APPENDIX F

REAL ESTATE PLANNING REPORT

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US Army Corps of Engineers
New England District

Section 107 Navigation Improvement Study
Real Estate Planning Report

Point Judith Harbor of Refuge and Point Judith Pond
Narragansett, Rhode Island

Prepared By:

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696 Virginia Road

Concord, MA 01742

October 5, 2017

Real Estate Planning Report
U.S. ARMY CORPS OF ENGINEERS
New England District

Point Judith Harbor of Refuge and Point Judith Pond
Narragansett, Rhode Island
Section 107 Navigation Improvement Project
Real Estate Planning Report

1. **PURPOSE**: The real estate planning report will be utilized to estimate both the real estate acquisition costs and administrative costs associated with the detailed project report. The detailed project report is advocating Section 107 construction alternatives for navigation improvements to enhance port operations at Point Judith, located in Rhode Island. An initial appraisal report was completed in 1985 which concluded a detailed study of the navigation conditions in Point Judith should be completed, however the project was not implemented due to funding considerations.

2. **PROJECT AUTHORITY:** The detailed project report (DPR), was prepared under the authority and provisions of section 107 of the 1960 River and Harbor Act which provides USACE authority to construction navigation improvements through partnership with non-federal sponsors. The 2018 detailed project report (DPR) evaluates the findings of the 1985 report, and updates the completed detailed study of the navigation conditions, while further evaluating USACE recommendations for navigation improvements, at this project location. The study evaluates the justification for USACE to participate in the improvement and expansion of navigation conditions in Point Judith Pond and Port Galilee in regards to modifying the existing general navigation project (FNP) for commercial fishing vessels. The navigation modifications are intended to accommodate safe and efficient vessel movement to the western (existing) and northern sides (new federal channel) of the commercial bulkhead located at the Port of Galilee. Three alternatives were developed and evaluated to provide new or increased channel access into areas where fleet movement can be accommodated and potential growth considered.

   The preferred plan (National Economic Development, NED) is a combination of two alternatives (Plans A & B) which involves widening by 50 feet the existing 150 foot wide by 15-foot deep (MLW) west bulkhead channel for approximately 700 feet (Plan A) and extending into the north basin by dredging a new 150 foot by 11 foot deep (MLW) for approximately 1,200 feet (Plan B). The navigation improvement would dispose of the clean dredged material at a previously used near shore bar nourishment area. The dredging would be by mechanical dredge and scow that will be able to operate in shallow draft areas in the channel, it has been reported that all construction activities will be waterside with no requirements for access, staging, storage or mobilization.

3. **EXISTING FEDERAL PROJECTS:** The Point Judith Harbor area includes a federally constructed 770-acre offshore Harbor Refuge protected by three breakwaters and an anchorage and berthing area in lower Point Judith Pond.

4. **EXISTING FEDERALLY OWNED LANDS:** There are no federal lands associated with project requirements.

5. **LANDS OWNED BY THE NON-FEDERAL SPONSOR**: All projects areas required for construction, operation, maintenance, repair, replacement, & rehabilitation (OMRR&R) are reported to be subtidal within the waters of the United States. The Rhode Island Coastal Resources Management Council (CRMC) is identified as the non-federal project partner.

6. **NAVIGATIONAL SERVITUDE:** Project construction requirements are based on Section 107 authority and there is a linkage between the preferred plan and navigation purpose. As result, navigation servitude applies in accordance with project authorities and the proposed construction alternatives.

7. **INDUCED FLOODING**: Induced flooding is not anticipated to result from implementation of the proposed project.

8. **REAL ESTATE REQUIREMENTS**: Land, Easements, Rights-of-Way, Relocations, Borrow Material, and Dredged or Excavated Material Disposal Requirements. The Project Delivery Team (PDT) confirms that the proposed navigation improvements and dredged material disposal sites do not require the acquisition of any real property interests based on application of Navigation Servitude (Federal riparian rights below MHWL). Plan details depict the limits of construction (and operation) within the existing and proposed federal navigation channel. Therefore, no temporary work area, road/access easements, or permanent easements are required for construction or maintenance. If limited temporary access or staging areas are determined to be needed in the future, this will be a contractor requirement or USACE will work with non-Federal Sponsor to accomplish.

9. **BASELINE COST ESTIMATE FOR REAL ESTATE**: Real estate costs are typically based on the feasibility plan alternatives and project authorities which will specify USACE LERRD requirements in accordance with construction requirements and (OMRR&R). As referenced above, there are no lands, easements, rights-of way are required for improvement project implementation. The area to be dredged and the open water disposal areas required for construction are below the ordinary high watermark of the navigable watercourse and will entail work by a waterborne dredging plant.

10. **PUBLIC LAW91-646 RELOCATIONS**: The displacement of residences or businesses is not anticipated based on project requirements.

11. **UTILITY AND FACILITY RELOCATIONS**: There are no facility relocations and/or utility displacement anticipated at this time. Confirmation will be conducted during the

project's Design and Implementation phase.

12. **MINERAL ACTIVITY**: There are no present or anticipated mining and/or drilling activity in the vicinity of the project that may affect project purposes and the operation thereof.

13. **TIMBER RIGHTS**: There are no harvesting activities to occur within the proposed project footprint.

14. **ASSESSMENT OF NON-FEDERAL SPONSOR ACQUISITION CAPABILITY**: The non-federal sponsor has been identified as the Rhode Island Coastal Resources Management Council (CRMC). Based on project construction alternatives, there are no real property requirements, all construction will reportedly take place waterside.

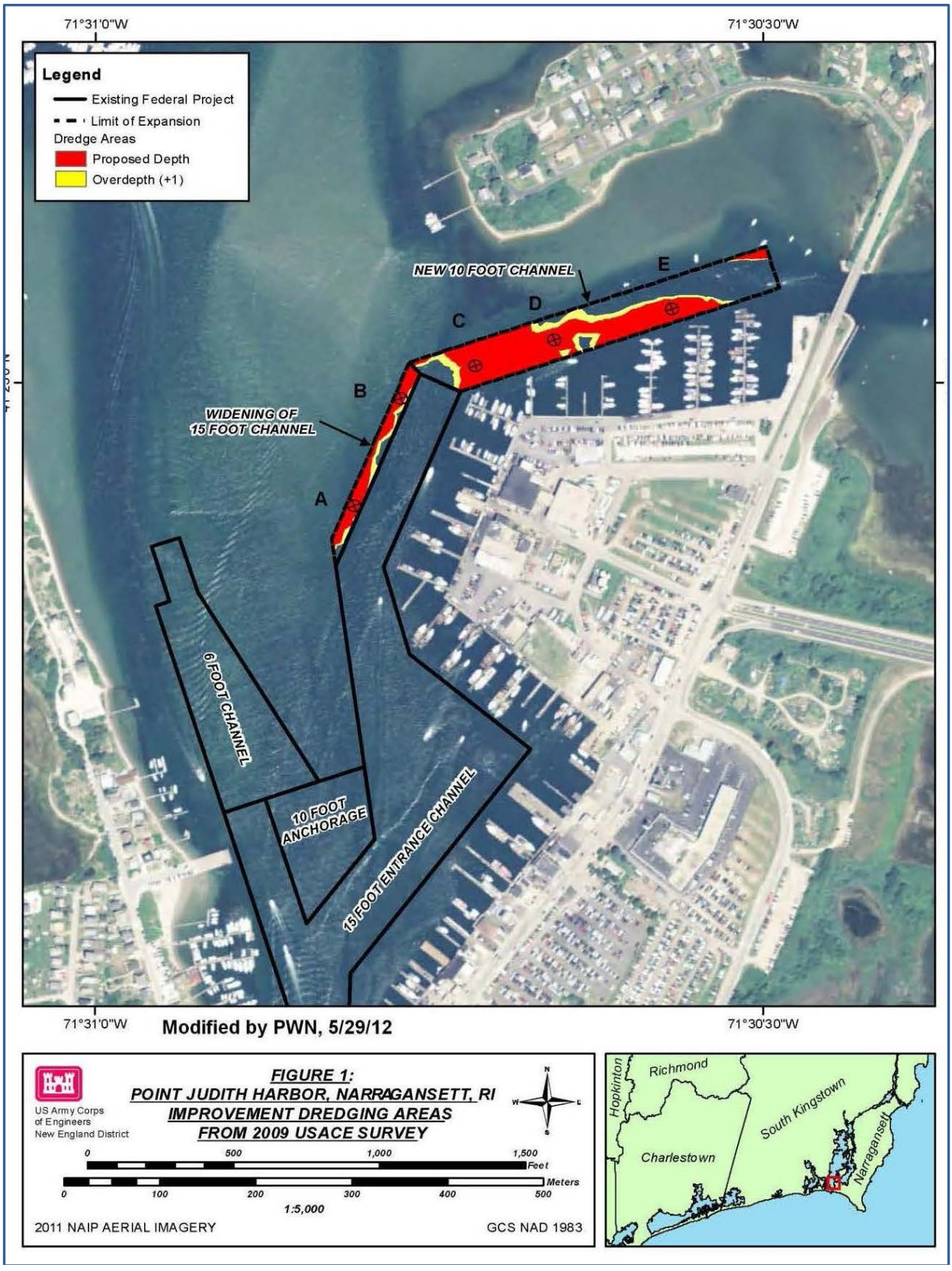
15. **ZONING**: There are no real property acquisition requirements.

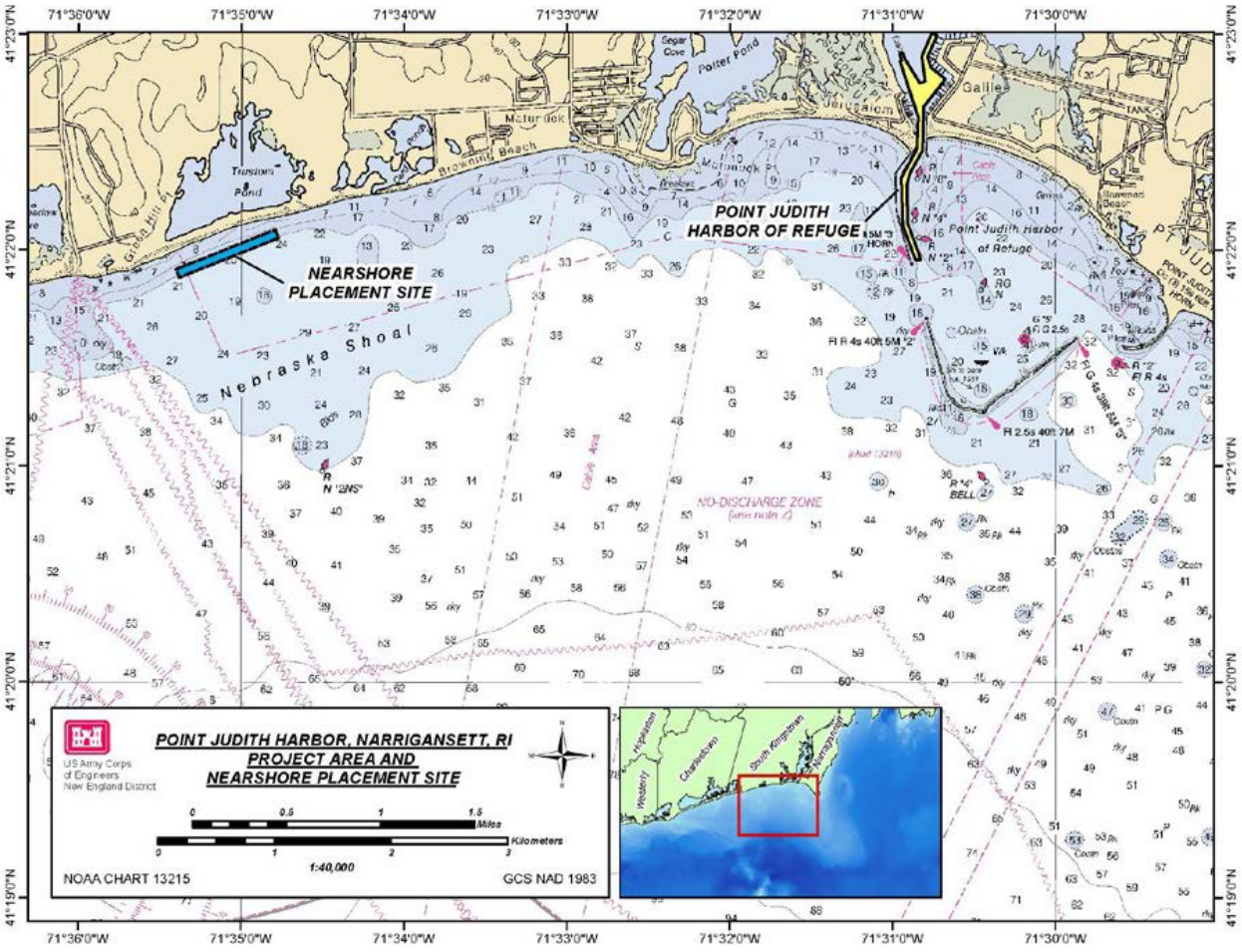
16. **ACQUISITION SCHEDULE**: Project schedules have not been defined as of the date of this report.

17. **ENVIRONMENTAL:** The NAE Planning division is currently completing a review and evaluation of the environmental effects of the project, to be presented in the Environmental Assessment Report (NEPA). If it is determined that modification of the existing federal navigation project and establishment of new federal channel is not a major federal action significantly affecting the quality of environment, a finding of no significant impact will be issued (FONSI determination).

18. **ATTITUDES OF THE LANDOWNERS**: The study has involved personnel of other federal offices, state agencies, and local authorities including the Rhode Island Department of Environmental Management. Overall, stakeholders have indicated support for dredging improvements at the referenced project location. The proposed project will be offered to the public through the 30-day public notice period to solicit comments and concerns.

19. **NOTIFICATION TO NON-FEDERAL SPONSOR:** If the project is approved, a project partnership agreement will be required to be executed by the non-federal sponsor, identified as Rhode Island Coastal Resources Management Council (RI CRMC).


71°31'0"W
71°30'30"W
Legend
Existing Federal Project
Limit of Expansion
Dredge Areas
Proposed Depth
Overdepth (+1)
NEW 10 FOOT CHANNEL
E
D
C
B
A
WIDENING OF
15 FOOT CHANNEL
6 FOOT CHANNEL
10 FOOT
ANCHORAGE
15 FOOT ENTRANCE CHANNEL
Modified by PWN, 5/29/12
FIGURE 1:
POINT JUDITH HARBOR, NARRAGANSETT, RI
IMPROVEMENT DREDGING AREAS
FROM 2009 USACE SURVEY
US Army Corps
of Engineers
New England District
0 500 1,000 1,500 Feet
0 100 200 300 400 500 Meters
1:5,000
2011 NAIP AERIAL IMAGERY
GCS NAD 1983
Hopkinton
Richmond
South Kingstown
Charlestown
Narragansett


71°36'0"W
71°35'0"W
71°34'0"W
71°33'0"W
71°32'0"W
71°31'0"W
71°30'0"W
41°23'0"N
41°22'0"N
41°21'0"N
41°20'0"N
41°19'0"N
POINT JUDITH HARBOR OF REFUGE
NEARSHORE PLACEMENT SITE
Nebraska Shoal
NO-DISCHARGE ZONE
POINT JUDITH HARBOR, NARRIGANSETT, RI
PROJECT AREA AND
NEARSHORE PLACEMENT SITE
US Army Corps of Engineers New England District
Miles
Kilometers
1:40,000
NOAA CHART 13215
GCS NAD 1983

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APPENDIX G

SEDIMENT SAMPLING & TESTING

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Part 1

Sample Core Results

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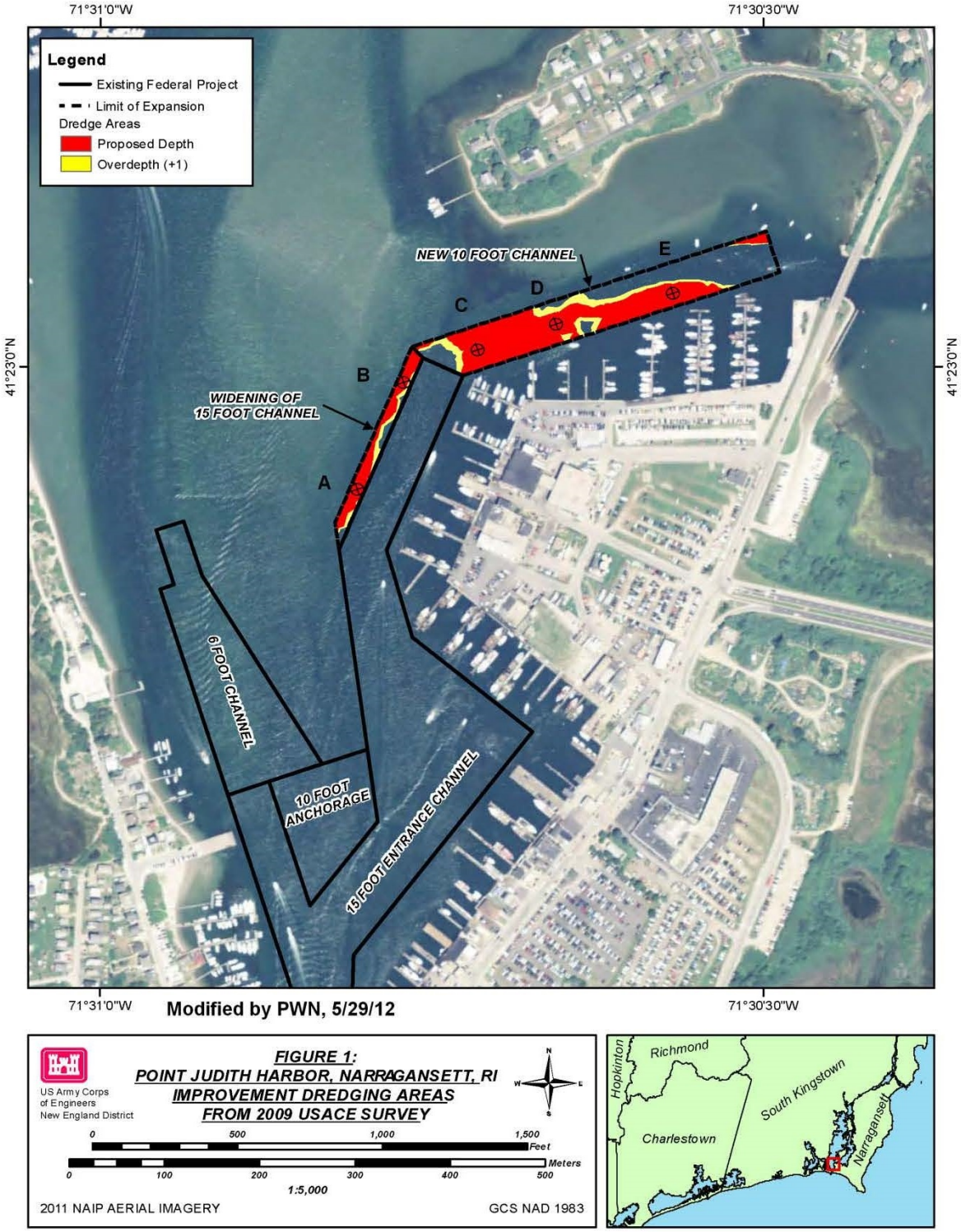
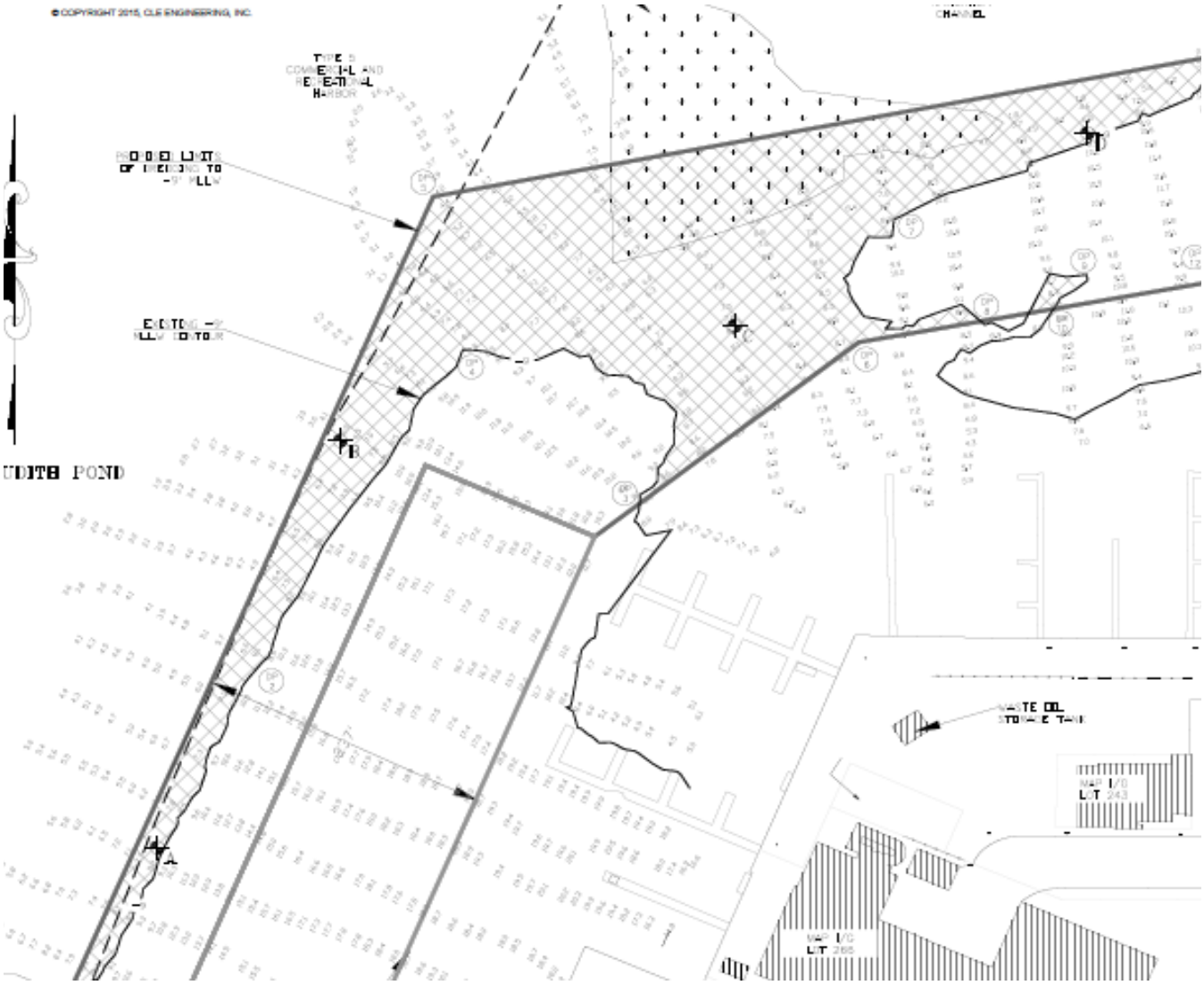
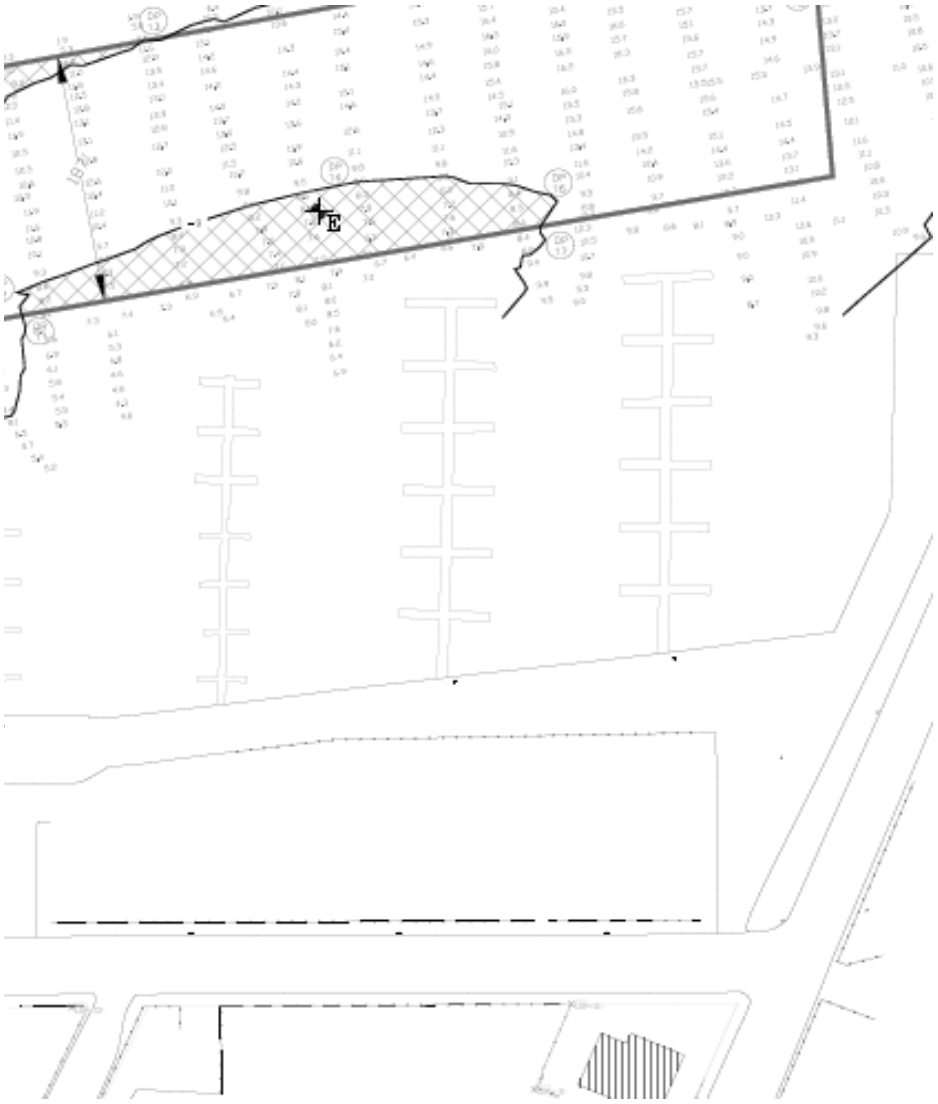

71°31'0"W
71°30'30"W
41°23'0"N
Legend
Existing Federal Project
Limit of Expansion
Dredge Areas
Proposed Depth
Overdepth (+1)
NEW 10 FOOT CHANNEL
E
D
C
B
A
WIDENING OF
15 FOOT CHANNEL
6 FOOT CHANNEL
10 FOOT
ANCHORAGE
15 FOOT ENTRANCE CHANNEL
Modified by PWN, 5/29/12
US Army Corps
of Engineers
New England District
FIGURE 1:
POINT JUDITH HARBOR, NARRAGANSETT, RI
IMPROVEMENT DREDGING AREAS
FROM 2009 USACE SURVEY
N
W
E
S
0
500
1,000
1,500
Feet
0
100
200
300
400
500
Meters
1:5,000
2011 NAIP AERIAL IMAGERY
GCS NAD 1983
Hopkinton
Richmond
South Kingstown
Charlestown
Narragansett

