APPENDIX D: Marine Fisheries Supporting Documentation

ENVIRONMENT
& HEALTH

Prepared for:
Prysmian S.p.A.
Viale Sarca 336
20126 Milan, Italy

Prepared By:
Ramboll Italy Srl
Ramboll US Consulting, Inc.
Portland, ME /Boston, MA

Date:
March 2022

Project Number:
330003098

FINAL PRELIMINARY SEDIMENT INVESTIGATION REPORT
BRAYTON POINT, SOMERSET, MASSACHUSETTS

1. Introduction

Ramboll Italy Srl and Ramboll US Consulting (Ramboll) are pleased to present this Final Preliminary Sediment Investigation Report to Prysmian S.p.A (Prysmian) detailing the processes followed during the preliminary sediment investigation to evaluate feasibility of dredging to the southeast of the Brayton Point property located at One Brayton Point, Somerset, Massachusetts (the "Site"). This summary report details the overall investigation work completed and provides recommendations based on the findings of the preliminary sediment investigation. The investigation was completed in general accordance with Ramboll Proposal Number 330003003, dated December 5, 2021.

The Brayton Point facility is located on a peninsula, surrounded on three sides by water: Taunton River to the southeast, Lee River to the west and Mount Hope Bay to the south. The site locus is shown on **Figure 1**.

2. Background

It is Ramboll's understanding that Prysmian desires to develop a new vessel access and berth at the Brayton Point property. This access will require establishing a new navigational channel that connects to the federally maintained Fall River Harbor Channel via an existing privately maintained channel servicing the northeastern portion of the Brayton Point property. Conceptually the proposed channel may measure approximately 2,500 linear feet (760 meters) traveling southwest from the private channel for direct vessel access to the southern portion of the property. The new channel may require establishing an available vessel draft of at least 35 ft (approximately 10 m) below mean lower low water consistent with the privately maintained and federally maintained channels in the vicinity of the Site. Based on information provided by Prysmian, Ramboll understands that the project may require approximately 1.1 million cubic yards (880,000 cubic meters) of dredging to establish the proposed channel.

3. Field Activities

3.1 Bathymetric Survey

Ramboll contracted TG&B Marine Services, a marine services contractor, assisted by VesPos, a certified marine hydrographic surveyor, to complete a bathymetric survey of the proposed area of interest (**Figure 2**). The bathymetric survey was completed on December 17, 2021. Data was collected every six inches (approximately 15 centimeters) along each transect. Transect spacing was 20 ft (approximately 6 m) on center. Tie lines were run perpendicular to the main transects for quality control. Following the completion of field work, the data was processed and overlain on a figure showing plotted water depths, contour lines, structures and shoreline features.

3.2 Sediment Coring

Ramboll subcontracted TG&B Marine Services, a marine services contractor, to mobilize and deploy a support vessel capable of collecting marine sediment samples from the area of investigation. Eight locations were proposed for preliminary characterization, the locations are depicted on **Figure 2**. The sediment core locations were chosen to give a cross sectional representation of the investigation area

in order to support the decision as to the feasibility of a full scall investigation in the future. The sediment coring program occurred on January 5, 7 and 11, 2022.

Sediment was collected by Vibracore methods to a target depth of twenty-five feet (7.6 meters) below the sediment surface, achieving a sampled sediment elevation of approximately minus 35-ft (11 meters) mean low water. In the event that core refusal was encountered at less than the target depth, up to two additional attempts were made per location. To lessen the risk of cross contamination during the coring program all coring and sampling equipment was decontaminated prior to the initial boring and between each subsequent core location using an Alconox and water wash process. No sediment was encountered that exhibited obvious signs of contamination (e.g., odors or staining) or field screening indicative of total VOCs greater than 10 parts per million (ppm), therefore no investigation derived wastes were generated and/or stored on Site.

3.3 Sediment Logging and Sampling

Ramboll proposed to collect samples from up to three depth intervals per core location for laboratory analysis; however, the actual sampled intervals were assessed in the field based on total recovered sediment thickness and material types observed. Sample locations SED-01 and SED-02 were terminated at a depth of less than the target depth as core barrel refusal was encountered.

Sampling equipment was decontaminated prior to the initial core and between each subsequent location, and dedicated sampling collection liners were employed. Sediments were collected on a continuous basis to the target depth or refusal. Each core was field screened in general accordance with the Massachusetts DEP Jar Headspace Method with a photoionization detector (PID) to determine the relative concentrations of volatile organic compounds (VOCs) present in the sediment recovered in the sampling device. The onsite Ramboll geologist(s) logged and classified the sediments for each sample interval in general conformance with the Unified Soil Classification System (USCS) for use in generating sediment core logs. Excess sampled sediments were returned to the target dredge area.

Selected intervals were vertically homogenized where appropriate and necessary to achieve analytical testing volume requirements (dis-similar sediment layers were not vertically homogenized). The samples were homogenized in a stainless-steel mixing bowl or dedicated disposable container, as appropriate, over the selected vertical interval. Homogenized samples were placed in clean, appropriately preserved, laboratory-supplied containers, and sealed, labeled and placed on ice pending delivery under chain-of-custody procedures to the laboratory for analysis.

Sediment samples were analyzed for the parameters outlined in **Table 1,** the suite of analysis is consistent with the United Stated Environmental Protection Agency (USEPA)/United States Army Corp of Engineers (USACE) Tier II whole sediment chemistry requirements for ocean disposal and MADEP 401 Water Quality Certificate and sediment re-use sampling requirements. Note that these data are appropriate for evaluating preliminary project feasibility and may contribute to the data needs for permitting but may not represent all sediment analysis necessary for permitting of a future dredging project (e.g., additional characterization will be required). Quality assurance samples (field duplicate, matrix spike and matrix spike duplicate samples) were collected and submitted at a rate of one per twenty primary samples collected. A total of 22 sediment samples (21 primary samples and 1 QA/QC sample) were submitted for analysis on standard turnaround (TAT) to Eurofins Analytical in Pittsburg, PA.

