Jacobs

Final West Zone 2 & 3 Remedial Action Report

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Revision no: B

U S Army Corps of Engineers, New England District

New Bedford Harbor Superfund Site
August 2024

Final West Zone 2 & 3 Remedial Action Report

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Acronyms and abbreviations

CDE	Cornell Dubilier Electronic, Inc.
cy	cubic yards
DDA	debris disposal area
EPA	U.S. Environmental Protection Agency
GPS	global positioning system
Jacobs	Jacobs Engineering Group, Inc.
LH	Lower Harbor
MCP	Massachusetts Contingency Plan
mg/kg	milligrams per kilogram
NAE	U.S. Army Corps of Engineers – New England District
NBHSS	New Bedford Harbor Superfund Site
NPL	Superfund National Priorities List
OH	Outer Harbor
PCB	polychlorinated biphenyl
ppm	parts per million
RBG	risk-based goals
ROD	Record of Decision
RTK	real-time kinematic
SES	Sevenson Environmental Services, Inc.
SWCA	SWCA Environmental Consultants
TCL	target cleanup level
TSCA	Toxic Substances Control Act
UH	Upper Harbor

1. Introduction

Remediation and restoration of the West Zone 2 and West Zone 3 (WZ2-3) intertidal areas of the New Bedford Harbor Superfund Site was conducted by Jacobs Engineering Group, Inc. (Jacobs) under U.S. Army Corps of Engineers – New England District (NAE) Remediation Action Contract No. W912WJ-15-D-0001 from August 2023 through June 2024 for the U.S. Environmental Protection Agency (EPA). The primary objective of remedial action at WZ2-3 was to remove soil and sediment with polychlorinated biphenyl (PCB) concentrations greater than the site-specific target cleanup levels (TCLs) and to restore this area to pre-existing or comparable conditions. The TCLs for WZ2-3 are 25 milligrams per kilogram (mg/kg) for shoreline recreational areas (0-1 ft depth interval) given the planned New Bedford River Walk, 50 mg/kg for shoreline recreational areas deeper than the 0-1 ft depth interval, and 10 mg/kg for mudflats, as established in the *1998 Record of Decision for the New Bedford Harbor Superfund Site* (NBHSS) (EPA 1998) and its associated modifications (e.g., Explanation of Significant Differences).

The West Zone 2 and West Zone 3 remediation areas are adjacent to one another and are shown in Figure 1-1 and Figure 1-2. The excavation areas are presented on Figures 2-3a to 2-3c. It should be noted that the cove area of Parcel 112-133 (Titleist property) was originally planned to be remediated by a land based or amphibious excavator, but after vegetation clearing and re-evaluation of the sediment type, it was decided that a floating barge-based dredge approach would be the most effective option for remediation. This area is identified on Figure 1-4. The excavation areas in total comprised approximately 162,951 square feet (3.7 acres). Approximately 7,947 cubic yards (cy) of PCB-contaminated soil and sediment were excavated.

The purpose of this Remedial Action Report is to document the remediation activity and final disposition of the restored West Zone 2 and West Zone 3 areas. Contaminated soil and sediments were removed and disposed off-site, and the areas were restored in accordance with the *Draft Final Intertidal Work Plan for West Zone 2-3, Revision 1* (Jacobs 2022a), the Project Note *Draft Final WZ2-3 Prism Revision and Dredging of Cove* (Jacobs, 2023a), the Project Note *Draft Final Revisions to WZ2-3 Restoration Plan* (Jacobs, 2024a), and *Draft Final West Zone 2 & 3 Supplemental Planting Plan* (Jacobs, 2024b).

1.1 Site History

The New Bedford Harbor Superfund Site (NBHSS or Site) was proposed for the Superfund National Priorities List (NPL) in 1982 and finalized on the NPL in 1983. Pursuant to 40 CFR 300.425 (c)(2), the Commonwealth of Massachusetts nominated the harbor as its priority site for listing on the NPL. The Site is located approximately 55 miles south of Boston, in Bristol County, Massachusetts and is bounded to the east by the Town of Acushnet and Town of Fairhaven; and bounded to the west by the City of New Bedford and the Town of Dartmouth. The Site covers approximately 18,000 acres, extending from the shallow northern reaches of the Acushnet River Estuary, southward through the commercial harbor of New Bedford and into the adjacent section of Buzzards Bay. Based on the different geographic, environmental, and man-made features in the harbor, it has been subdivided into three sections identified as the Upper Harbor (UH), Lower Harbor (LH), and the Outer Harbor (OH) (Figure 1-1).

The subtidal area and impacted intertidal zones of the UH comprise approximately 250 acres and are bounded to the North by the Wood Street Bridge area and to the South by the Coggeshall Street Bridge. The LH comprises approximately 750 acres and is bounded to the north by the Coggeshall Street Bridge and to the south by the New Bedford Hurricane Barrier. The OH (approximately 17,000 acres) begins at the Hurricane Barrier and extends southward into Buzzards Bay to an imaginary line extending from Rocky Point (the southern tip of West Island in Fairhaven) southwesterly to a New Bedford Harbor navigational channel buoy, Buoy C3 and then southwesterly to Mishaum Point in Dartmouth.

PCB contamination of the soil, sediments, and seafood in and around New Bedford Harbor was first identified in the mid-1970s. Site-specific investigations by the EPA began in 1983 and 1984 and included pilot dredging and disposal studies and extensive physical and chemical computer modeling. These earlier studies are summarized in the *Draft Final Public Health Risk Assessment*, the *Draft Final Feasibility Study of Remedial Alternatives for the Estuary and Lower Harbor/Bay*, and the *Draft Final Supplemental Feasibility Study Evaluation for Upper Buzzards Bay* (Ebasco Services Inc.,1989, 1990, 1992). In 1990, the *Record of Decision Summary New Bedford Harbor/Hot Spot Operable Unit* was issued by EPA to address hotspots within the Upper Harbor, and in 1998, the *Record of Decision for the Upper and Lower Harbor Operable Unit* was issued to address the remaining contamination throughout the harbor (EPA, 1990, 1998).

Based on the results of these investigations and knowledge of the operations at the former Aerovox mill at 740 Belleville Avenue in New Bedford, the Aerovox mill was identified as the principal source of PCB contamination in the UH. During operations at this facility (1940s – 1970s), PCB wastes were discharged directly to the UH through open trenches/spills and direct dumping, and indirectly via the City's sewerage system. During the same general time period, inputs of PCBs were also contributed to the Site by operations at the Cornell Dubilier Electronics, Inc. (CDE) facility, located just south of the New Bedford Hurricane Barrier in the OH.

Operations at the former Aerovox mill resulted in significantly elevated PCB concentrations in UH sediments that generally decreased from north to south across the NBHSS Site. Prior to the completion of remedial efforts, UH sediments contained PCB concentrations that ranged from below detection to more than 100,000 parts per million (ppm) in localized areas. As a tidal embayment with diurnal 4-foot tides, intertidal mudflats and vegetated saltmarshes became contaminated with PCBs in the UH and in certain, localized shoreline areas of the LH. This report documents the Remedial Action that occurred during 2023-2024 in two of these UH shoreline areas, West Zone 2, and West Zone 3, in New Bedford, Massachusetts located on the Acushnet River just south of the former Aerovox mill (Figure 1-1).

2. Remedial Activities

The methods used to complete the remedial action at West Zones 2 and 3 are presented below.

2.1 Pre-Remediation Environmental Sampling and Site Preparation

Environmental sampling of sediment and soil from the subtidal, intertidal, and upland areas around WZ2-3 was conducted in 2000, 2001, 2015, 2018, and 2019. These data were used to determine the horizontal and vertical boundaries of the areas requiring remediation. Figures 1-3a through 1-3c and Tables 2-1a

through 2-1d present characterization sample locations and data used to determine the final remedial boundaries.

Pre-existing conditions at WZ2-3 were documented prior to the initiation of remedial activities to establish baseline conditions for backfill, contouring, and re-establishment of native vegetation. This included a pre-excavation elevation survey and mapping of wetland cover types within the intertidal areas (Figures 2-1a through 2-1c). Other pre-excavation preparation activities included coordination with property owners, clearing of trees and vegetation, removal of debris, construction of access roads and staging areas, utility surveying, and mobilization of equipment.

A portion of Parcel 112-133 (Titleist) originally included in the WZ2-3 excavation boundary was previously remediated in 2022 as part of the Massachusetts 21E cleanup effort led by Brown and Caldwell. The excavation prism in this area was revised to exclude the previously remediated area and then documented in the Project Note *Draft Final Titleist Sheet Pile Survey Results and Modification of WZ 2&3 Excavation* (Jacobs, 2023b), which is provided as Attachment A.

2.2 Removal of Contaminated Soil & Sediments

Excavation of the intertidal areas was conducted by Sevenson Environmental Services, Inc. (SES) with a Komatsu PC300 long-front excavator that was guided by real-time kinematic global positioning system (RTK GPS). The associated RTK GPS software program inside of the excavator records the actual horizontal and vertical extents of excavation. Target elevations were established by using the cut depth figures presented in the Work Plan and Project Notes (Jacobs, 2022a, 2023a).

Excavated material was loaded into sealed roll-off containers and transported by truck to the Debris Disposal Area (DDA) located at 103 Sawyer Street, New Bedford, MA for stabilization with Portland cement and load out. See Section 3 below for disposal details. Concrete pieces and boulders found within the excavation areas were removed, cleaned, and used to stabilize riverbank slopes or submerged in certain areas along the shoreline.

Remedial excavation and restoration was performed directly adjacent to the existing Crib Cap, a subtidal/intertidal sediment cap constructed in September 2020 that extends seaward from the shoreline of Parcels 111-146 and 111-98 (Figure 1-2). The armor layer of the cap which consists of 4- to 10-inch stone was not disturbed during remedial excavation of WZ2-3. For further information on the Crib Cap and other sediment caps refer to the *Final Upper Harbor Sediment Caps Remedial Action Report* (Jacobs, 2021).

A total of 7,947 cy of contaminated soil and sediment was removed from the West Zone 2 and West Zone 3 intertidal areas. This value is based on estimates derived from the pre-excavation and post-excavation survey data. The as-built limits of excavation are presented on Figure 2-2a and Figure 2-2b for West Zone 2, and on Figure 2-2c for West Zone 3.

2.3 Remedial Environmental Sampling

As documented in the Final Pre-Excavation Confirmatory Pilot Test Technical Memorandum, post excavation compliance elevations were used for establishing that the applicable TCLs were achieved

(Jacobs, 2020). This pilot test, which was conducted in 2018 and 2020, demonstrated that compliance with the excavation design prism, post excavation total PCB congener concentrations were shown to be below pre-excavation sample concentrations and meet the proper TCLs. The pre- and post-excavation compliance survey data are shown in Table 2-2a and compliance survey locations are shown in Figures 2-3a through 2-3c.

Ambient air monitoring was conducted by an independent party, Cashins & Associates, Inc., at fixed monitoring locations during WZ2-3 remedial activities in accordance with the *Draft Final Ambient Air Monitoring Plan for Remediation Activities, Revision 5* (Jacobs, 2022b). One additional location, #84 Riverbank Lofts, was established in the north parking lot of the Riverbank Lofts apartment complex located at 200 Riverside Ave, New Bedford, MA. No exceedances to air Risk-Based Goals (RBGs) were identified during excavation (EPA 2024).

2.4 Site Restoration

Site restoration activities, excluding the planting of spring marsh grasses and upland plants, were completed in February 2024 following methodology defined in the work plans (Jacobs, 2022a, 2024a, 2024b). Restoration activities included coir log installation, topsoil backfilling, construction of 5 drainage swales, and placement of boulders/concrete pieces along the shoreline. Backfill of excavated areas was performed by Sevenson using fill material as specified in the *Draft Final Generic Upper Harbor Intertidal Work Plan* (Jacobs, 2019a) and Draft Final Topsoil Acceptance Plan (Jacobs, 2019b). The final post-excavation and post-restoration compliance elevations for WZ2-3 are presented in Table 2-2a. Topsoil was tested for MCP Massachusetts Contingency Plan (MCP) S-1 Soil Cleanup Standards, acceptable nutrient ranges, and geotechnical requirements (Jacobs, 2019a, 2019b). A summary of the topsoil analysis results is provided in Attachment B.

Planting of native shrubs, trees, and saltmarsh grasses was performed by SWCA Environmental Consultants (SWCA) from May through June 2024. Restoration planting requirements were outlined in the work plans (Jacobs, 2022a) and additional documents including Draft Final West Zone 2 & 3 Supplemental Planting Plan (Jacobs, 2024b) and Draft Final Revisions to West Zones 2 and 3 Restoration Plan (Jacobs, 2024a). Upland areas also received a salt tolerant grass seed mix in addition to the installation of upland plants and shrubs. A Planting Summary is provided in Table 2-3 and species information on saltmarsh grasses, native trees and shrubs is available in Attachment C.

A field change was required to be made to the work plan (Jacobs, 2023b) concerning a narrow, man-made peninsula on Parcel 112-133 (Titleist property). During the excavation phase, when taking apart the peninsula, the number and size of boulders and concrete material found to make up the peninsula were larger and more numerous than expected. This material had been obscured by vegetation and/or submerged at the time of drafting the work plan. The project team discussed the conditions with Titleist and the City of New Bedford, and it was decided that this feature no longer served a function and did not need to be fully replaced following excavation. Due to the size of the concrete and boulders (many greater than 4 ft. in diameter), it was determined that offsite disposal was not practical due to cost and equipment availability. A decision was made to repurpose the material as shoreline armor and place any remaining

boulders or concrete at the east edge of the restoration, seaward of the restored salt marsh, and sunk into the mud to the maximum extent possible. A full description of the revisions, including figures and subsequent changes to restoration plantings in this area, is provided in (Attachment C).

A post-excavation drone survey was conducted by Meridian Associates, Inc. in April 2024 to document post-restoration topography. This survey provided the base layers for the post-excavation and restoration record drawings presented in Figure 2-2a through Figure 2-2c.

A pre-final inspection of the restored parcels was performed by Jacobs and NAE, accompanied by EPA and SES, on March 19, 2024 which generated punch list items that included addressing washout areas between stones along the shoreline of Parcel 111-146, conservation seed mix application, clearing around an outfall pipe to prevent future obstruction, and replacing pre-existing fencing on Parcel 112-133. A final inspection was performed on August 15, 2024 following the completion of upland plantings and herbivory fence installation. The final inspection was conducted by Jacobs and NAE accompanied by EPA and SES.

Site monitoring and maintenance will continue through the first five full growing seasons (Fall 2029) and will document the extent to which the wetland restoration and, where applicable, upland restoration goals of the project are being met. The monitoring and maintenance protocols are described in the *Draft Final Generic Upper Harbor Intertidal Work Plan* (Jacobs, 2019a).

3. Waste Management

Soil and Sediment generated from West Zone 2 and West Zone 3 Intertidal Remediation was disposed of in accordance with the Toxic Substances Control Act (TSCA). Approximately 10,860 tons of stabilized soil and sediment generated during remediation were transported via truck from the Sawyer Street facility to MHF-LS Transload, Inc. in Worcester, Massachusetts where it was transloaded to rail cars for ultimate disposal at the Wayne Disposal, Inc. Site #2 Landfill, operated by Republic Services, in Belleville, MI.

4. References

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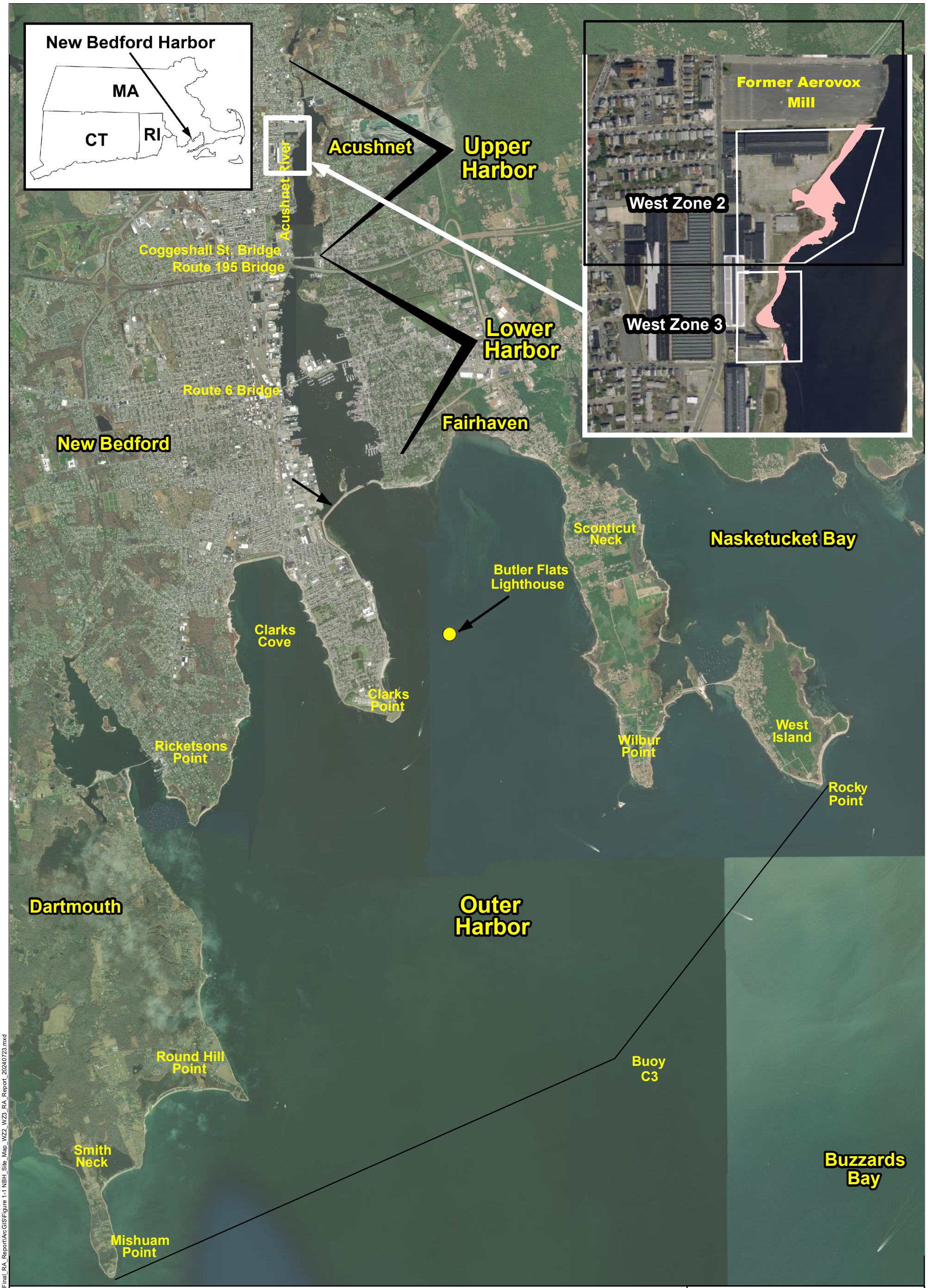
Figures



Legend

Intertidal Remediation Zones

N

0 0.5 1 2 Miles

Basemap Reference: Bing Maps Aerial

Jacobs

Site Location Map

New Bedford Harbor Superfund Site

NAME: jpiccuito Date: 8/5/2024

Figure 1-1

Path: Y:\NBH\Projects\35BG1001\20240723_WZ2_WZ3_Draft_Final_RA_Report\ArcGIS\Figure 1-1 NBH_Site_Map_WZ2_WZ3_RA_Report_20240723.mxd

112-133

111-146

111-98

111-155

Bellevue Ave

New Bedford Harbor

West Zone 2

West Zone 3

Upper Harbor

Site Location

Basemap Source: Aerial Imagery MassGIS 2021

Legend

- West Zone 2 Management Area
- West Zone 3 Management Area
- Parcel Boundary
- Crib Cap Limits (full depth)
- Proposed Limits of Excavation

0 150 300 Feet

Jacobs

Intertidal West Zones 2 and 3 Site Location and Features

New Bedford Harbor Superfund Site

Figure 1-2

Path: Y:\NBH\Projects\35BG1001\20240723_WZ2_WZ3_Draft_Final_RA_Report\ArcGIS\Figure 1-2 Site Location_WZ2_WZ3_RA_Report_20240723.mxd

Legend

- Pre-Excavation PCB Characterization Samples
- Parcel Boundary
- MHHW (1.99 ft)
- MLLW (-1.97 ft)
- Proposed Limits of Excavation

Basemap Source: Aerial Imagery MassGIS 2021

0 60 120 Feet

MHHW and MLLW Elevations NAVD88 ft.
(Green Seal, 2018)

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West Zones 2 and 3 Parcel 112-133 Proposed Excavation Boundaries and PCB Sample Locations

New Bedford Harbor Superfund Site

Figure 1-3a

Path: Y:\NBH\Projects\35BG10011\20240723_WZ2_WZ3_Draft_Final_RA_Report\ArcGIS\Figure 1-3a WZ2_WZ3_Parcel_112_133_Samp_Locs_RA_Report_20240723.mxd

Legend

- Pre-Excavation PCB Characterization Samples
- Parcel Boundary
- MHHW (1.99 ft)
- MLLW (-1.97 ft)
- Proposed Limits of Excavation

Basemap Source: Aerial Imagery MassGIS 2021

0 60 120 Feet

MHHW and MLLW Elevations NAVD88 ft.
(Green Seal, 2018)

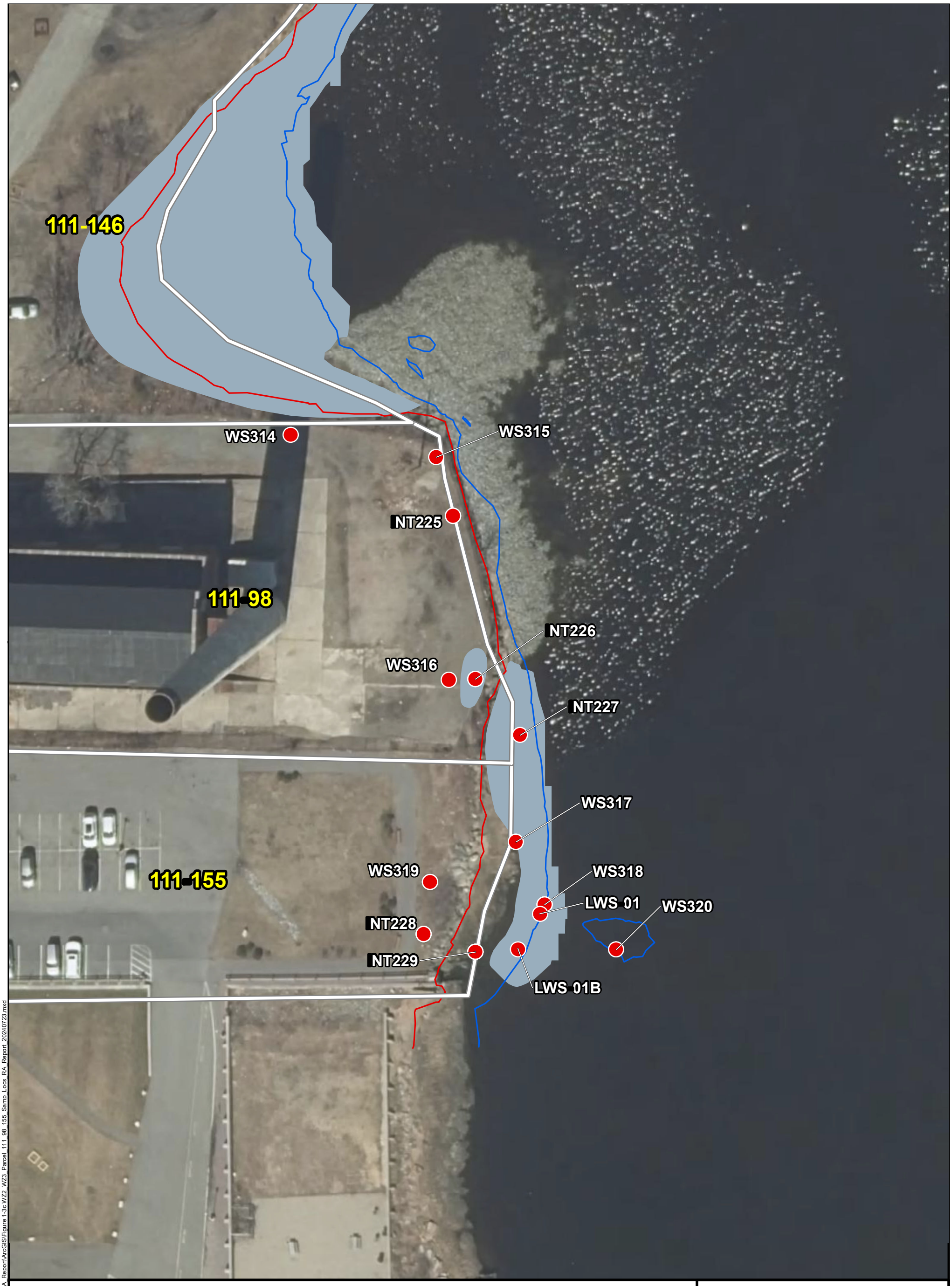
Jacobs

West Zones 2 and 3 Parcel 111-146
Proposed Excavation Boundaries and PCB Sample Locations

New Bedford Harbor Superfund Site

Figure 1-3b

Path: Y:\NBH\Projects\35BG100120240723_WZ2_WZ3_Draft_Final_RA_Report\ArcGIS\Figure 1-3b WZ2_WZ3_Parcel_111_146_Samp_Locs_RA_Report_20240723.mxd



Legend

- Pre-Excavation PCB Characterization Samples
- Parcel Boundary
- MHHW (1.99 ft)
- MLLW (-1.97 ft)
- Proposed Limits of Excavation

Basemap Source: Aerial Imagery MassGIS 2021

0 40 80 Feet

MHHW and MLLW Elevations NAVD88 ft.
(Green Seal, 2018)

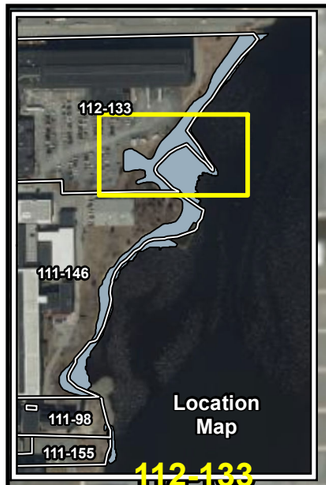
Jacobs

West Zones 2 and 3 Parcels 111-98 and 111-155 Proposed Excavation Boundaries and PCB Sample Locations

New Bedford Harbor Superfund Site

Figure 1-3c

Path: Y:\NBH\Projects\35BG10012\20240723_WZ2_WZ3_Draft_Final_RA_Report\ArcGIS\Figure 1-3c WZ2_WZ3_Parcel_111_98_155_Samp_Locs_RA_Report_20240723.mxd



111-146

Legend

- MHHW (1.99 ft)
- MLLW (-1.97 ft)
- Parcel Boundary

Feet of Sediment To Remove

1 2 3 4 5 6

2.1 Pre-Excavation Elevations NAVD88 ft. (Green Seal 2018, SES 7/21/23 Cove Area)

actual limits of water based dredging

Volume = 780.6 CY

Pre-Excavation, MHHW and MLLW Elevations NAVD88 ft. and Basemap Photography Sources: Green Seal 2018, MassGIS 2014

0 70 Feet

Basemap Source: Aerial Imagery MassGIS 2021

West Zones 2 and 3 Cove Dredge Prism

New Bedford Harbor Superfund Site

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Figure 1-4

Path: Y:\NBH\Projects\35BG100\120240723_WZ2_WZ3_Draft_Final_RA_Report\ArcGIS\Figure 1-4 WZ2_WZ3 Cove Dredge Prism_RA_Report_20240723.mxd

Notes:

Existing vegetative cover was surveyed by Green Seal, LLC (October 2018).