Project: Point Judith Pond Federal Channel Extension - Galilee Project

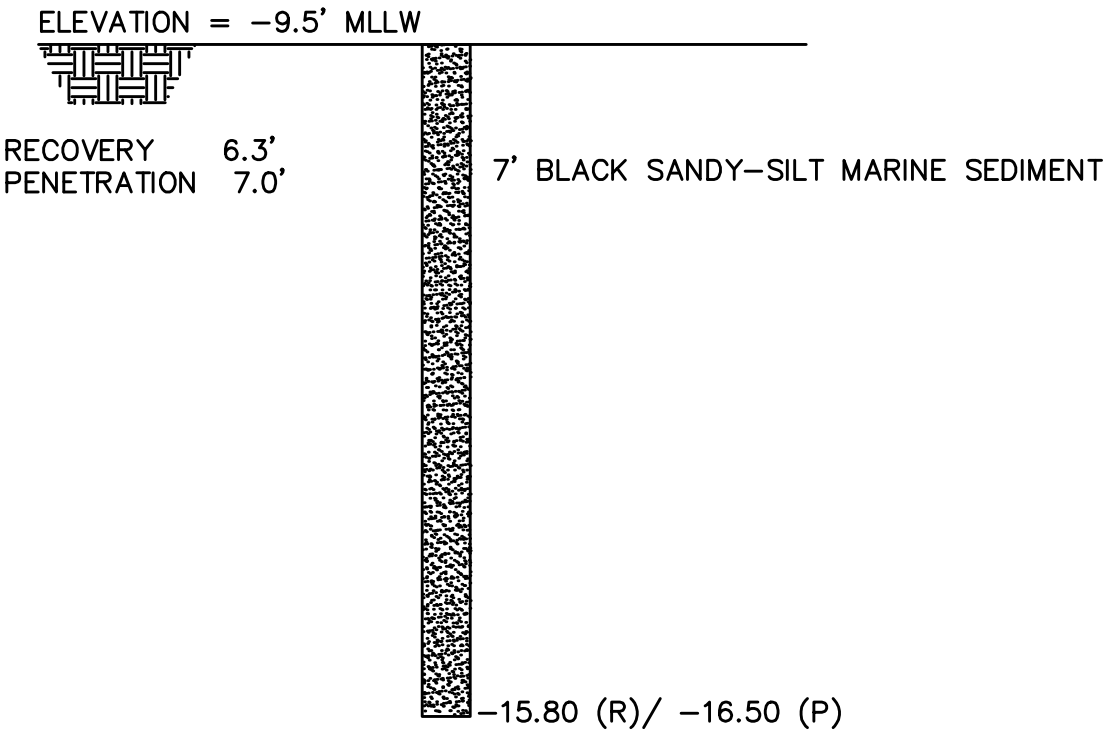
Percent Finer						
Sieve Name	Sieve Size	Sample ID A 26884-002	Sample ID B 26884-004	Sample ID C 26884-006	Sample ID D 26884-008	Sample ID E 26884-010
0.75 in	19	100	100	100		
0.5 in	12.5	100	100	99		
0.375 in	9.5	100	100	99	100	
#4	4.75	99	99	99	100	100
#10	2	98	99	99	100	100
#20	0.85	96	99	98	100	100
#40	0.42	85	97	97	99	99
#60	0.25	47	80	90	97	96
#100	0.15	13	24	27	77	64
#200	0.075	2.6	5.1	9.6	20	16
Grain Size						
% Cobble		--	--	--	--	--
% Gravel		0.9	1	1	0.2	0
% Sand		96.8	93.9	89.4	79.8	84.4
% Silt & Clay		2.3	5.1	9.6	20	15.6
Description		Moist, olive sand	Moist, olive sand with silt. Sample contains shell fragments	Moist, olive sand with silt.	Moist, olive silty sand. Sample contains shell fragments	Moist, olive silty sand.
AASHTO Clasification		Silty Gravel and Sand A-2-4-(0)	Silty Soils A-4-(0)	Silty Soils A-4-(0)	Silty Gravel and Sand A-2-4-(0)	Silty Gravel and Sand A-2-4-(0)


© COPYRIGHT 2015, CLE ENGINEERING, INC.
EXISTING
SOUTH POND
WASTE OIL
STORAGE TANK
MAP 1/G
LOT 265



SAMPLING LOCATION
GAL–A: LAT: 41° 22.9520" N LONG: 71° 30.8044" W

SAMPLING LOCATION GAL–A



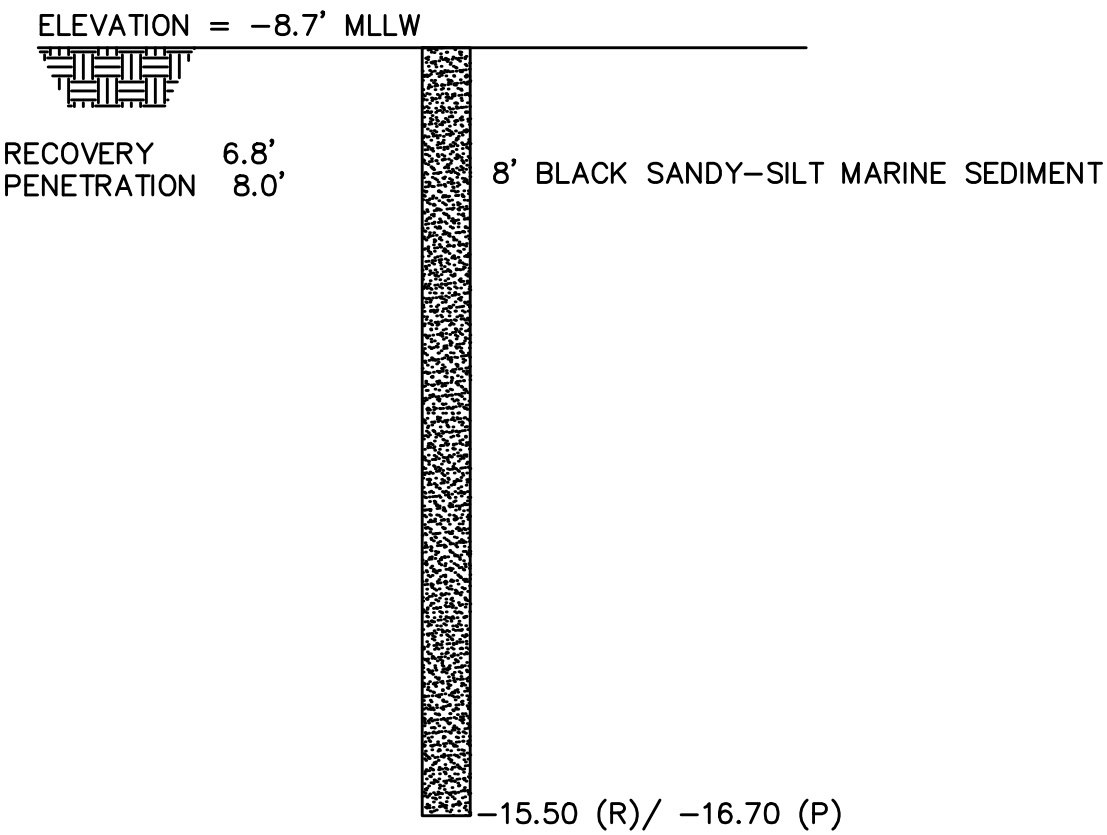
MATERIAL DESCRIPTIONS BASED ON
EXAMINATION OF THE SAMPLES
ON SITE AT TIME OF COLLECTION ONLY

POINT JUDITH POND
GALILEE
NARRAGANSETT, RI
CORE RESULTS
LOCATION: GAL–A
BY: CLE ENGINEERING
FOR: QDC

DATE: DECEMBER 14, 2015

SAMPLING LOCATION
GAL–B: LAT: 41° 23.0084" N LONG: 71° 30.7719" W

SAMPLING LOCATION GAL–B



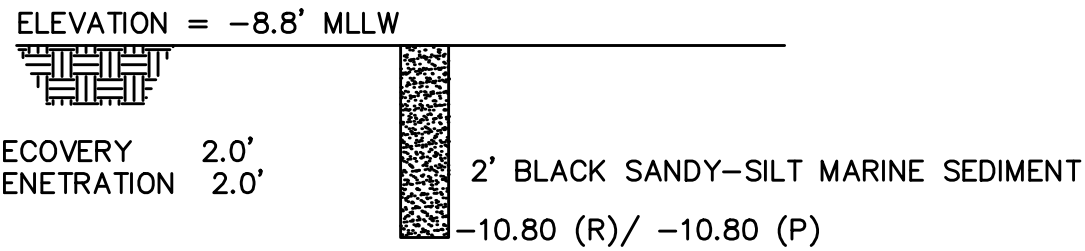
MATERIAL DESCRIPTIONS BASED ON
EXAMINATION OF THE SAMPLES
ON SITE AT TIME OF COLLECTION ONLY

POINT JUDITH POND
GALILEE
NARRAGANSETT, RI
CORE RESULTS
LOCATION: GAL–B
BY: CLE ENGINEERING
FOR: QDC

DATE: DECEMBER 14, 2015

SAMPLING LOCATION
GAL–C: LAT: 41° 23.0244" N LONG: 71° 30.7018" W

SAMPLING LOCATION GAL–C



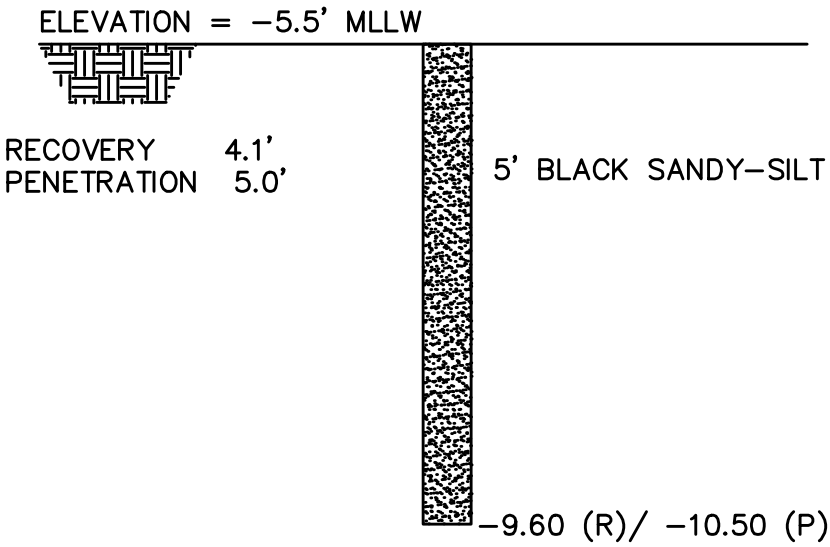
MATERIAL DESCRIPTIONS BASED ON
EXAMINATION OF THE SAMPLES
ON SITE AT TIME OF COLLECTION ONLY

POINT JUDITH POND
GALILEE
NARRAGANSETT, RI
CORE RESULTS
LOCATION: GAL–C
BY: CLE ENGINEERING
FOR: QDC

DATE: DECEMBER 14, 2015

SAMPLING LOCATION
GAL–D: LAT: 41° 23.0511" N LONG: 71° 30.6391" W

SAMPLING LOCATION GAL–D



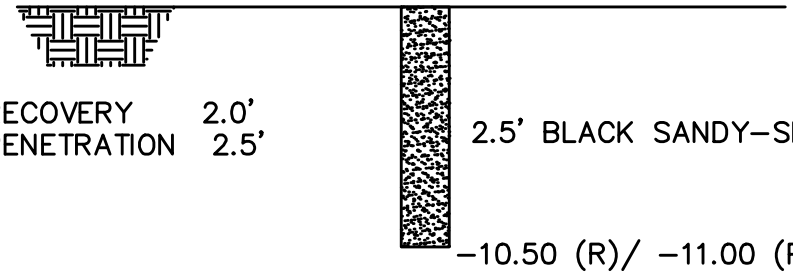
MATERIAL DESCRIPTIONS BASED ON
EXAMINATION OF THE SAMPLES
ON SITE AT TIME OF COLLECTION ONLY

POINT JUDITH POND
GALILEE
NARRAGANSETT, RI
CORE RESULTS
LOCATION: GAL–D
BY: CLE ENGINEERING
FOR: QDC

DATE: DECEMBER 14, 2015

SAMPLING LOCATION
GAL–E: LAT: 41° 23.0434" N LONG: 71° 30.5695" W

SAMPLING LOCATION GAL–E



MATERIAL DESCRIPTIONS BASED ON
EXAMINATION OF THE SAMPLES
ON SITE AT TIME OF COLLECTION ONLY

POINT JUDITH POND
GALILEE
NARRAGANSETT, RI
CORE RESULTS
LOCATION: GAL–E
BY: CLE ENGINEERING
FOR: QDC

DATE: DECEMBER 14, 2015

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Part 2

Physical Test Results

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TOXICOLOGICAL EVALUATION
OF A PROPOSED DREDGE SEDIMENT:
Grain Size Analysis

Point Judith Pond
Federal Project Channel Extension, Narragansett, Rhode Island

Rhode Island Fast Ferry
Narragansett Bay, North Kingston, Rhode Island
New England District Corps of Engineers Application Number NAE-2015-861

Electric Boat - Quonset Point Facility
Narragansett Bay, North Kingstown, Rhode Island
New England District Corps of Engineers Application Number NAE-2015-1853

Prepared For:

CLE Engineering, Incorporated
15 Creek Road
Marion, Massachusetts 02738

Prepared By:

EnviroSystems, Incorporated
One Lafayette Road
Hampton, New Hampshire 03842

Reference 26884
January 2016

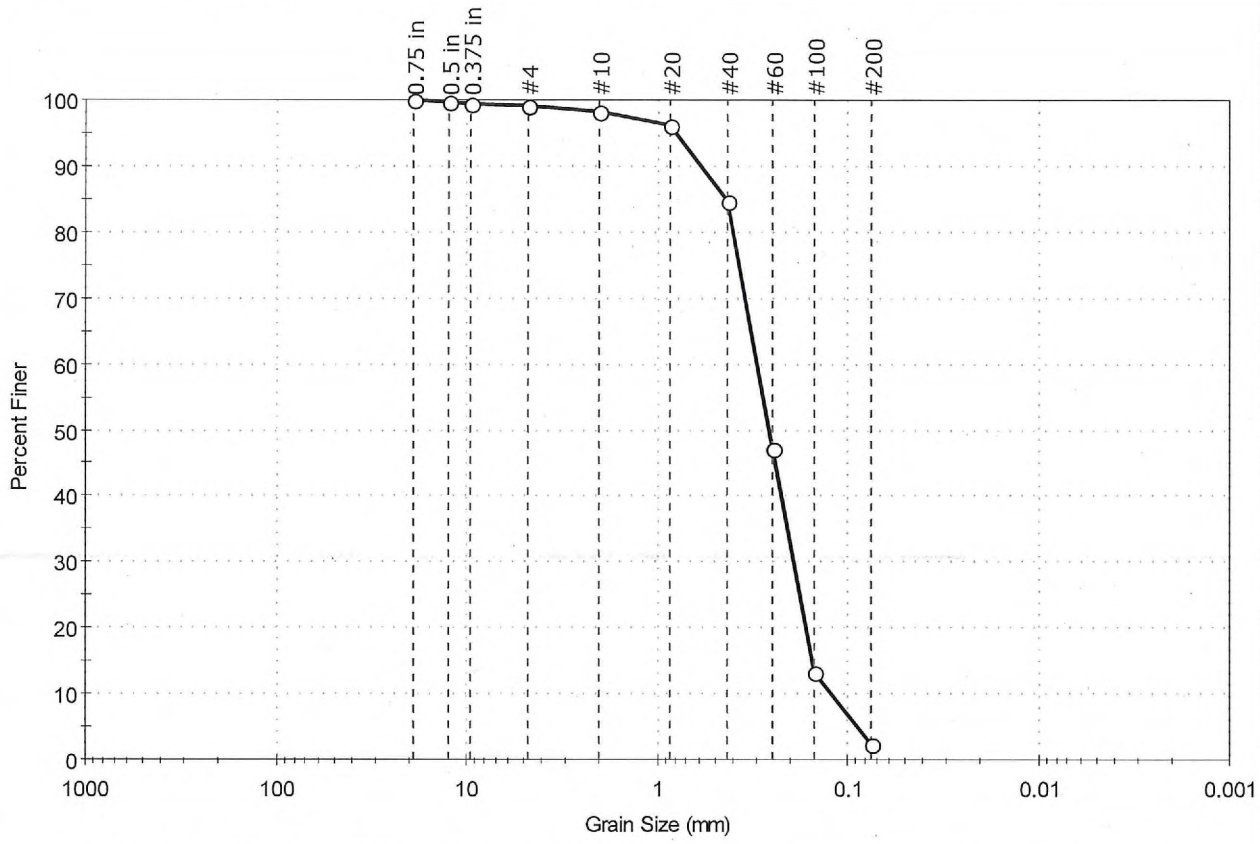
Sample Key

ESI Code	Field ID	Project	Sampled	Received
26884-002	12-14-15 GAL-A	Point Judith Pond Federal Project Channel Extension, Narragansett, RI	12/14/15	12/15/15 1130
26884-004	12-14-15 GAL-B	Point Judith Pond Federal Project Channel Extension, Narragansett, RI	12/14/15	12/15/15 1130
26884-006	12-14-15 GAL-C	Point Judith Pond Federal Project Channel Extension, Narragansett, RI	12/14/15	12/15/15 1130
26884-008	12-14-15 GAL-D	Point Judith Pond Federal Project Channel Extension, Narragansett, RI	12/14/15	12/15/15 1130
26884-010	12-14-15 GAL-E	Point Judith Pond Federal Project Channel Extension, Narragansett, RI	12/14/15	12/15/15 1130
26884-012	FF-A CLE	Fast Ferry, Narragansett Bay, North Kingston, RI	12/15/15	12/15/15 1555
26884-014	FF-B CLE	Fast Ferry, Narragansett Bay, North Kingston, RI	12/15/15	12/15/15 1555
26884-016	FF-C CLE	Fast Ferry, Narragansett Bay, North Kingston, RI	12/15/15	12/15/15 1555
26884-018	FF-D CLE	Fast Ferry, Narragansett Bay, North Kingston, RI	12/15/15	12/15/15 1555
26884-020	FF-E CLE	Fast Ferry, Narragansett Bay, North Kingston, RI	12/15/15	12/15/15 1555
26884-021	QDC-A CLE	Electric Boat - Quonset Point Facility, North Kingstown, RI	12/16/15	12/17/15 1340
26884-023	QDC-B CLE	Electric Boat - Quonset Point Facility, North Kingstown, RI	12/16/15	12/17/15 1340
26884-025	QDC-C CLE	Electric Boat - Quonset Point Facility, North Kingstown, RI	12/16/15	12/17/15 1340
26884-027	QDC-D CLE	Electric Boat - Quonset Point Facility, North Kingstown, RI	12/16/15	12/17/15 1340
26884-029	QDC-E CLE	Electric Boat - Quonset Point Facility, North Kingstown, RI	12/16/15	12/17/15 1340
26884-031	QDC-F CLE	Electric Boat - Quonset Point Facility, North Kingstown, RI	12/16/15	12/17/15 1340
26884-033	QDC-G CLE	Electric Boat - Quonset Point Facility, North Kingstown, RI	12/16/15	12/17/15 1340
26884-035	QDC-H CLE	Electric Boat - Quonset Point Facility, North Kingstown, RI	12/16/15	12/17/15 1340
26884-037	QDC-I CLE	Electric Boat - Quonset Point Facility, North Kingstown, RI	12/16/15	12/17/15 1340
26884-039	QDC-J CLE	Electric Boat - Quonset Point Facility, North Kingstown, RI	12/16/15	12/17/15 1340

GeoTesting EXPRESS

Client:	EnviroSystems, Inc.				
Project:	26884				
Location:	---			Project No:	GTX-304174
Boring ID:	---	Sample Type:	bag	Tested By:	jbr
Sample ID:	26884-002	Test Date:	01/06/16	Checked By:	emm
Depth :	---	Test Id:	359218		
Test Comment:	---				
Visual Description:	Moist, olive sand				
Sample Comment:	---				

Particle Size Analysis - ASTM D422



% Cobble	% Gravel	% Sand	% Silt & Clay Size
–	0.9	96.8	2.3

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
0.75 in	19.00	100		
0.5 in	12.50	100		
0.375 in	9.50	100		
#4	4.75	99		
#10	2.00	98		
#20	0.85	96		
#40	0.42	85		
#60	0.25	47		
#100	0.15	13		
#200	0.075	2.3		

Coefficients

D_{85} = 0.4311 mm D_{30} = 0.1931 mm
D_{60} = 0.2996 mm D_{15} = 0.1541 mm
D_{50} = 0.2601 mm D_{10} = 0.1224 mm
C_u = 2.448 C_c = 1.017

Classification

ASTM Poorly graded sand (SP)

AASHTO Fine Sand (A-3 (1))

Sample/Test Description

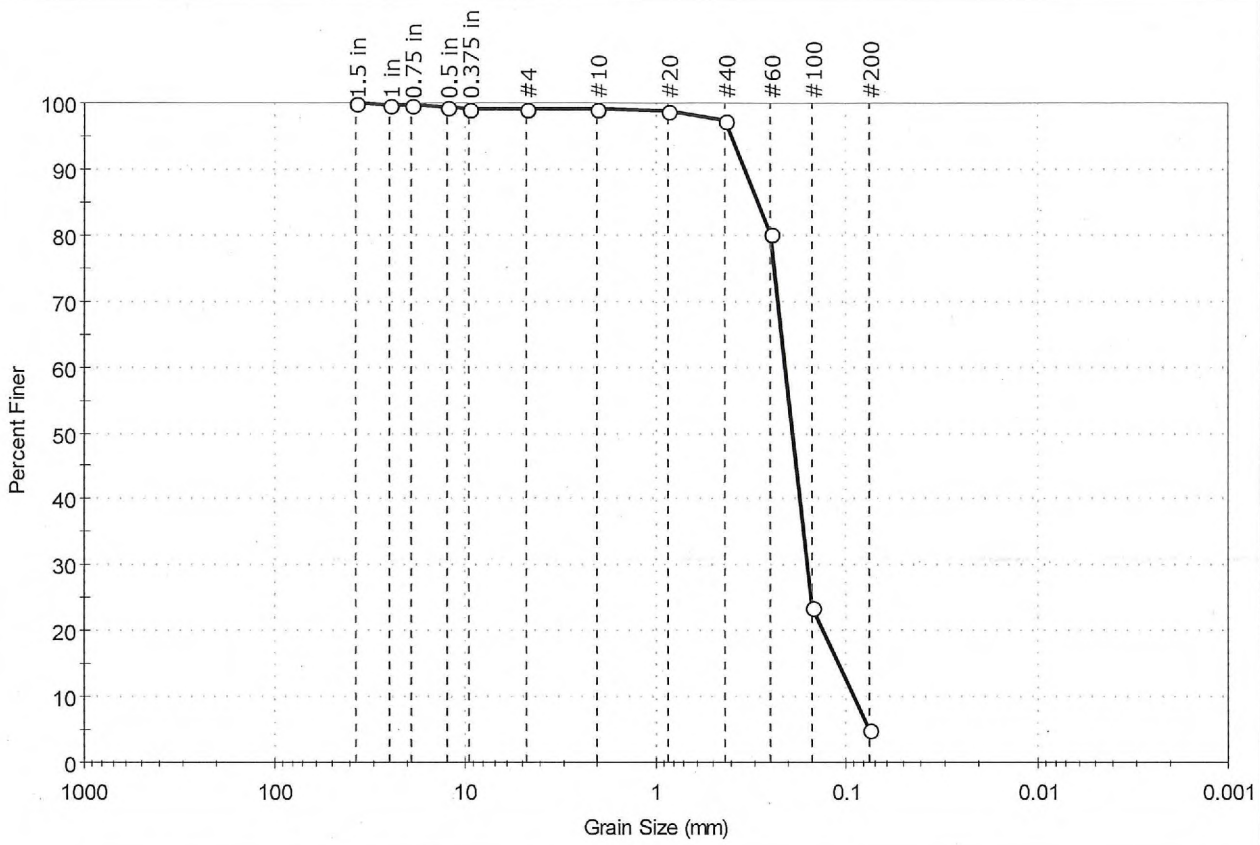
Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness : ---

GeoTesting EXPRESS

Client:	EnviroSystems, Inc.				
Project:	26884				
Location:	---			Project No:	GTX-304174
Boring ID:	---	Sample Type:	bag	Tested By:	jbr
Sample ID:	26884-004	Test Date:	01/05/16	Checked By:	emm
Depth :	---	Test Id:	359219		
Test Comment:	---				
Visual Description:	Moist, olive sand with silt				
Sample Comment:	Sample contains shell fragments				

Particle Size Analysis - ASTM D422



% Cobble	% Gravel	% Sand	% Silt & Clay Size
—	1.0	93.9	5.1

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
1.5 in	37.50	100		
1 in	25.00	100		
0.75 in	19.00	100		
0.5 in	12.50	99		
0.375 in	9.50	99		
#4	4.75	99		
#10	2.00	99		
#20	0.85	99		
#40	0.42	97		
#60	0.25	80		
#100	0.15	24		
#200	0.075	5.1		

Coefficients

D_{85} =0.2888 mm	D_{30} =0.1588 mm
D_{60} =0.2081 mm	D_{15} =0.1085 mm
D_{50} =0.1901 mm	D_{10} =0.0900 mm
C_u =2.312	C_c =1.346

Classification

ASTM N/A

AASHTO Fine Sand (A-3 (1))

Sample/Test Description

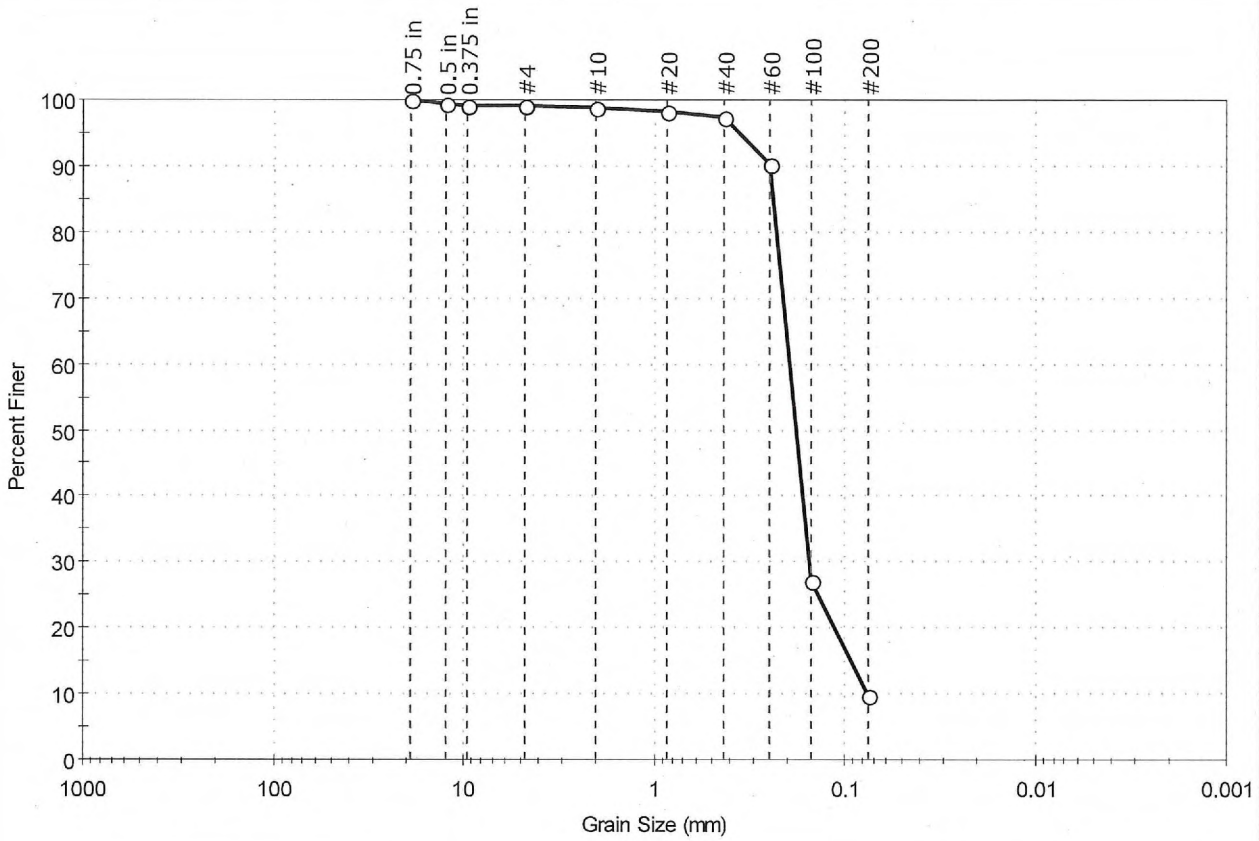
Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness : ---