Table 1
Analytical Parameters and Methods

Parameter	Analytical Method
Physical Analysis	
Grain Size	ASTM 6913/D7928
Total Organic Carbon	USEPA Lloyd Kahn
Atterberg Limits	ASTM D4318
Specific Gravity	ASTM D854
pH	USEPA 9045D
Water Content	SM 2540G
Chemical Analysis	
Volatile Organic Compounds (VOCs)	USEPA 8260C
Semi-volatile Organic Compounds (SVOCs)	USEPA 8270E
Extractable Petroleum Hydrocarbons (EPA)	MADEP EPH
Chlorinated Pesticides	USEPA 8081B
Poly-chlorinated Biphenyls (PCBs)	USEPA 8082A
Chlorinated dioxins/furans	USEPA 1613B
Metals/Mercury	USEPA 6010B/7471B
Acid Volatile Sulfide/Simultaneously Extracted Metals (AVS/SEM)	USEPA 9034/SEM
Ammonia	USEPA 350.1

4. Data Quality Evaluation

A data quality review was performed to confirm that the appropriate standards have been achieved with respect to data quality and use. The data quality review included both a limited data usability assessment and a representativeness evaluation as summarized below. As part of this process, quality assurance indicators were utilized to evaluate sample collection and measurement error. These indicators have been examined in the context of the intended use of the data, and an overall assessment of the data for rendering an opinion on possible disposal/disposition options. For the purposes of this sediment investigation, a data usability assessment (DUA) was conducted for sediment analytical data collected by Ramboll as part of the investigation activities. These data are contained in the following data packages, which are provided as **Attachment A** of this report:

Table 2
Laboratory Data Packages

Lab Data Package	Sample Matrix
J132351-1	Sediment
J132193-1	Sediment
J131977-1	Sediment

The purpose of the DUA is to evaluate the quality of the data and to determine its usability in a representativeness evaluation. A DUA includes a field component and an analytical component. The field component evaluates the sampling method, sample preservation, sample handling and holding times, to establish compliance with the applicable methods and protocols and thereby confirm that the samples analyzed at the laboratory are representative of the sampling point. The analytical DUA was used to evaluate whether the analytical data points are scientifically valid and defensible and are representative of Site conditions.

4.1 Number, Spatial Distribution, and Handling of Samples

The number and location of samples are considered appropriate to screen for the presence of VOC, SVOCs, petroleum factions, PAHs, PCBs, and metals concentrations throughout the area of interest in support of the preliminary investigation. Sample locations were chosen to give a cross sectional representation of the investigation area in order to support the decision as to the feasibility of a full scall investigation in the future. All samples were handled and stored in accordance with the requirements of the specific method requirements, according to lab reports and field notes. Due to shipping delays beyond Ramboll's control, several of the VOC samples were received at the laboratory outside of their respective holding times. The EPA 8260D Method specifies that samples are to be frozen or analyzed within 48-hours of collection. The affected samples were collected from locations SED-01, SED-02, SED-03, SED-04, SED-05, and SED-06.

4.2 Inconsistency and Uncertainty

No information collected during investigation was found to be inconsistent or contribute significant uncertainty pertaining to the use of the existing datasets.

4.3 Information Considered Unrepresentative

No information collected during investigation was found to be unrepresentative pertaining to the use of the existing datasets.

5. Data Usability Assessment

The purpose of the data usability assessment is to evaluate the quality of the dataset and to determine its usability in a representativeness evaluation. A data usability assessment includes a field component and an analytical component. The field component evaluates the sampling method, sample preservation, sample handling and holding times to establish compliance with the applicable methods and protocols and thereby confirm that the samples analyzed at the laboratory are representative of the sampling point. The analytical data usability assessment is used to evaluate whether the analytical data points are scientifically valid and defensible and of a sufficient level of precision, accuracy, and sensitivity to be used in the representativeness evaluation.

5.1 Field Quality Control Assessment

A review of the applicable field quality control elements was performed for the samples collected by Ramboll in support of the investigation. Sample containers were packed on ice in coolers immediately after collection, labeled appropriately, and were accompanied by complete chain-of-custody forms from the time of sample collection until laboratory delivery. Sediment samples were received at the analytical laboratory on ice, however due to delays in shipping some samples (VOCs) were not either frozen or analyzed within the allowable holding times per the respective analytical method. There is no indication that handling may have negatively impacted sediment sample quality. The affected samples were collected from locations SED-01, SED-02, SED-03, SED-04, SED-05, and SED-06. Ramboll did not note laboratory narratives or other that would indicate improper sampling collection, handling, or preservation prior or during laboratory analysis. Therefore, condition that would bias any data such that data would not be usable are not expected.

5.2 Data Usability Conclusions

In summary, the overall representativeness of the data was evaluated qualitatively based on Site use information, information on the surrounding properties, and observations made during field activities. Based on these sources of information, the data collected are concluded to be adequately representative of current conditions at the Site. Based on a review of established standard methods and procedures for collection and analysis of data, the data collected by Ramboll used in support of this preliminary investigation are considered to be of comparable quality over the entire sampling period.

6. Results

6.1 Bathymetric Survey

Ramboll contracted TG&B Marine Services, assisted by VesPos Hydrographic Surveyors, a certified marine hydrographic surveyor, to complete a bathymetric survey of the proposed area of interest indicated on **Figure 3**. On December 17, 2021, the bathymetric survey was conducted by using a 200 Kilohertz (kHz) single beam Novatel RTK Global Navigation Satellite System (GNSS) with Keynet Virtual Reference System (VRS) providing 3D centimeter accuracy and an Innerspace 455 survey grade depth sounder with 0.1 ft (0.03 m) vertical accuracy. Data was collected every six inches along each transect. Transect spacing was 20 ft (7 m) on center. Tie lines were run perpendicular to the main transects for quality control. Additional transect lines were completed in areas where objects, features or side slopes required further definition. The GNSS coordinates were cross checked before the survey by setting the antenna on a known point (project control point).

The bathymetric survey revealed that the sediment surface in the work area is relatively level (flat) with the majority of the area of interest lying in approximately 13 ft (4 m) of water. As expected, the depth to sediment decreased in areas closer to shore. No major submerged objects or obstructions were identified during the survey. The plan view of the survey area showing plotted water depths, contour lines, structures and shoreline features is presented as **Figure 2**.