112 133

111 146

5

3

0

5

5

0

5

3

Legend

- 0-1' Excavation Depth
- 1-2' Excavation Depth
- 2-3' Excavation Depth
- 3-4' Excavation Depth
- 4-5' Excavation Depth
- 5-6' Excavation Depth
- 1-foot Contour
- Mean Lower Low Water
- Mean Higher High Water
- Parcel Boundary
- High Marsh
- Low Marsh
- Mudflat
- Scrub-Shrub Marsh
- Upland/Lawn
- Upland

MHHW and MLLW Elevations NAVD88 ft. (Green Seal, 2018)

0 50 100 Feet

Basemap Source: Aerial Imagery MassGIS 2021

Vertical Datum: NAVD88

West Zone 2-3 Parcel 112-133 Pre-existing Vegetation, Topography, and Excavation Area

New Bedford Harbor Superfund Site

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Figure 2-1a

Path: Y:\NB\Projects\35BG100\20240723_W22_W23_Draft_Final_RA_Report\ArcGIS\Figure 2-1a W22_W23_Parcel_112_133_Pre_Existing_RA_Report_20240723.mxd

Notes:

Existing vegetative cover was surveyed by Green Seal, LLC (October 2018).

111 146

112 133

111 98

5

0

5

0

5

5

0

5

Legend

- 0-1' Excavation Depth
- 1-2' Excavation Depth
- 2-3' Excavation Depth
- 3-4' Excavation Depth
- 4-5' Excavation Depth
- 1-foot Contour
- Mean Lower Low Water
- Mean Higher High Water
- Low Marsh
- Mudflat
- Phragmites
- Parcel Boundary
- Beach
- Scrub-Shrub Marsh
- Upland

MHHW and MLLW Elevations NAVD88 ft.
(Green Seal, 2018)

0 50 100 Feet

Basemap Source: Aerial Imagery MassGIS 2021

Vertical Datum: NAVD88

West Zone 2-3 Parcel 111-146 Pre-existing Vegetation, Topography, and Excavation Area

New Bedford Harbor Superfund Site

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Figure 2-1b

Path: Y:\NBH\Projects\35BG1001\20240723_W22_W23_Draft_Final_RA_Report\ArcGIS\Figure 2-1b W22_W23_Parcel_111_146_Pre_Existing_RA_Report_20240723.mxd

Existing vegetative cover was

111 155

111 98

111 146

105 170

5

0

5

5

5

Legend

- 0-1' Excavation Depth
- 1-2' Excavation Depth
- 1-foot Contour
- Mean Lower Low Water
- Mean Higher High Water
- Parcel Boundary
- Mudflat
- Upland/Lawn
- Low Marsh

MHHW and MLLW Elevations NAVD88 ft.
(Green Seal, 2018)

0 25 50 Feet

Basemap Source: Aerial Imagery MassGIS 2021

Vertical Datum: NAVD88

West Zone 2-3 Parcels 111-98 and 111-155 Pre-Existing Vegetation, Topography, and Excavation Area

New Bedford Harbor Superfund Site

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Figure 2-1c

Path: Y:\NBH\Projects\35BG1001\20240723_W22_W23_Draft_Final_RA_Report\ArcGIS\Figure 2-1c W22_W23_Parcel_111_98_155_Pre_Existing_RA_Report_20240723.mxd

Drainage Swale

Drainage Swale

Drainage Swale

TITLEIST

HADLEY STEET

Drainage Swale

112-133

111-146

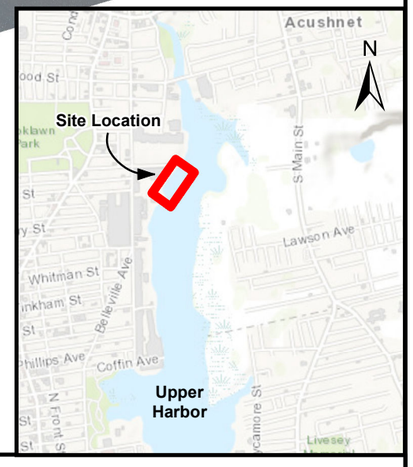
Outfall Pipes

Stone Splash Pads

Placement of "stone like" concrete chunks

Wetland Cover Types

- Low Marsh
- High Marsh
- Upland
- Mudflat
- New Grass
- Scrub Shrub Marsh
- Conservation Seed Mix/Transition



Legend

- Post-Restoration 1-foot Contours
- Post-Restoration 5-foot Contours
- MHHW (1.99 ft. Post-Restoration)
- MLLW (-1.97 ft. Post-Restoration)
- Coir Log @ 0.5 ft. NAVD88
- As-built Limits of Excavation
- Parcel Boundary
- Rip-rap/Swale
- Rock/Boundary
- Large concrete pieces buried in mud or below 0.5' for erosion
- Fence
- Outfall Pipe
- Exposed Outfall Pipe
- Stone Splash Pads
- Trees & Shrubs (planted during restoration)

Restoration Aerial: Meridian April 2024

Datum Info:
Vertical - NAVD88, feet
Horizontal - NAD83 StatePlane MA, feet

0 50 100 Feet

Basemap Data Source:
MassGIS, ESRI and Meridian (April. 2024)

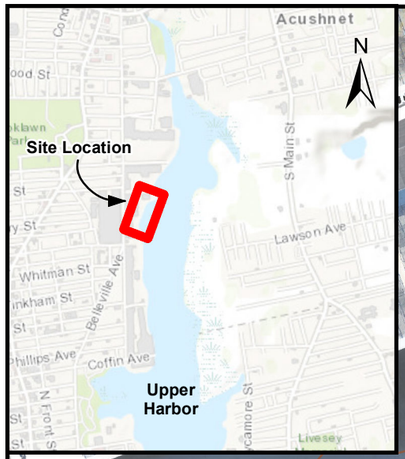
West Zone 2-3 Parcel 112-133
Post-Excavation and Restoration Record Drawing

New Bedford Harbor Superfund Site

Jacobs

Figure 2-2a

Path: Y:\NBH\Projects\35BG100120240723_WZ2_WZ3_Draft_Final_RA_Report\ArcGIS\Figure 2-2a WZ2_WZ3_Parcel 112-133 Titleist Record_Drawing_RA_Report_20200723.mxd



DARN IT

Location of Draiange Ditch and Pavement Repair

Drainage Swale

Drainage Swale

Drainage Swale

111-146

111-98

112-133

Filled with 4-10 inch "rip -rap"

Wetland Cover Types

- Low Marsh
- High Marsh
- Upland
- Mudflat
- New Grass
- Scrub Shrub Marsh
- Conservation Seed Mix/Transition

Legend

- Post-Restoration 1-foot Contours
- Post-Restoration 5-foot Contours
- MHHW (1.99 ft. Post-Restoration)
- MLLW (-1.97 ft. Post-Restoration)
- As-built Limits of Excavation
- Parcel Boundary
- Drainage Ditch
- Pavement Repair
- Rip-rap/Swale
- Rip-rap
- Gravel Parking Area
- Trees & Shrubs (planted during restoration)
- Rock/Boundary
- Coir Log @ 0.5 ft. NAVD88

Restoration Aerial: Meridian April 2024

Datum Info:
Vertical - NAVD88, feet
Horizontal - NAD83 StatePlane MA, feet

0 50 100 Feet

Basemap Data Source:
MassGIS, ESRI and
Meridian (April. 2024)

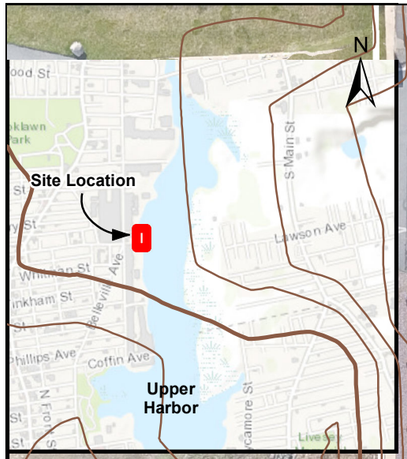
West Zone 2-3 Parcel 111-146
Post-Excavation and Restoration Record Drawing

New Bedford Harbor Superfund Site

Jacobs

Figure 2-2b

Path: Y:\NBH\Projects\35BG10011\20240723_WZ2_WZ3_Draft_Final_RA_Report\ArcGIS\Figure 2-2b WZ2_WZ3_Parcel 111-146 Record_Drawing_RA_Report_20240723.mxd



111-155

111-98

111-146

105-170

Filled with 4-10 inch "rip -rap"

Wetland Cover Types

- Low Marsh
- High Marsh
- Mudflat
- Conservation Seed Mix/Transition

Legend

- Post-Restoration 1-foot Contours
- Post-Restoration 5-foot Contours
- MHHW (1.99 ft. Post-Restoration)
- MLLW (-1.97 ft. Post-Restoration)
- Coir Log @ 0.5 ft. NAVD88
- As-built Limits of Excavation
- Parcel Boundary
- Rip-rap
- Rock/Boundary
- Trees & Shrubs (planted during restoration)

Restoration Aerial: Meridian April 2024

Datum Info:
Vertical - NAVD88, feet
Horizontal - NAD83 StatePlane MA, feet

0 50 100 Feet

Basemap Data Source:
MassGIS, ESRI and Meridian (April. 2024)

West Zone 2-3 Parcels 111-155 and 111-98
Post-Excavation and Restoration Record Drawing

New Bedford Harbor Superfund Site

Jacobs

Figure 2-2c

Path: Y:\NBH\Projects\35BG100120240723_WZ2_WZ3_Draft_Final_RA_Report\ArcGIS\Figure 2-2c WZ2_WZ3_Parcel 111-98_155 Record_Drawing_RA_Report_20240723.mxd

Path: Y:\NBH\Projects\35BG1001\20240723_WZ2_WZ3_Draft_Final_RA_Report\ArcGIS\Figure 2-3a WZ2_WZ3_Parcel 112-133 Compliance Survey Locations_RA_Report_20240723.mxd

Legend

- Parcel Boundary
- MHHW (1.99 ft. Post-Restoration)
- MLLW (-1.97 ft. Post-Restoration)
- Coir Log@ 0.5 ft. NAVD88
- As-built Limits of Excavation

Compliance Location

- Sidewall Survey Compliance Location
- Floor Survey Compliance Location

Basemap Source: Aerial Imagery MassGIS 2021

0 60 120 Feet

Jacobs

West Zone 2-3 Parcel 112-133 Compliance Survey Locations

New Bedford Harbor Superfund Site

Figure 2-3a

Legend

- Parcel Boundary
- MHHW (1.99 ft. Post-Restoration)
- MLLW (-1.97 ft. Post-Restoration)
- Coir Log@ 0.5 ft. NAVD88
- As-built Limits of Excavation

Compliance Location

- Sidewall Survey Compliance Location
- Floor Survey Compliance Location

Basemap Source: Aerial Imagery MassGIS 2021

0 60 120 Feet

Jacobs

West Zone 2-3 Parcel 111-146 Compliance Survey Locations

New Bedford Harbor Superfund Site

Figure 2-3b

Path: Y:\NBH\Projects\35BG10011\20240723_WZ2_WZ3_Draft_Final_RA_Report\ArcGIS\Figure 2-3b WZ2_WZ3_Parcel 111-146 Compliance Survey Locations_RA_Report_20240723.mxd

111-146

111-98

WS333

WS327

INT227

WS334

WS317

WS318

111-155

Path: Y:\NBH\Projects\35BG10012024072 3_WZ2_WZ3_Draft_Final_RA_Report\ArcGIS\Figure 2-3c WZ2_WZ3_Parcel 111-98_155 Compliance Survey Locations_RA_Report_20240723.mxd

Legend

- Parcel Boundary
- MHHW (1.99 ft. Post-Restoration)
- MLLW (-1.97 ft. Post-Restoration)
- Coir Log@ 0.5 ft. NAVD88
- As-built Limits of Excavation

Compliance Location

- Sidewall Survey Compliance Location
- Floor Survey Compliance Location

Basemap Source: Aerial Imagery MassGIS 2021

0 40 80 Feet

Jacobs

West Zone 2-3 Parcels 111-98 and 111-155 Compliance Survey Locations

New Bedford Harbor Superfund Site

Figure 2-3c

Tables

Table 2-1a
Pre-Excavation PCB Characterization Sample Results for Parcel 112-133

Parcel	Type	Sample ID	Station ID	Sample Depth Top (ft)	Sample Depth Bottom (ft)	Sample Date	Description	Total PCB (mg/kg)	Final Qualifier
112-133	Upland	S-15G-INT203-00-10	INT203	0.0	1.0	8/6/2015	PCB from Immunoassay (Aroclor 1254)	2885	D
112-133	Upland	S-15G-INT203-10-20	INT203	1.0	2.0	8/6/2015	PCB from Immunoassay (Aroclor 1254)	1767	D
112-133	Upland	S-15G-INT203-20-30	INT203	2.0	3.0	8/6/2015	PCB from Immunoassay (Aroclor 1254)	51	D
112-133	Upland	S-15G-INT204-00-10	INT204	0.0	1.0	8/6/2015	PCB from Immunoassay (Aroclor 1254)	87	D
112-133	Upland	S-15G-INT204-10-20	INT204	1.0	2.0	8/6/2015	PCB from Immunoassay (Aroclor 1254)	1.9	
112-133	Upland	S-15G-INT205-00-10	INT205	0.0	1.0	8/6/2015	Total 139 PCB cong (excl non-detects)		28.0
112-133	Upland	S-15G-INT205-10-20	INT205	1.0	2.0	8/6/2015	PCB from Immunoassay (Aroclor 1254)		2.2
112-133	Mudflat	S-15G-INT206-00-10	INT206	0.0	1.0	8/4/2015	PCB from Immunoassay (Aroclor 1254)	2585	D
112-133	Mudflat	S-15G-INT206-10-20	INT206	1.0	2.0	8/4/2015	PCB from Immunoassay (Aroclor 1254)	55	D
112-133	Mudflat	S-15G-INT206-20-30	INT206	2.0	3.0	8/4/2015	PCB from Immunoassay (Aroclor 1254)	0.8	
112-133	Mudflat	S-15G-INT206-30-40	INT206	3.0	4.0	8/4/2015	PCB from Immunoassay (Aroclor 1254)	1.0	
112-133	Saltmarsh	S-15G-INT207-00-10	INT207	0.0	1.0	8/6/2015	PCB from Immunoassay (Aroclor 1254)	1388	D
112-133	Saltmarsh	S-15G-INT207-10-15	INT207	1.0	1.5	8/6/2015	PCB from Immunoassay (Aroclor 1254)	694	D
112-133	Saltmarsh	S-15G-INT207-40-60	INT207	4.0	6.0	8/6/2015	PCB from Immunoassay (Aroclor 1254)	244	D
112-133	Upland	S-15G-INT208-00-10	INT208	0.0	1.0	8/6/2015	Total 139 PCB cong (excl non-detects)	49.0	
112-133	Upland	S-15G-INT208-10-20	INT208	1.0	2.0	8/6/2015	PCB from Immunoassay (Aroclor 1254)	8.8	
112-133	Upland	S-15G-INT208-20-30	INT208	2.0	3.0	8/6/2015	PCB from Immunoassay (Aroclor 1254)	4.0	
112-133	Upland	S-15G-INT209-00-10	INT209	0.0	1.0	8/6/2015	PCB from Immunoassay (Aroclor 1254)	2.5	
112-133	Upland	S-15G-INT209-10-20	INT209	1.0	2.0	8/6/2015	PCB from Immunoassay (Aroclor 1254)	1.2	
112-133	Mudflat	S-15G-INT210-00-10	INT210	0.0	1.0	8/4/2015	PCB from Immunoassay (Aroclor 1254)	89	D
112-133	Mudflat	S-15G-INT210-10-20	INT210	1.0	2.0	8/4/2015	Total 139 PCB cong (excl non-detects)	27.0	
112-133	Mudflat	S-15G-INT210-20-30	INT210	2.0	3.0	8/4/2015	Total 139 PCB cong (excl non-detects)	30.0	
112-133	Mudflat	S-15G-INT210-30-40	INT210	3.0	4.0	8/4/2015	PCB from Immunoassay (Aroclor 1254)	0.7	
112-133	Saltmarsh	S-15G-INT211-00-10	INT211	0.0	1.0	8/6/2015	PCB from Immunoassay (Aroclor 1254)	474	D
112-133	Saltmarsh	S-15G-INT211-10-20	INT211	1.0	2.0	8/6/2015	PCB from Immunoassay (Aroclor 1254)	156	D
112-133	Saltmarsh	S-15G-INT211-20-30	INT211	2.0	3.0	8/6/2015	Total 139 PCB cong (excl non-detects)	37.0	
112-133	Mudflat	S-15G-INT212-00-10	INT212	0.0	1.0	8/4/2015	PCB from Immunoassay (Aroclor 1254)	68	D
112-133	Mudflat	S-15G-INT212-10-15	INT212	1.0	1.5	8/4/2015	PCB from Immunoassay (Aroclor 1254)	0.7	
112-133	Mudflat	S-15G-INT212-15-25	INT212	1.5	2.5	8/4/2015	PCB from Immunoassay (Aroclor 1254)	0.5	U
112-133	Upland	S-15G-INT263-00-10	INT263	0.0	1.0	8/6/2015	PCB from Immunoassay (Aroclor 1254)	182	D
112-133	Upland	S-15G-INT263-10-20	INT263	1.0	2.0	8/6/2015	PCB from Immunoassay (Aroclor 1254)	384	D
112-133	Upland	S-15G-INT263-20-30	INT263	2.0	3.0	8/6/2015	PCB from Immunoassay (Aroclor 1254)	2.2	
112-133	Upland	S-15G-INT264-00-10	INT264	0.0	1.0	8/6/2015	PCB from Immunoassay (Aroclor 1254)	8.2	D
112-133	Upland	S-15G-INT264-10-20	INT264	1.0	2.0	8/6/2015	PCB from Immunoassay (Aroclor 1254)	3.4	
112-133	Mudflat	S-3290-2.1-2.6	S-3290	2.1	2.6	9/21/2001	Total 18 NOAA PCB cong (excl non-detects)	1.6	
112-133	Saltmarsh	S-3294-1.8-2.3	S-3294	1.8	2.3	8/23/2001	Total 18 NOAA PCB cong (excl non-detects)	286	
112-133	Saltmarsh	S-3294-2.3-2.8	S-3294	2.3	2.8	8/23/2001	Total 18 NOAA PCB cong (excl non-detects)	15.9	
112-133	Mudflat	S-3297-1.2-1.7	S-3297	1.2	1.7	8/23/2001	Total 18 NOAA PCB cong (excl non-detects)	11.2	
112-133	Mudflat	S-3297-1.7-2.2	S-3297	1.7	2.2	8/23/2001	Total 18 NOAA PCB cong (excl non-detects)	6.0	
112-133	Upland	S-3304-0.0-1.0	S-3304	0.0	1.0	11/14/2001	Total 18 NOAA PCB cong (excl non-detects)	46.8	

Table 2-1a
Pre-Excavation PCB Characterization Sample Results for Parcel 112-133

Parcel	Type	Sample ID	Station ID	Sample Depth Top (ft)	Sample Depth Bottom (ft)	Sample Date	Description	Total PCB (mg/kg)	Final Qualifier
112-133	Upland	S-3304-1.0-2.0	S-3304	1.0	2.0	11/14/2001	Total 18 NOAA PCB cong (excl non-detects)		8.6
112-133	Saltmarsh	S-3305-0.0-1.0	S-3305	0.0	1.0	11/14/2001	Total 18 NOAA PCB cong (excl non-detects)		177
112-133	Saltmarsh	S-3305-1.0-2.0	S-3305	1.0	2.0	11/14/2001	Total 18 NOAA PCB cong (excl non-detects)		9.4
112-133	Saltmarsh	S-3305-1.0-2.0REP	S-3305	1.0	2.0	11/14/2001	Total 18 NOAA PCB cong (excl non-detects)		21.8
112-133	Saltmarsh	S-3305-2.0-3.0	S-3305	2.0	3.0	11/14/2001	Total 18 NOAA PCB cong (excl non-detects)		8.1
112-133	Saltmarsh	S-3315-1.5-2.0	S-3315	1.5	2.0	8/28/2001	Total 18 NOAA PCB cong (excl non-detects)		0.52
112-133	Saltmarsh	S-3315-2.0-2.5	S-3315	2.0	2.5	8/28/2001	Total 18 NOAA PCB cong (excl non-detects)		0.18
112-133	Saltmarsh	S-3328-0.0-1.0	S-3328	0.0	1.0	11/15/2001	Total 18 NOAA PCB cong (excl non-detects)		598
112-133	Saltmarsh	S-3328-1.0-2.0	S-3328	1.0	2.0	11/15/2001	Total 18 NOAA PCB cong (excl non-detects)		33.2
112-133	Mudflat	S-3329-3.0-3.5	S-3329	3.0	3.5	8/27/2001	Total 18 NOAA PCB cong (excl non-detects)		2.5
112-133	Saltmarsh	S-3339-.8-1.3	S-3339	0.8	1.3	9/13/2001	Total 18 NOAA PCB cong (excl non-detects)		0.31
112-133	Mudflat	S-3340-2.8-3.3	S-3340	2.8	3.3	8/27/2001	Total 18 NOAA PCB cong (excl non-detects)		0.91
112-133	Saltmarsh	S-3808-0.0-1.0	S-3808	0.0	1.0	11/14/2001	Total 18 NOAA PCB cong (excl non-detects)	4160	
112-133	Saltmarsh	S-3808-1.0-2.0	S-3808	1.0	2.0	11/14/2001	Total 18 NOAA PCB cong (excl non-detects)	4160	
112-133	Channel	S-3809-0.0-1.0	S-3809	0.0	1.0	11/14/2001	Total 18 NOAA PCB cong (excl non-detects)		78.0
112-133	Channel	S-3809-1.0-2.0	S-3809	1.0	2.0	11/14/2001	Total 18 NOAA PCB cong (excl non-detects)		143
112-133	Saltmarsh	S-0931-1	S-931	0.0	1.0	10/6/2000	Total 18 NOAA PCB cong (excl non-detects)		54.6
112-133	Saltmarsh	S-0931-2	S-931	1.0	2.0	10/6/2000	Total 18 NOAA PCB cong (excl non-detects)		133
112-133	Mudflat	S-WS201-17ADD5-00-10	WS201	0.0	1.0	7/18/18	PCB from Immunoassay (Aroclor 1254)		271
112-133	Mudflat	S-WS201-17ADD5-10-20	WS201	1.0	2.0	7/18/18	PCB from Immunoassay (Aroclor 1254)		0.2
112-133	Mudflat	S-WS201-17ADD5-20-30	WS201	2.0	3.0	7/18/18	PCB from Immunoassay (Aroclor 1254)		1.0
112-133	Mudflat	S-WS202-17ADD5-00-10	WS202	0.0	1.0	7/18/18	PCB from Immunoassay (Aroclor 1254)		160
112-133	Mudflat	S-WS202-17ADD5-10-20	WS202	1.0	2.0	7/18/18	PCB from Immunoassay (Aroclor 1254)		47
112-133	Mudflat	S-WS202-17ADD5-20-30	WS202	2.0	3.0	7/18/18	PCB from Immunoassay (Aroclor 1254)		58
112-133	Mudflat	S-WS202-17ADD5-30-37	WS202	3.0	3.7	7/18/18	PCB from Immunoassay (Aroclor 1254)		1.2
112-133	Mudflat	S-WS203-17ADD5-00-10	WS203	0.0	1.0	7/18/18	PCB from Immunoassay (Aroclor 1254)		179
112-133	Mudflat	S-WS203-17ADD5-10-20	WS203	1.0	2.0	7/18/18	PCB from Immunoassay (Aroclor 1254)		25
112-133	Mudflat	S-WS203-17ADD5-20-30	WS203	2.0	3.0	7/18/18	PCB from Immunoassay (Aroclor 1254)		0.3
112-133	Upland	S-WS204-18FSP13-00-10	WS204	0.0	1.0	11/5/2018	PCB from Immunoassay (Aroclor 1254)	770	JD
112-133	Upland	S-WS204-18FSP13-10-20	WS204	1.0	2.0	11/5/2018	PCB from Immunoassay (Aroclor 1254)	240	JD
112-133	Upland	S-WS204-18FSP13-20-30	WS204	2.0	3.0	11/5/2018	PCB from Immunoassay (Aroclor 1254)	320	JD
112-133	Saltmarsh	S-WS205-18FSP13-00-10	WS205	0.0	1.0	11/5/2018	PCB from Immunoassay (Aroclor 1254)	290	JD
112-133	Saltmarsh	S-WS205-18FSP13-10-20	WS205	1.0	2.0	11/5/2018	PCB from Immunoassay (Aroclor 1254)	95	JD
112-133	Saltmarsh	S-WS205-18FSP13-20-30	WS205	2.0	3.0	11/5/2018	PCB from Immunoassay (Aroclor 1254)	8.7	J
112-133	Saltmarsh	S-WS205-18FSP13-30-40	WS205	3.0	4.0	11/5/2018	PCB from Immunoassay (Aroclor 1254)	9.6	J
112-133	Saltmarsh	S-WS206-18FSP13-10-20	WS206	1.0	2.0	11/5/2018	Total 209 PCB cong (excl non-detects)	165	
112-133	Saltmarsh	S-WS206-18FSP13-20-30	WS206	2.0	3.0	11/5/2018	Total 209 PCB cong (excl non-detects)	23.0	
112-133	Saltmarsh	S-WS206-18FSP13-30-40	WS206	3.0	4.0	11/5/2018	PCB from Immunoassay (Aroclor 1254)	19	JD
112-133	Upland	S-WS207-18FSP13-20-30	WS207	2.0	3.0	11/1/2018	PCB from Immunoassay (Aroclor 1254)	530	JD
112-133	Upland	S-WS207-18FSP13-30-40	WS207	3.0	4.0	11/1/2018	Total 209 PCB cong (excl non-detects)	38.1	

