

**SAMPLING AND ANALYSIS PLAN
FOR
“Geotechnically Unsuitable Soils”**

SAP

Massachusetts Clean Energy Center

**New Bedford, Massachusetts
August 5, 2013**

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1.0 Introduction and Purpose

At the request of USEPA, this Sampling and Analysis Plan (SAP) has been prepared for sampling activities that will be performed to provide additional characterization of “geotechnically unsuitable soils” generated during earthwork operations at the South Terminal Confined Disposal Facility (CDF) in New Bedford Harbor. Due to the presence of PCBs noted during initial investigation of the Main Facility Parcels of the project, EPA, within its “Final Determination for the South Terminal Project”, dated November 2012, issued as part of its TSCA Determination within Appendix J(1) condition 4 which stated the following:

“In the event it is determined that soils that are deemed to be “geotechnically unsuitable” must be removed and disposed off-site, the contractor shall submit a sampling and analysis plan for characterization of these soils to EPA for review and approval, unless characterization data exists which documents the PCB concentrations in the soils. If PCB concentrations in these soils are determined to be > 1 ppm but < 50 ppm, EPA approval will be required for disposal of these soils. If PCB concentrations are determined to be greater than or equal to (\geq) 50 ppm, the soils shall be disposed of in accordance with 761.61(a)(5)(i)(B)(2)(iii).”

Thus, the purpose of this plan is to outline the procedures for characterization of “geotechnically unsuitable soils” as required within the above-cited Condition #4 of Appendix J(1). Subsequent to EPA approval of this plan, characterization activities will be initiated; should the characterization activities indicate PCB concentrations > 1 ppm but < 50 ppm, EPA approval will be sought for disposal of the soils. If PCB concentrations are determined to be greater than or equal to (\geq) 50 ppm, the soils will be disposed of in accordance with 761.61(a)(5)(i)(B)(2)(iii).

1.1 Project Description

The South Terminal CDF project site is located within the inner portion of New Bedford Harbor in New Bedford, Massachusetts, as shown on **Figure 1**. A plan showing the proposed general layout of the proposed work is attached as **Figure 2**.

The South Terminal CDF is a filled structure located adjacent to the shoreline that will be bounded by sheet piling, and capped with crushed stone. Approximately 1,200 linear feet of berthing space will be available at the facility. The area to the east and south of

the CDF will be dredged to accommodate vessels of various sizes. Portions of the existing South Terminal Basin would be dredged in order to construct a channel connecting the new South Terminal CDF boat basin to the federal turning basin north of South Terminal.

Previous environmental assessment of the South Terminal CDF has shown that both contaminated soil, groundwater, and sediment are present within the project footprint (including the presence of PCBs). Initial characterization was performed by the Commonwealth preceding the issuance of the Draft Determination. During that investigation, the presence of PCBs was detected within the Main Facility Parcels (the four most northern and eastern parcels, immediately adjacent to the water and north and east of Blackmer Street).

1.2 Document Purpose

During the course of construction at the South Terminal CDF, some grading of existing “upper existing material” is anticipated. During the course of re-grading, some material was anticipated to be identified as “geotechnically unsuitable” for reuse at the facility. This is due to strictly geotechnical considerations; heavy loading anticipated in the future at the facility demands that highly compressible and/or non-granular materials be removed and disposed of offsite. As a result of the historic PCB concentrations in soil, as well as the limitations of existing site characterization, and the likelihood of generation of “geotechnically unsuitable soils”, this sampling and analysis plan has been prepared for the purpose of conducting additional characterization of such “geotechnically unsuitable soils” to provide EPA with additional information regarding the presence of PCBs in soils prior to determining the final disposal facility and the ultimate destination of such soils.

This document is intended to provide a work plan, which describes proposed sampling activities, sampling methods, laboratory parameters and field/laboratory quality assurance/quality control (QA/QC) procedures, as well as sampling frequencies, and a sampling schedule. This Sampling Plan is provide to the USEPA, and is intended to be used in the field during sampling activities for characterizing the areas of concern.

2.0 Project Organization and Responsibilities

Apex Companies LLC will follow a well defined project management organization so that project goals are met during both the field sampling and the laboratory testing portions of the Sampling Plan. Project staff will be integrated into a project team, with individual members contributing their area of expertise to the overall sampling plan under the

supervision of a single project manager.