6.2 Sediment Stratigraphy and Depth to Bedrock

Ramboll's subcontractor advanced eleven cores (at eight primary locations) into the submerged sediments adjacent to the Brayton Point site. Based on the observations made during the investigation the sediments in the area of interest are primarily fine-grained silts and sands. Locations SED-01 and SED-02 were terminated at depths less than the target depth due to shallow refusal. SED-01 was terminated at a depth of 3 ft (1 mr) on bedrock (shale), and SED-02 at a depth of 5 ft (1.5 m) in cobbles (Note: multiple attempts were made at each of these locations). Location SED-03 was terminated at a depth of 19.5 ft (6 m) on clay. Locations SED-04, SED-05, SED-06, SED-07, and SED-08 were all advanced a full 25 ft (7.6 m) into the sediment. Observations at these locations included fine silts overlying medium sands, overlying silts and trace amounts of clay.

Bedrock at the site as observed through either exposed bedrock outcrops or during the previously completed land-based boring program primarily consist of shale, schist and brecciated graphite. According to the Bedrock Geologic Map of Massachusetts (Zen,1983), subsurface materials beneath the Brayton Point property belong to the "Mattapan Volcanic Complex" in the Milford-Dedham Zone (Boston Basin) and consist of rhyolite, melaphyre and agglomerates. These materials are primarily sedimentary and volcanic rocks of the Proterozoic era. It is expected that the bedrock underling the marine sediments would be of similar nature.

6.3 Grain Size Analysis

The grain-size analyses of the collected sediment samples indicate that the descriptions of the sediment in each core accurately characterize the encountered material. Samples were submitted for analysis of the physical properties in accordance with ASTM Method D422. Physical parameters associated with the sediments are included as **Table 3**. The grain-size distributions for the samples analyzed were variable and ranged as follows:

- Gravel - 0 to 65%
- Sand - 38% to 87%
- Silt - 2% to 81%
- Clay - 2% to 48%

6.4 Sediment Laboratory Sample Results

Ramboll compared the analytical data from the sediment sampling to the following regulatory driven criteria:

- National Oceanic and Atmospheric Administration (NOAA) screening values based on Effects Range Low (ER-L) and Effects Range Medium (ER-M) ecological values for saline waters (for open-water disposal), and
- Massachusetts Interim Policy COMM-94-007: Dredged Sediment Reuse or Disposal (for upland disposal)

A total of 22 sediment samples (21 primary samples and 1 QA/QC sample) were collected and submitted to the laboratory for analysis. In general, inorganics (metals) were the most commonly detected analyte. Metals detected above the ER-L included arsenic, chromium, cobalt, cooper, lead, manganese, mercury, silver, tin, and zinc. The concentrations of mercury in particular, are in exceedance of the regulatory limit by an order of magnitude. It is important to note also that cobalt, manganese, mercury, and tin were detected at levels that also exceeded the ER-M ecological values for saline waters. Various organics were detected as well, with select PAHs in exceedance of the ER-L limits including acenaphthylene, anthracene, benzo[g,h,i]perylene, and fluorene. None of the analytes were detected at concentrations that exceeded the regulatory limits for upland disposal. A graphical representation of chemical parameters exceeding the ER-M ecological threshold defined by NOAA is presented as **Figure 4.**

Generally, the highest concentrations of detected analytes lie within the top five feet (1.5 meters) of sediment. This is important to note as there is potential to design a dredge program that will allow for the segregation of sediments for different disposal options based on depth. Detected compounds and constituents and other chemical characteristics associated with the sediments are included as **Table 4**. Compounds and constituents analyzed but not detected are reported in the laboratory data reports included as **Attachment A**.

In order to assess whether the contaminants in the sediments might be attributable to a contamination of the Site, the concentration of the contaminants (exciding the ER-M ecological threshold) are plotted versus the average distance of the Site coastline (area pertaining to Prysmian), as reported in **Figure 5**. However, Figure 5, does not allow to outline a correlation between the distance of the coast and the presence of contaminants in the sediment.

7. Feasibility of Dredging

The analytical data suggests that sediment in the area of concern would be acceptable for upland disposal, and likely the dredge operation could be performed in a manner that would allow for segregation of the sediments by depth, therefore allowing partial upland disposal and partial open-water disposal.

7.1 Permitting

Dredging and disposal activities are governed by federal and state regulations; local ordinances or regulations may also be relevant. The dredging process can be divided into two separate, permittable processes: dredging, and disposal or discharge of dredged materials. The US Army Corps of Engineers (Corps) regulates the discharge of dredged materials; the regulatory program depends on whether the disposal occurs inside or outside of the shoreward limit of the territorial sea (defined as three miles from shore). Section 404 of the Clean Water Act contains the regulations governing inshore disposal or "waters of the United States", which includes freshwater wetlands, mud flats, salt marshes, and the sea floor. Section 103 of the Marine Protection, Research, and Sanctuaries Act (MPRSA) governs ocean disposal, with oversight by the US Environmental Protection Agency. The Corps has no jurisdiction over upland disposal as long as there are no wetlands or linkage to waterway involved. Dredged materials are exempt from the Resource Conservation and Recovery Act (RCRA), which applies to the storage, transport and disposal of hazardous waste materials. The Corps permit application process is an entry point for all federal agencies to review and comment on a project. The federal agencies consider how the project will affect resources under their jurisdiction.

The Corps' application process involves several key questions:

1. A statement describing the need for the project and whether the project has been dredged before (Maintenance dredging vs a new project).
2. An evaluation of the potential dredging and disposal alternatives, with a compelling argument that the least environmentally damaging practicable alternative has been selected; in the case of ocean disposal, the application should demonstrate that there are no other "practicable" alternatives. In other words, sites can be ruled out if they are too costly, logistically difficult to use, or can't be used from an engineering perspective.
3. Adverse impacts have been avoided and minimized.

7.2 Endangered Species Review

Three primary agencies would be likely to review and comment on a proposed dredge project in the vicinity of the Brayton Point site. The US Fish and Wildlife Service and National Marine Fisheries Service will review the project for potential impacts to federally listed endangered species. National Marine Fisheries Service will determine if there are adverse impacts to Essential Fish Habitat, primarily important habitats for commercially important finfish. The US EPA will review any proposed ocean disposal activities. The Corps will review all factors relevant to the project, including human factors such as economics, energy needs, safety and navigation as well as environmental factors such as fish and wildlife, and water quality at the dredge and disposal sites.