Table 2-1a
Pre-Excavation PCB Characterization Sample Results for Parcel 112-133

Parcel	Type	Sample ID	Station ID	Sample Depth Top (ft)	Sample Depth Bottom (ft)	Sample Date	Description	Total PCB (mg/kg)	Final Qualifier
112-133	Upland	S-WS207-18FSP13-40-50	WS207	4.0	5.0	11/1/2018	Total 209 PCB cong (excl non-detects)	28.8	
112-133	Saltmarsh	S-WS208-18FSP13-00-10	WS208	0.0	1.0	11/5/2018	PCB from Immunoassay (Aroclor 1254)	80	JD
112-133	Saltmarsh	S-WS208-18FSP13-10-20	WS208	1.0	2.0	11/5/2018	PCB from Immunoassay (Aroclor 1254)	84	JD
112-133	Saltmarsh	S-WS208-18FSP13-20-30	WS208	2.0	3.0	11/5/2018	Total 209 PCB cong (excl non-detects)	126	
112-133	Saltmarsh	S-WS208B-18FSP13-30-40	WS208B	3.0	4.0	1/24/2019	Total 209 PCB cong (excl non-detects)	40.1	
112-133	Saltmarsh	S-WS208B-18FSP13-40-50	WS208B	4.0	5.0	1/24/2019	Total 209 PCB cong (excl non-detects)	150	
112-133	Saltmarsh	S-WS208B-18FSP13-50-60	WS208B	5.0	6.0	1/24/2019	Total 209 PCB cong (excl non-detects)	33.3	
112-133	Upland	S-WS209-18FSP13-00-10	WS209	0.0	1.0	11/1/2018	Total 209 PCB cong (excl non-detects)	5.1	
112-133	Upland	S-WS209R-18FSP13-00-10-REP	WS209	0.0	1.0	11/1/2018	Total 209 PCB cong (excl non-detects)	5.5	
112-133	Upland	S-WS209-18FSP13-10-20	WS209	1.0	2.0	11/1/2018	PCB from Immunoassay (Aroclor 1254)	3.8	J
112-133	Upland	S-WS209R-18FSP13-10-20-REP	WS209	1.0	2.0	11/1/2018	PCB from Immunoassay (Aroclor 1254)	2.5	JB
112-133	Saltmarsh	S-WS210-18FSP13-00-10	WS210	0.0	1.0	11/5/2018	PCB from Immunoassay (Aroclor 1254)	86	JD
112-133	Saltmarsh	S-WS210-18FSP13-10-20	WS210	1.0	2.0	11/5/2018	Total 209 PCB cong (excl non-detects)	17.5	
112-133	Upland	S-WS211-18FSP13-00-10	WS211	0.0	1.0	11/1/2018	Total 209 PCB cong (excl non-detects)	29.6	
112-133	Upland	S-WS211-18FSP13-10-20	WS211	1.0	2.0	11/1/2018	PCB from Immunoassay (Aroclor 1254)	6.6	J
112-133	Saltmarsh	S-WS212-18FSP13-00-10	WS212	0.0	1.0	11/5/2018	PCB from Immunoassay (Aroclor 1254)	77	JD
112-133	Saltmarsh	S-WS212-18FSP13-10-20	WS212	1.0	2.0	11/5/2018	Total 209 PCB cong (excl non-detects)	37.7	
112-133	Saltmarsh	S-WS212-18FSP13-20-30	WS212	2.0	3.0	11/5/2018	Total 209 PCB cong (excl non-detects)	6.1	
112-133	Upland	S-WS213-18FSP13-00-10	WS213	0.0	1.0	10/18/2018	Total 209 PCB cong (excl non-detects)	34.1	
112-133	Upland	S-WS213-18FSP13-10-20	WS213	1.0	2.0	10/18/2018	Total 209 PCB cong (excl non-detects)	25.8	
112-133	Saltmarsh	S-WS214-18FSP13-20-30	WS214	2.0	3.0	11/1/2018	PCB from Immunoassay (Aroclor 1254)	64	JD
112-133	Saltmarsh	S-WS214-18FSP13-30-40	WS214	3.0	4.0	11/1/2018	PCB from Immunoassay (Aroclor 1254)	83	JD
112-133	Saltmarsh	S-WS214-18FSP13-40-48	WS214	4.0	4.8	11/1/2018	Total 209 PCB cong (excl non-detects)	237	
112-133	Saltmarsh	S-WS214B-18FSP13-50-60	WS214B	5.0	6.0	1/31/2019	Total 209 PCB cong (excl non-detects)	77.0	
112-133	Upland	S-WS215-18FSP13-00-10	WS215	0.0	1.0	10/18/2018	Total 209 PCB cong (excl non-detects)	1530	
112-133	Upland	S-WS215-18FSP13-10-20	WS215	1.0	2.0	10/18/2018	PCB from Immunoassay (Aroclor 1254)	410	JD
112-133	Upland	S-WS215-18FSP13-20-30	WS215	2.0	3.0	10/18/2018	PCB from Immunoassay (Aroclor 1254)	428	
112-133	Upland	S-WS215B-18FSP13-30-40	WS215B	3.0	4.0	1/31/2019	Total 209 PCB cong (excl non-detects)	1580	
112-133	Saltmarsh	S-WS216-18FSP13-20-30	WS216	2.0	3.0	11/6/2018	PCB from Immunoassay (Aroclor 1254)	680	JD
112-133	Saltmarsh	S-WS216-18FSP13-30-40	WS216	3.0	4.0	11/6/2018	Total 209 PCB cong (excl non-detects)	40.6	
112-133	Upland	S-WS217-18FSP13-00-10	WS217	0.0	1.0	10/31/2018	PCB from Immunoassay (Aroclor 1254)	8.9	J
112-133	Upland	S-WS217-18FSP13-10-20	WS217	1.0	2.0	10/31/2018	PCB from Immunoassay (Aroclor 1254)	2.7	J
112-133	Upland	S-WS218-18FSP13-00-10	WS218	0.0	1.0	10/31/2018	PCB from Immunoassay (Aroclor 1254)	56	JD
112-133	Upland	S-WS218-18FSP13-10-20	WS218	1.0	2.0	10/31/2018	Total 209 PCB cong (excl non-detects)	12.2	
112-133	Upland	S-WS219-18FSP13-00-10	WS219	0.0	1.0	10/18/2018	Total 209 PCB cong (excl non-detects)	4.8	
112-133	Upland	S-WS219-18FSP13-10-20	WS219	1.0	2.0	10/18/2018	PCB from Immunoassay (Aroclor 1254)	4.1	J
112-133	Saltmarsh	S-WS220-18FSP13-20-30	WS220	2.0	3.0	11/5/2018	Total 209 PCB cong (excl non-detects)	12.2	
112-133	Saltmarsh	S-WS220-18FSP13-30-40	WS220	3.0	4.0	11/5/2018	Total 209 PCB cong (excl non-detects)	21.4	
112-133	Saltmarsh	S-WS220-18FSP13-40-48	WS220	4.0	4.8	11/5/2018	Total 209 PCB cong (excl non-detects)	21.4	
112-133	Upland	S-WS221-18FSP13-00-10	WS221	0.0	1.0	10/18/2018	Total 209 PCB cong (excl non-detects)	11.4	

Table 2-1a
Pre-Excavation PCB Characterization Sample Results for Parcel 112-133

Parcel	Type	Sample ID	Station ID	Sample Depth Top (ft)	Sample Depth Bottom (ft)	Sample Date	Description	Total PCB (mg/kg)	Final Qualifier
112-133	Upland	S-WS221-18FSP13-10-20	WS221	1.0	2.0	10/18/2018	PCB from Immunoassay (Aroclor 1254)	6.6	J
112-133	Channel	S-WS222-18FSP13-20-30	WS222	2.0	3.0	11/1/2018	Total 209 PCB cong (excl non-detects)	6.5	
112-133	Channel	S-WS223-18FSP13-00-10	WS223	0.0	1.0	11/1/2018	Total 209 PCB cong (excl non-detects)	0.062	
112-133	Channel	S-WS223-18FSP13-10-20	WS223	1.0	2.0	11/1/2018	PCB from Immunoassay (Aroclor 1254)	2.2	JB
112-133	Upland	S-WS224-18FSP13-00-10	WS224	0.0	1.0	11/1/2018	Total 209 PCB cong (excl non-detects)	166	
112-133	Upland	S-WS224-18FSP13-10-20	WS224	1.0	2.0	11/1/2018	Total 209 PCB cong (excl non-detects)	19.0	
112-133	Upland	S-WS238-18FSP13-00-10	WS238	0.0	1.0	10/31/2018	Total 209 PCB cong (excl non-detects)	2.8	
112-133	Upland	S-WS238-18FSP13-10-20	WS238	1.0	2.0	10/31/2018	PCB from Immunoassay (Aroclor 1254)	3.2	J
112-133	Upland	S-WS239-18FSP13-00-10	WS239	0.0	1.0	10/18/2018	Total 209 PCB cong (excl non-detects)	17.7	
112-133	Upland	S-WS239-18FSP13-10-20	WS239	1.0	2.0	10/18/2018	Total 209 PCB cong (excl non-detects)	139	
112-133	Upland	S-WS239B-18FSP13-20-30	WS239B	2.0	3.0	1/10/2019	Total 209 PCB cong (excl non-detects)	3.7	
112-133	Upland	S-WS239B-18FSP13-30-40	WS239B	3.0	4.0	1/10/2019	PCB from Immunoassay (Aroclor 1254)	3.5	J
112-133	Upland	S-WS239B-18FSP13-40-50	WS239B	4.0	5.0	1/10/2019	PCB from Immunoassay (Aroclor 1254)	1.6	JB
112-133	Upland	S-WS240-18FSP13-00-10	WS240	0.0	1.0	1/31/2019	Total 209 PCB cong (excl non-detects)	14.9	
112-133	Upland	S-WS240-18FSP13-10-20	WS240	1.0	2.0	1/31/2019	PCB from Immunoassay (Aroclor 1254)	3.3	J
112-133	Upland	S-WS241-18FSP13-00-10	WS241	0.0	1.0	1/9/2019	PCB from Immunoassay (Aroclor 1254)	190	JD
112-133	Upland	S-WS241R-18FSP13-00-10-REP	WS241	0.0	1.0	1/9/2019	PCB from Immunoassay (Aroclor 1254)	270	JD
112-133	Upland	S-WS241-18FSP13-10-20	WS241	1.0	2.0	1/9/2019	PCB from Immunoassay (Aroclor 1254)	9.5	J
112-133	Upland	S-WS241R-18FSP13-10-20-REP	WS241	1.0	2.0	1/9/2019	PCB from Immunoassay (Aroclor 1254)	9.6	J
112-133	Upland	S-WS241-18FSP13-20-30	WS241	2.0	3.0	1/9/2019	PCB from Immunoassay (Aroclor 1254)	6.2	J
112-133	Upland	S-WS241R-18FSP13-20-30-REP	WS241	2.0	3.0	1/9/2019	PCB from Immunoassay (Aroclor 1254)	5.4	J
112-133	Upland	S-WS242-18FSP13-00-10	WS242	0.0	1.0	1/9/2019	Total 209 PCB cong (excl non-detects)	4.2	
112-133	Upland	S-WS242-18FSP13-10-20	WS242	1.0	2.0	1/9/2019	PCB from Immunoassay (Aroclor 1254)	3.9	J

Notes:
Pre-excavation confirmatory congener samples are shaded green. See Section 3.3 of Draft Final Intertidal Work Plan for West Zone 2-3, Revision 1 (Jacobs, 2022) for more details.
D - reported value is from a dilution; U - not detected; J - estimated value; B - contaminant detected in the blank.
Samples identified as “Total 18 NOAA PCB Cong” were multiplied by a site specific factor of 2.6 to obtain Total PCB results (Tetra Tech Foster Wheeler, 2004).

Table 2-1b
Pre-Excavation PCB Characterization Sample Results for Parcel 111-146

Parcel	Type	Sample ID	Station ID	Sample Depth Top (ft)	Sample Depth Bottom (ft)	Sample Date	Description	Total PCB (mg/kg)	Final Qualifier
111-146	Upland	S-15L-INT214-00-10	INT214	0.0	1.0	7/14/2015	PCB from Immunoassay (Aroclor 1254)	3.8	
111-146	Upland	S-15L-INT214-10-20	INT214	1.0	2.0	7/14/2015	PCB from Immunoassay (Aroclor 1254)	0.5	U
111-146	Upland	S-15L-INT215-00-10	INT215	0.0	1.0	7/14/2015	PCB from Immunoassay (Aroclor 1254)	4.3	
111-146	Upland	S-15L-INT215-10-20	INT215	1.0	2.0	7/14/2015	PCB from Immunoassay (Aroclor 1254)	0.5	U
111-146	Upland	S-15L-INT216-00-10	INT216	0.0	1.0	7/14/2015	Total 139 PCB cong (excl non-detects)	88.0	
111-146	Upland	S-15L-INT216-10-20	INT216	1.0	2.0	7/14/2015	PCB from Immunoassay (Aroclor 1254)	3.8	
111-146	Upland	S-15L-INT217-00-10	INT217	0.0	1.0	7/14/2015	PCB from Immunoassay (Aroclor 1254)	4.9	
111-146	Upland	S-15L-INT217-10-20	INT217	1.0	2.0	7/14/2015	PCB from Immunoassay (Aroclor 1254)	2.8	
111-146	Upland	S-15L-INT218-00-10	INT218	0.0	1.0	7/14/2015	PCB from Immunoassay (Aroclor 1254)	2.6	
111-146	Upland	S-15L-INT218-10-20	INT218	1.0	2.0	7/14/2015	PCB from Immunoassay (Aroclor 1254)	1.2	
111-146	Upland	S-15L-INT219-00-10	INT219	0.0	1.0	7/14/2015	Total 139 PCB cong (excl non-detects)	13.0	
111-146	Upland	S-15L-INT219-10-20	INT219	1.0	2.0	7/14/2015	Total 139 PCB cong (excl non-detects)	22.0	
111-146	Upland	S-15L-INT219-10-20-REP	INT219	1.0	2.0	7/14/2015	Total 139 PCB cong (excl non-detects)	40.0	
111-146	Upland	S-15L-INT219-20-30	INT219	2.0	3.0	7/14/2015	PCB from Immunoassay (Aroclor 1254)	7.0	
111-146	Upland	S-15L-INT219-20-30-REP	INT219	2.0	3.0	7/14/2015	PCB from Immunoassay (Aroclor 1254)	8.2	
111-146	Mudflat	S-15L-INT220-00-10	INT220	0.0	1.0	7/14/2015	PCB from Immunoassay (Aroclor 1254)	42	D
111-146	Mudflat	S-15L-INT220-10-20	INT220	1.0	2.0	7/14/2015	PCB from Immunoassay (Aroclor 1254)	3.4	
111-146	Upland	S-15L-INT221-00-10	INT221	0.0	1.0	7/14/2015	PCB from Immunoassay (Aroclor 1254)	1.7	
111-146	Upland	S-15L-INT221-10-20	INT221	1.0	2.0	7/14/2015	PCB from Immunoassay (Aroclor 1254)	1.2	
111-146	Upland	S-15L-INT222-00-10	INT222	0.0	1.0	7/15/2015	PCB from Immunoassay (Aroclor 1254)	519	D
111-146	Upland	S-15L-INT222-00-10-REP	INT222	0.0	1.0	7/15/2015	PCB from Immunoassay (Aroclor 1254)	379	D
111-146	Upland	S-15L-INT222-10-20	INT222	1.0	2.0	7/15/2015	PCB from Immunoassay (Aroclor 1254)	4.1	
111-146	Upland	S-15L-INT222-10-20-REP	INT222	1.0	2.0	7/15/2015	PCB from Immunoassay (Aroclor 1254)	6.8	
111-146	Upland	S-15L-INT222-20-30	INT222	2.0	3.0	7/15/2015	PCB from Immunoassay (Aroclor 1254)	1.5	
111-146	Upland	S-15L-INT222-20-30-REP	INT222	2.0	3.0	7/15/2015	PCB from Immunoassay (Aroclor 1254)	1.3	
111-146	Saltmarsh	S-15G-INT223-00-10	INT223	0.0	1.0	8/5/2015	PCB from Immunoassay (Aroclor 1254)	89	D
111-146	Saltmarsh	S-15G-INT223-10-20	INT223	1.0	2.0	8/5/2015	PCB from Immunoassay (Aroclor 1254)	0.6	
111-146	Saltmarsh	S-3350-0.0-0.5	S-3350	0.0	0.5	11/14/2001	Total 18 NOAA PCB cong (excl non-detects)	312	
111-146	Saltmarsh	S-3350-0.0-0.5REP	S-3350	0.0	0.5	11/14/2001	Total 18 NOAA PCB cong (excl non-detects)	57.2	
111-146	Saltmarsh	S-3350-.5-1.0	S-3350	0.5	1.0	11/14/2001	Total 18 NOAA PCB cong (excl non-detects)	17.7	
111-146	Saltmarsh	S-3350-1.0-2.0	S-3350	1.0	2.0	11/14/2001	Total 18 NOAA PCB cong (excl non-detects)	0.86	
111-146	Saltmarsh	S-3350-2.0-3.0	S-3350	2.0	3.0	11/14/2001	Total 18 NOAA PCB cong (excl non-detects)	0.070	
111-146	Saltmarsh	S-3351-0.0-1.0	S-3351	0.0	1.0	11/14/2001	Total 18 NOAA PCB cong (excl non-detects)	936	
111-146	Saltmarsh	S-3351-1.0-2.0	S-3351	1.0	2.0	11/14/2001	Total 18 NOAA PCB cong (excl non-detects)	2.6	
111-146	Saltmarsh	S-3351-2.0-3.0	S-3351	2.0	3.0	11/14/2001	Total 18 NOAA PCB cong (excl non-detects)	9.1	
111-146	Saltmarsh	S-0927-1	S-927	0.0	1.0	10/11/2000	Total PCB Congeners (sum CONG x factor)	53.0	
111-146	Saltmarsh	S-0927-2	S-927	1.0	2.0	10/11/2000	Total PCB Congeners (sum CONG x factor)	230	
111-146	Saltmarsh	S-0927-3	S-927	2.0	3.0	10/11/2000	Total PCB Congeners (sum CONG x factor)	110	
111-146	Upland	S-0928-1	S-928	0.0	1.0	10/11/2000	Total PCB Congeners (sum CONG x factor)	4.8	
111-146	Saltmarsh	S-0929-1	S-929	0.0	1.0	10/10/2000	Total PCB Congeners (sum CONG x factor)	400	

Table 2-1b
Pre-Excavation PCB Characterization Sample Results for Parcel 111-146

Parcel	Type	Sample ID	Station ID	Sample Depth Top (ft)	Sample Depth Bottom (ft)	Sample Date	Description	Total PCB (mg/kg)	Final Qualifier
111-146	Saltmarsh	S-0929-2	S-929	1.0	2.0	10/10/2000	Total PCB Congeners (sum CONG x factor)	1100	
111-146	Mudflat	S-15D-VC19-00-08	VC19	0.0	0.8	12/4/2015	PCB from Immunoassay (Aroclor 1254)	305	D
111-146	Mudflat	S-15D-VC19-08-13	VC19	0.8	1.3	12/4/2015	Total 139 PCB cong (excl non-detects)	0.98	
111-146	Mudflat	S-15D-VC19-13-18	VC19	1.3	1.8	12/4/2015	PCB from Immunoassay (Aroclor 1254)	0.5	
111-146	Mudflat	S-15D-VI5-00-05	VI5	0.0	0.5	12/7/2015	PCB from Immunoassay (Aroclor 1254)	6.3	D
111-146	Mudflat	S-15D-VI5-05-10	VI5	0.5	1.0	12/7/2015	PCB from Immunoassay (Aroclor 1254)	1.0	
111-146	Mudflat	S-15D-VO16-00-05	VO16	0.0	0.5	12/4/2015	PCB from Immunoassay (Aroclor 1254)	137	D
111-146	Mudflat	S-15D-VO16-05-10	VO16	0.5	1.0	12/4/2015	PCB from Immunoassay (Aroclor 1254)	1.8	
111-146	Saltmarsh	S-WS225-18FSP13-00-10	WS225	0.0	1.0	11/1/2018	PCB from Immunoassay (Aroclor 1254)	360	JD
111-146	Saltmarsh	S-WS225-18FSP13-10-20	WS225	1.0	2.0	11/1/2018	Total 209 PCB cong (excl non-detects)	34.0	
111-146	Upland	S-WS226-18FSP13-00-10	WS226	0.0	1.0	11/1/2018	Total 209 PCB cong (excl non-detects)	5.94	
111-146	Upland	S-WS226-18FSP13-10-20	WS226	1.0	2.0	11/1/2018	PCB from Immunoassay (Aroclor 1254)	8.0	J
111-146	Mudflat	S-WS227-18FSP13-00-10	WS227	0.0	1.0	11/2/2018	PCB from Immunoassay (Aroclor 1254)	6.7	J
111-146	Mudflat	S-WS227-18FSP13-10-20	WS227	1.0	2.0	11/2/2018	PCB from Immunoassay (Aroclor 1254)	2.5	J
111-146	Upland	S-WS228-18FSP13-00-10	WS228	0.0	1.0	11/6/2018	Total 209 PCB cong (excl non-detects)	4.16	
111-146	Upland	S-WS228-18FSP13-10-20	WS228	1.0	2.0	11/6/2018	Total 209 PCB cong (excl non-detects)	25.9	
111-146	Saltmarsh	S-WS229-18FSP13-00-10	WS229	0.0	1.0	11/1/2018	PCB from Immunoassay (Aroclor 1254)	260	JD
111-146	Saltmarsh	S-WS229-18FSP13-10-20	WS229	1.0	2.0	11/1/2018	PCB from Immunoassay (Aroclor 1254)	81	JD
111-146	Saltmarsh	S-WS229-18FSP13-20-30	WS229	2.0	3.0	11/1/2018	Total 209 PCB cong (excl non-detects)	10.3	
111-146	Mudflat	S-WS230-18FSP13-00-10	WS230	0.0	1.0	10/31/2018	PCB from Immunoassay (Aroclor 1254)	8.9	J
111-146	Mudflat	S-WS230-18FSP13-10-20	WS230	1.0	2.0	10/31/2018	PCB from Immunoassay (Aroclor 1254)	3.1	J
111-146	Saltmarsh	S-WS231-18FSP13-00-10	WS231	0.0	1.0	11/1/2018	PCB from Immunoassay (Aroclor 1254)	330	JD
111-146	Saltmarsh	S-WS231-18FSP13-10-20	WS231	1.0	2.0	11/1/2018	Total 209 PCB cong (excl non-detects)	65.6	
111-146	Saltmarsh	S-WS231-18FSP13-20-30	WS231	2.0	3.0	11/1/2018	Total 209 PCB cong (excl non-detects)	34.1	
111-146	Mudflat	S-WS232-18FSP13-00-10	WS232	0.0	1.0	11/6/2018	Total 209 PCB cong (excl non-detects)	31.4	
111-146	Mudflat	S-WS232-18FSP13-10-20	WS232	1.0	2.0	11/6/2018	PCB from Immunoassay (Aroclor 1254)	17	JD
111-146	Upland	S-WS233-18FSP13-00-10	WS233	0.0	1.0	10/18/2018	Total 209 PCB cong (excl non-detects)	0.91	
111-146	Upland	S-WS233-18FSP13-10-20	WS233	1.0	2.0	10/18/2018	Total 209 PCB cong (excl non-detects)	24.4	
111-146	Saltmarsh	S-WS234-18FSP13-10-20	WS234	1.0	2.0	11/6/2018	Total 209 PCB cong (excl non-detects)	33.8	
111-146	Upland	S-WS235-18FSP13-00-10	WS235	0.0	1.0	10/18/2018	Total 209 PCB cong (excl non-detects)	0.588	
111-146	Upland	S-WS235-18FSP13-10-20	WS235	1.0	2.0	10/18/2018	PCB from Immunoassay (Aroclor 1254)	4.1	J
111-146	Saltmarsh	S-WS236-18FSP13-00-10	WS236	0.0	1.0	10/18/2018	PCB from Immunoassay (Aroclor 1254)	100	JD
111-146	Saltmarsh	S-WS236-18FSP13-10-20	WS236	1.0	2.0	10/18/2018	PCB from Immunoassay (Aroclor 1254)	93	JD
111-146	Saltmarsh	S-WS236-18FSP13-20-30	WS236	2.0	3.0	10/18/2018	PCB from Immunoassay (Aroclor 1254)	60	JD
111-146	Saltmarsh	S-WS236-18FSP13-30-40	WS236	3.0	4.0	10/18/2018	PCB from Immunoassay (Aroclor 1254)	81	
111-146	Saltmarsh	S-WS236B-18FSP13-40-50	WS236B	4.0	5.0	1/9/2019	Total 209 PCB cong (excl non-detects)	4.54	
111-146	Saltmarsh	S-WS236B-18FSP13-50-60	WS236B	5.0	6.0	1/9/2019	PCB from Immunoassay (Aroclor 1254)	6.7	J
111-146	Upland	S-WS237-18FSP13-00-10	WS237	0.0	1.0	10/18/2018	Total 209 PCB cong (excl non-detects)	0.599	
111-146	Upland	S-WS237-18FSP13-10-20	WS237	1.0	2.0	10/18/2018	PCB from Immunoassay (Aroclor 1254)	0.8	JB
111-146	Saltmarsh	S-WS243-18FSP13-10-20	WS243	1.0	2.0	1/9/2019	Total 209 PCB cong (excl non-detects)	20.9	

