.0085)		8260B Low		1	07/06/22 15:56	D2G0074	DG20621
1,1-Dichloroethene	ND (0.0085)		8260B Low		1	07/06/22 15:56	D2G0074	DG20621
1,1-Dichloropropene	ND (0.0085)		8260B Low		1	07/06/22 15:56	D2G0074	DG20621
1,2,3-Trichlorobenzene	ND (0.0085)		8260B Low		1	07/06/22 15:56	D2G0074	DG20621
1,2,3-Trichloropropane	ND (0.0085)		8260B Low		1	07/06/22 15:56	D2G0074	DG20621
1,2,4-Trichlorobenzene	ND (0.0085)		8260B Low		1	07/06/22 15:56	D2G0074	DG20621
1,2,4-Trimethylbenzene	ND (0.0085)		8260B Low		1	07/06/22 15:56	D2G0074	DG20621
1,2-Dibromo-3-Chloropropane	ND (0.0085)		8260B Low		1	07/06/22 15:56	D2G0074	DG20621
1,2-Dibromoethane	ND (0.0085)		8260B Low		1	07/06/22 15:56	D2G0074	DG20621
1,2-Dichlorobenzene	ND (0.0085)		8260B Low		1	07/06/22 15:56	D2G0074	DG20621
1,2-Dichloroethane	ND (0.0085)		8260B Low		1	07/06/22 15:56	D2G0074	DG20621
1,2-Dichloropropane	ND (0.0085)		8260B Low		1	07/06/22 15:56	D2G0074	DG20621
1,3,5-Trimethylbenzene	ND (0.0085)		8260B Low		1	07/06/22 15:56	D2G0074	DG20621
1,3-Dichlorobenzene	ND (0.0085)		8260B Low		1	07/06/22 15:56	D2G0074	DG20621
1,3-Dichloropropane	ND (0.0085)		8260B Low		1	07/06/22 15:56	D2G0074	DG20621
1,4-Dichlorobenzene	ND (0.0085)		8260B Low		1	07/06/22 15:56	D2G0074	DG20621
1,4-Dioxane	ND (0.0171)		8260B Low		1	07/06/22 15:56	D2G0074	DG20621
2,2-Dichloropropane	ND (0.0085)		8260B Low		1	07/06/22 15:56	D2G0074	DG20621
2-Butanone	ND (0.0854)		8260B Low		1	07/06/22 15:56	D2G0074	DG20621
2-Chlorotoluene	ND (0.0085)		8260B Low		1	07/06/22 15:56	D2G0074	DG20621
2-Hexanone	ND (0.0854)		8260B Low		1	07/06/22 15:56	D2G0074	DG20621
4-Chlorotoluene	ND (0.0085)		8260B Low		1	07/06/22 15:56	D2G0074	DG20621
4-Isopropyltoluene	ND (0.0085)		8260B Low		1	07/06/22 15:56	D2G0074	DG20621
4-Methyl-2-Pentanone	ND (0.0854)		8260B Low		1	07/06/22 15:56	D2G0074	DG20621
Acetone	**0.211** (0.0854)		8260B Low		1	07/06/22 15:56	D2G0074	DG20621
Benzene	ND (0.0085)		8260B Low		1	07/06/22 15:56	D2G0074	DG20621
Bromobenzene	ND (0.0085)		8260B Low		1	07/06/22 15:56	D2G0074	DG20621
Bromochloromethane	ND (0.0085)		8260B Low		1	07/06/22 15:56	D2G0074	DG20621

CERTIFICATE OF ANALYSIS

Client Name: Tighe & Bond
Client Project ID: Neponset Dredge
Client Sample ID: SED-110
Date Sampled: 06/28/22 13:38
Percent Solids: 50
Initial Volume: 5.8
Final Volume: 10
Extraction Method: 5035

ESS Laboratory Work Order: 22F1147
ESS Laboratory Sample ID: 22F1147-10
Sample Matrix: Sediment
Units: mg/kg dry
Analyst: MEK

5035/8260B Volatile Organic Compounds / Low Level

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Bromodichloromethane	ND (0.0085)		8260B Low		1	07/06/22 15:56	D2G0074	DG20621
Bromoform	ND (0.0085)		8260B Low		1	07/06/22 15:56	D2G0074	DG20621
Bromomethane	ND (0.0171)		8260B Low		1	07/06/22 15:56	D2G0074	DG20621
Carbon Disulfide	**0.0169** (0.0085)		8260B Low		1	07/06/22 15:56	D2G0074	DG20621
Carbon Tetrachloride	ND (0.0085)		8260B Low		1	07/06/22 15:56	D2G0074	DG20621
Chlorobenzene	ND (0.0085)		8260B Low		1	07/06/22 15:56	D2G0074	DG20621
Chloroethane	ND (0.0171)		8260B Low		1	07/06/22 15:56	D2G0074	DG20621
Chloroform	ND (0.0085)		8260B Low		1	07/06/22 15:56	D2G0074	DG20621
Chloromethane	ND (0.0171)		8260B Low		1	07/06/22 15:56	D2G0074	DG20621
cis-1,2-Dichloroethene	ND (0.0085)		8260B Low		1	07/06/22 15:56	D2G0074	DG20621
cis-1,3-Dichloropropene	ND (0.0029)		8260B Low		1	07/06/22 15:56	D2G0074	DG20621
Dibromochloromethane	ND (0.0027)		8260B Low		1	07/06/22 15:56	D2G0074	DG20621
Dibromomethane	ND (0.0085)		8260B Low		1	07/06/22 15:56	D2G0074	DG20621
Dichlorodifluoromethane	ND (0.0171)		8260B Low		1	07/06/22 15:56	D2G0074	DG20621
Diethyl Ether	ND (0.0085)		8260B Low		1	07/06/22 15:56	D2G0074	DG20621
Di-isopropyl ether	ND (0.0085)		8260B Low		1	07/06/22 15:56	D2G0074	DG20621
Ethyl tertiary-butyl ether	ND (0.0085)		8260B Low		1	07/06/22 15:56	D2G0074	DG20621
Ethylbenzene	ND (0.0085)		8260B Low		1	07/06/22 15:56	D2G0074	DG20621
Hexachlorobutadiene	ND (0.0085)		8260B Low		1	07/06/22 15:56	D2G0074	DG20621
Isopropylbenzene	ND (0.0085)		8260B Low		1	07/06/22 15:56	D2G0074	DG20621
Methyl tert-Butyl Ether	ND (0.0085)		8260B Low		1	07/06/22 15:56	D2G0074	DG20621
Methylene Chloride	ND (0.0171)		8260B Low		1	07/06/22 15:56	D2G0074	DG20621
Naphthalene	ND (0.0085)		8260B Low		1	07/06/22 15:56	D2G0074	DG20621
n-Butylbenzene	ND (0.0085)		8260B Low		1	07/06/22 15:56	D2G0074	DG20621
n-Propylbenzene	ND (0.0085)		8260B Low		1	07/06/22 15:56	D2G0074	DG20621
sec-Butylbenzene	ND (0.0085)		8260B Low		1	07/06/22 15:56	D2G0074	DG20621
Styrene	ND (0.0085)		8260B Low		1	07/06/22 15:56	D2G0074	DG20621
tert-Butylbenzene	ND (0.0085)		8260B Low		1	07/06/22 15:56	D2G0074	DG20621
Tertiary-amyl methyl ether	ND (0.0085)		8260B Low		1	07/06/22 15:56	D2G0074	DG20621
Tetrachloroethene	ND (0.0085)		8260B Low		1	07/06/22 15:56	D2G0074	DG20621
Tetrahydrofuran	ND (0.0085)		8260B Low		1	07/06/22 15:56	D2G0074	DG20621
Toluene	ND (0.0085)		8260B Low		1	07/06/22 15:56	D2G0074	DG20621

CERTIFICATE OF ANALYSIS

Client Name: Tighe & Bond
Client Project ID: Neponset Dredge
Client Sample ID: SED-110
Date Sampled: 06/28/22 13:38
Percent Solids: 50
Initial Volume: 5.8
Final Volume: 10
Extraction Method: 5035

ESS Laboratory Work Order: 22F1147
ESS Laboratory Sample ID: 22F1147-10
Sample Matrix: Sediment
Units: mg/kg dry
Analyst: MEK

5035/8260B Volatile Organic Compounds / Low Level

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
trans-1,2-Dichloroethene	ND (0.0085)		8260B Low		1	07/06/22 15:56	D2G0074	DG20621
trans-1,3-Dichloropropene	ND (0.0027)		8260B Low		1	07/06/22 15:56	D2G0074	DG20621
Trichloroethene	ND (0.0085)		8260B Low		1	07/06/22 15:56	D2G0074	DG20621
Trichlorofluoromethane	ND (0.0085)		8260B Low		1	07/06/22 15:56	D2G0074	DG20621
Vinyl Chloride	ND (0.0171)		8260B Low		1	07/06/22 15:56	D2G0074	DG20621
Xylene O	ND (0.0085)		8260B Low		1	07/06/22 15:56	D2G0074	DG20621
Xylene P,M	ND (0.0171)		8260B Low		1	07/06/22 15:56	D2G0074	DG20621
Xylenes (Total)	ND (0.00862)		8260B		1	07/06/22 15:56		[CALC]

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichloroethane-d4	*122 %*		*70-130*
Surrogate: 4-Bromofluorobenzene	*97 %*		*70-130*
Surrogate: Dibromofluoromethane	*109 %*		*70-130*
Surrogate: Toluene-d8	*99 %*		*70-130*

CERTIFICATE OF ANALYSIS

Client Name: Tighe & Bond
Client Project ID: Neponset Dredge
Client Sample ID: SED-110
Date Sampled: 06/28/22 13:38
Percent Solids: 50
Initial Volume: 30
Final Volume: 2
Extraction Method: 3540C

ESS Laboratory Work Order: 22F1147
ESS Laboratory Sample ID: 22F1147-10
Sample Matrix: Sediment
Units: mg/kg dry
Analyst: DMC
Prepared: 7/7/22 14:00

8082 Polychlorinated Biphenyls (PCB) / Congeners

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
BZ#8 [2C]	**0.00359** (0.00053)		8082A Cong		1	07/11/22 18:16	D2G0129	DG20701
BZ#18 [2C]	**0.00699** (0.00053)		8082A Cong		1	07/11/22 18:16	D2G0129	DG20701
BZ#28 [2C]	**0.0195** (0.00267)		8082A Cong		5	07/12/22 15:47	D2G0129	DG20701
BZ#44 [2C]	**0.0131** (0.00053)		8082A Cong		1	07/11/22 18:16	D2G0129	DG20701
BZ#52	**0.0221** (0.00267)		8082A Cong		5	07/12/22 15:47	D2G0129	DG20701
BZ#66 [2C]	**0.0191** (0.00267)		8082A Cong		5	07/12/22 15:47	D2G0129	DG20701
BZ#101	**0.0274** (0.00267)		8082A Cong		5	07/12/22 15:47	D2G0129	DG20701
BZ#105 [2C]	**0.0111** (0.00053)		8082A Cong		1	07/11/22 18:16	D2G0129	DG20701
BZ#118	**0.0197** (0.00267)		8082A Cong		5	07/12/22 15:47	D2G0129	DG20701
BZ#128 [2C]	**0.00324** (0.00053)		8082A Cong		1	07/11/22 18:16	D2G0129	DG20701
BZ#138 [2C]	**0.0185** (0.00267)		8082A Cong		5	07/12/22 15:47	D2G0129	DG20701
BZ#153 [2C]	**P, LC 0.0101** (0.00053)		8082A Cong		1	07/11/22 18:16	D2G0129	DG20701
BZ#170 [2C]	**0.00410** (0.00053)		8082A Cong		1	07/11/22 18:16	D2G0129	DG20701
BZ#180 [2C]	**0.00482** (0.00053)		8082A Cong		1	07/11/22 18:16	D2G0129	DG20701
BZ#187 [2C]	**0.00444** (0.00053)		8082A Cong		1	07/11/22 18:16	D2G0129	DG20701
BZ#195	**0.00072** (0.00053)		8082A Cong		1	07/11/22 18:16	D2G0129	DG20701
BZ#206	**P, LC 0.00085** (0.00053)		8082A Cong		1	07/11/22 18:16	D2G0129	DG20701
BZ#209	ND (0.00053)		8082A Cong		1	07/11/22 18:16	D2G0129	DG20701

	%Recovery	*Qualifier*	*Limits*
Surrogate: Tetrachloro-m-xylene	*66 %*		*30-150*
Surrogate: Tetrachloro-m-xylene [2C]	*71 %*		*30-150*

CERTIFICATE OF ANALYSIS

Client Name: Tighe & Bond
Client Project ID: Neponset Dredge
Client Sample ID: SED-110
Date Sampled: 06/28/22 13:38
Percent Solids: 50

ESS Laboratory Work Order: 22F1147
ESS Laboratory Sample ID: 22F1147-10
Sample Matrix: Sediment

Classical Chemistry

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Corrosivity (pH)	**8.19** (N/A)		9045		1	EAM	07/11/22 18:31	S.U.	DG21154
Corrosivity (pH) Sample Temp	**Soil pH measured in water at 20.9 ºC.**								
Eh (ORP)	**WL 101** (N/A)		2580		1	EAM	07/11/22 18:31	mv	DG21153
Hexavalent Chromium	**O** ND (0.8)		7196A		1	JLK	07/11/22 16:44	mg/kg dry	DG21146
Percent Moisture	**50** (1)		2540G		1	EAM	06/30/22 21:18	%	DF23056
Total Organic Carbon (Average)	**32300** (93.5)		LK		1	CCP	07/12/22 15:38	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: Tighe & Bond
Client Project ID: Neponset Dredge
Client Sample ID: SED-110
Date Sampled: 06/28/22 13:38
Percent Solids: 50
Initial Volume: 25.1
Final Volume: 1
Extraction Method: 3546

ESS Laboratory Work Order: 22F1147
ESS Laboratory Sample ID: 22F1147-10
Sample Matrix: Sediment
Units: mg/kg dry

Prepared: 7/1/22 14:33

MADEP-EPH Extractable Petroleum Hydrocarbons

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
C9-C18 Aliphatics1	ND (29.6)		MADEP-EPH		1	MJV	07/05/22 20:30	D2G0031	DG20126
C19-C36 Aliphatics1	**116** (29.6)		MADEP-EPH		1	MJV	07/05/22 20:30	D2G0031	DG20126
C11-C22 Unadjusted Aromatics1	**55.7** (29.6)		EPH8270		1	MJV	07/05/22 22:32	D2G0039	DG20126
C11-C22 Aromatics1,2	**53.7** (29.9)		EPH8270			TJ	07/07/22 1:39		[CALC]
2-Methylnaphthalene	**0.016** (0.016)		EPH8270SIM		1	TJ	07/07/22 1:39	D2G0078	DG20126
Acenaphthene	ND (0.016)		EPH8270SIM		1	TJ	07/07/22 1:39	D2G0078	DG20126
Naphthalene	**B 0.036** (0.016)		EPH8270SIM		1	TJ	07/07/22 1:39	D2G0078	DG20126
Phenanthrene	**0.164** (0.016)		EPH8270SIM		1	TJ	07/07/22 1:39	D2G0078	DG20126
Acenaphthylene	**0.024** (0.016)		EPH8270SIM		1	TJ	07/07/22 1:39	D2G0078	DG20126
Anthracene	**0.040** (0.016)		EPH8270SIM		1	TJ	07/07/22 1:39	D2G0078	DG20126
Benzo(a)anthracene	**0.166** (0.016)		EPH8270SIM		1	TJ	07/07/22 1:39	D2G0078	DG20126
Benzo(a)pyrene	**0.187** (0.016)		EPH8270SIM		1	TJ	07/07/22 1:39	D2G0078	DG20126
Benzo(b)fluoranthene	**0.151** (0.016)		EPH8270SIM		1	TJ	07/07/22 1:39	D2G0078	DG20126
Benzo(g,h,i)perylene	**0.124** (0.016)		EPH8270SIM		1	TJ	07/07/22 1:39	D2G0078	DG20126
Benzo(k)fluoranthene	**0.136** (0.016)		EPH8270SIM		1	TJ	07/07/22 1:39	D2G0078	DG20126
Chrysene	**0.196** (0.016)		EPH8270SIM		1	TJ	07/07/22 1:39	D2G0078	DG20126
Dibenzo(a,h)Anthracene	ND (0.016)		EPH8270SIM		1	TJ	07/07/22 1:39	D2G0078	DG20126
Fluoranthene	**0.296** (0.016)		EPH8270SIM		1	TJ	07/07/22 1:39	D2G0078	DG20126
Fluorene	ND (0.016)		EPH8270SIM		1	TJ	07/07/22 1:39	D2G0078	DG20126
Indeno(1,2,3-cd)Pyrene	**0.107** (0.016)		EPH8270SIM		1	TJ	07/07/22 1:39	D2G0078	DG20126
Pyrene	**0.361** (0.016)		EPH8270SIM		1	TJ	07/07/22 1:39	D2G0078	DG20126

	%Recovery	Qualifier	Limits
Surrogate: 1-Chlorooctadecane	*62 %*		*40-140*
Surrogate: 2-Bromonaphthalene	*89 %*		*40-140*
Surrogate: 2-Fluorobiphenyl	*87 %*		*40-140*
Surrogate: O-Terphenyl	*76 %*		*40-140*

CERTIFICATE OF ANALYSIS

Client Name: Tighe & Bond
Client Project ID: Neponset Dredge
Client Sample ID: SED-110
Date Sampled: 06/28/22 13:38

ESS Laboratory Work Order: 22F1147
ESS Laboratory Sample ID: 22F1147-10
Sample Matrix: Sediment

Subcontracted Analysis

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Grain Size	**See Attached** (N/A)								

CERTIFICATE OF ANALYSIS

Client Name: Tighe & Bond
Client Project ID: Neponset Dredge
Client Sample ID: SED-110
Date Sampled: 06/28/22 13:38
Percent Solids: 50
Initial Volume: 100
Final Volume: 2000
Extraction Method: 1311

ESS Laboratory Work Order: 22F1147
ESS Laboratory Sample ID: 22F1147-10
Sample Matrix: Sediment
Units: °C
Analyst: NAR
Prepared: 7/11/22 17:00

TCLP Extraction by 1311

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Batch
Temperature (Min C)	**19.9** (N/A)		1311		1	NAR	07/12/22 13:00	DG21141
Temperature (Max C)	**21.7** (N/A)		1311		1	NAR	07/12/22 13:00	DG21141
Temperature (Range)	**Temperature is not within 23 +/-2 °C.** (N/A)							

CERTIFICATE OF ANALYSIS

Client Name: Tighe & Bond
Client Project ID: Neponset Dredge
Client Sample ID: SED-111
Date Sampled: 06/28/22 13:12
Percent Solids: 60
Initial Volume: 5.3
Final Volume: 10
Extraction Method: 5035

ESS Laboratory Work Order: 22F1147
ESS Laboratory Sample ID: 22F1147-11
Sample Matrix: Sediment
Units: mg/kg dry
Analyst: MEK

5035/8260B Volatile Organic Compounds / Low Level

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
1,1,1,2-Tetrachloroethane	ND (0.0079)		8260B Low		1	07/06/22 16:21	D2G0074	DG20621
1,1,1-Trichloroethane	ND (0.0079)		8260B Low		1	07/06/22 16:21	D2G0074	DG20621
1,1,2,2-Tetrachloroethane	ND (0.0024)		8260B Low		1	07/06/22 16:21	D2G0074	DG20621
1,1,2-Trichloroethane	ND (0.0079)		8260B Low		1	07/06/22 16:21	D2G0074	DG20621
1,1-Dichloroethane	ND (0.0079)		8260B Low		1	07/06/22 16:21	D2G0074	DG20621
1,1-Dichloroethene	ND (0.0079)		8260B Low		1	07/06/22 16:21	D2G0074	DG20621
1,1-Dichloropropene	ND (0.0079)		8260B Low		1	07/06/22 16:21	D2G0074	DG20621
1,2,3-Trichlorobenzene	ND (0.0079)		8260B Low		1	07/06/22 16:21	D2G0074	DG20621
1,2,3-Trichloropropane	ND (0.0079)		8260B Low		1	07/06/22 16:21	D2G0074	DG20621
1,2,4-Trichlorobenzene	ND (0.0079)		8260B Low		1	07/06/22 16:21	D2G0074	DG20621
1,2,4-Trimethylbenzene	ND (0.0079)		8260B Low		1	07/06/22 16:21	D2G0074	DG20621
1,2-Dibromo-3-Chloropropane	ND (0.0079)		8260B Low		1	07/06/22 16:21	D2G0074	DG20621
1,2-Dibromoethane	ND (0.0079)		8260B Low		1	07/06/22 16:21	D2G0074	DG20621
1,2-Dichlorobenzene	ND (0.0079)		8260B Low		1	07/06/22 16:21	D2G0074	DG20621
1,2-Dichloroethane	ND (0.0079)		8260B Low		1	07/06/22 16:21	D2G0074	DG20621
1,2-Dichloropropane	ND (0.0079)		8260B Low		1	07/06/22 16:21	D2G0074	DG20621
1,3,5-Trimethylbenzene	ND (0.0079)		8260B Low		1	07/06/22 16:21	D2G0074	DG20621
1,3-Dichlorobenzene	ND (0.0079)		8260B Low		1	07/06/22 16:21	D2G0074	DG20621
1,3-Dichloropropane	ND (0.0079)		8260B Low		1	07/06/22 16:21	D2G0074	DG20621
1,4-Dichlorobenzene	ND (0.0079)		8260B Low		1	07/06/22 16:21	D2G0074	DG20621
1,4-Dioxane	ND (0.0158)		8260B Low		1	07/06/22 16:21	D2G0074	DG20621
2,2-Dichloropropane	ND (0.0079)		8260B Low		1	07/06/22 16:21	D2G0074	DG20621
2-Butanone	ND (0.0791)		8260B Low		1	07/06/22 16:21	D2G0074	DG20621
2-Chlorotoluene	ND (0.0079)		8260B Low		1	07/06/22 16:21	D2G0074	DG20621
2-Hexanone	ND (0.0791)		8260B Low		1	07/06/22 16:21	D2G0074	DG20621
4-Chlorotoluene	ND (0.0079)		8260B Low		1	07/06/22 16:21	D2G0074	DG20621
4-Isopropyltoluene	ND (0.0079)		8260B Low		1	07/06/22 16:21	D2G0074	DG20621
4-Methyl-2-Pentanone	ND (0.0791)		8260B Low		1	07/06/22 16:21	D2G0074	DG20621
Acetone	**0.296** (0.0791)		8260B Low		1	07/06/22 16:21	D2G0074	DG20621
Benzene	ND (0.0079)		8260B Low		1	07/06/22 16:21	D2G0074	DG20621
Bromobenzene	ND (0.0079)		8260B Low		1	07/06/22 16:21	D2G0074	DG20621
Bromochloromethane	ND (0.0079)		8260B Low		1	07/06/22 16:21	D2G0074	DG20621

CERTIFICATE OF ANALYSIS

Client Name: Tighe & Bond
Client Project ID: Neponset Dredge
Client Sample ID: SED-111
Date Sampled: 06/28/22 13:12
Percent Solids: 60
Initial Volume: 5.3
Final Volume: 10
Extraction Method: 5035

ESS Laboratory Work Order: 22F1147
ESS Laboratory Sample ID: 22F1147-11
Sample Matrix: Sediment
Units: mg/kg dry
Analyst: MEK

5035/8260B Volatile Organic Compounds / Low Level

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Bromodichloromethane	ND (0.0079)		8260B Low		1	07/06/22 16:21	D2G0074	DG20621
Bromoform	ND (0.0079)		8260B Low		1	07/06/22 16:21	D2G0074	DG20621
Bromomethane	ND (0.0158)		8260B Low		1	07/06/22 16:21	D2G0074	DG20621
Carbon Disulfide	**0.0109** (0.0079)		8260B Low		1	07/06/22 16:21	D2G0074	DG20621
Carbon Tetrachloride	ND (0.0079)		8260B Low		1	07/06/22 16:21	D2G0074	DG20621
Chlorobenzene	ND (0.0079)		8260B Low		1	07/06/22 16:21	D2G0074	DG20621
Chloroethane	ND (0.0158)		8260B Low		1	07/06/22 16:21	D2G0074	DG20621
Chloroform	ND (0.0079)		8260B Low		1	07/06/22 16:21	D2G0074	DG20621
Chloromethane	ND (0.0158)		8260B Low		1	07/06/22 16:21	D2G0074	DG20621
cis-1,2-Dichloroethene	ND (0.0079)		8260B Low		1	07/06/22 16:21	D2G0074	DG20621
cis-1,3-Dichloropropene	ND (0.0027)		8260B Low		1	07/06/22 16:21	D2G0074	DG20621
Dibromochloromethane	ND (0.0025)		8260B Low		1	07/06/22 16:21	D2G0074	DG20621
Dibromomethane	ND (0.0079)		8260B Low		1	07/06/22 16:21	D2G0074	DG20621
Dichlorodifluoromethane	ND (0.0158)		8260B Low		1	07/06/22 16:21	D2G0074	DG20621
Diethyl Ether	ND (0.0079)		8260B Low		1	07/06/22 16:21	D2G0074	DG20621
Di-isopropyl ether	ND (0.0079)		8260B Low		1	07/06/22 16:21	D2G0074	DG20621
Ethyl tertiary-butyl ether	ND (0.0079)		8260B Low		1	07/06/22 16:21	D2G0074	DG20621
Ethylbenzene	ND (0.0079)		8260B Low		1	07/06/22 16:21	D2G0074	DG20621
Hexachlorobutadiene	ND (0.0079)		8260B Low		1	07/06/22 16:21	D2G0074	DG20621
Isopropylbenzene	ND (0.0079)		8260B Low		1	07/06/22 16:21	D2G0074	DG20621
Methyl tert-Butyl Ether	ND (0.0079)		8260B Low		1	07/06/22 16:21	D2G0074	DG20621
Methylene Chloride	ND (0.0158)		8260B Low		1	07/06/22 16:21	D2G0074	DG20621
Naphthalene	ND (0.0079)		8260B Low		1	07/06/22 16:21	D2G0074	DG20621
n-Butylbenzene	ND (0.0079)		8260B Low		1	07/06/22 16:21	D2G0074	DG20621
n-Propylbenzene	ND (0.0079)		8260B Low		1	07/06/22 16:21	D2G0074	DG20621
sec-Butylbenzene	ND (0.0079)		8260B Low		1	07/06/22 16:21	D2G0074	DG20621
Styrene	ND (0.0079)		8260B Low		1	07/06/22 16:21	D2G0074	DG20621
tert-Butylbenzene	ND (0.0079)		8260B Low		1	07/06/22 16:21	D2G0074	DG20621
Tertiary-amyl methyl ether	ND (0.0079)		8260B Low		1	07/06/22 16:21	D2G0074	DG20621
Tetrachloroethene	ND (0.0079)		8260B Low		1	07/06/22 16:21	D2G0074	DG20621
Tetrahydrofuran	ND (0.0079)		8260B Low		1	07/06/22 16:21	D2G0074	DG20621
Toluene	ND (0.0079)		8260B Low		1	07/06/22 16:21	D2G0074	DG20621

CERTIFICATE OF ANALYSIS

Client Name: Tighe & Bond
Client Project ID: Neponset Dredge
Client Sample ID: SED-111
Date Sampled: 06/28/22 13:12
Percent Solids: 60
Initial Volume: 5.3
Final Volume: 10
Extraction Method: 5035

ESS Laboratory Work Order: 22F1147
ESS Laboratory Sample ID: 22F1147-11
Sample Matrix: Sediment
Units: mg/kg dry
Analyst: MEK

5035/8260B Volatile Organic Compounds / Low Level

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
trans-1,2-Dichloroethene	ND (0.0079)		8260B Low		1	07/06/22 16:21	D2G0074	DG20621
trans-1,3-Dichloropropene	ND (0.0025)		8260B Low		1	07/06/22 16:21	D2G0074	DG20621
Trichloroethene	ND (0.0079)		8260B Low		1	07/06/22 16:21	D2G0074	DG20621
Trichlorofluoromethane	ND (0.0079)		8260B Low		1	07/06/22 16:21	D2G0074	DG20621
Vinyl Chloride	ND (0.0158)		8260B Low		1	07/06/22 16:21	D2G0074	DG20621
Xylene O	ND (0.0079)		8260B Low		1	07/06/22 16:21	D2G0074	DG20621
Xylene P,M	ND (0.0158)		8260B Low		1	07/06/22 16:21	D2G0074	DG20621
Xylenes (Total)	ND (0.00943)		8260B		1	07/06/22 16:21		[CALC]

	%Recovery	*Qualifier*	*Limits*
Surrogate: 1,2-Dichloroethane-d4	*113 %*		*70-130*
Surrogate: 4-Bromofluorobenzene	*95 %*		*70-130*
Surrogate: Dibromofluoromethane	*104 %*		*70-130*
Surrogate: Toluene-d8	*99 %*		*70-130*

CERTIFICATE OF ANALYSIS

Client Name: Tighe & Bond
Client Project ID: Neponset Dredge
Client Sample ID: SED-111
Date Sampled: 06/28/22 13:12
Percent Solids: 60
Initial Volume: 30.4
Final Volume: 2
Extraction Method: 3540C

ESS Laboratory Work Order: 22F1147
ESS Laboratory Sample ID: 22F1147-11
Sample Matrix: Sediment
Units: mg/kg dry
Analyst: DMC
Prepared: 7/7/22 14:00

8082 Polychlorinated Biphenyls (PCB) / Congeners

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
BZ#8 [2C]	**0.00093** (0.00045)		8082A Cong		1	07/11/22 18:46	D2G0129	DG20701
BZ#18 [2C]	**P, LC 0.00081** (0.00045)		8082A Cong		1	07/11/22 18:46	D2G0129	DG20701
BZ#28	**0.00198** (0.00045)		8082A Cong		1	07/11/22 18:46	D2G0129	DG20701
BZ#44 [2C]	**0.00145** (0.00045)		8082A Cong		1	07/11/22 18:46	D2G0129	DG20701
BZ#52	**0.00256** (0.00045)		8082A Cong		1	07/11/22 18:46	D2G0129	DG20701
BZ#66 [2C]	**0.00211** (0.00045)		8082A Cong		1	07/11/22 18:46	D2G0129	DG20701
BZ#101	**0.00317** (0.00045)		8082A Cong		1	07/11/22 18:46	D2G0129	DG20701
BZ#105 [2C]	**0.00209** (0.00045)		8082A Cong		1	07/11/22 18:46	D2G0129	DG20701
BZ#118	**0.00328** (0.00045)		8082A Cong		1	07/11/22 18:46	D2G0129	DG20701
BZ#128	**0.00088** (0.00045)		8082A Cong		1	07/11/22 18:46	D2G0129	DG20701
BZ#138	**0.00364** (0.00045)		8082A Cong		1	07/11/22 18:46	D2G0129	DG20701
BZ#153	**0.00360** (0.00045)		8082A Cong		1	07/11/22 18:46	D2G0129	DG20701
BZ#170 [2C]	**0.00108** (0.00045)		8082A Cong		1	07/11/22 18:46	D2G0129	DG20701
BZ#180	**0.00141** (0.00045)		8082A Cong		1	07/11/22 18:46	D2G0129	DG20701
BZ#187 [2C]	**0.00119** (0.00045)		8082A Cong		1	07/11/22 18:46	D2G0129	DG20701
BZ#195 [2C]	ND (0.00045)		8082A Cong		1	07/11/22 18:46	D2G0129	DG20701
BZ#206	ND (0.00045)		8082A Cong		1	07/11/22 18:46	D2G0129	DG20701
BZ#209	ND (0.00045)		8082A Cong		1	07/11/22 18:46	D2G0129	DG20701