2.1 Project Organization and Key Personnel

The personnel identified below are considered to be key members of the site characterization project team. The team will maintain an open communication line between the Client, Apex and the regulatory bodies which are engaged in the review process.

Mr. Jay Borkland is the Program Manager for the South Terminal CDF project at Apex Companies LLC. The Program Manager will be responsible for interacting with the regulatory bodies, and the client in resolving any issues which arise prior to and during the sample collection and analysis phase. Mr. Borkland will also ensure that the sampling plan is executed in conformance with this Plan through the Project Manager.

Mr. Chet Myers, P.E. is the Project Manager for the South Terminal CDF project and will oversee the overall project design including the site investigation. The field staff will report directly to Mr. Myers.

Mr. Michael Bingham, LSP, has been designated the Licensed Site Professional to oversee the investigation of the upland areas and to achieve or maintain regulatory compliance with the Massachusetts Contingency Plan. Mr. Bingham will implement the environmental investigations of the project site. As Project Manager, he will also manage the analytical laboratories for the soil and groundwater samples collected as described in this document.

3.0 Sampling and Analytical Program

3.1 Stockpile Creation

During earthwork operations, the Owner (or its representative) will be overseeing the process to determine whether soils appear to be suitable or unsuitable. In some cases, sieve size analyses may be utilized to determine whether soil is “geotechnically suitable”. In other cases, visual screening may be applicable (such as when topsoil is being removed).

The specifications for the New Bedford Marine Commerce Terminal direct the Contractor for the project to segregate any soils designated as “geotechnically unsuitable” by the Owner (or its representative). Additionally, the Contractor has the latitude to segregate some soils (such as topsoil) if the Owner (or its representative) has given guidelines to the Contractor to do so, due to the unsuitability of the layer itself (often due to a high quantity of existing organic matter).

The specifications stipulate that the Contractor shall segregate such soils into stockpiles that shall not exceed 500 cubic yards. These stockpiles will be placed into areas that are estimated to be approximately 120 feet by 40 feet. The average depth of soil within these stockpiles is anticipated to range from 4-6 feet; however, the overall dimensions may vary slightly in the field due to the site specific stockpile construction details.

After the creation of each stockpile, the dimensions of the stockpile will be collected, and the volume of the stockpile will be estimated. This volume will be used to estimate the number of samples to be collected to characterize the material.

3.2 Sample Collection

In order to provide additional characterization for EPA review, one sample will be collected for each 100 cubic yards of material within each stockpile. For the purposes of this calculation, the volume of the soil stockpile will first be estimated. The volume will then be divided by 100 to determine the number of samples. A residual fraction number will be rounded to the nearest whole number. For example, if the volume of the stockpile is estimated to be 443 cubic yards, the volume would be divided by 100 (4.43), and rounded to the nearest whole number (4 samples to be collected).

Each stockpile will be sampled and tracked individually. Sample numbers and labels will

refer to the stockpile identification shown on **Figure 3** and grid location. A total volume, in cubic yards, will be determined for each stockpile and a grid will be determined to enable collection of one sample per 100 cubic yards. Once a stockpile is divided into grid sections, three soil samples from each grid will be collected from shallow pits (up to 1-foot deep) from various heights within the grid area. Enough material from each sample location will be collected to create a composite sample and have enough left over for a discreet sample. Each discreet sample will be submitted to the lab to be held in the event the composite sample exhibits elevated PCB concentrations.

Detailed field notes will document the sample locations from each stockpile.

3.3 Sample Handling

Sampling equipment will be cleaned following standard decontamination procedures prior to individual sample collection. Soil samples will be logged and visually characterized prior to collection in laboratory-supplied pre-cleaned and pre-preserved jars. Samples will be stored at four (4) degrees Celsius in sample coolers on the vessel prior to shipment to the laboratory.

Samples for chemical analysis will be stored on ice from the time of sample collection until they are delivered to the laboratory. Samples will be collected and placed in the appropriate laboratory-provided sample container for each analytical method and sealed with the lid. The sealed container will then be labeled with indelible ink, with the sample location, depth interval and time of collection. The sample container will then be wrapped in protective shipping material (such as bubble wrap) and be placed in a cooler with ice. Ice will be placed in and around the samples to ensure uniform and quick chilling. Chemical ice shall not be used.