Table 2-1b
Pre-Excavation PCB Characterization Sample Results for Parcel 111-146

Parcel	Type	Sample ID	Station ID	Sample Depth Top (ft)	Sample Depth Bottom (ft)	Sample Date	Description	Total PCB (mg/kg)	Final Qualifier
111-146	Saltmarsh	S-WS243-18FSP13-20-30	WS243	2.0	3.0	1/9/2019	PCB from Immunoassay (Aroclor 1254)	6.9	J
111-146	Saltmarsh	S-WS243-18FSP13-30-40	WS243	3.0	4.0	1/9/2019	PCB from Immunoassay (Aroclor 1254)	3.1	J
111-146	Saltmarsh	S-WS301-18FSP13-00-10	WS301	0.0	1.0	10/16/2018	Total 209 PCB cong (excl non-detects)	74.1	
111-146	Saltmarsh	S-WS301-18FSP13-10-20	WS301	1.0	2.0	10/16/2018	Total 209 PCB cong (excl non-detects)	46.9	
111-146	Mudflat	S-WS302-18FSP13-00-10	WS302	0.0	1.0	10/16/2018	PCB from Immunoassay (Aroclor 1254)	0.6	JB
111-146	Mudflat	S-WS302-18FSP13-10-20	WS302	1.0	2.0	10/16/2018	PCB from Immunoassay (Aroclor 1254)	1.8	JB
111-146	Upland	S-WS303-18FSP13-00-10	WS303	0.0	1.0	10/16/2018	Total 209 PCB cong (excl non-detects)	1.31	
111-146	Upland	S-WS303-18FSP13-10-15	WS303	1.0	1.5	10/16/2018	PCB from Immunoassay (Aroclor 1254)	4.5	J
111-146	Mudflat	S-WS304-18FSP13-00-10	WS304	0.0	1.0	10/16/2018	PCB from Immunoassay (Aroclor 1254)	64	JD
111-146	Mudflat	S-WS304-18FSP13-10-20	WS304	1.0	2.0	10/16/2018	PCB from Immunoassay (Aroclor 1254)	94	JD
111-146	Mudflat	S-WS304-18FSP13-20-27	WS304	2.0	2.7	10/16/2018	PCB from Immunoassay (Aroclor 1254)	4.1	
111-146	Saltmarsh	S-WS305-18FSP13-00-10	WS305	0.0	1.0	11/2/2018	Total 209 PCB cong (excl non-detects)	33.0	
111-146	Saltmarsh	S-WS305-18FSP13-10-20	WS305	1.0	2.0	11/2/2018	Total 209 PCB cong (excl non-detects)	6.55	
111-146	Saltmarsh	S-WS306-18FSP13-00-10	WS306	0.0	1.0	11/2/2018	PCB from Immunoassay (Aroclor 1254)	74	JD
111-146	Saltmarsh	S-WS306-18FSP13-10-20	WS306	1.0	2.0	11/2/2018	PCB from Immunoassay (Aroclor 1254)	300	JD
111-146	Saltmarsh	S-WS306-18FSP13-20-30	WS306	2.0	3.0	11/2/2018	PCB from Immunoassay (Aroclor 1254)	98	JD
111-146	Saltmarsh	S-WS306-18FSP13-30-40	WS306	3.0	4.0	11/2/2018	Total 209 PCB cong (excl non-detects)	58.2	
111-146	Saltmarsh	S-WS306-18FSP13-40-50	WS306	4.0	5.0	11/2/2018	Total 209 PCB cong (excl non-detects)	52.0	
111-146	Saltmarsh	S-WS306B-18FSP13-50-60	WS306B	5.0	6.0	1/24/2019	Total 209 PCB cong (excl non-detects)	43.2	
111-146	Saltmarsh	S-WS306B-18FSP13-60-70	WS306B	6.0	7.0	1/24/2019	PCB from Immunoassay (Aroclor 1254)	24	JD
111-146	Upland	S-WS307-18FSP13-00-10	WS307	0.0	1.0	10/16/2018	Total 209 PCB cong (excl non-detects)	0.196	
111-146	Upland	S-WS307-18FSP13-10-20	WS307	1.0	2.0	10/16/2018	PCB from Immunoassay (Aroclor 1254)	3.1	J
111-146	Saltmarsh	S-WS308-18FSP13-10-20	WS308	1.0	2.0	11/2/2018	PCB from Immunoassay (Aroclor 1254)	190	JD
111-146	Saltmarsh	S-WS308-18FSP13-20-30	WS308	2.0	3.0	11/2/2018	PCB from Immunoassay (Aroclor 1254)	490	JD
111-146	Saltmarsh	S-WS308-18FSP13-30-40	WS308	3.0	4.0	11/2/2018	Total 209 PCB cong (excl non-detects)	69.3	
111-146	Saltmarsh	S-WS308-18FSP13-40-50	WS308	4.0	5.0	11/2/2018	Total 209 PCB cong (excl non-detects)	34.3	
111-146	Upland	S-WS309-18FSP13-00-10	WS309	0.0	1.0	10/16/2018	Total 209 PCB cong (excl non-detects)	1.38	
111-146	Upland	S-WS309-18FSP13-10-20	WS309	1.0	2.0	10/16/2018	PCB from Immunoassay (Aroclor 1254)	4.0	J
111-146	Mudflat	S-WS310-18FSP13-00-10	WS310	0.0	1.0	11/6/2018	Total 209 PCB cong (excl non-detects)	54.4	
111-146	Mudflat	S-WS310-18FSP13-10-20	WS310	1.0	2.0	11/6/2018	PCB from Immunoassay (Aroclor 1254)	5.5	J
111-146	Saltmarsh	S-WS311-18FSP13-00-10	WS311	0.0	1.0	11/6/2018	PCB from Immunoassay (Aroclor 1254)	74	JD
111-146	Saltmarsh	S-WS311-18FSP13-10-20	WS311	1.0	2.0	11/6/2018	PCB from Immunoassay (Aroclor 1254)	92	JD
111-146	Saltmarsh	S-WS311-18FSP13-20-30	WS311	2.0	3.0	11/6/2018	Total 209 PCB cong (excl non-detects)	3.44	
111-146	Saltmarsh	S-WS311-18FSP13-30-40	WS311	3.0	4.0	11/6/2018	PCB from Immunoassay (Aroclor 1254)	4.6	J
111-146	Upland	S-WS312-18FSP13-00-10	WS312	0.0	1.0	10/16/2018	Total 209 PCB cong (excl non-detects)	39.1	
111-146	Upland	S-WS312-18FSP13-10-20	WS312	1.0	2.0	10/16/2018	PCB from Immunoassay (Aroclor 1254)	4.2	J
111-146	Saltmarsh	S-WS313-18FSP13-00-10	WS313	0.0	1.0	11/5/2018	PCB from Immunoassay (Aroclor 1254)	80	JD
111-146	Saltmarsh	S-WS313-18FSP13-10-20	WS313	1.0	2.0	11/5/2018	Total 209 PCB cong (excl non-detects)	37.5	
111-146	Saltmarsh	S-WS313-18FSP13-20-30	WS313	2.0	3.0	11/5/2018	Total 209 PCB cong (excl non-detects)	9.08	
111-146	Saltmarsh	S-WS313-18FSP13-30-40	WS313	3.0	4.0	11/5/2018	PCB from Immunoassay (Aroclor 1254)	1.6	

Table 2-1b
Pre-Excavation PCB Characterization Sample Results for Parcel 111-146

Parcel	Type	Sample ID	Station ID	Sample Depth Top (ft)	Sample Depth Bottom (ft)	Sample Date	Description	Total PCB (mg/kg)	Final Qualifier
111-146	Saltmarsh	S-WS313-18FSP13-40-50	WS313	4.0	5.0	11/5/2018	PCB from Immunoassay (Aroclor 1254)		0.6
111-146	Saltmarsh	S-WS321-18FSP13-00-10	WS321	0.0	1.0	1/24/2019	Total 209 PCB cong (excl non-detects)	54.8	
111-146	Saltmarsh	S-WS321-18FSP13-10-20	WS321	1.0	2.0	1/24/2019	PCB from Immunoassay (Aroclor 1254)	23	JD
111-146	Upland	S-WS322-18FSP13-00-10	WS322	0.0	1.0	1/31/2019	Total 209 PCB cong (excl non-detects)	6.31	
111-146	Upland	S-WS322-18FSP13-10-20	WS322	1.0	2.0	1/31/2019	PCB from Immunoassay (Aroclor 1254)	0.5	J

Notes:
Pre-excavation confirmatory congener samples are shaded green. See Section 3.3 of Draft Final Intertidal Work Plan for West Zone 2-3, Revision 1 (Jacobs, 2022) for more details.
D - reported value is from a dilution; U - not detected; J - estimated value; B - contaminant detected in blank.
Samples identified as “Total 18 NOAA PCB Cong” were multiplied by a site specific factor of 2.6 to obtain Total PCB results (Tetra Tech Foster Wheeler, 2004).

Table 2-1c
Pre-Excavation PCB Characterization Sample Results for Parcel 111-98

Parcel	Type	Sample ID	Station ID	Sample Depth Top (ft)	Sample Depth Bottom (ft)	Sample Date	Description	Total PCB (mg/kg)	Final Qualifier
111-98	Upland	S-15L-INT225-00-10	INT225	0.0	1.0	7/15/2015	PCB from Immunoassay (Aroclor 1254)		3.6
111-98	Upland	S-15L-INT225-10-19	INT225	1.0	1.9	7/15/2015	PCB from Immunoassay (Aroclor 1254)		4.7
111-98	Upland	S-15L-INT226-00-10	INT226	0.0	1.0	7/15/2015	Total 139 PCB cong (excl non-detects)	50.0	
111-98	Upland	S-15L-INT226-10-20	INT226	1.0	2.0	7/15/2015	Total 139 PCB cong (excl non-detects)	28.0	
111-98	Upland	S-15L-INT226-20-30	INT226	2.0	3.0	7/15/2015	PCB from Immunoassay (Aroclor 1254)		1.0
111-98	Saltmarsh	S-15G-INT227-00-10	INT227	0.0	1.0	8/13/2015	PCB from Immunoassay (Aroclor 1254)	210	D
111-98	Saltmarsh	S-15G-INT227-10-20	INT227	1.0	2.0	8/13/2015	PCB from Immunoassay (Aroclor 1254)	2687	D
111-98	Saltmarsh	S-15G-INT227-20-30	INT227	2.0	3.0	8/13/2015	Total 139 PCB cong (excl non-detects)	23.0	
111-98	Saltmarsh	S-15G-INT227-30-37	INT227	3.0	3.7	8/13/2015	PCB from Immunoassay (Aroclor 1254)	18	D
111-98	Upland	S-WS314-18FSP13-00-10	WS314	0.0	1.0	10/31/2018	Total 209 PCB cong (excl non-detects)	1.23	
111-98	Upland	S-WS314-18FSP13-10-20	WS314	1.0	2.0	10/31/2018	PCB from Immunoassay (Aroclor 1254)	2.2	J
111-98	Upland	S-WS315-18FSP13-00-10	WS315	0.0	1.0	10/31/2018	Total 209 PCB cong (excl non-detects)	3.82	
111-98	Upland	S-WS315-18FSP13-10-20	WS315	1.0	2.0	10/31/2018	PCB from Immunoassay (Aroclor 1254)	8.1	J
111-98	Upland	S-WS316-18FSP13-00-10	WS316	0.0	1.0	10/31/2018	Total 209 PCB cong (excl non-detects)	5.99	
111-98	Upland	S-WS316-18FSP13-10-20	WS316	1.0	2.0	10/31/2018	PCB from Immunoassay (Aroclor 1254)	3.5	J

Notes:
Pre-excavation confirmatory congener samples are shaded green. See Section 3.3 of Draft Final Intertidal Work Plan for West Zone 2-3, Revision 1 (Jacobs, 2022) for more details.
D - reported value is from a dilution; J - estimated value

Table 2-1d
Pre-Excavation PCB Characterization Sample Results for Parcel 111-155

Parcel	Type	Sample ID	Station ID	Sample Depth Top (ft)	Sample Depth Bottom (ft)	Sample Date	Description	Total PCB (mg/kg)	Final Qualifier
111-155	Upland	S-15L-INT228-00-10	INT228	0.0	1.0	7/13/2015	PCB from Immunoassay (Aroclor 1254)	0.5	U
111-155	Upland	S-15L-INT228-10-20	INT228	1.0	2.0	7/13/2015	PCB from Immunoassay (Aroclor 1254)	1.1	
111-155	Upland	S-15L-INT228-20-30	INT228	2.0	3.0	7/13/2015	PCB from Immunoassay (Aroclor 1254)	5.0	
111-155	Saltmarsh	S-15G-INT229-00-10	INT229	0.0	1.0	8/28/2015	Total 139 PCB cong (excl non-detects)	12.0	
111-155	Saltmarsh	S-15G-INT229-10-20	INT229	1.0	2.0	8/28/2015	PCB from Immunoassay (Aroclor 1254)	7.4	
111-155	Saltmarsh	S-15G-INT229-20-30	INT229	2.0	3.0	8/28/2015	PCB from Immunoassay (Aroclor 1254)	4.5	
111-155	Saltmarsh	S-15G-INT229-30-40	INT229	3.0	4.0	8/28/2015	PCB from Immunoassay (Aroclor 1254)	0.8	
111-155	Saltmarsh	S-15G-INT229-40-50	INT229	4.0	5.0	8/28/2015	PCB from Immunoassay (Aroclor 1254)	1.2	
111-155	Saltmarsh	S-WS317-18FSP13-00-10	WS317	0.0	1.0	11/5/2018	Total 209 PCB cong (excl non-detects)	23.5	
111-155	Saltmarsh	S-WS317-18FSP13-10-20	WS317	1.0	2.0	11/5/2018	Total 209 PCB cong (excl non-detects)	2.71	
111-155	Mudflat	S-WS318-18FSP13-00-10	WS318	0.0	1.0	10/31/2018	Total 209 PCB cong (excl non-detects)	35.9	
111-155	Mudflat	S-WS318-18FSP13-10-20	WS318	1.0	2.0	10/31/2018	Total 209 PCB cong (excl non-detects)	28.6	
111-155	Mudflat	S-WS318-18FSP13-20-27	WS318	2.0	2.7	10/31/2018	PCB from Immunoassay (Aroclor 1254)	8.0	
111-155	Upland	S-WS319-18FSP13-00-10	WS319	0.0	1.0	10/31/2018	Total 209 PCB cong (excl non-detects)	0.0988	
111-155	Upland	S-WS319-18FSP13-10-20	WS319	1.0	2.0	10/31/2018	PCB from Immunoassay (Aroclor 1254)	1.9	J
111-155	Mudflat	S-WS320-18FSP13-00-10	WS320	0.0	1.0	11/5/2018	PCB from Immunoassay (Aroclor 1254)	5.9	J
111-155	Mudflat	S-WS320-18FSP13-10-20	WS320	1.0	2.0	11/5/2018	PCB from Immunoassay (Aroclor 1254)	6.4	J
111-155	Mudflat	S-LWS01-18FSP13-00-10	LWS01	0.0	1.0	2/11/2021	Total 209 PCB cong (excl non-detects)	18.3	
111-155	Mudflat	S-LWS01-18FSP13-10-20	LWS01	1.0	2.0	2/11/2021	Total 209 PCB cong (excl non-detects)	8.2	
111-155	Mudflat	S-LWS01-18FSP13-20-30	LWS01	2.0	3.0	2/11/2021	Total 209 PCB cong (excl non-detects)	3.8	
111-155	Mudflat	S-LWS01B-18FSP13-00-10	LWS01B	0.0	1.0	2/11/2021	Total 209 PCB cong (excl non-detects)	31.6	

Notes:
Pre-excavation confirmatory congener samples are shaded green. See Section 3.3 of Draft Final Intertidal Work Plan for West Zone 2-3, Revision 1 (Jacobs, 2022) for more details.
U - not detected; J - estimated value

Table 2-2
West Zone 2-3 Compliance Survey Control Table

Parcel	Station ID	Location	Easting	Northing	Design Elevation	Post-Excavation Elevation	Δ (ft)	Date Surveyed	Restoration Design Elevation	Post-Restoration Elevation	Δ (ft)	Date Surveyed
			MA State Plane ft, NAD83		NAVD88 ft				NAVD88 ft			
112-133	INT205	Sidewall	815193.39	2706304.74	4.5	4.4	-0.1	11/9/2023	5.3	5.6	0.3	2/23/2024
112-133	WS209	Sidewall	815331.52	2706443.5	0.1	0.0	-0.1	11/14/2023	2.0	2.1	0.1	2/23/2024
112-133	WS211	Sidewall	815280.51	2706339.12	-3.3	-3.6	-0.4	11/9/2023	NA	NA	NA	NA
112-133	WS213	Sidewall	815122.5	2706225.1	4.8	4.8	0.0	10/18/2023	5.8	5.8	0.0	2/27/2024
112-133	WS219	Sidewall	815090.4	2706165.8	3.0	2.3	-0.6	9/28/2023	3.7	5.3	1.6[a]	2/27/2024
112-133	WS221	Sidewall	815056	2706110.2	2.9	2.7	-0.2	9/14/2023	3.7	4.0	0.3	1/26/2024
112-133	WS242	Sidewall	815121.7	2706030.9	3.5	3.4	-0.1	9/20/2023	4.6	4.6	0.0	1/26/2024
112-133	WS244	Sidewall	815448.32	2706616.26	-0.3	-0.4	0.0	11/29/2023	2.7	2.7	0.0	2/26/2024
112-133	WS245	Sidewall	815394.5	2706527.41	-1.0	-1.0	-0.1	11/29/2023	1.6	1.6	0.0	2/26/2024
112-133	WS246	Sidewall	815008	2706192	4.6	4.6	-0.1	12/1/2023	5.6	5.5	-0.1	12/4/2023
112-133	WS247	Sidewall	814976	2706119	4.4	4.1	-0.3	12/4/2023	5.9	6.0	0.1	12/4/2023
112-133	WS251	Sidewall	815484	2706600	-3.1	-3.5	-0.4	11/28/2023	NA	NA	NA	NA
112-133	WS252	Sidewall	815427	2706524	-3.2	-3.2	0.0	11/28/2023	NA	NA	NA	NA
112-133	WS253	Sidewall	815368	2706447	-3.2	-3.3	-0.1	11/14/2023	NA	NA	NA	NA
112-133	WS254	Sidewall	815312	2706376	-3.2	-3.3	-0.1	11/13/2023	NA	NA	NA	NA
112-133	WS255	Sidewall	815253	2706305	-3.3	-3.4	0.0	11/9/2023	NA	NA	NA	NA
112-133	WS256	Sidewall	815260	2706217	-3.3	-3.5	-0.3	10/18/2023	NA	NA	NA	NA
112-133	WS257	Sidewall	815316	2706133	-3.4	-3.9	-0.5	10/18/2023	NA	NA	NA	NA
112-133	WS258	Sidewall	815273	2706097	-3.3	-3.5	-0.2	10/25/2023	NA	NA	NA	NA
112-133	WS259	Sidewall	815023	2706063	2.7	1.8	-0.9	9/12/2023	3.7	1.9	-1.8[c]	1/29/2024
112-133	S-3305	Floor	815273	2706372	0,22	0.1	-0.2	11/13/2023	2.3	2.4	0.1	2/15/2024
112-133	S-3340	Floor	815205	2706097	-2.7	-3.2	-0.4	11/1/2023	NA	NA	NA	NA
112-133	WS201	Floor	815226.7	2706033.2	-2.6	-2.9	-0.3	10/18/2023	NA	NA	NA	NA
112-133	WS202	Floor	815224.1	2706155.5	-4.6	-4.9	-0.3	11/1/2023	NA	NA	NA	NA
112-133	WS203	Floor	815125.6	2706124	-2.9	-3.5	-0.6	10/30/2023	NA	NA	NA	NA
112-133	WS206	Floor	815433.2	2706569.3	-1.8	-2.3	-0.5	11/30/2023	1.1	1.2	0.0	2/26/2024
112-133	WS208B	Floor	815380.1	2706497.6	-4.5	-4.6	-0.1	11/29/2023	1.5	1.4	-0.1	2/26/2024
112-133	WS210	Floor	815323.3	2706415	-1.2	-1.4	-0.2	11/14/2023	1.1	1.2	0.1	2/22/2024
112-133	WS212	Floor	815239.9	2706320.3	-0.7	-1.1	-0.4	11/8/2023	1.3	1.4	0.1	2/27/2024
112-133	WS215B	Floor	815191.4	2706254.7	-0.3	-0.8	-0.5	11/8/2023	2.9	2.9	0.0	2/15/2024
112-133	WS216	Floor	815174.3	2706211.3	-1.8	-1.8	0.0	10/18/2023	2.3	2.3	0.1	2/26/2024
112-133	WS218	Floor	814998.5	2706174.7	4.6	4.3	-0.3	12/1/2023	5.6	5.7	0.1	12/4/2023
112-133	WS220	Floor	815273.1	2706153.6	-1.2	-1.9	-0.7	10/18/2023	NA	NA	NA	NA
112-133	WS224	Floor	815130.4	2706042.8	2.6	2.4	-0.2	9/20/2023	2.7	2.7	0.0	1/26/2024
112-133	WS239B	Floor	814987.1	2706117.2	3.7	3.5	-0.2	11/30/2023	5.7	5.7	0.0	12/4/2023
111-146	WS226	Sidewall	815174.2	2705919	2.4	2.3	-0.1	9/8/2023	3.4	3.5	0.1	1/23/2024
111-146	WS228	Sidewall	815082	2705879.5	2.6	2.5	-0.1	9/6/2023	3.4	3.6	0.2	1/18/2024
111-146	WS248	Sidewall	815195	2705997	2.4	2.0	-0.5	9/20/2023	3.2	3.2	0.0	2/15/2024
111-146	WS249	Sidewall	814995	2705806	0.7	0.7	0.0	9/1/2023	2.3	2.5	0.2	1/19/2024
111-146	WS250	Sidewall	814916	2705728	2.0	3.1	1.1	8/30/2023	3.1	3.1	0.1	1/15/2024
111-146	WS260	Sidewall	815252	2706007	-2.8	-3.4	-0.5	9/11/2023	NA	NA	NA	NA
111-146	WS261	Sidewall	815249	2705911	-1.3	-1.6	-0.2	9/7/2023	NA	NA	NA	NA
111-146	WS262	Sidewall	815191	2705869	-1.5	-1.7	-0.2	9/7/2023	NA	NA	NA	NA
111-146	WS263	Sidewall	815160.52	2705825.68	-3.6	-3.7	-0.1	9/8/2023	NA	NA	NA	NA
111-146	WS264	Sidewall	815065	2705813	-3.5	-3.7	-0.2	9/1/2023	NA	NA	NA	NA
111-146	WS265	Sidewall	814981	2705751	-3.0	-3.1	-0.1	8/30/2023	NA	NA	NA	NA
111-146	WS312	Sidewall	814745.8	2705282.1	3.7	4.2	-0.6	8/11/2023	4.4	4.5	0.1	12/19/2023
111-146	WS323	Sidewall	814882	2705629	2.7	2.2	-0.5	8/29/2023	3.6	3.8	0.2	1/9/2024

Table 2-2
West Zone 2-3 Compliance Survey Control Table

Parcel	Station ID	Location	Easting	Northing	Design Elevation	Post-Excavation Elevation	Δ (ft)	Date Surveyed	Restoration Design Elevation	Post-Restoration Elevation	Δ (ft)	Date Surveyed
			MA State Plane ft, NAD83		NAVD88 ft				NAVD88 ft			
111-146	WS324	Sidewall	814874	2705535	1.8	1.5	-0.3	8/23/2023	2.7	2.9	0.2	1/5/2024
111-146	WS325	Sidewall	814844	2705449	-0.3	-0.7	-0.4	8/22/2023	2.1	2.1	0.0	1/8/2024
111-146	WS326	Sidewall	814774	2705379	3.2	3.1	-0.1	8/16/2023	3.7	4.0	0.3	12/20/2023
111-146	WS328	Sidewall	814928	2705672	-3.0	-3.4	-0.4	9/6/2023	NA	NA	NA	NA
111-146	WS329	Sidewall	814928	2705567	-3.4	-3.5	0.0	8/25/2023	NA	NA	NA	NA
111-146	WS330	Sidewall	814885	2705470	-3.5	-3.7	-0.2	8/22/2023	NA	NA	NA	NA
111-146	WS331	Sidewall	814835	2705388	-3.2	-3.5	-0.2	8/17/2023	NA	NA	NA	NA
111-146	WS332	Sidewall	814852	2705295	-3.3	-3.3	0.0	8/9/2023	NA	NA	NA	NA
111-146	S-3351	Floor	815237	2705992	-1.5	-1.9	-0.4	9/8/2023	0.6	0.7	0.1	1/24/2024
111-146	WS225	Floor	815245.5	2705953	-0.1	-0.4	-0.3	9/8/2023	1.0	1.0	0.0	1/24/2024
111-146	WS229	Floor	815145.5	2705865.7	-1.5	-1.9	-0.4	9/8/2023	0.8	1.0	0.2	1/22/2024
111-146	WS231	Floor	815063.7	2705847.2	-1.1	-1.3	-0.2	9/1/2023	1.3	1.5	0.2	1/18/2024
111-146	WS234	Floor	815004.2	2705793.1	-2.0	-2.1	-0.1	9/1/2023	1.3	1.3	0.0	1/19/2024
111-146	WS236B	Floor	814937.1	2705725.5	-3.7	-4.0	-0.3	8/30/2023	1.5	1.5	0.0	1/15/2024
111-146	WS243	Floor	815206.9	2705897.3	0.1	-0.5	-0.6	9/7/2023	1.4	1.6	0.2	1/23/2024
111-146	WS301	Floor	814906.3	2705641.3	-1.0	-1.2	-0.2	8/29/2023	1.4	1.5	0.2	1/9/2024
111-146	WS305	Floor	814895.7	2705553.3	-0.6	-0.8	-0.2	8/23/2023	1.7	2.0	0.3	1/5/2024
111-146	WS306B	Floor	814861.2	2705468.7	-4.3	-4.5	-0.2	8/23/2023	1.6	1.6	0.0	1/5/2024
111-146	WS308	Floor	814810.1	2705389	-3.9	-4.1	-0.3	8/17/2023	0.9	1.1	0.3	12/21/2023
111-146	WS311	Floor	814768.8	2705332.3	-0.8	-1.3	-0.5	8/15/2023	1.7	0.9	-0.822[c]	12/20/2023
111-146	WS313	Floor	814851.3	2705270.8	-1.1	-1.5	-0.4	8/9/2023	0.8	1.4	0.619[b]	12/19/2023
111-98	WS327	Sidewall	814918	2705126	-0.2	-0.3	-0.1	12/6/2023	1.8	1.8	0.0	12/13/2023
111-98	INT227	Floor	814929	2705112	-2.0	-2.5	-0.5	12/6/2023	0.9	0.9	0.0	12/13/2023
111-98	WS333	Floor	814908	2705139	5.1	5.1	0.0	12/7/2023	6.1	6.4	0.3	12/13/2023
111-155	WS317	Sidewall	814927.2	2705064.2	-0.7	-1.0	-0.3	12/6/2023	0.9	0.9	0.0	12/19/2023
111-155	WS334	Sidewall	814943	2705086	-3.4	-3.4	-0.1	12/7/2023	NA	NA	NA	NA
111-155	WS318	Floor	814939.9	2705036.2	-2.9	-3.2	-0.2	12/6/2023	NA	NA	NA	NA

Notes:
MA - Massachusetts; NAD83 - North American Datum 1983; NAVD88 - North American Vertical Datum 1988; ft - feet;
Δ - difference between post-excavation elevation and design elevation or difference between post-restoration elevation and restoration design elevation
NA - Outside restoration boundary (became mudflat or subtidal after excavation and restoration)
a - Point located on shoreline where boulders were placed. Surrounding area to grade
b - Location is above grade due to a minor field design change. This area is now rip-rap which was added to meet the Crib-Cap edge.
c - Located at the bottom of new swale. Surrounding area is to grade.

