

DRAFT Sampling and Analysis Plan for Yachting Solutions, Rockland Harbor, Rockland, Maine; NAE-2018-01522

1. Project Description: The applicant is proposing to mechanically dredge approximately 9,909 cubic yards (CY) of material from two shoaled areas within the Yachting Solutions boat basin in Rockland, Maine (Figure 1). The 0.24 acre western shoal (dredge area A) will be dredged to a depth of -6 feet at mean lower low water (MLLW) and the 1.4 acre shoal to the east (dredge area B) will be dredged to -13 feet MLLW in order to accommodate vessels along a new extended dock system (Figure 2). An allowable overdepth of one foot will be permitted in both areas. There is no record of previous dredging activity at this location. The applicant proposes to dispose of this material at the Rockland Disposal Site (RDS).

This sampling and analysis plan (SAP) has been developed by the New England District U.S. Army Corps of Engineers (NAE) to gather information to support a suitability determination for the proposed action. The sampling and analysis effort shall be divided into two phases. The first phase will include sampling and testing of dredge site sediment for grain size and bulk sediment chemistry in order to identify project contaminants of concern and to form a compositing plan for additional tiers of testing. The second phase will include sampling and testing of dredge site sediment and water for elutriate and biological testing in order to evaluate the material for placement at RDS. The results of biological testing will be evaluated against data from the RDS reference area collected in 2019. All sampling and analysis activities described in this plan shall follow the requirements set forth in the “*Regional Implementation Manual for the Evaluation of Dredged Material Proposed for Disposal in New England Waters*” (RIM) dated May 6, 2004. A copy of the RIM may be downloaded from the NAE website:

[http://www.nae.usace.army.mil/Missions/Regulatory/Dredged Material Program /RegionalImplementationManual.aspx](http://www.nae.usace.army.mil/Missions/Regulatory/Dredged%20Material%20Program/RegionalImplementationManual.aspx)

2. Conceptual Site Model: NAE reviewed historic testing data, spill records, water quality data, and adjacent land use information to develop a conceptual site model (CSM) for the proposed project. The CSM was used to characterize the system and identify potential sources of contamination, site-specific contaminants of concern, exposure pathways, and biological receptors in order to inform this sampling and analysis plan.

Project Setting: Rockland Harbor is located along the southwestern shoreline of Penobscot Bay, approximately 75 miles northeast of Portland, Maine. The Federal Navigation Project (FNP) in Rockland Harbor includes multiple channel segments with varying depths that extend from deep water at the harbor entrance and wrap around a series of natural coves to provide access to the Rockland waterfront. The Yachting Solutions boat basin is located at the head of

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navigation along the southernmost arm of the FNP (Figure 1). The facility provides transient and seasonal dockage for boats up to 250 feet in length and includes shoreside amenities including a pump out facility. Other land use along the Rockland waterfront is mainly commercial and includes multiple private marina facilities, a manufacturing plant (producing carrageenan from seaweed), the Rockland-Vinalhaven ferry terminal, a municipal fish pier, a U.S. Coast Guard station, and a waste water treatment facility.

Water Quality: Water quality in the project area is controlled primarily by tidal exchange with Penobscot Bay, with some freshwater input from multiple outfalls and upland runoff. Effluent from the Rockland Waste Water Treatment Facility is discharged to the inner harbor at a point to the northeast of the proposed project area. Water quality in Rockland Harbor is classified as SC by the Maine Department of Environmental Protection (MEDEP). SC waters are the third highest classification and are suitable for recreation, fishing, aquaculture, as habitat for fish and other marine life, as well as industrial uses.

Dredge History and Existing Testing Data: There is no record of dredging activity in the proposed project footprint. Sampling and bulk chemical analysis of sediments from a larger/ previously proposed project footprint took place in 2018. The results of analysis documented concentrations of individual metals, polycyclic aromatic hydrocarbons (PAHs), polychlorinated biphenyls (PCBs) and pesticides that were above the NOAA effects range limit (ERL) threshold values (Table 1). Total low and high molecular weight PAHs concentrations in the material from two samples (YS-8 and YS-9 depicted in Figure 3) exceeded the NOAA effects range median (ERM) values. Unfortunately none of the 2018 samples were located in the currently proposed dredge footprint.

In 1999 NAE completed a sediment sampling and bulk chemical analysis effort to characterize the sediments within shoaled portions of the FNP. The results of the analysis documented elevated levels of individual metals and PAHs (Table 2) in composite sample ABC (depicted in Figure 3), which was located in the immediate vicinity of the Yachting Solutions boat basin. This FNP composite sample along with two adjacent composite groups to the northeast were found to be unsuitable for unconfined open water placement at RDS based on a direct comparison of project data with bulk sediment chemistry data from the RDS reference area alone. NAE performed elutriate and biological testing to further evaluate the project and subsequently found it to be suitable for placement at RDS in a suitability determination dated 4 November 1999.

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Table 1: 2018 Yachting Solution Bulk Chemistry Contaminants of Concern