GeoTesting EXPRESS

Client:	EnviroSystems, Inc.				
Project:	26884				
Location:	---			Project No:	GTX-304174
Boring ID:	---	Sample Type:	bag	Tested By:	jbr
Sample ID:	26884-006	Test Date:	01/06/16	Checked By:	emm
Depth :	---	Test Id:	359220		
Test Comment:	---				
Visual Description:	Moist, olive sand with silt				
Sample Comment:	---				

Particle Size Analysis - ASTM D422



% Cobble	% Gravel	% Sand	% Silt & Clay Size
—	1.0	89.4	9.6

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
0.75 in	19.00	100		
0.5 in	12.50	99		
0.375 in	9.50	99		
#4	4.75	99		
#10	2.00	99		
#20	0.85	98		
#40	0.42	97		
#60	0.25	90		
#100	0.15	27		
#200	0.075	9.6		

Coefficients

D_{85} = 0.2398 mm D_{30} = 0.1537 mm
D_{60} = 0.1959 mm D_{15} = 0.0930 mm
D_{50} = 0.1806 mm D_{10} = 0.0762 mm
C_u = 2.571 C_c = 1.583

Classification

ASTM N/A

AASHTO Fine Sand (A-3 (1))

Sample/Test Description

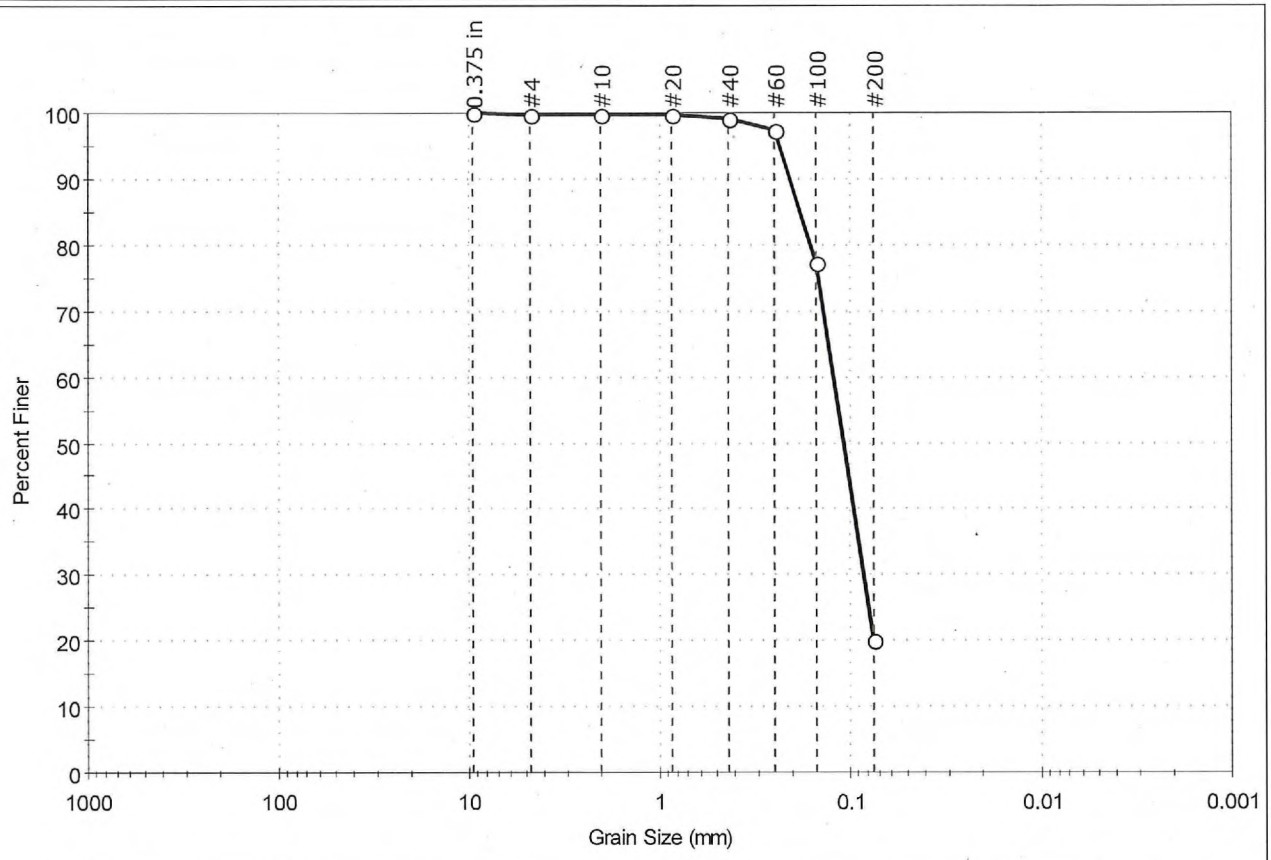
Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness : ---

GeoTesting EXPRESS

Client:	EnviroSystems, Inc.				
Project:	26884				
Location:	---			Project No:	GTX-304174
Boring ID:	---	Sample Type:	bag	Tested By:	jbr
Sample ID:	26884-008	Test Date:	01/06/16	Checked By:	emm
Depth :	---	Test Id:	359221		
Test Comment:	---				
Visual Description:	Moist, olive silty sand				
Sample Comment:	Sample contains shell fragments				

Particle Size Analysis - ASTM D422



% Cobble	% Gravel	% Sand	% Silt & Clay Size
—	0.2	79.8	20.0

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
0.375 in	9.50	100		
#4	4.75	100		
#10	2.00	100		
#20	0.85	100		
#40	0.42	99		
#60	0.25	97		
#100	0.15	77		
#200	0.075	20		

Coefficients

D_{85} = 0.1821 mm D_{30} = 0.0847 mm
D_{60} = 0.1216 mm D_{15} = N/A
D_{50} = 0.1078 mm D_{10} = N/A
C_u = N/A C_c = N/A

Classification

ASTM N/A

AASHTO Silty Gravel and Sand (A-2-4 (0))

Sample/Test Description

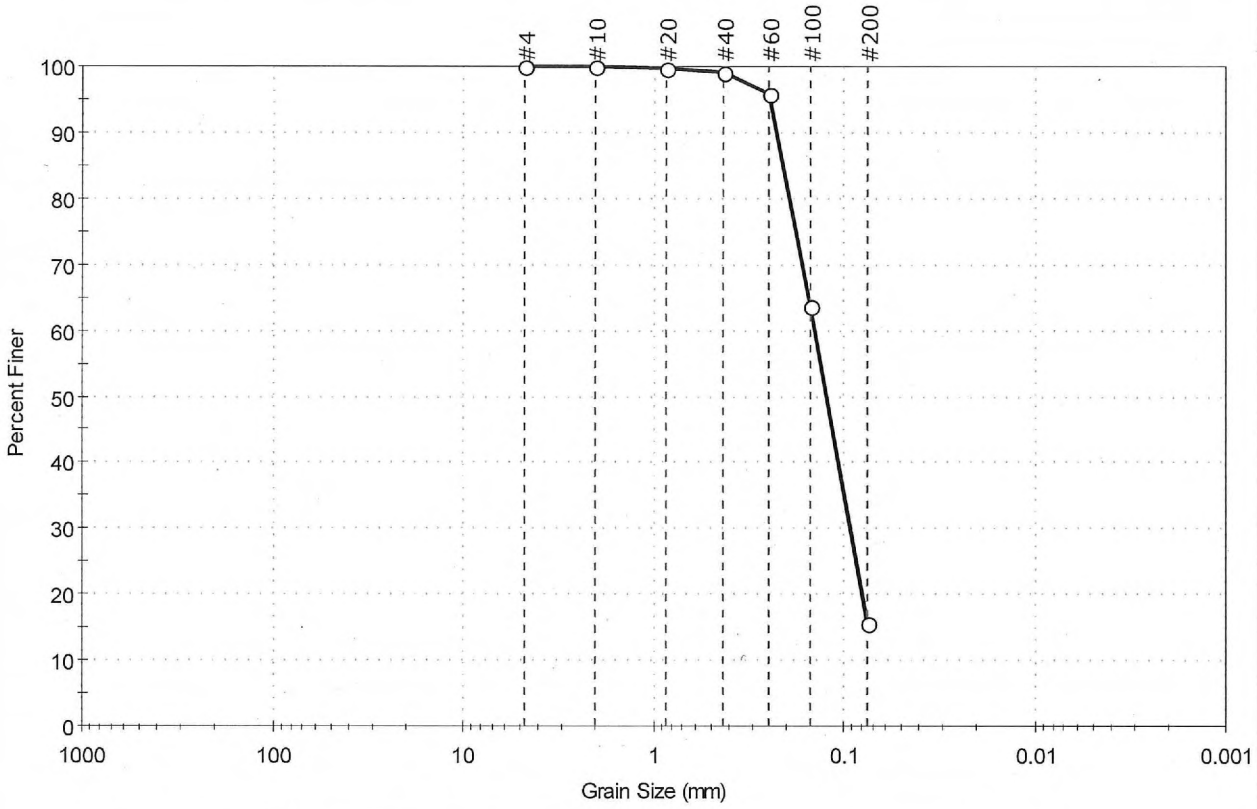
Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness : ---

GeoTesting EXPRESS

Client:	EnviroSystems, Inc.				
Project:	26884				
Location:	---			Project No:	GTX-304174
Boring ID:	---	Sample Type:	bag	Tested By:	jbr
Sample ID:	26884-010	Test Date:	01/06/16	Checked By:	emm
Depth :	---	Test Id:	359222		
Test Comment:	---				
Visual Description:	Moist, olive silty sand				
Sample Comment:	---				

Particle Size Analysis - ASTM D422



% Cobble	% Gravel	% Sand	% Silt & Clay Size
–	0.0	84.4	15.6

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	100		
#40	0.42	99		
#60	0.25	96		
#100	0.15	64		
#200	0.075	16		

Coefficients

D_{85} =0.2102 mm D_{30} =0.0923 mm
D_{60} =0.1421 mm D_{15} =N/A
D_{50} =0.1231 mm D_{10} =N/A
C_u =N/A C_c =N/A

Classification

ASTM N/A

AASHTO Silty Gravel and Sand (A-2-4 (0))

Sample/Test Description

Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness : ---

ESI EnviroSystems, Inc.
1 Lafayette Road
Hampton, N.H. 03843

Voice: 603-926-3345
FAX: 603-923-3521

ESI Job No:

CHAIN OF CUSTODY DOCUMENTATION

Client: EnviroSystems, Inc.	Contact: Renée McIsaac	Project Name: 26884	Page 1 of 2
Report to:	Address:	Project Number:	
Invoice to:	Address:	Project Manager:	
Voice: 603-926-3345 ext 212	Fax:	email: r.mcisaac@envirosystems.com	P.O. No: Quote No:

Protocol: RCRA SDWA NPDES USCOE Other : CENAE

Lab Number (assigned by lab)	Your Field ID: (must agree with container)	Date Sampled	Time Sampled	Sampled By	Grab or composit (G/C)	Container Size (ml.)	Container Type (P/G/T)	Field Preservation	Matrix S=Solid W=Water	Filter N=Not needed F=Done in field L=Lab to do	Analyses Requested\ Special Instructions:
	26884-002	–	–	–	–	1 quart ziplock bag	–	–	S	NA	Grain Size NE RIM Criteria (no hydrometer)
	26884-004										
	26884-006										
	26884-008										
	26884-010										
	26884-012										
	26884-014										
	26884-016										
	26884-018										
	26884-020										
	26884-021										
	26884-023										

Relinquished By:	Date:	Time:	Received By: Date: Time:
Relinquished By:	Date:	Time:	Received at Lab By: Date: Time:

Comments: 10 Day TAT

No: № 1925

Rhode Island Dredge Sediment Evaluations. CLE Engineering, Inc.
ESI Study 26884.

Sample Delivery Group No:

ESI

SAMPLE RECEIPT AND CONDITION DOCUMENTATION

STUDY NO:	26884		
SDG No:			
Project:	Point Judith Pond Federal Project Channel Extension, Narragansett, RI		
Delivered via:	**ESI**		
Date and Time Received:	12/15/15 1130	Date and TIme Logged into Lab:	12/15/15 1300
Received By:	RS	Logged into Lab by:	BP
Air bill / Way bill:	No	Air bill included in folder if received?	NA
Cooler on ice/packs:	YES	Custody Seals present?	NA
Cooler Blank Temp (C) at arrival:	2.4	Custody Seals intact?	NA
Number of COC Pages:	1		
COC Serial Number(s):			
COC Complete:	YES	Does the info on the COC match the samples?	Yes
Sampled Date:	Yes	Were samples received within holding time?	Yes
Field ID complete:	Yes	Were all samples properly labeled?	Yes
Sampled Time:	Yes	Were proper sample containers used?	Yes
Analysis request:	Yes	Were samples received intact? (none broken or leaking)	Yes
COC Signed and dated:	Yes	Were sample volumes sufficient for requested analysis?	Yes
Were all samples received?	Yes	Were VOC vials free of headspace?	NA
Client notification/authorization:	Not required	pH Test strip ID number:	NA

Field ID	Lab ID	Mx	Analysis Requested	Bottle	Req'd Pres'n	Verified Pres'n
12-14-15 GAL-A	26884-001	S	Hold;	3x1 Gal bucket	4C	Yes
12-14-15 GAL-A	26884-002	S	GZ;	1qt bag	4C	Yes
12-14-15 GAL-B	26884-003	S	Hold;	2x1 Gal bucket	4C	Yes
12-14-15 GAL-B	26884-004	S	GZ;	1qt bag	4C	Yes
12-14-15 GAL-C	26884-005	S	Hold;	2x1 Gal bucket	4C	Yes
12-14-15 GAL-C	26884-006	S	GZ;	1qt bag	4C	Yes
12-14-15 GAL-D	26884-007	S	Hold;	2x1 Gal bucket	4C	Yes
12-14-15 GAL-D	26884-008	S	GZ;	1qt bag	4C	Yes
12-14-15 GAL-E	26884-009	S	Hold;	2x1 Gal bucket	4C	Yes
12-14-15 GAL-E	26884-010	S	GZ;	1qt bag	4C	Yes

Notes and qualifications:

SEE C.O.C

ESI

EnviroSystems, Inc.
1 Lafayette Road
P.O. Box 778
Hampton, N.H. 03843

Voice: 603-926-3345
FAX: 603-926-3521

ESI Job No: 26884 4569

CHAIN OF CUSTODY DOCUMENTATION

Client: CLE Engineering	Contact: Ray Salazar	Project Name: QDC	Page 1 of 1
Report to:	Address: 15 Creek Road	Project Number: 14217	
Invoice to:	MARION Address: MA 02738	Project Manager: Wendy Rocha	
Voice:	Fax:	email: WRocha@CLEEngineering.com	P.O. No: Quote No:

Protocol: RCRA SDWA NPDES USCOE Other

Lab Number (assigned by lab)	Your Field ID: (must agree with container)	Date Sampled	Time Sampled	Sampled By	Grab or com-posit (G/C)	Container Size (ml.)	Container Type (P/G/T)	Field Preser-vation	Matrix S=Solid W=Water	Filter N=Not needed F=Done in field L=Lab to do	Analyses Requested\ Special Instructions:
											GRAIN SIZE / 10 DAY BIO
-001	12-14-15 GAL-A	12/14/15		RS		3x1	Gal				GR
-002	" GA-A	"		"		1qt	bag				
	~~GAL-A~~	"		"							
-003	" GAL-B	"		"		2x1	Gal				
-004	" GAL-B	"		"		1qt	bag				
-005	" GAL-C	"		"		2x1	Gal				
-006	" GAL-C	"		"		1qt	bag				
-007	" GAL-D	"		"		2x1	Gal				
-008	" GAL-D	"		"		1qt	bag				
-009	" GAL-E	"		"		2x1	Gal				
-010	" GAL-E	"		"		1qt	bag				
	"			"							

Relinquished By: Ray Salazar Date: 12/15/15 Time: 11:30 Received By: R Scott Date: 12/15/15 Time: 11:30

Relinquished By: Date: Time: Received at Lab By: Date: Time:

Comments: 2 yr

Part 3

Chemical Test Results

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CHEMICAL ANALYSIS
OF A MARINE SEDIMENT:

Point Judith Pond
Federal Project Channel Extension, Galilee Project
Narragansett, Rhode Island

Prepared For:

CLE Engineering, Incorporated
15 Creek Road
Marion, Massachusetts 02738

Prepared By:

EnviroSystems, Incorporated
One Lafayette Road
Hampton, New Hampshire 03842

EnviroSystems, Inc. Sample Deliver Group Reference 26884

Study Specific Reference 26884-100

LABORATORY STANDARDS STATEMENT

This study was performed by EnviroSystems, Incorporated at its facility in Hampton, New Hampshire. EnviroSystems' laboratory is accredited by the State of New Hampshire under the National Environmental Laboratory Accreditation (NELAC) program. Additionally, ESI is accredited under the Department of Defense (DoD) ELAP program, ISO/IEC 17025:2005, Certificate Number L2340. All testing conducted by EnviroSystems as part of this program was compliant with NELAC guidelines and standards. Additionally, this study was conducted in accordance with guidelines presented in the 2004 version of the New England District's Regional Implementation Manual (RIM) for Evaluation of Dredged Material Proposed for Disposal In New England Waters. Any deviations from specific elements of the RIM are detailed in the Protocol Deviation Section of this Report.

For EnviroSystems, Inc. Kenneth A. Simon — February 25, 2016

Kenneth A. Simon
Technical Director

Date

CHEMICAL ANALYSIS
OF A MARINE SEDIMENT:

Point Judith Pond
Federal Project Channel Extension, Galilee Project
Narragansett, Rhode Island

1.0 SAMPLE COLLECTION, PRESERVATION AND STORAGE

Sediment samples for chemical and physical analysiswere provided by CLE Environmental, Inc. from locations specified within the project work plan. Samples were received under chain of custody in sample containers appropriate for the specified analysis. Upon arrival at the laboratory, all samples received an internal sample control number and were logged into the project sample control sy stem. Samples were placed in a secure sample holding location and stored at a temperature of 4±2 °C until analysis.

2.0 ANALYSIS

Sample analysis was carried out following methods and protocol specified in the project Sample Analysis Plan by EnviroSystems, Inc. at its Hampton, NH facility. Review of the data report document showed that all sample holding times were met, unless otherwise qualified, that the analytical methods used in the analysis were appropriate for the parameter and sample matrix and met New England District Regional Implementation Manual requirements. Review of supporting quality assurance data documented that, except where qualified, all data collected meet all of the requirements of NELAC, for all NELAC accredited parameters.

3.0 RESULTS

Analytical methods used in the analysis of sediment samples were analyzed using protocol recommended in Tables 2 and 3 of the New England District RIM document with appropriate updates related to current methods. Trace metals were evaluated using EPA Method 6020, Inductively Coupled Plasma - Mass Spectrometry (ICP-MS), mercury was evaluated using EPA Method 245.7, Cold Vapor Atomic Fluorescence Spectrometry. PCB Congeners and PAH compounds were analyzed by EPA Method 8270C - SIM. Pesticides were analyzed by EPA Method 8081B. In cases where dilution of the sample extract was required the final reporting limit remained below the RIM document specified limits and did not result in artificial "Non Detects."

A review of QC data documented two incidences where the %R fell outside of acceptable limits. There were two incidences of the %RR exceeding the acceptable limit in a laboratory duplicate and one incidence of a low %R in a laboratory control sample.

A full copy of the analytical report is included in the following data appendix

TABLE OF CONTENTS

Report No: 26884 SDG:
Project: Point Judith Pond Federal Project Channel Extension, Narragansett, RI

Sample ID: RISDS-A
Matrix: Solid
Sampled: 12/17/15

Parameter		Result		Quant Limit	Units	Date Prepared	Date of Analysis	INIT/Method/Reference
Total solids	26884-041	82		0.1	%	02/09/16 1410	02/09/16 1410	JH /160.3 EPA 600/4/79/020
Organic Carbon Rep 1	26884-041	0.26	J2	0.1	%	02/09/16 1530	02/16/16 0700	AC /SW846 9060
Organic Carbon Rep 2	26884-041	0.29	J2	0.1	%	02/09/16 1530	02/16/16 0700	AC /SW846 9060
Arsenic, total	26884-041	2.8		0.1	ug/g dry wt	02/10/16 1130	02/10/16	JLH/SW846 3rd Ed. 6020
Cadmium, total	26884-041	ND		0.03	ug/g dry wt	02/10/16 1130	02/10/16	JLH/SW846 3rd Ed. 6020
Chromium, total	26884-041	9.6		0.1	ug/g dry wt	02/10/16 1130	02/10/16	JLH/SW846 3rd Ed. 6020
Copper, total	26884-041	2.3		0.03	ug/g dry wt	02/10/16 1130	02/10/16	JLH/SW846 3rd Ed. 6020
Lead, total	26884-041	6.2		0.03	ug/g dry wt	02/10/16 1130	02/10/16	JLH/SW846 3rd Ed. 6020
Mercury, total	26884-041	ND		0.01	ug/g dry wt	02/10/16 1130	02/16/16 1500	JLH/EPA 245.7
Nickel, total	26884-041	4.7		0.1	ug/g dry wt	02/10/16 1130	02/10/16	JLH/SW846 3rd Ed. 6020
Zinc, total	26884-041	17		0.1	ug/g dry wt	02/10/16 1130	02/10/16	JLH/SW846 3rd Ed. 6020

Notes:

ND = Not Detected

J2 = LCS %R on Rep 1 was low. The average of Rep 1 and Rep 2 passed.

Report No: 26884 SDG:
Project: Point Judith Pond Federal Project Channel Extension, Narragansett, RI

Sample ID: Site Composite
Matrix: Solid
Sampled: 01/13/16 0940

Parameter		Result		Quant Limit	Units	Date Prepared	Date of Analysis	INIT/Method/Reference
Total solids	26884-100	74		0.1	%	02/09/16 1410	02/09/16 1410	JH /160.3 EPA 600/4/79/020
Organic Carbon Rep 1	26884-100	0.57	J2J5	0.1	%	02/09/16 1530	02/16/16 0700	AC /SW846 9060
Organic Carbon Rep 2	26884-100	0.51	J2J5	0.1	%	02/09/16 1530	02/16/16 0700	AC /SW846 9060
Arsenic, total	26884-100	1.5		0.1	ug/g dry wt	02/10/16 1130	02/10/16	JLH/SW846 3rd Ed. 6020
Cadmium, total	26884-100	0.14		0.03	ug/g dry wt	02/10/16 1130	02/10/16	JLH/SW846 3rd Ed. 6020
Chromium, total	26884-100	10		0.1	ug/g dry wt	02/10/16 1130	02/10/16	JLH/SW846 3rd Ed. 6020
Copper, total	26884-100	5.2		0.03	ug/g dry wt	02/10/16 1130	02/10/16	JLH/SW846 3rd Ed. 6020
Lead, total	26884-100	4.7		0.03	ug/g dry wt	02/10/16 1130	02/10/16	JLH/SW846 3rd Ed. 6020
Mercury, total	26884-100	0.015		0.01	ug/g dry wt	02/10/16 1130	02/16/16 1500	JLH/EPA 245.7
Nickel, total	26884-100	6.2		0.1	ug/g dry wt	02/10/16 1130	02/10/16	JLH/SW846 3rd Ed. 6020
Zinc, total	26884-100	23		0.1	ug/g dry wt	02/10/16 1130	02/10/16	JLH/SW846 3rd Ed. 6020

Notes:

J2 = LCS %R on Rep 1 was low. The average of Rep 1 and Rep 2 passed.

J5 = Estimate, MS %R below limit.