7.3 Testing Requirements

National guidance for determining whether dredged material is acceptable for open-water disposal is provided in the Ocean Testing Manual (Green Book; EPA and Corps, 1991). The Regional Implementation Manual (RIM) (EPA and Corps, 2004), consistent with the Green Book, provides specific testing and evaluation methods for dredged material disposal projects in New England. Any updates and revisions will take precedence at the time of notification by the agencies. These guidance

documents are consistent in their application of test procedures used to determine acceptability for MPRSA 103 projects. The testing requirements are the same regardless of statute under which the material will be managed and each project is evaluated on a project-by-project basis. However, management of the material may differ depending on the regulations under which it is disposed.

7.4 Upland Disposal

The feasibility of upland disposal depends on two main factors 1) sediment contaminant levels, and 2) proximity and availability of suitable dewatering and disposal areas. Sediment can be either disposed of (at a landfill) or reused (beneficial reuse – fill materials, landfill cover soils, etc.). Only materials meeting the criteria for beneficial use of dredged material may be disposed of on land. Material that does not meet the criteria must be disposed of within a licensed landfill. In either case, dredged material must be dewatered prior to transportation and disposal. The costs of dewatering and/or bulking for transportation can be significant. Additionally, the geotechnical qualities of the material may dictate its ultimate disposition. High proportions of silt and clay, decrease the material's stability and limit its utility as construction material unless it is mixed with more granular material or stabilized with geotechnical fabric.

7.5 Open Ocean Disposal

There are two ocean disposal sites within hauling distance to the Brayton Point site located on Mount Hope Bay:

- Cape Cod Bay Disposal Site located approximately 8 nautical miles (nm) (15 kilometers) southwest of Long Point, Provincetown, MA. (Approximately 70 nm (130 kilometers) from Mount Hope Bay)
- Rhode Island Sound Disposal Site located approximately 9 nm (16.5 kilometers) south of Point Judith, RI and roughly 6.5 nm (12 kilometers) due east of Block Island. (Approximately 40 nm (75 kilometers) from Mount Hope Bay)

The feasibility of ocean disposal is dependent on several factors. The potential for high up-front costs can be offset by lower disposal costs, depending on the volume of material and proximity of the disposal site. Of the two sites the Rhode Island Sound Disposal site has taken dredged material from the Brayton Point site in the past (320,000 cy (253,000 m^3) from 1970-1976) and is a much shorter shipping route from Brayton Point than disposal at the Cape Cod Bay Disposal Site.

Figures

F:\GRAME\330003098\SLM_SOMERSET_MA\SLM_SOMERSET_MA.aprx\Ramboll_ANSI_A_Site_Location

PROJECT: 169000XXXX | DATED: 1/28/2022 | DESIGNER: GMILES

Map Scale: 1:24,000 | Map Center: 71°11'20"W 41°42'24"N

KEY MAP (not to scale)

0 1,000 2,000 Feet

SITE LOCATION

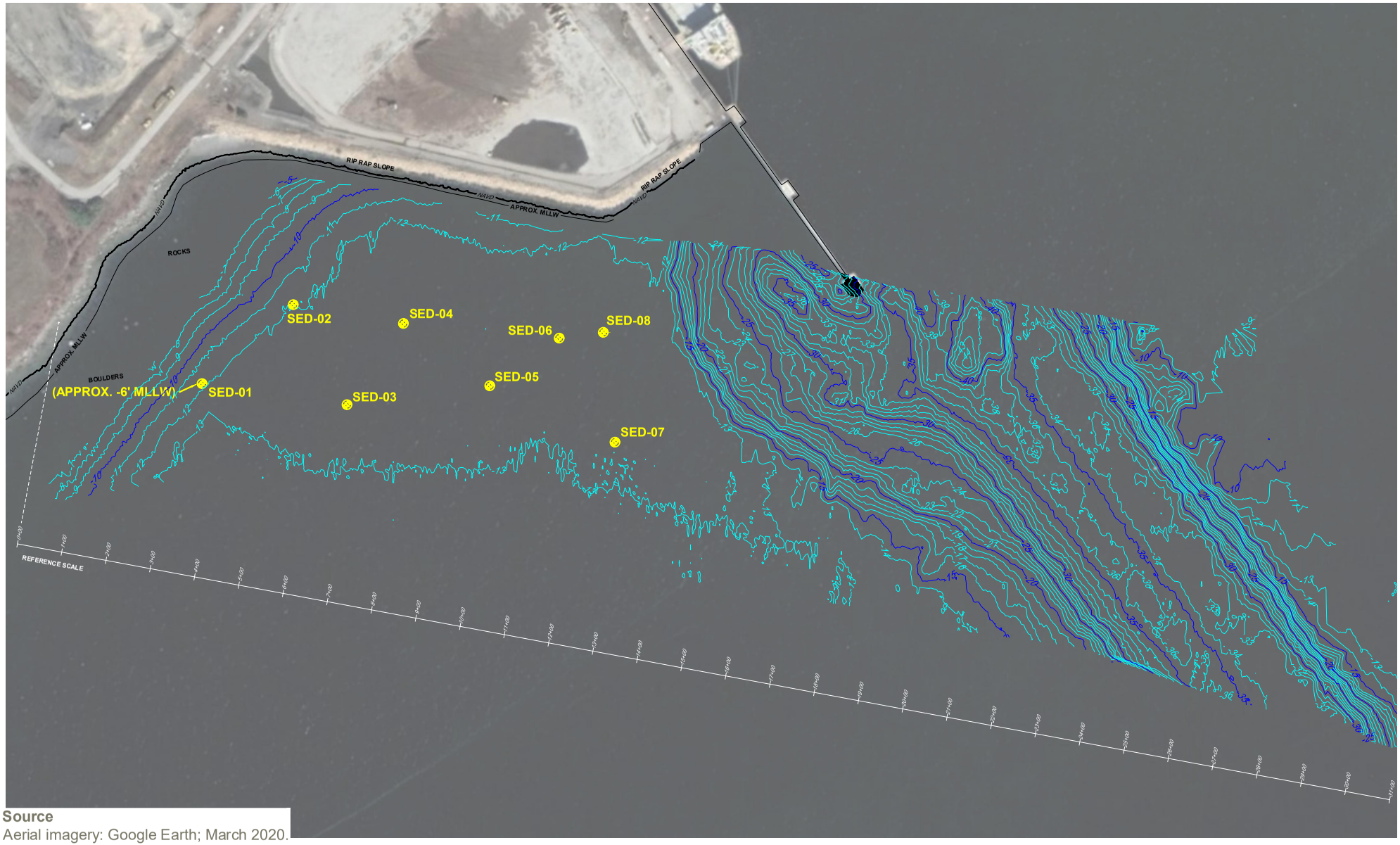
FORMER BRAYTON POINT STATION
ONE BRAYTON POINT ROAD
SOMERSET, MASSACHUSETTS

FIGURE 1

RAMBOLL US CONSULTING, INC.
A RAMBOLL COMPANY

RAMBOLL

PROJECT: 330003098 DATED: 2/1/2022 DESIGNER: GMILES F:\Graeme\330003098\SEDIMENT_INVESTIGATION_RESULTS.dwg



Source
Aerial imagery: Google Earth; March 2020.