Analyte	ERL	ERM	YS-1	YS-2	YS-3	YS-4	YS-5	YS-6	YS-7	YS-8	YS-9	YS-10	YS-11	YS-12	YS-13
METALS (ppm)															
Arsenic	8.2	70	19.3	18.4	14.4	18	14.4	18.9	17.3	9.48	17.4	18.7	18.7	18.2	24.1
Cadmium	1.2	9.6	0.12	0.09	0.14	0.56	0.59	0.14	0.23	0.51	0.72	0.93	0.09	0.10	0.33
Chromium	81	370	50.9	48.8	33.2	52.3	49.8	51	52.1	30.5	43.7	82.4	49.7	48.9	52.3
Copper	34	270	30.2	28	20.6	56.6	47.3	32.7	38	38.5	47.5	60.6	28.2	29.1	47.4
Lead	46.7	218	18.3	14.5	18.6	52.9	58.9	19.2	29.3	58.7	142	106	14.8	13.9	31.4
Mercury	0.15	0.71	0.03	0.01	0.04	0.21	0.26	0.04	0.12	0.18	0.33	0.45	0.01	0.01	0.14
Nickel	20.9	51.6	51.1	51.3	30.6	37.2	27.5	50.8	47.6	15.3	21.9	30.3	48.5	49.2	36.1
Zinc	150	410	106	84	76.5	165	168	95.1	112	195	187	208	83.3	80.1	108
Total LPAHs (ppb)	552	3160	280	1043	653	550	1075	189	793	2683	4229	1815	287	67	551
Total HPAHs (ppb)	1700	9600	1037	2840	2649	2636	5520	976	3385	13639	19140	9515	1973	313	2356
TOTAL PCBs (ppb)	22.7	180	18	18	18	19.2	47.2	22.2	19.8	34.4	83	118	18	18	59.4
PESTICIDES (ppb)	1.58	46.1	1.2	1.2	4.1	1.7	8	4.69	9	13.3	30.8	29.7	2.38	1.2	1.2

Yellow highlighted values above the ERL
 Red highlighted values above the ERM

Table 2: 1999 FNP Bulk Sediment Chemistry Contaminants of Concern

Analyte	ERL	ERM	Composite ABC	Composite FGHI	Composite JKLM
METALS (ppm)					
Arsenic	8.2	70	17	14.7	9.2
Copper	34	270	53	79.3	35
Lead	46.7	218	70.8	65.9	44
Mercury	0.2	0.71	0.3	0.19	0.13
Nickel	20.9	51.6	39.1	37.5	25.1
Zinc	150	410	170	133	109
LPAHs (ppb)	552	3160	768	1184	842
HPAHs (ppb)	1700	9600	4597	3143	1901

Yellow highlighted values above the ERL

Spill Data: NAE reviewed spill records from the Maine Department of Environmental Protection (DEP) Oil and Hazardous Waste spill database and the U.S. Coast Guard’s National Response Center website. Between 1 May 2005 and 3 January 2018 49 spills were reported to the Maine DEP within Rockland Harbor and the surrounding area. The majority of these records discussed either gasoline or oil spills or unknown sheens on the water. During the same timeframe, 78 spills were reported to the Coast Guard for Rockland Harbor, the majority of which were also for gasoline or oil spills or an unknown sheen on the water.

Risk Ranking: Following an initial review of the site characteristics, the possible sources of contamination, and the available recent and historical records, the dredging project at Yachting Solutions is given a **moderate** risk ranking according to the following matrix (Table 3, adapted from USACE 2014).

Table 3: Project Risk Ranking

Rank	Guidelines
Low	Few or no sources of contamination. Data available to verify no significant potential for adverse biological effects.
Low-Moderate	Few or no sources of contamination but existing data is insufficient to confirm ranking.
Moderate	Contamination sources exist within the vicinity of the project with the potential to produce chemical concentrations that may cause adverse biological effects.
High	Known sources of contamination within the project area and historical data exists that has previously failed biological testing.

3. Sample Collection: In the first phase of testing the applicant shall collect sediment cores from six stations within the proposed dredge areas as specified in Table 4 (also see Figure 4). These locations were selected based on information from the CSM described above, the high risk ranking for the project, and shoal areas identified in the project conditions survey submitted by the applicant. All core samples shall be collected to the proposed dredge depth plus the overdredge amount. Estimated core lengths based on the bathymetry provided by the applicant are provided in Table 4, but the required core length shall be determined at the time of the sampling effort using measured water depths at each location corrected to MLLW.

Upon collection all cores shall be measured and maintained in an upright position for a minimum of 15 minutes to allow any fine-grained material to settle. After a core has settled it shall be re-measured before any overlying water is drained. All cores shall be split lengthwise, photographed with a stadia rod for scale, and described in accordance with ASTM D 2488 (Standard Practice for Description and Identification of Soils). If any core shows significant stratification or obvious signs of contamination in the opinion of the sampling crew, in consultation with NAE staff, then subsamples shall be made of each layer. A composite of the dredge interval within each core or core layer shall be collected for grain size and bulk chemical analysis as described in sections below.

In the second phase of testing the applicant shall collect dredge area sediment and water from all of the sample locations described in Table 4 that are not excluded from further testing. Sufficient amounts of sediment and water shall be collected for elutriate preparation and analysis, water column toxicity testing, 10-day whole sediment toxicity testing, and 28-day bioaccumulation testing according to the sections below. Sediment cores from each station shall be collected to the appropriate project depth and transferred directly into polyethylene pails. Water samples shall be collected from the middle of the water column at each location using either a non-contaminating pump or a discrete water sampler.

All sediment and water samples held for testing shall be stored in accordance with the requirements in Table 5 (from Table 8-2 in "Evaluation of Dredged Material Proposed for Ocean Disposal Testing Manual" (Green Book) dated February 1991). Sample chain of custody forms shall be maintained by the Applicant and submitted to NAE with the data package described in section 5 of this SAP.

Vessel positioning shall be achieved using a Global Positioning System (GPS) that has been calibrated on site using a known reference point. The required horizontal accuracy at each sample location shall be 10 feet or less. Water depths at each location are to be determined with an accuracy of ± 0.1 foot (relative to

MLLW). All sample data including date, time, latitude, longitude, GPS accuracy, measured water depth, tidal correction, core penetration and recovery shall be recorded in a sampling log (Figure 5 or equivalent) and provided to NAE with the Applicant's core descriptions and photographs. All coordinate data shall be reported in geographic NAD 83 decimal degree format. All depth data shall be reported in tenths of feet.

4. Sample Analysis: Sediment and water samples from the dredge area shall undergo physical, chemical, and biological analysis as described in the sections below. All laboratories used for this project shall have an approved Laboratory Quality Assurance Plan (LQAP) on file with NAE. Any data produced by a lab without an approved LQAP will not be accepted. The RIM, a list of laboratories with approved LQAPs, and the reporting format and requirements for electronic submission of data are available for download through the NAE website: <http://www.nae.usace.army.mil/Missions/Regulatory/Dredged-Material-Program/>.