	%Recovery	Qualifier	Limits
Surrogate: Tetrachloro-m-xylene	*68 %*		*30-150*
Surrogate: Tetrachloro-m-xylene [2C]	*70 %*		*30-150*

CERTIFICATE OF ANALYSIS

Client Name: Tighe & Bond
Client Project ID: Neponset Dredge
Client Sample ID: SED-111
Date Sampled: 06/28/22 13:12
Percent Solids: 60

ESS Laboratory Work Order: 22F1147
ESS Laboratory Sample ID: 22F1147-11
Sample Matrix: Sediment

Classical Chemistry

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Percent Moisture	**40** (1)		2540G		1	EAM	06/30/22 21:18	%	DF23056
Total Organic Carbon (Average)	**13700** (97.4)		LK		1	CCP	07/12/22 15:55	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: Tighe & Bond
Client Project ID: Neponset Dredge
Client Sample ID: SED-111
Date Sampled: 06/28/22 13:12
Percent Solids: 60
Initial Volume: 24.7
Final Volume: 1
Extraction Method: 3546

ESS Laboratory Work Order: 22F1147
ESS Laboratory Sample ID: 22F1147-11
Sample Matrix: Sediment
Units: mg/kg dry

Prepared: 7/1/22 14:33

MADEP-EPH Extractable Petroleum Hydrocarbons

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
C9-C18 Aliphatics1	ND (25.5)		MADEP-EPH		1	MJV	07/05/22 21:04	D2G0031	DG20126
C19-C36 Aliphatics1	ND (25.5)		MADEP-EPH		1	MJV	07/05/22 21:04	D2G0031	DG20126
C11-C22 Unadjusted Aromatics1	ND (25.5)		EPH8270		1	MJV	07/05/22 23:13	D2G0039	DG20126
C11-C22 Aromatics1,2	ND (25.7)		EPH8270			TJ	07/07/22 2:00		[CALC]
2-Methylnaphthalene	ND (0.014)		EPH8270SIM		1	TJ	07/07/22 2:00	D2G0078	DG20126
Acenaphthene	ND (0.014)		EPH8270SIM		1	TJ	07/07/22 2:00	D2G0078	DG20126
Naphthalene	**B 0.020** (0.014)		EPH8270SIM		1	TJ	07/07/22 2:00	D2G0078	DG20126
Phenanthrene	**0.045** (0.014)		EPH8270SIM		1	TJ	07/07/22 2:00	D2G0078	DG20126
Acenaphthylene	ND (0.014)		EPH8270SIM		1	TJ	07/07/22 2:00	D2G0078	DG20126
Anthracene	ND (0.014)		EPH8270SIM		1	TJ	07/07/22 2:00	D2G0078	DG20126
Benzo(a)anthracene	**0.050** (0.014)		EPH8270SIM		1	TJ	07/07/22 2:00	D2G0078	DG20126
Benzo(a)pyrene	**0.055** (0.014)		EPH8270SIM		1	TJ	07/07/22 2:00	D2G0078	DG20126
Benzo(b)fluoranthene	**0.039** (0.014)		EPH8270SIM		1	TJ	07/07/22 2:00	D2G0078	DG20126
Benzo(g,h,i)perylene	**0.033** (0.014)		EPH8270SIM		1	TJ	07/07/22 2:00	D2G0078	DG20126
Benzo(k)fluoranthene	**0.048** (0.014)		EPH8270SIM		1	TJ	07/07/22 2:00	D2G0078	DG20126
Chrysene	**0.058** (0.014)		EPH8270SIM		1	TJ	07/07/22 2:00	D2G0078	DG20126
Dibenzo(a,h)Anthracene	ND (0.014)		EPH8270SIM		1	TJ	07/07/22 2:00	D2G0078	DG20126
Fluoranthene	**0.088** (0.014)		EPH8270SIM		1	TJ	07/07/22 2:00	D2G0078	DG20126
Fluorene	ND (0.014)		EPH8270SIM		1	TJ	07/07/22 2:00	D2G0078	DG20126
Indeno(1,2,3-cd)Pyrene	**0.029** (0.014)		EPH8270SIM		1	TJ	07/07/22 2:00	D2G0078	DG20126
Pyrene	**0.100** (0.014)		EPH8270SIM		1	TJ	07/07/22 2:00	D2G0078	DG20126

	%Recovery	*Qualifier*	*Limits*
Surrogate: 1-Chlorooctadecane	*72 %*		*40-140*
Surrogate: 2-Bromonaphthalene	*95 %*		*40-140*
Surrogate: 2-Fluorobiphenyl	*93 %*		*40-140*
Surrogate: O-Terphenyl	*77 %*		*40-140*

CERTIFICATE OF ANALYSIS

Client Name: Tighe & Bond
Client Project ID: Neponset Dredge
Client Sample ID: SED-111
Date Sampled: 06/28/22 13:12

ESS Laboratory Work Order: 22F1147
ESS Laboratory Sample ID: 22F1147-11
Sample Matrix: Sediment

Subcontracted Analysis

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Grain Size	**See Attached** (N/A)								

CERTIFICATE OF ANALYSIS

Client Name: Tighe & Bond
Client Project ID: Neponset Dredge
Client Sample ID: SED-101 Oven Dried
Date Sampled: 06/28/22 11:13
Percent Solids: 100

ESS Laboratory Work Order: 22F1147
ESS Laboratory Sample ID: 22F1147-12
Sample Matrix: Sediment
Units: mg/kg dry

Extraction Method: 3050B

Total Metals

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	I/V	F/V	Batch
Arsenic	**6.82** (0.99)		6010C		1	KJK	07/08/22 19:04	5.03	100	DG20751
Cadmium	**2.87** (0.20)		6010C		1	KJK	07/08/22 19:04	5.03	100	DG20751
Chromium	**122** (0.40)		6010C		1	KJK	07/08/22 19:04	5.03	100	DG20751
Copper	**117** (0.99)		6010C		1	KJK	07/08/22 19:04	5.03	100	DG20751
Lead	**184** (1.99)		6010C		1	KJK	07/08/22 19:04	5.03	100	DG20751
Mercury	**1.62** (0.474)		7471B		50	YIV	07/11/22 14:34	2.09	40	DG20721
Nickel	**14.8** (0.99)		6010C		1	KJK	07/08/22 19:04	5.03	100	DG20751
Zinc	**210** (0.99)		6010C		1	KJK	07/08/22 19:04	5.03	100	DG20751

CERTIFICATE OF ANALYSIS

Client Name: Tighe & Bond
Client Project ID: Neponset Dredge
Client Sample ID: SED-102 Oven Dried
Date Sampled: 06/28/22 11:25
Percent Solids: 100

ESS Laboratory Work Order: 22F1147
ESS Laboratory Sample ID: 22F1147-13
Sample Matrix: Sediment
Units: mg/kg dry

Extraction Method: 3050B

Total Metals

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	I/V	F/V	Batch
Arsenic	**6.61** (0.95)		6010C		1	KJK	07/08/22 19:06	5.24	100	DG20751
Cadmium	**3.11** (0.19)		6010C		1	KJK	07/08/22 19:06	5.24	100	DG20751
Chromium	**115** (0.38)		6010C		1	KJK	07/08/22 19:06	5.24	100	DG20751
Copper	**109** (0.95)		6010C		1	KJK	07/08/22 19:06	5.24	100	DG20751
Lead	**188** (1.91)		6010C		1	KJK	07/08/22 19:06	5.24	100	DG20751
Mercury	**1.58** (0.488)		7471B		50	YIV	07/11/22 14:36	2.03	40	DG20721
Nickel	**14.1** (0.95)		6010C		1	KJK	07/08/22 19:06	5.24	100	DG20751
Zinc	**201** (0.95)		6010C		1	KJK	07/08/22 19:06	5.24	100	DG20751

CERTIFICATE OF ANALYSIS

Client Name: Tighe & Bond
Client Project ID: Neponset Dredge
Client Sample ID: SED-103 Oven Dried
Date Sampled: 06/28/22 11:37
Percent Solids: 100

ESS Laboratory Work Order: 22F1147
ESS Laboratory Sample ID: 22F1147-14
Sample Matrix: Sediment
Units: mg/kg dry

Extraction Method: 3050B

Total Metals

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	I/V	F/V	Batch
Arsenic	**8.08** (0.99)		6010C		1	KJK	07/08/22 19:07	5.04	100	DG20751
Cadmium	**2.64** (0.20)		6010C		1	KJK	07/08/22 19:07	5.04	100	DG20751
Chromium	**113** (0.40)		6010C		1	KJK	07/08/22 19:07	5.04	100	DG20751
Copper	**110** (0.99)		6010C		1	KJK	07/08/22 19:07	5.04	100	DG20751
Lead	**157** (1.98)		6010C		1	KJK	07/08/22 19:07	5.04	100	DG20751
Mercury	**1.40** (0.485)		7471B		50	YIV	07/11/22 14:38	2.04	40	DG20721
Nickel	**15.3** (0.99)		6010C		1	KJK	07/08/22 19:07	5.04	100	DG20751
Zinc	**187** (0.99)		6010C		1	KJK	07/08/22 19:07	5.04	100	DG20751

CERTIFICATE OF ANALYSIS

Client Name: Tighe & Bond
Client Project ID: Neponset Dredge
Client Sample ID: SED-105 Oven Dried
Date Sampled: 06/28/22 12:10
Percent Solids: 100

ESS Laboratory Work Order: 22F1147
ESS Laboratory Sample ID: 22F1147-15
Sample Matrix: Sediment
Units: mg/kg dry

Extraction Method: 3050B

Total Metals

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	I/V	F/V	Batch
Arsenic	**7.36** (0.97)		6010C		1	KJK	07/08/22 19:09	5.17	100	DG20751
Cadmium	**2.96** (0.19)		6010C		1	KJK	07/08/22 19:09	5.17	100	DG20751
Chromium	**105** (0.39)		6010C		1	KJK	07/08/22 19:09	5.17	100	DG20751
Copper	**102** (0.97)		6010C		1	KJK	07/08/22 19:09	5.17	100	DG20751
Lead	**146** (1.93)		6010C		1	KJK	07/08/22 19:09	5.17	100	DG20751
Mercury	**1.31** (0.229)		7471B		25	YIV	07/11/22 14:41	2.16	40	DG20721
Nickel	**15.8** (0.97)		6010C		1	KJK	07/08/22 19:09	5.17	100	DG20751
Zinc	**176** (0.97)		6010C		1	KJK	07/08/22 19:09	5.17	100	DG20751

CERTIFICATE OF ANALYSIS

Client Name: Tighe & Bond
Client Project ID: Neponset Dredge
Client Sample ID: SED-106 Oven Dried
Date Sampled: 06/28/22 09:51
Percent Solids: 98

ESS Laboratory Work Order: 22F1147
ESS Laboratory Sample ID: 22F1147-16
Sample Matrix: Sediment
Units: mg/kg dry

Extraction Method: 3050B

Total Metals

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	I/V	F/V	Batch
Arsenic	**10.3** (0.98)		6010C		1	KJK	07/08/22 19:19	5.2	100	DG20751
Cadmium	**1.71** (0.20)		6010C		1	KJK	07/08/22 19:19	5.2	100	DG20751
Chromium	**114** (0.39)		6010C		1	KJK	07/08/22 19:19	5.2	100	DG20751
Copper	**138** (0.98)		6010C		1	KJK	07/08/22 19:19	5.2	100	DG20751
Lead	**181** (1.96)		6010C		1	KJK	07/08/22 19:19	5.2	100	DG20751
Mercury	**1.30** (0.241)		7471B		25	YIV	07/11/22 14:43	2.1	40	DG20721
Nickel	**18.2** (0.98)		6010C		1	KJK	07/08/22 19:19	5.2	100	DG20751
Zinc	**238** (0.98)		6010C		1	KJK	07/08/22 19:19	5.2	100	DG20751

CERTIFICATE OF ANALYSIS

Client Name: Tighe & Bond
Client Project ID: Neponset Dredge
Client Sample ID: SED-107 Oven Dried
Date Sampled: 06/28/22 10:06
Percent Solids: 100

ESS Laboratory Work Order: 22F1147
ESS Laboratory Sample ID: 22F1147-17
Sample Matrix: Sediment
Units: mg/kg dry

Extraction Method: 3050B

Total Metals

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	I/V	F/V	Batch
Arsenic	**9.60** (0.96)		6010C		1	KJK	07/08/22 19:20	5.2	100	DG20751
Cadmium	**1.31** (0.19)		6010C		1	KJK	07/08/22 19:20	5.2	100	DG20751
Chromium	**98.7** (0.38)		6010C		1	KJK	07/08/22 19:20	5.2	100	DG20751
Copper	**109** (0.96)		6010C		1	KJK	07/08/22 19:20	5.2	100	DG20751
Lead	**134** (1.92)		6010C		1	KJK	07/08/22 19:20	5.2	100	DG20751
Mercury	**1.09** (0.238)		7471B		25	YIV	07/11/22 14:45	2.08	40	DG20721
Nickel	**16.2** (0.96)		6010C		1	KJK	07/08/22 19:20	5.2	100	DG20751
Zinc	**187** (0.96)		6010C		1	KJK	07/08/22 19:20	5.2	100	DG20751

CERTIFICATE OF ANALYSIS

Client Name: Tighe & Bond
Client Project ID: Neponset Dredge
Client Sample ID: SED-108 Oven Dried
Date Sampled: 06/28/22 13:25
Percent Solids: 100

ESS Laboratory Work Order: 22F1147
ESS Laboratory Sample ID: 22F1147-18
Sample Matrix: Sediment
Units: mg/kg dry

Extraction Method: 3050B

Total Metals

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	I/V	F/V	Batch
Arsenic	**7.98** (1.00)		6010C		1	KJK	07/08/22 19:22	5	100	DG20751
Cadmium	**1.72** (0.20)		6010C		1	KJK	07/08/22 19:22	5	100	DG20751
Chromium	**90.0** (0.40)		6010C		1	KJK	07/08/22 19:22	5	100	DG20751
Copper	**94.3** (1.00)		6010C		1	KJK	07/08/22 19:22	5	100	DG20751
Lead	**134** (2.00)		6010C		1	KJK	07/08/22 19:22	5	100	DG20751
Mercury	**1.29** (0.241)		7471B		25	YIV	07/11/22 14:47	2.05	40	DG20721
Nickel	**14.4** (1.00)		6010C		1	KJK	07/08/22 19:22	5	100	DG20751
Zinc	**163** (1.00)		6010C		1	KJK	07/08/22 19:22	5	100	DG20751

CERTIFICATE OF ANALYSIS

Client Name: Tighe & Bond
Client Project ID: Neponset Dredge
Client Sample ID: SED-109 Oven Dried
Date Sampled: 06/28/22 10:55
Percent Solids: 100

ESS Laboratory Work Order: 22F1147
ESS Laboratory Sample ID: 22F1147-19
Sample Matrix: Sediment
Units: mg/kg dry

Extraction Method: 3050B

Total Metals

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	I/V	F/V	Batch
Arsenic	**10.2** (0.98)		6010C		1	KJK	07/08/22 19:24	5.08	100	DG20751
Cadmium	**5.86** (0.20)		6010C		1	KJK	07/08/22 19:24	5.08	100	DG20751
Chromium	**173** (0.39)		6010C		1	KJK	07/08/22 19:24	5.08	100	DG20751
Copper	**180** (0.98)		6010C		1	KJK	07/08/22 19:24	5.08	100	DG20751
Lead	**263** (1.97)		6010C		1	KJK	07/08/22 19:24	5.08	100	DG20751
Mercury	**1.45** (0.469)		7471B		50	YIV	07/11/22 14:50	2.11	40	DG20721
Nickel	**19.2** (0.98)		6010C		1	KJK	07/08/22 19:24	5.08	100	DG20751
Zinc	**285** (0.98)		6010C		1	KJK	07/08/22 19:24	5.08	100	DG20751

CERTIFICATE OF ANALYSIS

Client Name: Tighe & Bond
Client Project ID: Neponset Dredge
Client Sample ID: SED-110 Oven Dried
Date Sampled: 06/28/22 13:38
Percent Solids: 100

ESS Laboratory Work Order: 22F1147
ESS Laboratory Sample ID: 22F1147-20
Sample Matrix: Sediment
Units: mg/kg dry

Extraction Method: 3050B

Total Metals

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	I/V	F/V	Batch
Arsenic	**5.79** (0.96)		6010C		1	KJK	07/08/22 19:26	5.21	100	DG20751
Cadmium	**2.13** (0.19)		6010C		1	KJK	07/08/22 19:26	5.21	100	DG20751
Chromium	**166** (0.38)		6010C		1	KJK	07/08/22 19:26	5.21	100	DG20751
Copper	**128** (0.96)		6010C		1	KJK	07/08/22 19:26	5.21	100	DG20751
Lead	**112** (1.92)		6010C		1	KJK	07/08/22 19:26	5.21	100	DG20751
Mercury	**1.54** (0.446)		7471B		50	YIV	07/11/22 14:56	2.22	40	DG20721
Nickel	**19.1** (0.96)		6010C		1	KJK	07/08/22 19:26	5.21	100	DG20751
Zinc	**170** (0.96)		6010C		1	KJK	07/08/22 19:26	5.21	100	DG20751

CERTIFICATE OF ANALYSIS

Client Name: Tighe & Bond
Client Project ID: Neponset Dredge
Client Sample ID: SED-111 Oven Dried
Date Sampled: 06/28/22 13:12
Percent Solids: 100

ESS Laboratory Work Order: 22F1147
ESS Laboratory Sample ID: 22F1147-21
Sample Matrix: Sediment
Units: mg/kg dry

Extraction Method: 3050B

Total Metals

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	I/V	F/V	Batch
Arsenic	**3.09** (0.97)		6010C		1	KJK	07/08/22 19:28	5.14	100	DG20751
Cadmium	**0.27** (0.19)		6010C		1	KJK	07/08/22 19:28	5.14	100	DG20751
Chromium	**45.6** (0.39)		6010C		1	KJK	07/08/22 19:28	5.14	100	DG20751
Copper	**35.7** (0.97)		6010C		1	KJK	07/08/22 19:28	5.14	100	DG20751
Lead	**34.9** (1.95)		6010C		1	KJK	07/08/22 19:28	5.14	100	DG20751
Mercury	**0.366** (0.098)		7471B		10	YIV	07/11/22 14:59	2.03	40	DG20721
Nickel	**11.1** (0.97)		6010C		1	KJK	07/08/22 19:28	5.14	100	DG20751
Zinc	**60.5** (0.97)		6010C		1	KJK	07/08/22 19:28	5.14	100	DG20751

CERTIFICATE OF ANALYSIS

Client Name: Tighe & Bond
Client Project ID: Neponset Dredge

ESS Laboratory Work Order: 22F1147

Quality Control Data

Total Metals

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Batch DG20721 - 3050B										
Blank										
Mercury	ND	0.033	mg/kg wet							
LCS										
Mercury	18.8	3.09	mg/kg wet	22.10		85	80-120			
LCS Dup										
Mercury	19.0	3.14	mg/kg wet	22.10		86	80-120	1	20	
Batch DG20751 - 3050B										
Blank										
Arsenic	ND	2.50	mg/kg wet							
Cadmium	ND	0.50	mg/kg wet							
Chromium	ND	1.00	mg/kg wet							
Copper	ND	2.50	mg/kg wet							
Lead	ND	5.00	mg/kg wet							
Nickel	ND	2.50	mg/kg wet							
Zinc	ND	2.50	mg/kg wet							
Blank										
Arsenic	ND	2.50	mg/kg wet							
Cadmium	ND	0.50	mg/kg wet							
Chromium	ND	1.00	mg/kg wet							
Copper	ND	2.50	mg/kg wet							
Lead	ND	5.00	mg/kg wet							
Nickel	ND	2.50	mg/kg wet							
Zinc	ND	2.50	mg/kg wet							
LCS										
Arsenic	57.6	8.20	mg/kg wet	65.20		88	80-120			
Cadmium	97.3	1.64	mg/kg wet	118.0		82	80-120			
Chromium	139	3.28	mg/kg wet	159.0		87	80-120			
Copper	135	8.20	mg/kg wet	151.0		90	80-120			
Lead	199	16.4	mg/kg wet	230.0		86	80-120			
Nickel	167	8.20	mg/kg wet	183.0		91	80-120			
Zinc	320	8.20	mg/kg wet	375.0		85	80-120			
LCS										
Arsenic	ND	8.20	mg/kg wet	91.60		0	80-120			
Cadmium	ND	1.64	mg/kg wet	107.0		0	80-120			
Chromium	ND	3.28	mg/kg wet	129.0		0	80-120			
Copper	ND	8.20	mg/kg wet	62.30		0	80-120			
Lead	ND	16.4	mg/kg wet	122.0		0	80-120			
Nickel	ND	8.20	mg/kg wet	143.0		0	80-120			
Zinc	ND	8.20	mg/kg wet	307.0		0	80-120			
LCS										
Arsenic	ND	8.20	mg/kg wet	65.20		0	80-120			
Cadmium	ND	1.64	mg/kg wet	118.0		0	80-120			
Chromium	ND	3.28	mg/kg wet	159.0		0	80-120			

CERTIFICATE OF ANALYSIS

Client Name: Tighe & Bond
Client Project ID: Neponset Dredge

ESS Laboratory Work Order: 22F1147

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Total Metals										
Batch DG20751 - 3050B										
Copper	ND	8.20	mg/kg wet	151.0		0	80-120			
Lead	ND	16.4	mg/kg wet	230.0		0	80-120			
Nickel	ND	8.20	mg/kg wet	183.0		0	80-120			
Zinc	ND	8.20	mg/kg wet	375.0		0	80-120			
LCS Dup										
Arsenic	59.9	7.46	mg/kg wet	65.20		92	80-120	4	20	
Cadmium	97.7	1.49	mg/kg wet	118.0		83	80-120	0.5	20	
Chromium	139	2.99	mg/kg wet	159.0		87	80-120	0.2	20	
Copper	140	7.46	mg/kg wet	151.0		93	80-120	4	20	
Lead	202	14.9	mg/kg wet	230.0		88	80-120	1	20	
Nickel	167	7.46	mg/kg wet	183.0		91	80-120	0.2	20	
Zinc	320	7.46	mg/kg wet	375.0		85	80-120	0.06	20	
LCS Dup										
Arsenic	ND	7.25	mg/kg wet	91.60		0	80-120		20	
Cadmium	ND	1.45	mg/kg wet	107.0		0	80-120		20	
Chromium	ND	2.90	mg/kg wet	129.0		0	80-120		20	
Copper	ND	7.25	mg/kg wet	62.30		0	80-120		20	
Lead	ND	14.5	mg/kg wet	122.0		0	80-120		20	
Nickel	ND	7.25	mg/kg wet	143.0		0	80-120		20	
Zinc	ND	7.25	mg/kg wet	307.0		0	80-120		20	
LCS Dup										
Arsenic	ND	7.46	mg/kg wet	65.20		0	80-120		20	
Cadmium	ND	1.49	mg/kg wet	118.0		0	80-120		20	
Chromium	ND	2.99	mg/kg wet	159.0		0	80-120		20	
Copper	ND	7.46	mg/kg wet	151.0		0	80-120		20	
Lead	ND	14.9	mg/kg wet	230.0		0	80-120		20	
Nickel	ND	7.46	mg/kg wet	183.0		0	80-120		20	
Zinc	ND	7.46	mg/kg wet	375.0		0	80-120		20	
1311 TCLP Metals										
Batch DG21235 - 3005A_TCLP										
Blank										
Chromium	ND	0.020	mg/L							
Lead	ND	0.050	mg/L							
LCS										
Chromium	0.507	0.020	mg/L	0.5000		101	80-120			
Lead	0.527	0.050	mg/L	0.5000		105	80-120			
LCS Dup										
Chromium	0.541	0.020	mg/L	0.5000		108	80-120	6	20	
Lead	0.535	0.050	mg/L	0.5000		107	80-120	2	20	
5035/8260B Volatile Organic Compounds / Low Level										
Batch DG20532 - 5035										

CERTIFICATE OF ANALYSIS

Client Name: Tighe & Bond
Client Project ID: Neponset Dredge

ESS Laboratory Work Order: 22F1147

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier

5035/8260B Volatile Organic Compounds / Low Level

Batch DG20532 - 5035

Blank

1,1,1,2-Tetrachloroethane	ND	0.0050	mg/kg wet
1,1,1-Trichloroethane	ND	0.0050	mg/kg wet
1,1,2,2-Tetrachloroethane	ND	0.0015	mg/kg wet
1,1,2-Trichloroethane	ND	0.0050	mg/kg wet
1,1-Dichloroethane	ND	0.0050	mg/kg wet
1,1-Dichloroethene	ND	0.0050	mg/kg wet
1,1-Dichloropropene	ND	0.0050	mg/kg wet
1,2,3-Trichlorobenzene	ND	0.0050	mg/kg wet
1,2,3-Trichloropropane	ND	0.0050	mg/kg wet
1,2,4-Trichlorobenzene	ND	0.0050	mg/kg wet
1,2,4-Trimethylbenzene	ND	0.0050	mg/kg wet
1,2-Dibromo-3-Chloropropane	ND	0.0050	mg/kg wet
1,2-Dibromoethane	ND	0.0050	mg/kg wet
1,2-Dichlorobenzene	ND	0.0050	mg/kg wet
1,2-Dichloroethane	ND	0.0050	mg/kg wet
1,2-Dichloropropane	ND	0.0050	mg/kg wet
1,3,5-Trimethylbenzene	ND	0.0050	mg/kg wet
1,3-Dichlorobenzene	ND	0.0050	mg/kg wet
1,3-Dichloropropane	ND	0.0050	mg/kg wet
1,4-Dichlorobenzene	ND	0.0050	mg/kg wet
1,4-Dioxane	ND	0.0100	mg/kg wet
2,2-Dichloropropane	ND	0.0050	mg/kg wet
2-Butanone	ND	0.0500	mg/kg wet
2-Chlorotoluene	ND	0.0050	mg/kg wet
2-Hexanone	ND	0.0500	mg/kg wet
4-Chlorotoluene	ND	0.0050	mg/kg wet
4-Isopropyltoluene	ND	0.0050	mg/kg wet
4-Methyl-2-Pentanone	ND	0.0500	mg/kg wet
Acetone	ND	0.0500	mg/kg wet
Benzene	ND	0.0050	mg/kg wet
Bromobenzene	ND	0.0050	mg/kg wet
Bromochloromethane	ND	0.0050	mg/kg wet
Bromodichloromethane	ND	0.0050	mg/kg wet
Bromoform	ND	0.0050	mg/kg wet
Bromomethane	ND	0.0100	mg/kg wet
Carbon Disulfide	ND	0.0050	mg/kg wet
Carbon Tetrachloride	ND	0.0050	mg/kg wet
Chlorobenzene	ND	0.0050	mg/kg wet
Chloroethane	ND	0.0100	mg/kg wet
Chloroform	ND	0.0050	mg/kg wet
Chloromethane	ND	0.0100	mg/kg wet
cis-1,2-Dichloroethene	ND	0.0050	mg/kg wet
cis-1,3-Dichloropropene	ND	0.0017	mg/kg wet
Dibromochloromethane	ND	0.0016	mg/kg wet

CERTIFICATE OF ANALYSIS

Client Name: Tighe & Bond
Client Project ID: Neponset Dredge

ESS Laboratory Work Order: 22F1147

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
5035/8260B Volatile Organic Compounds / Low Level										
Batch DG20532 - 5035										
Dibromomethane	ND	0.0050	mg/kg wet							
Dichlorodifluoromethane	ND	0.0100	mg/kg wet							
Diethyl Ether	ND	0.0050	mg/kg wet							
Di-isopropyl ether	ND	0.0050	mg/kg wet							
Ethyl tertiary-butyl ether	ND	0.0050	mg/kg wet							
Ethylbenzene	ND	0.0050	mg/kg wet							
Hexachlorobutadiene	ND	0.0050	mg/kg wet							
Isopropylbenzene	ND	0.0050	mg/kg wet							
Methyl tert-Butyl Ether	ND	0.0050	mg/kg wet							
Methylene Chloride	ND	0.0100	mg/kg wet							
Naphthalene	ND	0.0050	mg/kg wet							
n-Butylbenzene	ND	0.0050	mg/kg wet							
n-Propylbenzene	ND	0.0050	mg/kg wet							
sec-Butylbenzene	ND	0.0050	mg/kg wet							
Styrene	ND	0.0050	mg/kg wet							
tert-Butylbenzene	ND	0.0050	mg/kg wet							
Tertiary-amyl methyl ether	ND	0.0050	mg/kg wet							
Tetrachloroethene	ND	0.0050	mg/kg wet							
Tetrahydrofuran	ND	0.0050	mg/kg wet							
Toluene	ND	0.0050	mg/kg wet							
trans-1,2-Dichloroethene	ND	0.0050	mg/kg wet							
trans-1,3-Dichloropropene	ND	0.0016	mg/kg wet							
Trichloroethene	ND	0.0050	mg/kg wet							
Trichlorofluoromethane	ND	0.0050	mg/kg wet							
Vinyl Chloride	ND	0.0100	mg/kg wet							
Xylene O	ND	0.0050	mg/kg wet							
Xylene P,M	ND	0.0100	mg/kg wet							
Surrogate: 1,2-Dichloroethane-d4	*0.0536*		mg/kg wet	*0.05000*		*107*	*70-130*			
Surrogate: 4-Bromofluorobenzene	*0.0472*		mg/kg wet	*0.05000*		*94*	*70-130*			
Surrogate: Dibromofluoromethane	*0.0496*		mg/kg wet	*0.05000*		*99*	*70-130*			
Surrogate: Toluene-d8	*0.0503*		mg/kg wet	*0.05000*		*101*	*70-130*			
LCS										
1,1,1,2-Tetrachloroethane	0.0484	0.0050	mg/kg wet	0.05000		97	70-130			
1,1,1-Trichloroethane	0.0483	0.0050	mg/kg wet	0.05000		97	70-130			
1,1,2,2-Tetrachloroethane	0.0402	0.0015	mg/kg wet	0.05000		80	70-130			
1,1,2-Trichloroethane	0.0448	0.0050	mg/kg wet	0.05000		90	70-130			
1,1-Dichloroethane	0.0478	0.0050	mg/kg wet	0.05000		96	70-130			
1,1-Dichloroethene	0.0495	0.0050	mg/kg wet	0.05000		99	70-130			
1,1-Dichloropropene	0.0462	0.0050	mg/kg wet	0.05000		92	70-130			
1,2,3-Trichlorobenzene	0.0410	0.0050	mg/kg wet	0.05000		82	70-130			
1,2,3-Trichloropropane	0.0404	0.0050	mg/kg wet	0.05000		81	70-130			
1,2,4-Trichlorobenzene	0.0416	0.0050	mg/kg wet	0.05000		83	70-130			
1,2,4-Trimethylbenzene	0.0414	0.0050	mg/kg wet	0.05000		83	70-130			
1,2-Dibromo-3-Chloropropane	0.0427	0.0050	mg/kg wet	0.05000		85	70-130			
1,2-Dibromoethane	0.0447	0.0050	mg/kg wet	0.05000		89	70-130			