Table 2-3
West Zone 2-3 Planting Summary

Date	High Marsh		Low Marsh	Notes
	Distichlis spicata	*Spartina patens*	*Spartina alterniflora*	
Tuesday, May 7, 2024	–	–	6,750	Parcel 111-155, 111-98, 111-146
Wednesday, May 8, 2024	–	1,400	6,550	Parcel 111-146
Thursday, May 9, 2024	–	1,100	6,400	Parcel 111-146
Monday, May 13, 2024	–	–	3,250	Parcel 111-146
Tuesday, May 14, 2024	–	–	4,100	Parcel 111-146 & 112-133
Wednesday, May 15, 2024	2,150	–	3,800	Parcel 111-146 & 112-133
Thursday, May 16, 2024	2,150	1,400	–	Parcel 111-146
Friday, May 17, 2024	1,500	2,050	–	Parcel 111-146
Monday, May 20, 2024	–	1,850	–	Parcel 111-146
Tuesday, May 21, 2024	–	400	5,050	Parcel 112-133 | Hydroseeding (Started & Completed)
Wednesday, May 22, 2024	–	5,000	–	Parcel 112-133
Thursday, May 23, 2024	–	–	450	Parcel 112-133
Tuesday, May 28, 2024	–	–	1,450	Parcel 111-146 & 112-133
Monday, June 10, 2024	–	–	–	Trees (2 ct) and Upland Plants (80 ct). Parcel 111-146
Wednesday, June 12, 2024	–	–	–	Upland Plants (262 ct)
Wednesday, June 19, 2024	5,550	–	–	Parcel 112-133 and 111-146, High/Low Marsh Planting Completed
Friday, June 21, 2024	–	–	–	Upland Plants (188 ct)
Monday, June 24, 2024	–	–	–	Upland Plants (568 ct)
Tuesday, June 25, 2024	–	–	–	Upland Plants (598 ct)
Total	**11,350**	**13,200**	**37,800**	Total individual high and low marsh plantings installed

Attachments

ATTACHMENT A

Project Note Draft Final Titleist Sheet Pile Survey Results and Modification of WZ 2&3 Excavation

Project Notes

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Client	NAE	**Date**	11 October 2023
Project	New Bedford Harbor Superfund Site	**Project No.**	35BG7000
Prepared By	Josh Cummings	**Document No.**	35BG7000-P1-0066
Issued By	Lonnie Fallin		
Subject	Draft Final | Titleist Sheet Pile Survey Results and Modification of WZ 2&3 Excavation		

Distribution	(* Denotes Part Time Participation)	**Distribution (attendees plus)**	**See below**	
USACE	**EPA**	**Sevenson**	**Jacobs**	**Jacobs (cont)**
Marie Esten	Dave Dickerson	Joe Mahoney	Lonnie Fallin	
Kerwin Donato	Natalie Burgo	Mike Brouillette	Josh Cummings	
Mike Degrazia			Patrick Curran	
			Sawyer Fallin-Hornsberger	

1	**PURPOSE**
	This revised project note serves to formally document the July 2022 RTK GPS survey of the temporary sheet pile wall installed at the Titleist property immediately south of the former Aerovox facility as part of the Massachusetts 21E cleanup effort led by Brown and Caldwell (BC). Additionally, the results of this survey have been used to update the excavation boundary of the West Zone 2 & 3 excavation work to be performed by Jacobs in 2023. Excavation and backfill landward of this sheet pile wall was performed by BC as part of its Aerovox site 21E cleanup. This revised prism supersedes the prism found in the Draft Final Intertidal Work Plan for West Zone 2-3, Revision 1 (Jacobs 2022).
2	**RESULTS**
	This survey was performed on June 22, 2022 by Jacobs, with the support and permission of Brown and Caldwell. See attached Figure 1 for map of sheet pile wall based on the RTK GPS survey results overlaid on the original WZ 2&3 excavation prism. Figure 2 shows the modified excavation prism and the area excavated under the 21E action.
3	**CONCLUSION**
	Sheet piles were removed by BC approximately two weeks after the survey was completed. These survey results will serve as an indicator for landward excavation boundary for NBHSS remedial efforts in this portion of the Titleist parcel. To ensure complete removal of contaminated sediments, the excavator operator will excavate an additional 2 feet beyond the former sheet pile location shown on the prism or until a change in material type indicating recently placed fill is observed.
4	**ATTACHMENT**
	Figure 1: Titleist Sheet Piles Parcel 112-133 WZ2 Plan North (Original July 2022 Survey) Figure 2: Titleist Sheet Piles Parcel 112-133 WZ2 Plan North (Revised 09/27/23).

112-133

Point	Easting	Northing
1	815437.8	2706634.2
2	815440.7	2706631.1
3	815445.1	2706622.9
4	815447.1	2706618.7
5	815448.4	2706614.2
6	815446.8	2706609.8
7	815442.3	2706602.2
8	815438.0	2706594.2
9	815433.5	2706586.5
10	815423.6	2706572.0
11	815413.7	2706557.2
12	815408.1	2706549.5
13	815404.0	2706541.9
14	815398.4	2706535.0
15	815393.0	2706527.6
16	815387.8	2706519.6
17	815382.8	2706511.8
18	815377.3	2706504.3
19	815374.7	2706500.4
20	815369.4	2706492.6
21	815320.2	2706431.2
22	815313.8	2706424.0
23	815307.4	2706417.0
24	815301.5	2706409.9
25	815295.5	2706402.8
26	815289.4	2706395.6
27	815283.3	2706388.6
28	815277.4	2706381.4
29	815271.4	2706374.4
30	815265.4	2706367.3
31	815259.6	2706360.2
32	815253.9	2706352.9
33	815247.7	2706345.9
34	815242.4	2706339.1
35	815209.3	2706293.4
36	815205.1	2706286.6
37	815203.5	2706286.1
38	815200.7	2706287.9
39	815198.0	2706292.8
40	815196.6	2706297.0
41	815196.3	2706301.6

Legend

- Sheet Pile
- MHHW (1.99 ft)
- MLLW (-1.97 ft)
- Sheet Pile Wall
- Parcel Boundary

Feet of Sediment To Remove

- 1
- 2
- 3
- 4
- 5
- 6

0 5 10 20 30 40 Feet

Pre-Excavation, MHHW and MLLW Elevations NAVD88 ft.
and Basemap Photography Sources: Green Seal 2018 and MassGIS 2021

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Titleist Sheet Piles
Parcel 112-133 WZ2 Plan North
(Original July 2022)

New Bedford Harbor Superfund Site

July 2022 **Figure 1**

Path: Y:\NBH\Projects\355BG100\20220629_Aerovox_Sheet_Piles\ArcGIS\Aerovox_Sheet_Piles_Parcel_112_133_EZ2_Exc_Plan_North_20220629.mxd

Legend

- Sheet Pile (RTK GPS survey location July 2022)
- MHHW (1.99 ft)
- MLLW (-1.97 ft)
- Sheet Pile Wall (Removed, former location)
- Parcel Boundary
- Excavated during 21E remediation by others

Feet of Sediment To Remove

1
2
3
4
5
6

Note: Excavation will be continued landward of former sheetpile wall location for approximately 2 ft. or until visual observation confirms a material change to recent fill.

0 5 10 20 30 40 Feet

Pre-Excavation, MHHW and MLLW Elevations NAVD88 ft.
and Basemap Photography Sources: Green Seal 2018 and MassGIS 2021

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Parcel 112-133 WZ2 Plan North (Revised 09/27/23)

New Bedford Harbor Superfund Site

September 2023 **Figure 2**

Path: Y:\NBH\Projects\355BG100\20230724_WZ2_WZ3 Daily Tracking\Excavation_Prism_Update\ArcGIS\Parcel_112_133_WZ2_Exc_Plan_North_Updated_20230720.mxd

ATTACHMENT B
West Zone 2-3 Topsoil Analytical Results Summary

Attachment B
West Zone 2-3 Topsoil Analytical Results Summary

			Acceptable Nutrient Ranges										Geotech (Method D7928)			MCP S-1 Soil Cleanup Standards									
			pH	CEC	Base Saturation	Avail Plant Moisture	Organic Matter Content	Mg	Ca	K	N	P	Sand	Silt	Clay										
Batch #	Date	Supplier	6 - 7	>20 meq/100g	>35%	50 - 70%	5 - 8%	50 - 120 ppm	1000 - 1500 ppm	100 - 160 ppm	>25 ppm	>15 ppm	45 - 85%	0 - 50%	0 - 20%	Metals	Petroleum Hydrocarbons	Target VOCs	Target SVOCs	EDB	1,4-Dioxane	Cyanide	PCBs	Backfill Location	Approved Vol (CY)
057	29-Nov-2023	READ Custom	6.5	10.0	79.9	NA	5.7	156	1064	535	131.2	98	82.6	11.6	5.8	P	P	P	P	P	P	P	P	WZ2-3	500
058	12-Dec-2023	READ Custom	6.6	10.6	81.2	NA	5.6	170	1142	583	134.8	123	78.5	16.2	5.3	–	–	–	–	–	–	–	–	WZ2-3	500
059	14-Dec-2023	READ Custom	6.4	10.5	81.0	NA	5.3	182	1113	547	136.2	111	79.5	12.4	8.1	–	–	–	–	–	–	–	–	WZ2-3	500
060	19-Dec-2023	READ Custom	6.4	13.8	85.5	NA	5.2	233	1771	389	138.1	107	78.2	13.4	8.4	–	–	–	–	–	–	–	–	WZ2-3	500
061	5-Jan-2024	READ Custom	6.5	13.5	79.2	NA	6.0	210	1486	586	121.1	128	76.1	14.4	9.5	P	P	P	P	P	P	P	P	WZ2-3	500
062	5-Jan-2024	READ Custom	6.2	11.4	80.6	NA	5.2	189	1235	561	108.7	121	79.8	13.7	6.5	–	–	–	–	–	–	–	–	WZ2-3	500
063	24-Jan-2024	READ Custom	6.2	12.6	82.6	2.26	6.1	196	1440	608	124.3	140	78.0	16.6	5.5	–	–	–	–	–	–	–	–	WZ2-3	500
064	25-Jan-2024	READ Custom	6.2	11.6	82.7	NA	5.1	183	1324	555	130.0	127	80.4	14.0	5.7	–	–	–	–	–	–	–	–	WZ2-3	500
065	26-Jan-2024	READ Custom	6.2	10.9	79.8	NA	5.7	175	1184	516	117.5	112	78.8	16.7	4.5	P	P	P	P	P	P	P	P	WZ2-3	500
066	16-Feb-2024	READ Custom	6.1	12.5	82.3	NA	5.2	201	1395	633	165.9	129	82.3	12.4	5.3	–	–	–	–	–	–	–	–	WZ2-3	500
067	20-Feb-2024	READ Custom	6.3	12.9	84.6	NA	5.8	204	1535	614	111.4	150	83.6	11.2	5.2	–	–	–	–	–	–	–	–	WZ2-3	500
068	20-Feb-2024	READ Custom	6.2	11.6	81.1	NA	5.5	180	1282	572	135.3	127	82.4	11.7	5.9	–	–	–	–	–	–	–	–	WZ2-3	500
069	26-Feb-2024	READ Custom	6.3	14.0	84.3	NA	5.5	218	1649	676	109.6	146	82.7	11.9	5.4	P	P	P	P	P	P	P	P	WZ2-3	500
070	14-Mar-2024	READ Custom	6.0	12.8	78.2	NA	5.3	182	1402	574	147.3	133	78.0	15.9	6.1	–	–	–	–	–	–	–	–	WZ2-3	500
071	18-Mar-2024	READ Custom	6.1	12.5	72.8	NA	5.5	177	1215	610	169.7	112	80.9	16.9	2.2	–	–	–	–	–	–	–	–	WZ2-3	500
Averages			6.3	12.1	81.1	NA	5.5	190.4	1349.1	570.6	132.1	124.3	80.1	13.9	6.0										

ATTACHMENT C

West Zone 2-3 Supplemental Planting Plan and Revisions to West Zones 2&3 Restoration Plan

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WEST ZONE- 2 AND 3 PLANTING PLAN SUMMARY NARRATIVE

PROPOSED PLANTINGS (SPRING 2024)

THE INTENT OF THIS PLANTING DESIGN IS TO RESTORE RIPARIAN AND UPLAND HABITAT DEGRADED BY TEMPORARY CONSTRUCTION ACCESS AND STAGING. A TOTAL OF 11 TREES ARE PROPOSED TO OFFSET TREES LOST OR SIGNIFICANTLY DAMAGED DURING RESTORATION EFFORTS. TREES WILL BE AT A 3'-5' HEIGHT IN CONTAINERS OR BAREROOT, AS APPROPRIATE FOR THE SPECIES. ALL PROPOSED SHRUBS WILL BE IN 1-GALLON CONTAINERS. SLOW-RELEASE FERTILIZER, SUCH AS OSMOCOTE, SHOULD ACCOMPANY SHRUB AND TREE PLANTINGS TO PROMOTE HEALTH AND VIGOR DURING ESTABLISHMENT. SPECIFIC SEED MIXES SHOULD BE INSTALLED ONLY IN LOCATIONS SPECIFIED ON THE PLANS. TEMPORARY FENCING, CAGING, OR OTHER HERBIVORE DETERRENT MEASURES SHOULD BE PROVIDED AROUND TREES AND SHRUBS THROUGH THE ESTABLISHMENT PERIOD.

PLANTING AREAS A + B

PLANTING AREAS 'A' AND 'B' CONSISTS OF GROUND DISTURBANCE RESTORATION IN UPLAND AREAS ALONG AN INDUSTRIAL SHORELINE ON THE NEW BEDFORD SIDE OF THE ACUSHNET RIVER. DURING EXCAVATION 11 TREES GREATER THAN 6 INCHES AT THE DIAMETER AT BREAST HEIGHT WERE REMOVED IN ORDER TO CREATE TEMPORARY HAUL ROADS USING PLASTIC MATS. THESE TREES WILL BE REPLACED THROUGHOUT PLANTING AREAS A AND B WITH NATIVE AND SITE APPROPRIATE TREE SPECIES. THE REMAINING UPLAND AREA WILL BE PLANTED WITH NEW ENGLAND COASTAL SALT TOLERANT GRASS MIX, MANUFACTURED BY NEW ENGLAND WETLAND PLANTS INC. THE SEED SHALL BE APPLIED BY HYDROSEED/HYDROMULCH METHOD. APPROPRIATE MIXED SHRUB MATERIAL IS PROPOSED TO STABILIZE BANKS AND PROVIDE NATIVE HABITAT ALONG THE ACUSHNET RIVER. THE CURRENT PLANTING PLAN IS COGNIZANT OF THE PLAN PROVIDED BY THE CITY OF NEW BEDFORD FOR A FUTURE RIVER WALK. NONE OF THE TREE MATERIAL HAS BEEN PLACED WHERE THE FUTURE PATH IS CURRENTLY PROPOSED AND INTENDS TO COMPLIMENT THE PATHWAY. TREES ARE NOT PROPOSED ALONG THE TITLEIST WATERFRONT DUE TO PLANTING AREA RESTRICTIONS RESULTING FROM THE PROPOSED FENCE LOCATION AND CURRENT PATH ALIGNMENT.

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EMAIL ADDRESS:
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Legend:

Key Map:

Stamp:
MASSACHUSETTS
Anthony Salmeri
NO. 4220
REGISTERED LANDSCAPE ARCHITECT

Project Title:
WEST ZONE 2 & 3
NEW BEDFORD
HARBOR
SUPERFUND SITE
NEW BEDFORD, MA

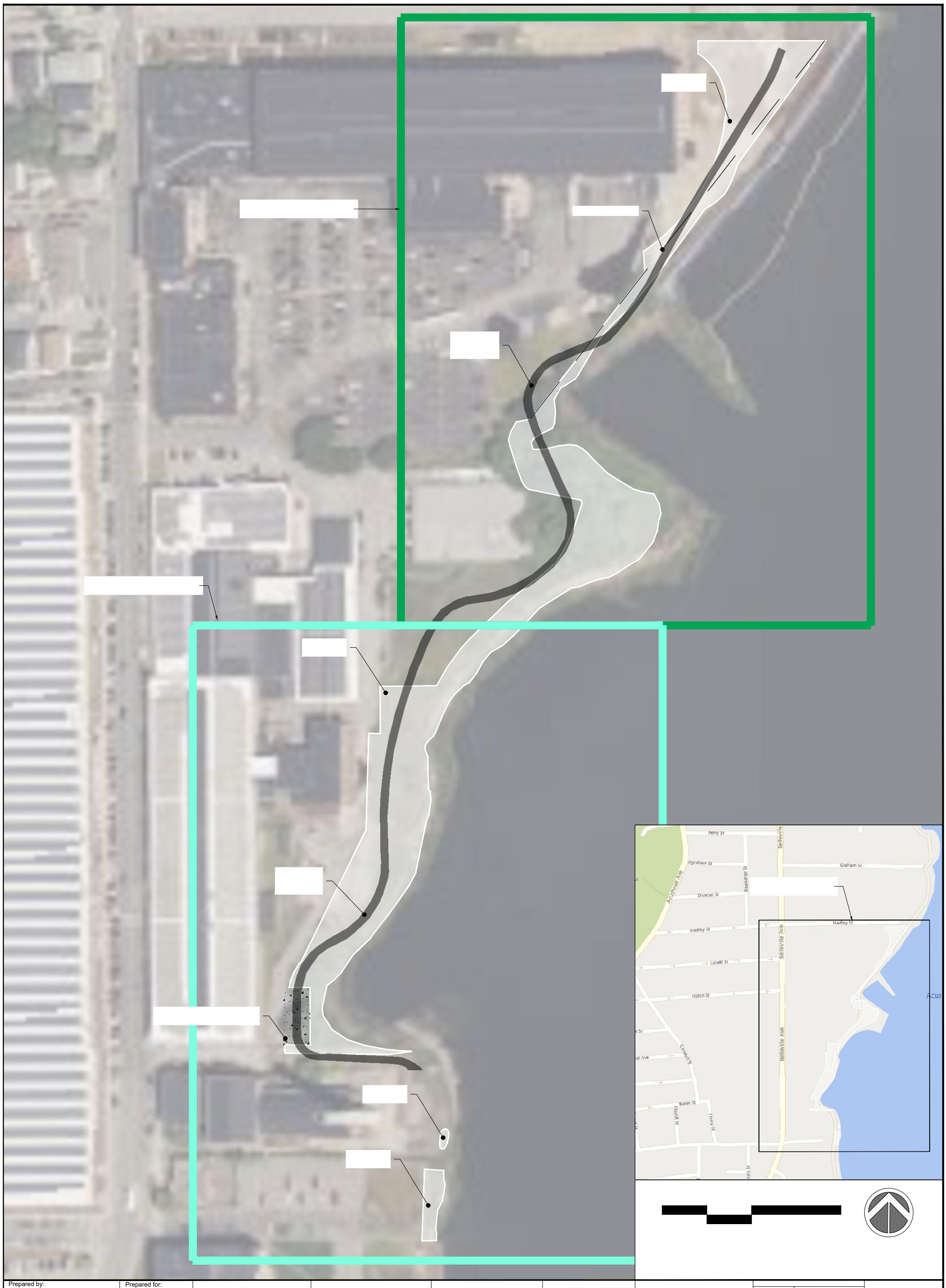
Sheet Title:
NARRATIVE

DATE:	03/27/2024
SCALE:	AS SHOWN
DRAWN BY:	CD
CHECKED BY:	TS
FILE #:	73355-000-AMH

REVISIONS

DATE:	BY:	NOTE:

Sheet No:
LP-01



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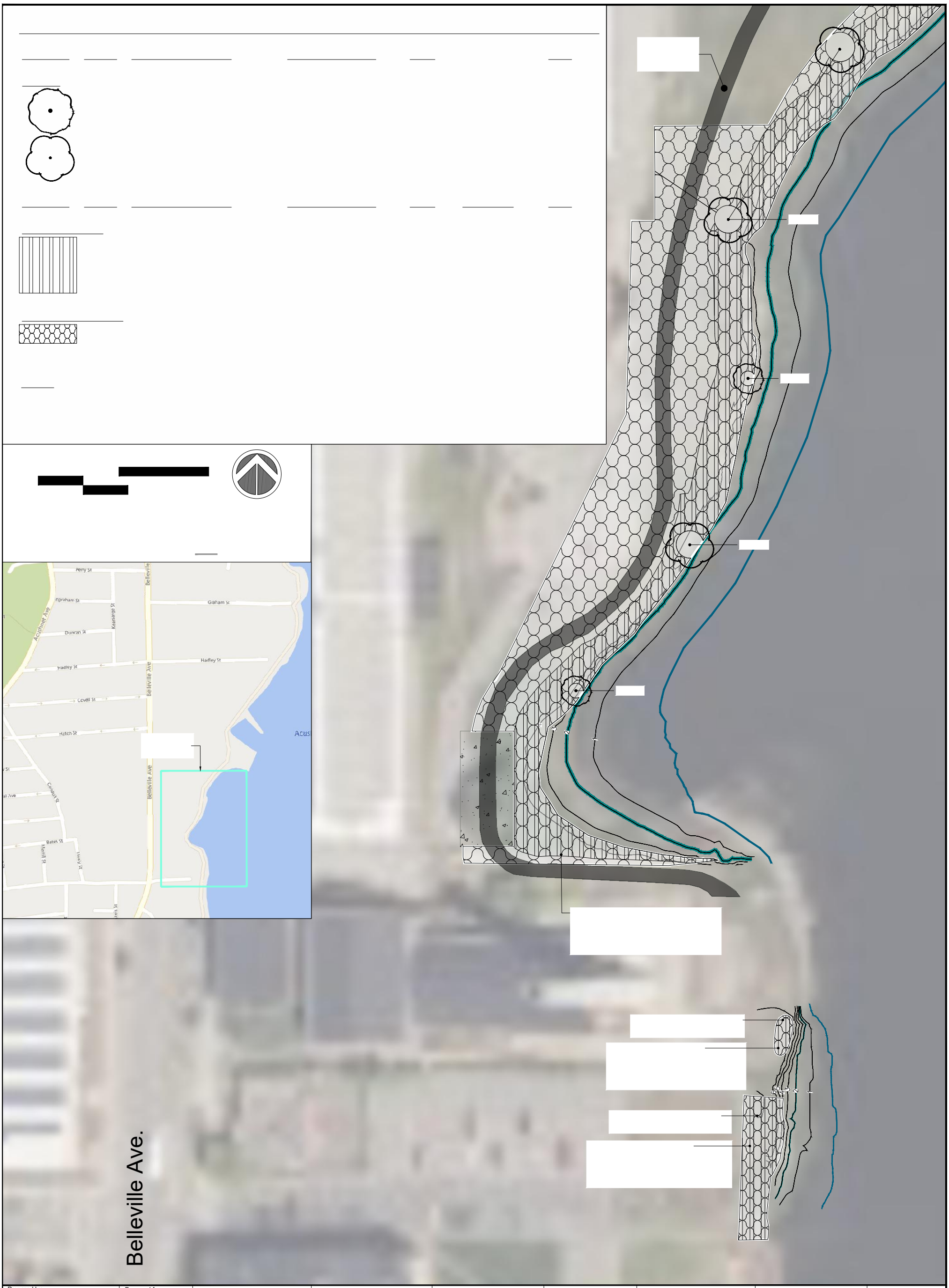

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Brittany Somers
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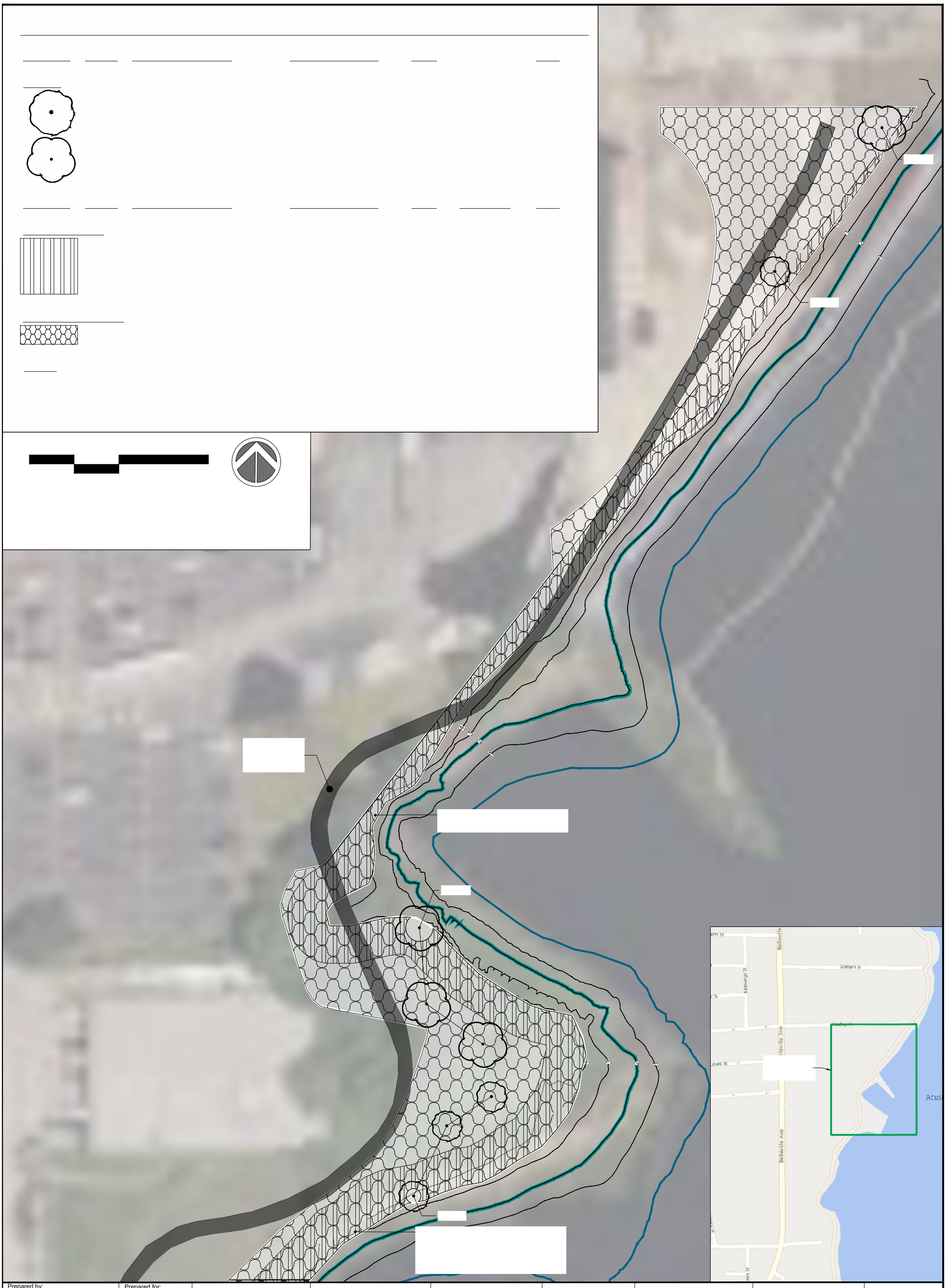

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Bethany Sommers
REGISTERED LANDSCAPE ARCHITECT
NO. 4220

TOTAL PLANT COUNT

SYMBOL	CODE	BOTANICAL NAME	COMMON NAME	SIZE	QTY	PLANTING PLAN A	PLANTING PLAN B
TREES							
	AR	ACER RUBRUM	RED MAPLE	3`-5` HT.	6	2	4
	QR	QUERCUS RUBRA	RED OAK	3`-5` HT.	7	3	4

SYMBOL	CODE	BOTANICAL NAME	COMMON NAME	SIZE	SPACING	QTY	PLANTING PLAN A	PLANTING PLAN B
SHRUB AREAS								
		TRANSITION				37,846 SF	17,814 SF	20,032 SF
	BH4	BACCHARIS HALIMIFOLIA	GROUNDSEL BUSH	1 GAL.	25% @ 72" o.c.	274	129	145
	IF4	IVA FRUTESCENS	MARSH ELDER	1 GAL.	50% @ 72" o.c.	547	258	289
	MP4	MYRICA PENSYLVANICA	NORTHERN BAYBERRY	1 GAL.	25% @ 72" o.c.	274	129	145
GROUND COVERS								
		SALT TOLERANT SEED MIX (35 LBS/AC)				88,719 SF	42,187 SF	46,532 SF

* MYRICA PENSYLVANICA TO BE PLACED ON UPGRADIENT SIDE OF SHRUB PLANTING AREA, WHERE PRACTICABLE.