Grain Size and Bulk Sediment Chemistry: All samples from the proposed dredge footprint shall be individually analyzed for grain size and the results reported to NAE before any compositing is performed. NAE will provide the Applicant with a compositing plan for bulk chemical analysis based on sample proximity, physical characteristics recorded during the core description process, and the results of grain size analysis. Testing parameters, analytical methods, and reporting limits to be used are outlined in Table 6. The listed analytical methods are recommended but can be replaced by other methods that will give the required reporting limits. Additional guidance on the physical and chemical analysis of sediments can be found in chapter 5 of the RIM.

Elutriate Chemistry: Elutriate samples shall be prepared from the dredge area water and sediments according to the project compositing plan. The elutriate samples and clean seawater (provided by the Applicant's laboratory) used for dilutions in the suspended phase particulate bioassays shall undergo chemical analysis according to the testing parameters, analytical methods, and reporting limits outlined in Table 7. The listed analytical methods are recommended but can be replaced by other methods that will give the required reporting limits. Additional guidance can be found in Section 6.1 of the RIM and Section 9.4 of the Green Book.

Water Column Toxicity Testing: Suspended phase particulate bioassays shall be performed on each composite sample in accordance with the requirements specified in Section 6.2 of the RIM, and Section 11.1 of the Green Book. Three test species shall be used: a crustacean (*Mysidopsis bahia*); a fish (*Menidia*

menidia or *Menidia beryllina*); and the planktonic larvae of a third species (either

Mytilus edulis or *Arbacia punctulata*). Clean seawater provided by the Applicant's laboratory shall be used as both control and dilution water.

Excessive ammonia concentrations in the elutriate samples may cause a toxic response not of interest to the suspended phase particulate bioassay, which focuses on persistent contaminants. To account for this potential false positive, the EPA and NAE have devised a protocol to determine if ammonia is the driver of toxicity in situations where unionized ammonia is present at concentrations that may cause toxicity. In order to facilitate this protocol the Applicant's laboratory shall measure total ammonia in the undiluted elutriate samples prior to test initiation and calculate the unionized ammonia concentration based on additional measurements of pH, temperature, and salinity. If calculated unionized ammonia concentrations are greater than the applicable WQC the contractor shall notify the Applicant within 24 hours and seek guidance from NAE on project-specific procedures for preparation of additional elutriate samples requiring treatment for ammonia reduction and additional suspended phase acute toxicity testing.

10-Day Whole Sediment Toxicity Testing: 10-day whole sediment toxicity testing shall be performed on each composite sample in accordance with the requirements specified in Chapter 7.1 of the RIM, Section 11.2 of the Green Book, and Methods for Assessing the Toxicity of Sediment-Associated Contaminants with Estuarine and Marine Amphipods, 1994. The bioassay test shall use two species of test animals, the amphipod *Ampelisca abdita* and the mysid shrimp *Americamysis bahia*.

The results of the 10-day toxicity test shall be reported to NAE as soon as possible after its completion. If this test shows a statistically significant mortality, in accordance with the above documents, NAE may decide to cancel the further testing.

28-Day Bioaccumulation Testing: 28-day bioaccumulation testing shall be performed on each composite sample in accordance with the requirements specified in Chapter 7.2 of the RIM and Section 12.1 of the Green Book. The bioaccumulation test shall use a bivalve, either *Macoma nasuta* or *Macoma balthica*, and the polychaete *Nereis virens* as test animals. At the end of the 28-day test, the tissues of the survivors shall be tested for the project contaminants of concern according to Table 9 of the RIM. The contaminants of concern will be determined from the bulk sediment chemistry testing described above.

5. **Reporting requirements:** All sediment testing data is required to be submitted electronically in the electronic data deliverable (EDD) format available on the NAE website (<http://www.nae.usace.army.mil/Missions/Disposal-Area-Monitoring-System-DAMOS/Electronic-Data-Deliverables.aspx>). Hard copy data