CERTIFICATE OF ANALYSIS

Client Name: Tighe & Bond
Client Project ID: Neponset Dredge

ESS Laboratory Work Order: 22F1147

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
5035/8260B Volatile Organic Compounds / Low Level										
Batch DG20532 - 5035										
1,2-Dichlorobenzene	0.0414	0.0050	mg/kg wet	0.05000		83	70-130			
1,2-Dichloroethane	0.0465	0.0050	mg/kg wet	0.05000		93	70-130			
1,2-Dichloropropane	0.0468	0.0050	mg/kg wet	0.05000		94	70-130			
1,3,5-Trimethylbenzene	0.0423	0.0050	mg/kg wet	0.05000		85	70-130			
1,3-Dichlorobenzene	0.0418	0.0050	mg/kg wet	0.05000		84	70-130			
1,3-Dichloropropane	0.0438	0.0050	mg/kg wet	0.05000		88	70-130			
1,4-Dichlorobenzene	0.0421	0.0050	mg/kg wet	0.05000		84	70-130			
1,4-Dioxane	0.773	0.0100	mg/kg wet	1.000		77	70-130			
2,2-Dichloropropane	0.0518	0.0050	mg/kg wet	0.05000		104	70-130			
2-Butanone	0.238	0.0500	mg/kg wet	0.2500		95	70-130			
2-Chlorotoluene	0.0427	0.0050	mg/kg wet	0.05000		85	70-130			
2-Hexanone	0.217	0.0500	mg/kg wet	0.2500		87	70-130			
4-Chlorotoluene	0.0426	0.0050	mg/kg wet	0.05000		85	70-130			
4-Isopropyltoluene	0.0402	0.0050	mg/kg wet	0.05000		80	70-130			
4-Methyl-2-Pentanone	0.215	0.0500	mg/kg wet	0.2500		86	70-130			
Acetone	0.273	0.0500	mg/kg wet	0.2500		109	70-130			
Benzene	0.0473	0.0050	mg/kg wet	0.05000		95	70-130			
Bromobenzene	0.0423	0.0050	mg/kg wet	0.05000		85	70-130			
Bromochloromethane	0.0496	0.0050	mg/kg wet	0.05000		99	70-130			
Bromodichloromethane	0.0512	0.0050	mg/kg wet	0.05000		102	70-130			
Bromoform	0.0451	0.0050	mg/kg wet	0.05000		90	70-130			
Bromomethane	0.0559	0.0100	mg/kg wet	0.05000		112	70-130			
Carbon Disulfide	0.0490	0.0050	mg/kg wet	0.05000		98	70-130			
Carbon Tetrachloride	0.0516	0.0050	mg/kg wet	0.05000		103	70-130			
Chlorobenzene	0.0433	0.0050	mg/kg wet	0.05000		87	70-130			
Chloroethane	0.0498	0.0100	mg/kg wet	0.05000		100	70-130			
Chloroform	0.0483	0.0050	mg/kg wet	0.05000		97	70-130			
Chloromethane	0.0469	0.0100	mg/kg wet	0.05000		94	70-130			
cis-1,2-Dichloroethene	0.0486	0.0050	mg/kg wet	0.05000		97	70-130			
cis-1,3-Dichloropropene	0.0522	0.0017	mg/kg wet	0.05000		104	70-130			
Dibromochloromethane	0.0496	0.0016	mg/kg wet	0.05000		99	70-130			
Dibromomethane	0.0473	0.0050	mg/kg wet	0.05000		95	70-130			
Dichlorodifluoromethane	0.0418	0.0100	mg/kg wet	0.05000		84	70-130			
Diethyl Ether	0.0485	0.0050	mg/kg wet	0.05000		97	70-130			
Di-isopropyl ether	0.0487	0.0050	mg/kg wet	0.05000		97	70-130			
Ethyl tertiary-butyl ether	0.0491	0.0050	mg/kg wet	0.05000		98	70-130			
Ethylbenzene	0.0434	0.0050	mg/kg wet	0.05000		87	70-130			
Hexachlorobutadiene	0.0382	0.0050	mg/kg wet	0.05000		76	70-130			
Isopropylbenzene	0.0430	0.0050	mg/kg wet	0.05000		86	70-130			
Methyl tert-Butyl Ether	0.0472	0.0050	mg/kg wet	0.05000		94	70-130			
Methylene Chloride	0.0514	0.0100	mg/kg wet	0.05000		103	70-130			
Naphthalene	0.0408	0.0050	mg/kg wet	0.05000		82	70-130			
n-Butylbenzene	0.0414	0.0050	mg/kg wet	0.05000		83	70-130			
n-Propylbenzene	0.0425	0.0050	mg/kg wet	0.05000		85	70-130			
sec-Butylbenzene	0.0401	0.0050	mg/kg wet	0.05000		80	70-130			

CERTIFICATE OF ANALYSIS

Client Name: Tighe & Bond
Client Project ID: Neponset Dredge

ESS Laboratory Work Order: 22F1147

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
5035/8260B Volatile Organic Compounds / Low Level										
Batch DG20532 - 5035										
Styrene	0.0441	0.0050	mg/kg wet	0.05000		88	70-130			
tert-Butylbenzene	0.0415	0.0050	mg/kg wet	0.05000		83	70-130			
Tertiary-amyl methyl ether	0.0479	0.0050	mg/kg wet	0.05000		96	70-130			
Tetrachloroethene	0.0400	0.0050	mg/kg wet	0.05000		80	70-130			
Tetrahydrofuran	0.0400	0.0050	mg/kg wet	0.05000		80	70-130			
Toluene	0.0464	0.0050	mg/kg wet	0.05000		93	70-130			
trans-1,2-Dichloroethene	0.0474	0.0050	mg/kg wet	0.05000		95	70-130			
trans-1,3-Dichloropropene	0.0476	0.0016	mg/kg wet	0.05000		95	70-130			
Trichloroethene	0.0448	0.0050	mg/kg wet	0.05000		90	70-130			
Trichlorofluoromethane	0.0463	0.0050	mg/kg wet	0.05000		93	70-130			
Vinyl Chloride	0.0481	0.0100	mg/kg wet	0.05000		96	70-130			
Xylene O	0.0446	0.0050	mg/kg wet	0.05000		89	70-130			
Xylene P,M	0.0899	0.0100	mg/kg wet	0.1000		90	70-130			
Surrogate: 1,2-Dichloroethane-d4	*0.0512*		mg/kg wet	*0.05000*		*102*	*70-130*			
Surrogate: 4-Bromofluorobenzene	*0.0502*		mg/kg wet	*0.05000*		*100*	*70-130*			
Surrogate: Dibromofluoromethane	*0.0533*		mg/kg wet	*0.05000*		*107*	*70-130*			
Surrogate: Toluene-d8	*0.0492*		mg/kg wet	*0.05000*		*98*	*70-130*			
LCS Dup										
1,1,1,2-Tetrachloroethane	0.0507	0.0050	mg/kg wet	0.05000		101	70-130	5	20	
1,1,1-Trichloroethane	0.0491	0.0050	mg/kg wet	0.05000		98	70-130	2	20	
1,1,2,2-Tetrachloroethane	0.0413	0.0015	mg/kg wet	0.05000		83	70-130	3	20	
1,1,2-Trichloroethane	0.0454	0.0050	mg/kg wet	0.05000		91	70-130	1	20	
1,1-Dichloroethane	0.0483	0.0050	mg/kg wet	0.05000		97	70-130	1	20	
1,1-Dichloroethene	0.0510	0.0050	mg/kg wet	0.05000		102	70-130	3	20	
1,1-Dichloropropene	0.0464	0.0050	mg/kg wet	0.05000		93	70-130	0.5	20	
1,2,3-Trichlorobenzene	0.0427	0.0050	mg/kg wet	0.05000		85	70-130	4	20	
1,2,3-Trichloropropane	0.0417	0.0050	mg/kg wet	0.05000		83	70-130	3	20	
1,2,4-Trichlorobenzene	0.0430	0.0050	mg/kg wet	0.05000		86	70-130	3	20	
1,2,4-Trimethylbenzene	0.0424	0.0050	mg/kg wet	0.05000		85	70-130	2	20	
1,2-Dibromo-3-Chloropropane	0.0445	0.0050	mg/kg wet	0.05000		89	70-130	4	20	
1,2-Dibromoethane	0.0469	0.0050	mg/kg wet	0.05000		94	70-130	5	20	
1,2-Dichlorobenzene	0.0425	0.0050	mg/kg wet	0.05000		85	70-130	2	20	
1,2-Dichloroethane	0.0472	0.0050	mg/kg wet	0.05000		94	70-130	1	20	
1,2-Dichloropropane	0.0478	0.0050	mg/kg wet	0.05000		96	70-130	2	20	
1,3,5-Trimethylbenzene	0.0432	0.0050	mg/kg wet	0.05000		86	70-130	2	20	
1,3-Dichlorobenzene	0.0426	0.0050	mg/kg wet	0.05000		85	70-130	2	20	
1,3-Dichloropropane	0.0461	0.0050	mg/kg wet	0.05000		92	70-130	5	20	
1,4-Dichlorobenzene	0.0427	0.0050	mg/kg wet	0.05000		85	70-130	2	20	
1,4-Dioxane	0.793	0.0100	mg/kg wet	1.000		79	70-130	3	20	
2,2-Dichloropropane	0.0521	0.0050	mg/kg wet	0.05000		104	70-130	0.5	20	
2-Butanone	0.241	0.0500	mg/kg wet	0.2500		96	70-130	1	20	
2-Chlorotoluene	0.0435	0.0050	mg/kg wet	0.05000		87	70-130	2	20	
2-Hexanone	0.222	0.0500	mg/kg wet	0.2500		89	70-130	2	20	
4-Chlorotoluene	0.0432	0.0050	mg/kg wet	0.05000		86	70-130	1	20	
4-Isopropyltoluene	0.0411	0.0050	mg/kg wet	0.05000		82	70-130	2	20	

CERTIFICATE OF ANALYSIS

Client Name: Tighe & Bond
Client Project ID: Neponset Dredge

ESS Laboratory Work Order: 22F1147

Quality Control Data

5035/8260B Volatile Organic Compounds / Low Level

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Batch DG20532 - 5035										
4-Methyl-2-Pentanone	0.215	0.0500	mg/kg wet	0.2500		86	70-130	0.2	20	
Acetone	0.273	0.0500	mg/kg wet	0.2500		109	70-130	0.1	20	
Benzene	0.0480	0.0050	mg/kg wet	0.05000		96	70-130	1	20	
Bromobenzene	0.0428	0.0050	mg/kg wet	0.05000		86	70-130	1	20	
Bromochloromethane	0.0501	0.0050	mg/kg wet	0.05000		100	70-130	0.9	20	
Bromodichloromethane	0.0520	0.0050	mg/kg wet	0.05000		104	70-130	2	20	
Bromoform	0.0471	0.0050	mg/kg wet	0.05000		94	70-130	4	20	
Bromomethane	0.0543	0.0100	mg/kg wet	0.05000		109	70-130	3	20	
Carbon Disulfide	0.0498	0.0050	mg/kg wet	0.05000		100	70-130	2	20	
Carbon Tetrachloride	0.0524	0.0050	mg/kg wet	0.05000		105	70-130	2	20	
Chlorobenzene	0.0447	0.0050	mg/kg wet	0.05000		89	70-130	3	20	
Chloroethane	0.0499	0.0100	mg/kg wet	0.05000		100	70-130	0.2	20	
Chloroform	0.0490	0.0050	mg/kg wet	0.05000		98	70-130	1	20	
Chloromethane	0.0454	0.0100	mg/kg wet	0.05000		91	70-130	3	20	
cis-1,2-Dichloroethene	0.0492	0.0050	mg/kg wet	0.05000		98	70-130	1	20	
cis-1,3-Dichloropropene	0.0533	0.0017	mg/kg wet	0.05000		107	70-130	2	20	
Dibromochloromethane	0.0518	0.0016	mg/kg wet	0.05000		104	70-130	4	20	
Dibromomethane	0.0482	0.0050	mg/kg wet	0.05000		96	70-130	2	20	
Dichlorodifluoromethane	0.0419	0.0100	mg/kg wet	0.05000		84	70-130	0.2	20	
Diethyl Ether	0.0497	0.0050	mg/kg wet	0.05000		99	70-130	2	20	
Di-isopropyl ether	0.0495	0.0050	mg/kg wet	0.05000		99	70-130	2	20	
Ethyl tertiary-butyl ether	0.0502	0.0050	mg/kg wet	0.05000		100	70-130	2	20	
Ethylbenzene	0.0448	0.0050	mg/kg wet	0.05000		90	70-130	3	20	
Hexachlorobutadiene	0.0393	0.0050	mg/kg wet	0.05000		79	70-130	3	20	
Isopropylbenzene	0.0438	0.0050	mg/kg wet	0.05000		88	70-130	2	20	
Methyl tert-Butyl Ether	0.0484	0.0050	mg/kg wet	0.05000		97	70-130	3	20	
Methylene Chloride	0.0523	0.0100	mg/kg wet	0.05000		105	70-130	2	20	
Naphthalene	0.0429	0.0050	mg/kg wet	0.05000		86	70-130	5	20	
n-Butylbenzene	0.0419	0.0050	mg/kg wet	0.05000		84	70-130	1	20	
n-Propylbenzene	0.0432	0.0050	mg/kg wet	0.05000		86	70-130	2	20	
sec-Butylbenzene	0.0408	0.0050	mg/kg wet	0.05000		82	70-130	2	20	
Styrene	0.0455	0.0050	mg/kg wet	0.05000		91	70-130	3	20	
tert-Butylbenzene	0.0424	0.0050	mg/kg wet	0.05000		85	70-130	2	20	
Tertiary-amyl methyl ether	0.0490	0.0050	mg/kg wet	0.05000		98	70-130	2	20	
Tetrachloroethene	0.0411	0.0050	mg/kg wet	0.05000		82	70-130	3	20	
Tetrahydrofuran	0.0418	0.0050	mg/kg wet	0.05000		84	70-130	5	20	
Toluene	0.0467	0.0050	mg/kg wet	0.05000		93	70-130	0.6	20	
trans-1,2-Dichloroethene	0.0486	0.0050	mg/kg wet	0.05000		97	70-130	3	20	
trans-1,3-Dichloropropene	0.0485	0.0016	mg/kg wet	0.05000		97	70-130	2	20	
Trichloroethene	0.0449	0.0050	mg/kg wet	0.05000		90	70-130	0.3	20	
Trichlorofluoromethane	0.0469	0.0050	mg/kg wet	0.05000		94	70-130	1	20	
Vinyl Chloride	0.0476	0.0100	mg/kg wet	0.05000		95	70-130	0.9	20	
Xylene O	0.0460	0.0050	mg/kg wet	0.05000		92	70-130	3	20	
Xylene P,M	0.0926	0.0100	mg/kg wet	0.1000		93	70-130	3	20	
Surrogate: 1,2-Dichloroethane-d4	*0.0501*		mg/kg wet	*0.05000*		*100*	*70-130*			

CERTIFICATE OF ANALYSIS

Client Name: Tighe & Bond
Client Project ID: Neponset Dredge

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Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
5035/8260B Volatile Organic Compounds / Low Level										
Batch DG20532 - 5035										
Surrogate: 4-Bromofluorobenzene	*0.0506*		mg/kg wet	*0.05000*		*101*	*70-130*			
Surrogate: Dibromofluoromethane	*0.0530*		mg/kg wet	*0.05000*		*106*	*70-130*			
Surrogate: Toluene-d8	*0.0498*		mg/kg wet	*0.05000*		*100*	*70-130*			
Batch DG20621 - 5035										
Blank										
1,1,1,2-Tetrachloroethane	ND	0.0050	mg/kg wet							
1,1,1-Trichloroethane	ND	0.0050	mg/kg wet							
1,1,2,2-Tetrachloroethane	ND	0.0015	mg/kg wet							
1,1,2-Trichloroethane	ND	0.0050	mg/kg wet							
1,1-Dichloroethane	ND	0.0050	mg/kg wet							
1,1-Dichloroethene	ND	0.0050	mg/kg wet							
1,1-Dichloropropene	ND	0.0050	mg/kg wet							
1,2,3-Trichlorobenzene	ND	0.0050	mg/kg wet							
1,2,3-Trichloropropane	ND	0.0050	mg/kg wet							
1,2,4-Trichlorobenzene	ND	0.0050	mg/kg wet							
1,2,4-Trimethylbenzene	ND	0.0050	mg/kg wet							
1,2-Dibromo-3-Chloropropane	ND	0.0050	mg/kg wet							
1,2-Dibromoethane	ND	0.0050	mg/kg wet							
1,2-Dichlorobenzene	ND	0.0050	mg/kg wet							
1,2-Dichloroethane	ND	0.0050	mg/kg wet							
1,2-Dichloropropane	ND	0.0050	mg/kg wet							
1,3,5-Trimethylbenzene	ND	0.0050	mg/kg wet							
1,3-Dichlorobenzene	ND	0.0050	mg/kg wet							
1,3-Dichloropropane	ND	0.0050	mg/kg wet							
1,4-Dichlorobenzene	ND	0.0050	mg/kg wet							
1,4-Dioxane	ND	0.0100	mg/kg wet							
2,2-Dichloropropane	ND	0.0050	mg/kg wet							
2-Butanone	ND	0.0500	mg/kg wet							
2-Chlorotoluene	ND	0.0050	mg/kg wet							
2-Hexanone	ND	0.0500	mg/kg wet							
4-Chlorotoluene	ND	0.0050	mg/kg wet							
4-Isopropyltoluene	ND	0.0050	mg/kg wet							
4-Methyl-2-Pentanone	ND	0.0500	mg/kg wet							
Acetone	ND	0.0500	mg/kg wet							
Benzene	ND	0.0050	mg/kg wet							
Bromobenzene	ND	0.0050	mg/kg wet							
Bromochloromethane	ND	0.0050	mg/kg wet							
Bromodichloromethane	ND	0.0050	mg/kg wet							
Bromoform	ND	0.0050	mg/kg wet							
Bromomethane	ND	0.0100	mg/kg wet							
Carbon Disulfide	ND	0.0050	mg/kg wet							
Carbon Tetrachloride	ND	0.0050	mg/kg wet							
Chlorobenzene	ND	0.0050	mg/kg wet							
Chloroethane	ND	0.0100	mg/kg wet							

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Client Name: Tighe & Bond
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Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
5035/8260B Volatile Organic Compounds / Low Level										
Batch DG20621 - 5035										
Chloroform	ND	0.0050	mg/kg wet							
Chloromethane	ND	0.0100	mg/kg wet							
cis-1,2-Dichloroethene	ND	0.0050	mg/kg wet							
cis-1,3-Dichloropropene	ND	0.0017	mg/kg wet							
Dibromochloromethane	ND	0.0016	mg/kg wet							
Dibromomethane	ND	0.0050	mg/kg wet							
Dichlorodifluoromethane	ND	0.0100	mg/kg wet							
Diethyl Ether	ND	0.0050	mg/kg wet							
Di-isopropyl ether	ND	0.0050	mg/kg wet							
Ethyl tertiary-butyl ether	ND	0.0050	mg/kg wet							
Ethylbenzene	ND	0.0050	mg/kg wet							
Hexachlorobutadiene	ND	0.0050	mg/kg wet							
Isopropylbenzene	ND	0.0050	mg/kg wet							
Methyl tert-Butyl Ether	ND	0.0050	mg/kg wet							
Methylene Chloride	ND	0.0100	mg/kg wet							
Naphthalene	ND	0.0050	mg/kg wet							
n-Butylbenzene	ND	0.0050	mg/kg wet							
n-Propylbenzene	ND	0.0050	mg/kg wet							
sec-Butylbenzene	ND	0.0050	mg/kg wet							
Styrene	ND	0.0050	mg/kg wet							
tert-Butylbenzene	ND	0.0050	mg/kg wet							
Tertiary-amyl methyl ether	ND	0.0050	mg/kg wet							
Tetrachloroethene	ND	0.0050	mg/kg wet							
Tetrahydrofuran	ND	0.0050	mg/kg wet							
Toluene	ND	0.0050	mg/kg wet							
trans-1,2-Dichloroethene	ND	0.0050	mg/kg wet							
trans-1,3-Dichloropropene	ND	0.0016	mg/kg wet							
Trichloroethene	ND	0.0050	mg/kg wet							
Trichlorofluoromethane	ND	0.0050	mg/kg wet							
Vinyl Chloride	ND	0.0100	mg/kg wet							
Xylene O	ND	0.0050	mg/kg wet							
Xylene P,M	ND	0.0100	mg/kg wet							
Surrogate: 1,2-Dichloroethane-d4	*0.0540*		mg/kg wet	*0.05000*		*108*	*70-130*			
Surrogate: 4-Bromofluorobenzene	*0.0468*		mg/kg wet	*0.05000*		*94*	*70-130*			
Surrogate: Dibromofluoromethane	*0.0504*		mg/kg wet	*0.05000*		*101*	*70-130*			
Surrogate: Toluene-d8	*0.0493*		mg/kg wet	*0.05000*		*99*	*70-130*			
LCS										
1,1,1,2-Tetrachloroethane	0.0510	0.0050	mg/kg wet	0.05000		102	70-130			
1,1,1-Trichloroethane	0.0505	0.0050	mg/kg wet	0.05000		101	70-130			
1,1,2,2-Tetrachloroethane	0.0415	0.0015	mg/kg wet	0.05000		83	70-130			
1,1,2-Trichloroethane	0.0439	0.0050	mg/kg wet	0.05000		88	70-130			
1,1-Dichloroethane	0.0476	0.0050	mg/kg wet	0.05000		95	70-130			
1,1-Dichloroethene	0.0554	0.0050	mg/kg wet	0.05000		111	70-130			
1,1-Dichloropropene	0.0485	0.0050	mg/kg wet	0.05000		97	70-130			
1,2,3-Trichlorobenzene	0.0520	0.0050	mg/kg wet	0.05000		104	70-130			

CERTIFICATE OF ANALYSIS

Client Name: Tighe & Bond
Client Project ID: Neponset Dredge

ESS Laboratory Work Order: 22F1147

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
5035/8260B Volatile Organic Compounds / Low Level										
Batch DG20621 - 5035										
1,2,3-Trichloropropane	0.0419	0.0050	mg/kg wet	0.05000		84	70-130			
1,2,4-Trichlorobenzene	0.0486	0.0050	mg/kg wet	0.05000		97	70-130			
1,2,4-Trimethylbenzene	0.0507	0.0050	mg/kg wet	0.05000		101	70-130			
1,2-Dibromo-3-Chloropropane	0.0430	0.0050	mg/kg wet	0.05000		86	70-130			
1,2-Dibromoethane	0.0483	0.0050	mg/kg wet	0.05000		97	70-130			
1,2-Dichlorobenzene	0.0486	0.0050	mg/kg wet	0.05000		97	70-130			
1,2-Dichloroethane	0.0462	0.0050	mg/kg wet	0.05000		92	70-130			
1,2-Dichloropropane	0.0448	0.0050	mg/kg wet	0.05000		90	70-130			
1,3,5-Trimethylbenzene	0.0516	0.0050	mg/kg wet	0.05000		103	70-130			
1,3-Dichlorobenzene	0.0489	0.0050	mg/kg wet	0.05000		98	70-130			
1,3-Dichloropropane	0.0477	0.0050	mg/kg wet	0.05000		95	70-130			
1,4-Dichlorobenzene	0.0491	0.0050	mg/kg wet	0.05000		98	70-130			
1,4-Dioxane	0.764	0.0100	mg/kg wet	1.000		76	70-130			
2,2-Dichloropropane	0.0519	0.0050	mg/kg wet	0.05000		104	70-130			
2-Butanone	0.243	0.0500	mg/kg wet	0.2500		97	70-130			
2-Chlorotoluene	0.0495	0.0050	mg/kg wet	0.05000		99	70-130			
2-Hexanone	0.251	0.0500	mg/kg wet	0.2500		101	70-130			
4-Chlorotoluene	0.0499	0.0050	mg/kg wet	0.05000		100	70-130			
4-Isopropyltoluene	0.0514	0.0050	mg/kg wet	0.05000		103	70-130			
4-Methyl-2-Pentanone	0.201	0.0500	mg/kg wet	0.2500		80	70-130			
Acetone	0.275	0.0500	mg/kg wet	0.2500		110	70-130			
Benzene	0.0474	0.0050	mg/kg wet	0.05000		95	70-130			
Bromobenzene	0.0482	0.0050	mg/kg wet	0.05000		96	70-130			
Bromochloromethane	0.0479	0.0050	mg/kg wet	0.05000		96	70-130			
Bromodichloromethane	0.0501	0.0050	mg/kg wet	0.05000		100	70-130			
Bromoform	0.0419	0.0050	mg/kg wet	0.05000		84	70-130			
Bromomethane	0.0455	0.0100	mg/kg wet	0.05000		91	70-130			
Carbon Disulfide	0.0502	0.0050	mg/kg wet	0.05000		100	70-130			
Carbon Tetrachloride	0.0526	0.0050	mg/kg wet	0.05000		105	70-130			
Chlorobenzene	0.0498	0.0050	mg/kg wet	0.05000		100	70-130			
Chloroethane	0.0527	0.0100	mg/kg wet	0.05000		105	70-130			
Chloroform	0.0489	0.0050	mg/kg wet	0.05000		98	70-130			
Chloromethane	0.0484	0.0100	mg/kg wet	0.05000		97	70-130			
cis-1,2-Dichloroethene	0.0495	0.0050	mg/kg wet	0.05000		99	70-130			
cis-1,3-Dichloropropene	0.0452	0.0017	mg/kg wet	0.05000		90	70-130			
Dibromochloromethane	0.0472	0.0016	mg/kg wet	0.05000		94	70-130			
Dibromomethane	0.0465	0.0050	mg/kg wet	0.05000		93	70-130			
Dichlorodifluoromethane	0.0502	0.0100	mg/kg wet	0.05000		100	70-130			
Diethyl Ether	0.0467	0.0050	mg/kg wet	0.05000		93	70-130			
Di-isopropyl ether	0.0457	0.0050	mg/kg wet	0.05000		91	70-130			
Ethyl tertiary-butyl ether	0.0478	0.0050	mg/kg wet	0.05000		96	70-130			
Ethylbenzene	0.0516	0.0050	mg/kg wet	0.05000		103	70-130			
Hexachlorobutadiene	0.0516	0.0050	mg/kg wet	0.05000		103	70-130			
Isopropylbenzene	0.0525	0.0050	mg/kg wet	0.05000		105	70-130			
Methyl tert-Butyl Ether	0.0475	0.0050	mg/kg wet	0.05000		95	70-130			

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Client Name: Tighe & Bond
Client Project ID: Neponset Dredge

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Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
5035/8260B Volatile Organic Compounds / Low Level										
Batch DG20621 - 5035										
Methylene Chloride	0.0472	0.0100	mg/kg wet	0.05000		94	70-130			
Naphthalene	0.0432	0.0050	mg/kg wet	0.05000		86	70-130			
n-Butylbenzene	0.0505	0.0050	mg/kg wet	0.05000		101	70-130			
n-Propylbenzene	0.0517	0.0050	mg/kg wet	0.05000		103	70-130			
sec-Butylbenzene	0.0503	0.0050	mg/kg wet	0.05000		101	70-130			
Styrene	0.0475	0.0050	mg/kg wet	0.05000		95	70-130			
tert-Butylbenzene	0.0525	0.0050	mg/kg wet	0.05000		105	70-130			
Tertiary-amyl methyl ether	0.0426	0.0050	mg/kg wet	0.05000		85	70-130			
Tetrachloroethene	0.0494	0.0050	mg/kg wet	0.05000		99	70-130			
Tetrahydrofuran	0.0362	0.0050	mg/kg wet	0.05000		72	70-130			
Toluene	0.0480	0.0050	mg/kg wet	0.05000		96	70-130			
trans-1,2-Dichloroethene	0.0515	0.0050	mg/kg wet	0.05000		103	70-130			
trans-1,3-Dichloropropene	0.0414	0.0016	mg/kg wet	0.05000		83	70-130			
Trichloroethene	0.0475	0.0050	mg/kg wet	0.05000		95	70-130			
Trichlorofluoromethane	0.0523	0.0050	mg/kg wet	0.05000		105	70-130			
Vinyl Chloride	0.0530	0.0100	mg/kg wet	0.05000		106	70-130			
Xylene O	0.0528	0.0050	mg/kg wet	0.05000		106	70-130			
Xylene P,M	0.109	0.0100	mg/kg wet	0.1000		109	70-130			
Surrogate: 1,2-Dichloroethane-d4	*0.0476*		mg/kg wet	*0.05000*		*95*	*70-130*			
Surrogate: 4-Bromofluorobenzene	*0.0491*		mg/kg wet	*0.05000*		*98*	*70-130*			
Surrogate: Dibromofluoromethane	*0.0480*		mg/kg wet	*0.05000*		*96*	*70-130*			
Surrogate: Toluene-d8	*0.0491*		mg/kg wet	*0.05000*		*98*	*70-130*			
LCS Dup										
1,1,1,2-Tetrachloroethane	0.0558	0.0050	mg/kg wet	0.05000		112	70-130	9	20	
1,1,1-Trichloroethane	0.0522	0.0050	mg/kg wet	0.05000		104	70-130	3	20	
1,1,2,2-Tetrachloroethane	0.0437	0.0015	mg/kg wet	0.05000		87	70-130	5	20	
1,1,2-Trichloroethane	0.0474	0.0050	mg/kg wet	0.05000		95	70-130	8	20	
1,1-Dichloroethane	0.0511	0.0050	mg/kg wet	0.05000		102	70-130	7	20	
1,1-Dichloroethene	0.0585	0.0050	mg/kg wet	0.05000		117	70-130	6	20	
1,1-Dichloropropene	0.0498	0.0050	mg/kg wet	0.05000		100	70-130	3	20	
1,2,3-Trichlorobenzene	0.0545	0.0050	mg/kg wet	0.05000		109	70-130	5	20	
1,2,3-Trichloropropane	0.0441	0.0050	mg/kg wet	0.05000		88	70-130	5	20	
1,2,4-Trichlorobenzene	0.0501	0.0050	mg/kg wet	0.05000		100	70-130	3	20	
1,2,4-Trimethylbenzene	0.0525	0.0050	mg/kg wet	0.05000		105	70-130	3	20	
1,2-Dibromo-3-Chloropropane	0.0452	0.0050	mg/kg wet	0.05000		90	70-130	5	20	
1,2-Dibromoethane	0.0538	0.0050	mg/kg wet	0.05000		108	70-130	11	20	
1,2-Dichlorobenzene	0.0511	0.0050	mg/kg wet	0.05000		102	70-130	5	20	
1,2-Dichloroethane	0.0495	0.0050	mg/kg wet	0.05000		99	70-130	7	20	
1,2-Dichloropropane	0.0478	0.0050	mg/kg wet	0.05000		96	70-130	6	20	
1,3,5-Trimethylbenzene	0.0525	0.0050	mg/kg wet	0.05000		105	70-130	2	20	
1,3-Dichlorobenzene	0.0508	0.0050	mg/kg wet	0.05000		102	70-130	4	20	
1,3-Dichloropropane	0.0531	0.0050	mg/kg wet	0.05000		106	70-130	11	20	
1,4-Dichlorobenzene	0.0503	0.0050	mg/kg wet	0.05000		101	70-130	3	20	
1,4-Dioxane	0.850	0.0100	mg/kg wet	1.000		85	70-130	11	20	
2,2-Dichloropropane	0.0535	0.0050	mg/kg wet	0.05000		107	70-130	3	20	

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Client Name: Tighe & Bond
Client Project ID: Neponset Dredge