PCB Congeners in Sediment
SW 846 8082/EPA 680 modified

Lab Number:	26884-041
Sample Designation:	RISDS-A
Date Sampled:	12/17/15
Date Extracted:	02/10/16
Date Analyzed:	02/13/16
Matrix:	Solid
Moisture (%):	18
Sample Amount (g):	25
Final Volume (mL)	1.0
Dilution Factor:	1

Congener Number	PCB Congener	Concentration (ug/Kg)	Qualifier
8	2,4'-dichlorobiphenyl	0.05	U
18	2,2',5-trichlorobiphenyl	0.05	U
28	2,4,4'-trichlorobiphenyl	0.05	U
44	2,2',3,5'-tetrachlorobiphenyl	0.05	U
49	2,2',4,5'-tetrachlorobiphenyl	0.05	U
52	2,2',5,5'-tetrachlorobiphenyl	0.05	U
66	2,3',4,4'-tetrachlorobiphenyl	0.05	U
77	3,3',4,4'-tetrachlorobiphenyl	0.05	U
87	2,2',3,4,5'-pentachlorobiphenyl	0.05	U
101	2,2',4,5,5'-pentachlorobiphenyl	0.09	
105	2,3,3',4,4'-pentachlorobiphenyl	0.05	U
118	2,3',4,4',5-pentachlorobiphenyl	0.07	
126	3,3',4,4',5-pentachlorobiphenyl	0.05	
128	2,2',3,3',4,4'-hexachlorobiphenyl	0.05	U
138	2,2',3,4,4',5'-hexachlorobiphenyl	0.06	
153	2,2',4,4',5,5'-hexachlorobiphenyl	0.12	
156	2,3,3',4,4',5-hexachlorobiphenyl		
169	3,3',4,4',5,5'-hexachlorobiphenyl		
170	2,2',3,3',4,4',5-heptachlorobiphenyl	0.05	U
180	2,2',3,4,4',5,5'-heptachlorobiphenyl	0.07	
183	2,2',3,4,4',5',6-heptachlorobiphenyl	0.05	U
184	2,2',3,4,4',6,6'-heptachlorobiphenyl	0.05	U
187	2,2',3,4',5,5',6-heptachlorobiphenyl	0.05	U
195	2,2',3,3',4,4',5,6-octachlorobiphenyl	0.05	U
206	2,2',3,3',4,4',5,5',6-nonachlorobiphenyl	0.05	U
209	2,2',3,3',4,4',5,5',6,6'-decachlorobiphenyl	0.06	

Surrogate Standard	Recovery (%)	Advisory Limits (%)
PCB 198	100	30 - 150

U = Not detected at value reported

PCB Congeners in Sediment
SW 846 8082/EPA 680 modified

Lab Number:	26884-100
Sample Designation:	Site Composite
Date Sampled:	01/13/16
Date Extracted:	02/10/16
Date Analyzed:	02/12/16
Matrix:	Solid
Moisture (%):	26
Sample Amount (g):	29
Final Volume (mL)	1.0
Dilution Factor:	1

Congener Number	PCB Congener	Concentration (ug/Kg)	Qualifier
8	2,4'-dichlorobiphenyl	0.06	
18	2,2',5-trichlorobiphenyl	0.05	U
28	2,4,4'-trichlorobiphenyl	0.05	U
44	2,2',3,5'-tetrachlorobiphenyl	0.16	
49	2,2',4,5'-tetrachlorobiphenyl	0.16	
52	2,2',5,5'-tetrachlorobiphenyl	0.31	
66	2,3',4,4'-tetrachlorobiphenyl	0.05	U
77	3,3',4,4'-tetrachlorobiphenyl	0.05	U
87	2,2',3,4,5'-pentachlorobiphenyl	0.20	
101	2,2',4,5,5'-pentachlorobiphenyl	0.43	
105	2,3,3',4,4'-pentachlorobiphenyl	0.18	
118	2,3',4,4',5-pentachlorobiphenyl	0.36	
126	3,3',4,4',5-pentachlorobiphenyl	0.05	U
128	2,2',3,3',4,4'-hexachlorobiphenyl	0.12	
138	2,2',3,4,4',5'-hexachlorobiphenyl	0.65	
153	2,2',4,4',5,5'-hexachlorobiphenyl	0.72	J8
156	2,3,3',4,4',5-hexachlorobiphenyl		
169	3,3',4,4',5,5'-hexachlorobiphenyl		
170	2,2',3,3',4,4',5-heptachlorobiphenyl	0.26	
180	2,2',3,4,4',5,5'-heptachlorobiphenyl	0.81	J8
183	2,2',3,4,4',5',6-heptachlorobiphenyl	0.21	
184	2,2',3,4,4',6,6'-heptachlorobiphenyl	0.05	U
187	2,2',3,4',5,5',6-heptachlorobiphenyl	0.56	
195	2,2',3,3',4,4',5,6-octachlorobiphenyl	0.07	
206	2,2',3,3',4,4',5,5',6-nonachlorobiphenyl	0.10	
209	2,2',3,3',4,4',5,5',6,6'-decachlorobiphenyl	0.05	U

Surrogate Standard	Recovery (%)	Advisory Limits (%)
PCB 198	83	30 - 150

U = Not detected at value reported
J8 = Estimate. Dup %RR above limit.

Polynuclear Aromatic Hydrocarbons in Sediment
SW 846 8270/EPA 680 modified

Lab Number:	26884-041
Sample Designation:	RISDS-A
Date Sampled:	12/17/15
Date Extracted:	02/10/16 0900
Date Analyzed:	02/11/16
Matrix:	Solid
Moisture (%):	18
Sample Amount (g):	25
Final Volume (mL)	1.00
Dilution Factor:	1

Compound	Concentration (ug/Kg)	Qualifier
naphthalene	10	U
acenaphthylene	10	U
acenaphthene	10	U
fluorene	10	U
phenanthrene	20	
anthracene	5	J
fluoranthene	13	
pyrene	9	J
benzo[a]anthracene	10	U
chrysene	10	U
benzo[b]fluoranthene	10	U
benzo[k]fluoranthene	10	U
benzo[a]pyrene	10	U
indeno[1,2,3-cd]pyrene	10	U
dibenz[a,h]anthracene	10	U
benzo[g,h,i]perylene	10	U

Surrogate Standards	Recovery (%)	Advisory Limits (%)
2-fluorobiphenyl	79	30 - 150
o-terphenyl	109	30 - 150

U = Not detected at the reporting limit.

J = Analyte detected below the reprting limt.

Polynuclear Aromatic Hydrocarbons in Sediment
SW 846 8270/EPA 680 modified

Lab Number:	26884-100
Sample Designation:	Site Composite
Date Sampled:	01/13/16 0940
Date Extracted:	02/10/16 0900
Date Analyzed:	02/11/16
Matrix:	Solid
Moisture (%):	26
Sample Amount (g):	29
Final Volume (mL)	1.00
Dilution Factor:	1

Compound	Concentration (ug/Kg)	Qualifier
naphthalene	10	U
acenaphthylene	10	U
acenaphthene	10	U
fluorene	10	U
phenanthrene	29	
anthracene	9	J
fluoranthene	54	
pyrene	54	
benzo[a]anthracene	21	
chrysene	32	
benzo[b]fluoranthene	25	
benzo[k]fluoranthene	18	
benzo[a]pyrene	16	
indeno[1,2,3-cd]pyrene	11	
dibenz[a,h]anthracene	10	U
benzo[g,h,i]perylene	12	

Surrogate Standards	Recovery (%)	Advisory Limits (%)
2-fluorobiphenyl	66	30 - 150
o-terphenyl	86	30 - 150

U = Not detected at the reporting limit.

J = Analyte detected below the reprting limt.

Pesticides in Sediment
SW 846 8081B

Lab Number:	26884-041
Sample Designation:	RISDS-A
Date Sampled:	12/17/15
Date Extracted:	02/10/16 0900
Date Analyzed:	02/12/16
Matrix:	Solid
Moisture (%):	18
Sample Amount (g):	25
Final Volume (mL)	1.0
Dilution Factor:	1

Analyte	Concentration (ug/Kg)	Qualifier
aldrin	0.13	T
gamma-chlordane (cis)	0.1	U
alpha-chlordane (trans)	0.1	U
cis-nonachlor	0.1	U
trans-nonachlor	0.1	U
oxychlordane	0.1	U
4,4'-DDT	0.2	U
4,4'-DDE	0.2	U
4,4'-DDD	0.2	U
alpha-BHC	0.1	U
dieldrin	0.2	U
endosulfan I	0.1	U
endosulfan II	0.2	U
endrin	0.2	U
heptachlor	0.1	U
heptachlor epoxide	0.1	U
hexachlorobenzene	0.1	U
gamma-BHC (lindane)	0.1	U
methoxychlor	1	U
toxaphene	5	U

Surrogate Standard	Recovery (%)	Advisory Limits (%)
tetrachloro-m-xylene	41	30 - 150
decachlorobiphenyl	78	30 - 150

U = Not detected at indicated level.
T = Concentrations of target analytes were too low for GCMS confirmation. Compound identification is tentative.

Pesticides in Sediment
SW 846 8081B

Lab Number:	26884-100
Sample Designation:	Site Composite
Date Sampled:	01/13/16 0940
Date Extracted:	02/10/16 0900
Date Analyzed:	02/11/16
Matrix:	Solid
Moisture (%):	26
Sample Amount (g):	29
Final Volume (mL)	1.0
Dilution Factor:	1

Analyte	Concentration (ug/Kg)	Qualifier
aldrin	0.14	T
gamma-chlordane (cis)	0.09	U
alpha-chlordane (trans)	0.09	U
cis-nonachlor	0.09	U
trans-nonachlor	0.36	T
oxychlordane	0.09	U
4,4'-DDT	0.43	P
4,4'-DDE	0.44	P
4,4'-DDD	0.2	U
alpha-BHC	0.09	U
dieldrin	0.24	T
endosulfan I	0.09	U
endosulfan II	0.2	U
endrin	0.2	U
heptachlor	0.09	U
heptachlor epoxide	0.09	U
hexachlorobenzene	0.09	U
gamma-BHC (lindane)	0.09	U
methoxychlor	0.9	U
toxaphene	5	U

Surrogate Standard	Recovery (%)	Advisory Limits (%)
tetrachloro-m-xylene	56	30 - 150
decachlorobiphenyl	61	30 - 150

U = Not detected at indicated level.
T = Concentrations of target analytes were too low for GCMS confirmation. Compound identification is tentative.
P = Presence of analyte confirmed by GC-MS.

Quality Control Summary

Parameter: Arsenic, total
Project: Rhode Island Dredge Sediment Evaluations
Matrix: Solid
QC Batch No: 440S

Pertains to samples:

Lab ID	Sample ID	Lab ID	Sample ID
26884-041	RISDS-A		
26884-100	Site Composite		
26884-101	Composite 1		
26884-102	Composite 2		
26884-103	Composite A		
26884-104	Composite B		

	Control Limit +/-	Preparation Blank Result ug/g dry wt	Q		M
PB440S	0.1	0.1	U		Pass

LABORATORY CONTROL SAMPLE RECOVERY

ID	Control Limit %	Lab Control Sample Result ug/g dry wt	True Value ug/g dry wt	%R	Lab Control Dup Sample Result ug/g dry wt	True Value ug/g dry wt	%R	
LCS	85-115	23.9	25	96	24.8	25	99	Pass
SRM	70-130	17.9	18.9	95				Pass

DUPLICATE ANALYSIS

ID	Control Limit %	Duplicate Result ug/g dry wt	Q	Sample Result ug/g dry wt	Q	RPD	Q	
26884-100	20	1.52		1.54		1		Pass

SPIKE SAMPLE ANALYSIS

ID	Control Limit %	Spiked Sample Result ug/g dry wt	Spike Added ug/g dry wt	Sample Result ug/g dry wt	Q	%R	Q	
26884-100S	80-120	26.5	26.0	1.54		96		Pass
26884-100SD	80-120	27.1	26.4	1.54		97		Pass

Quality Control Summary

Parameter: Cadmium, total
Project: Rhode Island Dredge Sediment Evaluations
Matrix: Solid
QC Batch No: 440S

Pertains to samples:

Lab ID	Sample ID	Lab ID	Sample ID
26884-041	RISDS-A		
26884-100	Site Composite		
26884-101	Composite 1		
26884-102	Composite 2		
26884-103	Composite A		
26884-104	Composite B		

	Control Limit +/-	Preparation Blank Result ug/g dry wt	Q		M
PB440S	0.03	0.03	U		Pass

LABORATORY CONTROL SAMPLE RECOVERY

ID	Control Limit %	Lab Control Sample Result ug/g dry wt	True Value ug/g dry wt	%R	Lab Control Dup Sample Result ug/g dry wt	True Value ug/g dry wt	%R	
LCS	85-115	11.9	12.5	95	12.1	12.5	97	Pass
SRM	70-130	8.16	8.8	93				Pass

DUPLICATE ANALYSIS

ID	Control Limit %	Duplicate Result ug/g dry wt	Q	Sample Result ug/g dry wt	Q	RPD	Q	
26884-100	20	0.14		0.14		NC		Pass

SPIKE SAMPLE ANALYSIS

ID	Control Limit %	Spiked Sample Result ug/g dry wt	Spike Added ug/g dry wt	Sample Result ug/g dry wt	Q	%R	Q	
26884-100S	80-120	12.9	13.0	0.14		98		Pass
26884-100SD	80-120	13.1	13.2	0.14		98		Pass

Quality Control Summary

Parameter: Chromium, total
Project: Rhode Island Dredge Sediment Evaluations
Matrix: Solid
QC Batch No: 440S

Pertains to samples:

Lab ID	Sample ID	Lab ID	Sample ID
26884-041	RISDS-A		
26884-100	Site Composite		
26884-101	Composite 1		
26884-102	Composite 2		
26884-103	Composite A		
26884-104	Composite B		

	Control Limit +/-	Preparation Blank Result ug/g dry wt	Q		M
PB440S	0.1	0.11			High

LABORATORY CONTROL SAMPLE RECOVERY

ID	Control Limit %	Lab Control Sample Result ug/g dry wt	True Value ug/g dry wt	%R	Lab Control Dup Sample Result ug/g dry wt	True Value ug/g dry wt	%R	
LCS	85-115	19.4	20	97	19.7	20	98	Pass
SRM	70-130	186	266	70				Pass

DUPLICATE ANALYSIS

ID	Control Limit %	Duplicate Result ug/g dry wt	Q	Sample Result ug/g dry wt	Q	RPD	Q	
26884-100	20	9.17		9.97		8		Pass

SPIKE SAMPLE ANALYSIS

ID	Control Limit %	Spiked Sample Result ug/g dry wt	Spike Added ug/g dry wt	Sample Result ug/g dry wt	Q	%R	Q	
26884-100S	80-120	29.5	20.8	9.97		94		Pass
26884-100SD	80-120	30.1	21.1	9.97		95		Pass

Quality Control Summary

Parameter: Copper, total
Project: Rhode Island Dredge Sediment Evaluations
Matrix: Solid
QC Batch No: 440S

Pertains to samples:

Lab ID	Sample ID	Lab ID	Sample ID
26884-041	RISDS-A		
26884-100	Site Composite		
26884-101	Composite 1		
26884-102	Composite 2		
26884-103	Composite A		
26884-104	Composite B		

	Control Limit +/-	Preparation Blank Result ug/g dry wt	Q		M
PB440S	0.03	0.05			High

LABORATORY CONTROL SAMPLE RECOVERY

ID	Control Limit %	Lab Control Sample Result ug/g dry wt	True Value ug/g dry wt	%R	Lab Control Dup Sample Result ug/g dry wt	True Value ug/g dry wt	%R	
LCS	85-115	23.9	25	96	24.3	25	97	Pass
SRM	70-130	331	380	87				Pass

DUPLICATE ANALYSIS

ID	Control Limit %	Duplicate Result ug/g dry wt	Q	Sample Result ug/g dry wt	Q	RPD	Q	
26884-100	20	5.11		5.19		2		Pass

SPIKE SAMPLE ANALYSIS

ID	Control Limit %	Spiked Sample Result ug/g dry wt	Spike Added ug/g dry wt	Sample Result ug/g dry wt	Q	%R	Q	
26884-100S	80-120	29.7	26.0	5.19		94		Pass
26884-100SD	80-120	30.5	26.4	5.19		96		Pass

Quality Control Summary

Parameter: Lead, total
Project: Rhode Island Dredge Sediment Evaluations
Matrix: Solid
QC Batch No: 440S

Pertains to samples:

Lab ID	Sample ID	Lab ID	Sample ID
26884-041	RISDS-A		
26884-100	Site Composite		
26884-101	Composite 1		
26884-102	Composite 2		
26884-103	Composite A		
26884-104	Composite B		

	Control Limit +/-	Preparation Blank Result ug/g dry wt	Q		M
PB440S	0.03	0.03	U		Pass

LABORATORY CONTROL SAMPLE RECOVERY

ID	Control Limit %	Lab Control Sample Result ug/g dry wt	True Value ug/g dry wt	%R	Lab Control Dup Sample Result ug/g dry wt	True Value ug/g dry wt	%R	
LCS	85-115	23.7	25	95	24.1	25	96	Pass
SRM	70-130	290	330	88				Pass

DUPLICATE ANALYSIS

ID	Control Limit %	Duplicate Result ug/g dry wt	Q	Sample Result ug/g dry wt	Q	RPD	Q	
26884-100	20	4.79		4.71		2		Pass

SPIKE SAMPLE ANALYSIS

ID	Control Limit %	Spiked Sample Result ug/g dry wt	Spike Added ug/g dry wt	Sample Result ug/g dry wt	Q	%R	Q	
26884-100S	80-120	30.8	26.0	4.71		100		Pass
26884-100SD	80-120	30.3	26.4	4.71		97		Pass

Quality Control Summary

Parameter: Mercury, total
Project: Rhode Island Dredge Sediment Evaluations
Matrix: Solid
QC Batch No: 130S

Pertains to samples:

Lab ID	Sample ID	Lab ID	Sample ID
26884-041	RISDS-A		
26884-100	Site Composite		
26884-101	Composite 1		
26884-102	Composite 2		
26884-103	Composite A		
26884-104	Composite B		

	Control Limit +/-	Preparation Blank Result ug/g	Q		M
PB130S	0.01	0.01	U		Pass

LABORATORY CONTROL SAMPLE RECOVERY

ID	Control Limit %	Lab Control Sample Result ug/g	True Value ug/g	%R	Lab Control Dup Sample Result ug/g	True Value ug/g	%R	
LCS	85-115	1.51	1.6	94	1.54	1.6	96	Pass
SRM	70-130	3.68	3.4	108				Pass

DUPLICATE ANALYSIS

ID	Control Limit %	Duplicate Result ug/g dry wt	Q	Sample Result ug/g dry wt	Q	RPD	Q	
26884-100	20	0.014		0.015		NC		Pass

SPIKE SAMPLE ANALYSIS

ID	Control Limit %	Spiked Sample Result ug/g dry wt	Spike Added ug/g dry wt	Sample Result ug/g dry wt	Q	%R	Q	
26884-100S	80-120	1.59	1.66	0.015		95		Pass
26884-100SD	80-120	1.68	1.69	0.015		99		Pass

Quality Control Summary

Parameter: Nickel, total
Project: Rhode Island Dredge Sediment Evaluations
Matrix: Solid
QC Batch No: 440S

Pertains to samples:

Lab ID	Sample ID	Lab ID	Sample ID
26884-041	RISDS-A		
26884-100	Site Composite		
26884-101	Composite 1		
26884-102	Composite 2		
26884-103	Composite A		
26884-104	Composite B		

	Control Limit +/-	Preparation Blank Result ug/g dry wt	Q		M
PB440S	0.1	0.1	U		Pass

LABORATORY CONTROL SAMPLE RECOVERY

ID	Control Limit %	Lab Control Sample Result ug/g dry wt	True Value ug/g dry wt	%R	Lab Control Dup Sample Result ug/g dry wt	True Value ug/g dry wt	%R	
LCS	85-115	48.0	50	96	48.8	50	98	Pass
SRM	70-130	57.3	76.1	75				Pass

DUPLICATE ANALYSIS

ID	Control Limit %	Duplicate Result ug/g dry wt	Q	Sample Result ug/g dry wt	Q	RPD	Q	
26884-100	20	5.67		6.21		9		Pass

SPIKE SAMPLE ANALYSIS

ID	Control Limit %	Spiked Sample Result ug/g dry wt	Spike Added ug/g dry wt	Sample Result ug/g dry wt	Q	%R	Q	
26884-100S	80-120	55.6	52.0	6.21		95		Pass
26884-100SD	80-120	55.9	52.8	6.21		94		Pass

Quality Control Summary

Parameter: Zinc, total
Project: Rhode Island Dredge Sediment Evaluations
Matrix: Solid
QC Batch No: 440S

Pertains to samples:

Lab ID	Sample ID	Lab ID	Sample ID
26884-041	RISDS-A		
26884-100	Site Composite		
26884-101	Composite 1		
26884-102	Composite 2		
26884-103	Composite A		
26884-104	Composite B		

	Control Limit +/-	Preparation Blank Result ug/g dry wt	Q		M
PB440S	0.1	0.1	U		Pass

LABORATORY CONTROL SAMPLE RECOVERY

ID	Control Limit %	Lab Control Sample Result ug/g dry wt	True Value ug/g dry wt	%R	Lab Control Dup Sample Result ug/g dry wt	True Value ug/g dry wt	%R	
LCS	85-115	47.4	50	95	48.1	50	96	Pass
SRM	70-130	551	656	84				Pass

DUPLICATE ANALYSIS

ID	Control Limit %	Duplicate Result ug/g dry wt	Q	Sample Result ug/g dry wt	Q	RPD	Q	
26884-100	20	23.4		23.2		1		Pass

SPIKE SAMPLE ANALYSIS

ID	Control Limit %	Spiked Sample Result ug/g dry wt	Spike Added ug/g dry wt	Sample Result ug/g dry wt	Q	%R	Q	
26884-100S	80-120	75.1	52.0	23.2		100		Pass
26884-100SD	80-120	76.4	52.8	23.2		101		Pass

Metals by ICPMS and Mercury by CVAF
EPA 200.8 SW846 6020 and EPA 245.7

Lab Number: MDL2015
Sample Designatior Solid
Date Analyzed: 03/15/15
Date Analyzed: 02/04/15 Mercury
Matrix: Solid
Sample Amount (g) 1
Final Volume (mL) 50

	True Value	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	RL	MDL
	ug/g	ug/g	ug/g	ug/g	ug/g	ug/g	ug/g	ug/g	ug/g	ug/g
Aluminum, total	0.5	0.544	0.481	0.449	0.364	0.291	0.491	0.468	0.25	0.3
Antimony, total	0.01	0.00955	0.0101	0.00945	0.01	0.0102	0.0099	0.00945	0.10	0.001
Arsenic, total	0.025	0.0222	0.0272	0.029	0.0229	0.0245	0.027	0.0261	0.10	0.007
Barium, total	0.2	0.193	0.193	0.191	0.2	0.205	0.193	0.195	0.10	0.015
Beryllium, total	0.005	0.00495	0.00565	0.0051	0.00505	0.00495	0.00495	0.00505	0.10	0.001
Boron, total	0.05	0.034	0.0343	0.0364	0.0338	0.0311	0.0329	0.0315	0.25	0.005
Cadmium, total	0.0125	0.013	0.0124	0.0129	0.0126	0.0129	0.0123	0.0125	0.10	0.001
Calcium, total	0.5	0.5	0.55	0.4	0.55	0.55	0.55	0.45	0.10	0.18
Chromium, total	0.02	0.0188	0.0198	0.0191	0.0198	0.0192	0.0198	0.0191	0.10	0.0012
Cobalt, total	0.05	0.0478	0.0481	0.0476	0.0465	0.0472	0.0464	0.0472	0.10	0.0019
Copper, total	0.025	0.0237	0.0244	0.0244	0.0237	0.0243	0.0234	0.0236	0.10	0.0012
Iron, total	0.25	0.271	0.266	0.272	0.168	0.149	0.201	0.194	0.25	0.15
Lead, total	0.025	0.0245	0.0244	0.0242	0.0246	0.0249	0.0242	0.0242	0.10	0.001
Magnesium, total	0.5	0.5	0.45	0.45	0.35	0.3	0.5	0.55	0.25	0.3
Manganese, total	0.05	0.0468	0.0464	0.0478	0.0467	0.0463	0.0486	0.0482	0.10	0.003
Mercury, total	0.025	0.0273	0.0264	0.0272	0.0266	0.0268	0.027	0.0277	0.01	0.002
Molybdenum, total	0.05	0.0536	0.0512	0.0521	0.0441	0.0434	0.0334	0.0321	0.10	0.03
Nickel, total	0.05	0.0476	0.0491	0.0476	0.0467	0.0482	0.0483	0.0469	0.10	0.003
Potassium, total	1.25	1.3	1.35	1.45	1.15	1.15	1.3	1.3	0.10	0.3
Selenium, total	0.025	0.0267	0.0269	0.026	0.0245	0.0261	0.0282	0.0283	0.10	0.004
Silver, total	0.025	0.0236	0.0248	0.0248	0.0248	0.0252	0.0241	0.0246	0.10	0.0016
Sodium, total	1.25	1.15	1.1	1.25	1	0.95	1.1	1.15	0.25	0.3
Strontium, total	0.01	0.0099	0.00995	0.00975	0.00975	0.01	0.0099	0.0098	0.10	0.001
Thallium, total	0.025	0.0195	0.0196	0.0196	0.019	0.0191	0.0182	0.0175	0.10	0.003
Tin, total	0.01	0.0088	0.00835	0.00835	0.0093	0.00915	0.00885	0.0091	0.10	0.0011
Vanadium, total	0.05	0.0484	0.0476	0.0483	0.0479	0.0477	0.0489	0.0483	0.10	0.0013
Zinc, total	0.05	0.0496	0.0527	0.0519	0.0522	0.0491	0.0504	0.0495	0.10	0.005

Quality Control Summary

Parameter: Organic carbon Rep 1
Project: Rhode Island Dredge Sediment Evaluations
Matrix: Solid
QC Batch No: 461S

Pertains to samples:

Lab ID	Sample ID	Lab ID	Sample ID
26884-041	RISDS-A		
26884-100	Site Composite		
26884-101	Composite 1		
26884-102	Composite 2		
26884-103	Composite A		
26884-104	Composite B		

	Control Limit +/-	Preparation Blank Result %	Q		M
PB461S	0.1	0.1	U		Pass

LABORATORY CONTROL SAMPLE RECOVERY

ID	Control Limit %	Lab Control Sample Result %	True Value %	%R	Lab Control Dup Sample Result %	True Value %	%R	
LCS	70-130	0.68	1	68	0.78	1	78	Low
SRM	70-130	3.7	4.4	85				Pass

DUPLICATE ANALYSIS

ID	Control Limit %	Duplicate Result %	Q	Sample Result %	Q	RPD	Q	
26884-100	30	0.54		0.57		5		Pass

SPIKE SAMPLE ANALYSIS

ID	Control Limit %	Spiked Sample Result %	Spike Added %	Sample Result %	Q	%R	Q	
26884-100S	60-140	1.06	1	0.57		49	J5	Low
26884-100SD	60-140	1.16	1	0.57		59	J5	Low

J2 = LCS %R below limit.
J5 = MS %R below limit

Quality Control Summary

Parameter: Organic carbon Rep 2
Project: Rhode Island Dredge Sediment Evaluations
Matrix: Solid
QC Batch No: 461S SDG: 0

Pertains to samples:

Lab ID	Sample ID	Lab ID	Sample ID
26884-041	RISDS-A		
26884-100	Site Composite		
26884-101	Composite 1		
26884-102	Composite 2		
26884-103	Composite A		
26884-104	Composite B		

	Control Limit +/-	Preparation Blank Result %	Q		M
PB461S	0.1	0.1	U		Pass

LABORATORY CONTROL SAMPLE RECOVERY

ID	Control Limit %	Lab Control Sample Result %	True Value %	%R	Lab Control Dup Sample Result %	True Value %	%R	
LCS	70-130	0.83	1	83	0.73	1	73	Pass
SRM	70-130	3.17	4.4	72				Pass

DUPLICATE ANALYSIS

ID	Control Limit %	Duplicate Result %	Q	Sample Result %	Q	RPD	Q	
26884-100	30	0.62		0.51		19		Pass

SPIKE SAMPLE ANALYSIS

ID	Control Limit %	Spiked Sample Result %	Spike Added %	Sample Result %	Q	%R	Q	
26884-100S	60-140	1.10	1	0.51		59	J5	Low
26884-100SD	60-140	1.11	1	0.51		60	J5	Low

J5 = MS %R below limit

Wet Chemistry
SW846 9060
Total Organic Carbon in Sediment

Lab Number:	MDL S 2015
Sample Designation:	Sediment
Date Sampled:	01/22/15
Date Analyzed:	01/22/15
Matrix:	Sediment
Moisture:	NA
Sample Amount (mL):	NA
Final Volume (mL)	NA
Dilution Factor:	1

	True Value % Dry Wt	Replicate 1 % Dry Wt	Replicate 2 % Dry Wt	Replicate 3 % Dry Wt	Replicate 4 % Dry Wt	Replicate 5 % Dry Wt	Replicate 6 % Dry Wt	Replicate 7 % Dry Wt	Std Dev % Dry Wt	MDL % Dry Wt
Total Organic Carbon	0.1	0.08	0.06	0.06	0.06	0.08	0.04	0.12	0.02	0.07

PCB Congeners in Sediment
SW 846 8082/EPA 680 modified

Lab Number:	PB921S
Sample Designation:	Laboratory Blank PB921S
Date Sampled:	02/10/16
Date Extracted:	02/10/16
Date Analyzed:	02/12/16
Matrix:	Solid
Sample Amount (g):	20
Final Volume (mL)	1.00
Dilution Factor:	1

Congener Number	PCB Congener	Concentration (ug/Kg)	Qualifier
8	2,4'-dichlorobiphenyl	0.1	U
18	2,2',5-trichlorobiphenyl	0.1	U
28	2,4,4'-trichlorobiphenyl	0.1	U
44	2,2',3,5'-tetrachlorobiphenyl	0.1	U
49	2,2',4,5'-tetrachlorobiphenyl	0.1	U
52	2,2',5,5'-tetrachlorobiphenyl	0.1	U
66	2,3',4,4'-tetrachlorobiphenyl	0.1	U
77	3,3',4,4'-tetrachlorobiphenyl	0.1	U
87	2,2',3,4,5'-pentachlorobiphenyl	0.1	U
101	2,2',4,5,5'-pentachlorobiphenyl	0.1	U
105	2,3,3',4,4'-pentachlorobiphenyl	0.1	U
118	2,3',4,4',5-pentachlorobiphenyl	0.1	U
126	3,3',4,4',5-pentachlorobiphenyl	0.1	U
128	2,2',3,3',4,4'-hexachlorobiphenyl	0.1	U
138	2,2',3,4,4',5'-hexachlorobiphenyl	0.1	U
153	2,2',4,4',5,5'-hexachlorobiphenyl	0.1	U
156	2,3,3',4,4',5-hexachlorobiphenyl		
169	3,3',4,4',5,5'-hexachlorobiphenyl		
170	2,2',3,3',4,4',5-heptachlorobiphenyl	0.1	U
180	2,2',3,4,4',5,5'-heptachlorobiphenyl	0.1	U
183	2,2',3,4,4',5',6-heptachlorobiphenyl	0.1	U
184	2,2',3,4,4',6,6'-heptachlorobiphenyl	0.1	U
187	2,2',3,4',5,5',6-heptachlorobiphenyl	0.1	U
195	2,2',3,3',4,4',5,6-octachlorobiphenyl	0.1	U
206	2,2',3,3',4,4',5,5',6-nonachlorobiphenyl	0.1	U
209	2,2',3,3',4,4',5,5',6,6'-decachlorobiphenyl	0.1	U

Surrogate Standards	Recovery (%)	Advisory Limits (%)
PCB 198	86	30 - 150

U = Not detected at indicated level.