NEW ENGLAND WETLAND PLANTS, INC

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New England Coastal Salt Tolerant Grass Mix

Botanical Name	Common Name	Indicator
Elymus canadensis	Canada Wild Rye	FACU+
Festuca rubra	Red Fescue	FACU
Panicum amarum	Atlantic Coastal Panic Grass	FACU-
Andropogon gerardii	Big Bluestem	FAC
Sorghastrum nutans	Indian Grass	UPL
Panicum virgatum	Switch Grass	FAC
Juncus tenuis	Path Rush	FAC

PRICE PER LB. $26.00 MIN. QUANITY 4 LBS. **TOTAL:** $104.00 APPLY: 35 LBS/ACRE :1250 sq ft/lb

The New England Coastal Salt Tolerant Seed Mix contains a selection of native grasses that tolerate salty conditions. This mix is appropriate for drier coastal areas that receive salt spray or mist. Always apply on clean bare soil. The mix may be applied by hydro-seeding, by mechanical spreader, or on small sites it can be spread by hand. Lightly rake, or roll to ensure proper seed to soil contact. Best results are obtained with a Spring seeding. Late Spring and early Summer seeding will benefit with a light mulching of weed-free straw to conserve moisture. If conditions are drier than usual, watering may be required. Late Fall and Winter dormant seeding require an increase in the seeding rate. Fertilization is not required unless the soils are particularly infertile. Preparation of a clean weed free soil surface is necessary for optimal results.

New England Wetland Plants, Inc. may modify seed mixes at any time depending upon seed availability. The design criteria and ecological function of the mix will remain unchanged. Price is $/bulk pound, FOB warehouse, Plus SH and applicable taxes.

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EMAIL ADDRESS:
josh.cummings@jacobs.com

Legend:

Key Map:

Stamp:
MASSACHUSETTS
Anthony Salmeri
NO. 4220
REGISTERED LANDSCAPE ARCHITECT

Project Title:
WEST ZONE 2 & 3
NEW BEDFORD HARBOR
SUPERFUND SITE
NEW BEDFORD, MA

Sheet Title:
DETAIL SHEET

DATE:	03/27/2024
SCALE:	AS SHOWN
DRAWN BY:	CD
CHECKED BY:	TS
FILE #:	73355-000-AMH

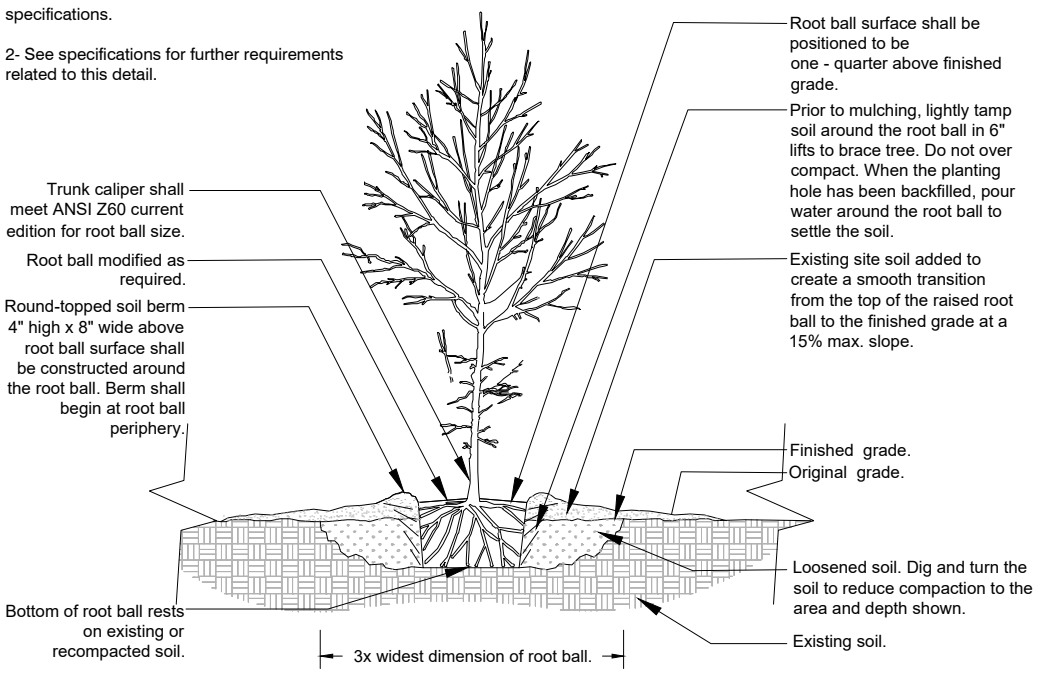
REVISIONS

DATE:	BY:	NOTE:

Sheet No:
LD-01

Notes:
1- Trees shall be of quality prescribed in crown observations and root observations details and specifications.

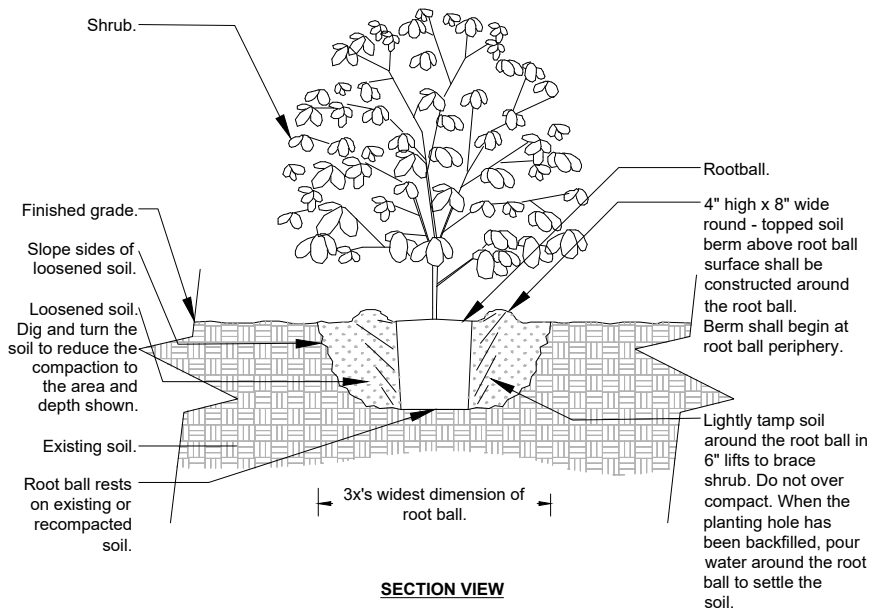
2- See specifications for further requirements related to this detail.



1 TREE PLANTING DETAIL
Scale: NTS

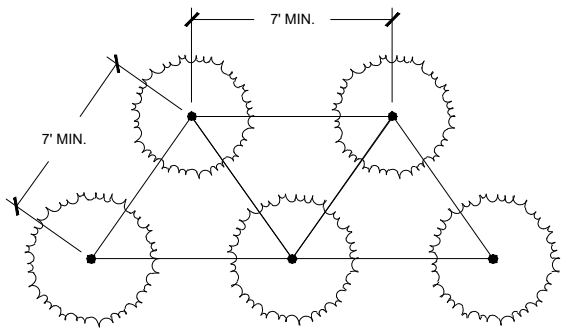
Notes:
1- Shrubs shall be of quality prescribed in the root observations detail and specifications.

2- See specifications for further requirements related to this detail.



SECTION VIEW

2 SHRUB PLANTING DETAIL
Scale: NTS



NOTES:
SHRUBS TO BE SPACED IN RANDOMIZED CLUSTERS OF 5 TO 7 PLANTS OF THE SAME SPECIES

3 SHRUB SPACING (TYP.)
Scale: NTS

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LD-02

STABILIZATION AND PLANTING NOTES:

1. REMOVE OBSTRUCTIONS, AS REQUIRED, TO PERMIT INSTALLATION OF NEW CONSTRUCTION. CUT MINOR ROOTS OF TREES INDICATED TO REMAIN IN A CLEAN AND CAREFUL MANNER WHERE SUCH ROOTS AND BRANCHES OBSTRUCT INSTALLATION OF NEW CONSTRUCTION.
2. REPAIR OR REPLACE EXISTING TREES AND VEGETATION THAT ARE DAMAGED BY CONSTRUCTION OPERATIONS IN A MANNER ACCEPTABLE TO THE LANDSCAPE ARCHITECT.

SEEDING AND MANAGEMENT GUIDANCE

SEEDING CHRONOLOGY/TIMING

THE FOLLOWING METHODOLOGY PROVIDES SEQUENCING FOR ESTABLISHING THE SEED MIXES PRESCRIBED HEREIN. THIS PROCESS SHOULD BEGIN FOLLOWING FINAL GRADING.

LIVE OR SPRING SEEDING: "LIVE SEEDING" TAKES PLACE WHEN SOIL TEMPERATURES ARE CONSISTENTLY ABOVE 55 DEGREES FAHRENHEIT AND SEED CAN ACTIVELY GERMINATE WITHOUT THE RISK OF A HARD FREEZE. IN THE PROJECT REGION LIVE SEEDING IS RECOMMENDED BETWEEN APRIL 15 AND JUNE 15. PLANTING AFTER MID-JUNE IS NOT RECOMMENDED SINCE NEWLY ESTABLISHED PLANTINGS LACK ROOT DEPTH AND ARE SUSCEPTIBLE TO BURNOUT RELATED TO DROUGHT CONDITIONS.

DORMANT SEEDING: THE OPTIMAL TIME TO "DORMANT SEED" PRESCRIBED NATIVE GRASSES AND FORBS IS WHEN SOIL TEMPERATURES ARE CONSISTENTLY BELOW 55 DEGREES FAHRENHEIT, APPROXIMATELY BETWEEN NOVEMBER 15 AND APRIL 15 IN THE PROJECT REGION. SEEDING WHEN SNOW IS ON THE GROUND SHOULD BE AVOIDED SINCE IT REDUCES SEED-TO-SOIL CONTACT AND EXPOSES THE SEED TO PREDATION. DURING THIS PERIOD, THE PRESCRIBED COOL SEASON NURSE CROP AND NATIVE COOL SEASON SPECIES WILL ESTABLISH; HOWEVER, WARM SEASON GRASSES AND FORBS WILL GERMINATE IN THE SPRING WHEN SOIL TEMPERATURES RISE. DORMANT SEEDING ENABLES COLD STRATIFICATION OF THE SEED AND ALLOWS THE SEED THE EARLIEST GERMINATION POSSIBLE GOING INTO THE LIVE SEEDING PERIOD.

TEMPORARY COVER CROP/STABILIZATION SEED MIXES: COOL-SEASON GRASSES SHOULD BE INSTALLED AS NEEDED WHEN ADEQUATE SOIL MOISTURE IS PRESENT, AND SOIL TEMPERATURES ARE ABOVE 55 DEGREES FAHRENHEIT. TEMPORARY SEEDING IS NOT RECOMMENDED BETWEEN DECEMBER 1 AND MARCH 1.

WEATHER FORECASTS SHOULD BE MONITORED AS SUPPLEMENTAL WATERING MAY BE NECESSARY DURING PROLONGED DRY PERIODS.

SOIL SCARIFICATION/ SEED BED PREPARATION

SEED BED PREPARATION IS THE PROCESS OF SCARIFYING AND LOOSENING THE SOIL SURFACE IN ORDER TO CREATE A LOOSE, FRIABLE, SOIL SURFACE. THE SOIL SURFACE SHOULD BE A UNIFORM PLANAR SURFACE THAT IS FLAT AND WITHOUT EXCESSIVE RIDGES, FURROWS, RUTS OR MOUNDS AND LOW SPOTS WHERE WATER CAN COLLECT. SOIL SCARIFICATION SHOULD ONLY OCCUR WHEN WEATHER, SOIL CONDITIONS, AND CONSTRUCTION PHASING ALLOWS FOR NO LONGER THAN 48 HOURS BETWEEN SCARIFICATION (THE BEGINNING OF THE SEEDING PROCESS) AND COVERING THE SEED WITH HYDROMULCH. THE SOIL SHOULD BE SCARIFIED TO MAXIMUM DEPTH OF 3 INCHES (SEE BELOW).

SEED APPLICATION

A WELL-PREPARED SEED BED PROVIDES A LOOSE FRIABLE SOIL SURFACE FOR WHICH THE SEED CAN BE SOWN INTO. SEED APPLICATION IS A TWO-PART PROCESS: 1) SEED APPLICATION AT PROPER RATES PER ACRE, AND 2) SOW THE SEED INTO THE SOIL 1/8" TO ¼" DEPTH MAXIMUM. APPROPRIATE SEED RATES FOR EACH PRESCRIBED SEED MIX ARE SPECIFIED ON SHEET LP-03.

BROADCAST: A SPREADER EQUIPPED WITH AN AGITATOR (NEAR THE SEED RATE APERTURE) IS REQUIRED FOR SUCCESSFUL BROADCAST PLANTING OF DIVERSE SEED MIXES WITH VARIED SEED SIZES. CHECK THE SEED LABEL PRIOR TO OPENING THE BULK BAG TO CONFIRM THE CORRECT SEED IS BEING APPLIED TO THE SPECIFIED LOCATION. CHECK THE BULK BAGS OF SEED TO CONFIRM IF ALL SEED SPECIES ARE WITHIN EACH BAG OR IF IN BAGS SEPARATED BY SIZE OR CHAFF. IF SEPARATED, BLEND THE APPROPRIATE BAGS FOR EACH PLANTING AREA WITHIN THE SPREADER HOPPER OR IN A CLEAN DRUM/BARREL PRIOR TO SEEDING. ONCE THE SEED IS SPREAD THE SEED MUST BE SOWN INTO THE SOIL TO THE DEPTH ABOVE IN ORDER TO INCREASE CHANCES OF GERMINATION WITH SEED-TO-SOIL CONTACT AND BY KEEPING SOIL MOISTURE CLOSE TO THE SEED. THE BROADCASTED SEED CAN BE SOWN BY A NUMBER OF WAYS INCLUDING "TRACKED" IN WITH A LOW PSI RUBBER TIRE OR TRACKED MACHINE WITH OVERLAPPING PASSES, USE OF A CULTIPACKER, OR HEAVY ROLLER. BROADCAST SEED SHALL BE COVERED WITH HYDROMULCH.

PLANT SUCCESSION NOTES

IT IS POSSIBLE THAT SOME SEEDED AREAS MIGHT BECOME DOMINATED BY NATIVE PLANT SPECIES EXISTING IN THE SOIL SEED BANK. THIS INCLUDES BENEFICIAL NATIVE GRASSES AND FORBS. THESE ARE STILL BENEFICIAL SPECIES TO WILDLIFE AND COMPATIBLE WITH PRESCRIBED SEED MIXES. LIKEWISE, IT IS POSSIBLE THAT PERENNIAL GRASS AND FORB SPECIES MAY NOT BECOME APPARENT DURING THE FIRST GROWING SEASON, TAKING UP TO THREE YEARS TO BECOME ESTABLISHED. ANNUAL FORBS SHOULD BECOME ESTABLISHED WITHIN THE FIRST GROWING SEASON. SPECIFIC MANAGEMENT PRACTICES DETAILED BELOW WILL ENSURE ESTABLISHMENT OF ALL SEED MIXES OVER TIME.

WOODY PLANT ESTABLISHMENT

THE FOLLOWING APPROACH PROVIDES SEQUENCING FOR ESTABLISHING WOODY VEGETATION.

1. PLANTING HOLE PREPARATION - DETERMINE THE CORRECT PLANTING HOLE DEPTH BY MEASURING FROM THE PLANT TRUNK FLARE TO THE BOTTOM OF THE ROOTBALL; THE UPPERMOST STRUCTURAL ROOTS IN THE ROOTBALL WITHIN 1-3 INCHES OF THE SOIL SURFACE MEASURE 2-5 INCHES FROM THE TRUNK; THE PLANTING HOLE SHOULD BE APPROXIMATELY 3-5 TIMES THE WIDTH OF THE CONTAINER WITH OUTWARD SLOPING SIDES.
2. SETTING THE PLANT - CAREFULLY SET THE PLANT AT APPROXIMATELY 0-2 INCHES ABOVE THE EXISTING GRADE, REMOVE CONTAINER, AND RESET ROOTBALL IN PLANTING HOLE.
3. SETTING BACKFILLED SOIL - WATER BACKFILL SOIL HALFWAY THROUGH THE BACKFILL PROCESS AND ALLOW IT TO DRAIN; WHEN THE WATER HAS DRAINED AWAY RESUME BACKFILLING AND WATER THOROUGHLY AGAIN; DO NOT TAMP OR COMPACT BACKFILL. SMOOTH OUT SURFACE SOIL AND ENSURE TRUNK FLARE IS EXPOSED AND STRUCTURAL ROOTS ARE WITHIN 3-INCHES OF SOIL MEASURED 4-INCHES FROM THE TRUNK.
4. USE OF FERTILIZERS - SLOW-RELEASE FERTILIZER, SUCH AS OSMOCOTE, SHOULD BE INCLUDED DURING THE INSTALLATION OF ALL CONTAINERS AND GALLON CONTAINER MATERIAL.

MAINTENANCE AND MONITORING

1. FOR BEST MANAGEMENT PRACTICES THAT ARE NOT TO REMAIN IN PLACE AS A PART OF FINAL STABILIZATION SUCH AS SILT FENCE AND OTHER TEMPORARY MEASURES, BEST MANAGEMENT PRACTICES SHOULD BE REMOVED WHEN ALL LAND DISTURBING ACTIVITIES HAVE CEASED AND AREAS HAVE BEEN PERMANENTLY STABILIZED.
2. A SIMPLE SITE INSPECTION PERFORMED BY SOMEONE WITH KNOWLEDGE OF THE ORIGINAL DESIGN OF THE PROJECT IS THE MOST COST EFFECTIVE AND IS GENERALLY CONSIDERED SUFFICIENT MONITORING. THIS INSPECTION SHOULD INCLUDE OBSERVING INSTALLED VEGETATION AND OVERALL ENVIRONMENTAL CONDITIONS. TAKING PICTURES ALONG WITH NOTES IS THE BEST WAY TO DOCUMENT ANY PROBLEMS OBSERVED. PERIODIC PICTURES OF THE SAME AREA WILL MAKE IT EASIER TO IDENTIFY CHANGING CHARACTERISTICS.
3. MONITORING IS OF GREATEST IMPORTANCE DURING THE FIRST TWO YEARS AFTER CONSTRUCTION. INSPECTIONS SHOULD BE CONDUCTED AFTER HIGH-WATER EVENTS OR HEAVY STORM ACTION. DURING PERIODS OF LOW-WATER LEVELS, VISUAL MONITORING SHOULD CONFIRM IF SUPPLEMENTAL WATERING IS REQUIRED, HOWEVER, ULTIMATE CONTROL FOR SUPPLEMENTAL WATERING WILL BE THE RESPONSIBILITY OF THE CONTRACTOR.
4. AN EVALUATION OF VEGETATIVE GROWTH SHOULD BE PART OF EVERY INSPECTION. ADDITIONAL PLANTING MAY BE NEEDED DEPENDING ON THE GROWTH OF THE PLANTS WITHIN THE FIRST TWO YEARS.

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Jacobs

Project Notes

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Client	NAE	**Date**	14 February 2024
Project	New Bedford Harbor Superfund Site	**Project No.**	35BG7000
Prepared By	Joshua Cummings		35BG7000-P1-0073
Issued By	Lonnie Fallin		
Subject	Draft Final Revisions to West Zones 2&3 Restoration Plan		

Distribution	(* Denotes Part Time Participation)	**Distribution (attendees plus)**	**See below**

Client	**EPA**	**Sevenson**	**Jacobs**	**MA DEP**
Kerwin Donato	Dave Dickerson	Joe Mahoney	Anita Rigassio Smith	Paul Craffey
Marie Esten	Natalie Burgo		Josh Cummings	
			Patrick Curran	
			Lonnie Fallin	

1 PURPOSE

This project note summarizes revisions to the West Zones 2 and 3 restoration plans, since the issuance of the Draft Final Intertidal Work Plan for West Zone 2-3, Revision 1, dated May 2022 (WP). Sections 3-7 describe changes to restoration topography and Section 8 describes changes to the restoration planting plan which were necessitated due to the changing topography. A supplemental planting plan is being developed to address restoration plantings to be installed in impacted areas, outside of the restoration footprint. The supplemental planting plan will also re-evaluate the WP prescribed upland, transition, and scrub-shrub plantings within the restoration footprint to ensure species are properly sited with the revised restoration plan.

2 BACKGROUND

During the excavation phase of West Zones 2 & 3 it was observed that there were many large stones, remnant concrete chunks and a narrow man-made peninsula, constructed from concrete pieces within the area to be excavated. Completion of the excavation required disassembly of the man-made peninsula. As an alternative to offsite disposal, the rocks and concrete were rinsed of mud for reuse as deep fill or in the construction of the restoration, similar to other zones on the West side of the upper harbor. Because of the quantity of rocks and concrete generated during excavation, a plan was needed to ensure the reuse of the material in a beneficial manner.

Lessons learned from previous restorations since the original WP was issued, have led to adjustments to intertidal restorations in the upper harbor. These adjustments are intended to increase the chances of successful plant establishment while reducing the potential for severe erosion and ensuring the beneficial reuse of recovered large stones. Adjustments include utilizing location specific elevation based planting zones, incorporating natural stone from the site, incorporating drainage swales which are coordinated with existing upland conditions and working with property owners or their representatives to produce a restored area which will be beneficial for future use of the area.

3 REMOVAL AND REUSE OF CONCRETE FROM MAN-MADE PENINSULA

During the excavation phase of the WZ 2&3 remediation, it was necessary to remove the large concrete chunks which made up a derelict man-made peninsula behind Titleist (Parcel 112-133) in order to remove all of the sediment as dictated by the WP. The project team discussed the work with Titleist and the City of New Bedford, and it was decided that the man-made peninsula no longer served a function and did not need to be replaced following excavation. Due to the size of the concrete chunks (many greater than 4 ft. in diameter) and volume of

	concrete, it was determined that off site disposal was not practical. A decision was made to rinse the concrete of visible sediment and stockpile it for reuse in the restoration of the parcel as either armor stone or deep fill depending on size and shape. Concrete that appears "stone like" will be used to provide shoreline armor near the fence line or transition to upland areas and visible, while the remainder of the concrete will be placed at the east edge of the restoration, beyond the salt marsh, and sunk into the mud to the extent possible (non-visible). Figure 1 shows the proposed topography of the restored shoreline with the inclusion of the recovered concrete. Attachment A provides the original WP proposed restoration for comparison and also shows the areas where deep sediment removal was required and necessitated the removal of the man-made peninsula.
4	**PARCEL 112-133 (TITLEIST) SHORELINE REVISION**
	Following on the decision not to rebuild the man-made peninsula, it was necessary to redesign the topography behind the Titleist facility. With the goal of maintaining the amount of saltmarsh in the WP, the shoreline was redrawn to incorporate a more natural appearing "bump out" where the man-made peninsula once stood. Numerous large natural stones were also recovered and rinsed during the excavation. These stones will be utilized in the restoration to provide shoreline and drainage swale armor. The majority of the stones will be placed close to the landward excavated edge to protect the uplands from erosion due to wind driven waves. Figure 1 illustrates the revised shoreline and locations where rock and "stone like" concrete will be utilized as shoreline armor. Figure 1 shows the location of a cross-section of the restored area, Figure 7 shows the cross-section. Three vitrified clay or iron outfall pipes were identified within the excavation area. Available information and field observations confirmed that at least one of the outfall pipes was an active drain. Because definitive information on the pipes was not available, efforts were made to protect the pipes during remediation. The pipes will be accounted for during restoration and a small stone splash pad will be installed below the known active pipe(s) to prevent future erosion. These outfall pipes are identified in Figure 1. The outfall observed to be in use (active) is labeled as outfall 2 on Figure 1.
5	**TOE OF MARSH REVISION**
	Lessons learned during the restoration of East Zone 1 and subsequent restorations, concluded that setting the low marsh toe at an elevation of 0.5 ft. NAVD88 generally results in successful establishment of low marsh plantings when combined with a suitable soil mixture and gentle slopes which positively drain. The West Zone 2&3 WP restoration design had been completed prior to this, thus, to increase the chances of a successful restoration, it was decided to use the WP proposed horizontal location of the marsh toe (demarcated by a coir log) but set the elevation to an even 0.5 ft. NAVD88. This generally resulted in raising the elevation of the marsh toe by 0.5-1.0 ft. while maintaining the restoration elevation on the landward side. The resulting effect was that there was no substantial change in the amount of proposed marsh, but the restored marsh would have a gentler slope to the uplands, which has been observed to reduce the amount of erosion and increase the successful establishment of marsh grasses. An additional protective measure of adding a dense grade wedge of material against the seaward edge of the coir log has been included. This helps protect the coir log from erosion undercutting the log or wave driven uplift and log failure, both of which may result in significant erosion and plant loss before the marsh is established. Figures 1-3 show the revised restoration and can be compared to the WP proposed restoration in Attachment A. It should be noted that the horizontal location of the coir log at the toe of the marsh was adjusted in select areas of Parcels 111-155, 111-98, and 111-146 to smooth the shoreline and eliminate sharp bends. The purpose of this is to prevent future erosion and produce a more natural appearance.
6	**REUSE OF EXCAVATED ROCKS**
	The reuse of excavated large rocks and "stone like" concrete behind the Titleist facility was discussed in Sections 3 and 4. Many large rocks and pieces of concrete ("stone like" and slabs/chunks) were also recovered during the excavation of Parcel 111-146, behind Darn IT Inc. These rocks and concrete were similarly rinsed of visible mud and set aside for reuse during restoration. Rinsed rocks will be reused in this area by placing them on the landward edge of excavation and incorporating them into the restoration. The intent is to help prevent erosion of

the upland areas during storms with wind driven waves. Rinsed non "stone like" concrete will be reused as deep fill during restoration with the goal of minimizing any concrete that may be visible from the surface at completion. Figure 2 illustrates the location of the rocks to be reused during restoration and illustrates the location of a cross section, Figure 8 shows a cross-section of the marsh to be installed within Parcel 111-146.