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Quality Control Data

5035/8260B Volatile Organic Compounds / Low Level

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Batch DG20621 - 5035										
2-Butanone	0.266	0.0500	mg/kg wet	0.2500		106	70-130	9	20	
2-Chlorotoluene	0.0510	0.0050	mg/kg wet	0.05000		102	70-130	3	20	
2-Hexanone	0.287	0.0500	mg/kg wet	0.2500		115	70-130	13	20	
4-Chlorotoluene	0.0515	0.0050	mg/kg wet	0.05000		103	70-130	3	20	
4-Isopropyltoluene	0.0524	0.0050	mg/kg wet	0.05000		105	70-130	2	20	
4-Methyl-2-Pentanone	0.221	0.0500	mg/kg wet	0.2500		88	70-130	10	20	
Acetone	0.311	0.0500	mg/kg wet	0.2500		124	70-130	12	20	
Benzene	0.0501	0.0050	mg/kg wet	0.05000		100	70-130	6	20	
Bromobenzene	0.0509	0.0050	mg/kg wet	0.05000		102	70-130	5	20	
Bromochloromethane	0.0523	0.0050	mg/kg wet	0.05000		105	70-130	9	20	
Bromodichloromethane	0.0539	0.0050	mg/kg wet	0.05000		108	70-130	7	20	
Bromoform	0.0458	0.0050	mg/kg wet	0.05000		92	70-130	9	20	
Bromomethane	0.0463	0.0100	mg/kg wet	0.05000		93	70-130	2	20	
Carbon Disulfide	0.0529	0.0050	mg/kg wet	0.05000		106	70-130	5	20	
Carbon Tetrachloride	0.0544	0.0050	mg/kg wet	0.05000		109	70-130	3	20	
Chlorobenzene	0.0539	0.0050	mg/kg wet	0.05000		108	70-130	8	20	
Chloroethane	0.0560	0.0100	mg/kg wet	0.05000		112	70-130	6	20	
Chloroform	0.0527	0.0050	mg/kg wet	0.05000		105	70-130	7	20	
Chloromethane	0.0501	0.0100	mg/kg wet	0.05000		100	70-130	3	20	
cis-1,2-Dichloroethene	0.0533	0.0050	mg/kg wet	0.05000		107	70-130	7	20	
cis-1,3-Dichloropropene	0.0488	0.0017	mg/kg wet	0.05000		98	70-130	8	20	
Dibromochloromethane	0.0528	0.0016	mg/kg wet	0.05000		106	70-130	11	20	
Dibromomethane	0.0509	0.0050	mg/kg wet	0.05000		102	70-130	9	20	
Dichlorodifluoromethane	0.0509	0.0100	mg/kg wet	0.05000		102	70-130	1	20	
Diethyl Ether	0.0525	0.0050	mg/kg wet	0.05000		105	70-130	12	20	
Di-isopropyl ether	0.0500	0.0050	mg/kg wet	0.05000		100	70-130	9	20	
Ethyl tertiary-butyl ether	0.0525	0.0050	mg/kg wet	0.05000		105	70-130	10	20	
Ethylbenzene	0.0560	0.0050	mg/kg wet	0.05000		112	70-130	8	20	
Hexachlorobutadiene	0.0525	0.0050	mg/kg wet	0.05000		105	70-130	2	20	
Isopropylbenzene	0.0539	0.0050	mg/kg wet	0.05000		108	70-130	3	20	
Methyl tert-Butyl Ether	0.0529	0.0050	mg/kg wet	0.05000		106	70-130	11	20	
Methylene Chloride	0.0509	0.0100	mg/kg wet	0.05000		102	70-130	8	20	
Naphthalene	0.0465	0.0050	mg/kg wet	0.05000		93	70-130	8	20	
n-Butylbenzene	0.0510	0.0050	mg/kg wet	0.05000		102	70-130	1	20	
n-Propylbenzene	0.0525	0.0050	mg/kg wet	0.05000		105	70-130	2	20	
sec-Butylbenzene	0.0511	0.0050	mg/kg wet	0.05000		102	70-130	2	20	
Styrene	0.0517	0.0050	mg/kg wet	0.05000		103	70-130	8	20	
tert-Butylbenzene	0.0542	0.0050	mg/kg wet	0.05000		108	70-130	3	20	
Tertiary-amyl methyl ether	0.0472	0.0050	mg/kg wet	0.05000		94	70-130	10	20	
Tetrachloroethene	0.0590	0.0050	mg/kg wet	0.05000		118	70-130	18	20	
Tetrahydrofuran	0.0412	0.0050	mg/kg wet	0.05000		82	70-130	13	20	
Toluene	0.0504	0.0050	mg/kg wet	0.05000		101	70-130	5	20	
trans-1,2-Dichloroethene	0.0548	0.0050	mg/kg wet	0.05000		110	70-130	6	20	
trans-1,3-Dichloropropene	0.0449	0.0016	mg/kg wet	0.05000		90	70-130	8	20	
Trichloroethene	0.0508	0.0050	mg/kg wet	0.05000		102	70-130	7	20	

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Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
5035/8260B Volatile Organic Compounds / Low Level										
Batch DG20621 - 5035										
Trichlorofluoromethane	0.0538	0.0050	mg/kg wet	0.05000		108	70-130	3	20	
Vinyl Chloride	0.0543	0.0100	mg/kg wet	0.05000		109	70-130	3	20	
Xylene O	0.0574	0.0050	mg/kg wet	0.05000		115	70-130	8	20	
Xylene P,M	0.118	0.0100	mg/kg wet	0.1000		118	70-130	8	20	
Surrogate: 1,2-Dichloroethane-d4	*0.0473*		mg/kg wet	*0.05000*		*95*	*70-130*			
Surrogate: 4-Bromofluorobenzene	*0.0510*		mg/kg wet	*0.05000*		*102*	*70-130*			
Surrogate: Dibromofluoromethane	*0.0487*		mg/kg wet	*0.05000*		*97*	*70-130*			
Surrogate: Toluene-d8	*0.0507*		mg/kg wet	*0.05000*		*101*	*70-130*			
8082 Polychlorinated Biphenyls (PCB) / Congeners										
Batch DG20701 - 3540C										
Blank										
BZ#101	ND	0.00027	mg/kg wet							
BZ#101 [2C]	ND	0.00027	mg/kg wet							
BZ#105	ND	0.00027	mg/kg wet							
BZ#105 [2C]	ND	0.00027	mg/kg wet							
BZ#118	ND	0.00027	mg/kg wet							
BZ#118 [2C]	ND	0.00027	mg/kg wet							
BZ#128	ND	0.00027	mg/kg wet							
BZ#128 [2C]	ND	0.00027	mg/kg wet							
BZ#138	ND	0.00027	mg/kg wet							
BZ#138 [2C]	ND	0.00027	mg/kg wet							
BZ#153	ND	0.00027	mg/kg wet							
BZ#153 [2C]	ND	0.00027	mg/kg wet							
BZ#170	ND	0.00027	mg/kg wet							
BZ#170 [2C]	ND	0.00027	mg/kg wet							
BZ#18	ND	0.00027	mg/kg wet							
BZ#18 [2C]	ND	0.00027	mg/kg wet							
BZ#180	ND	0.00027	mg/kg wet							
BZ#180 [2C]	ND	0.00027	mg/kg wet							
BZ#187	ND	0.00027	mg/kg wet							
BZ#187 [2C]	ND	0.00027	mg/kg wet							
BZ#195	ND	0.00027	mg/kg wet							
BZ#195 [2C]	ND	0.00027	mg/kg wet							
BZ#206	ND	0.00027	mg/kg wet							
BZ#206 [2C]	ND	0.00027	mg/kg wet							
BZ#209	ND	0.00027	mg/kg wet							
BZ#209 [2C]	ND	0.00027	mg/kg wet							
BZ#28	ND	0.00027	mg/kg wet							
BZ#28 [2C]	ND	0.00027	mg/kg wet							
BZ#44	ND	0.00027	mg/kg wet							
BZ#44 [2C]	ND	0.00027	mg/kg wet							
BZ#52	ND	0.00027	mg/kg wet							
BZ#52 [2C]	ND	0.00027	mg/kg wet							
BZ#66	ND	0.00027	mg/kg wet							

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Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8082 Polychlorinated Biphenyls (PCB) / Congeners										
Batch DG20701 - 3540C										
BZ#66 [2C]	ND	0.00027	mg/kg wet							
BZ#8	ND	0.00027	mg/kg wet							
BZ#8 [2C]	ND	0.00027	mg/kg wet							
Surrogate: Tetrachloro-m-xylene	*0.00256*		mg/kg wet	*0.003333*		*77*	*30-150*			
Surrogate: Tetrachloro-m-xylene [2C]	*0.00280*		mg/kg wet	*0.003333*		*84*	*30-150*			
LCS										
BZ#101	0.00272	0.00027	mg/kg wet	0.003333		82	40-140			
BZ#101 [2C]	0.00295	0.00027	mg/kg wet	0.003333		89	40-140			
BZ#105	0.00305	0.00027	mg/kg wet	0.003333		92	40-140			
BZ#105 [2C]	0.00337	0.00027	mg/kg wet	0.003333		101	40-140			
BZ#118	0.00308	0.00027	mg/kg wet	0.003333		92	40-140			
BZ#118 [2C]	0.00316	0.00027	mg/kg wet	0.003333		95	40-140			
BZ#128	0.00282	0.00027	mg/kg wet	0.003333		85	40-140			
BZ#128 [2C]	0.00316	0.00027	mg/kg wet	0.003333		95	40-140			
BZ#138	0.00295	0.00027	mg/kg wet	0.003333		89	40-140			
BZ#138 [2C]	0.00308	0.00027	mg/kg wet	0.003333		92	40-140			
BZ#153	0.00280	0.00027	mg/kg wet	0.003333		84	40-140			
BZ#153 [2C]	0.00295	0.00027	mg/kg wet	0.003333		88	40-140			
BZ#170	0.00283	0.00027	mg/kg wet	0.003333		85	40-140			
BZ#170 [2C]	0.00300	0.00027	mg/kg wet	0.003333		90	40-140			
BZ#18	0.00272	0.00027	mg/kg wet	0.003333		81	40-140			
BZ#18 [2C]	0.00293	0.00027	mg/kg wet	0.003333		88	40-140			
BZ#180	0.00288	0.00027	mg/kg wet	0.003333		86	40-140			
BZ#180 [2C]	0.00307	0.00027	mg/kg wet	0.003333		92	40-140			
BZ#187	0.00282	0.00027	mg/kg wet	0.003333		85	40-140			
BZ#187 [2C]	0.00301	0.00027	mg/kg wet	0.003333		90	40-140			
BZ#195	0.00279	0.00027	mg/kg wet	0.003333		84	40-140			
BZ#195 [2C]	0.00297	0.00027	mg/kg wet	0.003333		89	40-140			
BZ#206	0.00284	0.00027	mg/kg wet	0.003333		85	40-140			
BZ#206 [2C]	0.00301	0.00027	mg/kg wet	0.003333		90	40-140			
BZ#209	0.00275	0.00027	mg/kg wet	0.003333		83	40-140			
BZ#209 [2C]	0.00293	0.00027	mg/kg wet	0.003333		88	40-140			
BZ#28	0.00283	0.00027	mg/kg wet	0.003333		85	40-140			
BZ#28 [2C]	0.00310	0.00027	mg/kg wet	0.003333		93	40-140			
BZ#44	0.00283	0.00027	mg/kg wet	0.003333		85	40-140			
BZ#44 [2C]	0.00296	0.00027	mg/kg wet	0.003333		89	40-140			
BZ#52	0.00283	0.00027	mg/kg wet	0.003333		85	40-140			
BZ#52 [2C]	0.00297	0.00027	mg/kg wet	0.003333		89	40-140			
BZ#66	0.00304	0.00027	mg/kg wet	0.003333		91	40-140			
BZ#66 [2C]	0.00318	0.00027	mg/kg wet	0.003333		95	40-140			
BZ#8	0.00284	0.00027	mg/kg wet	0.003333		85	40-140			
BZ#8 [2C]	0.00291	0.00027	mg/kg wet	0.003333		87	40-140			
Surrogate: Tetrachloro-m-xylene	*0.00281*		mg/kg wet	*0.003333*		*84*	*30-150*			
Surrogate: Tetrachloro-m-xylene [2C]	*0.00300*		mg/kg wet	*0.003333*		*90*	*30-150*			

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Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8082 Polychlorinated Biphenyls (PCB) / Congeners										
Batch DG20701 - 3540C										
LCS Dup										
BZ#101	0.00283	0.00027	mg/kg wet	0.003333		85	40-140	4	30	
BZ#101 [2C]	0.00308	0.00027	mg/kg wet	0.003333		93	40-140	4	30	
BZ#105	0.00329	0.00027	mg/kg wet	0.003333		99	40-140	8	30	
BZ#105 [2C]	0.00359	0.00027	mg/kg wet	0.003333		108	40-140	6	30	
BZ#118	0.00328	0.00027	mg/kg wet	0.003333		99	40-140	6	30	
BZ#118 [2C]	0.00333	0.00027	mg/kg wet	0.003333		100	40-140	5	30	
BZ#128	0.00285	0.00027	mg/kg wet	0.003333		85	40-140	1	30	
BZ#128 [2C]	0.00328	0.00027	mg/kg wet	0.003333		98	40-140	4	30	
BZ#138	0.00313	0.00027	mg/kg wet	0.003333		94	40-140	6	30	
BZ#138 [2C]	0.00323	0.00027	mg/kg wet	0.003333		97	40-140	5	30	
BZ#153	0.00300	0.00027	mg/kg wet	0.003333		90	40-140	7	30	
BZ#153 [2C]	0.00312	0.00027	mg/kg wet	0.003333		94	40-140	6	30	
BZ#170	0.00299	0.00027	mg/kg wet	0.003333		90	40-140	5	30	
BZ#170 [2C]	0.00318	0.00027	mg/kg wet	0.003333		95	40-140	6	30	
BZ#18	0.00286	0.00027	mg/kg wet	0.003333		86	40-140	5	30	
BZ#18 [2C]	0.00307	0.00027	mg/kg wet	0.003333		92	40-140	5	30	
BZ#180	0.00300	0.00027	mg/kg wet	0.003333		90	40-140	4	30	
BZ#180 [2C]	0.00323	0.00027	mg/kg wet	0.003333		97	40-140	5	30	
BZ#187	0.00296	0.00027	mg/kg wet	0.003333		89	40-140	5	30	
BZ#187 [2C]	0.00315	0.00027	mg/kg wet	0.003333		95	40-140	5	30	
BZ#195	0.00292	0.00027	mg/kg wet	0.003333		88	40-140	5	30	
BZ#195 [2C]	0.00318	0.00027	mg/kg wet	0.003333		95	40-140	7	30	
BZ#206	0.00298	0.00027	mg/kg wet	0.003333		89	40-140	5	30	
BZ#206 [2C]	0.00321	0.00027	mg/kg wet	0.003333		96	40-140	6	30	
BZ#209	0.00290	0.00027	mg/kg wet	0.003333		87	40-140	5	30	
BZ#209 [2C]	0.00308	0.00027	mg/kg wet	0.003333		93	40-140	5	30	
BZ#28	0.00296	0.00027	mg/kg wet	0.003333		89	40-140	4	30	
BZ#28 [2C]	0.00327	0.00027	mg/kg wet	0.003333		98	40-140	5	30	
BZ#44	0.00304	0.00027	mg/kg wet	0.003333		91	40-140	7	30	
BZ#44 [2C]	0.00309	0.00027	mg/kg wet	0.003333		93	40-140	4	30	
BZ#52	0.00297	0.00027	mg/kg wet	0.003333		89	40-140	5	30	
BZ#52 [2C]	0.00308	0.00027	mg/kg wet	0.003333		93	40-140	4	30	
BZ#66	0.00320	0.00027	mg/kg wet	0.003333		96	40-140	5	30	
BZ#66 [2C]	0.00334	0.00027	mg/kg wet	0.003333		100	40-140	5	30	
BZ#8	0.00270	0.00027	mg/kg wet	0.003333		81	40-140	5	30	
BZ#8 [2C]	0.00311	0.00027	mg/kg wet	0.003333		93	40-140	7	30	
Surrogate: Tetrachloro-m-xylene	*0.00279*		mg/kg wet	*0.003333*		*84*	*30-150*			
Surrogate: Tetrachloro-m-xylene [2C]	*0.00308*		mg/kg wet	*0.003333*		*92*	*30-150*			
Classical Chemistry										
Batch DG20846 - General Preparation										
Blank										
Total Organic Carbon (1)	ND	100	mg/kg							

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Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Classical Chemistry										
Batch DG20846 - General Preparation										
Total Organic Carbon (2)	ND	100	mg/kg							
LCS										
Total Organic Carbon (1)	9210	100	mg/kg	10000		92	80-120			
Total Organic Carbon (2)	9370	100	mg/kg	10000		94	80-120			
LCS Dup										
Total Organic Carbon (1)	9320	100	mg/kg	10000		93	80-120	1	25	
Total Organic Carbon (2)	9540	100	mg/kg	10000		95	80-120	2	25	
Batch DG21146 - General Preparation										
Blank										
Hexavalent Chromium	ND	0.7	mg/kg wet							
LCS										
Hexavalent Chromium	33.1	0.7	mg/kg wet	33.32		99	80-120			
LCS Dup										
Hexavalent Chromium	32.7	0.7	mg/kg wet	33.32		98	80-120	1	20	
Reference										
Hexavalent Chromium	275	7.7	mg/kg wet	384.3		72	62-138			
MADEP-EPH Extractable Petroleum Hydrocarbons										
Batch DF23021 - 3546										
Blank										
C19-C36 Aliphatics1	ND	15.0	mg/kg wet							
C9-C18 Aliphatics1	ND	15.0	mg/kg wet							
Surrogate: 1-Chlorooctadecane	*1.74*		mg/kg wet	*2.000*		*87*	*40-140*			
Blank										
Surrogate: 2-Bromonaphthalene	*1.69*		mg/kg wet	*2.000*		*85*	*40-140*			
Surrogate: 2-Fluorobiphenyl	*1.55*		mg/kg wet	*2.000*		*78*	*40-140*			
Surrogate: O-Terphenyl	*1.48*		mg/kg wet	*2.000*		*74*	*40-140*			
Blank										
2-Methylnaphthalene	ND	0.008	mg/kg wet							
Acenaphthene	ND	0.008	mg/kg wet							
Acenaphthylene	ND	0.008	mg/kg wet							
Anthracene	ND	0.008	mg/kg wet							
Benzo(a)anthracene	ND	0.008	mg/kg wet							
Benzo(a)pyrene	ND	0.008	mg/kg wet							
Benzo(b)fluoranthene	ND	0.008	mg/kg wet							
Benzo(g,h,i)perylene	ND	0.008	mg/kg wet							
Benzo(k)fluoranthene	ND	0.008	mg/kg wet							
Chrysene	ND	0.008	mg/kg wet							
Dibenzo(a,h)Anthracene	ND	0.008	mg/kg wet							
Fluoranthene	ND	0.008	mg/kg wet							
Fluorene	ND	0.008	mg/kg wet							

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Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
MADEP-EPH Extractable Petroleum Hydrocarbons										
Batch DF23021 - 3546										
Indeno(1,2,3-cd)Pyrene	ND	0.008	mg/kg wet							
Naphthalene	ND	0.008	mg/kg wet							
Phenanthrene	ND	0.008	mg/kg wet							
Pyrene	ND	0.008	mg/kg wet							
LCS										
C19-C36 Aliphatics1	16.4	15.0	mg/kg wet	16.00		102	40-140			
C9-C18 Aliphatics1	7.9	15.0	mg/kg wet	12.00		66	40-140			
Surrogate: 1-Chlorooctadecane	*1.62*		mg/kg wet	*2.000*		*81*	*40-140*			
LCS										
Surrogate: 2-Bromonaphthalene	*1.76*		mg/kg wet	*2.000*		*88*	*40-140*			
Surrogate: 2-Fluorobiphenyl	*1.61*		mg/kg wet	*2.000*		*80*	*40-140*			
Surrogate: O-Terphenyl	*1.57*		mg/kg wet	*2.000*		*79*	*40-140*			
LCS										
2-Methylnaphthalene Breakthrough	0.0		%				0-5			
Naphthalene Breakthrough	0.0		%				0-5			
LCS										
2-Methylnaphthalene	1.18	0.040	mg/kg wet	2.000		59	40-140			
Acenaphthene	1.24	0.040	mg/kg wet	2.000		62	40-140			
Acenaphthylene	1.20	0.040	mg/kg wet	2.000		60	40-140			
Anthracene	1.37	0.040	mg/kg wet	2.000		68	40-140			
Benzo(a)anthracene	1.39	0.040	mg/kg wet	2.000		70	40-140			
Benzo(a)pyrene	1.34	0.040	mg/kg wet	2.000		67	40-140			
Benzo(b)fluoranthene	1.31	0.040	mg/kg wet	2.000		66	40-140			
Benzo(g,h,i)perylene	1.24	0.040	mg/kg wet	2.000		62	40-140			
Benzo(k)fluoranthene	1.39	0.040	mg/kg wet	2.000		70	40-140			
Chrysene	1.43	0.040	mg/kg wet	2.000		72	40-140			
Dibenzo(a,h)Anthracene	1.33	0.040	mg/kg wet	2.000		67	40-140			
Fluoranthene	1.32	0.040	mg/kg wet	2.000		66	40-140			
Fluorene	1.22	0.040	mg/kg wet	2.000		61	40-140			
Indeno(1,2,3-cd)Pyrene	1.38	0.040	mg/kg wet	2.000		69	40-140			
Naphthalene	1.09	0.040	mg/kg wet	2.000		54	40-140			
Phenanthrene	1.26	0.040	mg/kg wet	2.000		63	40-140			
Pyrene	1.25	0.040	mg/kg wet	2.000		62	40-140			
LCS Dup										
C19-C36 Aliphatics1	15.3	15.0	mg/kg wet	16.00		96	40-140	7	25	
C9-C18 Aliphatics1	7.3	15.0	mg/kg wet	12.00		61	40-140	7	25	
Surrogate: 1-Chlorooctadecane	*1.46*		mg/kg wet	*2.000*		*73*	*40-140*			
LCS Dup										
Surrogate: 2-Bromonaphthalene	*1.74*		mg/kg wet	*2.000*		*87*	*40-140*			
Surrogate: 2-Fluorobiphenyl	*1.59*		mg/kg wet	*2.000*		*80*	*40-140*			
Surrogate: O-Terphenyl	*1.54*		mg/kg wet	*2.000*		*77*	*40-140*			

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Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
MADEP-EPH Extractable Petroleum Hydrocarbons										
Batch DF23021 - 3546										
LCS Dup										
2-Methylnaphthalene Breakthrough	0.0		%				0-5		200	
Naphthalene Breakthrough	0.0		%				0-5		200	
LCS Dup										
2-Methylnaphthalene	1.24	0.040	mg/kg wet	2.000		62	40-140	5	30	
Acenaphthene	1.29	0.040	mg/kg wet	2.000		64	40-140	4	30	
Acenaphthylene	1.32	0.040	mg/kg wet	2.000		66	40-140	10	30	
Anthracene	1.40	0.040	mg/kg wet	2.000		70	40-140	3	30	
Benzo(a)anthracene	1.39	0.040	mg/kg wet	2.000		69	40-140	0.1	30	
Benzo(a)pyrene	1.36	0.040	mg/kg wet	2.000		68	40-140	1	30	
Benzo(b)fluoranthene	1.35	0.040	mg/kg wet	2.000		67	40-140	3	30	
Benzo(g,h,i)perylene	1.25	0.040	mg/kg wet	2.000		62	40-140	0.6	30	
Benzo(k)fluoranthene	1.38	0.040	mg/kg wet	2.000		69	40-140	0.9	30	
Chrysene	1.46	0.040	mg/kg wet	2.000		73	40-140	2	30	
Dibenzo(a,h)Anthracene	1.33	0.040	mg/kg wet	2.000		67	40-140	0	30	
Fluoranthene	1.37	0.040	mg/kg wet	2.000		68	40-140	3	30	
Fluorene	1.34	0.040	mg/kg wet	2.000		67	40-140	10	30	
Indeno(1,2,3-cd)Pyrene	1.39	0.040	mg/kg wet	2.000		69	40-140	0.7	30	
Naphthalene	1.16	0.040	mg/kg wet	2.000		58	40-140	6	30	
Phenanthrene	1.28	0.040	mg/kg wet	2.000		64	40-140	2	30	
Pyrene	1.48	0.040	mg/kg wet	2.000		74	40-140	17	30	
Batch DG20126 - 3546										
Blank										
C19-C36 Aliphatics1	ND	15.0	mg/kg wet							
C9-C18 Aliphatics1	ND	15.0	mg/kg wet							
Surrogate: 1-Chlorooctadecane	*1.93*		mg/kg wet	*2.000*		*97*	*40-140*			
Blank										
C11-C22 Unadjusted Aromatics1	ND	15.0	mg/kg wet							
Surrogate: 2-Bromonaphthalene	*1.70*		mg/kg wet	*2.000*		*85*	*40-140*			
Surrogate: 2-Fluorobiphenyl	*1.66*		mg/kg wet	*2.000*		*83*	*40-140*			
Surrogate: O-Terphenyl	*1.63*		mg/kg wet	*2.000*		*82*	*40-140*			
Blank										
2-Methylnaphthalene	ND	0.008	mg/kg wet							
Acenaphthene	ND	0.008	mg/kg wet							
Acenaphthylene	ND	0.008	mg/kg wet							
Anthracene	ND	0.008	mg/kg wet							
Benzo(a)anthracene	ND	0.008	mg/kg wet							
Benzo(a)pyrene	ND	0.008	mg/kg wet							
Benzo(b)fluoranthene	ND	0.008	mg/kg wet							
Benzo(g,h,i)perylene	ND	0.008	mg/kg wet							
Benzo(k)fluoranthene	ND	0.008	mg/kg wet							
Chrysene	ND	0.008	mg/kg wet							
Dibenzo(a,h)Anthracene	ND	0.008	mg/kg wet							

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Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
MADEP-EPH Extractable Petroleum Hydrocarbons										
Batch DG20126 - 3546										
Fluoranthene	ND	0.008	mg/kg wet							
Fluorene	ND	0.008	mg/kg wet							
Indeno(1,2,3-cd)Pyrene	ND	0.008	mg/kg wet							
Naphthalene	0.012	0.008	mg/kg wet							
Phenanthrene	ND	0.008	mg/kg wet							
Pyrene	ND	0.008	mg/kg wet							
LCS										
C19-C36 Aliphatics1	15.2	15.0	mg/kg wet	16.00		95	40-140			
C9-C18 Aliphatics1	7.7	15.0	mg/kg wet	12.00		64	40-140			
Surrogate: 1-Chlorooctadecane	*1.73*		mg/kg wet	*2.000*		*86*	*40-140*			
LCS										
C11-C22 Unadjusted Aromatics1	27.5	15.0	mg/kg wet	34.00		81	40-140			
Surrogate: 2-Bromonaphthalene	*1.80*		mg/kg wet	*2.000*		*90*	*40-140*			
Surrogate: 2-Fluorobiphenyl	*1.81*		mg/kg wet	*2.000*		*91*	*40-140*			
Surrogate: O-Terphenyl	*1.66*		mg/kg wet	*2.000*		*83*	*40-140*			
LCS										
2-Methylnaphthalene Breakthrough	0.0		%				0-5			
Naphthalene Breakthrough	0.0		%				0-5			
LCS										
2-Methylnaphthalene	1.37	0.040	mg/kg wet	2.000		69	40-140			
Acenaphthene	1.32	0.040	mg/kg wet	2.000		66	40-140			
Acenaphthylene	1.35	0.040	mg/kg wet	2.000		68	40-140			
Anthracene	1.42	0.040	mg/kg wet	2.000		71	40-140			
Benzo(a)anthracene	1.45	0.040	mg/kg wet	2.000		73	40-140			
Benzo(a)pyrene	1.43	0.040	mg/kg wet	2.000		72	40-140			
Benzo(b)fluoranthene	1.48	0.040	mg/kg wet	2.000		74	40-140			
Benzo(g,h,i)perylene	1.31	0.040	mg/kg wet	2.000		65	40-140			
Benzo(k)fluoranthene	1.41	0.040	mg/kg wet	2.000		71	40-140			
Chrysene	1.51	0.040	mg/kg wet	2.000		76	40-140			
Dibenzo(a,h)Anthracene	1.35	0.040	mg/kg wet	2.000		67	40-140			
Fluoranthene	1.47	0.040	mg/kg wet	2.000		74	40-140			
Fluorene	1.42	0.040	mg/kg wet	2.000		71	40-140			
Indeno(1,2,3-cd)Pyrene	1.42	0.040	mg/kg wet	2.000		71	40-140			
Naphthalene	1.19	0.040	mg/kg wet	2.000		59	40-140			
Phenanthrene	1.36	0.040	mg/kg wet	2.000		68	40-140			
Pyrene	1.52	0.040	mg/kg wet	2.000		76	40-140			
LCS Dup										
C19-C36 Aliphatics1	14.6	15.0	mg/kg wet	16.00		91	40-140	4	25	
C9-C18 Aliphatics1	7.5	15.0	mg/kg wet	12.00		63	40-140	2	25	
Surrogate: 1-Chlorooctadecane	*1.65*		mg/kg wet	*2.000*		*82*	*40-140*			
LCS Dup										
C11-C22 Unadjusted Aromatics1	25.7	15.0	mg/kg wet	34.00		76	40-140	7	25	

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Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
MADEP-EPH Extractable Petroleum Hydrocarbons										
Batch DG20126 - 3546										
Surrogate: 2-Bromonaphthalene	*1.70*		mg/kg wet	*2.000*		*85*	*40-140*			
Surrogate: 2-Fluorobiphenyl	*1.72*		mg/kg wet	*2.000*		*86*	*40-140*			
Surrogate: O-Terphenyl	*1.50*		mg/kg wet	*2.000*		*75*	*40-140*			
LCS Dup										
2-Methylnaphthalene Breakthrough	0.0		%				0-5		200	
Naphthalene Breakthrough	0.0		%				0-5		200	
LCS Dup										
2-Methylnaphthalene	1.20	0.040	mg/kg wet	2.000		60	40-140	13	30	
Acenaphthene	1.22	0.040	mg/kg wet	2.000		61	40-140	8	30	
Acenaphthylene	1.28	0.040	mg/kg wet	2.000		64	40-140	5	30	
Anthracene	1.38	0.040	mg/kg wet	2.000		69	40-140	3	30	
Benzo(a)anthracene	1.35	0.040	mg/kg wet	2.000		67	40-140	8	30	
Benzo(a)pyrene	1.33	0.040	mg/kg wet	2.000		67	40-140	7	30	
Benzo(b)fluoranthene	1.40	0.040	mg/kg wet	2.000		70	40-140	6	30	
Benzo(g,h,i)perylene	1.23	0.040	mg/kg wet	2.000		61	40-140	6	30	
Benzo(k)fluoranthene	1.31	0.040	mg/kg wet	2.000		66	40-140	7	30	
Chrysene	1.42	0.040	mg/kg wet	2.000		71	40-140	6	30	
Dibenzo(a,h)Anthracene	1.26	0.040	mg/kg wet	2.000		63	40-140	7	30	
Fluoranthene	1.43	0.040	mg/kg wet	2.000		71	40-140	3	30	
Fluorene	1.20	0.040	mg/kg wet	2.000		60	40-140	16	30	
Indeno(1,2,3-cd)Pyrene	1.31	0.040	mg/kg wet	2.000		66	40-140	8	30	
Naphthalene	1.26	0.040	mg/kg wet	2.000		63	40-140	6	30	
Phenanthrene	1.32	0.040	mg/kg wet	2.000		66	40-140	3	30	
Pyrene	1.42	0.040	mg/kg wet	2.000		71	40-140	7	30	

CERTIFICATE OF ANALYSIS

Client Name: Tighe & Bond
Client Project ID: Neponset Dredge ESS Laboratory Work Order: 22F1147