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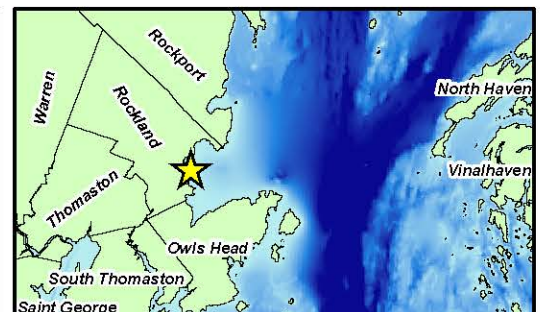
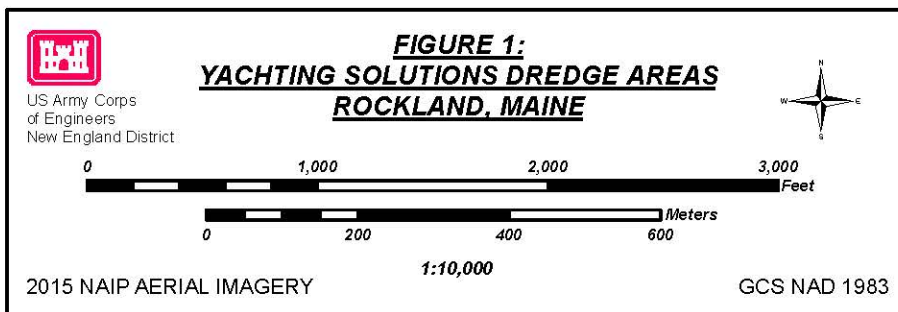
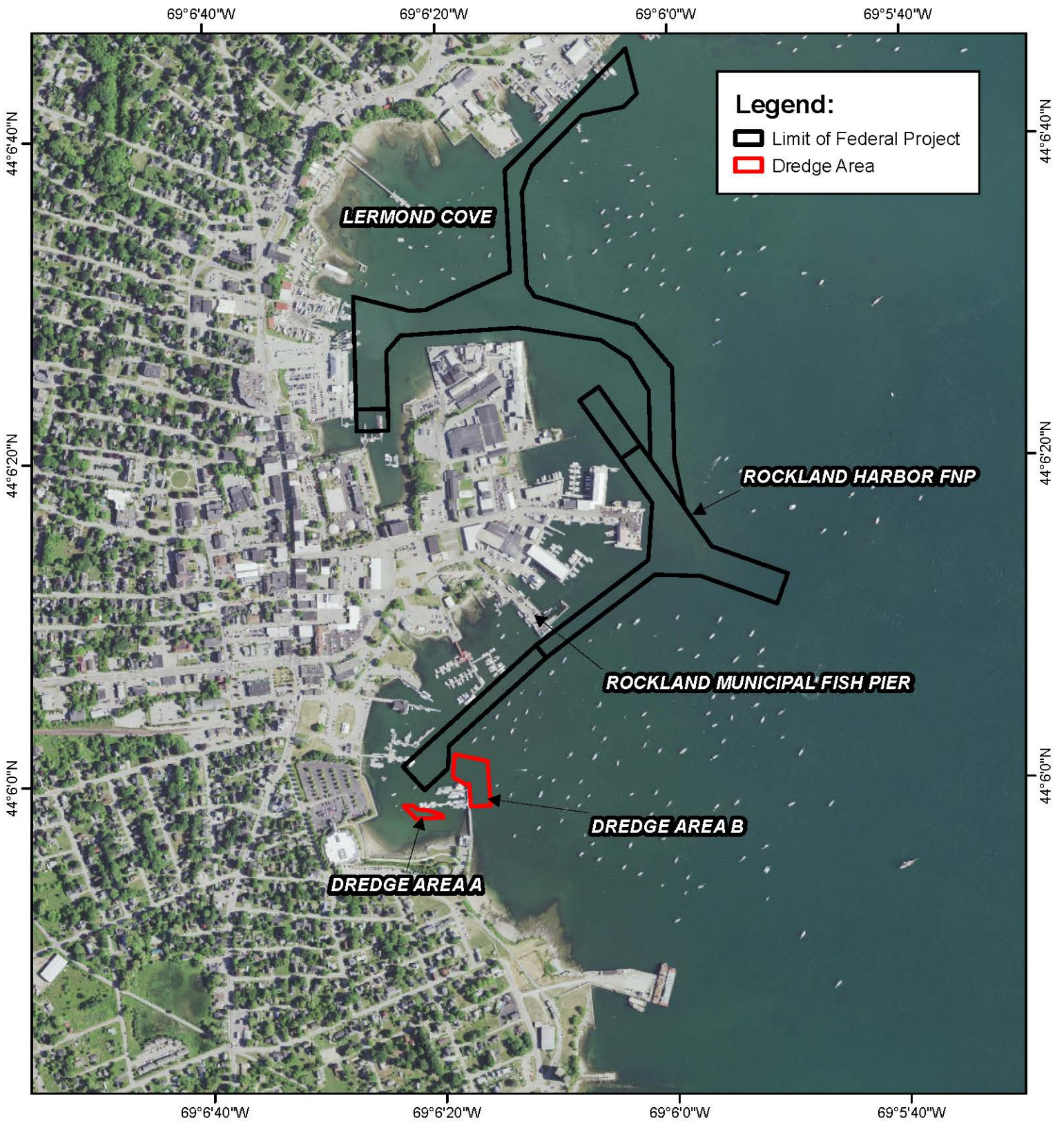
submission is also required but may be substituted with a printer friendly, easy-to-read format (e.g., PDF, MS Word). Any analytes not detected shall be reported as half the method detection limit (MDL) and qualified with a “U”. RIM quality control summary tables are required to be submitted with each project dataset. These tables are found in Appendix II of the RIM.

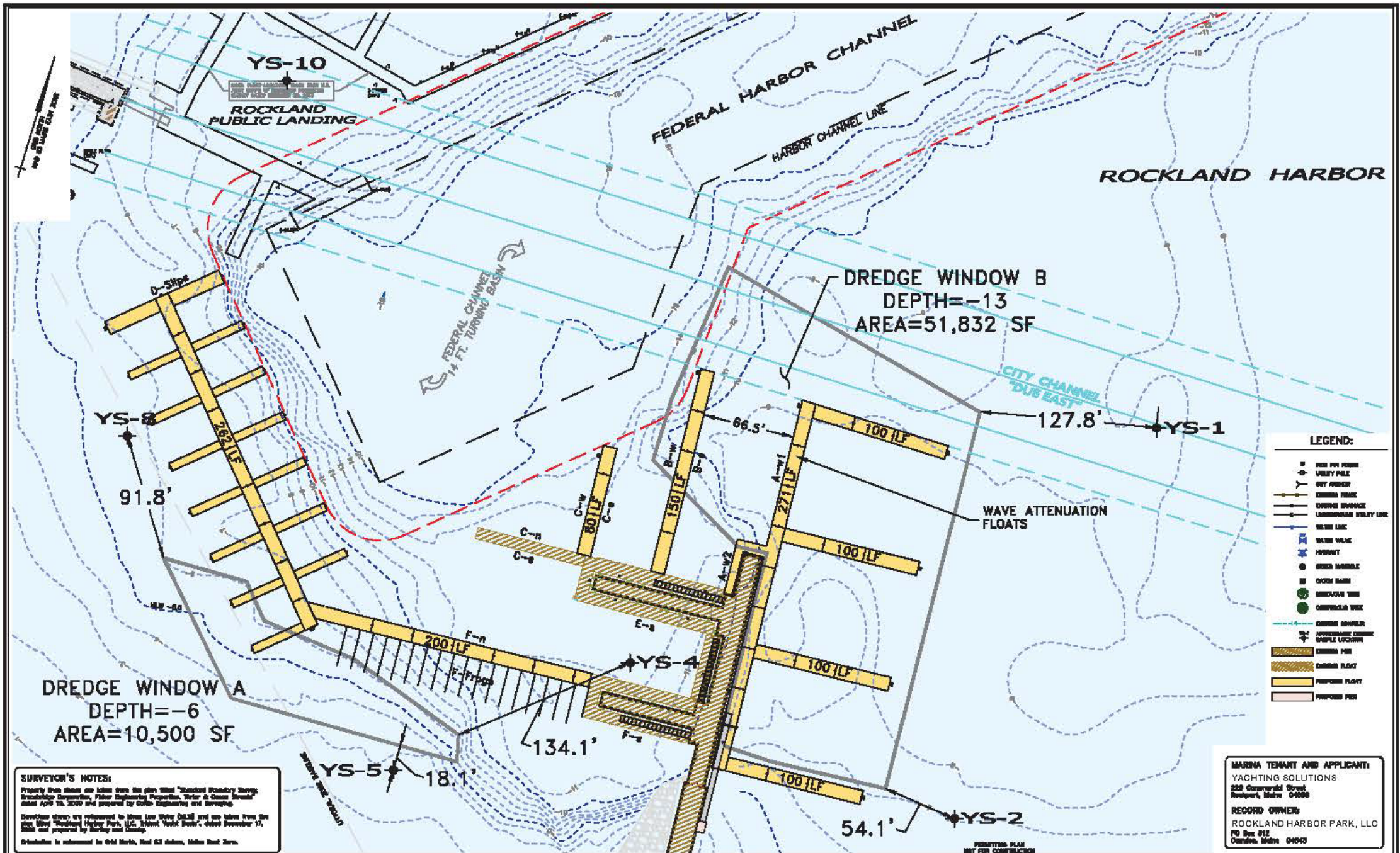
6. **Contact Information:** Questions about this plan should be directed to Gabriella Saloio at 978-318-8138 or gabriella.j.saloio@usace.army.mil.