At the completion of daily sample collection events, all of the samples will be added to the Chain of Custody form with appropriate analytical testing methods noted. The Chain of Custody will be placed in a sealable watertight plastic bag, and affixed to the lid of the cooler. The cooler lid will be closed tightly, and taped shut with clear packing tape. Sample coolers will be shipped via courier or by overnight express service to an EPA certified laboratory for analysis. Standard quality control and quality assurance (QA/QC) samples (including field and matrix spike duplicates) will be collected as part of the sampling protocol.

3.4 Sampling Quality Control

QA/QC duplicate samples will be collected at the rate of up to one duplicate for every ten samples per sample matrix. Samples will be collected and labeled in such a manner as to make them easily associated with the primary samples.

Soil samples to be used for duplicate samples will be homogenized prior to being split into the primary and duplicate samples. Primary and duplicate samples will be transported and stored in the same manner. All duplicate samples will be run by the laboratory as “blind” samples.

Up to one half of the duplicate samples will be analyzed utilizing a different analytical laboratory to provide analytical quality assurance for the project.

3.5 Sample Analysis

Samples will be sent to an offsite chemical analysis laboratory. Samples will be hand-delivered or couriered to the laboratory in sample coolers in order to maintain appropriate sample conditions. Samples requiring physical characterization will be sent to a qualified geotechnical laboratory.

In general, the compounds of concern will be addressed with the following chemical analysis:

- PCB Aroclors (EPA Method 8082 With Non-Target ECD Peaks Reported),

3.5.1 Laboratory Methods

Samples will be sent to a laboratory certified in Massachusetts to conduct the analysis listed above. Chemical analytical methods will be performed in accordance with USEPA protocols. Laboratory methods detection limits will meet applicable MassDEP regulatory criteria and the MDLs for each analysis and compound is attached as **Appendix A**.