Notes and Definitions

WL	Results obtained from a deionized water leach of the sample.
CD+	Continuing Calibration %Diff/Drift is above control limit (CD+).
D	Diluted.
LC	Lower value is used due to matrix interferences (LC).
O	Test performed from a previously opened container
P	Percent difference between primary and confirmation results exceeds 40% (P).
B	Present in Method Blank (B).
U	Analyte included in the analysis, but not detected
Z18	Temperature is not within 23 +/-2 ºC.
Z-08	See Attached
Z-10	Soil pH measured in water at 20.4 ºC.
Z-10a	Soil pH measured in water at 20.5 ºC.
Z-10b	Soil pH measured in water at 20.7 ºC.
Z-10c	Soil pH measured in water at 20.8 ºC.
Z-10d	Soil pH measured in water at 20.9 ºC.
Q	Calibration required quadratic regression (Q).
ND	Analyte NOT DETECTED at or above the MRL (LOQ), LOD for DoD Reports, MDL for J-Flagged Analytes
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference
MDL	Method Detection Limit
MRL	Method Reporting Limit
LOD	Limit of Detection
LOQ	Limit of Quantitation
DL	Detection Limit
I/V	Initial Volume
F/V	Final Volume
§	Subcontracted analysis; see attached report
1	Range result excludes concentrations of surrogates and/or internal standards eluting in that range.
2	Range result excludes concentrations of target analytes eluting in that range.
3	Range result excludes the concentration of the C9-C10 aromatic range.
Avg	Results reported as a mathematical average.
NR	No Recovery
[CALC]	Calculated Analyte
SUB	Subcontracted analysis; see attached report
RL	Reporting Limit
EDL	Estimated Detection Limit
MF	Membrane Filtration
MPN	Most Probable Number
TNTC	Too numerous to Count
CFU	Colony Forming Units

CERTIFICATE OF ANALYSIS

Client Name: Tighe & Bond
Client Project ID: Neponset Dredge

ESS Laboratory Work Order: 22F1147

ESS LABORATORY CERTIFICATIONS AND ACCREDITATIONS

ENVIRONMENTAL

Rhode Island Potable and Non Potable Water: LAI00179
http://www.health.ri.gov/find/labs/analytical/ESS.pdf

Connecticut Potable and Non Potable Water, Solid and Hazardous Waste: PH-0750
http://www.ct.gov/dph/lib/dph/environmental_health/environmental_laboratories/pdf/OutofStateCommercialLaboratories.pdf

Maine Potable and Non Potable Water, and Solid and Hazardous Waste: RI00002
http://www.maine.gov/dhhs/mecdc/environmental-health/dwp/partners/labCert.shtml

Massachusetts Potable and Non Potable Water: M-RI002
http://public.dep.state.ma.us/Labcert/Labcert.aspx

New Hampshire (NELAP accredited) Potable and Non Potable Water, Solid and Hazardous Waste: 2424
http://des.nh.gov/organization/divisions/water/dwgb/nhelap/index.htm

New York (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: 11313
http://www.wadsworth.org/labcert/elap/comm.html

New Jersey (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: RI006
http://datamine2.state.nj.us/DEP_OPRA/OpraMain/pi_main?mode=pi_by_site&sort_order=PI_NAMEA&Select+a+Site:=58715

Pennsylvania: 68-01752
http://www.dep.pa.gov/Business/OtherPrograms/Labs/Pages/Laboratory-Accreditation-Program.aspx

THIELSCH ENGINEERING
195 Frances Avenue
Cranston RI, 02910
Phone: (401)-467-6454
Fax: (401)-467-2398
thielsch.com
Let's Build a Solid Foundation

Client Information:
Tighe & Bond
Pocasset, MA
PM: G. Hedman
Assigned By: ESS
Collected By: J. Perry / E. Larkin

Project Information:
Neponset Dredge
Milton, MA
ESS Project Number: 22F1147
Summary Page: 1 of 1
Report Date: 07.11.22

LABORATORY TESTING DATA SHEET, Report No.: 7422-G-112

Source	Sample ID	Depth (ft)	Laboratory No.	Identification Tests								Proctor / CBR / Permeability Tests								Laboratory Log and Soil Description
				As Received Moisture Content %	LL %	PL %	Gravel %	Sand %	Fines %	Org. %	Wet unit wt. (pcf)	Dry unit wt. (pcf)	Test Moisture Content %	γ_d MAX (pcf) W_{opt} (%)	γ_d MAX (pcf) W_{opt} (%) (Corr.)	Target Test Setup as % of Proctor	CBR @ 0.1"	CBR @ 0.2"	Permeability cm/sec	
				D2216	D4318		D6913			D2974	D7263	D7263		D1557						
Grab/Composite	SED-101	-	22F1147-01	156.0			0.0	23.4	76.6											Dark Gray Organic silt with sand
Grab/Composite	SED-102	-	22F1147-02	157.0			0.0	22.8	77.2											Very Dark Brown Organic silt with sand
Grab/Composite	SED-103	-	22F1147-03	142.0			0.0	42.8	57.2											Very Dark Brown Organic sandy silt
Grab/Composite	SED-105	-	22F1147-05	128.0			0.0	31.7	68.3											Very Dark Brown Organic sandy silt
Grab/Composite	SED-106	-	22F1147-06	207.0			0.0	37.1	62.9											Dark Gray Organic sandy silt
Grab/Composite	SED-107	-	22F1147-07	182.0			0.0	13.9	86.1											Dark Gray Organic silt
Grab/Composite	SED-108	-	22F1147-08	144.0			0.0	31.7	68.3											Dark Gray Organic sandy silt
Grab/Composite	SED-109	-	22F1147-09	96.0			0.0	20.9	79.1											Dark Gray Organic silt with sand
Grab/Composite	SED-110	-	22F1147-10	106.0			0.0	29.9	70.1											Dark Gray Organic sandy silt
Grab/Composite	SED-111	-	22F1147-11	60.6			0.0	34.5	65.5											Dark Gray Organic sandy silt

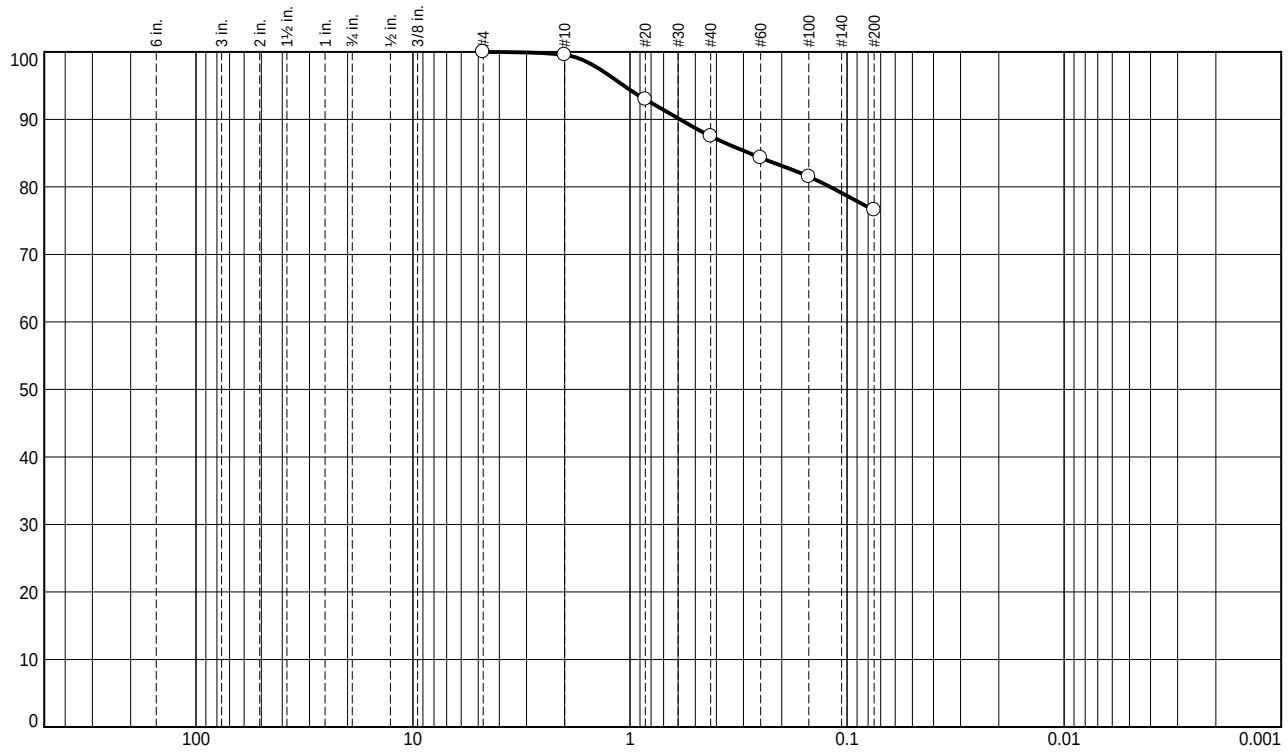
Date Received: *07.05.22*

Reviewed By:

Date Reviewed: *07.12.22*

Particle Size Distribution Report

ASTM D6913



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.4	12.1	10.9	76.6	

Test Results (ASTM D6913)

Sieve Size or Diam. (mm.)	Finer (%)	Spec.* (%)	Out of Spec. (%)	Pct. of Fines
#4	100.0			
#10	99.6			
#20	93.0			
#40	87.5			
#60	84.3			
#100	81.5			
#200	76.6			

* (no specification provided)

Material Description

Dark Gray Organic silt with sand

Atterberg Limits

PL= LL= PI=

Coefficients

D_{90}= 0.5893 D_{85}= 0.2818 D_{60}=
D_{50}= D_{30}= D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= ML AASHTO= A-7-5(13)

Test Remarks

Sample visually classified as plastic. Sample rolled below 1/8".

Source of Sample: Grab/Composite Depth: -
Sample Number: SED-101 Sample Date: 07.07.22

Thielsch Engineering Inc.
Cranston, RI

Client: ESS
Project: Neponset Dredge
Milton, MA
Project No: 22F1147

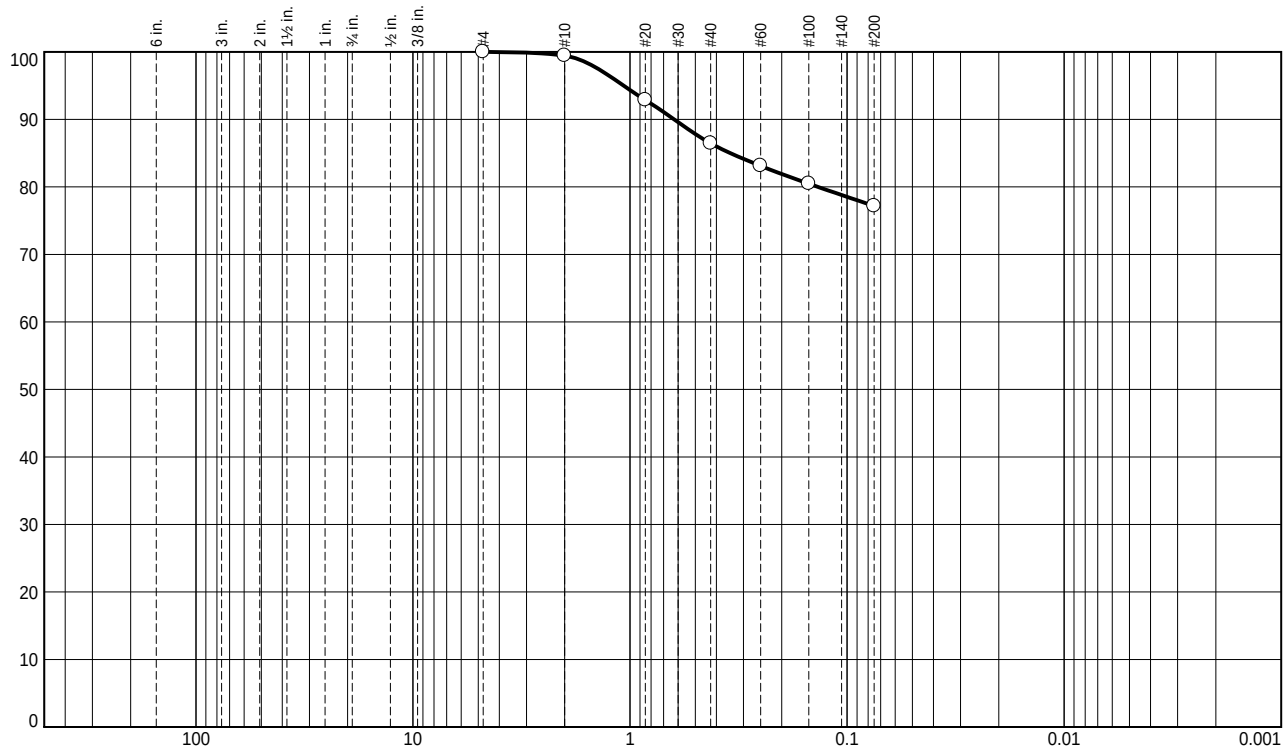
Figure 22F1147-01

Tested By: JB Checked By:

These results are for the exclusive use of the client for whom they were obtained. They apply only to the samples tested and are not indicative of apparently identical samples.

Particle Size Distribution Report

ASTM D6913



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.6	13.0	9.2	77.2	

Test Results (ASTM D6913)

Sieve Size or Diam. (mm.)	Finer (%)	Spec.* (%)	Out of Spec. (%)	Pct. of Fines
#4	100.0			
#10	99.4			
#20	92.9			
#40	86.4			
#60	83.1			
#100	80.5			
#200	77.2			

* (no specification provided)

Material Description

Very Dark Brown Organic silt with sand

Atterberg Limits

PL= LL= PI=

Coefficients

D_{90}= 0.6265 D_{85}= 0.3454 D_{60}=
D_{50}= D_{30}= D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= CL AASHTO= A-7-5(13)

Test Remarks

Sample visually classified as plastic. Sample rolled below 1/8".

Source of Sample: Grab/Composite Depth: -
Sample Number: SED-102 Sample Date: 07.07.22

Thielsch Engineering Inc.
Cranston, RI

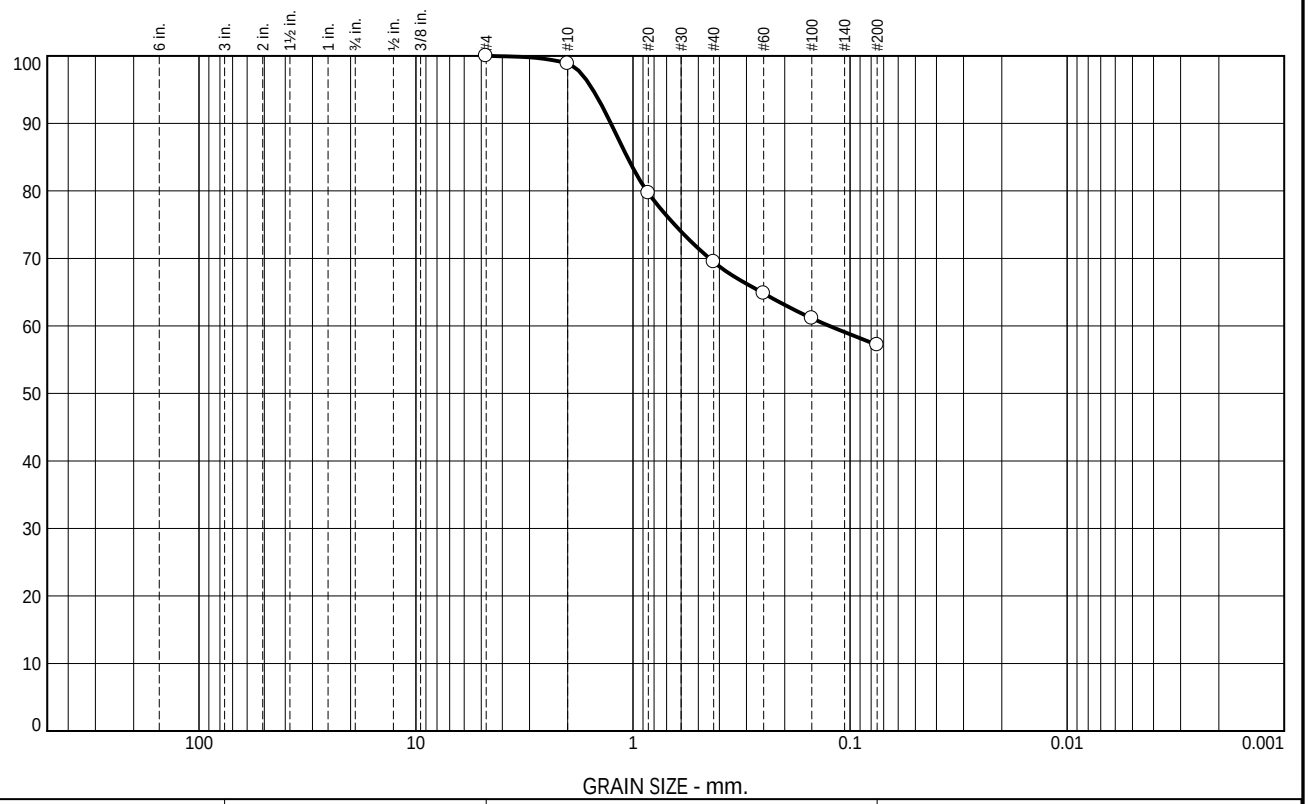
Client: ESS
Project: Neponset Dredge
Milton, MA
Project No: 22F1147

Figure 22F1147-02

Tested By: JB Checked By:

Particle Size Distribution Report

ASTM D6913



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	1.1	29.4	12.3	57.2	

Test Results (ASTM D6913)

Sieve Size or Diam. (mm.)	Finer (%)	Spec.* (%)	Out of Spec. (%)	Pct. of Fines
#4	100.0			
#10	98.9			
#20	79.7			
#40	69.5			
#60	64.8			
#100	61.1			
#200	57.2			

* (no specification provided)

Material Description

Very Dark Brown Organic sandy silt

Atterberg Limits

PL= LL= PI=

Coefficients

D_{90}= 1.2657 D_{85}= 1.0622 D_{60}= 0.1247
D_{50}= D_{30}= D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= CL AASHTO= A-7-5(7)

Test Remarks

Sample visually classified as plastic. Sample rolled below 1/8".

Source of Sample: Grab/Composite Depth: -
Sample Number: SED-103 Sample Date: 07.07.22

Thielsch Engineering Inc.

Cranston, RI

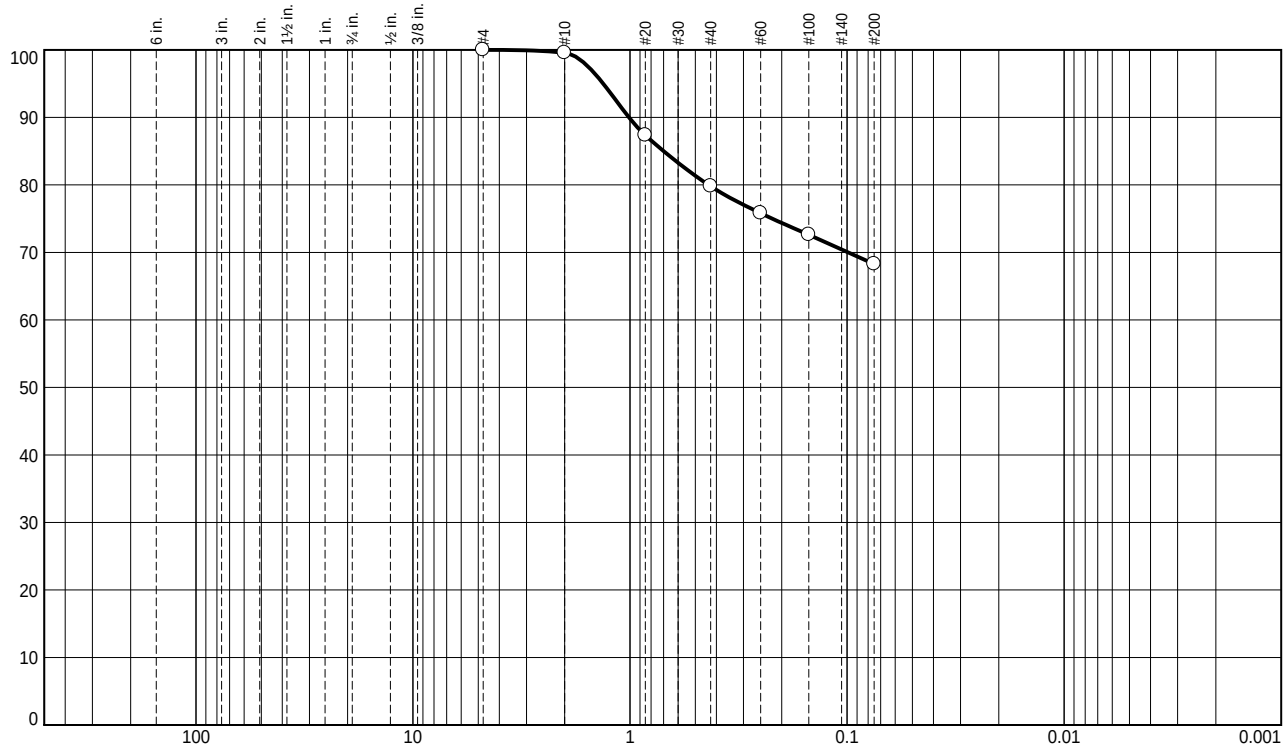
Client: ESS
Project: Neponset Dredge
Milton, MA
Project No: 22F1147

Figure 22F1147-03

Tested By: JB Checked By:

Particle Size Distribution Report

ASTM D6913



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.4	19.8	11.5	68.3	

Test Results (ASTM D6913)

Sieve Size or Diam. (mm.)	Finer (%)	Spec.* (%)	Out of Spec. (%)	Pct. of Fines
#4	100.0			
#10	99.6			
#20	87.4			
#40	79.8			
#60	75.8			
#100	72.6			
#200	68.3			

* (no specification provided)

Material Description

Very Dark Brown Organic sandy silt

Atterberg Limits

PL= LL= PI=

Coefficients

D_{90}= 1.0108 D_{85}= 0.7001 D_{60}=
D_{50}= D_{30}= D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= CL AASHTO= A-7-5(10)

Test Remarks

Sample visually classified as plastic. Sample rolled below 1/8".

Source of Sample: Grab/Composite Depth: -
Sample Number: SED-105 Sample Date: 07.07.22

Thielsch Engineering Inc.

Cranston, RI

Client: ESS
Project: Neponset Dredge
Milton, MA
Project No: 22F1147

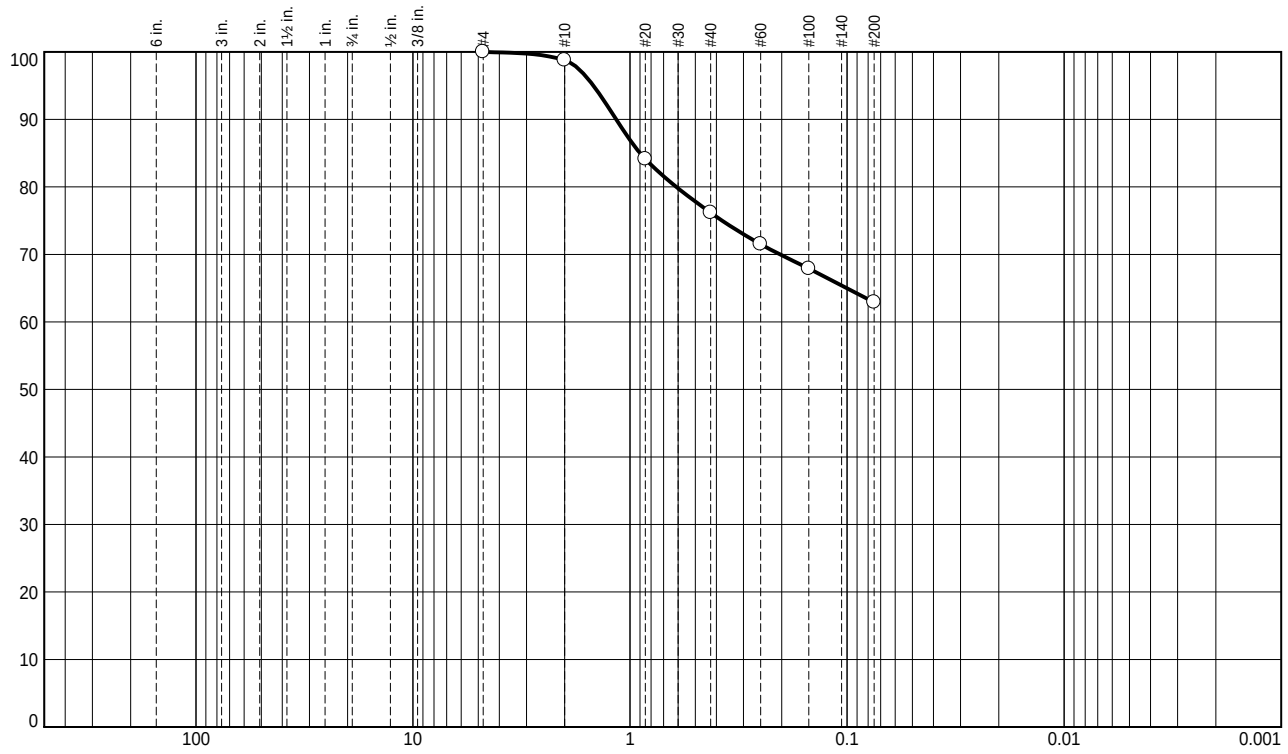
Figure 22F1147-05

Tested By: JB Checked By:

These results are for the exclusive use of the client for whom they were obtained. They apply only to the samples tested and are not indicative of apparently identical samples.

Particle Size Distribution Report

ASTM D6913



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	1.2	22.6	13.3	62.9	

Test Results (ASTM D6913)

Sieve Size or Diam. (mm.)	Finer (%)	Spec.* (%)	Out of Spec. (%)	Pct. of Fines
#4	100.0			
#10	98.8			
#20	84.1			
#40	76.2			
#60	71.5			
#100	67.9			
#200	62.9			

* (no specification provided)

Material Description

Dark Gray Organic sandy silt

Atterberg Limits

PL= LL= PI=

Coefficients

D_{90}= 1.1585 D_{85}= 0.8993 D_{60}=
D_{50}= D_{30}= D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= CL AASHTO= A-7-5(9)

Test Remarks

Sample visually classified as plastic. Sample rolled below 1/8".

Source of Sample: Grab/Composite Depth: -
Sample Number: SED-106 Sample Date: 07.07.22

Thielsch Engineering Inc.
Cranston, RI

Client: ESS
Project: Neponset Dredge
Milton, MA
Project No: 22F1147

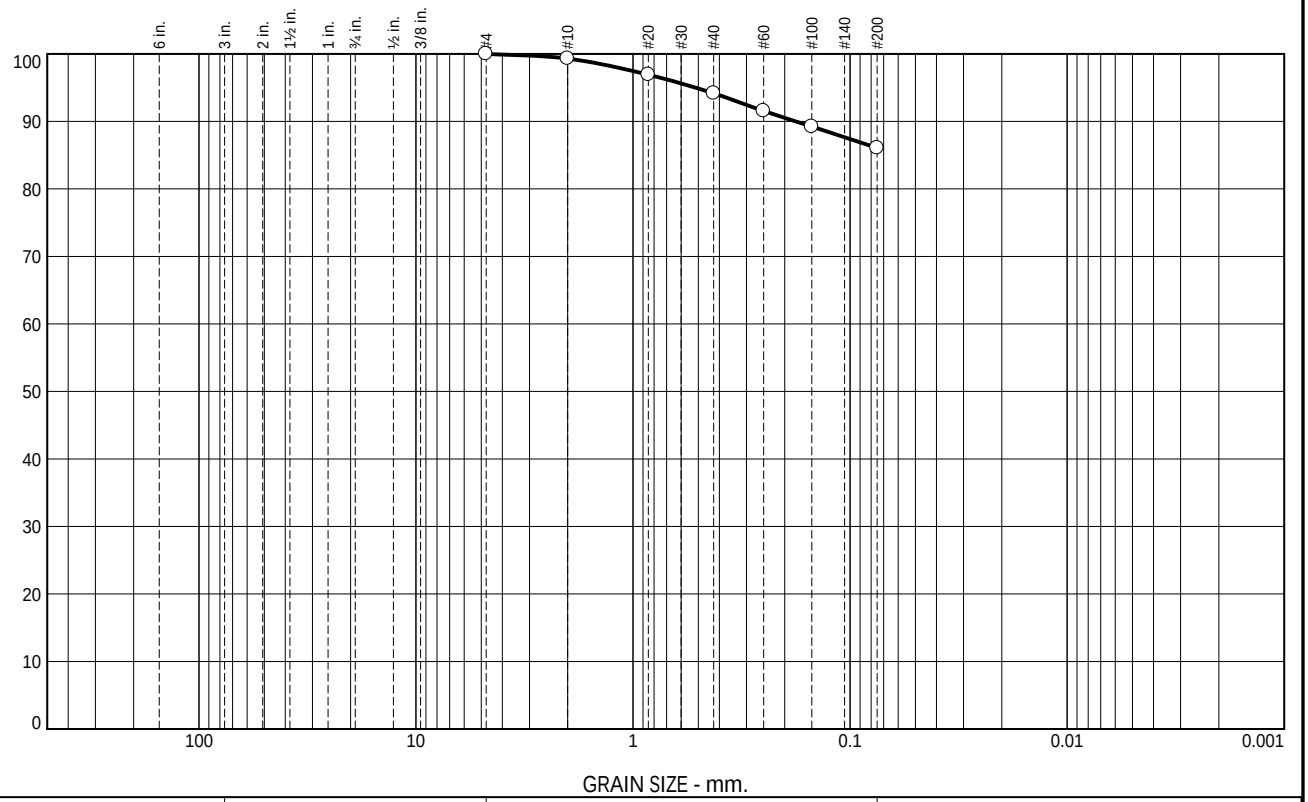
Figure 22F1147-06

Tested By: JB Checked By:

These results are for the exclusive use of the client for whom they were obtained. They apply only to the samples tested and are not indicative of apparently identical samples.

Particle Size Distribution Report

ASTM D6913



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.7	5.1	8.1	86.1	

Test Results (ASTM D6913)

Sieve Size or Diam. (mm.)	Finer (%)	Spec.* (%)	Out of Spec. (%)	Pct. of Fines
#4	100.0			
#10	99.3			
#20	96.9			
#40	94.2			
#60	91.5			
#100	89.2			
#200	86.1			

* (no specification provided)

Material Description

Dark Gray Organic silt

Atterberg Limits

PL= LL= PI=

Coefficients

D_{90}= 0.1782 D_{85}= D_{60}=
D_{50}= D_{30}= D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= CL AASHTO= A-7-5(15)

Test Remarks

Sample visually classified as plastic. Sample rolled below 1/8".

Source of Sample: Grab/Composite Depth: -
Sample Number: SED-107 Sample Date: 07.07.22

Thielsch Engineering Inc.