Gabriella Saloio
Biologist
New England District
U.S. Army Corps of Engineers

Table 4: Sediment Sample Locations and Estimated Core Lengths

Station	Latitude (NAD 83)	Longitude (NAD 83)	Survey Depth (Feet MLLW)	Project Depth (Feet MLLW)	Overdepth (Feet)	Estimated Core length (Feet)
A-1	44.099537	-69.106234	-5.6	-6.0	1.0	1.4
A-2	44.099443	-69.105790	-4.7	-6.0	1.0	2.3
B-1	44.099690	-69.104526	-7.5	-13.0	1.0	6.5
B-2	44.100455	-69.104747	-8.5	-13.0	1.0	5.5
B-3	44.100090	-69.105254	-9.0	-13.0	1.0	5.0
B-4	44.100455	-69.105098	-9.2	-13.0	1.0	5.2





69° 6' 25" W

69° 6' 20" W

69° 6' 15" W

44° 5' 5" N

44° 5' 5" N

44° 5' 0" N

44° 5' 0" N

44° 5' 55" N





44° 5' 55" N

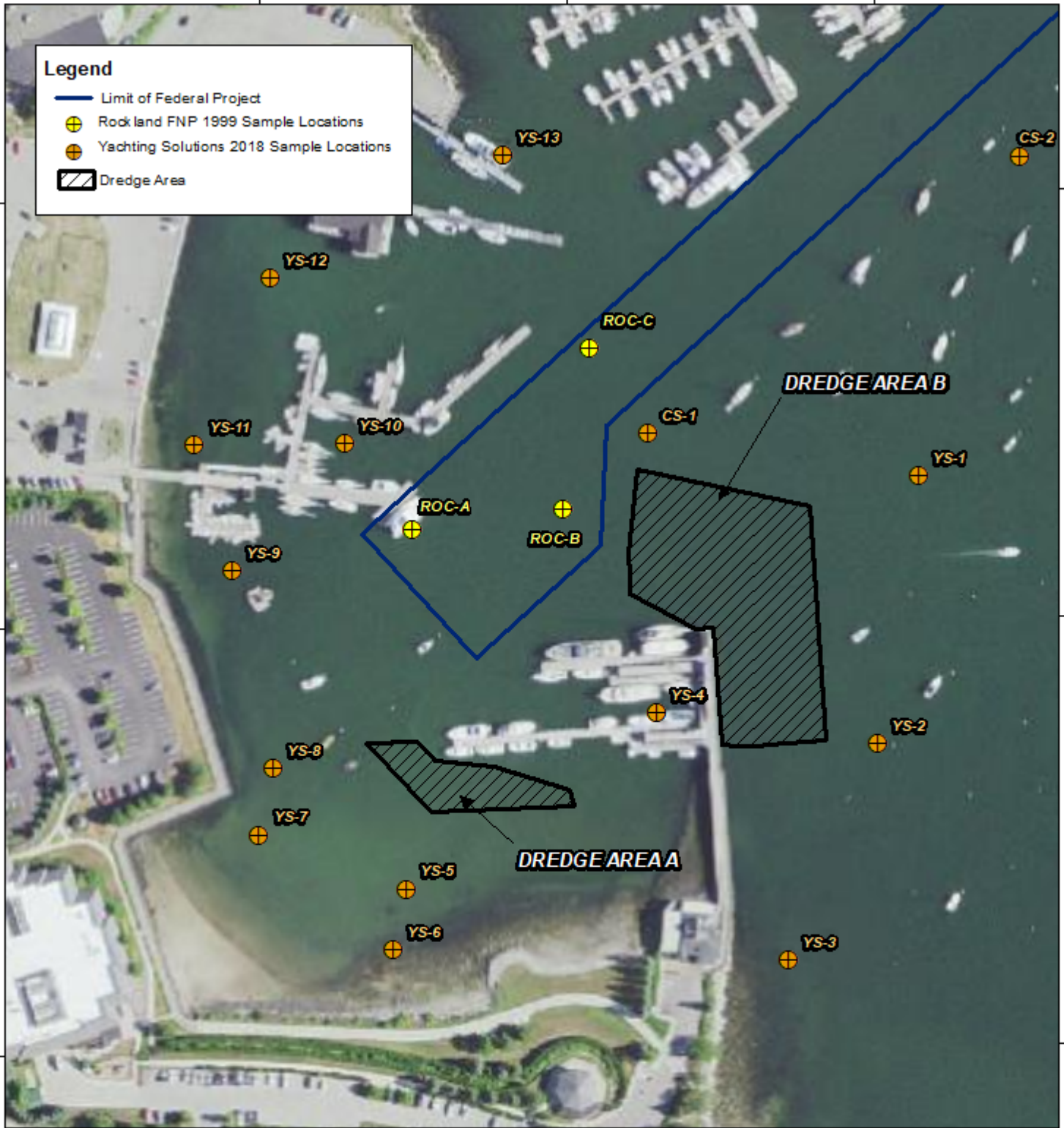
69° 6' 25" W

69° 6' 20" W

69° 6' 15" W

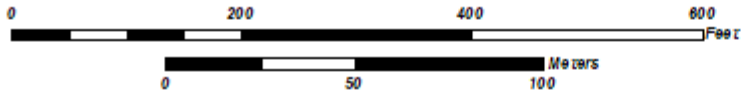
Legend

-  Limit of Federal Project
-  Rockland FNP 1999 Sample Locations
-  Yachting Solutions 2018 Sample Locations
-  Dredge Area



US Army Corps
of Engineers
New England District

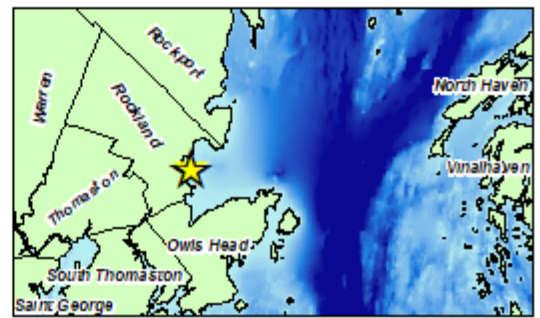
FIGURE 3
YACHTING SOLUTIONS
HISTORIC SAMPLE LOCATIONS



2015 NAIP AERIAL IMAGERY

1:2,000

GCS NAD 1983



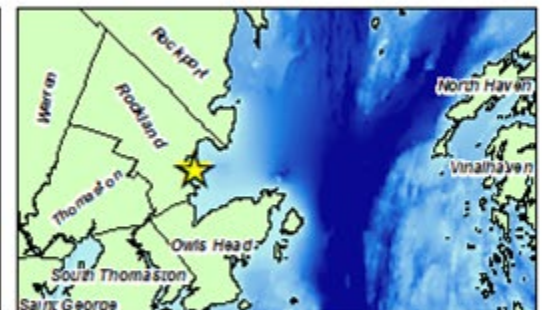
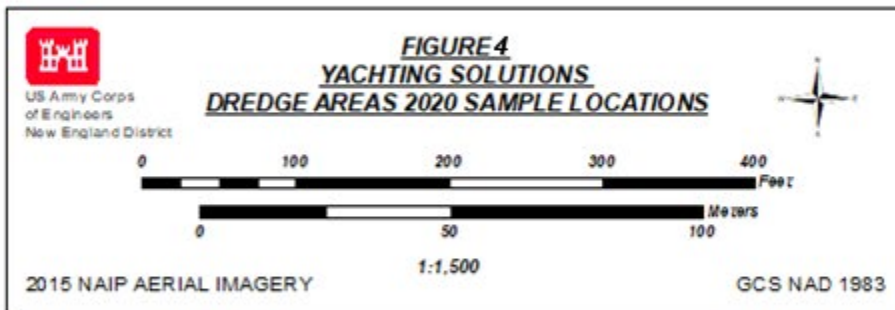
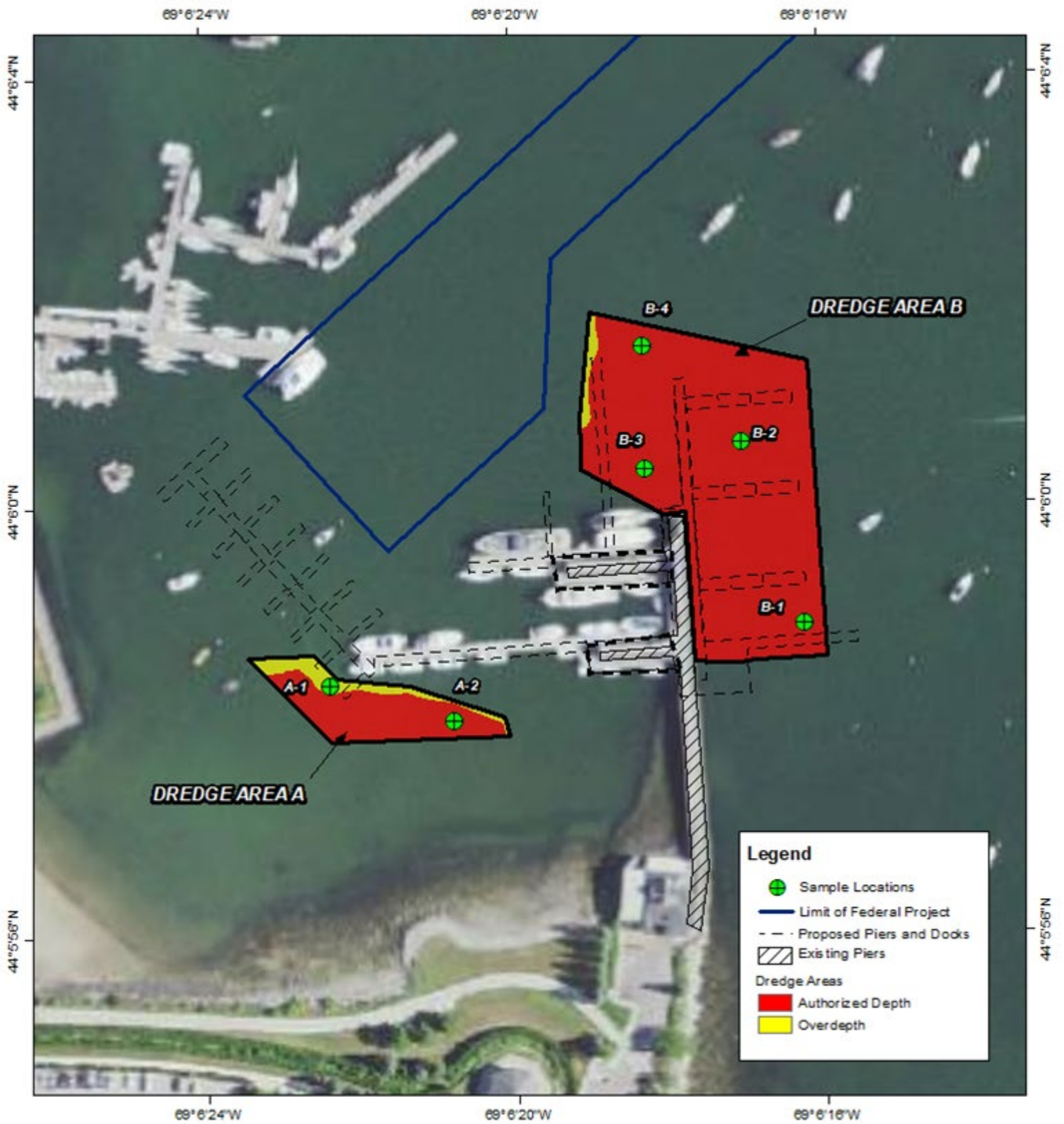