FIGURE 1

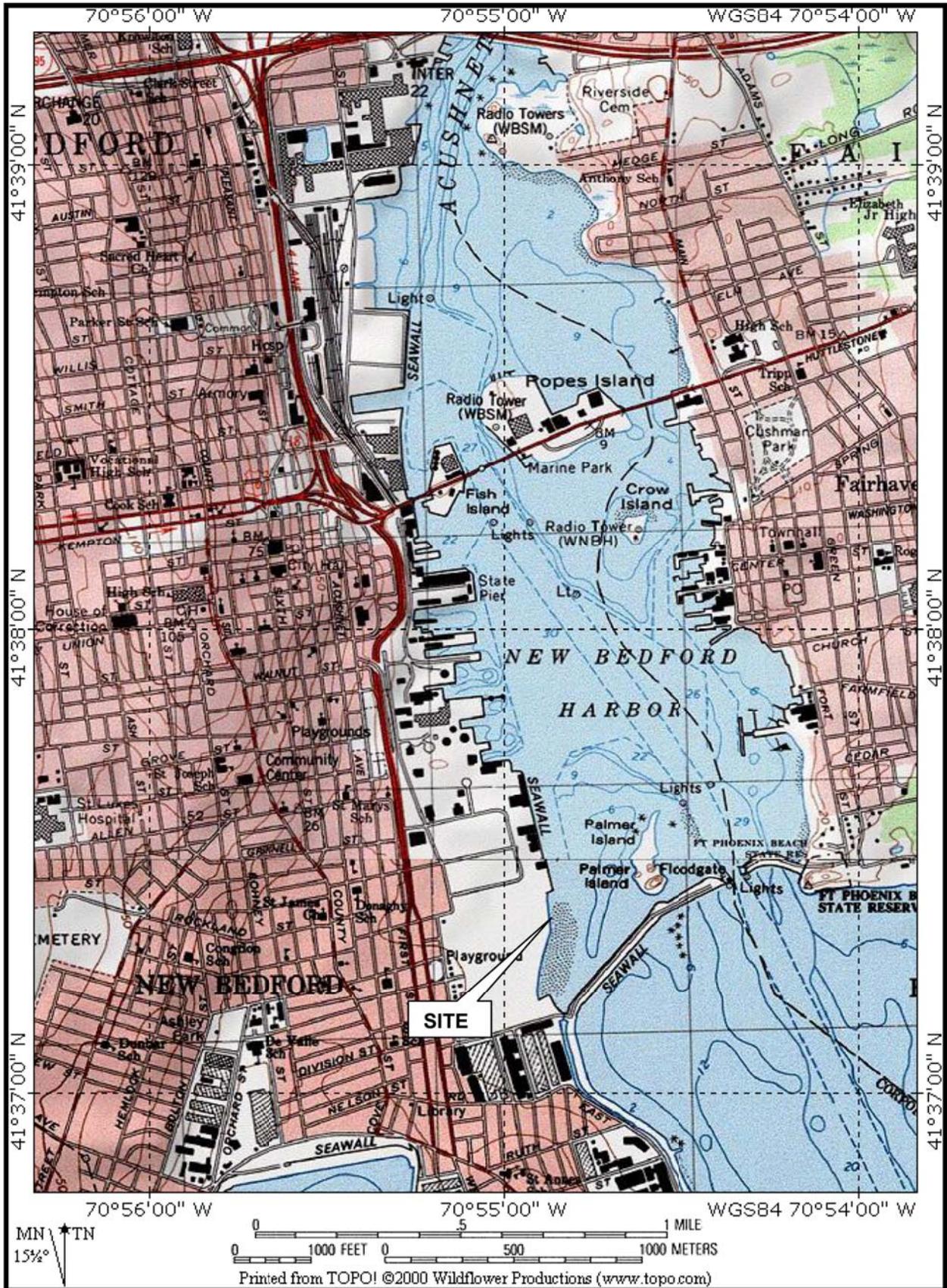
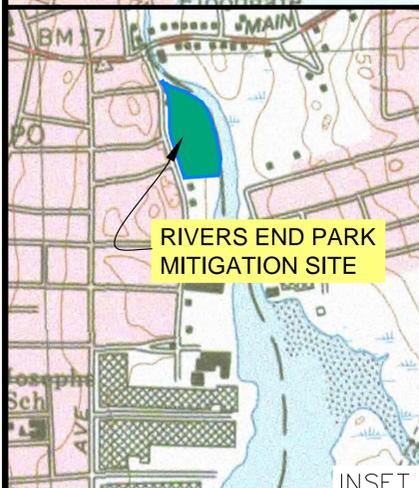
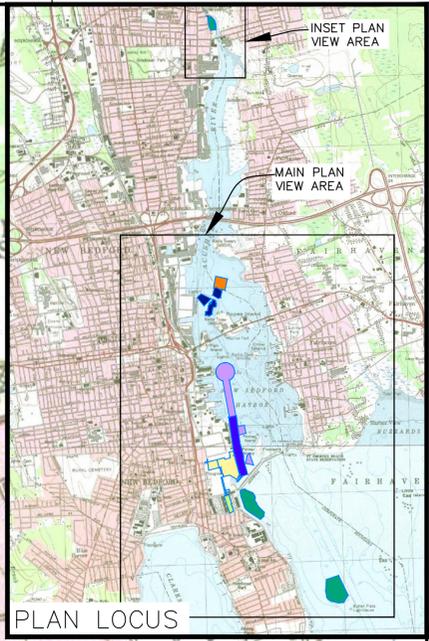
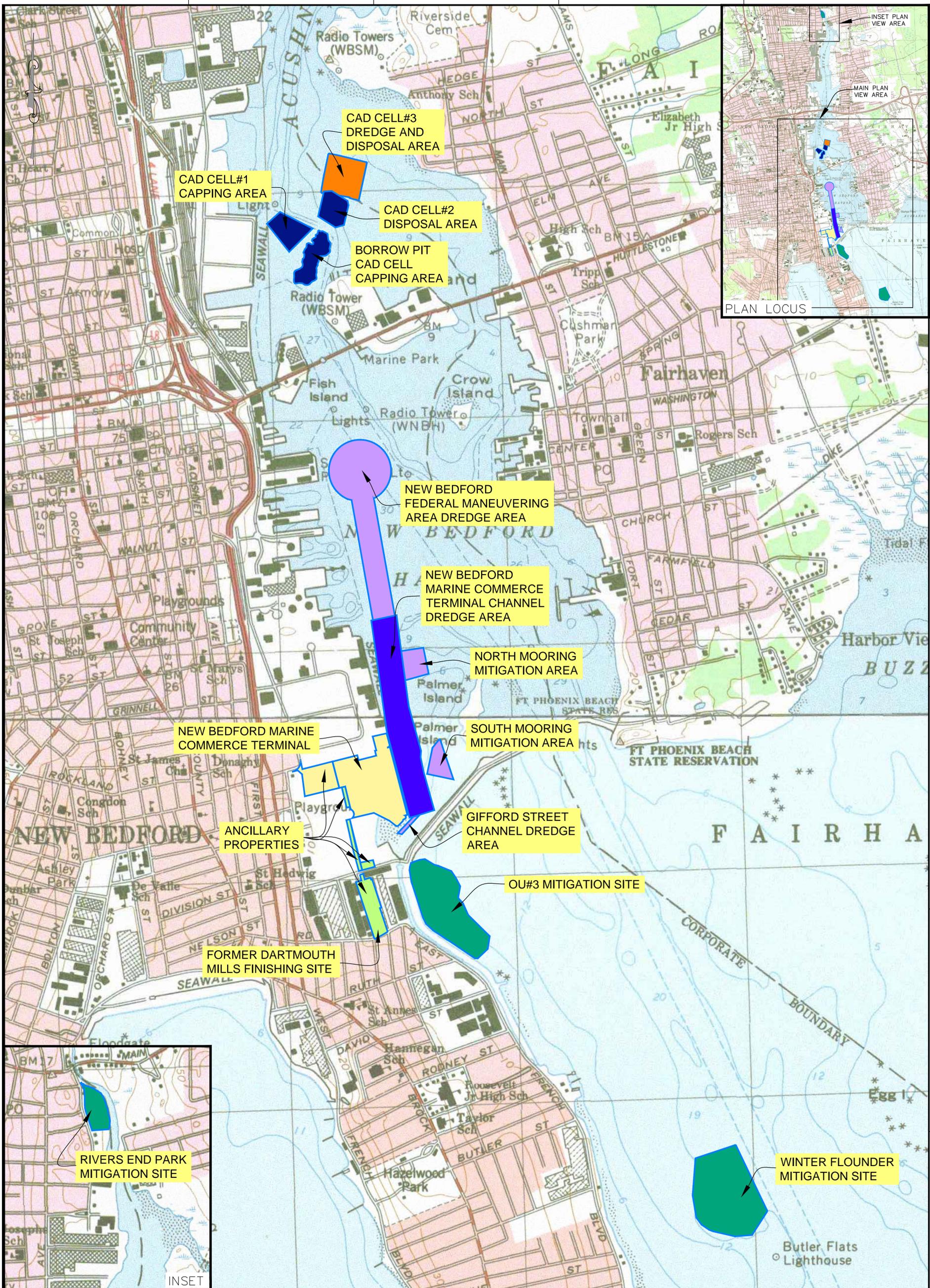