7 **INSTALLATION OF SWALES**

At the time of issuing this PN, five swales have been planned for the West Zone 2&3 restoration. Four of the swales are planned to be installed behind the Titleist facility in locations identified by representatives from Titleist. These swales will replace drainage areas which were previously existing and eroding to various degrees. A fifth swale is to be installed in the small cove at the south end of the Darn IT property (Parcel 111-146) to accommodate stormwater runoff. All of the swales will be “U” shaped and approximately 1 ft. deep for every 3 ft. wide and sloped to promote positive drainage (ideally 2% to 4% slope, if existing conditions allow). Swales will be lined with a geotextile fabric with overlap of adjacent fabric pieces to prevent undercutting beneath the fabric. The swales will then be filled with 4–10-inch stone in a layer approximately 8-12 inches deep, maintaining the “U” shape. Swales will be flared at the discharge to help break the drainage water velocity and shaped to adequately collect stormwater at the upper end. Figures 1 and 2 show the locations of the swales. Figure 9 illustrates the construction of a typical swale to be installed at WZ 2&3 in plan view and cross section.

8 **REVISED PLANTING PLAN FOR EXCAVATED AREA**

Because changes are to be made to the topography of West Zone 2&3 as described in the preceding sections, the quantities of plants for each planting zone must also be revised. The original WP delineated planting zones were based on field observations and analysis of aerial survey data. The revised planting zones are determined by elevation ranges which have been utilized in previous upper harbor restorations with success. Figures 4-6 illustrate the planting zones as determined by the following ranges.

- Low Marsh = 0.5-2.0 ft. NAVD88
- High Marsh = 2.0-3.4 ft. NAVD88
- Transition & Upland = 3.4 ft. and above NAVD88.

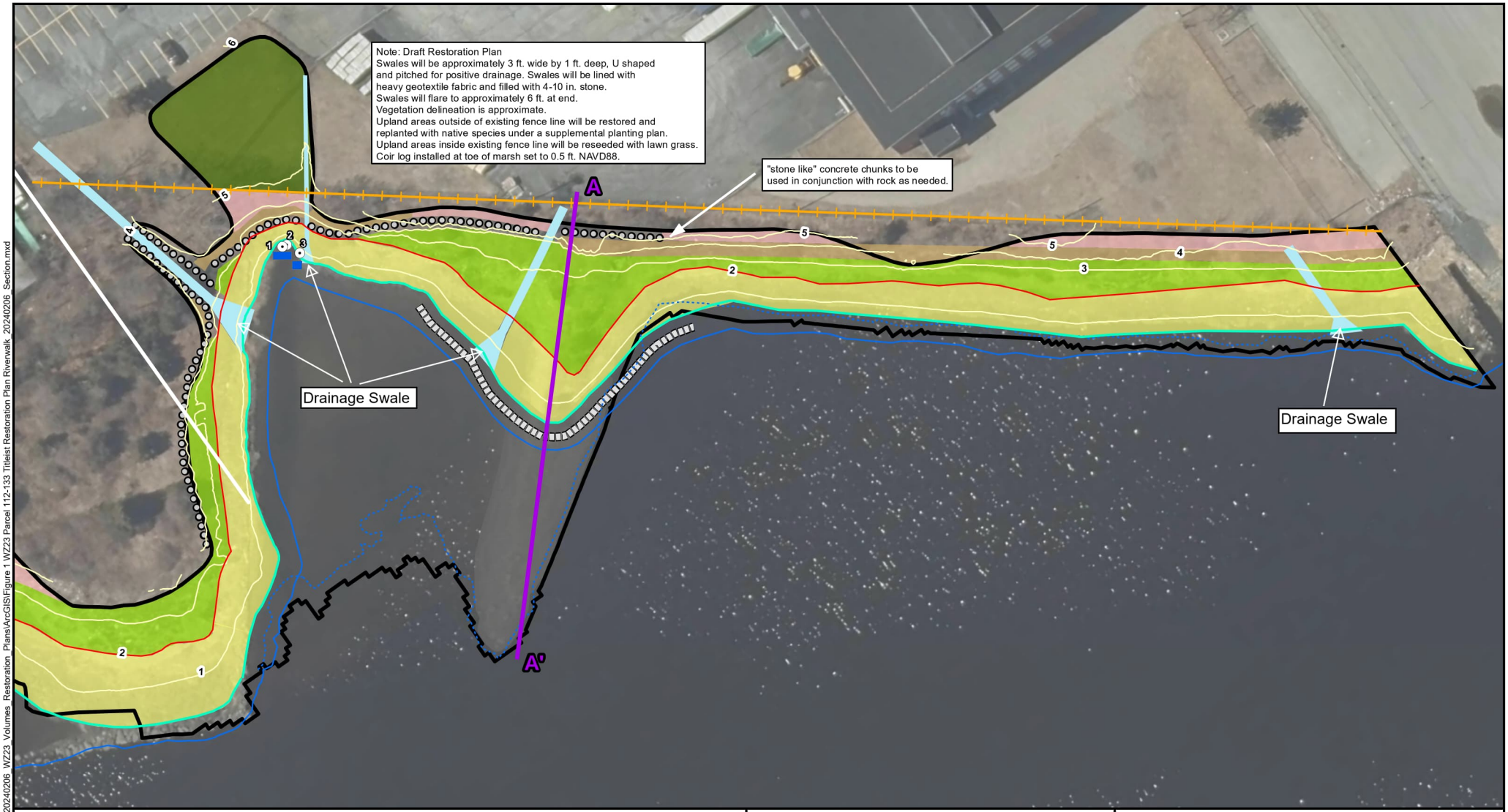
The table below compares the square footage of marsh plantings presented in tables 7-1a, 7-1b and 7-1c of the WP with the proposed revised planting plan. It should be noted that the revised plan does not include a beach area of 0.052 acres (2,265 square feet) which was proposed in the WP.

	Plan	Parcels 111-155 & 111-98	Parcel 111-146	Parcel 112-133
Low Marsh	2022 Work Plan	0.029 acres	0.503 acres	0.469 acres
High Marsh	2022 Work Plan	0.0 acres	0.059 acres	0.155 acres
Total	2022 Work Plan	**0.029** acres	**0.562** acres	**0.624** acres
Low Marsh	2024 Revised Plan	0.04 acres	0.54 acres	0.37 acres
High Marsh	2024 Revised Plan	0.0 acres	0.30 acres	0.28 acres
Total	2024 Revised Plan	**0.04** acres	**0.84** acres	**0.65** acres

One noteworthy difference between the WP and the revised plan presented in this PN, is that the WP called for scrub-shrub marsh to be installed at elevations which have been found to be too low for consistent successful establishment. Scrub-shrub marsh will therefore be installed at WZ 2&3 at the observed wrack line and above. The wrack line is typically observed to be around 3.4 ft. NAVD88 in the upper harbor but may vary depending on topography and exposure. The method of siting the scrub-shrub marsh, consisting of *Iva frutescens* (high tide bush) at the wrack line and above has been used successfully since the East Zone 1 restoration and was the

	method used by the contracted Professional Wetland Scientist, Charlotte Cogswell, who was assisting the project at that time. Scrub-shrub plantings will be installed in Parcels 111-146 (Darn IT) and 112-133 (Titleist) within the transition/upland zones adjacent the marsh utilizing the wrack line as guidance. Figures 4-6 can be compared to the original WP proposed restoration in Attachment A to visualize the changes to the marsh planting scheme. As a part of the WZ 2&3 supplemental planting plan, currently being developed by SWCA, the upland (non-lawn), scrub-shrub/transition areas are being re-evaluated. The re-evaluation will account for changes in restoration topography presented in this PN and will re-assign planting areas as needed to increase the chances of a successful restoration. It is noteworthy that there was an apparent loss of upland when comparing the WP to this PN in Parcel 112-133 (Titleist). Some of this loss can be attributed to the removal of the man-made peninsula. An additional important note is that the WP did not use the same elevation-based metric in determining habitat types and the WP classified some areas below 3.4 ft. NAVD88 as upland. Comparing the total acreage restored presented in the WP (2.09 acres) vs. what is presented here (1.89 acres) results in a loss of 0.196 acres of land. The overall loss of 0.196 acres can be attributed to the removal of the man-made-peninsula.
9	**FIGURES**
	Figure 1 Intertidal West Zone 2-3 Parcel 112-133 Titleist Restoration Plan Figure 2 Intertidal West Zone 2-3 Parcel 111-146 Restoration Plan Figure 3 Intertidal West Zone 2-3 Parcel 111-98 and 111-155 Restoration Plan Figure 4 Intertidal West Zone 2-3 Parcel 111-98 and 111-155 Planting Zones Figure 5 Intertidal West Zone 2-3 Parcel 111-146 Planting Zones Figure 6 Intertidal West Zone 2-3 Parcel 112-133 Planting Zones Figure 7 WZ2/3 Cross Sectional Details Parcel 112-133 Figure 8 WZ2/3 Cross Sectional Details Parcel 111-146 Figure 9 Typical Swale
10	**ATTACHMENTS**
	Attachment A – Work Plan Proposed Wetland Cover Types and Topography
11	**REFERENCES**
	Jacobs, 2022 (May). Draft Final Intertidal Work Plan for West Zone 2-3, Revision 1. ACE-J23-35BG6000-M1-0089

Figures



Legend

- Property Line
- Excavation
- Proposed 1-foot Contour
- Large concrete pieces to be buried in mud or below 0.5' to extent possible
- Cross Section Line
- Proposed Coir Log
- Proposed MHHW
- Proposed MLLW
- Former MLLW
- Deep fill (submerged)
- Existing Outfall (point)
- Proposed Splash Pad
- Proposed Stone Armor
- Proposed Drainage Swale
- Fence
- Proposed Upland
- Proposed Scrub-Shrub Marsh
- Proposed High Marsh
- Proposed Low Marsh
- Proposed Lawn

0 50 100 Feet

December 12, 2023

DRAFT

MassGIS 2021

Vertical Datum: NAVD88

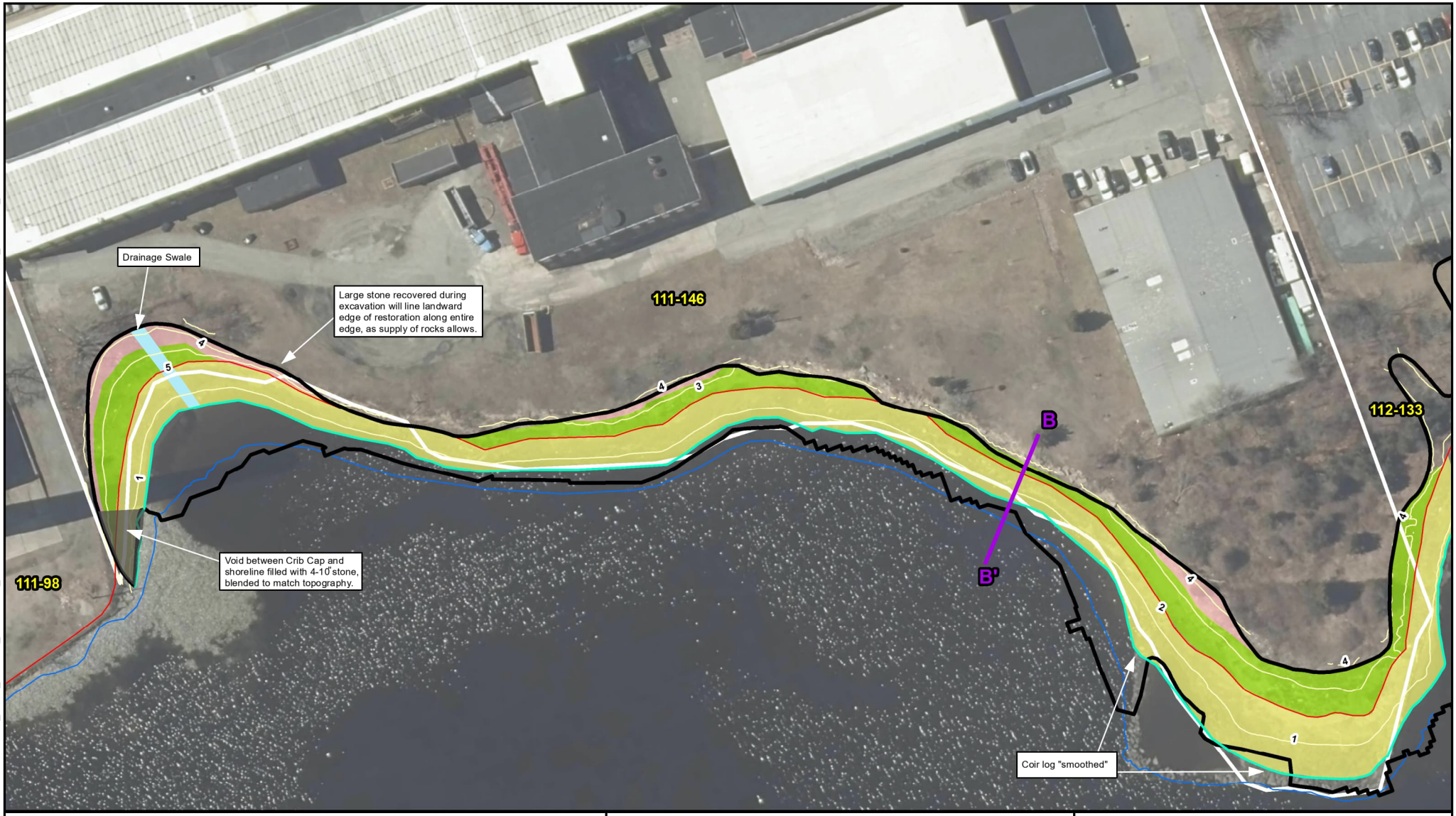
Intertidal West Zone 2-3 Parcel 112-133
Titleist Restoration Plan

New Bedford Harbor Superfund Site

Jacobs

Figure 1

Path: Y:\NBH\Projects\35BG1001\20240206_WZ23_Volumes_Restoration_Plans\ArcGIS\Figure 1 WZ23 Parcel 112-133 Titleist Restoration Plan Riverwalk_20240206_Section.mxd



Legend

- Property Line
- Excavation
- Proposed 1-foot Contour
- Cross Section Line
- Proposed Coir Log
- Proposed MHHW
- Proposed MLLW
- Drainage Swale
- Proposed Upland/Scrub-Shrub Marsh
- Proposed Low Marsh
- Proposed High Marsh

Note: Coir log installed at toe of marsh set to 0.5 ft. NAVD88.

0 50 100 Feet

December 12, 2023

DRAFT

Vertical Datum: NAVD88

MassGIS 2021

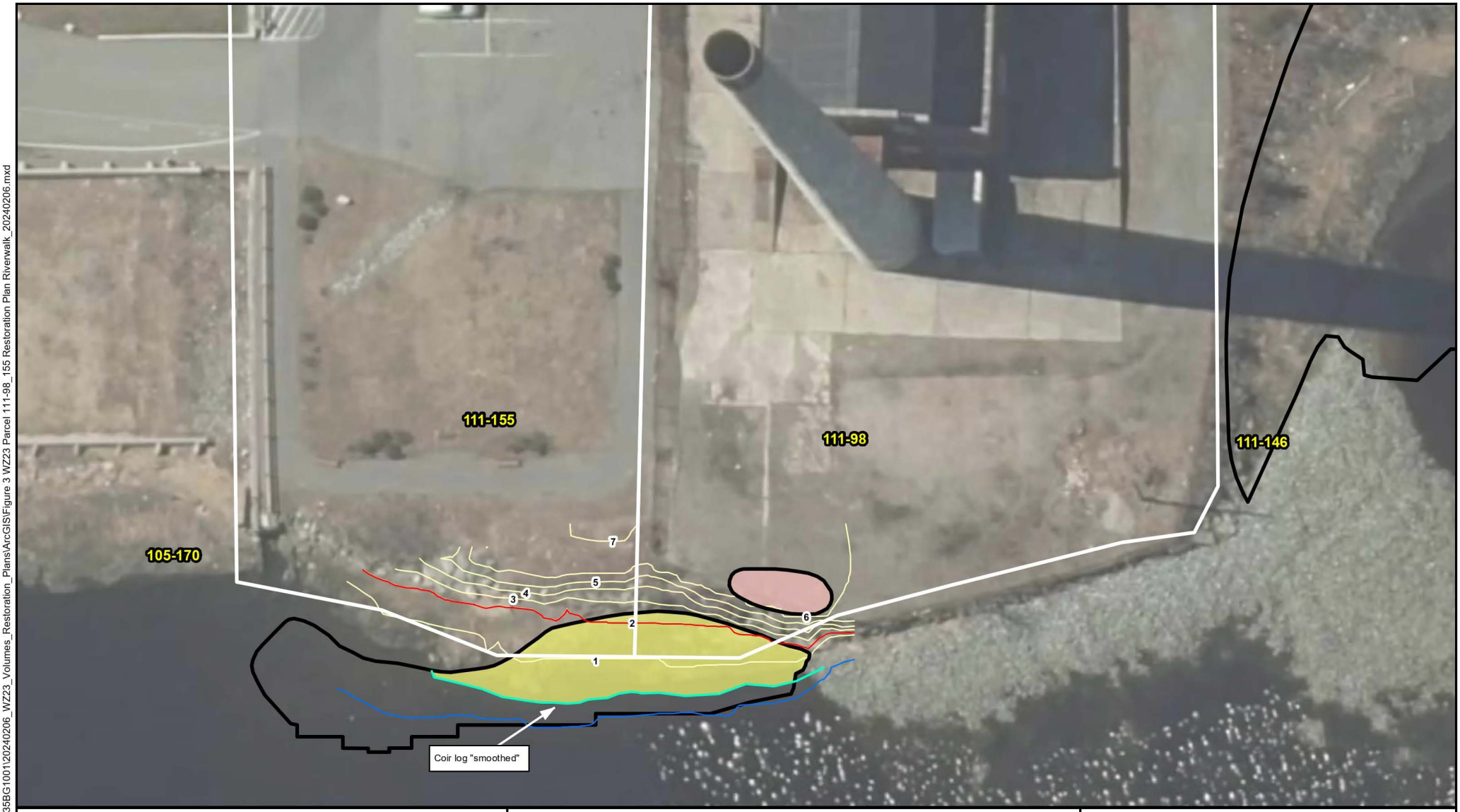
Intertidal West Zone 2-3 Parcel 111-146 Restoration Plan

New Bedford Harbor Superfund Site

Jacobs

Figure 2

Path: Y:\NBH\Projects\35BG1001\20240206_WZ23_Volumes_Restoration_Plans\ArcGIS\Figure 2 WZ23 Parcel 111-146 Restoration Plan Riverwalk_20240206_Section.mxd



Legend

- Property Line
- Excavation
- Proposed 1-foot Contour
- Proposed Coir Log
- Proposed MHHW
- Proposed MLLW
- Proposed Upland
- Proposed Low Marsh

Note: Coir log installed at toe of marsh set to 0.5 ft. NAVD88.

0 50 100 Feet

December 22, 2023

DRAFT

Vertical Datum: NAVD88

MassGIS 2021

Intertidal West Zone 2-3 Parcel 111-98 and 111-155 Restoration Plan

New Bedford Harbor Superfund Site

Jacobs

Figure 3

Path: Y:\NBH\Projects\35BG1001\20240206_WZ23_Volumes_Restoration_Plans\ArcGIS\Figure 3 WZ23 Parcel 111-98_155 Restoration Plan Rivenwalk_20240206.mxd

Legend

- Low Marsh (Est. Sqft 1,584) = 0.04 acres
- Upland (Est. Sqft 378) = 0.009 acres

0 50 100 Feet

Basemap Data Source:
Green Seal Environmental, MassGIS

Vertical Datum:
NAVD88

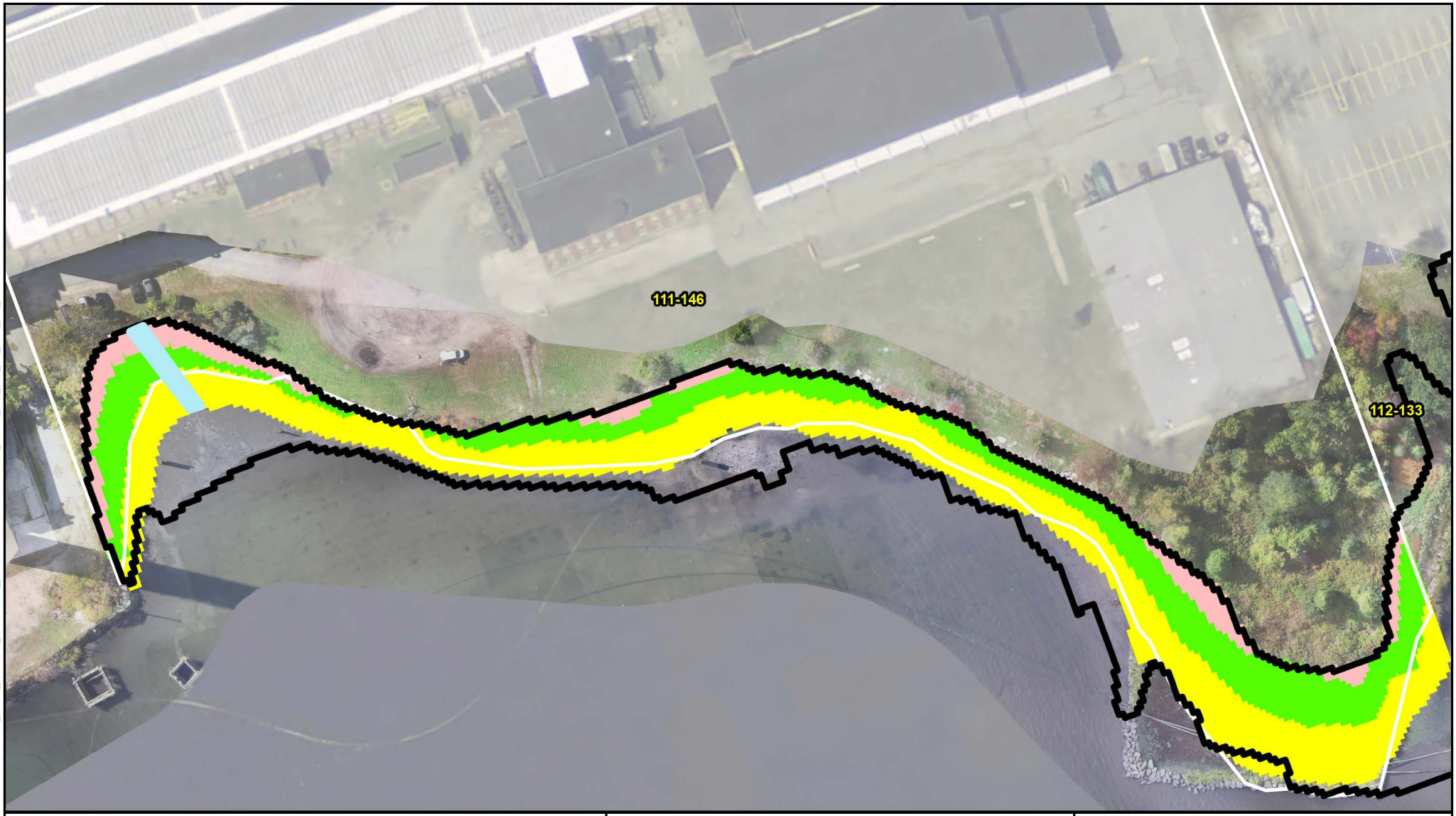
Intertidal West Zone 2-3 Parcel 111-98 and 111-155 Planting Zones

Jacobs

New Bedford Harbor Superfund Site

Figure 4

Path: Y:\NBH\Projects\35BG1001\20240206_WZ23_Volumes_Restoration_Plans\ArcGIS\Figure 4 WZ23_Parcel_111_98_and_111_155_Vg_Calc_Est_20240206.mxd



Legend

- Low Marsh (Est. Sqft 23,733) = 0.54 acres
- High Marsh (Est. Sqft 12,870) = 0.30 acres
- Transition/Upland (Est. Sqft 2,367) = 0.05 acres
- Drainage Swale

0 50 100 Feet

Basemap Data Source:
Green Seal Environmental, MassGIS

Vertical Datum:
NAVD88

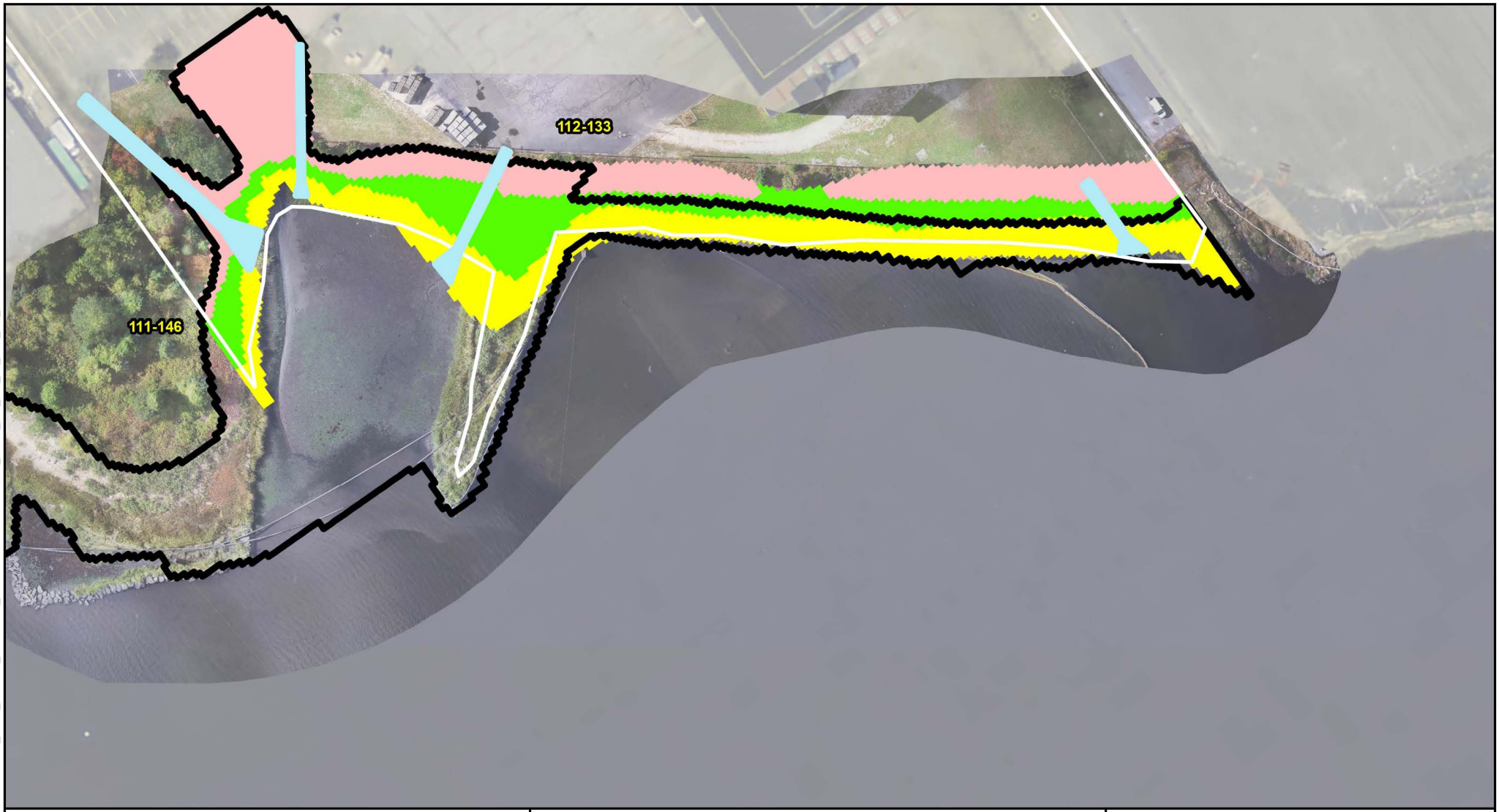
Intertidal West Zone 2-3 Parcel 111-146
Planting Zones