TABLE 5: RECOMMENDED PROCEDURES FOR SAMPLE COLLECTION, PRESERVATION, AND STORAGE

<u>Analyses</u>	<u>Collection Method</u>	<u>Sample Volume</u>	<u>Container</u>	<u>Preservation Technique</u>	<u>Storage Conditions</u>	<u>Holding Time^d</u>
Sediment						
Chemical/Physical Analyses						
Metals	Grab/corer	200 mL	Precleaned polyethylene jar ^c	Dry ice ^c	≤ 20° C ^c	Hg - 30 days Others - 6 Months ^d
Organic Compounds	Grab/corer	475 mL	Solvent-rinsed glass jar with Teflon lid ^c	Dry ice ^c	≤ 20° C/dark ^d	10 days ^d
Particle Size	Grab/corer	75 mL	Whirl-pac bag ^c	Dry ice ^c	≤ 20° C ^c	Undetermined
Total Organic Carbon	Grab/corer	3 L	Heat treated glass vial with Teflon lined lid ^c	Dry ice or freezer storage for extended storages; otherwise refrigerate	≤ 20° C ^c	Undetermined
Sediment From Which Elutriate is Prepared	Grab/corer	Dependant on tests performed	Glass with Teflon lined lid	Completely fill and Refrigerate	≤ 4° C/dark/airtight	Undetermined
Biological Tests						
Dredged Material	Grab/corer	12-15 L per sample	Plastic bag or container ^e	Completely fill and Refrigerate; sieve	≤ 4° C/dark/airtight	14 days ⁱ
Reference Sediment	Grab/corer	45-50 L per test	Plastic bag or container ^e	Completely fill and Refrigerate; sieve	≤ 4° C/dark/airtight	14 days ⁱ
Control Sediment	Grab/corer	21-25 L per test	Plastic bag or container ^e	Completely fill and Refrigerate; sieve	≤ 4° C/dark/airtight	14 days ⁱ
Water and Elutriate						
Chemical/Physical Analyses						
Metals	Discrete sampler or pump	1 L	Acid-rinsed polyethylene or glass jar	pH <2 with HNO ₃ ^d	4° C 2° C ^d	Hg - 28 days Others - 6 Months ^h

TABLE 5: RECOMMENDED PROCEDURES FOR SAMPLE COLLECTION, PRESERVATION, AND STORAGE (CONTINUED)

Organics	Discrete sampler or pump	4 L	Amber glass bottle ^d	Airtight seal; refrigerate	4° C 2° C ^d	5 days ^d
Tissue						
Metals	Trawl/ Teflon coated grab	30 g	Double Ziploc ^c	Handle with non-metallic forceps; plastic gloves; dry ice ^c	≤ -20° C ^c	Hg - 14 days Others - 6 months ⁱ
PCBs and Chlorinated Pesticides	Trawl/ Teflon coated grab	100 g	Hexane-rinsed double aluminum foil and double Ziploc ^c Heat cleaned	Handle with hexane-rinsed stainless steel forceps; dry ice ^c	≤ -20° C ^c	10 days ⁱ
Volatile Organic Compounds	Trawl/ Teflon coated grab	50 g	aluminum foil and water tight plastic bag ⁱ	Covered ice chest ^d	≤ -20° C ⁱ	10 days ⁱ
PAHs	Trawl/ Teflon coated grab	50 g	Hexane-rinsed double aluminum foil and double Ziploc ^c	Handle with hexane-rinsed stainless steel forceps; dry ice ^c	≤ -20° C ⁱ	10 days ⁱ
Lipids	Trawl/ Teflon coated grab	50 g	Hexane-rinsed aluminum foil	Handle with hexane-rinsed stainless steel forceps; quick freeze	20° C	Undetermined

^a This table contains only a summary of collection, preservation, and storage procedures for samples. The cited references should be consulted for a more detailed description of these procedures.

^b These holding times are for sediment, water, and tissue based on guidance that is sometimes administrative rather than technical in nature. There are no promulgated, scientifically based holding time criteria for sediments, tissues, or elutriates. References should be consulted if holding times for sample extracts are desired. Holding times are from the time of sample collection.