Cranston, RI

Client: ESS
Project: Neponset Dredge
Milton, MA
Project No: 22F1147

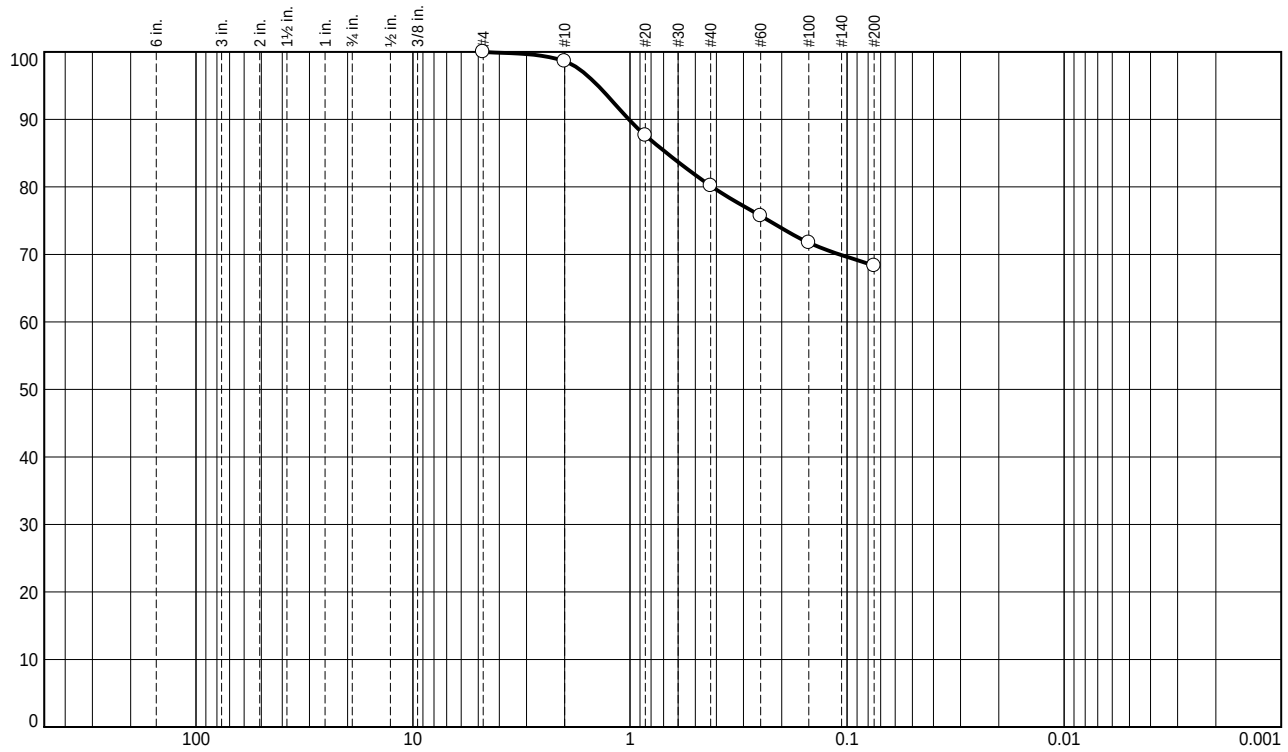
Figure 22F1147-07

Tested By: JB Checked By:

These results are for the exclusive use of the client for whom they were obtained. They apply only to the samples tested and are not indicative of apparently identical samples.

Particle Size Distribution Report

ASTM D6913



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	1.4	18.5	11.8	68.3	

Test Results (ASTM D6913)

Sieve Size or Diam. (mm.)	Finer (%)	Spec.* (%)	Out of Spec. (%)	Pct. of Fines
#4	100.0			
#10	98.6			
#20	87.6			
#40	80.1			
#60	75.7			
#100	71.7			
#200	68.3			

* (no specification provided)

Material Description

Dark Gray Organic sandy silt

Atterberg Limits

PL= LL= PI=

Coefficients

D_{90}= 1.0128 D_{85}= 0.6765 D_{60}=
D_{50}= D_{30}= D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= CL AASHTO= A-7-5(10)

Test Remarks

Sample visually classified as plastic. Sample rolled below 1/8".

Source of Sample: Grab/Composite Depth: -
Sample Number: SED-108 Sample Date: 07.07.22

Thielsch Engineering Inc.
Cranston, RI

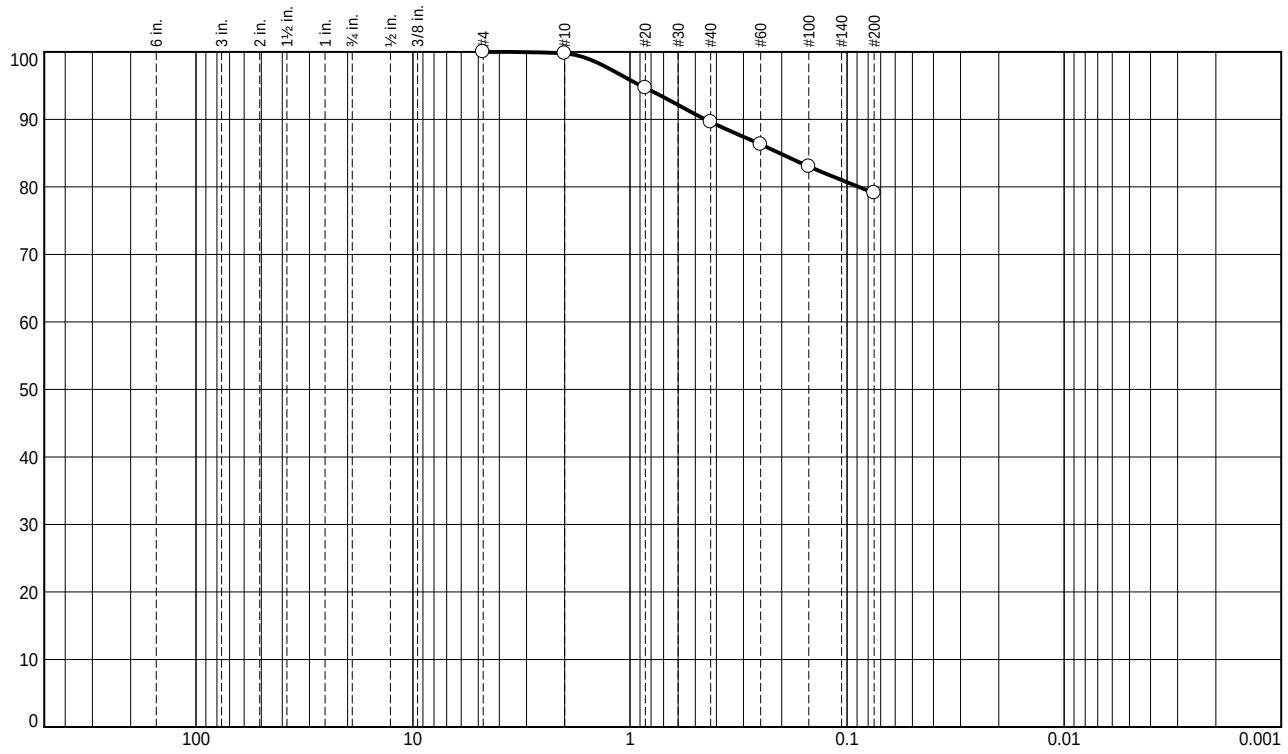
Client: ESS
Project: Neponset Dredge
Milton, MA
Project No: 22F1147

Figure 22F1147-08

Tested By: JB Checked By:

Particle Size Distribution Report

ASTM D6913



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.2	10.2	10.5	79.1	

Test Results (ASTM D6913)

Sieve Size or Diam. (mm.)	Finer (%)	Spec.* (%)	Out of Spec. (%)	Pct. of Fines
#4	100.0			
#10	99.8			
#20	94.7			
#40	89.6			
#60	86.3			
#100	83.0			
#200	79.1			

* (no specification provided)

Material Description

Dark Gray Organic silt with sand

Atterberg Limits

PL= LL= PI=

Coefficients

D_{90}= 0.4498 D_{85}= 0.2045 D_{60}=
D_{50}= D_{30}= D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= CL AASHTO= A-7-5(13)

Test Remarks

Sample visually classified as plastic. Sample rolled below 1/8".

Source of Sample: Grab/Composite Depth: -
Sample Number: SED-109 Sample Date: 07.07.22

Thielsch Engineering Inc.
Cranston, RI

Client: ESS
Project: Neponset Dredge
Milton, MA
Project No: 22F1147

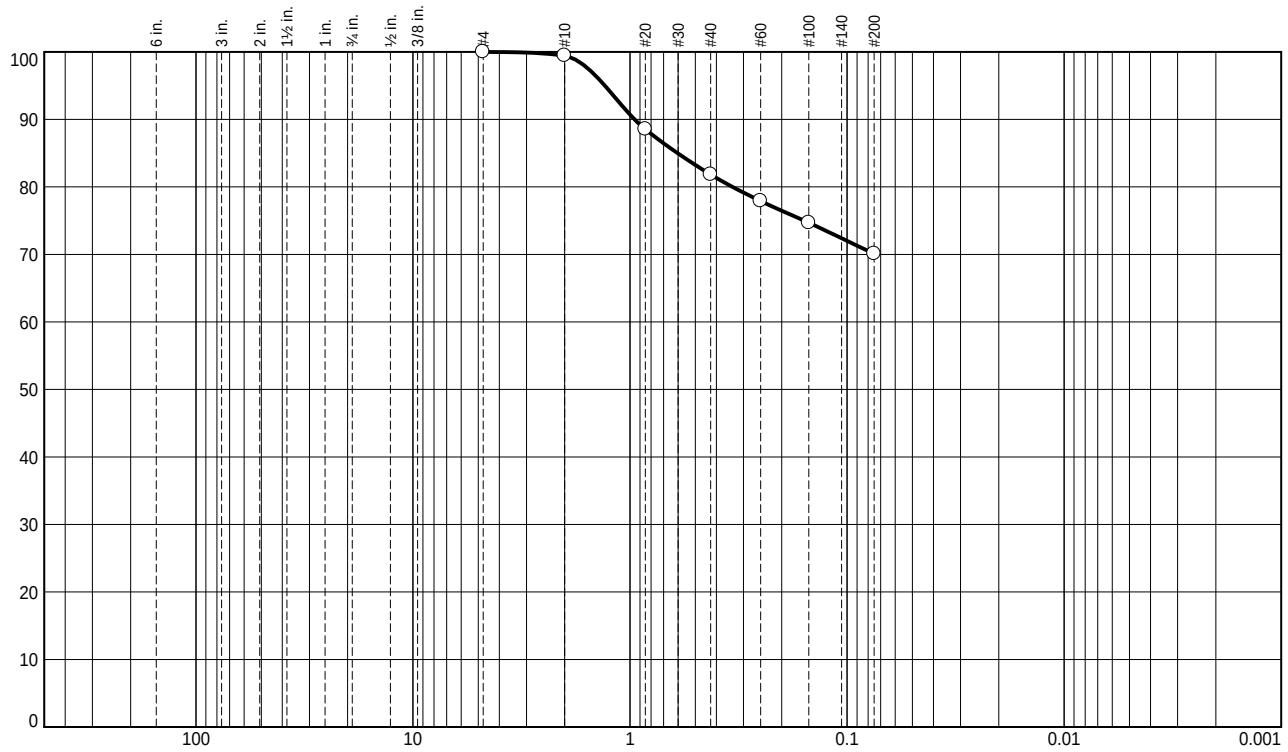
Figure 22F1147-09

Tested By: JB Checked By:

These results are for the exclusive use of the client for whom they were obtained. They apply only to the samples tested and are not indicative of apparently identical samples.

Particle Size Distribution Report

ASTM D6913



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.6	17.6	11.7	70.1	

Test Results (ASTM D6913)

Sieve Size or Diam. (mm.)	Finer (%)	Spec.* (%)	Out of Spec. (%)	Pct. of Fines
#4	100.0			
#10	99.4			
#20	88.5			
#40	81.8			
#60	77.9			
#100	74.7			
#200	70.1			

* (no specification provided)

Material Description

Dark Gray Organic sandy silt

Atterberg Limits

PL= LL= PI=

Coefficients

D_{90}= 0.9531 D_{85}= 0.6045 D_{60}=
D_{50}= D_{30}= D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= CL AASHTO= A-7-5(11)

Test Remarks

Sample visually classified as plastic. Sample rolled below 1/8".

Source of Sample: Grab/Composite Depth: -
Sample Number: SED-110 Sample Date: 07.07.22

Thielsch Engineering Inc.

Cranston, RI

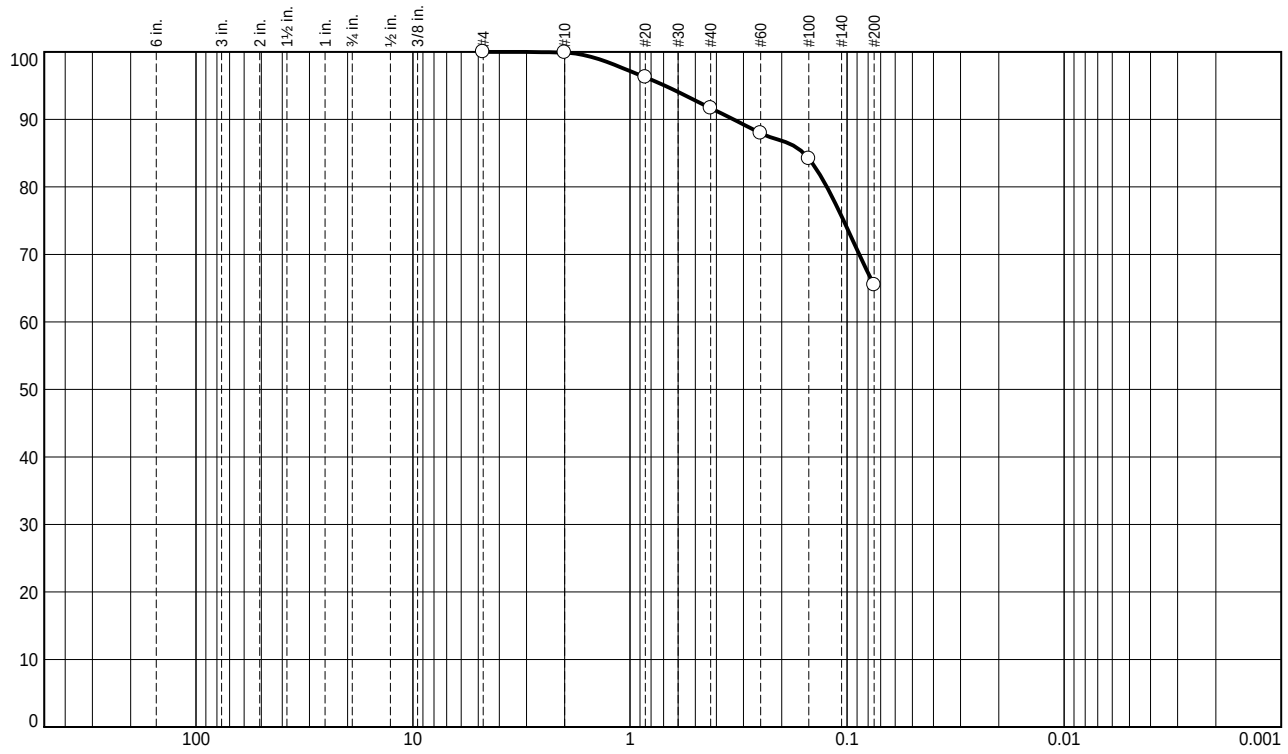
Client: ESS
Project: Neponset Dredge
Milton, MA
Project No: 22F1147

Figure 22F1147-10

Tested By: JB Checked By:

Particle Size Distribution Report

ASTM D6913



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.1	8.2	26.2	65.5	

Test Results (ASTM D6913)

Sieve Size or Diam. (mm.)	Finer (%)	Spec.* (%)	Out of Spec. (%)	Pct. of Fines
#4	100.0			
#10	99.9			
#20	96.2			
#40	91.7			
#60	87.9			
#100	84.2			
#200	65.5			

* (no specification provided)

Material Description

Dark Gray Organic sandy silt

Atterberg Limits

PL= LL= PI=

Coefficients

D_{90}= 0.3342 D_{85}= 0.1584 D_{60}=
D_{50}= D_{30}= D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= ML AASHTO= A-7-5(10)

Test Remarks

Sample visually classified as plastic. Sample rolled below 1/8".

Source of Sample: Grab/Composite Depth: -
Sample Number: SED-111 Sample Date: 07.07.22

Thielsch Engineering Inc.

Cranston, RI

Client: ESS
Project: Neponset Dredge
Milton, MA
Project No: 22F1147

Figure 22F1147-11

Tested By: JB Checked By:

ESS Laboratory Sample and Cooler Receipt Checklist

Client: Tighe & Bond - KPB/TB

Shipped/Delivered Via: ESS Courier

ESS Project ID: 22F1147
Date Received: 6/30/2022
Project Due Date: 7/8/2022
Days for Project: 5 Day

1. Air bill manifest present? No
   Air No.: NA
2. Were custody seals present? No
3. Is radiation count <100 CPM? Yes
4. Is a Cooler Present? Yes
   Temp: 3.1 Iced with: Ice
5. Was COC signed and dated by client? Yes

6. Does COC match bottles? ~~Yes~~ No (initials 6/30/22)
7. Is COC complete and correct? Yes
8. Were samples received intact? Yes
9. **Were labs informed about short holds & rushes?** Yes / No / (NA)
10. Were any analyses received outside of hold time? Yes / (No)

11. Any Subcontracting needed? (Yes) / No
    ESS Sample IDs: 1-11
    Analysis: Grain Size
    TAT: 5 day

12. Were VOAs received? (Yes) / No
    a. Air bubbles in aqueous VOAs? Yes / No
    b. Does methanol cover soil completely? (Yes) / No / NA

13. Are the samples properly preserved? (Yes) / No
    a. If metals preserved upon receipt: Date: Time: By/Acid Lot#:
    b. Low Level VOA vials frozen: Date: ~~6/30/22~~ 6/29/22 Time: ~~2015~~ 1400 By: ~~[initials]~~ Client (initials 6/30/22)
    ~~"within 48 hours" per COC~~

Sample Receiving Notes:

COC = SED-104 collected 1155; Caps = SED-103 collected 1155 (all jars except -435). 2oz jar for SED-105 = SED-104.

14. Was there a need to contact Project Manager? Yes / (No)
    a. Was there a need to contact the client? (Yes) / No
    Who was contacted? Emma Larkin Date: 7/1/22 Time: By: hdm

Resolution:

Use IDs from COC - LL vials frozen 6/29 by client

Sample Number	Container ID	Proper Container	Air Bubbles Present	Sufficient Volume	Container Type	Preservative	Record pH (Cyanide and 608 Pesticides)
1	310426	Yes	N/A	Yes	8 oz jar	NP	
1	310427	Yes	N/A	Yes	8 oz jar	NP	
1	310428	Yes	N/A	Yes	8 oz jar	NP	
1	310459	Yes	N/A	Yes	4 oz. Jar	NP	
1	310470	Yes	N/A	Yes	2 oz. Jar	NP	
1	310481	Yes	N/A	Yes	VOA Vial	DI Water	
1	310482	Yes	N/A	Yes	VOA Vial	DI Water	
1	310503	Yes	N/A	Yes	VOA Vial	MeOH	
2	310429	Yes	N/A	Yes	8 oz jar	NP	
2	310430	Yes	N/A	Yes	8 oz jar	NP	
2	310431	Yes	N/A	Yes	8 oz jar	NP	
2	310460	Yes	N/A	Yes	4 oz. Jar	NP	
2	310471	Yes	N/A	Yes	2 oz. Jar	NP	
2	310483	Yes	N/A	Yes	VOA Vial	DI Water	
2	310484	Yes	N/A	Yes	VOA Vial	DI Water	
2	310504	Yes	N/A	Yes	VOA Vial	MeOH	
3	310432	Yes	N/A	Yes	8 oz jar	NP	

ESS Laboratory Sample and Cooler Receipt Checklist

Client: Tighe & Bond - KPB/TB

ESS Project ID: 22F1147

Date Received: 6/30/2022

3	310433	Yes	N/A	Yes	8 oz jar	NP
3	310434	Yes	N/A	Yes	8 oz jar	NP
3	310461	Yes	N/A	Yes	4 oz. Jar	NP
3	310472	Yes	N/A	Yes	2 oz. Jar	NP
3	310485	Yes	N/A	Yes	VOA Vial	DI Water
3	310486	Yes	N/A	Yes	VOA Vial	DI Water
3	310505	Yes	N/A	Yes	VOA Vial	MeOH
4	310435	Yes	N/A	Yes	8 oz jar	NP
4	310436	Yes	N/A	Yes	8 oz jar	NP
4	310437	Yes	N/A	Yes	8 oz jar	NP
4	310462	Yes	N/A	Yes	4 oz. Jar	NP
4	310473	Yes	N/A	Yes	2 oz. Jar	NP
4	310487	Yes	N/A	Yes	VOA Vial	DI Water
4	310488	Yes	N/A	Yes	VOA Vial	DI Water
4	310506	Yes	N/A	Yes	VOA Vial	MeOH
5	310438	Yes	N/A	Yes	8 oz jar	NP
5	310439	Yes	N/A	Yes	8 oz jar	NP
5	310440	Yes	N/A	Yes	8 oz jar	NP
5	310463	Yes	N/A	Yes	4 oz. Jar	NP
5	310474	Yes	N/A	Yes	2 oz. Jar	NP
5	310489	Yes	N/A	Yes	VOA Vial	DI Water
5	310490	Yes	N/A	Yes	VOA Vial	DI Water
5	310507	Yes	N/A	Yes	VOA Vial	MeOH
6	310441	Yes	N/A	Yes	8 oz jar	NP
6	310442	Yes	N/A	Yes	8 oz jar	NP
6	310443	Yes	N/A	Yes	8 oz jar	NP
6	310464	Yes	N/A	Yes	4 oz. Jar	NP
6	310475	Yes	N/A	Yes	2 oz. Jar	NP
6	310491	Yes	N/A	Yes	VOA Vial	DI Water
6	310492	Yes	N/A	Yes	VOA Vial	DI Water
6	310508	Yes	N/A	Yes	VOA Vial	MeOH
7	310444	Yes	N/A	Yes	8 oz jar	NP
7	310445	Yes	N/A	Yes	8 oz jar	NP
7	310446	Yes	N/A	Yes	8 oz jar	NP
7	310465	Yes	N/A	Yes	4 oz. Jar	NP
7	310476	Yes	N/A	Yes	2 oz. Jar	NP
7	310493	Yes	N/A	Yes	VOA Vial	DI Water
7	310494	Yes	N/A	Yes	VOA Vial	DI Water
7	310509	Yes	N/A	Yes	VOA Vial	MeOH
8	310447	Yes	N/A	Yes	8 oz jar	NP
8	310448	Yes	N/A	Yes	8 oz jar	NP
8	310449	Yes	N/A	Yes	8 oz jar	NP
8	310466	Yes	N/A	Yes	4 oz. Jar	NP
8	310477	Yes	N/A	Yes	2 oz. Jar	NP
8	310495	Yes	N/A	Yes	VOA Vial	DI Water
8	310496	Yes	N/A	Yes	VOA Vial	DI Water
8	310510	Yes	N/A	Yes	VOA Vial	MeOH
9	310450	Yes	N/A	Yes	8 oz jar	NP
9	310451	Yes	N/A	Yes	8 oz jar	NP
9	310452	Yes	N/A	Yes	8 oz jar	NP
9	310467	Yes	N/A	Yes	4 oz. Jar	NP
9	310478	Yes	N/A	Yes	2 oz. Jar	NP
9	310497	Yes	N/A	Yes	VOA Vial	DI Water

ESS Laboratory Sample and Cooler Receipt Checklist

Client: Tighe & Bond - KPB/TB

ESS Project ID: 22F1147
Date Received: 6/30/2022

9	310498	Yes	N/A	Yes	VOA Vial	DI Water
9	310511	Yes	N/A	Yes	VOA Vial	MeOH
10	310453	Yes	N/A	Yes	8 oz jar	NP
10	310454	Yes	N/A	Yes	8 oz jar	NP
10	310455	Yes	N/A	Yes	8 oz jar	NP
10	310468	Yes	N/A	Yes	4 oz. Jar	NP
10	310479	Yes	N/A	Yes	2 oz. Jar	NP
10	310499	Yes	N/A	Yes	VOA Vial	DI Water
10	310500	Yes	N/A	Yes	VOA Vial	DI Water
10	310512	Yes	N/A	Yes	VOA Vial	MeOH
11	310456	Yes	N/A	Yes	8 oz jar	NP
11	310457	Yes	N/A	Yes	8 oz jar	NP
11	310458	Yes	N/A	Yes	8 oz jar	NP
11	310469	Yes	N/A	Yes	4 oz. Jar	NP
11	310480	Yes	N/A	Yes	2 oz. Jar	NP
11	310501	Yes	N/A	Yes	VOA Vial	DI Water
11	310502	Yes	N/A	Yes	VOA Vial	DI Water
11	310513	Yes	N/A	Yes	VOA Vial	MeOH

2nd Review

Were all containers scanned into storage/lab? Initials KL

Are barcode labels on correct containers? Yes / No

Are all Flashpoint stickers attached/container ID # circled? Yes / No / NA

Are all Hex Chrome stickers attached? Yes / No / NA

Are all QC stickers attached? Yes / No / NA

Are VOA stickers attached if bubbles noted? Yes / No / NA

Completed By: KL Date & Time: 6-30-22 1956

Reviewed By: [signature] Date & Time: 6/30/22 2020

185 Frances Avenue
Cranston, RI 02910
Phone: 401-461-7181
Fax: 401-461-4486
www.esslaboratory.com

CHAIN OF CUSTODY

ESS Lab # 22P1147 | Page 1 of 2

Turn Time (Days): ☐ > 5 ☑ 5 ☐ 4 ☐ 3 ☐ 2 ☐ 1 ☐ Same Day

Regulatory State: MA **Criteria:** 401 WQC / <RCS-1 / Aggregate Saugu

Is this project for any of the following?:
☐ CT RCP ☐ MA MCP ☐ RGP ☐ Permit ☑ 401 WQ

ELECTRONIC DELIVERABLES (Final Reports are PDF)
☑ Limit Checker ☐ State Forms ☐ EQuIS
☑ Excel ☐ Hard Copy ☑ Enviro Data
☐ CLP-Like Package ☐ Other (Specify) →

CLIENT INFORMATION

Client: Tighe & Bond
Address: 4 Barlows Landing Road, Unit 15
Pocasset, MA 02559
Phone: 401-440-9342

Email Distribution List: Ghedman@tighebond.com, Elarkin@tighebond.com, JLLibby@tigheBond.com

PROJECT INFORMATION

Project Name: Neponset Dredge
Project Location: Milton, MA
Project Number: M5087-003
Project Manager: G. Hedman
Bill to: Tighe & Bond
PO#: N/A
Quote#: Neponset River

Client acknowledges that sampling is compliant with all EPA / State regulatory programs

REQUESTED ANALYSES

ESS Lab ID	Collection Date	Collection Time	Sample Type	Sample Matrix	Sample ID	VOCs- low level ~~(hold)~~ JA	VOCs- high level 7/5/22	Metals*	PCB NOAA Congeners	TOC - Loyd Kahn	EPH with PAH	Grain Size	Percent Water	Total PCBs (hold)								Total Number of Bottles
1	6/28/2022	11:13	Grab/Composite	Sediment	SED-101	X	X	X	X	X	X	X	X									8
2	6/28/2022	11:25	Grab/Composite	Sediment	SED-102	X	X	X	X	X	X	X	X									8
3	6/28/2022	11:37	Grab/Composite	Sediment	SED-103	X	X	X	X	X	X	X	X									8
4	~~6/28/2022~~	~~11:55~~	~~Grab/Composite~~	~~Sediment~~	~~SED-104~~		~~X~~	~~X~~	~~X~~	~~X~~	~~X~~	~~X~~	~~X~~		hdm 7/1/22							8
5	6/28/2022	12:10	Grab/Composite	Sediment	SED-105	X	X	X	X	X	X	X	X									8
6	6/28/2022	9:51	Grab/Composite	Sediment	SED-106	X	X	X	X	X	X	X	X									8
7	6/28/2022	10:06	Grab/Composite	Sediment	SED-107	X	X	X	X	X	X	X	X									8
8	6/28/2022	13:25	Grab/Composite	Sediment	SED-108	X	X	X	X	X	X	X	X									8
9	6/28/2022	10:55	Grab/Composite	Sediment	SED-109	X	X	X	X	X	X	X	X									8
10	6/28/2022	13:38	Grab/Composite	Sediment	SED-110	X	X	X	X	X	X	X	X									8
Container Type:	AC-Air Cassette AG-Amber Glass B-BOD Bottle C-Cubitainer J-Jar O-Other P-Poly S-Sterile V-Vial					V	V	AG	AG	AG	AG	AG	AG	AG								
Container Volume:	1-100 mL 2-2.5 gal 3-250 mL 4-300 mL 5-500 mL 6-1L 7-VOA 8-2 oz 9-4 oz 10-8 oz 11-Other*					7	7	10	10	10	10	10	10	10								80
Preservation Code:	1-Non Preserved 2-HCl 3-H2SO4 4-HNO3 5-NaOH 6-Methanol 7-Na2S2O3 8-ZnAce, NaOH 9-NH4Cl 10-DI H2O 11-Other*					11	11	1	1	1	1	1	1	1								

Sampled by : J.Perry/E.Larkin

Chain needs to be filled out neatly and completely for on time delivery.

Laboratory Use Only
Cooler Temperature (°C): 3.1 / 1 a

Comments: * Please specify "Other" preservative and containers types in this space
*Metals: arsenic, cadmium, chromium, copper, lead, mercury, nickel, zinc, voc sample was a grab; run Hx Cr if total Cr>100 mg/kg; run TCLP if 20X rule is exceeded; provide results in envirodata format; other: 2 DI vials, 1 MeOH via; vials frozen within 48 hours Frozen 6/29/22 @ 2pm

All samples submitted are subject to ESS Laboratory's payment terms and conditions.

Dissolved Filtration
☐ Lab Filter

Relinquished by (Signature)	Date	Time	Received by (Signature)	Relinquished by (Signature)	Date	Time	Received by (Signature)
	6/29/22	15:31	6/30/22 12:05		6/30/22	18:14	
Relinquished by (Signature)	**Date**	**Time**	**Received by (Signature)**	**Relinquished by (Signature)**	**Date**	**Time**	**Received by (Signature)**

185 Frances Avenue
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www.esslaboratory.com

CHAIN OF CUSTODY

ESS Lab # 22F1147 | Page 2 of 2

Turn Time: ☐ > 5 ☑ 5 ☐ 4 ☐ 3 ☐ 2 ☐ 1 ☐ Same Day

Regulatory State: MA **Criteria:** 401 WQC / <RCS-1 / Aggregate Sa

Is this project for any of the following?: ☐ CT RCP ☐ MA MCP ☐ RGP ☐ Permit ☑ 401 WQ

ELECTRONIC DELIVERABLES (Final Reports are PDF)

☑ Limit Checker ☐ State Forms ☐ EQuIS
☑ Excel ☐ Hard Copy ☑ Enviro Data
☐ CLP-Like Package ☐ Other (Specify) →

CLIENT INFORMATION

Client: Tighe & Bond
Address: 4 Barlows Landing Road, Unit 15
Phone: 401-440-9342
Email Distribution List: Ghedman@tighebond.com Elarkin@tighebond.com JLLibby@tigheBond.com

PROJECT INFORMATION

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Bill to: Tighe & Bond
PO#: N/A
Quote#: Neponset River

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REQUESTED ANALYSES

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11	6/28/2022	13:12	Grab/Composite	Sediment	SED-111	X	X	X	X	X	X	X	X		8
Container Type:	AC-Air Cassette AG-Amber Glass B-BOD Bottle C-Cubitainer J-Jar O-Other P-Poly S-Sterile V-Vial					V	V	AG	AG	AG	AG	AG	AG	AG	
Container Volume:	1-100 mL 2-2.5 gal 3-250 mL 4-300 mL 5-500 mL 6-1L 7-VOA 8-2 oz 9-4 oz 10-8 oz 11-Other*					7	7	10	10	10	10	10	10	10	8
Preservation Code:	1-Non Preserved 2-HCl 3-H2SO4 4-HNO3 5-NaOH 6-Methanol 7-Na2S2O3 8-ZnAce, NaOH 9-NH4Cl 10-DI H2O 11-Other*					11	11	1	1	1	1	1	1	1	

Sampled by : J.Perry/E.Larkin

Chain needs to be filled out neatly and completely for on time delivery.