PCB Congeners in Sediment
SW 846 8082/EPA 680 modified

Lab Number:	LCS921S / LCSD921S
Sample Designation:	Laboratory Control Sample Duplicate
Date Sampled:	02/10/16
Date Extracted:	02/10/16
Date Analyzed:	02/12/16
Matrix:	Solid
Sample Amount (g):	20
Final Volume (mL)	1.00
Dilution Factor:	1

Congener Number	PCB Congener	LCS Concentration (ug/Kg)	LCS Recovery (%)	Recovery Limit (%)	LCSD Concentration (ug/Kg)	LCSD Recovery (%)	Recovery Limit (%)	Relative Difference (%)	RPD Limit (%)
8	2,4'-dichlorobiphenyl	6.65	66	30 - 150	8.1	81	30 - 150	20	30
18	2,2',5-trichlorobiphenyl	6.6	66	30 - 150	7.9	79	30 - 150	18	30
28	2,4,4'-trichlorobiphenyl	6.77	68	30 - 150	8.4	84	30 - 150	22	30
44	2,2',3,5'-tetrachlorobiphenyl	7.15	71	30 - 150	8.7	87	30 - 150	20	30
49	2,2',4,5'-tetrachlorobiphenyl	7.08	71	30 - 150	9.1	91	30 - 150	25	30
52	2,2',5,5'-tetrachlorobiphenyl	6.75	68	30 - 150	8.6	86	30 - 150	24	30
66	2,3',4,4'-tetrachlorobiphenyl	7.97	80	30 - 150	9.3	93	30 - 150	16	30
77	3,3',4,4'-tetrachlorobiphenyl	8.97	90	30 - 150	10	102	30 - 150	13	30
87	2,2',3,4,5'-pentachlorobiphenyl	8.14	81	30 - 150	9.8	98	30 - 150	18	30
101	2,2',4,5,5'-pentachlorobiphenyl	7.49	75	30 - 150	9	90	30 - 150	19	30
105	2,3,3',4,4'-pentachlorobiphenyl	8.33	83	30 - 150	9.8	98	30 - 150	16	30
118	2,3',4,4',5-pentachlorobiphenyl	8.49	85	30 - 150	9.8	98	30 - 150	14	30
126	3,3',4,4',5-pentachlorobiphenyl	8.22	82	30 - 150	10	101	30 - 150	20	30
128	2,2',3,3',4,4'-hexachlorobiphenyl	7.69	77	30 - 150	9.2	92	30 - 150	18	30
138	2,2',3,4,4',5'-hexachlorobiphenyl	7.46	75	30 - 150	9.2	92	30 - 150	21	30
153	2,2',4,4',5,5'-hexachlorobiphenyl	7.86	79	30 - 150	9.4	94	30 - 150	18	30
156	2,3,3',4,4',5-hexachlorobiphenyl			30 - 150			30 - 150		30
169	3,3',4,4',5,5'-hexachlorobiphenyl			30 - 150			30 - 150		30
170	2,2',3,3',4,4',5-heptachlorobiphenyl	8.42	84	30 - 150	10	101	30 - 150	18	30
180	2,2',3,4,4',5,5'-heptachlorobiphenyl	8	80	30 - 150	9.5	95	30 - 150	17	30
183	2,2',3,4,4',5',6-heptachlorobiphenyl	7.89	79	30 - 150	9.5	95	30 - 150	18	30
184	2,2',3,4,4',6,6'-heptachlorobiphenyl	7.59	76	30 - 150	9.1	91	30 - 150	18	30
187	2,2',3,4',5,5',6-heptachlorobiphenyl	7.66	77	30 - 150	9	90	30 - 150	17	30
195	2,2',3,3',4,4',5,6-octachlorobiphenyl	8.02	80	30 - 150	9.5	95	30 - 150	17	30
206	2,2',3,3',4,4',5,5',6-nonachlorobiphenyl	8.38	84	30 - 150	10	100	30 - 150	17	30
209	2,2',3,3',4,4',5,5',6,6'-decachlorobiphen	8.03	80	30 - 150	9.9	99	30 - 150	21	30

Surrogate Standard		Recovery (%)	Advisory Limits (%)	Recovery (%)	Advisory Limits (%)
198	2,2',3,3',4,5,5',6-octachlorobiphenyl	78	30 - 150	94	30 - 150

ESI

PCB Congeners in Sediment
SW 846 8082/EPA 680 modified

Lab Number:	26884-100D
Sample Designation:	Site Composite (Laboratory Duplicate)
Date Sampled:	02/10/16
Date Extracted:	02/10/16
Date Analyzed:	02/12/16
Matrix:	Solid
Moisture (%):	26
Sample Amount (g):	29.00
Final Volume (mL)	1.00
Dilution Factor:	1

Congener Number	PCB Congener	Duplicate Result (ug/Kg)	Duplicate Qualifier	Sample Result (ug/Kg)	Sample Qualifier	Relative Difference (%)	Limit (%)	Qualifier
8	2,4'-dichlorobiphenyl	0.057		0.06		NC	30	
18	2,2',5-trichlorobiphenyl	0.047	U	0.047	U	NC	30	
28	2,4,4'-trichlorobiphenyl	0.049		0.047	U	NC	30	
44	2,2',3,5'-tetrachlorobiphenyl	0.17		0.16		NC	30	
49	2,2',4,5'-tetrachlorobiphenyl	0.17		0.16		NC	30	
52	2,2',5,5'-tetrachlorobiphenyl	0.32		0.31		5	30	
66	2,3',4,4'-tetrachlorobiphenyl	0.047	U	0.047	U	NC	30	
77	3,3',4,4'-tetrachlorobiphenyl	0.047	U	0.047	U	NC	30	
87	2,2',3,4,5'-pentachlorobiphenyl	0.19		0.2		NC	30	
101	2,2',4,5,5'-pentachlorobiphenyl	0.43		0.43		0	30	
105	2,3,3',4,4'-pentachlorobiphenyl	0.18		0.18		NC	30	
118	2,3',4,4',5-pentachlorobiphenyl	0.4		0.36		9	30	
126	3,3',4,4',5-pentachlorobiphenyl	0.047	U	0.047	U	NC	30	
128	2,2',3,3',4,4'-hexachlorobiphenyl	0.11		0.12		NC	30	
138	2,2',3,4,4',5'-hexachlorobiphenyl	0.63		0.65		4	30	
153	2,2',4,4',5,5'-hexachlorobiphenyl	0.5		0.72		36	30	J8
156	2,3,3',4,4',5-hexachlorobiphenyl						30	
169	3,3',4,4',5,5'-hexachlorobiphenyl						30	
170	2,2',3,3',4,4',5-heptachlorobiphenyl	0.13		0.26		NC	30	
180	2,2',3,4,4',5,5'-heptachlorobiphenyl	0.29		0.81		96	30	J8
183	2,2',3,4,4',5',6-heptachlorobiphenyl	0.09		0.21		NC	30	
184	2,2',3,4,4',6,6'-heptachlorobiphenyl	0.047	U	0.047	U	NC	30	
187	2,2',3,4',5,5',6-heptachlorobiphenyl	0.2		0.56		NC	30	
195	2,2',3,3',4,4',5,6-octachlorobiphenyl	0.066		0.069		NC	30	
206	2,2',3,3',4,4',5,5',6-nonachlorobiphenyl	0.047	U	0.1		NC	30	
209	2,2',3,3',4,4',5,5',6,6'-decachlorobipheny	0.056		0.047	U	NC	30	

Surrogate Standard	Recovery (%)	Recovery (%)	Advisory Limits (%)
PCB 198	89	83	30 - 150

U = Not detected at reporting limit.
NC = Not calculated due to one or more values less than five times the reporting limit.
J8 = Estimate. Dup %RR above limit.

PCB Congeners in Sediment
SW 846 8082/EPA 680 modified

Lab Number:	26884-100MSD
Sample Designation:	Site Composite (Matrix Spike Duplicate)
Date Sampled:	02/10/16
Date Extracted:	02/10/16
Date Analyzed:	02/12/16
Matrix:	Solid
Sample Amount (g):	29.00
Final Volume (mL)	1.00
Dilution Factor:	1.00

Congener Number	PCB Congener	Sample Result (ug/Kg)	Amount Added (ug/Kg)	MS Result (ug/Kg)	Recovery (%)	Recovery Limit (%)	MSD Result (ug/Kg)	Recovery (%)	Recovery Limit (%)	Relative Difference (%)	RPD Limit (%)
8	2,4'-dichlorobiphenyl	0.06	9	7.8	83	30 - 150	8.4	89	30 - 150	7	30
18	2,2',5-trichlorobiphenyl	ND	9	7.9	85	30 - 150	7.8	84	30 - 150	2	30
28	2,4,4'-trichlorobiphenyl	ND	9	8.4	90	30 - 150	8.5	91	30 - 150	2	30
44	2,2',3,5'-tetrachlorobiphenyl	0.16	9	8.7	92	30 - 150	8.3	88	30 - 150	5	30
49	2,2',4,5'-tetrachlorobiphenyl	0.16	9	8.9	94	30 - 150	8.3	88	30 - 150	7	30
52	2,2',5,5'-tetrachlorobiphenyl	0.31	9	9	93	30 - 150	8.4	86	30 - 150	7	30
66	2,3',4,4'-tetrachlorobiphenyl	ND	9	9.2	98	30 - 150	9	97	30 - 150	2	30
77	3,3',4,4'-tetrachlorobiphenyl	ND	9	9.8	105	30 - 150	9.4	101	30 - 150	4	30
87	2,2',3,4,5'-pentachlorobiphenyl	0.2	9	9.6	101	30 - 150	8.9	93	30 - 150	8	30
101	2,2',4,5,5'-pentachlorobiphenyl	0.43	9	8.8	90	30 - 150	8.7	89	30 - 150	1	30
105	2,3,3',4,4'-pentachlorobiphenyl	0.18	9	9.2	97	30 - 150	9.1	96	30 - 150	1	30
118	2,3',4,4',5-pentachlorobiphenyl	0.36	9	9.8	102	30 - 150	9.2	94	30 - 150	7	30
126	3,3',4,4',5-pentachlorobiphenyl	ND	9	9.8	105	30 - 150	9.6	103	30 - 150	2	30
128	2,2',3,3',4,4'-hexachlorobiphenyl	0.12	9	8.9	94	30 - 150	8.6	91	30 - 150	3	30
138	2,2',3,4,4',5'-hexachlorobiphenyl	0.65	9	9.1	90	30 - 150	9	90	30 - 150	0	30
153	2,2',4,4',5,5'-hexachlorobiphenyl	0.72	9	9.1	90	30 - 150	8.8	87	30 - 150	3	30
156	2,3,3',4,4',5-hexachlorobiphenyl	NA	NA								
169	3,3',4,4',5,5'-hexachlorobiphenyl	NA	NA								
170	2,2',3,3',4,4',5-heptachlorobiphenyl	0.26	9	9.3	97	30 - 150	9.2	96	30 - 150	1	30
180	2,2',3,4,4',5,5'-heptachlorobiphenyl	0.81	9	8.8	85	30 - 150	8.4	81	30 - 150	4	30
183	2,2',3,4,4',5',6-heptachlorobiphenyl	0.21	9	8.5	89	30 - 150	8.5	89	30 - 150	0	30
184	2,2',3,4,4',6,6'-heptachlorobiphenyl	ND	9	9.2	99	30 - 150	8.2	88	30 - 150	12	30
187	2,2',3,4',5,5',6-heptachlorobiphenyl	0.56	9	8.9	90	30 - 150	8.5	85	30 - 150	5	30
195	2,2',3,3',4,4',5,6-octachlorobiphenyl	0.069	9	8.5	91	30 - 150	8.4	90	30 - 150	1	30
206	2,2',3,3',4,4',5,5',6-nonachlorobiphenyl	0.1	9	8.8	93	30 - 150	8.5	90	30 - 150	3	30
209	2,2',3,3',4,4',5,5',6,6'-decachlorobipheny	ND	9	9	97	30 - 150	8.5	91	30 - 150	6	30

Surrogate Standard	MS Recovery (%)	MS Advisory Limits (%)	MSD Recovery (%)	MSD Advisory Limits (%)
PCB 198	88	30 - 150	87	30 - 150

ND = Not detected
NA = Not added or evaluated

PCB Congeners in Sediment
SW 846 8082/EPA 680 modified

Lab Number:	SRM921S
Sample Designation:	Standard Reference Material NIST 1944
Date Sampled:	02/10/16
Date Extracted:	02/10/16
Date Analyzed:	02/12/16
Matrix:	Solid
Sample Amount (g):	1.00
Final Volume (mL)	1.00
Dilution Factor:	2

Congener Number	PCB Congener	Result (ug/Kg)	True Value (ug/Kg)	Recovery (%)	Limit (%)
8	2,4'-dichlorobiphenyl	22	22	97	30 - 150
18	2,2',5-trichlorobiphenyl	53	51	104	30 - 150
28	2,4,4'-trichlorobiphenyl	75	81	93	30 - 150
44	2,2',3,5'-tetrachlorobiphenyl	54	60	90	30 - 150
49	2,2',4,5'-tetrachlorobiphenyl	60	53	113	30 - 150
52	2,2',5,5'-tetrachlorobiphenyl	75	79	94	30 - 150
66	2,3',4,4'-tetrachlorobiphenyl	64	72	88	30 - 150
77	3,3',4,4'-tetrachlorobiphenyl	ND	NA	NA	30 - 150
87	2,2',3,4,5'-pentachlorobiphenyl	31	30	104	30 - 150
101	2,2',4,5,5'-pentachlorobiphenyl	73	73	100	30 - 150
105	2,3,3',4,4'-pentachlorobiphenyl	24	25	97	30 - 150
118	2,3',4,4',5-pentachlorobiphenyl	60	58	104	30 - 150
126	3,3',4,4',5-pentachlorobiphenyl	ND	NA	NA	30 - 150
128	2,2',3,3',4,4'-hexachlorobiphenyl	10	8.5	118	30 - 150
138	2,2',3,4,4',5'-hexachlorobiphenyl	62	62	99	30 - 150
153	2,2',4,4',5,5'-hexachlorobiphenyl	62	74	83	30 - 150
156	2,3,3',4,4',5-hexachlorobiphenyl				30 - 150
169	3,3',4,4',5,5'-hexachlorobiphenyl				30 - 150
170	2,2',3,3',4,4',5-heptachlorobiphenyl	23	23	102	30 - 150
180	2,2',3,4,4',5,5'-heptachlorobiphenyl	38	44	85	30 - 150
183	2,2',3,4,4',5',6-heptachlorobiphenyl	10	12	84	30 - 150
184	2,2',3,4,4',6,6'-heptachlorobiphenyl	ND	NA	NA	30 - 150
187	2,2',3,4',5,5',6-heptachlorobiphenyl	23	25	90	30 - 150
195	2,2',3,3',4,4',5,6-octachlorobiphenyl	4	3.8	77	30 - 150
206	2,2',3,3',4,4',5,5',6-nonachlorobiphenyl	8.7	9.2	94	30 - 150
209	2,2',3,3',4,4',5,5',6,6'-decachlorobiphenyl	7.3	6.8	107	30 - 150

Surrogate Standard	Recovery (%)	Advisory Limits (%)
PCB 198	99	30 - 150

ND = Not detected
NA = Not added or evaluated

PCB Congeners in Solid Matrix
SW 846 8082/EPA 680 modified

Method Detection Limt Study	MDL 2016 Solid
Sample Designation:	MDL Solid Matrix
Date Sampled:	01/27/16
Date Extracted:	01/27/16
Date Analyzed:	02/19/16
Matrix:	Solid
Sample Amount (g):	20.00
Final Volume (mL)	1
Dilution Factor:	1

Congener Number	PCB Congener	True Value (ug/Kg)	Replicate 1 (ug/Kg)	Replicate 2 (ug/Kg)	Replicate 3 (ug/Kg)	Replicate 4 (ug/Kg)	Replicate 5 (ug/Kg)	Replicate 6 (ug/Kg)	Replicate 7 (ug/Kg)	Calcd MDL (ug/Kg)
8	2,4'-Dichlorobiphenyl	0.1	0.09	0.09	0.11	0.10	0.10	0.11	0.11	0.03
18	2,2',5-Trichlorobiphenyl	0.1	0.11	0.11	0.09	0.10	0.10	0.08	0.10	0.03
28	2,4,4'-Trichlorobiphenyl	0.1	0.10	0.10	0.08	0.10	0.10	0.09	0.09	0.03
52	2,2',5,5'-Tetrachlorobiphenyl	0.1	0.10	0.10	0.11	0.09	0.10	0.10	0.10	0.02
49	2,2',4,5'-Tetrachlorobiphenyl	0.1	0.09	0.09	0.10	0.09	0.10	0.09	0.08	0.02
44	2,2',3,5'-Tetrachlorobiphenyl	0.1	0.10	0.10	0.09	0.09	0.09	0.09	0.10	0.01
66	2,3',4,4'-Tetrachlorobiphenyl	0.1	0.09	0.09	0.10	0.10	0.09	0.09	0.09	0.01
101	2,2',4,5,5'-Pentachlorobiphenyl	0.1	0.10	0.10	0.10	0.11	0.11	0.10	0.10	0.01
87	2,2',3,4,5'-Pentachlorobiphenyl	0.1	0.10	0.10	0.12	0.11	0.11	0.10	0.11	0.01
77	3,3',4,4'-Tetrachlorobiphenyl	0.1	0.10	0.10	0.11	0.10	0.10	0.09	0.09	0.02
118	2,3',4,4',5-Pentachlorobiphenyl	0.1	0.11	0.11	0.11	0.10	0.10	0.12	0.12	0.02
184	2,2',3,4,4',6,6'-Heptachlorobiphenyl	0.1	0.10	0.10	0.11	0.11	0.09	0.11	0.10	0.02
153	2,2',4,4',5,5'-Hexachlorobiphenyl	0.1	0.11	0.11	0.12	0.11	0.11	0.11	0.11	0.01
105	2,3,3',4,4'-Pentachlorobiphenyl	0.1	0.12	0.12	0.10	0.11	0.10	0.11	0.11	0.02
138	2,2',3,4,4',5'-Hexachlorobiphenyl	0.1	0.12	0.12	0.11	0.11	0.11	0.11	0.11	0.01
126	3,3',4,4',5-Pentachlorobiphenyl	0.1	0.16	0.16	0.20	0.19	0.17	0.17	0.17	0.05
187	2,2',3,4',5,5',6-Heptachlorobiphenyl	0.1	0.10	0.10	0.09	0.09	0.10	0.10	0.11	0.02
183	2,2',3,4,4',5',6-Heptachlorobiphenyl	0.1	0.11	0.11	0.11	0.11	0.11	0.12	0.11	0.01
128	2,2',3,3',4,4'-Hexachlorobiphenyl	0.1	0.11	0.11	0.10	0.11	0.11	0.11	0.11	0.01
180	2,2',3,4,4',5,5'-Heptachlorobiphenyl	0.1	0.10	0.10	0.10	0.10	0.11	0.10	0.11	0.01
170	2,2',3,3',4,4',5-Heptachlorobiphenyl	0.1	0.10	0.10	0.11	0.11	0.12	0.10	0.09	0.02
195	2,2',3,3',4,4',5,6-Octachlorobiphenyl	0.1	0.10	0.10	0.11	0.10	0.11	0.11	0.10	0.02
206	2,2',3,3',4,4',5,5',6-Nonachlorobiphenyl	0.1	0.12	0.12	0.12	0.11	0.13	0.13	0.12	0.02
209	Decachlorobiphenyl	0.1	0.12	0.12	0.13	0.12	0.12	0.12	0.12	0.01

Surrogate Standard	Recovery (%)	Recovery (%)	Recovery (%)	Recovery (%)	Recovery (%)	Recovery (%)	Recovery (%)
PCB 198	103	103	104	106	105	106	104

Polynuclear Aromatic Hydrocarbons in Sediment
SW 846 8270/EPA 680 modified

Lab Number:	PB921S
Sample Designation:	Laboratory Blank
Date Sampled:	02/10/16 0900
Date Extracted:	02/10/16 0900
Date Analyzed:	02/11/16
Matrix:	Solid
Sample Amount (g):	20.00
Final Volume (mL)	1.00
Dilution Factor:	1

Compound	Concentration (ug/Kg)	Qualifier
naphthalene	10	U
acenaphthylene	10	U
acenaphthene	10	U
fluorene	10	U
phenanthrene	10	U
anthracene	10	U
fluoranthene	10	U
pyrene	10	U
benzo[a]anthracene	10	U
chrysene	10	U
benzo[b]fluoranthene	10	U
benzo[k]fluoranthene	10	U
benzo[a]pyrene	10	U
indeno[1,2,3-cd]pyrene	10	U
dibenz[a,h]anthracene	10	U
benzo[g,h,i]perylene	10	U

Surrogate Standard	Recovery (%)	Advisory Limits (%)
2-fluorobiphenyl	69	30 - 150
o-terphenyl	90	30 - 150

U = Not detected at indicated level.

Polynuclear Aromatic Hydrocarbons in Sediment
SW 846 8270/EPA 680 modified

Lab Number:	LCS921S / LCSD921S
Sample Designation:	Laboratory Control Sample Duplicate
Date Sampled:	02/10/16 0900
Date Extracted:	02/10/16 0900
Date Analyzed:	02/11/16
Matrix:	Solid
Sample Amount (g):	20.00
Final Volume (mL)	1.00
Dilution Factor:	1

Compound	True Value (ug/Kg)	LCS Result (ug/Kg)	Recovery (%)	Recovery Limit (%)	LCSD Result (ug/Kg)	Recovery (%)	Recovery Limit (%)	Relative Difference (%)	RPD Limit (%)
naphthalene	50	34	67	30 - 150	39	78	30 - 150	15	30
acenaphthylene	50	30	59	30 - 150	37	73	30 - 150	21	30
acenaphthene	50	33	66	30 - 150	39	78	30 - 150	16	30
fluorene	50	34	69	30 - 150	40	80	30 - 150	15	30
phenanthrene	50	40	80	30 - 150	48	95	30 - 150	18	30
anthracene	50	46	92	30 - 150	53	105	30 - 150	14	30
fluoranthene	50	47	94	30 - 150	50	100	30 - 150	6	30
pyrene	50	39	78	30 - 150	39	79	30 - 150	0	30
benzo[a]anthracene	50	42	84	30 - 150	48	95	30 - 150	13	30
chrysene	50	50	99	30 - 150	47	95	30 - 150	5	30
benzo[b]fluoranthene	50	39	77	30 - 150	39	78	30 - 150	1	30
benzo[k]fluoranthene	50	55	110	30 - 150	54	109	30 - 150	1	30
benzo[a]pyrene	50	45	89	30 - 150	45	90	30 - 150	1	30
indeno[1,2,3-cd]pyrene	50	41	83	30 - 150	44	88	30 - 150	6	30
dibenz[a,h]anthracene	50	43	86	30 - 150	45	90	30 - 150	4	30
benzo[g,h,i]perylene	50	44	89	30 - 150	46	93	30 - 150	5	30

Surrogate Standards	Recovery (%)	Advisory Limits (%)	Recovery (%)	Advisory Limits (%)
2-fluorobiphenyl	53	30 - 150	60	30 - 150
o-terphenyl	71	30 - 150	74	30 - 150

Polynuclear Aromatic Hydrocarbons in Sediment
SW 846 8270/EPA 680 modified

Lab Number:	26884-100D
Sample Designation:	Site Composite (Laboratory Duplicate)
Date Sampled:	01/13/16
Date Extracted:	02/10/16 0900
Date Analyzed:	02/11/16
Matrix:	Solid
Sample Amount (g):	29
Final Volume (mL)	1.00
Dilution Factor:	1

Compound	Duplicate Concentration (ug/Kg)	Duplicate Qualifier	Sample Concentration (ug/Kg)	Sample Qualifier	Relative Difference (%)	Limit (%)	Qualifier
naphthalene	9	U	9	U	NC	30	
acenaphthylene	9	U	9	U	NC	30	
acenaphthene	9	U	9	U	NC	30	
fluorene	9	U	9	U	NC	30	
phenanthrene	38	B	29	B	NC	30	
anthracene	9		9		NC	30	
fluoranthene	62		54		13	30	
pyrene	68		54		22	30	
benzo[a]anthracene	25		21		NC	30	
chrysene	31		32		NC	30	
benzo[b]fluoranthene	20		25		NC	30	
benzo[k]fluoranthene	22		18		NC	30	
benzo[a]pyrene			16		NC	30	
indeno[1,2,3-cd]pyrene	13		11		NC	30	
dibenz[a,h]anthracene	9	U	9	U	NC	30	
benzo[g,h,i]perylene	14		12		NC	30	

Surrogate Standard	Recovery (%)	Recovery (%)	Advisory Limits (%)
2-fluorobiphenyl	65	66	30 - 150
o-terphenyl	91	86	30 - 150

U = Not detected.
NC = Not calculated due to one or both values less than five times the reporting limit.
B = Analyte observed in the laboratory blank below the reporting limit.