New Bedford Harbor Superfund Site

Jacobs

Figure 5

Path: Y:\NBH\Projects\35BG1001\20240206_WZ23_Volumes_Restoration_Plans\ArcGIS\Figure 5 WZ23_Parcel_111_146_Vg_Calc_Est_20240206.mxd



Path: Y:\NBH\Projects\35BG1001\20240206_WZ23_Volumes_Restoration_Plans\ArcGIS\Figure 6 WZ23_Parcel_112_133_Vg_Calc_Est_20240206.mxd

Legend

- Low Marsh (Est. Sqft 16,326) = 0.37 acres
- High Marsh (Est. Sqft 12,159) = 0.28 acres
- Transition/Upland (Est. Sqft 13,329) = 0.3 acres
- Drainage Swale

0 60 120 Feet

Basemap Data Source:
Green Seal Environmental, MassGIS

Vertical Datum:
NAVD88

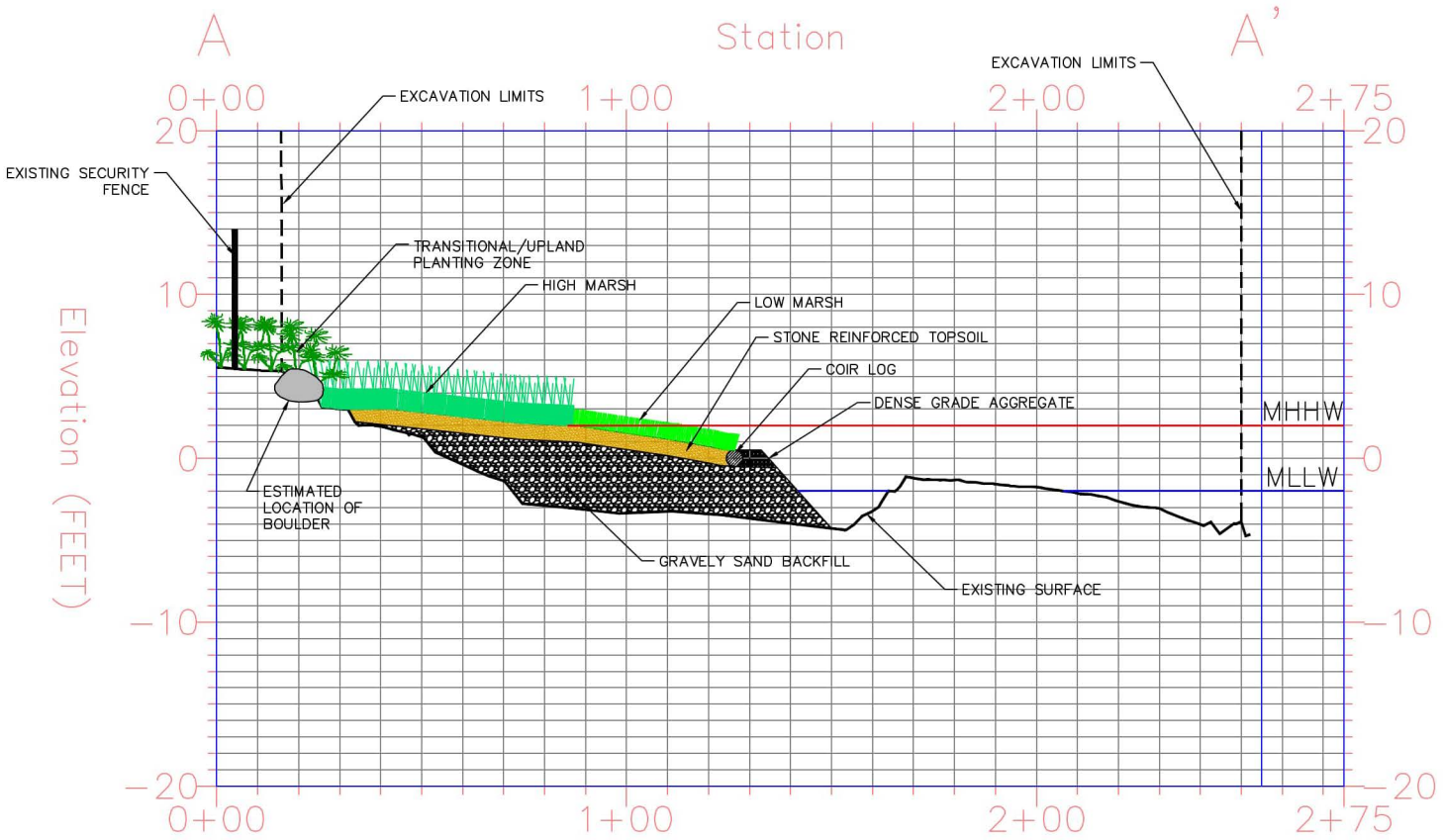
Intertidal West Zone 2-3 Parcel 112-133
Planting Zones

New Bedford Harbor Superfund Site

Jacobs

Figure 6

A PROFILE



0 30
Horizontal Scale in Feet

0 7.5
Vertical Scale in Feet

Jacobs

No.	Revision	Date	App.

Client/Owner:
USACE/EPA

Issued for:
Project Planning

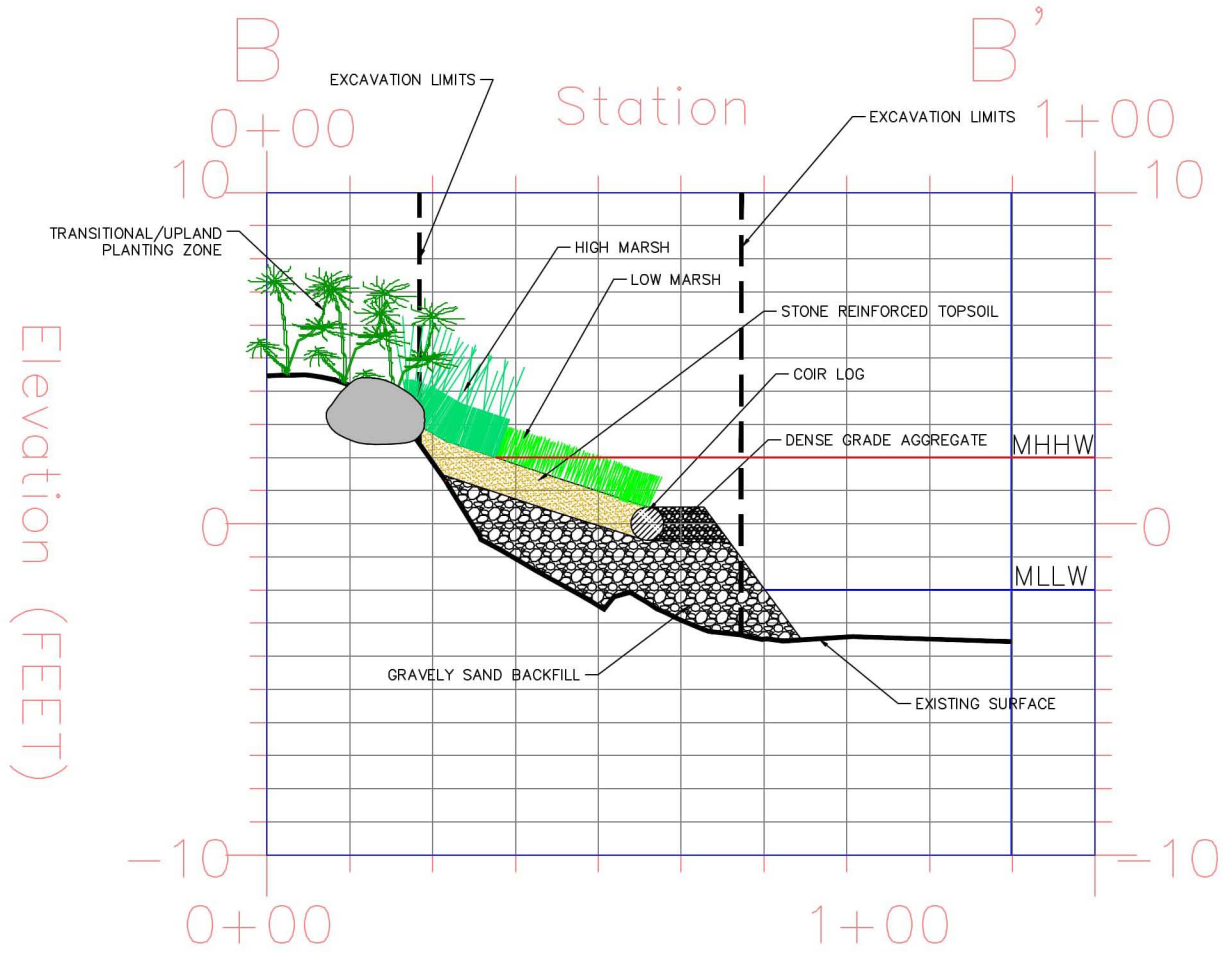
Drawing Title:
WZ2/3 Cross Sectional Details
Parcel 112-133

LEGEND

WZ2/3 Existing Surface Post Excavation and Upland Topography

Date: 2/6/2024
Scale:
Designed By:
Drawn by:
Checked by:
Project Number:
Sheet 1 of 1
Drawing Number:
Figure 7

B PROFILE



0 15
Horizontal Scale in Feet

0 3.75
Vertical Scale in Feet

Jacobs

No.	Revision	Date	App.

Client/Owner:
USACE/EPA

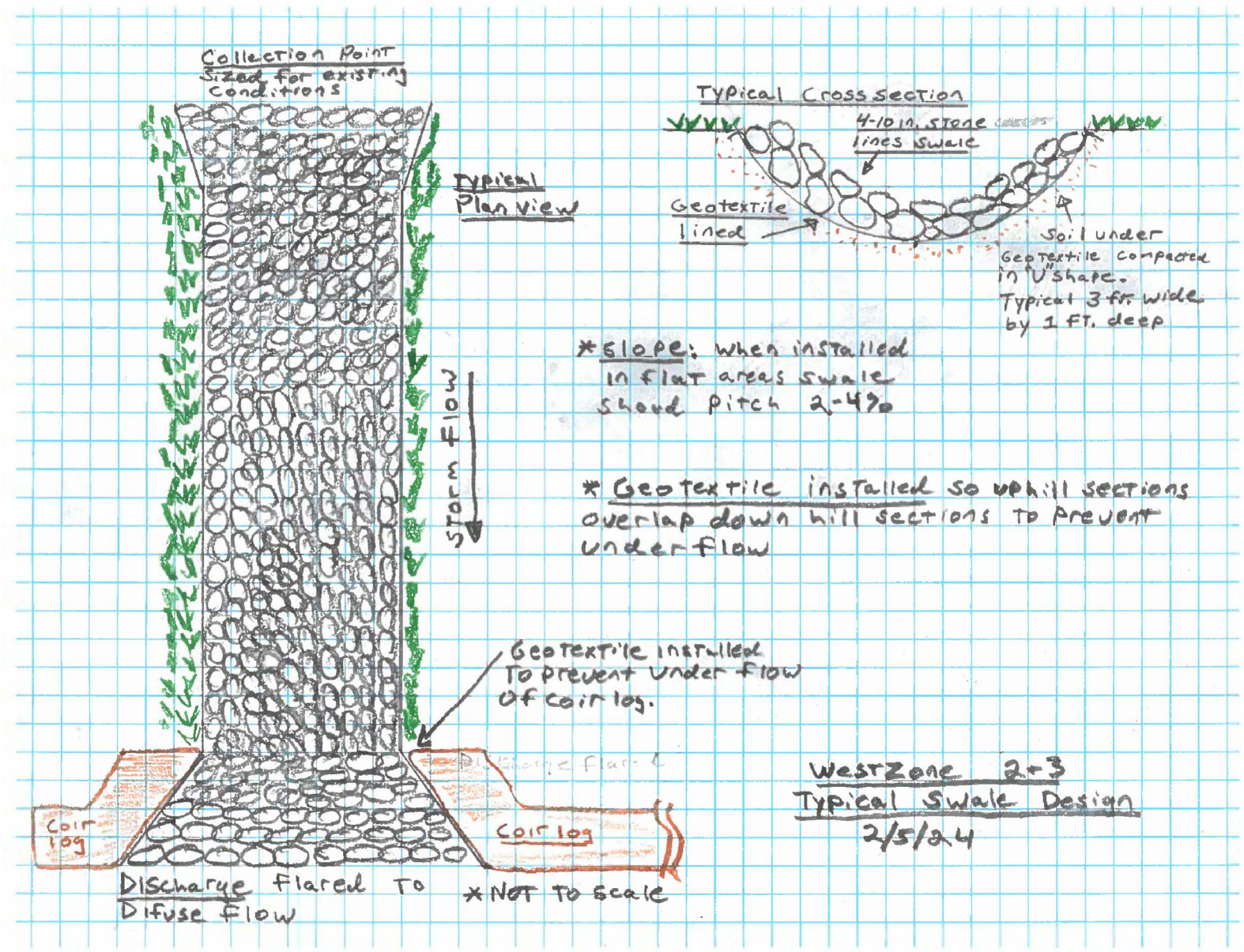
Issued for:
Project Planning

Drawing Title:
WZ2/3 Cross Sectional Details
Parcel 111-146

LEGEND

WZ2/3 Existing Surface Post Excavation and Upland Topography

Date: 2/6/2024
Scale:
Designed By:
Drawn by:
Checked by:
Project Number:
Sheet 1 of 1
Drawing Number:
Figure 8



Path: Y:\NBH\Projects\35BG\001\20240206_WZ23_Volumes_Restoration_Plans\ArcGIS\Figure 7 Typical Swale_20240206.mxd

Typical Swale

New Bedford Harbor Superfund Site

Jacobs

Figure 9

ATTACHMENT A

Work Plan Proposed Wetland Cover Types and Topography

Shrub Restoration Area Plantings
Areas 1, 2, 4, 7, 13, 14, 16, 18, 20, 22:
Iva frutescens, 1-gallon containers, 36" on-center spacing requirements.

Area 3:
Juniperus virginiana, 1-gallon containers, 48" on-center spacing requirements.

Area 5:
Rosa virginiana, 1-gallon containers, 36" on-center spacing requirements.

Area 6:
Kalmia latifolia, 1-gallon containers, 48" on-center spacing requirements.

Area 8:
Juniperus virginiana, 1-gallon containers, 48" on-center spacing requirements.
Acer rubrum, 1-gallon containers, 120" on-center spacing requirements.

Area 9:
Rosa virginiana, 1-gallon containers, 36" on-center spacing requirements.
Clethra alnifolia, 1-gallon containers, 36" on-center spacing requirements.

Area 10:
Juniperus virginiana, 1-gallon containers, 48" on-center spacing requirements.
Iva frutescens, 1-gallon containers, 36" on-center spacing requirements.

Area 11:
Juniperus virginiana, 1-gallon containers, planted along upland edge of area, 48" on-center spacing requirements.
Iva frutescens, 1-gallon containers, 36" on-center spacing requirements.

Area 12:
Clethra alnifolia, 1-gallon containers, 36" on-center spacing requirements.

Area 15:
Juniperus virginiana, 1-gallon containers, planted along scrub-shrub edge of area, 48" on-center spacing requirements.
Iva frutescens, 1-gallon containers, 36" on-center spacing requirements.

Area 17:
Rosa virginiana, 1-gallon containers, 36" on-center spacing requirements.
Iva frutescens, 1-gallon containers, 36" on-center spacing requirements.

Area 19:
Juniperus virginiana, 1-gallon containers, 48" on-center spacing requirements.
Quercus rubra, 1-gallon containers, 120" on-center spacing requirements.

Area 21:
Juniperus virginiana, 1-gallon containers, 48" on-center spacing requirements.
Quercus rubra, 1-gallon containers, 120" on-center spacing requirements.
Acer rubrum, 1-gallon containers, 120" on-center spacing requirements.

Scrub-Shrub Marsh areas shall be planted with a 50/50 mix of Iva frutescens, 1-gallon containers, 36" on-center spacing requirements, and Juniperus virginiana, 1-gallon containers, 48" on-center spacing requirements.

Notes:
Proposed High Marsh plantings to include 50/50 mix of Spartina patens and Distichlis spicata, plugs, 12" on-center spacing requirements.

Proposed Low Marsh plantings to include Spartina alterniflora, plugs, 12" on-center spacing requirements.

Any native trees removed as part of access road construction or excavation will be replaced in-kind (1-gallon containers). Any invasive trees removed will be replaced on a one-to-one basis with native tree species constituting similar growth form, habit, and size (1-gallon containers).

Areas of proposed restoration surface shall be uniformly graded with a smooth finished surface and will transition back to match existing grades upon completion of construction. Slight differences between depicted and constructed surfaces may occur due to microtopographic variations across the site.

Final restored elevations will be documented in the After Action Report.

MHHW and MLLW lines are approximate.

Upland/lawn areas shall be seeded with contractor's lawn seed mix.

Legend

- 0-1' Excavation Depth
- 1-2' Excavation Depth
- 2-3' Excavation Depth
- 3-4' Excavation Depth
- 4-5' Excavation Depth
- 5-6' Excavation Depth
- Proposed Access Road
- 1-foot Contour
- Mean Higher High Water
- Mean Lower Low Water
- Proposed Coir Log
- Parcel Boundary
- Proposed Shrub Restoration Area
- Proposed High Marsh
- Proposed Low Marsh
- Minimal Backfill as Needed for Drainage or Slope Stability
- Proposed Scrub-Shrub Marsh
- Proposed Upland/Lawn
- Proposed Upland

0 60 120 Feet

April 2022

Basemap Data Source:
Green Seal Environmental, MassGIS

Vertical Datum:
NAVD88

Intertidal West Zone 2-3 Parcel 112-133 Proposed Wetland Cover Types and Topography

New Bedford Harbor Superfund Site

JACOBS

Figure 7-1a

Shrub Restoration Area Plantings
Area 1:
Iva frutescens, 1-gallon containers, 36" on-center spacing requirements.

Area 2:
Iva frutescens, 1-gallon containers, 36" on-center spacing requirements.

Area 3:
Iva frutescens, 1-gallon containers, 36" on-center spacing requirements.
Rosa virginiana, 1-gallon containers, 36" on-center spacing requirements.
Lindera benzoin, 1-gallon containers, 36" on-center spacing requirements.

Area 4:
Iva frutescens, 1-gallon containers, 36" on-center spacing requirements.
Lindera benzoin, 1-gallon containers, 36" on-center spacing requirements.

Area 5:
Acer rubrum, 1-gallon containers, 120" on-center spacing requirements.
Solidago bicolor, 1-gallon containers, 36" on-center spacing requirements.

Scrub-Shrub Marsh areas shall be planted with Iva frutescens, 1-gallon containers, 36" on-center spacing requirements.

Notes:
Proposed High Marsh plantings to include 50/50 mix of Spartina patens and Distichlis spicata, plugs, 12" on-center spacing requirements.

Proposed Low Marsh plantings to include Spartina alterniflora, plugs, 12" on-center spacing requirements.

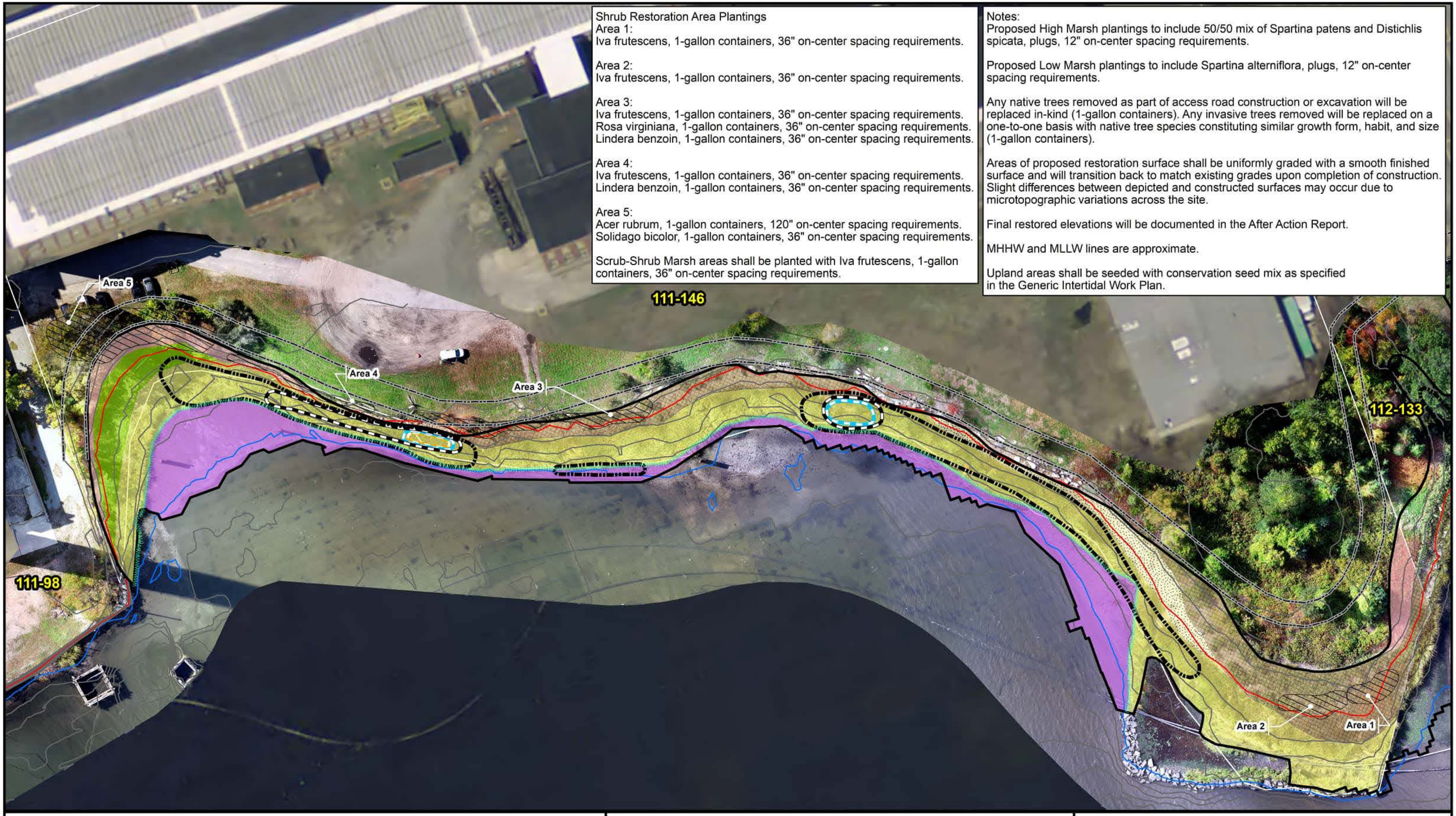
Any native trees removed as part of access road construction or excavation will be replaced in-kind (1-gallon containers). Any invasive trees removed will be replaced on a one-to-one basis with native tree species constituting similar growth form, habit, and size (1-gallon containers).

Areas of proposed restoration surface shall be uniformly graded with a smooth finished surface and will transition back to match existing grades upon completion of construction. Slight differences between depicted and constructed surfaces may occur due to microtopographic variations across the site.

Final restored elevations will be documented in the After Action Report.

MHHW and MLLW lines are approximate.

Upland areas shall be seeded with conservation seed mix as specified in the Generic Intertidal Work Plan.



Legend

- 0-1' Excavation Depth
- 1-2' Excavation Depth
- 2-3' Excavation Depth
- 3-4' Excavation Depth
- 4-5' Excavation Depth
- 1-foot Contour
- Mean Lower Low Water
- Mean Higher High Water
- Parcel Boundary
- Proposed Access Road
- Proposed Coir Log
- Proposed Shrub Restoration Area
- Proposed Beach
- High Marsh
- Proposed Low Marsh
- Minimal Backfill as Needed for Drainage or Slope Stability
- Proposed Scrub-Shrub Marsh
- Proposed Upland

0 50 100 Feet

April 2022

Basemap Data Source:
Green Seal Environmental, MassGIS

Vertical Datum:
NAVD88

Intertidal West Zone 2-3
Parcel 111-146
Proposed Wetland Cover Types
New Bedford Harbor Superfund Site

JACOBS

Figure 7-1b

Notes:
Proposed Low Marsh plantings to include Spartina alterniflora, plugs, 12" on-center spacing requirements.

Any native trees removed as part of access road construction or excavation will be replaced in-kind (1-gallon containers). Any invasive trees removed will be replaced on a one-to-one basis with native tree species constituting similar growth form, habit, and size (1-gallon containers).

Areas of proposed restoration surface shall be uniformly graded with a smooth finished surface and will transition back to match existing grades upon completion of construction. Slight differences between depicted and constructed surfaces may occur due to microtopographic variations across the site.

Final restored elevations will be documented in the After Action Report.

MHHW and MLLW lines are approximate.

Upland/lawn areas shall be seeded with conservation seed mix as specified in the Generic Intertidal Work Plan.

Shrub Restoration Area Plantings
Area 1:
Rosa virginiana, 1-gallon containers, 36" on-center spacing requirements.
Rhus glabra, 1-gallon containers, 36" on-center spacing requirements.
Lindera benzoin, 1-gallon containers, 36" on-center spacing requirements.
Juniperus virginiana, 1-gallon containers, planted landward edge of area, 48" on-center spacing requirements.

Area 2:
Lindera benzoin, 1-gallon containers, 36" on-center spacing requirements.
Solidago bicolor, 1-gallon containers, planted along upland edge of area, 36" on-center spacing requirements.

111-155
111-98
111-146
105-170
Area 1
Area 2
5
0
-5

Legend

- Proposed Coir Log
- 1-foot Contour
- Mean Lower Low Water
- Mean Higher High Water
- 0-1' Excavation Depth
- 1-2' Excavation Depth
- Proposed Shrub Restoration Area
- Parcel Boundary
- Proposed Access Road
- Proposed Low Marsh
- Minimal Backfill as Needed for Drainage or Slope Stability
- Proposed Upland/Lawn

0 50 100 Feet

April 2022

Basemap Data Source:
Green Seal Environmental, MassGIS

Vertical Datum:
NAVD88

Intertidal West Zone 2-3 Parcels 111-98/111-155
Proposed Wetland Cover Types and Topography

New Bedford Harbor Superfund Site

JACOBS

Figure 7-1c