Laboratory Use Only
Cooler Temperature (°C): 3.1 / 1C

Comments: * Please specify "Other" preservative and containers types in this space
*Metals: arsenic, cadmium, chromium, copper, lead, mercury, nickel, zinc, voc sample was a grab; run Hx Cr if total Cr>100 mg/kg; run TCLP if 20X rule is exceeded; provide results in envirodata format; other: 2 DI vials, 1 MeOH via; vials frozen within 48 hours Frozen 6/29/22 @ 2pm (hdm 7/1/22)

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Dissolved Filtration
☐ Lab Filter

Relinquished by (Signature)	Date	Time	Received by (Signature)	Relinquished by (Signature)	Date	Time	Received by (Signature)
	6/29/22	1513	6/30/22 10:05		6/30/22	18:4	
Relinquished by (Signature)	Date	Time	Received by (Signature)	Relinquished by (Signature)	Date	Time	Received by (Signature)

Appendix D

1. This report has been prepared on behalf of and for the exclusive use of the Client and is subject to and issued in accordance with the Agreement and the provisions thereof. Documents provided on this project shall not, in whole or in part, be disseminated or conveyed to any other party, nor used by any other party without the prior written consent of Tighe & Bond. Reuse of documents by Client or others without Tighe & Bond's written permission and mutual agreement shall be at the user's sole risk, without liability on Tighe & Bond's part and Client agrees to indemnify and hold Tighe & Bond harmless from all claims, damages, and expenses, including attorney's fees, arising out of such unauthorized use or reuse.

2. Tighe & Bond acknowledges and agrees that, subject to the Limitations set forth herein and prior written approval by Tighe & Bond, this report may be provided to specific financial institutions, attorneys, title insurers, lessees and/or governmental agencies identified by Client at or about the time of issuance of the report in connection with the conveyance, mortgaging, leasing, or similar transaction involving the real property which is the subject matter of a report and any work product. Use of this report for any purpose by any persons, firm, entity, or governmental agency shall be deemed acceptance of the restrictions and conditions contained therein, these Limitations and the provisions of Tighe & Bond's Agreement with Client. No warranty, express or implied, is made by way of Tighe & Bond's performance of services or providing an environmental site assessment, including but not limited to any warranty with the contents of a report or with any and all work product.

3. Tighe & Bond performed the subsurface investigation in accordance with our Agreement (including any stated scope and schedule limitations) and used the degree of care and skill ordinarily exercised under similar circumstances by members of the profession practicing in the same or similar locality. The objective of a subsurface investigation is to evaluate the presence or absence of contamination. Where access was denied or conditions obscured, Tighe & Bond provides no opinion or report on such areas. The subsurface investigation may not identify all contaminated media as our scope may be limited to certain locations within a site or due to geologic variability, contamination variability, seasonal conditions, obstructions such as buildings, utilities, or other site features and/or other unknown conditions. Tighe & Bond performed the subsurface investigation using reasonable methods to access and identify the presence of contaminated media. Therefore, additional contaminated media may be present at the site and may be discovered during development and site work, so an appropriate cost contingency should be carried by the Client based on their risk tolerance. Tighe & Bond also makes no opinion or report of contamination that may have migrated off site unless off-site investigations are specifically including in the scope of services.

4. Findings, observations, and conclusions presented in this report, including but not limited to the extent of any subsurface explorations or other tests performed by Tighe & Bond, are limited by the scope of services outlined in the Agreement, which may establish schedule and/or budgetary constraints for an environmental assessment or phase thereof. Furthermore, while it is anticipated that each assessment will be performed in accordance with generally accepted professional practices and applicable standards (such as ASTM, etc.) and applicable state and Federal regulations, as may be further described in the report and/or the Agreement, Tighe & Bond does not assume responsibility for the impacts of any changes in environmental standards, practices, or regulations subsequent to performance of its services.

5. In preparing this report, Tighe & Bond, Inc. may have relied on certain information provided by governmental agencies or personnel as well as information and/or representations provided by other persons, firms, or entities, and on information in the files of governmental agencies made available to Tighe & Bond at the time of the site assessment. To the extent that such information, representations, or files may be inaccurate, missing, incomplete or not provided to Tighe & Bond, Tighe & Bond is not responsible. Although there may be some degree of overlap in the information provided by these various sources, Tighe & Bond does not assume responsibility for independently verifying the accuracy, authenticity, or completeness of any and all information reviewed by or received from others during the course of the site assessment.

6. The assessment presented is based solely upon information obtained or received prior to issuance of the report. If additional environmental or other relevant information is developed at a later date, Client agrees to bring such information to the attention of Tighe & Bond promptly. Upon evaluation of such information, Tighe & Bond reserves the right to recommend modification of this report and its conclusions. In addition, dense forested areas on the site created some visual and access limitations during the site reconnaissance.

7. Emerging contaminants, including per- and poly-fluorinated alkyl substances (PFAS), are hazardous materials or mixtures (including naturally occurring or manmade chemical, microbial, or radiological substances) that are characterized by having a perceived or real threat to human health, public safety, or the environment for which there are no published health standards or guidelines and there is insufficient or limited available toxicological information or toxicity information that is evolving or being re-evaluated; or there is not significant new source, pathway, or detection limit information. The state of these compounds is constantly being updated and therefore, Tighe & Bond cannot be held liable for not including these compounds in the list of analytes that are analyzed when our services are performed. Unless otherwise specified, Tighe & Bond will only analyze for compounds ordinarily included under similar circumstances by members of the profession practicing in the same or similar locality. Tighe & Bond will not be liable for not including these or any other compounds in the list of target analytes if information regarding their use is not made available by current or former operators/owners at the facility being evaluated. We will also not be liable for not analyzing for the presence of an emerging contaminant, even if that compound is detected at a later date.

8. Tighe & Bond makes no guarantee or warranty that this report (if provided to a regulatory agency) will pass a regulatory audit/review. The Licensed Site Professional (LSP), Licensed Environmental Professional (LEP), Professional Geologist (PG), Professional Engineer (PE) or other relevant professional licensure and the applicable regulatory reviewing agency may have differences of opinion on aspects of (and approaches to) the assessment, remediation, risk evaluation or closure and the regulatory agency may request additional information, sampling data, analysis and/or remediation. Such differences of opinion will not be interpreted to imply that Tighe & Bond's services were not performed competently and in accordance with the standard of care. If additional investigations, response action evaluations, or discussions are needed following a regulatory audit/review, Tighe & Bond can provide these services under a separate Agreement.

9. If an Opinion of Probable Construction Costs (OPCC) is provided, Tighe & Bond has no control over the cost or availability of labor, equipment or materials, or over market conditions or the contractor's method of pricing, and that the opinion of probable costs is made on the basis of Tighe & Bond's professional judgment and experience is based on currently available information. Tighe & Bond makes no guarantee nor warranty, expressed or implied, that the actual costs of the construction work will not vary from the OPCC.

APPENDIX B

Neponset River Estuary

Area of Critical Environmental Concern

Resource Management Plan

March 1996

Massachusetts Executive Office of Environmental Affairs
Department of Environmental Management
Areas of Critical Environmental Concern (ACEC) Program

William F. Weld, Governor
Argeo Paul Cellucci, Lt. Governor

Trudy Coxe, Secretary, EOEA
Peter C. Webber, Commissioner, DEM

Water-dependent Uses

Goal: Preserve and encourage water-dependent uses.

Inventory

Water-dependent uses

The number of water-dependent uses along the Neponset River Estuary has decreased from earlier decades, but the river still supports several recreational, commercial, and industrial uses dependent on waterfront locations. There are currently four yacht clubs, two marinas and several commercial properties that accommodate vessel berthing. There are only two water dependent facilities in the upper estuary, i.e., the area south of the Granite Avenue Bridge. The lower estuary, however, features many more water-dependent facilities and, by reason of past alteration of the resources and proximity to the open waters of the bay, is more suitable for these uses.

As discussed above, a number of private water-dependent uses exist in the ACEC. The estuary has a long history of commercial and industrial water-dependent uses, and the remnants of structures used for these purposes are still in existence along the riverfront. The locations of these structures are shown on Figure 10 and identified in Table 3. Permit information on these structures is contained in Appendix D.

Upper estuary: South of Granite Avenue Bridge

Milton Yacht Club

Milton Yacht Club is situated at the upper end of the estuary, near the tidal reach of the river, and at the head of the main dredged navigational channel. The property occupied by the club is leased from the town which also owns the fixed dock and other waterfront structures. The yacht club owns the floating dock and maintains the entire property. The club has about 130 members (100 regular member, 30 associate members), half of which are from Milton. The size of the club is limited in the by-laws to the number of boats that can be stored in the yard.

There are no slips; all boats are at two strings of moorings, one on each side of the dredged channel. There are approximately 30 moorings and boats are reached by dinghies kept at the dock. The fleet consists almost entirely of power boats, averaging about 32' in length, and drawing 2.5 to 3.0' of water. At low tide the navigable portion of the river is extremely narrow, some moored boats rest on mud. The area was last dredged in 1984 and, according to club members, is in serious need of dredging. The club does not anticipate expansion, but requires maintenance of its past and present facilities.

Much of the water frontage is a parking lot owned by H.P. Hood, but is used by the yacht club and the public. The northern corner of the parking lot is a popular location for launching canoes. While this arrangement has apparently worked well, changes in the private ownership of the land could disrupt and possibly diminish the amount of access and use currently enjoyed at this location.

Table 3: Previously authorized waterfront structures in the Neponset River Estuary ACEC

Location	Structures	Fig. 10 Map Ref.
Milton Yacht Club		1
224 Adams Street, Milton	build and maintain a pier and float; asphalt boat launching ramp extending 95' into tidewaters	2
T Construction Corp	piles and floats	3
Shlager Auto Body	fixed pier	4
2 Granite Avenue	piles for fixed pier	5
Neponset Valley Yacht Club	fixed pier, floating docks, boat launch ramp	6
Sagamore Creek at Walnut Street	maintain existing concrete platform and timber bulkhead and remove 5 piles	7
2 Hancock Street, Quincy	4 commercial floats 10'X30'; maint of existing pier construct fixed pier fill shoreline	8
Taylor Street, north of MBTA bridge	construct and maintain pile-supported piers and walkways, travel-lift slip and dock, steel sheet piling, timber pile breakwater; removal of steel barge;	9
Bay State Road	construct storm drain, tide gate and stone headwall for shoreline stabilization and flood control	10
Port Norfolk Condominiums, Boston	construct multi-unit residential buildings and site work, construct public waterfront walkway, viewing platform, place granite block seawall in and over existing filleds tidelands	11
Port Norfolk Yacht Club, 179 Walnut Street	concrete boat ramp, marine railway, retaining wall, floating docks, timber pier	12
Ericsson and Walnut Street, Boston	construct 36" strom drain outfall, associated riprap	13
Old Colony Yacht Club	place timber piles, floats, and steel barge bulkhead	14
Victory Road Park	place 135 l.f. of rip-rap, construct 60' timber bridge	15
MWRA Pier, west of Marina Bay, Quincy	construct a pier, ramp, floating dock, shore protection, and parking facility	16
Marina Bay, Quincy	pile-supported pier to support floats; pile-held dock extension for commercial boating facilities; wood wharf; wooded decks	17
Surrounding Harborside Condominiums, Quincy		18

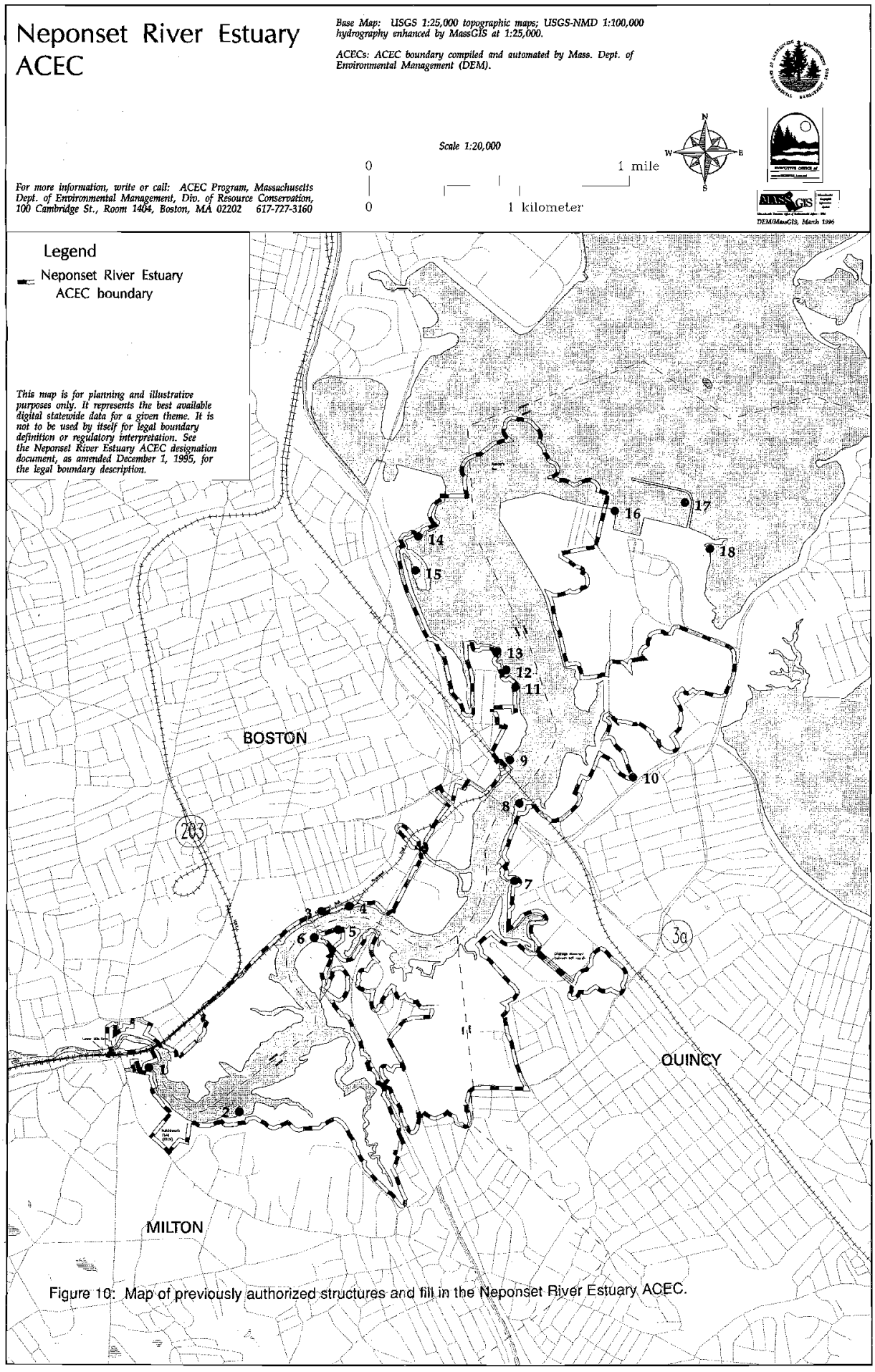


Figure 10: Map of previously authorized structures and fill in the Neponset River Estuary ACEC.

Neponset Valley Yacht Club

Neponset Valley Yacht Club is situated on MDC property just south of the Granite Avenue Bridge. It has 40 members and 20 boats on moorings accessed by dinghies from a fixed dock with floats. There is a boat launch ramp useable only at mid-tide or higher. The public occasionally uses the ramp to launch canoes, but yacht club members are wary because of the possibility of injury and liability. The entire property floods periodically at extreme high tides making any substantial improvements or permanent additions to this site ill-advised.

Mid Estuary: Neponset River Bridge to Granite Avenue

The area between the Neponset River Bridge and the Granite Avenue Bridge delineates the middle section of the Neponset Estuary ACEC. On the north side of the river is the former Hallet Street landfill and the former Neponset Drive-in Theater, both now owned by the MDC. These properties are the future site of Pope John Paul II Park. The south side of the river has extensive saltmarsh acreage with the President's Golf Course rising on the hills beyond. The State Street Bank office complex fronts a portion of the Quincy riverfront and the Southeast Expressway crosses the ACEC in this section. Currently, there is no water-dependent use in this area.

Lower Estuary: North of Neponset Avenue Bridge

While there are a number of sites of former water-dependent commercial or industrial uses in the upper and middle section of the estuary, the existing marine uses are concentrated in the lower part of the estuary, north of the Neponset Avenue Bridge (Route 3A). These sites represent the preferred areas for limited expansion for economic development rather than impacting new undeveloped areas of the ACEC. At the same time, these fairly intensive uses and operations at these sites represent continuous and cumulative impacts on the natural resources such as nonpoint pollution, boating discharges and accidental spills.

Cashman Marine

Cashman Marine is a water-dependent industrial property on the Quincy shoreline between the Neponset Avenue bridge and the MBTA Red Line bridge. The site is used for loading/unloading earth materials between trucks and barges.

Port Norfolk Yacht Club

Port Norfolk Yacht Club has approximately 85 slips and boats. The boat basin and upland have been created and modified through a series of dredging, filling, and structures authorizations (see Appendix D).

Thomas Marine

Formerly called Norwood Marine, this marina has slips for 100+ boats, travel lift, pump out, upland boat storage, boat maintenance facilities, and offers sale of marine supplies. The owner is planning work to improve some structural conditions and, possibly, reconfigure the boat basin.

Old Colony Yacht Club

Old Colony Yacht Club is located in a tight area adjacent to and surrounded by the former landfill, now Victory Road Park, the Commercial Point CSO outfall, and the Boston Gas facility. Repairs to bulkheading and some maintenance dredging have been completed recently.

MWRA Water Transportation Facility

Squantum Point supports one of the mainland ferry terminals for transporting MWRA workers to Deer Island and is an MDC park. This area offers potential for more public access and as a passenger water transportation facility after the MWRA completes it work in 1999.

Venetia Restaurant

The Venetia Restaurant is located on the waterfront between Thomas Marine and the Port Norfolk Yacht Club. There are several slips, moorings and old pilings located nearby.

Dredged Areas

Lower Estuary: Navigation channel north of Neponset Avenue Bridge

A channel provides navigable water through Dorchester Bay from the main ship channel (President Roads) in Boston Harbor up to the Neponset Avenue Bridge (see Figure 11b and c). This channel was authorized by Congress in 1907 and last dredged in 1966-67 to a depth of fifteen feet (MLW) by 100' wide. Later plans (see Appendix D) to increase the depth and breadth of the channel have since been deauthorized (personal communication, ACOE).

Mid and Upper Estuary: Navigation channel south of the Neponset Avenue Bridge

The reach of the river south of the Neponset Avenue Bridge to the Milton Yacht Club is navigable by recreational boats. While no specific record of a navigation channel being dredged *throughout* this section has been obtained, a condition of the Army Corps of Engineers' agreement to dredge the channel north of the Neponset Avenue Bridge was that the state was to dredge and maintain this reach to a depth of -6.0 feet (MLW). The Corps condition survey report of 1978 notes that this condition has been fulfilled (see Appendix D). Commonwealth records do indicate that the state has dredged two section of this reach: one in the vicinity of the Neponset Valley Yacht Club and the other at and below Milton Yacht Club (Figure 11 a and b).

In 1982 DEQE's Division of Waterways commissioned a feasibility study for the dredging of this portion of the Neponset River. The study recommended the (federal) channel width of one hundred feet be extended upstream to the Milton Town Landing with the following depths: ten feet (MLW) from the upstream terminus of the federal channel to the Granite Avenue Draw Bridge; a tapering depth of ten feet to six feet (MLW) through the mooring area of the Neponset Valley Yacht Club to a point about 1050 feet upstream of the Granite Avenue Bridge; and from this point to the Milton Town Landing, a proposed depth of six feet (MLW). This project was not implemented as described due to lack of funding and permit concerns about dredging and disposal impacts, but maintenance dredging by DEM did take place in the area of Milton Yacht Club.

Figures 11(a), (b), and (c) depict areas in the ACEC which have been dredged in the past and Table 4 identifies each site. Additional information on the extent of work authorized for each site is contained in Appendix D, a comprehensive listing of permits and licenses issued in the Neponset Estuary. It should be noted that several entries in Figure 11, Table 4, and Appendix D are for locations that, based on former and current use, have been dredged in the past, but for which dredge permits have not been located.

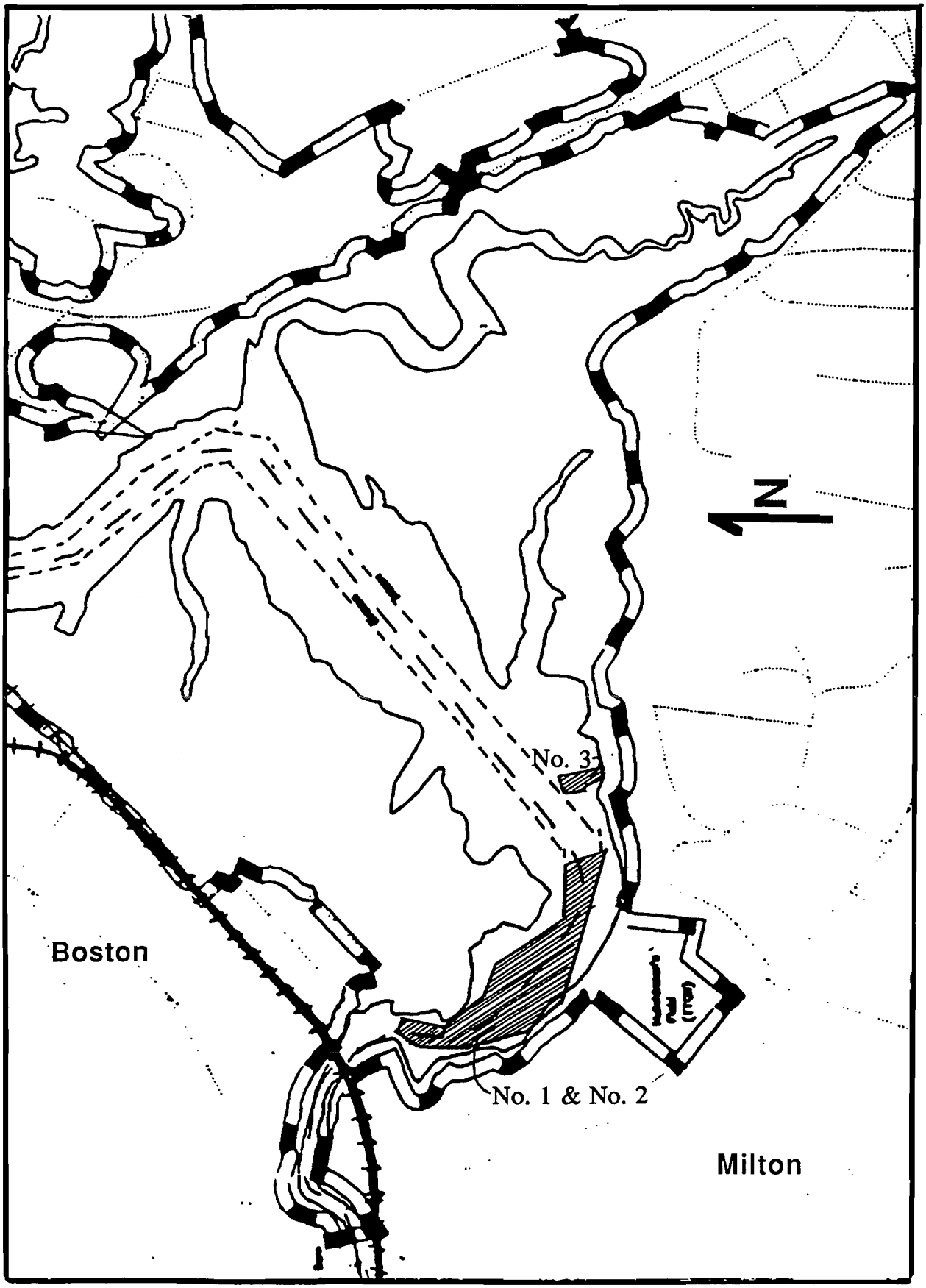


Figure 11 (a): Map of previously authorized dredging in the upper Neponset River Estuary ACEC.

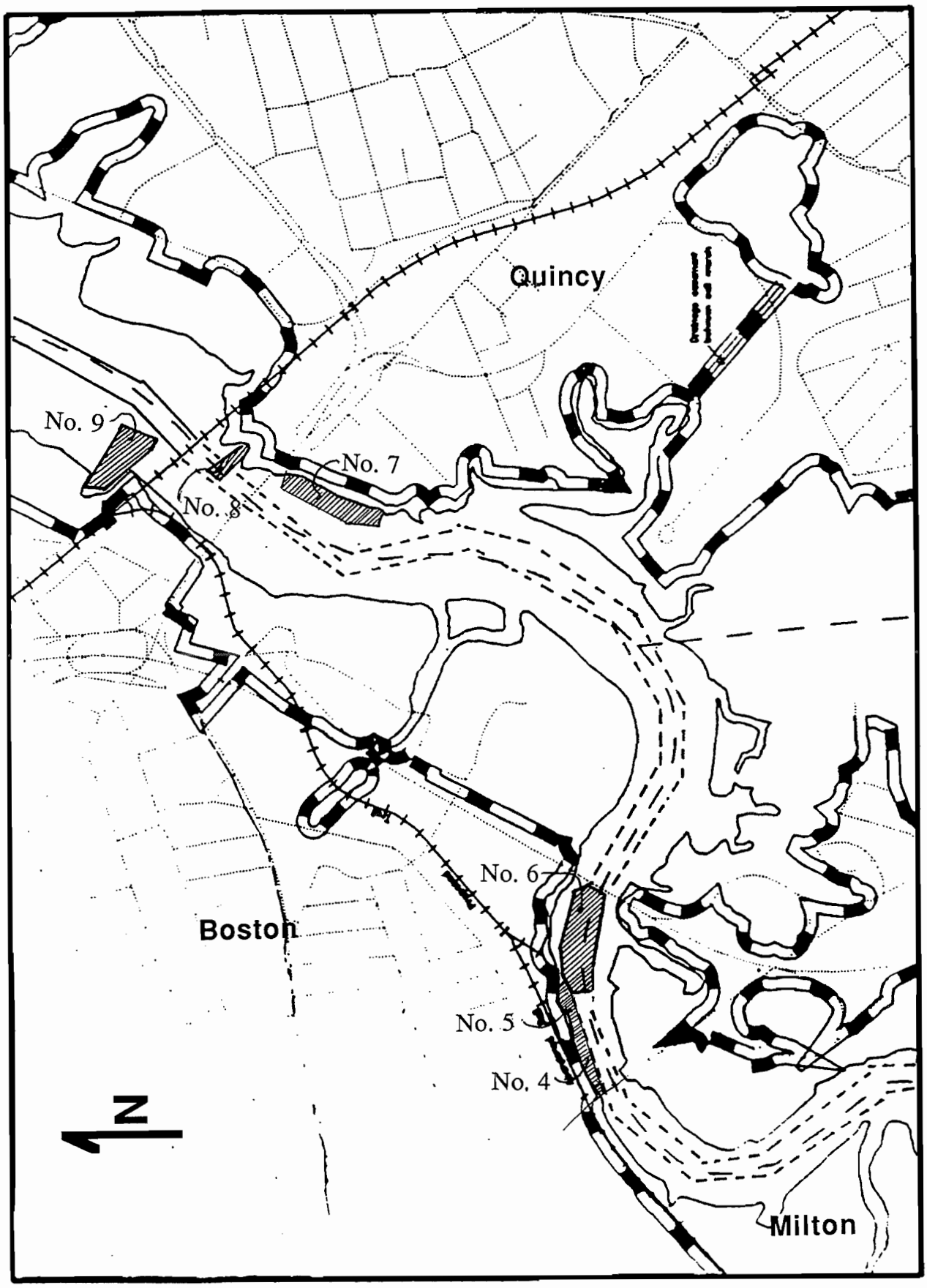


Figure 11 (b): Map of previously authorized dredging in the mid Neponset River Estuary ACEC.

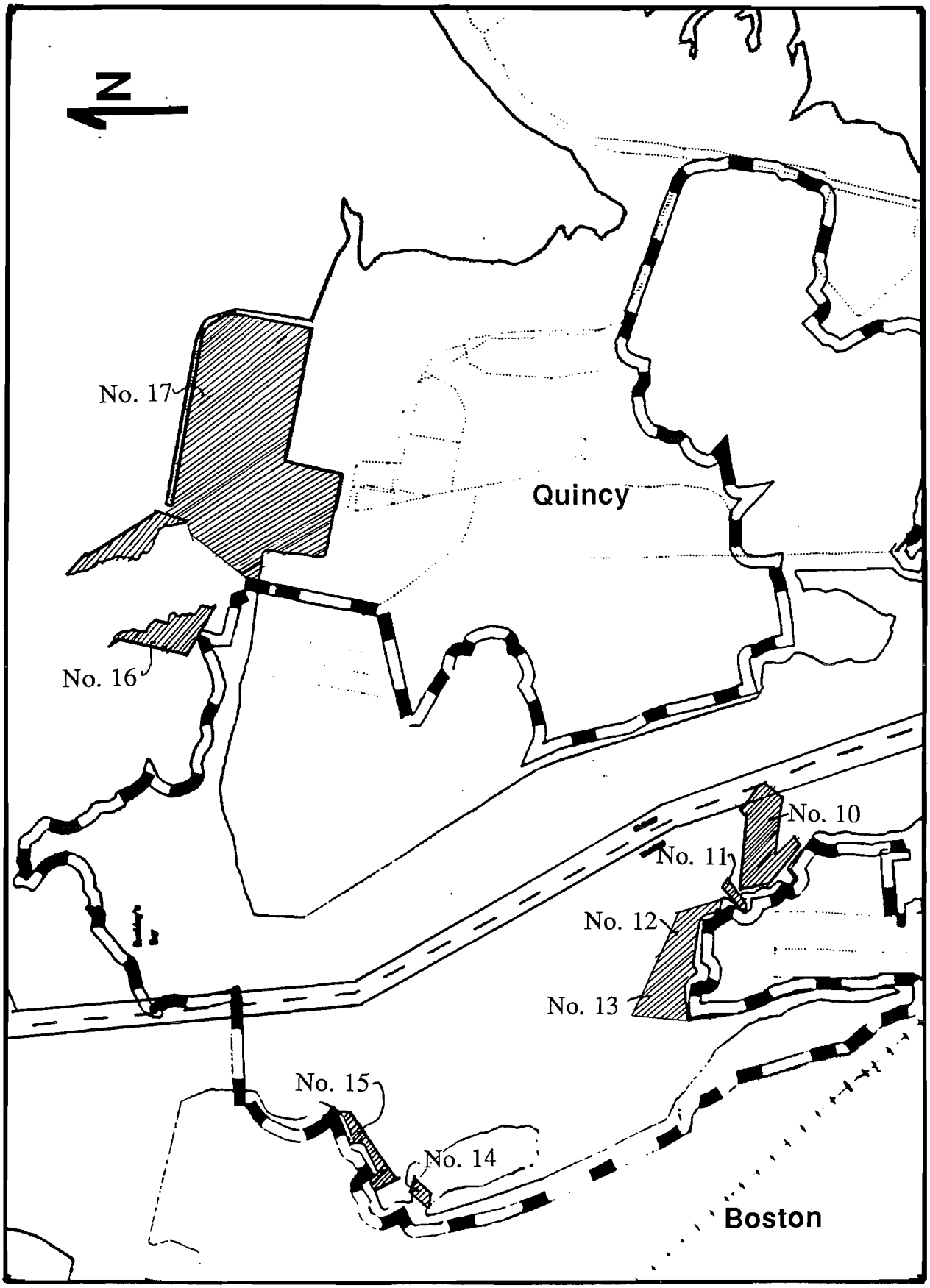


Figure 11 (c): Map of previously authorized dredging in the lower Neponset River Estuary ACEC.