Polynuclear Aromatic Hydrocarbons in Sediment
SW 846 8270/EPA 680 modified

Lab Number:	26884-100MSD
Sample Designation:	Site Composite (Matrix Spike Duplicate)
Date Sampled:	02/10/16 0900
Date Extracted:	02/10/16 0900
Date Analyzed:	02/11/16
Matrix:	Solid
Sample Amount (g):	29.00
Final Volume (mL)	1
Dilution Factor:	1

Compound	Sample Result (ug/Kg)	Amount Added (ug/Kg)	MS Result (ug/Kg)	Recovery (%)	Recovery Limit (%)	MSD Result (ug/Kg)	Recovery (%)	Recovery Limit (%)	Relative Difference (%)	RPD Limit (%)
naphthalene	U	47	39	80	30 - 150	40	83	30 - 150	3	30
acenaphthylene	U	47	45	90	30 - 150	46	92	30 - 150	3	30
acenaphthene	U	47	41	84	30 - 150	42	86	30 - 150	1	30
fluorene	U	47	47	93	30 - 150	49	97	30 - 150	4	30
phenanthrene	29 B	47	66	81	30 - 150	69	86	30 - 150	4	30
anthracene	9	47	46	81	30 - 150	54	97	30 - 150	15	30
fluoranthene	54	47	90	78	30 - 150	92	82	30 - 150	2	30
pyrene	54	47	101	99	30 - 150	100	99	30 - 150	0	30
benzo[a]anthracene	21	47	65	96	30 - 150	65	95	30 - 150	1	30
chrysene	32	47	71	82	30 - 150	66	72	30 - 150	7	30
benzo[b]fluoranthene	25	47	62	80	30 - 150	61	77	30 - 150	2	30
benzo[k]fluoranthene	18	47	61	91	30 - 150	60	89	30 - 150	2	30
benzo[a]pyrene	16	47	58	90	30 - 150	54	81	30 - 150	8	30
indeno[1,2,3-cd]pyrene	11	47	53	90	30 - 150	51	85	30 - 150	4	30
dibenz[a,h]anthracene	U	47	46	94	30 - 150	45	92	30 - 150	2	30
benzo[g,h,i]perylene	12	47	52	86	30 - 150	48	78	30 - 150	7	30

Surrogate Standard	Recovery (%)	Advisory Limits (%)	Recovery (%)	Advisory Limits (%)
2-fluorobiphenyl	71	30 - 150	68	30 - 150
o-terphenyl	90	30 - 150	89	30 - 150

U = Not detected
B = Analyte observed in the laboratory blank below the reporting limit.

Polynuclear Aromatic Hydrocarbons in Sediment
SW 846 8270/EPA 680 modified

Lab Number:	SRM921S
Sample Designation:	Standard Reference Material NIST 1944
Date Sampled:	02/10/16 0900
Date Extracted:	02/10/16 0900
Date Analyzed:	03/08/10
Matrix:	Solid
Sample Amount (g):	1.00
Final Volume (mL)	1.00
Dilution Factor:	2

Compound	Result (ug/Kg)	True Value (ug/Kg)	Recovery (%)	Limit (%)
naphthalene	1200	1650	70	30 - 150
acenaphthylene	960	NA	NA	30 - 150
acenaphthene	370	570	65	30 - 150
fluorene	460	850	54	30 - 150
phenanthrene	5200	5270	99	30 - 150
anthracene	890	NA	NA	30 - 150
fluoranthene	8800	8920	99	30 - 150
pyrene	8200	9700	85	30 - 150
benzo[a]anthracene	3900	4720	84	30 - 150
chrysene	4600	4860	96	30 - 150
benzo[b]fluoranthene	2900	3870	74	30 - 150
benzo[k]fluoranthene	2700	2300	119	30 - 150
benzo[a]pyrene	2800	4300	64	30 - 150
indeno[1,2,3-cd]pyrene	2000	2780	70	30 - 150
dibenz[a,h]anthracene	490	424	115	30 - 150
benzo[g,h,i]perylene	2200	2840	76	30 - 150

Surrogate Standard	Recovery (%)	Advisory Limits (%)
2-fluorobiphenyl	87	30 - 150
o-terphenyl	114	30 - 150

NA = Not added or evaluated

Polynuclear Aromatic Hydrocarbons in Solids
SW 846 8270/EPA 680 modified

Lab Number:	26884
Sample Designation:	Method Detection Limit Study
Date Sampled:	04/06/15
Date Extracted:	04/06/15
Date Analyzed:	05/12/15
Matrix:	Solid
Sample Amount (g):	10.00
Final Volume (mL)	1.00
Dilution Factor:	1

	Rep 1 ug/Kg	Rep 2 ug/Kg	Rep 3 ug/Kg	Rep 4 ug/Kg	Rep 5 ug/Kg	Rep 6 ug/Kg	Rep 7 ug/Kg	Calculated MDL ug/Kg
naphthalene	10.7	13.2	16.3	NA	15.0	15.0	15.2	5.8
acenaphthylene	8.9	12.0	13.2	9.5	13.7	12.5	13.1	5.5
acenaphthene	9.8	13.4	14.9	10.5	15.3	14.1	13.9	6.3
fluorene	11.3	15.0	15.9	14.4	16.7	14.9	15.7	5.1
phenanthrene	21.2	26.1	26.4	28.4	27.7	26.9	26.6	6.8
anthracene	8.1	11.5	10.6	14.3	14.7	10.8	10.9	6.7
fluoranthene	12.3	16.8	16.8	19.2	18.0	17.1	17.4	6.3
pyrene	12.7	15.1	18.8	19.0	18.1	17.3	17.9	6.7
benzo[a]anthracene	9.4	10.5	12.6	14.9	12.4	12.0	12.2	5.1
chrysene	12.6	14.4	12.9	19.2	17.0	12.1	12.7	7.8
benzo[b]fluoranthene	9.4	13.5	14.1	15.2	14.4	12.4	13.8	5.6
benzo[k]fluoranthene	9.6	13.6	12.5	15.7	15.0	13.8	14.3	5.8
benzo[a]pyrene	10.2	12.6	13.0	16.6	15.4	9.2	10.2	8.2
indeno[1,2,3-cd]pyrene	8.7	12.0	12.0	14.6	14.1	10.9	10.8	5.9
dibenz[a,h]anthracene	8.7	10.3	9.4	12.6	11.1	9.2	10.8	3.9
benzo[g,h,i]perylene	9.8	13.0	11.6	14.6	14.2	10.7	12.2	5.2

Pesticides in Sediment
SW 846 8081B

Lab Number:	PB922S
Sample Designation:	Laboratory Blank
Date Sampled:	02/10/16 0900
Date Extracted:	02/10/16 0900
Date Analyzed:	02/11/16
Matrix:	Solid
Moisture (%):	NA
Sample Amount (g):	20.00
Final Volume (mL)	1.00
Dilution Factor:	1

Analyte	Concentration (ug/Kg)	Qualifier
aldrin	0.1	U
gamma-chlordane (cis)	0.1	U
alpha-chlordane (trans)	0.1	U
cis-nonachlor	0.1	U
trans-nonachlor	0.1	U
oxychlordane	0.1	U
4,4'-DDT	0.2	U
4,4'-DDE	0.2	U
4,4'-DDD	0.2	U
alpha-BHC	0.1	U
dieldrin	0.2	U
endosulfan I	0.1	U
endosulfan II	0.2	U
endrin	0.2	U
heptachlor	0.1	U
heptachlor epoxide	0.1	U
hexachlorobenzene	0.1	U
gamma-BHC (lindane)	0.1	U
methoxychlor	1	U
toxaphene	5	U

Surrogate Standard	Recovery (%)	Advisory Limits (%)
tetrachloro-m-xylene	60	30 - 150
decachlorobiphenyl	84	30 - 150

U = Not detected at indicated level.

Pesticides in Sediment
SW 846 8081B

Lab Number:	LCSD922S
Sample Designation:	Laboratory Control Sample Duplicate
Date Sampled:	02/10/16 0900
Date Extracted:	02/10/16 0900
Date Analyzed:	02/11/16
Matrix:	Solid
Moisture:	NA
Sample Amount (g):	20
Final Volume (mL)	1
Dilution Factor:	1

Analyte	LCS True Value (ug/Kg)	LCS Found (ug/Kg)	LCS Recovery (%)	LCSD True Value (ug/Kg)	LCSD Found (ug/Kg)	LCSD Recovery (%)	Relative Difference (%)
aldrin	1	0.711	71	1	0.779	78	9
gamma-chlordane	1	0.787	79	1	0.696	70	12
alpha-chlordane	1	0.749	75	1	0.722	72	4
cis-nonachlor	1	0.849	85	1	0.883	88	4
trans-nonachlor	1	0.851	85	1	0.96	96	12
oxychlordane	1	0.782	78	1	0.871	87	11
4,4'-DDT	2	1.76	88	2	1.9	95	7
4,4'-DDE	2	1.68	84	2	1.72	86	3
4,4'-DDD	2	1.81	91	2	1.7	85	7
alpha-BHC	1	0.685	68	1	0.721	72	5
dieldrin	2	1.79	89	2	1.82	91	1
endosulfan I	1	0.788	79	1	0.771	77	2
endosulfan II	2	1.51	75	2	1.72	86	14
endrin	2	1.91	95	2	1.97	99	3
heptachlor	1	0.95	95	1	1.07	107	12
heptachlor epoxide	1	1.15	115	1	1.08	108	7
hexachlorobenzene	1	0.697	70	1	0.713	71	2
gamma-BHC (lindane)	1	0.631	63	1	0.734	73	15
methoxychlor	10	9.65	97	10	9.69	97	0

Surrogate Standard	Recovery (%)	Recovery (%)	Advisory Limits (%)
tetrachloro-m-xylene	70	94	30 - 150
decachlorobiphenyl	113	109	30 - 150

Pesticides in Sediment
SW 846 8081B

Lab Number:	26884-100
Sample Designation:	Site Composite (Laboratory Duplicate)
Date Sampled:	01/13/16 0940
Date Extracted:	02/10/16 0900
Date Analyzed:	02/11/16
Matrix:	Solid
Moisture (%):	26
Sample Amount (g):	29
Final Volume (mL)	1
Dilution Factor:	1

Analyte	Sample Concentration (ug/Kg)	Qualifier	Duplicate Concentration (ug/Kg)	Qualifier	Relative Difference (%)	Limit (%)
aldrin	0.138	T	0.125	T	9	30
gamma-chlordane (cis)	0.093	U	0.093	U	NC	30
alpha-chlordane (trans)	0.093	U	0.112	T	NC	30
cis-nonachlor	0.093	U	0.093	U	NC	30
trans-nonachlor	0.356	T	0.259	T	NC	30
oxychlordane	0.093	U	0.093	U	NC	30
4,4'-DDT	0.431	P	0.366	T	16	30
4,4'-DDE	0.443	P	0.428	T	3	30
4,4'-DDD	0.19	U	0.19	U	NC	30
alpha-BHC	0.093	U	0.093	U	NC	30
dieldrin	0.243	T	0.219	T	11	30
endosulfan I	0.093	U	0.093	U	NC	30
endosulfan II	0.19	U	0.19	U	NC	30
endrin	0.19	U	0.19	U	NC	30
heptachlor	0.093	U	0.093	U	NC	30
heptachlor epoxide	0.093	U	0.093	U	NC	30
hexachlorobenzene	0.093	U	0.093	U	NC	30
gamma-BHC (lindane)	0.093	U	0.093	U	NC	30
methoxychlor	0.93	U	0.93	U	NC	30
toxaphene	4.7	U	4.7	U	NC	30

Surrogate Standard	Sample Recovery (%)	Duplicate Recovery (%)	Advisory Limits (%)
tetrachloro-m-xylene	56	59	30 - 150
decachlorobiphenyl	61	60	30 - 150

U = Not detected at indicated level.
NC = Not calculated due to one or both values less than five times quantitation limit.
T = Concentrations of target analytes were too low for GCMS confirmation. Compound identification is tentative.
P = Presence of analyte confirmed by GC-MS.

Pesticides in Sediment
SW 846 8081B

Lab Number:	26884-100MSD
Sample Designation:	Site Composite (Matrix Spike Duplicate)
Date Sampled:	01/13/16 0940
Date Extracted:	02/10/16 0900
Date Analyzed:	02/11/16
Matrix:	Solid
Moisture (%):	26
Sample Amount (g):	29
Final Volume (mL)	1
Dilution Factor:	1

Compound	Sample Result (ug/Kg)	Amount Added (ug/Kg)	MS Result (ug/Kg)	Recovery (%)	Recovery Limit (%)	MSD Result (ug/Kg)	Recovery (%)	Recovery Limit (%)	Relative Difference (%)	RPD Limit (%)	Qual
aldrin	0.14	0.9	0.67	57	30-150	0.6	49	30-150	11	30	
gamma-chlordane (cis)	ND	0.9	0.61	65	30-150	0.58	62	30-150	5	30	
alpha-chlordane (trans)	ND	0.9	0.67	72	30-150	0.63	67	30-150	7	30	
cis-nonachlor	ND	0.9	0.63	68	30-150	0.6	65	30-150	4	30	
trans-nonachlor	0.36	0.9	0.68	35	30-150	0.65	31	30-150	5	30	
oxychlordane	ND	0.9	0.64	69	30-150	0.52	55	30-150	22	30	
4,4'-DDT	0.43	1.9	1.4	53	30-150	1.4	50	30-150	4	30	
4,4'-DDE	0.44	1.9	1.6	62	30-150	1.6	61	30-150	1	30	
4,4'-DDD	ND	1.9	1.1	61	30-150	1.1	60	30-150	1	30	
alpha-BHC	ND	0.9	0.55	59	30-150	0.5	53	30-150	10	30	
dieldrin	0.24	1.9	1.4	62	30-150	1.3	59	30-150	4	30	
endosulfan I	ND	0.9	0.63	68	30-150	0.61	65	30-150	4	30	
endosulfan II	ND	1.9	1.1	59	30-150	0.98	53	30-150	12	30	
endrin	ND	1.9	1.4	76	30-150	1.4	75	30-150	1	30	
heptachlor	ND	0.9	0.4	43	30-150	0.4	43	30-150	1	30	
heptachlor epoxide	ND	0.9	0.52	56	30-150	0.48	52	30-150	7	30	
hexachlorobenzene	ND	0.9	0.63	67	30-150	0.57	61	30-150	9	30	
gamma-BHC (lindane)	ND	0.9	0.59	64	30-150	0.54	58	30-150	9	30	
methoxychlor	ND	9.3	7	75	30-150	6.9	74	30-150	1	30	
toxaphene	ND	NA	NA	NA	30-150	NA	NA	30-150	NA	30	

Surrogate Standard	Recovery (%)	Recovery (%)	Advisory Limits (%)
tetrachloro-m-xylene	79	66	30 - 150
decachlorobiphenyl	73	72	30 - 150

Notes:

ND = Not detected above reporting limit.
NA = Compound not added or evaluated.

Pesticides in Sediment
SW 846 8081B

Lab Number:	SRM922S
Sample Designation:	Standard Reference Material NIST 1944
Date Sampled:	02/10/16 0930
Date Extracted:	02/10/16 0930
Date Analyzed:	02/13/16
Matrix:	Solid
Moisture (%):	0
Sample Amount (g):	1.00
Final Volume (mL)	1.00
Dilution Factor:	1

Anayte	Concentration (ug/Kg)	True Value (ug/Kg)	Recovery (%)	Limit (%)	Qual
aldrin	NA	NA	NA	30-150	
gamma-chlordane	NA	NA	NA	30-150	
alpha-chlordane	22.1	16.51	134	30-150	
cis-nonachlor	15.9	3.7	431	30-150	J3
trans-nonachlor	9.42	8.2	115	30-150	
oxychlordane	NA	NA	NA	30-150	
4,4'-DDT	136	119	114	30-150	
4,4'-DDE	87	86	101	30-150	
4,4'-DDD	68.9	108	64	30-150	
alpha-BHC	2.02	2	101	30-150	
dieldrin	NA	NA	NA	30-150	
endosulfan I	NA	NA	NA	30-150	
endosulfan II	NA	NA	NA	30-150	
endrin	NA	NA	NA	30-150	
heptachlor	NA	NA	NA	30-150	
heptachlor epoxide	NA	NA	NA	30-150	
hexachlorobenzene	3.94	6.03	65	30-150	
gamma-BHC (Lindane)	NA	NA	NA	30-150	
methoxychlor	NA	NA	NA	30-150	
toxaphene	NA	NA	NA	30-150	

Surrogate Standard	Recovery (%)	Advisory Limits (%)
tetrachloro-m-xylene	66	30 - 150
decachlorobiphenyl	52	30 - 150

NA = No reference value available
J3 = SRM %R above limit.

Lab Number:	MDLS2015
Sample Designation:	Sediment
Date Sampled:	02/11/15
Date Extracted:	02/11/15
Date Analyzed:	02/19/15
Matrix:	Solid
Moisture:	0 %
Sample Amount (g):	10.00
Final Volume (mL)	1
Dilution Factor:	1

Compound	True Value (ug/Kg)	Replicate 1 (ug/Kg)	Replicate 2 (ug/Kg)	Replicate 3 (ug/Kg)	Replicate 4 (ug/Kg)	Replicate 5 (ug/Kg)	Replicate 6 (ug/Kg)	Replicate 7 (ug/Kg)	MDL
hexachlorobenzene	0.2	0.18	0.19	0.19	0.19	0.19	0.19	0.18	0.013
alpha-BHC	0.2	0.12	0.11	0.12	0.13	0.12	0.11	0.12	0.019
gamma-BHC (lindane)	0.2	0.13	0.14	0.14	0.15	0.15	0.14	0.15	0.023
beta-BHC	0.2	0.17	0.21	0.22	0.20	0.26	0.15	0.20	0.102
delta-BHC	0.2	0.13	0.17	0.12	0.14	0.12	0.13	0.14	0.052
heptachlor	0.2	0.16	0.17	0.18	0.20	0.14	0.16	0.16	0.051
aldrin	0.2	0.13	0.14	0.13	0.13	0.13	0.15	0.14	0.024
oxychlordane	0.2	0.15	0.16	0.15	0.16	0.16	0.16	0.17	0.023
chlorpyrifos	0.2	0.19	0.21	0.20	0.22	0.18	0.18	0.21	0.046
heptachlor epoxide	0.2	0.15	0.16	0.17	0.17	0.16	0.16	0.14	0.033
gamma-chlordane (cis)	0.2	0.18	0.19	0.19	0.20	0.18	0.18	0.18	0.018
trans-nonachlor	0.2	0.16	0.17	0.14	0.18	0.16	0.15	0.16	0.037
alpha-chlordane (trans)	0.2	0.16	0.15	0.16	0.19	0.16	0.16	0.17	0.036
endosulfan I	0.2	0.17	0.19	0.16	0.18	0.17	0.17	0.17	0.022
4,4'-DDE	0.4	0.30	0.33	0.31	0.31	0.30	0.29	0.32	0.037
dieldrin	0.4	0.28	0.32	0.31	0.33	0.28	0.30	0.27	0.063
endrin	0.4	0.30	0.31	0.31	0.31	0.31	0.31	0.30	0.012
cis-nonachlor	0.2	0.14	0.14	0.14	0.14	0.14	0.13	0.14	0.010
4,4'-DDD	0.4	0.28	0.29	0.29	0.29	0.29	0.29	0.28	0.013
endosulfan II	0.4	0.28	0.30	0.30	0.30	0.28	0.29	0.29	0.023
toxaphene	100	88.5	90	90.7	90.2	89.2	90	91.00	2.5
4,4'-DDT	0.4	0.28	0.28	0.30	0.31	0.29	0.30	0.29	0.031
endrin aldehyde	0.4	0.27	0.32	0.32	0.35	0.29	0.32	0.31	0.075
endosulfan sulfate	0.4	0.28	0.31	0.32	0.31	0.28	0.31	0.31	0.040
methoxychlor	2	1.73	1.90	1.93	1.90	1.84	1.86	1.79	0.203
endrin ketone	0.4	0.29	0.30	0.31	0.30	0.29	0.30	0.31	0.021

Table II-1: Completeness Checklist

Quality Assurance/Quality Control Questions	Yes/No? Comments?
1. Was the report signed by the responsible applicant approved representative?	Yes
2. Were the methods for sampling, chemical and biological testing described in the Sampling and Analysis Plan (SAP) and the Laboratory QA Plan (LQAP) followed?	Yes
3. If not, were deviations documented?	NA
4. Was the SAP approved by the New England District?	Yes
5. Did the applicant use a laboratory with a LQAP on file at the New England District?	Yes
6. Did the samples adequately represent the physical/chemical variability in the dredging area?	Yes
7. Were the correct stations sampled (include the precision of the navigation method used)?	Yes
8. Were the preservation and storage requirements in Chapter 8 of the EPA/Corps QA/QC Manual (EPA/USACE 1995) and EPA (2001d) followed?	Yes
9. Were the samples properly labeled?	Yes
10. Were all the requested data included?	Yes
11. Were the reporting limits met?	Yes
12. Were the chain-of-custody forms properly processed?	Yes
13. Were the method blanks run and were the concentration below the acceptance criteria?	Yes
14. Was the MDL study performed on each matrix (with this data submission) or within the last 12 months?	Yes
15. Were the SRM/CRM analyses within acceptance criteria?	No
16. Were the matrix spike/matrix spike duplicates run at the required frequency and was the percent recovery/RPD within the acceptance criteria?	No
17. Were the duplicate samples analyzed and were the RPDs within the required acceptance criteria?	No
18. For each analytical fraction of organic compounds, were recoveries for the internal standard within the acceptance criteria?	Yes
19. Were surrogate recoveries within the required acceptance criteria?	Yes
20. Were corrective action forms provided for all non-conforming data?	NA
21. Were all the species-specific test conditions in Appendix V met?	NA
22. Were the test-specific age requirements met for each test species?	NA
23. Was the bulk physical/chemical testing performed on the sediments/composites that were biologically tested?	NA
24. Were the mortality acceptance criteria met for the water column and sediment toxicity tests?	NA
25. Were the test performance requirements in Table 11.3 of EPA (1994a) met?	NA

Table II-2: Quality Control Summary for Analyses of Polyaromatic Hydrocarbons (PAHs) and other base-neutrals in Sedime

Method Reference Number: 8270C

Quality Control (QC) Element	Acceptance Criteria*	Criteria Met? Yes/No	List results outside criteria (Cross-reference results table in data report)	Location of Results (Retained at Lab or in Data Package)
Initial Calibration	Must be performed prior to the analysis of any QC sample or field sample (<20 % RSD for each compound)	Yes		Retained at Lab
Calculation of Method Detection Limits (MDLs)	For each matrix, analyzed once per 12 month period (see Section 5.2 for MDL procedure)	Yes		In Data Report
Calibration Verification (Second Source)	Once, after initial calibration (80 to 120% recovery of each compound)	Yes		Retained at Lab
Continuing Calibration	At the beginning of every 12 hour shift (≤ 15 % D)	Yes		Retained at Lab
Standard Reference Materials	Within the limits provided by vendor	Yes		In Data Report
Method Blank	No target analytes > RL	Yes		In Data Report
Matrix Spike/Matrix Spike Duplicate (MS/MSD)	One set (MS/MSD) per group of field samples. Must contain all target analytes. (Recovery Limits 30 to 150%; RPD <30%)	Yes		In Data Report
Analytical Replicates	Analyze one sample in duplicate for each group of field samples (RPD < 30%)	Yes		In Data Report
Surrogate Recoveries	Calculate % recovery (30 to 150% recovery)	Yes		In Data Report
Internal Standard Areas	Within 50 to 200% of internal standards in continuing calibration check	Yes		Retained at Lab

* The Quality Control Acceptance Criteria are general guidelines. If alternate criteria are used, they must be documented in this table

Table II-3: Quality Control Summary for Analyses of Pesticides in Sediment, Tissue and Water Matrices

Method Reference Number: 8081B

Quality Control (QC) Element	Acceptance Criteria*	Criteria Met? Yes/No	List results outside criteria (Cross-reference results table in data report)	Location of Results (Retained at Lab or in Data Package)
Initial Calibration	Must be performed prior to the analysis of any QC sample or field sample (< 20 % RSD for each compound)	Yes		Retained at Lab
Calculation of Method Detection Limits (MDLs)	For each matrix, analyzed once per 12 month period (see Section 5.2 for MDL procedure)	Yes		In Data Report
Calibration Verification (Second Source)	Once, after initial calibration (80 to 120% recovery of each compound)	Yes		Retained at Lab
Continuing Calibration	Every 20 injections (≤ 15 % D)	Yes		Retained at Lab
Standard Reference Materials	Within the limits provided by vendor	No	Cis-nonachlor %R > limit	In Data Report
Method Blank	No target analytes > RL	Yes		In Data Report
Matrix Spike/Matrix Spike Duplicate (MS/MSD)	One set (MS/MSD) per group of field samples. Must contain all target analytes. (Recovery Limits 30 to 150%; RPD <30%)	Yes		In Data Report
Analytical Replicates	Analyze one sample in duplicate for each group of field samples (RPD < 30%)	Yes		In Data Report
Surrogate Recoveries	Calculate % recovery (30 to 150% recovery)	Yes		In Data Report

* The Quality Control Acceptance Criteria are general guidelines. If alternate criteria are used, they must be documented in this table

Table II-4: Quality Control Summary for Analyses of Polychorinated Biphenyls (PCB congeners) in Sediment, Tissue and Water Matrices

Method Reference Number: 8082A

Quality Control (QC) Element	Acceptance Criteria*	Criteria Met? Yes/No	List results outside criteria (Cross-reference results table in data report)	Location of Results (Retained at Lab or in Data Package)
Initial Calibration	Must be performed prior to the analysis of any QC sample or field sample (<20 % RSD for each compound)	Yes		Retained at Lab
Calculation of Method Detection Limits (MDLs)	For each matrix, analyzed once per 12 month period (see Section 5.2 for MDL procedure)	Yes		In Data Package
Calibration Verification (Second Source)	Once, after initial calibration. (80 to 120% recovery of each compound)	Yes		Retained at Lab
Continuing Calibration	Every 20 injections (± 15 % D)	Yes		Retained at Lab
Standard Reference Materials	Within the limits provided by vendor	Yes		In Data Package
Method Blank	No target analytes > RL	Yes		In Data Package
Matrix Spike/Matrix Spike Duplicate (MS/MSD)	One set (MS/MSD) per group of field samples. Must contain all target analytes. (Recovery Limits 30 to 150%; RPD <30%)	Yes		In Data Package
Analytical Replicates	Analyze one sample in duplicate for each group of field samples (RPD < 30%)	No	%RPD > 30 CGR 153 and 183	In Data Package
Surrogate Recoveries	Calculate % recovery (30 to 150% recovery)	Yes		In Data Package

* The Quality Control Acceptance Criteria are general guidelines. If alternate criteria are used, they must be documented in this table.