Notes
Survey provide by: VesPos Hydrographic Surveys, Chester, Connecticut, assisted by TG&B Marine Services, Monument Beach, Massachusetts.
Horizontal Coordinate System: NAD 83 (2001) StatePlane Massachusetts FIPS 2001 (US ft).
Vertical Coordinate System: NAVD 88.

0 300
Feet

SEDIMENT CORE LOCATIONS

FORMER BRAYTON POINT STATION
ONE BRAYTON POINT ROAD
SOMERSET, MASSACHUSETTS

FIGURE 2

RAMBOLL US CONSULTING, INC.
A RAMBOLL COMPANY

RAMBOLL

Tables

TABLE 3. Sediment Data - Physical Parameters

Sample Location		SED-01	SED-02	SED-02	SED-03	SED-03	SED-03	SED-04	SED-04	SED-04	SED-05	SED-05	SED-05	SED-06
Sample Date		1/10/2022	1/6/2022	1/6/2022	1/6/2022	1/6/2022	1/6/2022	1/6/2022	1/6/2022	1/6/2022	1/10/2022	1/10/2022	1/10/2022	1/10/2022
Interval (ft)		1-3	0-3	4-5	0-3	3-12	16-19.5	2-11	4-11	18-25	0-5	5-7	7-25	2-4
Analyte	Units													
Miscellaneous Parameters														
Percent Moisture	%	14.2	17.1	5.1	46.0	17.0	11.9	11.6	22.5	10.9	40.4	14.7	18.3	38.6
Percent Solids	%	85.8	82.9	94.9	54.0	83.0	88.1	88.4	77.5	89.1	59.6	85.3	81.7	61.4
pH	SU	7.6 HF	8.1 HF	8.1 HF	8.2 HF	8.1 HF	7.2 HF	7.8 HF	7.8 HF	7.7 HF	8.4 HF	8.3 HF	7.8 HF	8.2 HF
Temperature	Degrees C	17.0 HF	16.7 HF	17.2 HF	17.6 HF	19.8 HF	20.5 HF	20.1 HF	19.9 HF	19.2 HF	16.8 HF	20.0 HF	19.9 HF	19.4 HF
Specific Gravity	NONE	2.75	2.69	2.77	2.67	2.71	2.77	2.71	2.77	2.77	2.69	2.70	2.74	2.69
Specific Gravity at 20 deg Celsius	NONE	2.75	2.70	2.77	2.67	2.71	2.78	2.71	2.77	2.77	2.69	2.70	2.75	2.69
Total Organic Carbon - Duplicates	mg/Kg	10000	7600	5600	24000	1200 F2	6000	1100	2200	7800	16000	1500	1800	9000
Grain Size - by type														
Gravel	%	64.6	11.2	21.3	0.7	10.0	15.1	3.3	5.8	30.3	6.7	53.2	0.0	9.2
Sand	%	28.5	71.0	32.6	27.7	85.0	32.0	93.1	3.8	26.8	45.6	41.0	4.1	28.9
Coarse Sand	%	*4.7*	*6.1*	*6.6*	*0.9*	*10.3*	*6.5*	*7.3*	*0.2*	*6.4*	*2.3*	*6.0*	*0.0*	*2.5*
Medium Sand	%	*8.5*	*19.5*	*10.5*	*8.2*	*46.7*	*10.9*	*47.3*	*0.7*	*8.8*	*14.8*	*16.6*	*1.1*	*10.9*
Fine Sand	%	*15.3*	*45.4*	*15.5*	*18.6*	*28.0*	*14.6*	*38.5*	*2.9*	*11.6*	*28.5*	*18.4*	*3.0*	*15.5*
Silt	%	3.7	10.6	30.0	59.3	2.1	36.2	2.0	42.4	28.1	29.2	2.9	75.6	31.1
Clay	%	3.3	7.2	16.1	12.3	2.9	16.7	1.6	48.0	14.8	18.5	2.9	20.3	30.8
Grain Size - Distribution														
Sieve Size 3 inch - Percent Finer	% Passing	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Sieve Size 2 inch - Percent Finer	% Passing	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Sieve Size 1.5 inch - Percent Finer	% Passing	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Sieve Size 1 inch - Percent Finer	% Passing	51.4	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Sieve Size 0.75 inch - Percent Finer	% Passing	51.4	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	83.3	100.0	100.0
Sieve Size 0.375 inch - Percent Finer	% Passing	39.7	92.0	87.9	100.0	91.7	92.5	98.8	100.0	77.3	100.0	61.3	100.0	93.3
Sieve Size #80 - Percent Finer	% Passing	15.2	36.6	53.0	82.4	6.1	59.8	8.4	92.5	49.2	64.2	8.4	98.7	68.0
Sieve Size #60 - Percent Finer	% Passing	17.8	45.1	56.0	84.3	8.1	62.5	13.4	92.9	50.7	66.6	12.2	98.8	70.3
Sieve Size #40 - Percent Finer	% Passing	22.2	63.2	61.6	90.2	33.0	67.5	42.1	93.3	54.5	76.2	24.2	98.9	77.4
Sieve Size #4 - Percent Finer	% Passing	35.4	88.8	78.7	99.3	90.0	84.9	96.7	94.2	69.7	93.3	46.8	100.0	90.8
Sieve Size #200 - Percent Finer	% Passing	6.9	17.8	46.1	71.6	5.0	52.9	3.6	90.4	42.9	47.7	5.8	95.9	61.9
Sieve Size #20 - Percent Finer	% Passing	26.7	75.6	67.4	95.7	70.0	73.2	71.6	93.8	58.8	86.6	35.8	99.2	85.2
Sieve Size #100 - Percent Finer	% Passing	11.6	26.9	51.3	79.5	5.7	58.2	4.5	92.1	47.2	59.0	7.4	98.2	65.5
Sieve Size #10 - Percent Finer	% Passing	30.7	82.7	72.1	98.4	79.7	78.4	89.4	94.0	63.3	91.0	40.8	100.0	88.3
Hydrometer Reading 1 - Percent Finer	% Passing	6.7	15.9	35.9	50.5	5.1	38.6	2.1	84.9	33.1	44.6	5.5	60.6	64.1
Hydrometer Reading 2 - Percent Finer	% Passing	5.7	13.0	31.4	43.7	4.4	35.1	2.1	77.5	28.9	39.4	4.9	54.4	58.2
Hydrometer Reading 3 - Percent Finer	% Passing	4.6	10.9	25.2	31.4	4.4	27.2	1.6	68.9	23.0	32.4	4.2	37.3	46.5
Hydrometer Reading 4 - Percent Finer	% Passing	4.0	9.4	20.6	19.1	3.7	22.8	1.6	56.6	19.5	23.8	3.2	28.4	38.6
Hydrometer Reading 5 - Percent Finer	% Passing	3.3	7.2	16.1	12.3	2.9	16.7	1.6	48.0	14.8	18.5	2.9	20.3	30.8
Hydrometer Reading 6 - Percent Finer	% Passing	2.3	5.1	9.2	9.6	2.2	9.6	1.1	22.1	10.0	11.6	2.2	7.8	20.9
Hydrometer Reading 7 - Percent Finer	% Passing	1.6	4.1	5.1	6.4	2.0	5.0	0.9	8.2	5.1	9.9	1.9	4.2	15.1
Atterburg Limits														
Liquid Limit	NONE	0	0	22	63	0	0	0	0	21	50	0	0	49
Plastic Limit	NONE	0	0	19	31	0	0	0	0	19	26	0	0	24
Plasticity Index	NONE	NP	NP	3	32	NP	NP	NP	NP	2	24	NP	NP	25