^c NOAA (1989).

^d Tetra Tech (1986a)

^e Polypropylene should be used if phthalate bioaccumulation is of concern.

^f Two weeks is recommended; sediments must not be held for longer than 8 weeks prior to biological testing.

^g NOAA (1989).

^h Plumb (1981).

ⁱ Tetra Tech (1986b)

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Table 6: Bulk Sediment Testing Parameters

Parameter	Analytical Method	Reporting Limit (ppm)
Metals		
Arsenic	6010B, 6020, 7060, 7061	0.4
Cadmium	6010B, 6020, 7130, 7131	0.07
Chromium	6010B, 6020, 7190, 7191	0.5
Copper	6010B, 6020, 7210	0.5
Lead	6010B, 6020, 7420, 7421	0.5
Mercury	7471	0.02
Nickel	6010B, 6020, 7520	0.5
Zinc	6010B, 6020, 7950	1.0
PCBs (total by NOAA summation of congeners)		
See next page	8082A	0.001
Pesticides		
	NOAA (1993), 8081B	0.001
Aldrin	Heptachlor epoxide	
cis- & trans-Chlordane	Hexachlorobenzene	
4,4'-DDT, DDD, DDE	gamma-BHC (Lindane)	
Dieldrin	Methoxychlor	
α & β Endosulfan	cis- & trans-Nonachlor	
Endrin	Oxychlorodane	
Heptachlor	Toxaphene	0.025
Polycyclic Aromatic Hydrocarbons (PAH's)		
	8270C-SIM	0.01
Acenaphthene	Chrysene	
Acenaphthylene	Dibenzo(a,h)anthracene	
Anthracene	Fluoranthene	
Benzo(a)anthracene	Fluorene	
Benzo(a)pyrene	Indeno(1, 2, 3-cd)pyrene	
Benzo(b)fluoranthene	Naphthalene	
Benzo(k)fluoranthene	Phenanthrene	
Benzo(g, h, i)perylene	Pyrene	
Total Organic Carbon	Plumb (1981), APHA (1995)	0.1%
Percent Moisture	Plumb (1981), EPA (1992), PSEP (1986)	1.0%
Grain Size	Wet Sieve (#4, 10, 40, 200)	

Table 6: Bulk Sediment Testing Parameters (continued)

Analytical Method: NOAA (1993), 8082A

Reporting Limit: 1 ppb

Congeners:

8*	2,4' diCB
18*	2,2',5 triCB
28*	2,4,4' triCB
44*	2,2',3,5' tetraCB
49	2,2',4',5 tetraCB
52*	2,2',5,5' tetraCB
66*	2,3',4,4' tetraCB
87	2,2',3,4,5' pentaCB
101*	2,2',4,5,5' pentaCB
105*	2,3,3',4,4' pentaCB
118*	2,3',4,4',5 pentaCB
128*	2,3,3',4,4' hexaCB
138*	2,2',3,4,4',5' hexaCB
153*	2,2',4,4',5,5' hexaCB
170*	2,2',3,3',4,4',5 heptaCB
180*	2,2',3,4,4',5,5' heptaCB
183	2,2',3,4,4',5',6 heptaCB
184	2,2',3,4,4',6,6' heptaCB
187*	2,2',3,4',5,5',6 heptaCB
195*	2,2',3,3',4,4',5,6 octaCB
206*	2,2',3,3',4,4',5,5',6 nonaCB
209*	2,2',3,3',4,4',5,5',6,6' decaCB

* denotes a congener to be used in estimating Total PCB. To calculate Total PCB, sum the concentrations of all eighteen congeners marked with a "*" and multiply by 2.

The specified methods are recommendations only. Other acceptable methodologies capable of meeting the Reporting Limits can be used. Sample preparation methodologies (e.g. extraction and cleanup) and sample size may need to be modified to achieve the required Reporting Limits

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TABLE 7: ELUTRIATE TESTING PARAMETERS

<u>Parameter</u>	<u>Recommended Analytical Method</u>	<u>Reporting Limit (µg/L)</u>
Metals		
Arsenic	200.9, 1632	1.0
Cadmium	200.9, 1637	1.0
Chromium (VI)	218.6, 1636	1.0
Copper	200.9, 1639, 1640	0.6
Lead	200.9, 1639, 1640	1.0
Mercury	245.7, 1631	0.4
Nickel	200.9, 1639, 1640	1.0
Selenium	200.9, 1639	1.0
Silver	200.9	0.5
Zinc	200.9, 1639	1.0
PCBs (total, by either of these methods)	3510B, 8080A, NYSDEC	0.006
Pentachlorophenol	3501B, 8270C	2.60
Pesticides	3510B, 8080A	
Aldrin		0.26
Chlordane		0.02
Chloropyrifos		0.002
Dieldrin		0.14
4, 4'-DDT		0.03
α & β Endosulfan		0.007
Endrin		0.007
Heptachlor		0.01
Heptachlor epoxide		0.01
Lindane		0.26
Toxaphene		0.04

Reference:

NYSDEC. 1991. Analytical Method for the Determination of PCB Congeners by Fused Silica Capillary Column Gas Chromatography with Electron Capture Detector. NYSDEC #91-11.

FIGURE 5: EXAMPLE CORE LOG DATA SHEET

PROJECT: _____ DATE: _____

SAMPLING PERSONNEL: _____

SEA STATE: _____ WEATHER CODE: _____

LOCATION METHOD: _____

SAMPLE ID: _____ SAMPLER TYPE: _____

TIME: _____

SOUNDING: _____ CORRECTED DEPTH: _____

COORDINATES: N _____ E _____

PENETRATION/RECOVERY: _____ NO. OF ATTEMPTS: _____

MATERIAL DESCRIPTION: _____

CORE PHOTO:	NOTES:
<p><i>Insert core photograph with scale</i></p>	<p><i>Insert field notes and ASTM description of core</i></p>