Figure 1: Site Location Map

FIGURE 2



<p>NEW BEDFORD MARINE COMMERCE TERMINAL GENERAL SITE PLAN</p> <p>DRAWING NO. 1</p> <p>1 OF 1</p>		<p>GRAPHIC SCALE</p> <p>SCALE: 1"=600'</p> <p>0 300 600 1200</p>	<p>DATE: 5/30/2012</p> <p>DRAWING SCALE: 1 INCH = 600 FEET</p>	<p>CHECKED BY: GCD</p> <p>DRAWN BY: GCD</p>	<p>DESIGNED BY: GCD</p> <p>PROJECT NO.: 6890</p>	<p>NO. DATE DESCRIPTION BY</p> <p>1. 10/30/12 PROP. UPDATE</p>	<p>PROJECT</p> <p>NEW BEDFORD MARINE COMMERCE TERMINAL</p>	<p>OWNER</p> <p>MASSACHUSETTS CLEAN ENERGY CENTER 55 SUMMER STREET, 9TH FLOOR BOSTON, MASSACHUSETTS</p>	<p>184 HIGH STREET, SUITE 902 BOSTON, MA 02210</p> <p>59H CONNECTICUT AVENUE SOUTH WINDSOR, CT</p> <p>APEX</p> <p>ROCKVILLE, MD SOUTH WINDSOR, CT - BOSTON, MA - NEW BEDFORD, MA - HOLYOKE, MA</p>
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FIGURE 3

REVISIONS

#	DATE	DESCRIPTION
1	7/11/11	LAND BORINGS

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4. STRUCTURES AND FEATURES LOCATED BEYOND THE PROJECT LIMITS, ARE TAKEN FROM AN AERIAL SURVEY CONDUCTED BY THE ARMY CORPS OF ENGINEERS AND SHOULD BE CONSIDERED APPROXIMATE.