Notes. See Last Page

TABLE 3. Sediment Data - Physical Parameters

Analyte	Units	Sample Location	SED-06	SED-06	SED-07	SED-07	SED-07	SED-08	SED-08	SED-08
		Sample Date	1/10/2022	1/10/2022	1/4/2022	1/4/2022	1/4/2022	1/4/2022	1/4/2022	1/4/2022
		Interval (ft)	5-10	15-20	0-5	10-15	20-25	0-3	3-7	8-10
Miscellaneous Parameters										
Percent Moisture	%		17.6	19.5	32.4	18.9	24.0	35.4	15.6	19.9
Percent Solids	%		82.4	80.5	67.6	81.1	76.0	64.6	84.4	80.1
pH	SU		8.0 HF	7.7 HF	8.5 HF	7.4 HF	7.2 HF	8.4 HF	8.1 HF	7.4 HF
Temperature	Degrees C		19.9 HF	19.8 HF	19.7 HF	19.6 HF	19.7 HF	19.6 HF	19.5 HF	19.5 HF
Specific Gravity	NONE		2.69	2.73	2.69	2.70	2.72	2.67	2.70	2.70
Specific Gravity at 20 deg Celsius	NONE		2.69	2.73	2.69	2.70	2.72	2.67	2.70	2.70
Total Organic Carbon - Duplicates	mg/Kg		1200		17000		1500	31000	3500	1300
Grain Size - by type										
Gravel	%		0.0	0.0	0.0	0.0	0.0	0.1	2.2	0.0
Sand	%		13.4	5.1	22.8	25.1	2.9	19.8	86.7	7.3
Coarse Sand	%		*0.0*	*0.0*	*2.3*	*0.0*	*0.0*	*1.2*	*2.9*	*0.0*
Medium Sand	%		*0.5*	*0.5*	*8.3*	*0.0*	*0.0*	*6.0*	*29.7*	*0.2*
Fine Sand	%		*12.9*	*4.6*	*12.2*	*25.1*	*2.9*	*12.6*	*54.1*	*7.1*
Silt	%		79.7	84.7	51.2	70.2	86.0	56.4	8.9	83.6
Clay	%		6.9	10.2	26.0	4.7	11.1	23.7	2.2	9.1
Grain Size - Distribution										
Sieve Size 3 inch - Percent Finer	% Passing		100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Sieve Size 2 inch - Percent Finer	% Passing		100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Sieve Size 1.5 inch - Percent Finer	% Passing		100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Sieve Size 1 inch - Percent Finer	% Passing		100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Sieve Size 0.75 inch - Percent Finer	% Passing		100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Sieve Size 0.375 inch - Percent Finer	% Passing		100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Sieve Size #80 - Percent Finer	% Passing		99.1	98.2	85.1	99.9	99.8	87.1	20.6	99.5
Sieve Size #60 - Percent Finer	% Passing		99.3	98.6	86.4	99.9	99.9	88.3	32.7	99.5
Sieve Size #40 - Percent Finer	% Passing		99.5	99.5	89.4	100.0	100.0	92.7	65.2	99.8
Sieve Size #4 - Percent Finer	% Passing		100.0	100.0	100.0	100.0	100.0	99.9	97.8	100.0
Sieve Size #200 - Percent Finer	% Passing		86.6	94.9	77.2	74.9	97.1	80.1	11.1	92.7
Sieve Size #20 - Percent Finer	% Passing		99.9	99.9	93.1	100.0	100.0	95.4	85.8	99.9
Sieve Size #100 - Percent Finer	% Passing		98.2	97.4	83.4	98.8	99.6	85.2	17.3	98.8
Sieve Size #10 - Percent Finer	% Passing		100.0	100.0	97.7	100.0	100.0	98.7	94.9	100.0
Hydrometer Reading 1 - Percent Finer	% Passing		39.3	48.2	55.2	30.3	51.6	57.3	4.4	44.0
Hydrometer Reading 2 - Percent Finer	% Passing		24.4	38.5	47.0	20.4	40.5	49.8	3.9	32.4
Hydrometer Reading 3 - Percent Finer	% Passing		13.4	25.4	38.9	11.6	25.0	39.8	3.3	19.4
Hydrometer Reading 4 - Percent Finer	% Passing		9.5	16.4	32.4	7.6	17.7	31.1	2.8	13.0
Hydrometer Reading 5 - Percent Finer	% Passing		6.9	10.2	26.0	4.7	11.1	23.7	2.2	9.1
Hydrometer Reading 6 - Percent Finer	% Passing		3.0	3.9	17.8	2.9	5.9	16.2	2.2	5.2
Hydrometer Reading 7 - Percent Finer	% Passing		1.7	2.5	11.1	1.7	2.8	9.8	1.6	3.1
Atterburg Limits										
Liquid Limit	NONE		0	0	68	0	0	85	0	0
Plastic Limit	NONE		0	0	33	0	0	37	0	0
Plasticity Index	NONE		NP	NP	35	NP	NP	48	NP	NP