Table II-5: Quality Control Summary for Analyses of Metals in Sediments, Tissue and Water Matrices

Method Reference Numbers: Various Reference Numbers

Quality Control (QC) Element	Acceptance Criteria*	Criteria Met? Yes/No	List results outside criteria (Cross-reference results table in data report)	Location of Results (Retained at Lab or in Data Package)
Linear Range Determination for ICP	Performed Quarterly	Yes		Retained at Lab
Initial Calibration for AA, Hg	Performed Daily (Correlation Coefficient ≥0.995)	Yes		Retained at Lab
Calculation of Method Detection Limits (MDLs)	For each matrix, analyzed once per 12 month period (see Sechhjk.2 for MDL procedure)	Yes		In Data Package
Initial Calibration Verification/ Continuing Calibration Verification	Hg: 80 to 120% recovery Other metals: 90 to 110% recovery	Yes		Retained at Lab
Initial Calibration Blank/ Continuing Calibration Blank	No target analytes > Instrument Detection Limit (IDL)	Yes		Retained at Lab
Standard Reference Materials	Within the limits provided by vendor	Yes		In Data Package
Method Blank	No target analytes > RL	Yes		In Data Package
Sample Spike/ Sample Duplicate	One set per group of field samples. Must contain all target analytes. Recovery Limits (75 to 125%; RPD < 20% or < 35%)	Yes		In Data Package
Analytical Replicates	Analyze one sample in duplicate for each group of field samples (RPD < 30%)	Yes		In Data Package

* The Quality Control Acceptance Criteria are general guidelines. If alternate criteria are used, they must be documented in this table.

Table II-6: Quality Control Summary for Analyses of other Organic Chemicals not listed in Sediment, Tissue and Water Matrices

TOTAL ORGANIC CARBON

Method Reference Numbers: SW846 9060

Quality Control (QC) Element	Acceptance Criteria*	Criteria Met? Yes/No	List results outside criteria (Cross-reference results table in data report)	Location of Results (Retained at Lab or in Data Package)
Initial Calibration	Must be performed prior to the analysis of any QC sample or field sample (<20 % RSD for each compound)	Yes		Retained at Lab
Calculation of Method Detection Limits (MDLs)	For each matrix, analyzed once per 12 month period (see Section 5.2 for MDL procedure)	Yes		In Data Package
Calibration Verification (Second Source)	Once, after initial calibration (80 to 120% recovery of each compound)	Yes		Retained at Lab
Continuing Calibration	At the beginning of every 12 hour shift (± 15 % D)	Yes		Retained at Lab
Standard Reference Materials	Within the limits provided by vendor	Yes		In Data Package
Method Blank	No target analytes > RL	Yes		In Data Package
Matrix Spike/Matrix Spike Duplicate (MS/MSD)	One set (MS/MSD) per group of field samples. Must contain all target analytes. (Recovery Limits 60 to 140%; RPD <30%)	No	MS/MSD %R low	In Data Package
Analytical Replicates	Analyze one sample in duplicate for each group of field samples (RPD < 30%)	Yes		In Data Package
Surrogate Recoveries	Calculate % recovery (30 to 150% recovery)	NA		
Internal Standard Areas (if applicable)	Within 50 to 200% of internal standards in continuing calibration check	NA		

* The Quality Control Acceptance Criteria are general guidelines. If alternate criteria are used, they must be documented in this table.

SAMPLE RECEIPT AND CONDITION DOCUMENTATION

STUDY NO:	26884		
SDG No:			
Project:	Point Judith Pond Federal Project Channel Extension, Narragansett, RI		
Delivered via:	**ESI**		
Date and Time Received:	12/15/15 1130	Date and Time Logged into Lab:	12/15/15 1300
Received By:	RS	Logged into Lab by:	BP
Air bill / Way bill:	No	Air bill included in folder if received?	NA
Cooler on ice/packs:	YES	Custody Seals present?	NA
Cooler Blank Temp (C) at arrival:	2.4	Custody Seals intact?	NA
Number of COC Pages:	1		
COC Serial Number(s):			
COC Complete:	YES	Does the info on the COC match the samples?	Yes
Sampled Date:	Yes	Were samples received within holding time?	Yes
Field ID complete:	Yes	Were all samples properly labeled?	Yes
Sampled Time:	Yes	Were proper sample containers used?	Yes
Analysis request:	Yes	Were samples received intact? (none broken or leaking)	Yes
COC Signed and dated:	Yes	Were sample volumes sufficient for requested analysis?	Yes
Were all samples received?	Yes	Were VOC vials free of headspace?	NA
Client notification/authorization:	Not required	pH Test strip ID number:	NA

Field ID	Lab ID	Mx	Analysis Requested	Bottle	Req'd Pres'n	Verified Pres'n
12-14-15 GAL-A	26884-001	S	Hold;	3x1 Gal bucket	4C	Yes
12-14-15 GAL-A	26884-002	S	GZ;	1qt bag	4C	Yes
12-14-15 GAL-B	26884-003	S	Hold;	2x1 Gal bucket	4C	Yes
12-14-15 GAL-B	26884-004	S	GZ;	1qt bag	4C	Yes
12-14-15 GAL-C	26884-005	S	Hold;	2x1 Gal bucket	4C	Yes
12-14-15 GAL-C	26884-006	S	GZ;	1qt bag	4C	Yes
12-14-15 GAL-D	26884-007	S	Hold;	2x1 Gal bucket	4C	Yes
12-14-15 GAL-D	26884-008	S	GZ;	1qt bag	4C	Yes
12-14-15 GAL-E	26884-009	S	Hold;	2x1 Gal bucket	4C	Yes
12-14-15 GAL-E	26884-010	S	GZ;	1qt bag	4C	Yes

Notes and qualifications:

SEE C.O.C

L6087

ESI

EnviroSystems, Inc.
1 Lafayette Road
P.O. Box 778
Hampton, N.H. 03843

Voice: 603-926-3345
FAX: 603-926-3521

ESI Job No: 4569

CHAIN OF CUSTODY DOCUMENTATION

Galilee Project, Narragansett, Rhode Island
Point Judith Point, Federal Project Channel Extension
G-250

Client: CLE Engineering	Contact: Ray Salazar	Project Name: QDC	Page 1 of 1
Report to:	Address: 15 Creek Road	Project Number: 14217	
Invoice to:	Address: MARION MA 02738	Project Manager: Wendy Rocha	
Voice:	Fax:	email: WRocha@CLEEngineering.com	P.O. No: Quote No:

Protocol: RCRA SDWA NPDES USCOE Other

Lab Number (assigned by lab)	Your Field ID: (must agree with container)	Date Sampled	Time Sampled	Sampled By	Grab or comp-osit (G/C)	Container Size (ml.)	Container Type (P/G/T)	Field Preser-vation	Matrix S=Solid W=Water	Filter N=Not needed F=Done in field L=Lab to do	Analyses Requested\ Special Instructions:
											GRAIN SIZE / 10 DAY BIO
-001	12-14-15 GAL-A	12/14/15		RS		3x1	Gal				GR
-002	" GAL-A	"		"		1qt	bag				
	~~GAL-A~~	"		"							
-003	" GAL-B	"		"		2x1	Gal				
-004	" GAL-B	"		"		1qt	bag				
-005	" GAL-C	"		"		2x1	Gal				
-006	" GAL-C	"		"		1qt	bag				
-007	" GAL-D	"		"		2x1	Gal				
-008	" GAL-D	"		"		1qt	bag				
-009	" GAL-E	"		"		2x1	Gal				
-010	" GAL-E	"		"		1qt	bag				
	"			"							

Relinquished By: Ray Salazar Date: 12/15/15 Time: 11:30 Received By: R Scott Date: 12/15/15 Time: 11:30

Relinquished By: Date: Time: Received at Lab By: Date: Time:

Comments: 2.4°C

Page 50 of 50

Sample Delivery Group No:	Page of

COC Doc No:

APPENDIX H

ESSENTIAL FISH HABITAT ASSESSMENT

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ESSENTIAL FISH HABITAT ASSESSMENT

FOR THE

IMPROVEMENT DREDGING OF THE POINT JUDITH HARBOR

FEDERAL NAVIGATION PROJECT

September 2017

Prepared by

U.S. Army Corps of Engineers

New England District

696 Virginia Road

Concord, Massachusetts 01742-2751

1.0 INTRODUCTION

The 1996 amendments to the Magnuson-Stevens Fishery Conservation and Management Act require that an Essential Fish Habitat (EFH) consultation be conducted for activities that may adversely affect important habitats of federally managed marine and anadromous fish species. EFH includes "those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity." Point Judith Harbor and the nearshore placement site off Matunuck State Beach all fall into this category and have the potential to provide habitat for fish species in the area. The following is an assessment of the impacts to EFH from the improvement dredging of the Point Judith Harbor Federal Navigation Project (FNP).

2.0 PROPOSED ACTION

The proposed project includes the widening of the existing 15-foot deep West Bulkhead channel by 50 feet for a distance of approximately 700 feet and extending this same channel approximately 1,200 feet into the North Basin area at a width of 150 feet and a depth of 11 feet (see Figure 2 in the Environmental Assessment). Approximately 23,700 cubic yards (CY) of sandy material will be removed from the improvement sections using a mechanical dredge with supporting split-hull scows. The sandy dredged material will be placed in nearshore waters off of the Matunuck shoreline in South Kingstown, RI, approximately three miles west of the harbor. The dredged material will be placed in approximately 15 to 18 feet MLLW of water to maximize the beneficial use of dredge material for beach nourishment. Construction will occur between October 1 and January 31 of any given year in which funding becomes available and is expected to take two to three weeks to complete.

3.0 ANALYSIS OF IMPACTS

Impacts to EFH from any dredging and placement activity include potential changes in the physical and chemical properties of the water column, changes in sediment types both within the

channel and at adjacent areas, and changes in water depth. Consequently, changes in the abundance and/or distribution of prey species may also result from both dredging and placement activities. These impacts may range from both short-term, (i.e. impacts to the water column (increases in turbidity and total suspended solids)), to longer term impacts (i.e. changes in bathymetry as a result of dredging within the channel and deposition at the placement site).

3.1 Physical Environment

Water Quality - Any impacts from the dredging of the channel of Point Judith Harbor on water quality are expected to be temporary, short-term, and limited to the immediate project area. Water quality impacts would be primarily a result of increased suspended sediment (TSS) loads within the water column as a result of both the dredging and disposal operations. The sediments in the entrance channel are predominantly sand. Consequently, any suspended sediments should quickly settle out of the water column.

Decreases in dissolved oxygen (DO) levels are sometimes a concern with dredging and placement activities. Sandy material is generally not associated with high levels of organic carbon, and dredging operations are not likely to result in release of nutrients or decreases in dissolved oxygen. The area(s) are dynamic and well flushed due to tidal activity. Therefore, dissolved oxygen levels are not anticipated to be impacted by dredging and/or disposal activities of this project. No appreciable changes in the salinity regime, tidal flows or tide height are expected as a result of the proposed dredging or placement activity.

Bathymetry/Water Depth - Other impacts from the proposed project include changes in the bathymetry of the areas to be dredged and the placement site due to the removal and placement of sediment. Areas within the proposed project area that are to be dredged will result in deeper waters in those areas. At the nearshore placement site, material will be deposited in linear mounds oriented parallel to the shoreline to mimic a natural offshore bar. This will induce a more rapid assimilation of the sandy dredged material into the normal beach system.

3.2 Biological Environment

Prey Species - The abundance and/or distribution of prey species, for which EFH has been designated, may be impacted from dredging and placement activities conducted for the Point Judith Harbor improvement project. Many fish with EFH in the project area feed on organisms that live in or on the sediment. At locations that are to be dredged, these prey species will be disrupted and or destroyed during the dredging process. During material placement, prey species are likely to be buried. However, the substrate types in both dredging and placement locations following project completion are expected to be similar to pre-project conditions thus promoting rapid recolonization by organisms from adjacent areas. Therefore, any impacts to fish species using these areas for forage, would be expected to be temporary and highly localized.

Prey species that live in the water column are also likely to be impacted during dredging and placement activities. The increased suspended sediments resulting from dredging and mainly from placement activities, have the potential to destroy/disrupt planktonic species in the vicinity of the sediment plume. However, given the short-lived and transient nature of these water

column disturbances, it is expected that any impacts would be of a temporary nature and return to ambient conditions upon cessation of operational activities. Thus, any impacts would not be expected to have any significant long-term effects on prey species within the project area.

Two species of anadromous fish, alewives *Alosa pseudoharengus* and blueback herring *Alosa aestivalis*, are known to transit through Point Judith Pond to spawn in the Saugatucket River. These species generally begin migration into the pond at the end of February/beginning of March, with peak migration in April, and migration is generally completed by the end of May. Migration of these species from upstream areas to sea generally begins in August, peaks during the months of September/October, and is complete near the end of November. Anadromous fish serve as prey for some of the EFH species, such as bluefish. As the sandy nature of the sediments being dredged would have minimal impacts on the water quality of the area, any increases in suspended sediment levels would not affect anadromous fish in the area. Therefore, impacts to EFH species that prey on anadromous fish would not be significantly impacted in the project area.

Dredging will occur between October 1 and January 31 and is expected to take two to three months to complete. While a portion of the effort may occur towards the end of the anadromous fish out-migration period, the sandy nature of the material to be dredge and limited footprint of the construction effort compared to the overall estuarine area in Pond Judith Pond available for fish passage should not pose an impact to migrating fish. Therefore, no more than minimal impacts to the migrating fish EFH and expected.

Shellfish also serve as prey items for EFH species. As noted in Section 7.4 of the Environmental Assessment, there will be no direct impact to shellfish beds from the improvement dredging effort. At the nearshore placement site, placement activities would bury any shellfish in the direct footprint of the site. However, impacts will be confined to a localized area in comparison to the surrounding environment of similar habitat.

4.0 Life History of EFH Species

4.1 Selection of EFH Species

The National Marine Fisheries Service Guide to Essential Fish Habitat web site was used to determine which species have designated EFH in the project area and surrounding areas. The location of this website is http://www.nero.nmfs.gov/ro/doc/webintro.html. The species, and the life stages of those species, that have EFH in the study area was determined by using the quick reference 10 x 10 minute squares of latitude and longitude. The coordinates of the 10 x 10 minute squares that are representative of the geographic area of the proposed dredging and disposal activities are provided in Table 1 below. As the species noted in the 10 x 10 square that includes Point Judith are incomplete, the adjacent 10 x 10 square is also considered in this assessment.

Tables 2 and 3 presents a list of the species that have designated EFH within Point Judith Harbor and the nearshore disposal area off of Matunuck Beach. A short summary of the EFH for each life stage of each particular species is described in the sections below. Information on the species

was taken from the NMFS "Guide to EFH Species Designations" located at http://www.nero.nmfs.gov/ro/doc/list.htm.

Table 1. 10' x 10' Square Coordinates: Point Judith Harbor

10 x 10 square	Boundary	North	East	South	West
A	Coordinate	41° 30.0'	71° 20.0'	41° 20.0'	71° 30.0'
B	Coordinate	41° 30.0'	71° 30.0'	41° 20.0'	71° 40.0'

Square A Description (i.e. habitat, landmarks, coast line markers): Atlantic Ocean waters within Narragansett Bay within the square affecting the following: from Point Judith Harbor, Rhode Island to the west half of Newport Neck, along with the southern half of Conanicut Island, along with the inlets to the East and West Passage. These waters also affect the following: The Dumplings, Rose I., Brenton Pt., Fort Adams, Jamestown, R.I., Mackerel Cove, Beavertail Pt., Beaverhead, The Bonnet, Bonnet Pt., Watson Pier, Old Antonio Rock, Jones Ledge, Haycock Ledge, Brenton Reef, Seal Ledge, Whale Rock, River Ledge, Narragansett Pier, Point Judith, RI., Little Neck, Point Judith Neck, Black Pt., along with the precautionary area to the shipping traffic lanes to and from Narragansett Bay.

Square B Description (i.e. habitat, landmarks, coast line markers): Atlantic Ocean waters within the square within affecting the following: Point Judith Harbor, R. I., from the Marsh (northwest of Point Judith, R. I.) to halfway down Quonochontaug Beach. Also the following are affected by these waters: the eastern half of Quonochontaug Beach, Jerusalem R. I., Matunuck, R. I., and Green Hill, R. I., within Block Island Sound, along with Point Judith Pond, the Nebraska Shoal, and Charlestown Breachway.

Table 2. Species designations in Square A

Species	Eggs	Larvae	Juveniles	Adults
Atlantic cod *(Gadus morhua)*				X
haddock *(Melanogrammus aeglefinus)*		X		
pollock *(Pollachius virens)*				
whiting *(Merluccius bilinearis)*	X	X	X	
red hake *(Urophycis chuss)*	X	X	X	X
white hake *(Urophycis tenuis)*				
witch flounder *(Glyptocephalus cynoglossus)*				
winter flounder *(Pseudopleuronectes americanus)*	X	X	X	X
yellowtail flounder *(Limanda ferruginea)*				
windowpane flounder *(Scophthalmus aquosus)*	X	X	X	X
American plaice *(Hippoglossoides platessoides)*		X	X	X
ocean pout *(Macrozoarces americanus)*	X	X	X	X
Atlantic sea scallop *(Placopecten magellanicus)*				
Atlantic sea herring *(Clupea harengus)*		X	X	X
monkfish *(Lophius americanus)*	X	X		
bluefish *(Pomatomus saltatrix)*			X	X
long finned squid *(Loligo pealeii)*	n/a	n/a	X	X
short finned squid *(Illex illecebrosus)*	n/a	n/a		
Atlantic butterfish *(Peprilus triacanthus)*			X	
Atlantic mackerel *(Scomber scombrus)*	X	X	X	X
summer flounder *(Paralichthys dentatus)*		X	X	X
scup *(Stenotomus chrysops)*	X	X	X	X
black sea bass *(Centropristis striata)*	n/a		X	X
surf clam *(Spisula solidissima)*	n/a	n/a	X	X
ocean quahog *(Artica islandica)*	n/a	n/a		
spiny dogfish *(Squalus acanthias)*	n/a	n/a	X	X
tilefish *(Lopholatilus chamaeleonticeps)*				
king mackerel *(Scomberomorus cavalla)*	X	X	X	X
Spanish mackerel *(Scomberomorus maculatus)*	X	X	X	X
cobia *(Rachycentron canadum)*	X	X	X	X
sand tiger shark *(Carcharias taurus)*		X		
blue shark (*Prionace glauca)*		X		X
dusky shark *(Carcharhinus obscurus)*			X	
shortfin mako shark *(Isurus oxyrinchus)*			X	
sandbar shark *(Carcharhinus plumbeus)*			X	X
bluefin tuna *(Thunnus thynnus)*				X

Table 3. Species designations in Square B.

Species	Eggs	Larvae	Juveniles	Adults
Atlantic cod *(Gadus morhua)*				X
haddock *(Melanogrammus aeglefinus)*				
pollock *(Pollachius virens)*				
whiting *(Merluccius bilinearis)*				
red hake *(Urophycis chuss)*				
white hake *(Urophycis tenuis)*				
witch flounder *(Glyptocephalus cynoglossus)*				
winter flounder *(Pseudopleuronectes americanus)*				
yellowtail flounder *(Limanda ferruginea)*				
windowpane flounder *(Scophthalmus aquosus)*				
American plaice *(Hippoglossoides platessoides)*				
ocean pout *(Macrozoarces americanus)*				
Atlantic sea scallop *(Placopecten magellanicus)*				
Atlantic sea herring *(Clupea harengus)*				X
monkfish *(Lophius americanus)*				
bluefish *(Pomatomus saltatrix)*				X
long finned squid *(Loligo pealeii)*			X	X
short finned squid *(Illex illecebrosus)*				
Atlantic butterfish *(Peprilus triacanthus)*				
Atlantic mackerel *(Scomber scombrus)*				
summer flounder *(Paralichthys dentatus)*				
scup *(Stenotomus chrysops)*				
black sea bass *(Centropristis striata)*				
surf clam *(Spisula solidissima)*				
ocean quahog *(Artica islandica)*				
spiny dogfish *(Squalus acanthias)*				
tilefish *(Lopholatilus chamaeleonticeps)*				
king mackerel *(Scomberomorus cavalla)*	X	X	X	X
Spanish mackerel *(Scomberomorus maculatus)*	X	X	X	X
cobia *(Rachycentron canadum)*	X	X	X	X
sand tiger shark *(Carcharias taurus)*		X		
blue shark (*Prionace glauca)*				X
dusky shark *(Carcharhinus obscurus)*				
shortfin mako shark *(Isurus oxyrinchus)*				
sandbar shark *(Carcharhinus plumbeus)*				
bluefin tuna *(Thunnus thynnus)*				

4.2 EFH Species

Essential fish habitat (EFH) for adult Atlantic cod (*Gadus morhua*) is designated in the project area. Adult Atlantic cod are found in regions with bottom habitats having a substrate of rocks, pebbles, or gravel, water temperatures below 10^{o}C, and depths from 33 to 492 feet. This project is expected to have minimal effects on EFH for adult Atlantic cod because the majority of the work will occur at depths shallower than where the fish is normally found. Additionally, the material to be dredged is sand and which is not a preferred habitat type for cod.

Essential fish habitat (EFH) for haddock larvae (*Melanogrammus aeglefinus*) is designated in the project area. Larval haddock found in waters with depths from 30 to 90 meters. This project is expected to have no effects on EFH for larval haddock because the majority of the work will occur at depths shallower than where the larvae are normally found.

EFH is designated within the project area for eggs, larvae, and juveniles for whiting (*Merluccius bilinearis*). The eggs are pelagic and drift with the prevailing currents. Most eggs are found between 164 and 492 feet depth with peaks from June through September in temperatures below 20° C. The larvae are also pelagic and most are found at depths of 164 to 426.5 feet with abundance peaks from July through September. Juvenile whiting are found on bottom habitats of all substrate types with water temperatures below 21° C and depths between 66 – 886 feet. The Point Judith Harbor project is expected to have minimal effects on EFH for whiting eggs, larvae and juveniles because all these life stages are more common at greater depths than found in this dredging project (approximately 15 feet depth).

EFH is designated within the project area for eggs, larvae, and juveniles for red hake (Urophycis chuss). The eggs are found in surface waters with temperatures below 10° C and most often observed during the months from May - November, with peaks in June and July. Larvae are found in surface waters with temperatures below 19° C, water depths less than 656 feet, and salinity greater than 0.5 ‰. Red hake larvae are most often observed from May through December, with peaks in September - October. The juveniles are found on bottom habitats with a substrate of shell fragments, including areas with an abundance of live scallops. The water temperatures are below 16° C, depths less than 328 feet and a salinity range from 31 to 33‰. Although EFH for red hake is within the project area, this species is broadly distributed in north and mid-Atlantic waters from the Gulf of Maine to Cape Hatteras. Any disruption of EFH will be associated with the dredging or placement activities and therefore will not be long-term. Juveniles should be able to avoid any potential impacts because of their mobility. Eggs and larvae have the potential to be impacted by localized, short-term turbidity associated with the construction activity, but this activity will not occur during peak seasons for these sensitive life stages. Therefore, no more than minimal impact on red hake EFH is anticipated as a result of this project.

EFH is designated within the project area for all life stages of the winter flounder (*Pseudopleuronectes americanus*). The eggs of winter flounder, which are demersal, are typically found at depths of less than 16 feet in bottom waters in a broad range of salinities (10-30 ‰). Spawning, and therefore the presence of eggs, occurs from February to June. EFH for larvae, juveniles, and adults includes bottom habitats of mud and fine-grained sandy substrate in

waters ranging from 0.3 to 328 feet in depth. Spawning adults are typically associated with similar substrates in less than 19.7 feet of water. Although winter flounder EFH is located within the project area, juvenile and adults are very mobile and would be able to flee from the dredging or placement areas once activities commence. As this project is being constructed between October – January of the year in which funding becomes available, no more than minimal impacts to winter flounder eggs and larvae are expected. Additionally, habitat disturbance should be short-term and highly localized. Therefore, no more than minimal impacts to winter flounder and winter flounder EFH are expected.

EFH is designated within the project area for all stages of windowpane flounder (*Scopthalmus aquosus*). Juveniles and adults prefer bottom habitats of mud or fine-grained sand and can be found in salinities ranging from 5.5 ‰ to 36 ‰. Seasonal occurrences in the project area are generally from February to November, with peaks in occurring May and October. Although EFH for the windowpane is within the project area, any disruption of EFH will be associated with the dredging and placement activities therefore will not be long-term. Windowpane flounder adults and juveniles should be able to avoid any potential impacts because of their mobility. Therefore, no more than minimal impact on windowpane flounder EFH is anticipated as a result of this project.

EFH is designated within the project area for all life stages of ocean pout (*Macrozoarces americanus*). This species is a nearshore species that inhabits hard bottom substrates with salinities greater than 30 ‰. Ocean pout egg development takes two to three months during late fall and winter. The larvae are most often observed from late fall through spring. The sandy bottom substrate of the project area should limit any potential impact to the eggs and larvae. Adults and juveniles should be able to avoid any potential impacts because of their mobility. Therefore, no more than minimal impacts to ocean pout EFH are expected.

EFH is designated within the project area for Atlantic sea herring (*Clupea harengus*) juveniles and adults. Juvenile and adults typically prefer depths of 49.2 to 426.5 feet, depths that are generally deeper than those found within the project area. No more than minimal impact is expected to occur to Atlantic sea herring EFH.

EFH is designated within the project area for bluefish (*Pomatomus saltatrix*) juveniles and adults. Although juveniles and adults are found in the surface waters of mid-Atlantic estuaries from May through October, EFH for this species is mostly pelagic waters over the Continental Shelf. Bluefish adults are highly migratory, therefore, no more than minimal impact on bluefish EFH is anticipated as a result of the proposed project.

EFH is designated within the project area for long finned squid (*Loligo pealei*) adults. EFH is the pelagic waters found over the Continental Shelf (from the coast out to the limits of the EEZ), from the Gulf of Maine through Cape Hatteras, North Carolina where the highest catches are found. The squid are highly mobile so no more than minimal impact on EFH is anticipated.

EFH is designated with the project area for all stages of summer flounder (*Paralicthys dentatus*). Adult summer flounder migrate into shallow coastal and estuarine waters during warmer months

and move offshore during colder months. Although summer flounder may occur in the project area, adults should be able to avoid any potential impacts because of their mobility. At most, minimal impacts on summer flounder EFH are anticipated as a result of this project.

EFH is designated in the project area for all juvenile and adult scup (*Stenotomus chrysops*). Scup juveniles and adults have the potential to occur in estuarine systems during the spring and summer months. All life stages of scup prefer salinities greater than 15 ‰. Juveniles and adults use structured areas for foraging and refuge that are not available in the project area. They are highly mobile and should be able to avoid dredging and placement activities. No more than minimal impacts to Scup EFH are anticipated as a result of this project.

EFH is designated for black sea bass (*Centropristis striata*) juveniles and adults within the project area. EFH for the juveniles and adults of this species is predominantly within estuarine systems with oceanic salinities. Juveniles and adults are found in estuaries during spring and summer months in water temperatures above 6o C and salinities greater than 18 ‰. Black sea bass prefer rough, shelly substrates and can be found in natural and man-made structured habitats. Although sea bass may occur in the project area, adults and juveniles should be able to avoid any potential impacts because of their mobility. Therefore, no more than minimal impacts to black sea bass EFH are anticipated as a result of this project.