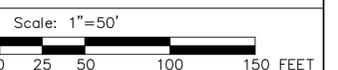
- B9/MW-6 BORING/MONITORING WELL LOCATION
- A-2011-B15 BEDROCK--20.55' OVER WATER GEOTECHNICAL BORING
- TP6 LARGE TEST PIT BOUNDARIES
- SMALL TEST PIT LOCATION
- PROPOSED EXCAVATION PCB CONCENTRATION > 50 PPM
- PROPOSED EXCAVATION EPH/TPH CONCENTRATION > 10,000 PPM

PREPARED FOR:

MASSACHUSETTS
CLEAN ENERGY
CENTER

DRAWING TITLE:

NEW BEDFORD MARINE
COMMERCE TERMINAL
PCB SAMPLE
RESULTS
CONSTRUCTION
PROGRESS



Date	10/28/10	Drawing No.
Proj. Mgr.		
Design	CWM	
Check	JAB	
Drawn	GCD	
Job No.	6690	
Last Rev.	7/30/2013	FIG. 3

NOTES:

1. ONLY PCB SAMPLE LOCATIONS SHOWN
2. TEST PITS AND BORINGS NOT TESTED FOR PCBs NOT SHOWN.

NEW BEDFORD

Appendix A

PCBs/22 NOAA Congeners (EPA Method 8270C Mod.)	Water Column Reporting Limit (ng/L)	Water Column Method Detection Limit	Sediment Reporting Limit (ug/kg)	Sediment Method Detection Limit
CI2-BZ#8-Cal	1	0.092	0.8	0.127
CI3-BZ#18	1	0.200	0.8	0.134
CI3-BZ#28	1	0.201	0.8	0.094
CI4-BZ#52	1	0.284	0.8	0.050
CI4-BZ#49	1	0.220	0.8	0.363
CI4-BZ#44	1	0.164	0.8	0.089
CI4-BZ#66	1	0.184	0.8	0.065
CI5-BZ#101	1	0.161	0.8	0.099
CI5-BZ#87-Cal	1	0.270	0.8	0.074
CI5-BZ#118	1	0.209	0.8	0.195
CI6-BZ#153	1	0.099	0.8	0.164
CI7-BZ#184	1	0.367	0.8	0.196
CI5-BZ#105	1	0.140	0.8	0.218
CI6-BZ#138	1	0.198	0.8	0.145
CI7-BZ#187	1	0.150	0.8	0.220
CI7-BZ#183	1	0.155	0.8	0.062
CI6-BZ#128	1	0.268	0.8	0.158
CI7-BZ#180	1	0.185	0.8	0.105
CI7-BZ#170	1	0.382	0.8	0.129
CI8-BZ#195	1	0.286	0.8	0.205
CI9-BZ#206-Cal/RTW	1	0.465	0.8	0.147
CI10-BZ#209-Cal/RTW	1	0.172	0.8	0.145

PCBs Aroclors (EPA Method 8082) With Non-Target ECD Peaks Reported	Soil Reporting Limit (ug/kg)	Groundwater Reporting Limit (ng/L)
Aroclor 1016	16	0.020
Aroclor 1221	16	0.020
Aroclor 1232	16	0.020
Aroclor 1242	16	0.020
Aroclor 1248	16	0.020
Aroclor 1254	16	0.020
Aroclor 1260	16	0.020
Aroclor 1262	16	0.020
Aroclor 1262	16	0.020

TPH (EPA Method 8015)	Water Reporting Limit (ug/L)	Water Method Detection Limit	Soil/Sediment Reporting Limit (ug/kg)	Soil/Sediment Method Detection Limit
TPH	500	75	33,300	5300