Notes. See Last Page

TABLE 3. Sediment Data - Physical Parameters

NOTES

This table prepared in color. Reproduction in black and white may not represent the data as intended
These data are based on final reporting by Eurofins Laboratory of Pittsburgh dated February 2022
Grain Size "Percent Sand" represents the total of line items indicated in *Italics* "Coarse Sand", "Medium Sand", and "Fine Sand"
Data has not been validated for usability
Interval refers to the depth below existing sediment surface
Sample data is presented by coring location
Qualifiers:
HF = field parameter measured in lab
NP = Not plastic

TABLE 4. Preliminary Sediment Data - Detected Analytes

Analyte	ER-L	ER-M	Sample Location	SED-01	SED-02	SED-03	SED-05	SED-06	SED-07	SED-08	SED-02	SED-05	SED-08	SED-03	SED-04
			Sample Date	1/10/2022	1/6/2022	1/6/2022	1/10/2022	1/10/2022	1/4/2022	1/4/2022	1/6/2022	1/10/2022	1/4/2022	1/6/2022	1/6/2022
			Interval (ft)	1-3	0-3	0-3	0-5	2-4	0-5	0-3	4-5	5-7	3-7	3-12	2-11
Inorganic Constituents (mg/kg)															
Aluminum		18000		6200	5400	8500	7700	5800	6900	6900	8800	3600	3200	3900	4500
Antimony		9.3		0.12		0.19			0.19	0.30	0.20				
Arsenic	8.2	70		4.8	4.7	**8.9**	7.4	4.9	**8.4**	7.5	5.5	1.4	2.4	1.5 B	2.2
Beryllium				0.27	0.25	0.64	0.56	0.36	0.46	0.46	0.23	0.18	0.12	0.18	0.15
Cadmium	1.2	9.6		0.29	0.13	0.53	0.25		1.0	0.95		0.057			
Chromium	81	370		22	16	**83**	28	14	42	51	13	10	5.1	6.1	6.6
Cobalt		10		5.3	3.7	5.4	4.8	4.0	4.2	4.1	9.2	2.5	2.7	3.0 B	3.9
Copper	34	270		14	12	**56**	15	5.9	28	31	18	5.7	3.3	3.5	4.0
Iron				16000	12000	19000	19000	14000	16000	15000	22000	7700	7500	8300	9500
Lead	47	218		19	36 F1	**65**	28	11	**56**	**69**	11	7.6	2.9	3.4	3.9
Manganese		260		130	110	170	180	140	130	130	240	120	100	130 F1	160
Mercury	0.15	0.71		**0.29**	**0.47**	1.9	**0.49**	0.071	2.3	3.0		0.022			
Nickel	21	52		13	8.4	16	12	9.1	11	10	20	6.4	5.2	6.5	8.1
Selenium		1				0.46									
Silver	1	3.7		0.30	0.064	**1.8**	0.18		0.28	0.34		0.092			
Thallium					0.068	0.13	0.13	0.11	0.093	0.10					
Tin		>3.4		2.2	3.5	6.9	4.1	1.5	8.1	9.0		0.80			
Zinc	150	410		79	53 F1	**160**	75 F1	37	**170**	**160**	43	24	14	17	19
Cadmium SEM				0.32		0.63		1.4		0.55					
Nickel SEM				8.5	5.4	12	8.1	7.4	3.4 B	2.1 B	12	4.6		4.3	3.9
Copper SEM				0.19			0.22	0.36	0.075 B	0.18 B		0.07	0.029 B		
Lead SEM				0.097			0.18	0.38	0.11	0.16		0.042	0.012		
Mercury SEM				0.000058	0.000071	0.00011	0.000024 J	0.00024		0.000019 J		0.000038		0.000027 J	
Zinc SEM				1.1 B			0.85 B	3.1 B	0.39 B	1.5 B		0.34 B	0.086 B		
Semivolatile Organic Compounds (ug/kg)															
Acenaphthylene	44	640				**68**	43	**64**							
Anthracene	85	1100				76	47	**100**		63					
Benzo[a]anthracene	261	1600				170	100	240		140					
Benzo[a]pyrene	430	1600				190	99	230		230					
Benzo[b]fluoranthene		1800		4.4		200	110	210		220					
Benzo[g,h,i]perylene	170					**180**	91	**190**		**180**					
Benzo[k]fluoranthene	240					69	36	96		110					
Chrysene	384	2800				190	120	260		160					
Dibenz(a,h)anthracene	63	260				40		51							
Fluoranthene	600	5100				200	130	270		190					
Fluorene	19	540						**29**							
Indeno[1,2,3-cd]pyrene	200					130	73	160		140					
Naphthalene	160	2100						35							
Phenanthrene	240	1500				99	59	120		100					
Pyrene	665	2600		4.4		380	210	500		360					
Organochlorine Pesticides (ug/kg)															
4,4'-DDD	2	20				0.79 p	0.25 p			0.11 p					
4,4'-DDE	2.2	27		0.063		1.4	0.49			0.17					
4,4'-DDT	1	7				0.11 p									
Aldrin	2					0.083									
Endrin	3			0.074			0.29					0.081			
Endrin aldehyde								0.15							