EFH is designated in the project area for all life stages of the following coastal migratory species: king mackerel (*Scomberomorus cavalla*), Spanish mackerel (*Scomberomorus maculatus*), and cobia *(Rachycentron canadum*). EFH for coastal migratory pelagic species includes sandy shoals of capes and offshore bars, high profile rocky bottom and barrier island ocean-side waters from the surf to the shelf break zone, all coastal inlets, and all state-designated nursery habitats of particular importance to coastal migratory pelagics. These species prefer warm water about 20° C. As the proposed project will occur in the fall and winter months, no more than minimal impacts to coastal migratory species are anticipated as a result of this project. Any habitat disturbed during construction should be functional when these species are present.

EFH is designated in the project area for either the juveniles or adults or both of the following highly migratory species: common thresher shark (*Alopias vulpinus*), blue shark (*Prionace glauca*), dusky shark (*Charcharinus obscurus*), shortfin mako shark (*Isurus oxyrhyncus*), sandbar shark (*Charcharinus plumbeus*), bluefin tuna (*Thunnus thynnus*), and sand tiger shark *(Odontaspis taurus*). Most of these species are found in pelagic waters of at least 82 feet (25 m) depth. The few that enter coastal waters are highly motile and can swim away from any dredging disturbances. Therefore, no more than minimal impacts to highly migratory species are anticipated as a result of this project.

EFH is designated within the dredge and placement areas for juvenile and adult little skates (*Leucoraja erinacea*). The little skate has a coastal distribution; and is found in habitats with sandy, gravelly, or mud substrates of the shallow water in the western Atlantic from Nova Scotia, Canada to North Carolina, USA. This species can tolerate a wide range of temperatures and salinity ranges from 27 to 33.8 ppt. They are found from the surface waters to depths of 295 feet (90 m). The little skate does not appear to have large-scale migrations but they do move to

shallower water during the summer and move to deeper water in fall or early winter. The skates are motile should be able to swim from any areas of disturbance. Therefore, no more than minimal impacts to little skate EFH are anticipated as a result of this project.

EFH is designated in the project areas for juvenile winter skates (*Leucoraja ocellata*). The winter skate also has a coastal distribution; and is found in habitats with sand and gravel for juveniles and sandy, gravelly, or mud substrates for adults. This species is found in the shallow water in the western Atlantic from Newfoundland Banks and southern Gulf of St. Lawrence in Canada to North Carolina, USA from the surface to depths of 295 feet. The skates are motile should be able to swim from any areas of disturbance. Therefore, no more than minimal impacts to little skate EFH are anticipated as a result of this project.

5.0 CUMULATIVE EFFECTS

Cumulative impacts are those resulting from the incremental impact of the proposed action when added to other past, present, and reasonably foreseeable future actions. Past and current activities in Point Judith Harbor include the maintenance dredging of the Federal channel, dredging of private marinas, commercial fishing vessel traffic, recreational boating, recreational fishing, and other water related recreational activities. Reasonably foreseeable future actions include the continuation of current maintenance and navigation activities. The effects of these previous and existing actions are generally limited to infrequent disturbances of the benthic communities in the dredged and disposal areas. Water quality, air quality, hydrology, and other biological resources are generally not significantly affected by these actions. The placement of sand in the nearshore environment keeps the sand within the system and reduces the overall erosion of the area. The direct effects of this project are not anticipated to add to impacts from other actions in the area. Therefore, no adverse cumulative impacts to EFH species are anticipated as a result of this project.

6.0 SUMMARY OF EFFECTS

The dredging activities proposed for improvement dredging of the Point Judith Harbor channel could potentially have some limited temporary impacts on EFH species found within the vicinity of the dredge and placement area. There would be minimal turbidity associated with the project since the material being dredged is sand and the project is projected to be completed in a short time frame (i.e., under 1 month). During the proposed work schedule of October through January, sensitive life stages of winter flounder (i.e., eggs and larvae) would not be significantly impacted by dredging or suspended sediments as they should not be present in significant numbers. Additionally the localized and short-term increases in turbidity levels should have minimal effects on anadromous fish and shellfish spawning. In general, eggs and larvae are more susceptible to impacts than juveniles and adults (Sherk et al., 1975) which can avoid dredging and disposal related disturbance. Due to the time of year for the proposed dredging, the EFH species with the greatest potential to be affected by the dredging project are those with planktonic eggs and larvae suspended in the water column (whiting, red hake, windowpane flounder). These eggs and larvae may be physically damaged or killed from exposure to elevated

concentrations of suspended solids, but the sediment contains few fines, so little material will stay suspended in the water column.

6.1. Conclusions

Although there is the potential for project activities to impact species which may occur in the dredging and disposal areas, any impacts are expected to be of short-term and limited to the immediate project area. Hydrological conditions such as tides and currents will not change as a result of the project. Any changes to water quality (temperature and TSS, DO) will be temporary and water quality will return to pre-project conditions when the project is complete. Prey species destroyed or otherwise impacted during the dredging and placement processes are expected to return following project completion.

Additionally, not all areas designated as EFH for the various species will be impacted. Most species with designated EFH in Point Judith Harbor also have EFH in Block Island Sound and other harbors along the coast. The effects of dredging and placement will be confined to limited areas of the Point Judith Harbor FNP and nearshore off of Matunuck Beach. Therefore, the species at these locations will be able to sustain the population of their respective species in this geographic region.

7.0. REFERENCES

LaSalle, M. W., D. G. Clarke, J. Homziak, J.D. Lunz, and T.J. Fredette. 1991. A framework for assessing the need for seasonal restrictions on dredging and disposal operations. Technical Report D-91-1. U.S. Army Engineer Waterways Experiment Station, Vicksburg, MS. NTIS No. AD A240 567.

Sherk, J.A., J.M. O'Connor, and D.A. Neumann. 1975. Effects of suspended and deposited sediments on estuarine environments. Estuarine Research. 2:541-558.

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APPENDIX I

AIR QUALITY RECORD OF NON-APPLICABILITY (RONA)

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RECORD OF NON-APPLICABILITY (RONA)

Emissions Calculations for:

Point Judith Section 107 Project

Narragansett, Rhode Island

GENERAL CONFORMITY - RECORD OF NON-APPLICABILITY

Project/Action Name:	Point Judith Harbor Section 107 Navigation Improvement Project Narragansett, Rhode Island
Project/Action Point of Contact:	Joseph B. MacKay, Chief, Environmental Resources Section Phone: 978-318-8142

General Conformity under the Clean Air Act, Section 176 has been evaluated for the project described above according to the requirements of 40 CFR 93, Subpart B. The requirements of this rule are not applicable to this project/action because:

Total direct and indirect emission from this project/action are estimated at less than 100 tons for Ozone, and are below the conformity threshold value established at 40 CFR 93.153(b) of 100 tons/year of Ozone;

AND

The project/action is not considered regionally significant under 40 CFR 93.153(i).

Supporting documentation and emissions estimates are:

(X) ATTACHED
(X) APPEAR IN THE NEPA DOCUMENTATION (Section 7.9)
( ) OTHER

SIGNED _____

Jay MacKay, Chief, Environmental Resources Section

General Conformity Review and Emission Inventory for the Point Judith Section 107 Project (Narragansett, RI)

Estimates from Cost Engineer

24-Aug-17

1	2	3	4	5	6	7	8	9	10	11
	Project Emission Sources and Estimated Power						NOx Emission Estimates		VOC Emission Estimates	
Equipment/Engine Category	# of Engines	hp	LF	hrs/day	Days of Operation	hp-hr	NOx EF (g/hp-hr)	NOx Emissions (tons)	VOC EF (g/hp-hr)	VOC Emissions (tons)
Dredge	1	625	1.00	10	12	75,000	9.200	0.76	1.300	0.11
Work Tug Boat	1	100	1.00	10	12	12,000	9.200	0.12	1.300	0.02
Crew/Survey Boat	1	100	1.00	10	12	12,000	9.200	0.12	1.300	0.02
Tow Tug	1	300	1.00	10	12	36,000	9.200	0.37	1.300	0.05
	1	0	1.00	0	0	-	9.200	0.00	1.300	0.00
	1	0	1.00	0	0	-	9.200	0.00	1.300	0.00
Total Emissions							**NOx Total**	**0.61**	**VOC Total**	**0.09**

Horsepower Hours

hp-hr = # of engines*hp*LF*hrs/day*days of operation

Load Factors

Load Factor (LF) represents the average percentage of rated horsepower used during a source's operational profile. For this worst case estimate, LF is held at 1 for all equipment. Typical is 0.4 to 0.6

Emission Factors

NOx Emissions Factor for Off-Road Construction Equipment is 9.20 g/hp-hr

VOC Emissions Factor for Off-Road Construction Equipment is 1.30 g/hp-hr

Emissions (g) = Power Demand (hp-hr) * Emission Factor (g/hp-hr)

Emissions (tons) = Emissions (g) * (1 ton/907200 g)

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APPENDIX J

DREDGED MATERIAL PLACEMENT SUITABILITY DETERMINATION

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CENAE-PDE April 25, 2018

Memorandum For: Mark Habel, Project Manager, CENAE-PDP

Subject: Suitability Determination for the Point Judith Pond Federal Navigation Project Channel Extension, Narragansett, Rhode Island.

1. **Summary:**

This memorandum addresses the suitability of dredged material from the Point Judith Pond Federal Navigation Project Channel Extension for placement at a nearshore beneficial reuse site. The New England District (NAE) of the U.S. Army Corps of Engineers (USACE) finds that sufficient data has been provided to satisfy the evaluation and testing requirements of Section 404 of the Clean Water Act (CWA). Based on an evaluation of the project site and the material proposed to be dredged, these sediments are suitable for placement at the proposed location.

2. **Project Description:**

NAE is proposing to widen the existing East Branch Channel of the Point Judith Pond Federal Navigation Project (FNP) by dredging an area approximately 700' long and 50' wide adjacent to the FNP to a depth of –15 FT Mean Lower Low Water (MLLW). This channel widening encompasses approximately 0.8 acres and will produce a volume of approximately 7,100 cubic yards of sandy material. NAE is also proposing to lengthen the East Branch Channel by dredging an area approximately 1,200' long and 150' wide to a depth of –11 FT MLLW. This channel extension covers approximately 4.1 acres and will produce a volume of approximately 11,200 cubic yards of sandy material. The existing FNP and proposed channel improvements are presented on Figure 1.

This material is expected to be mechanically dredged and placed at a previously used nearshore site off the Mantunuk shoreline for the purpose of beach nourishment (Figure 2).

3. **Sampling, Testing, and Analysis:**

A contractor for the Rhode Island Coastal Resources Management Council (RICRMC) collected sediment vibracore samples from Point Judith Pond in December 2015. Five locations were sampled in the proposed improvement areas to characterize the potential dredged material and are presented as Stations A-E on Figure 1. Sediment samples were analyzed for grain size and showed that the entire improvement area is predominately sand with fine grained material comprising less than 20% of any sample (Table 1).

Table 1. Grain Size Results from the Point Judith Pond FNP

Stations	A	B	C	D	E
% Gravel	0.9	1	1	0.2	0
% Sand	96.8	93.9	89.4	79.8	84.4
% Silt and Clay	2.3	5.1	9.6	20	15.6

Stations A and B were greater than 90% sand and were excluded from further testing. Samples from Stations C, D, and E were also predominately sand but were combined into a single composite sample (Composite 1) and analyzed for the bulk chemistry parameters specified in the in the Regional Implementation Manual for the Evaluation of Dredged Material Proposed for Disposal in New England Waters (RIM, EPA/USACE 2004). The additional analysis was performed to determine if the material may be suitable for open water placement at the Rhode Island Sound Disposal Site (RISDS) if an appropriate beneficial use site could not be identified.

The composite sample had detectable concentrations of metals, polycyclic aromatic hydrocarbons (PAHs), and polychlorinated biphenyls (PCBs). These concentrations were low and comparable to a sample the contractor collected at the RISDS reference area (Tables 2 – 4).

Table 2. PAH Concentrations from the Point Judith Pond FNP and RISDS

Analyte	RISDS	COMP 1
Naphthalene	U	U
Acenaphthylene	U	U
Acenaphthene	U	U
Fluorene	U	U
Phenanthrene	20	29
Anthracene	J	J
Fluoranthene	13	54
Pyrene	J	54
Benz(a)anthracene	U	21
Chrysene	U	32
Benzo(b)fluoranthene	U	25
Benzo(k)fluoranthene	U	18
Benzo(a)pyrene	U	16
Indeno(1,2,3-cd)Pyrene	U	11
Dibenz(a,h)anthracene	U	10
Benzo(ghi)perylene	U	12

U = Non-detect, J = Estimated Value, Units = µg/kg

Table 3. Metal Concentrations from the Point Judith Pond FNP and RISDS

Analyte	RISDS	COMP 1
Arsenic, Total	2.8	1.5
Cadmium, Total	U	0.14
Chromium, Total	9.6	10
Copper, Total	2.3	5.2
Lead, Total	6.2	4.7
Mercury, Total	U	0.015
Nickel, Total	4.7	6.2
Zinc, Total	17	23

U = Non-detect, Units = µg/kg

Table 4. PCB Concentrations from the Point Judith Pond FNP and RISDS

Analyte	RISDS	COMP 1
PCB 8	U	0.06
PCB 18	U	U
PCB 28	U	U
PCB 44	U	0.16
PCB 49	U	0.16
PCB 52	U	0.31
PCB 66	U	U
PCB 77	U	U
PCB 87	U	0.20
PCB 101	0.09	0.43
PCB 105	U	0.18
PCB 118	0.07	0.36
PCB 126	0.05	U
PCB 128	U	0.12
PCB 138	U	0.65
PCB 153	U	0.72
PCB 170	U	0.26
PCB 180	0.07	0.81
PCB 183	U	0.21
PCB 184	U	U
PCB 187	U	0.56
PCB 195	U	0.07
PCB 206	U	0.10
PCB 209	0.06	U

U = Non-detect, Units = µg/kg

The composite sample was then analyzed for the potential to cause toxicity to benthic organisms through a 10 day whole sediment toxicity test as described in the Evaluation of Dredged Material Proposed for Ocean Disposal Testing Manual (Green Book, EPA/USACE 1991). Mean survivability for the composite sample was 84% for *A. bahia* and 94% for *L. plumulosus* and was not statistically different from the survivability of organisms exposed to reference sediments from RISDS.

The nearshore placement area of off Mantunuk (Figure 2) was previously used for the placement of dredged material from the Point Judith FNP. Existing side-scan sonar survey data showed the surficial sediments to be composed primarily of sand (Boothroyd et al. 2006).

5. **Clean Water Act Regulatory Requirements:**

The placement of sediments at the nearshore site is regulated under Section 404 of the Clean Water Act. Subpart G of Section 404(b)(1), Guidelines for Specification of Disposal Sites for Dredged or Fill Material, describes the procedures for conducting this evaluation, including any relevant testing that may be required.

Under §230.60, General Evaluation of Dredged or Fill Material, further testing of the dredged material is not necessary if the material is not considered a carrier of contaminants. According to §230.60(a) this exclusion applies if the dredged material is composed primarily of sand, gravel, or other naturally occurring inert material from a high energy environment such as a coastal area with shifting sand bars and channels.

Based on a review of the sampling data, NAE determined that the material from the proposed improvement area of the Point Judith FNP is composed primarily of sand and is not likely a carrier of contaminants. Additional bulk chemistry and toxicity testing confirmed that the material is not a carrier of contaminants.

6. **Suitability Determination:**

Sediments from the Point Judith FNP improvement areas meet the exclusionary criteria established in §230.60(a) as dredged material that is not likely a carrier of contaminants that does not require further testing. Therefore, the material meets the requirements of Section 404 of the Clean Water Act and is suitable for placement as proposed.

Copies of this determination were sent to the United States Environmental Protection Agency Region 1 (USEPA) and RICRMC who concurred with the findings.

7. **References:**

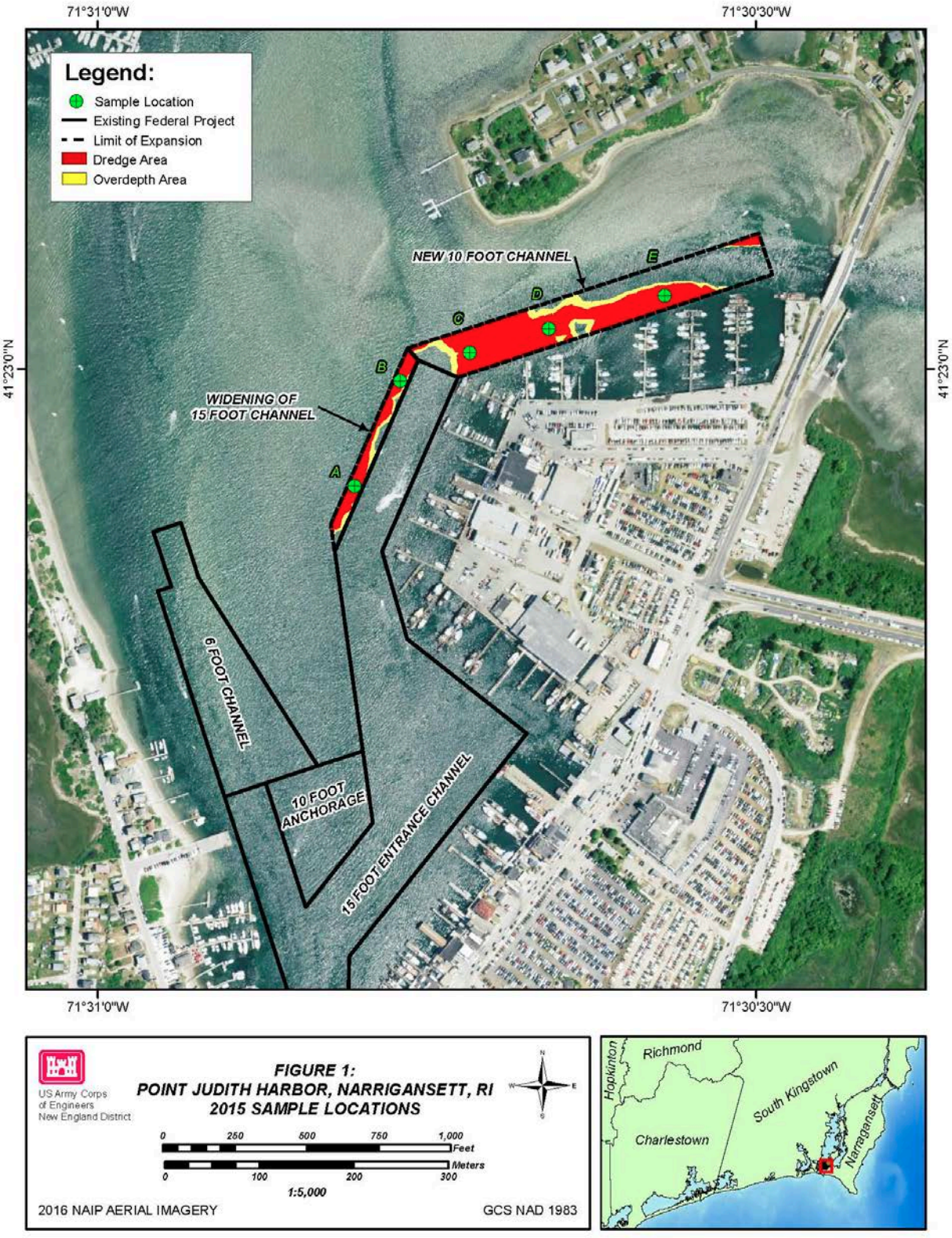
Boothyrod, J, et. al. 2006. Sidescan Report on the Nearshore Area off of Matunuck Beach, RI. Prepared for the U.S. Army Corps of Engineers, New England District, Concord, MA

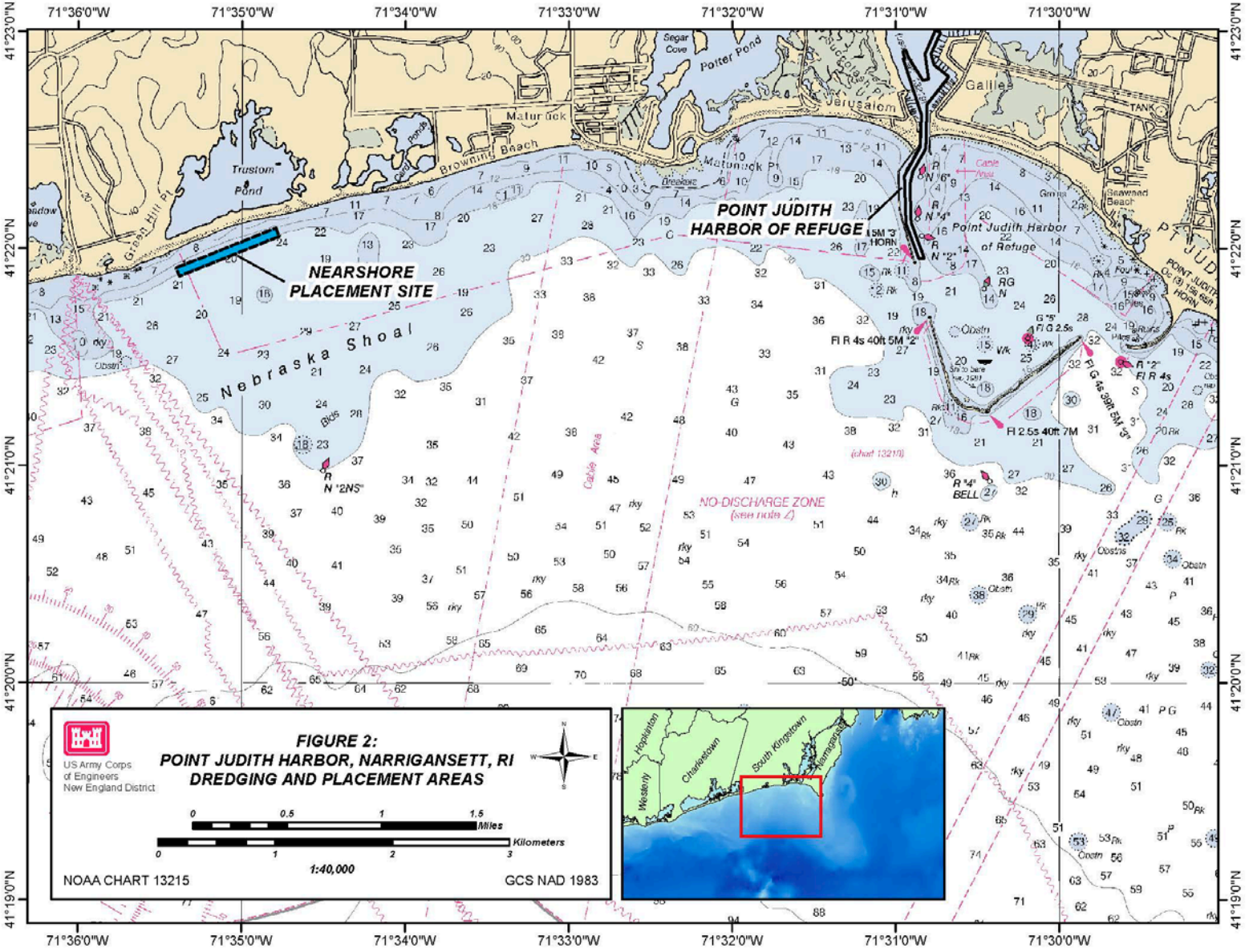
EPA/USACE 2004. Regional Implementation Manual for the Evaluation of Dredged Material Proposed for Disposal in New England Waters. U.S. EPA Region 1, Boston, MA/U.S. Army Corps of Engineers, New England District, Concord, MA.

EPA/USACE 1991. Evaluation of Dredged Material Proposed for Ocean Disposal – Testing Manual. Environmental Protection Agency, Office of Water and Department of the Army, United States Army Corps of Engineers. Washington, D.C.

Aaron Hopkins
Marine Ecologist
Environmental Resources Section
USACE – New England District

Joseph Mackay
Chief
Environmental Resources Section
USACE – New England District


71°31'0"W
71°30'30"W
41°23'0"N
Legend:
Sample Location
Existing Federal Project
Limit of Expansion
Dredge Area
Overdepth Area
NEW 10 FOOT CHANNEL
WIDENING OF 15 FOOT CHANNEL
A
B
C
D
E
6 FOOT CHANNEL
10 FOOT ANCHORAGE
15 FOOT ENTRANCE CHANNEL
US Army Corps of Engineers New England District
FIGURE 1:
POINT JUDITH HARBOR, NARRIGANSETT, RI
2015 SAMPLE LOCATIONS
0 250 500 750 1,000 Feet
0 100 200 300 Meters
1:5,000
2016 NAIP AERIAL IMAGERY
GCS NAD 1983
Hopkinton
Richmond
South Kingstown
Charlestown
Narragansett


71°36'0"W
71°35'0"W
71°34'0"W
71°33'0"W
71°32'0"W
71°31'0"W
71°30'0"W
41°23'0"N
41°22'0"N
41°21'0"N
41°20'0"N
41°19'0"N
NEARSHORE PLACEMENT SITE
POINT JUDITH HARBOR OF REFUGE
Nebraska Shoal
NO-DISCHARGE ZONE
(see note 2)
Cable Area
Point Judith Harbor of Refuge
Fl R 4s 40ft 5M "2"
Fl 2.5s 40ft 7M
Fl G 4s 39ft 5M "3"
Fl R 4s
Fl G 2.5s
R "4" BELL
N "2NS"
Potter Pond
Trustom Pond
Browning Beach
Matunuck
Jerusalem
Galilee
Segar Cove
Seaweed Beach
Obstn
Wk
Rk
FIGURE 2:
POINT JUDITH HARBOR, NARRIGANSETT, RI
DREDGING AND PLACEMENT AREAS
US Army Corps of Engineers
New England District
0 0.5 1 1.5 Miles
0 1 2 3 Kilometers
1:40,000
NOAA CHART 13215
GCS NAD 1983
Hopkinton
Westerly
Charlestown
South Kingstown
Narragansett

From: Hopkins, Aaron D CIV USARMY CENAE (US)
To: Habel, Mark L CIV USARMY CENAE (US)
Subject: Point Judith Suitability Determination
Date: Wednesday, April 25, 2018 1:23:46 PM

EPA's concurrence:

-----Original Message-----
From: Guza-Pabst, Olga [mailto:Guza-Pabst.Olga@epa.gov]
Sent: Tuesday, April 10, 2018 12:23 PM
To: Hopkins, Aaron D CIV USARMY CENAE (US) <Aaron.D.Hopkins@usace.army.mil>
Subject: [Non-DoD Source] RE: RI Suitability Determination

Hi Aaron, I concur with your SD. One question - why do chemistry on sediments that meet exclusionary criteria?

-----Original Message-----
From: Hopkins, Aaron D CIV USARMY CENAE (US) [mailto:Aaron.D.Hopkins@usace.army.mil]
Sent: Tuesday, April 10, 2018 9:46 AM
To: Guza-Pabst, Olga <Guza-Pabst.Olga@epa.gov>
Subject: RI Suitability Determination

Olga,

Attached is a draft suitability determination for proposed improvement dredging of the Point Judith Pond FNP. The material will be mechanically dredged and placed at a previously used nearshore site for beach nourishment.

Please respond within 10 working days if you have any comments or concerns.

Thank you,
Aaron

Aaron Hopkins
US Army Corps of Engineers
New England District
696 Virginia Road
Concord, MA 01742
978.318.8973