4) Privately-owned structures for a water-dependent use below the high-water mark, provided that:
    a) the proposed use is not industrial and is located within the footprint of existing previously authorized pile-supported structures. Example: a new commercial dock in area of former industrial pier;
    b) such structures are necessary to accommodate infrastructure facilities, and are designed to minimize encroachment in the water. Infrastructure facilities are those that produce, deliver or provide electric, gas, water, sewage, transportation, or telecommunications services to the public.
    c) such structures consistent with a Resource Management Plan adopted by the municipality and approved by the secretary.

Beyond those described above, the few limited circumstances described in the Ch.91 regulations in which fill or structures may be allowed in the ACEC (provided that reasonable measures are taken to avoid, minimize, and mitigate any encroachment in the waterway) include:

1) shoreline stabilization or rehabilitation of an existing shore protection structure;
2) installation of drainage, ventilation, or utility structures, or placement of minor and incidental fill necessary to accommodate any modification to existing *public* roadways or railroad track and/or rail bed; or
3) improvement or rehabilitation of existing *public* roadways or railroad track and/or rail bed, provided that any net encroachment with respect to public roadways is limited to widening by less than a single lane, adding shoulders, and upgrading substandard intersections.

None of the above effects or restricts the continuation, maintenance, or replacement of existing and/or licensed water-dependent use structures, nor limits structures otherwise eligible for licensing. An important provision in the Chapter 91 regulations allows for the permitting of new privately-owned structures below the high-water mark if they have been provided for in a Resource Management Plan that has been approved by the Secretary of EOEA and adopted by the local municipality (see above).

Under ACEC provisions, new or improvement dredging is not allowed; and only in those areas where previous dredging can be verified will maintenance dredging be permitted.

Upper Estuary: South of Granite Avenue Bridge

The existing boating facilities are appropriate in scale and strike a reasonable balance between the requirements of operations and maintenance vs. equitable access; however, there appears to be significant interest in more recreational/educational use in this end of the Neponset River estuary. The types of use most frequently mentioned include canoeing, kayaking and hiking/birding.

The general area around the Granite Ave. bridge could provide opportunities for increasing these kinds of uses. Neponset Valley Yacht Club site is well situated and physically suited for launching of canoes, kayaks and small boats. The property has existing parking and easy access off Granite Avenue. If planned in conjunction with similar or related activities around the perimeter of the No. 2 Granite Avenue building and possible long range public improvements at the Schlager site, it could serve as a highly visible recreational center of the estuary especially if coordinated with the MDC Plan.

Mid-estuary: Granite Avenue Bridge to Neponset Avenue Bridge

There exists the opportunity to reestablish waterfront structures and boating access in this transition area between the more natural environment to the south and the developed area of the lower estuary. Redevelopment of the T Construction Corp. and/or Schlager sites could accommodate restored structures for commercial or recreational boating. The waterfront of these sites has been engineered and the existence of former waterfront structures provide the opportunity under DEP Waterways Regs. 310 CMR 9.32(1), also called Ch.91 Regs, to permit new privately-owned structures for *commercial* use.

Lower Estuary: North of Neponset Avenue Bridge

This section of the ACEC contains the largest concentration of water-dependent uses including existing marinas, yacht clubs, restaurants and water transportation facilities.
An expansion of water-dependent uses is best accommodated in this area where necessary infrastructure investments have already been made, the channel is more navigable, a more pristine areas will not be impacted.

Given strict prohibitions concerning the alteration of saltmarsh and physical limitations due to shallow water depths in the upper estuary, and the potential use or reuse locations previously authorized or historically used for water-dependent structures, the construction of new privately-owned water-dependent use structures in locations not previously authorized or historically used is not recommended within the Neponset Estuary ACEC.

Dredging

The natural sedimentation processes that occur within a riverine estuary often result in the reoccurring shifting and shoaling of areas within the ACEC. This has repeatedly caused navigational problems for the numerous types of boating, shipping and economic activities that have historically utilized the Neponset River. The ACEC designation brings several regulatory provisions into effect that address the issue of dredging. These provisions relate to maintenance dredging vs. improvement dredging.

Maintenance dredging can be conducted in the ACEC upon approval of necessary permits. Maintenance dredging refers to the dredging of areas that have in the past been authorized for dredging regardless of whether or not dredging has ever been done. The areal extent and depth of maintenance dredging eligible for permitting is as described and shown in existing authorizations. Table 4, Appendix D and Figure 11 list and depict previously dredged areas within the Neponset River Estuary ACEC. The sites listed in Table 4, Appendix D and on Figure 11 include those identified through previous permits as well as those for which permits have not yet been located but, based on former or current use, it is apparent that dredging has been done in the past.

Improvement dredging, that is, new dredging, is prohibited in the ACEC except for the sole purpose of fisheries or wildlife enhancement. Improvement dredging is defined as dredging of an area that has not been authorized previously.

Consultations with owners of existing marinas and marine businesses and with board members of existing yacht clubs in the ACEC revealed no immediate or short term expansion plans that include the need for improvement dredging. In some cases, representatives of these facilities explained that there may be places within or at the perimeter of their boat berthing areas that have not been included in previous authorizations, but that if eligible for dredging, could improve the functioning and capacity of the existing facility without encroaching on contiguous resource areas.

This kind of improvement dredging would be consistent with another stated goal of increasing public access and recreational and educational opportunities. Nevertheless, if improvement dredging is to be allowed within the ACEC, it should be done under strict conditions to avoid and minimize any negative effects of the resources (see Appendix B, page 8, regarding the specific language of the December 1, 1995 amendments describing limited exemptions for certain improvement dredging projects). Those conditions could include the use of a tight closing environmental dredge bucket, seasonal prohibitions to avoid spawning and migration periods, no disposal in Massachusetts waters and preferably in containment sites for any contaminated sediment. The disposal of dredged material is prohibited in coastal tidelands unless for the express purpose of beach nourishment, dune construction or stabilization with vegetative cover, or the enhancement of fishery or wildlife habitat.

Implementation Strategy

Water-dependent Uses

Management Issues

Generally, throughout the entire ACEC tidelands area, all structures should now have a license under the Ch.91 regulations administered by DEP. All unlicensed structures in the ACEC should file for a Chapter 91 license under the Amnesty Program by October 4, 1996. The Amnesty Program provides a simple, low cost opportunity for all existing structures to obtain required permits before the new provisions of the law go into effect.

In the upper estuary south of the Granite Street Bridge, very limited expansion of water dependent uses or any other structures is appropriate. Any reconfiguration or limited expansion of existing (including previously authorized or built) privately-owned water-dependent use structures may be permitted in conformance to the following guidelines:

- requires no new (improvement) dredging
- reconfigured structure is no closer than 25' from tidal wetlands
- reconfigured structure is no closer than 10' from navigation channel

Any new publicly-owned structures may be permitted in conformance with the following guidelines:

- structures minimize encroachment into navigable waterway
- structures built over mudflat and saltmarsh be designed and constructed to avoid and minimize impacts
- planning for new structures be coordinated with that of other municipal, state, and citizen groups

Given strict prohibitions concerning the alteration of saltmarsh and physical limitations due to shallow water depths in the upper estuary, and the potential use or reuse locations previously authorized or historically used for water-dependent structures, the construction of new privately-owned water-dependent use structures in locations not previously authorized or historically used is not recommended within the Neponset Estuary ACEC.

Permits and Licenses for Previous Structures, Dredging and Fill in the Neponset River Estuary ACEC

Date Issued	Permit	Permitee	Agency	Activity: Dredging	Activity: Structures	Activity: Fill	Conditons
Milton Yacht Club							
5/83	Contract No. 3002	DEQE-Division of Waterways		maintenance dredge channel in Neponset River to -6.0 MLW (min width 100')			COE 404 permit prohibits dredging between March 1 through June 30 for protection of anadromous fishery
7/67	Contract No. 2585	DPW-Division of Waterways	DPW	dredge channel and basin in Neponset River to -6.0 MLW (min width 100'; plan shows wider area)			
Neponset River south of Neponset Avenue Bridge							
8/20/23	Contract No. 84; Authorized by chapter 353 of the Acts of 1923			Neponset Avenue Bridge to Granite Ave bridge: 100' wide, -6.0 MLW Granite Ave. Bridge to Godfrey's Coal Wharf: 75' wide, -6.0 MLW In front of Godfrey's Coal Wharf: not less than 50' Mooring basin in front of Vose's Grove to -6.0 MLW			
				Dredge and maintain a 2 mile reach of channel between the Neponset Bridge and Milton Mills to -6.0 MLW. (This dredging was required of the Commonwealth as a condition of ACOE dredging north of Neponset Bridge in 1907.			Narrative with ACOE's condition survey of 1986 states this dredging was done and has been maintained since 1910.)

APPENDIX D

Permits and Licenses for Previous Structures, Dredging and Fill in the Neponset River Estuary ACEC

Date Issued	Permit	Permitee	Agency	Activity			Conditons
				Dredging	Structures	Fill	
224 Adams Street, Milton							
8/3/84	C. 91 #1098	Marion R. Lynch	DEQE		maintain a pier and float; construct and maintain a boat launching ramp and wall		
12/29/83	WQ Certification #83W-140	Marion R. Lynch	DEQE/DWPC		maintain existing pier and float, construct and maintain a boat launching ramp	remove unauthorized fill	
5/17/76	C. 91 #125	Teresa L. Grogan	DEQE	dredging 37'X75' to depth of -4.0 MLW	build and maintain a pier and float; asphalt boat launching ramp extending 95' into tidewaters		
Neponset Valley Yacht Club							
3/56	Contract No. 1594	DPW-Division of Waterways	DPW	dredge channel to -8.0 MLW (min width 200')			
State Street South							
11/3/80	C. 91 License No. 687	SSB Realty, Inc.	DEQE	construct 400'X18' open channel between Sagamore Creek and existing 18'X10'6" box culvert		with associated filling and excavation in Sagamore Creek	
4/30/80	Water Quality Certificate	SSB Realty	Water Resources Commission/ DWPC			relocate 145' of a channel leading to and place fill in wetlands	

Permits and Licenses for Previous Structures, Dredging and Fill in the Neponset River Estuary ACEC

Date Issued	Permit	Permitee	Agency	Activity: Dredging	Activity: Structures	Activity: Fill	Conditons
10/8/69	License No. 5593	SSB Realty Trust	DPW		Construct 1200' X18'X10'6" box culvert to handle drainage formerly carried by Sagamore Creek.	Fill, pipe, and otherwise relocate and modify the main channel and estuaries of Sagamore Creek. Place solid fill in Sagamore Creek over a distance of 980'.	
	C. 91 License No. 5731 (referenced on Plan 687)						
	C. 91 License No. 3662 (6 plan sheets)	SSB Realty, Inc.				maintain and 8-story office and retail building and 4-story parking garage in and over the filled waters of Sagamore Creek	Licensee shall maintain public walkways and the ground level publicly accessible areas outside the footprint of buildings as shown on the plan. Place 4 benches as shown on sheet 6A. Place appropriate signage
Sagamore Creek at Walnut Street							
10/26/90	C. 91 License No. 2427	Hardwood N.V.	DEP		maintain existing concrete platform and timber bulkhead and remove 5 piles		remove piles within 2 years
Sagamore Creek between Walnut and Newbury Streets							
2/25/59	C. 91 License No. 4196	Charles M. McConaghy	DPW			relocate existing tidal creek and fill existing location of creek	

Permits and Licenses for Previous Structures, Dredging and Fill in the Neponset River Estuary ACEC

Date Issued	Permit	Permitee	Agency	Activity			Conditons
				Dredging	Structures	Fill	
2 Hancock Street, Quincy							
3/30/93	Dredging # 239	Neponset Landing Trust	DEP	maint. dredge 9,000 cy; max depth -7.0 MLW; disposal at MBDS			dredging by mechancal means; no dredging 3/1 - 5/31
1/29/93	WQ certification BRP WP 39, T #22481		DEP/WPC	dredging area 50' to 100' X 460' long			no dredging between 2/1 and 6/15; environmental bucket plus reduced size of hinge openings and flaps covering hinge openings; no dredging within 25' of saltmarsh
	Lic no. 5050 & 5690; pier repair (referenced on No. 239)		DEP?				
12/18/91	Order of Conds. 59-356		Quincy Con Com	dredging	4 commercial floats 10'X30'; maint of existing pier		no dredging 3/16 - 10/14 (dredging to be done 10/15 - 3/15); no vehicles or equipment stored within the 100' coastal bank buffer zone; no servicing of equipment on site; catch basins with gas/oil interceptors, cleaned bi-annually; no storage
Taylor Street, north of MBTA bridge							
3/7/86	1190	National Data Verification Service	DEQE	dredge 24.000 cy; for commercial marina facility	construct and maintain pile-supported piers and walkways, travel-lift slip and dock, steel sheet piling, timber pile breakwater; removal of steel barge;		
12/7/84	Order of Conditions (referenced in 1190)	same	Boston Con Com				

Appendix B

Permits and Licenses for Previous Structures, Dredging and Fill in the Neponset River Estuary ACEC

Date Issued	Permit	Permitee	Agency	Activity: Dredging	Activity: Structures	Activity: Fill	Conditons
10/2/84	Water Quality Certification (referenced in 1190)		DEQE				
Neponset River between Squantum Point and MBTA bridge							
1/11/67	C. 91 License No. 5186	Boston Edison Company	DPW			place and maintain solid fill and stone slope proection; construct and maintain culverts	
	C. 91 License No. 5185	Mass. Bay Transportation Authority				place solid fill with stone faced slope in Neponset River	
Bay State Road							
10/11/89	C. 91 License No. 2075	City of Quincy Department of Public Works	DEP		construct storm drain, tide gate and stone headwall for shoreline stabilization and flood control		

Permits and Licenses for Previous Structures, Dredging and Fill in the Neponset River Estuary ACEC

Date Issued	Permit	Permitee	Agency	Activity: Dredging	Activity: Structures	Activity: Fill	Conditons
Port Norfolk Condominiums, Boston							
	C. 91 #1601	Port Norfolk Condominium, Inc.			construct multi-unit residential buildings and site work, construct public waterfront walkway, viewing platform, place granite block seawall in and over existing filleds tidelands		Public pedestrian accesse walkways leading to and along the site's waterfront area. The walkway along the waterfront of the site shall be a minimum of 6' wide. The permittee shall connect the site's waterfront walkway with future public walkway
2/10/87	Superseding Order of Conditions	Port Norfolk Condominium, Inc.	DEQE				
4/18/86	Water Quality Certificate	Port Norfolk Condominium, Inc.	DEQE/DWPC				
1905	C. 91 License No. 2944		Harbor and Land Commissioner			fill tidelands	
Port Norfolk Yacht Club, 179 Walnut Street							
3/30/93	Dredge Permit No. 243	Port Norfolk Yacht Club	DEP	maintenance dredge 9,200 cy; max depth -6.0 MLW; disposal at MBDS			dredging by mechanical means
	C. 91 Lic no. 4593 (referenced on plan for #243)		DPW		marine railway & filled steel barge		
	Lic no. 2083 (referenced on plan for #243)		DPW		floating dock		
	Lic no. 1596 (referenced on plan for #243)		DEQE		floating docks		

Permits and Licenses for Previous Structures, Dredging and Fill in the Neponset River Estuary ACEC

Date Issued	Permit	Permitee	Agency	Activity: Dredging	Activity: Structures	Activity: Fill	Conditons
1/5/93	WQ cert. BRP WP 39, T # 40204		DEP				silt curtain; no dredging 2/1 to 6/15 to protect winter flounder spawnng and the anadromous (smelt, blue back herring, shad) fish run; modified clamshell bucket; no dredging within 25' of salt marsh
10/17/91	Order of Conds 6-488		Boston Con Com				no dredging from 2/1 to 6/15; no dewatering; waste oil disposal facility; absorption pillows accessible
4/11/90	C. 91 Lic no. 2303 (2023 referenced on plan for #243)	Port Norfolk Yacht Club, Inc.	DEP		construct retaining wall with rip-rap toe apron		
	License No. 3 (reference on Lic. Plan 2303)		Port of Boston		timber pier		
12/18/85	Dredge Permit #150	DEM-Division of Waterways	DEQE	dredge 16,000 cy of subaqueous material from irregularly shaped area			
and 8/2/84	Water Quality Certification 84W-009D	DEM-Division of Waterways	DEQE/DWPC	dredge 16,000 cy of sediment; disposal at MBDS			disposal of material to be capped because of accumulation of PCBs; dredging to be done during the least productive periods of estuarine species, 10/1 to 2/1
7/84	Contract No. 3045	DEM	DEM-Division of Waterways	maintenance dredge basin to -6.0 MLW			
5/3/84	Order of Conditions 6-253	DEM-Division of Waterways	Boston Con Com	dredge 16,000 cy			no dredging between February 1 and May 15
2/19/93	C. 91 License No. 3244	Port Norfolk Yacht Club	DEP		construct a concrete boat ramp		

Ericsson and Walnut Street, Boston

Permits and Licenses for Previous Structures, Dredging and Fill in the Neponset River Estuary ACEC

Date Issued	Permit	Permitee	Agency	Activity: Dredging	Activity: Structures	Activity: Fill	Conditons
4/28/87	C. 91 #1606	Boston Water and Sewer	DEQE	dredge 50 cy material	construct 36" strom drain outfall, associated riprap		
2/17/87	Water Quality Certification No. 86W-242	Boston Water and Sewer Commission			36" storm drain		
Old Colony Yacht Club (and Port Norfolk Yacht Club							
12/18/85	Dredge Permit #150	DEM-Division of Waterways	DEQE	dredge 13,000 cy at the Old Colony YC (see also Port Norfolk YC, dredge 16,000 cy)			
7/84	Contract No. 3045	DEM-Divsion of Waterways	DEM	maintenance dredge basin to -6.0 MLW			
5/3/84	Order of Conditions 6-254	DEM-Division of Waterways	Boston Con Com				no dredging between February 1 and May 15
4/17/84 (Old Colony)	Water Quality Certificate 84W-009D	DEM-Division of Waterways	DEQE/DWPC	dredge 13,000 cy at Old Colony YC; disposal at MBDS; (see also Port Norfolk YC)			Old Colony: no dredging between February 15 and May 15
1982	Section 404 and Section 10 (referenced in WQ cert.)		U.S. ACOE				
	License No. 5736	Old Colony Yacht Club	DPW	dredge area adjacent to seawall to depth of -5.0' MLW	place timber piles, floats, and steel barge bulkhead		

Permits and Licenses for Previous Structures, Dredging and Fill in the Neponset River Estuary ACEC

Date Issued	Permit	Permitee	Agency	Activity: Dredging	Activity: Structures	Activity: Fill	Conditons
Victory Road Park							
6/8/87	C. 91 License No. 1635	Metropolitan District Commission	DEQE	dredge two areas on either side of bridge: 1,900 cy to the east, 1,200 cy to the west; on-site upland disposal	place 135 l.f. of rip-rap, construct 60' timber bridge		
3/18/87		Water Quality Certification	DEQE				
6/13/86	Order of Conditions	MDC	Boston Con Com				
MWRA Pier, west of Marina Bay, Quincy							
10/27/89	Dredge Permit #187	DEM-Division of Waterways	DEP	dredge 51/000 cy to max depth of -10.0' MLW; disposal MBDS			
10/26/89	Water Quality Certification	DEM-Division of Waterways	DEQE/DWPC	dredge channel to -10 feet MLW, 51,000 cy; disposal at MBDS			dredging to be completed by February 15; dredging by tight-closing bucket to reduce sediment resuspension; silt curtain not suitable in this location
9/19/89	Order of Conditions #59-302	DEM-Division of Waterways (and MWRA)	Quincy Con Com				separate NOI required for proposed personnel pier project and all landward activities
5/16/90	C. 91 License No. 2350 (6 plan sheets)		DEP		construct a pier, ramp, floating dock, shore protection, and parking facility		

Permits and Licenses for Previous Structures, Dredging and Fill in the Neponset River Estuary ACEC

Date Issued	Permit	Permitee	Agency	Activity: Dredging	Activity: Structures	Activity: Fill	Conditons
Marina Bay, Quincy							
4/28/87	C. 91 No. 1617 (plan: 3 sheets)		4/23/84		construct pile-supported pier to support floats		
12/3/86	C. 91 License No. 1572	Boston Harbor Marina Company	DEQE		maintain existing pile-held dock extension for commercial boating facilities		
10/22/85	C. 91 License No. 1329	Boston Harbor Marina Co.	DEQE		construct timber open-pile pier, 2 gangways, "U" shaped floating dock, and associated piles for berthing of commercial and private vessels		
2/24/85	Order of Conditions (referenced in C. 91 Lic. No. 1329						
4/23/84	C. 91 #1081	Boston Harbor Marina Co.			install five steel mooring piles with batter piles to provide fixed mooring anchorage for "Edmund Fitzgerald"		
	Water Quality Certification No. 84W-024				5 steel mooring piles		
	Water Quality Certification No. 84W-025	Boston Harbor Marina Co.			construct a 70'X30' timber, open-pile deck adjacent to existing seawall and wood wharf for commercial marina		
10/30/75	C. 91 #54	Boston Harbor Marina, Inc.	DEQE		place and maintain rubber tire breakwater, construct travel lift piers and place pile held floats		

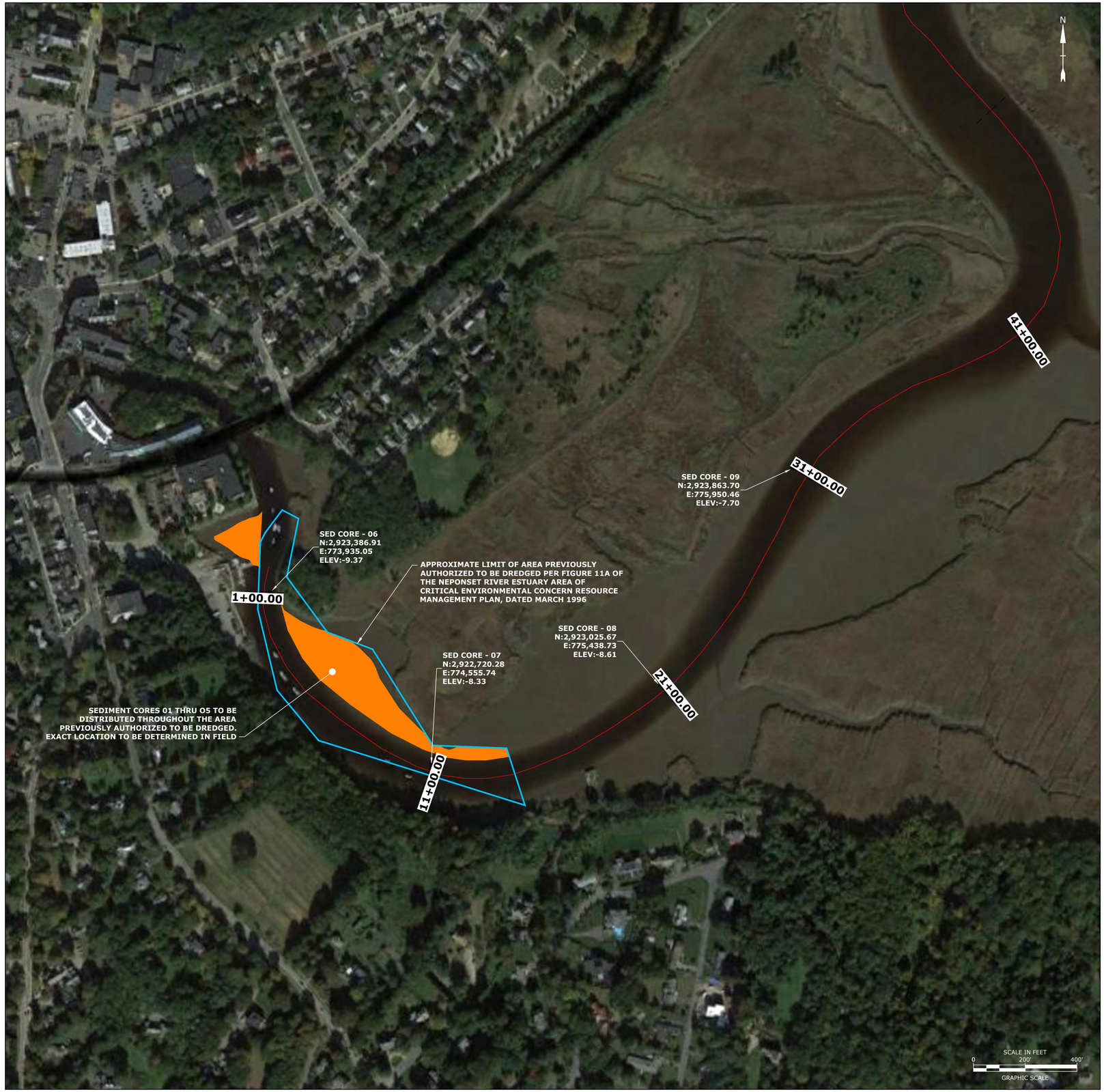
Date Issued	Permit	Permitee	Agency	Activity			
				Dredging	Structures	Fill	Conditons
	C. 91 License No. 4568 (referenced in license #54)		DPW				
	C. 91 License No. 1082	Boston Harbor Marina Co.	DEQE		construct 2 open-pile wooden deck extensions appurtenant to an existing, previously authorized (Lic. No. 4234) wooden deck for additional commercial docking facilities and waterfront access for transient vessels.		
	C. 91 License No. 4234 (referenced in Lic. 1082)						
Surrounding Harborside Condominiums, Quincy							
8/30/85	C. 91 License No. 1306	Boston Harbor Marina Co.			maintain existing multi-unit residential buildings, associated structures, construct multi-unit residential buildings; construct open-pile access pier and viewing platform; 2 drainage ditch catwalks over filled tidelands		open-pile timber public access walkway, octagonally-shaped viewing platform and catwalks to be constructed within 6 months; pubic access signage; public access easement to Quincy for general public use of 89.5 acres of coastal beach, saltmarsh
Neponset River Dorchester Bay to Neponset Avenue/Hancock Street							

Permits and Licenses for Previous Structures, Dredging and Fill in the Neponset River Estuary ACEC

Date Issued	Permit	Permitee	Agency	Activity			Conditons
				Dredging	Structures	Fill	
completed in 1909	Authorized by the River and Harbor Act in 1907	U.S. Army Corps of Engineers		100' wide channel dredged to -15.0 MLW. Last dredged in 1966-1967. Condition survey in 1978 revealed no hazards to			Commonwealth of Mass must dredge and maintain a 2 mile reach of channel between the Neponset Bridge and Milton Mills to -6.0 MLW

Tighe&Bond

APPENDIX C



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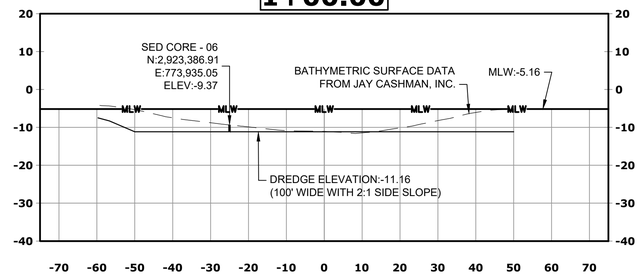

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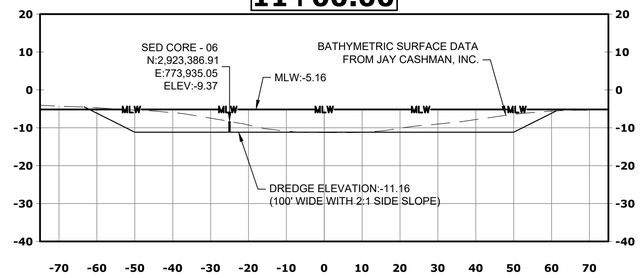

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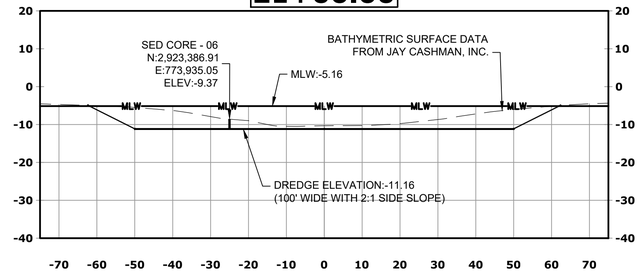

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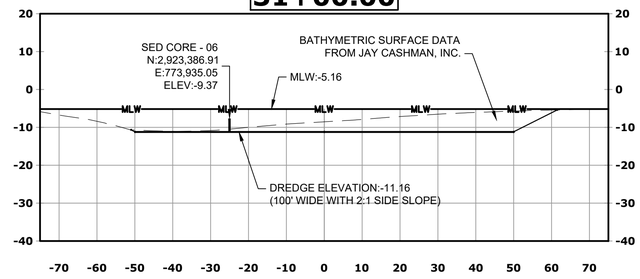

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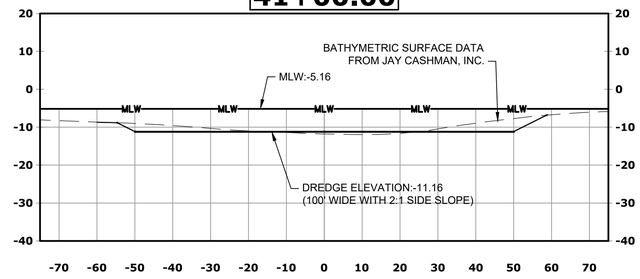

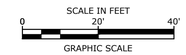

APPENDIX D

Preliminary Project and Permitting Schedule

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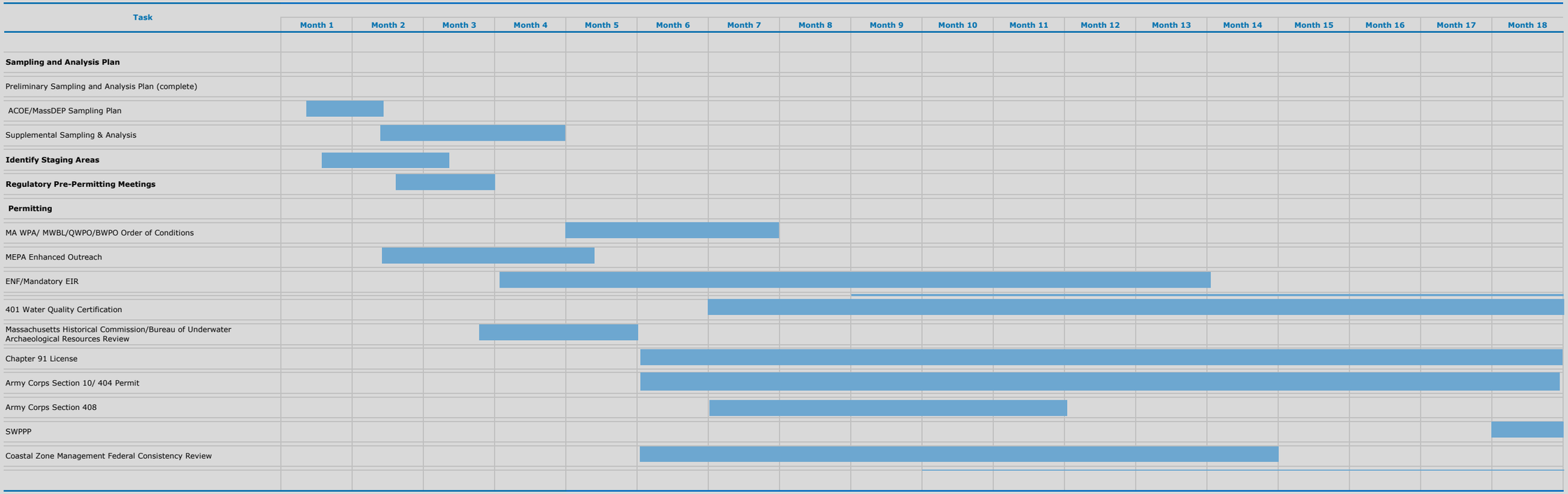
Neponset River Dredging Project
Town of Milton, MA



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