Notes. See Last Page

TABLE 4. Preliminary Sediment Data - Detected Analytes

	Sample Location		SED-01	SED-02	SED-03	SED-05	SED-06	SED-07	SED-08	SED-02	SED-05	SED-08	SED-03	SED-04
	Sample Date		1/10/2022	1/6/2022	1/6/2022	1/10/2022	1/10/2022	1/4/2022	1/4/2022	1/6/2022	1/10/2022	1/4/2022	1/6/2022	1/6/2022
	Interval (ft)		1-3	0-3	0-3	0-5	2-4	0-5	0-3	4-5	5-7	3-7	3-12	2-11
Analyte	ER-L	ER-M												
Polychlorinated Biphenyl Congeners (ug/kg)														
PCB-101					1.9 p									
PCB-105					1.1									
PCB-118					1.3 p									
PCB-128					1.4									
PCB-138					2.6									
PCB-153					2.6 p									
PCB-169														
PCB-170					1.7									
PCB-180					2.0									
PCB-187					1.7									
PCB-206					2.5									
PCB-209			0.79		3.2									
PCB-28					1.7		1.0							
PCB-49					1.3									
PCB-52					1.6									
PCB-66					1.6	0.99	0.79							
PCB-87					1.0 p									
Miscellaneous														
Acid Volatile Sulfides (AVS; mg/kg))			34		41	27	32		33					
SEM/AVS Ratio			1.5	NC	3.0	1.6	4.1	NC	1.8	NC	2.5	NC	1.8	1.2
Ammonia (mg/kg)					21			24	21					

Notes. See Last Page

TABLE 4. Preliminary Sediment Data - Detected Analytes

Analyte	ER-L	ER-M	Sample Location	SED-06	SED-08	SED-04	SED-03	SED-05	SED-04	SED-06	SED-07	SED-07			
			Sample Date	1/10/2022	1/4/2022	1/6/2022	1/6/2022	1/10/2022	1/6/2022	1/10/2022	1/4/2022	1/4/2022			
			Interval (ft)	5-10	8-10	11-18	16-19.5	7-25	18-25	15-20	10-15	20-25			
Inorganic Constituents (mg/kg)															
Aluminum		18000		1900	3600	8300	10000	5500	10000	3400	2000	5400			
Antimony		9.3					0.13		0.11						
Arsenic	8.2	70		0.73	2.4	4.1	6.2	2.4	**9.3**	2.3	1.4	2.0			
Beryllium				0.11	0.16	0.30	0.20	0.25	0.20	0.16	0.12	0.21			
Cadmium	1.2	9.6													
Chromium	81	370		3.8	6.1	12	15	8.7	14	5.7	3.6	8.4			
Cobalt		10		1.9	3.2	7.4	**13**	5.4	**12**	3.4	1.6	4.2			
Copper	34	270		3.5	4.1	8.9	23	6.8	25	4.9	2.8	5.7			
Iron				5000	9500	18000	26000	14000	25000	9000	5600	13000			
Lead	47	218		2.9	3.9	6.6	9.9	5.3	10	3.9	2.7	4.7			
Manganese		260		66	130	**300**	**630**	260	**410**	130	63 F1	170			
Mercury	0.15	0.71													
Nickel	21	52		3.7	6.4	15	**26**	11	**23**	6.6	3.2	9.3			
Selenium		1													
Silver	1	3.7													
Thallium															
Tin		>3.4													
Zinc	150	410		10	16	35	51	26	48	17	8.2	24			
Cadmium SEM															
Nickel SEM				3.2	1.5 B	12	11	5.9	11	3.3		2.0 B			
Copper SEM				0.061	0.042 B			0.078		0.057	0.025 B	0.047 B			
Lead SEM				0.021	0.015			0.021		0.015	0.012	0.018			
Mercury SEM				0.000032											
Zinc SEM				0.17 B	0.064 B			0.21 B		0.13 B	0.034 J B	0.084 B			
Semivolatile Organic Compounds (ug/kg)															
Acenaphthylene	44	640													
Anthracene	85	1100													
Benzo[a]anthracene	261	1600													
Benzo[a]pyrene	430	1600													
Benzo[b]fluoranthene		1800													
Benzo[g,h,i]perylene	170														
Benzo[k]fluoranthene	240														
Chrysene	384	2800													
Dibenz(a,h)anthracene	63	260													
Fluoranthene	600	5100													
Fluorene	19	540													
Indeno[1,2,3-cd]pyrene	200														
Naphthalene	160	2100													
Phenanthrene	240	1500													
Pyrene	665	2600													
Organochlorine Pesticides (ug/kg)															
4,4'-DDD	2	20													
4,4'-DDE	2.2	27													
4,4'-DDT	1	7													
Aldrin	2														
Endrin	3														
Endrin aldehyde															

Notes. See Last Page

TABLE 4. Preliminary Sediment Data - Detected Analytes

Analyte	ER-L	ER-M	Sample Location	SED-06	SED-08	SED-04	SED-03	SED-05	SED-04	SED-06	SED-07	SED-07			
			Sample Date	1/10/2022	1/4/2022	1/6/2022	1/6/2022	1/10/2022	1/6/2022	1/10/2022	1/4/2022	1/4/2022			
			Interval (ft)	5-10	8-10	4-11	16-19.5	7-25	18-25	15-20	10-15	20-25			
Polychlorinated Biphenyl Congeners (ug/kg)															
PCB-101															
PCB-105															
PCB-118															
PCB-128															
PCB-138															
PCB-153															
PCB-169											1.2 p				
PCB-170															
PCB-180															
PCB-187															
PCB-206															
PCB-209															
PCB-28												0.66			
PCB-49															
PCB-52															
PCB-66															
PCB-87															
Miscellaneous															
Acid Volatile Sulfides (AVS; mg/kg))															
SEM/AVS Ratio				1.5	0.38	NC	NC	NC	NC	NC	0.16	0.62			
Ammonia (mg/kg)															

Notes

This table prepared in color. Reproduction in black and white may not represent the data as intended

These data are based on final reporting by Eurofins Laboratory of Pittsburgh dated February 2022

This table presents only detected compounds and constituents. Non-detected compounds and constituents and the associated detection limits are presented in the final laboratory reports

Screening values presented are based on Effects Range Low (ER-L) and Effects Range Medium (ER-M) ecological values as presented by NOAA.

Values Exceeding ER-L are presented in Grey shading with **Black Text**

Values Exceeding ER-M are presented in Grey shading with **Red Text**

Data has not been validated for usability

Interval refers to the depth below existing sediment surface

Sample data is generally presented as shallowest to deepest interval

Qualifiers:

J = detection below the reporting limit and above the method detection limit; value estimated

B = analyte also observed in the associated method blank

p = percent difference between primary and secondary columns greater than 40%; lower value reported

HF = field parameter measured in lab