

January 14, 2025

Maine Coastal Program 32 Blossom Lane 21 State House Station Augusta, Maine 04330

**RE:** CZMA Federal Consistency Review Submission

Yachtsman Marina Dredging Kennebunkport, Maine 04046

To Whom it May Concern,

On behalf of KPT Marine, LLC (Applicant), Walsh Engineering Associates, Inc. (WEA), is pleased to submit the enclosed Coastal Zone Management Act (CZMA) Federal Consistency Review submission for the proposed dredging project to take place in the Kennebunk River, at the Yachtsman Marina. A Federal Consistency Review is required because two federal permits from the U.S. Army Corps of Engineers (USACE) are necessary to conduct the dredging/disposal work. This project also requires a state permit from the Maine Department of Environmental Protection (DEP) and local permits from the Town of Kennebunkport. A list of all permits required for the project, the associated regulatory entities, and the status of permit application submissions are shown in the table below:

Required Permit/Approval	Regulatory Entity	Status	
Section 408	USACE	Submitted11/22/2024	
Individual Standard Permit	USACE	Submitted 11/22/2024	
Natural Resources Protection Act Individual Permit	Maine DEP	Submitted 11/22/2024	
Kennebunk River Committee	Town of	To be submitted February/	
Approval	Kennebunkport/Kennebunk	March 2025	
Kennebunk River Harbor	Town of	To be submitted February/	
Master Approval	Kennebunkport/Kennebunk	March 2025	
Activities and Land Use Permit	Town of Kennebunkport	To be submitted following River Committee/Harbor Master approval	
Site Plan Review Town of Kennebunk		To be submitted following River Committee/Harbor Master approval	
Flood Hazard Development Permit	Town of Kennebunkport	To be submitted following River Committee/Harbor Master approval	

A Federal Consistency Submission Form is included with this letter, as well as copies of the USACE Section 408 and Individual Standard Permit applications that were submitted on November 22, 2024, and the Maine DEP Natural Resources Protection Act (NRPA) Individual Permit application that was also submitted on November 22, 2024.

On behalf of the applicant, thank you in advance for your review of this submission. We look forward to working with you and the Maine Coastal Program to make this project successful.

Respectfully,

Leyna Tobey, PE – Project Manager Walsh Engineering Associates, Inc.

Leyna L. Tobery

cc. KPT Marine, LLC - Shawn Dumas

USACE – Heather Stukas Maine DEP – Alison Sirois

Enc. Federal Consistency Submission Form

USACE Section 408 Permit Application (Submitted on November 22, 2024)

USACE Individual Standard Permit Application (Submitted on November 22, 2024) Maine DEP NRPA Individual Permit Application (Submitted on November 22, 2024)



The Maine Coastal Program (MCP) is the lead agency for Coastal Zone Management in Maine. MCP strongly suggests that applicants for a federal consistency determination or certification use this form for activities regulated under the Coastal Zone Management Act (CZMA) of 1972, as amended, and the National Oceanic and Atmospheric Administration (NOAA) Federal Consistency Regulations under 15 CFR Part 930. Although use of this form is not required, it is provided to applicants to facilitate the submission and timely review of a consistency determination or certification. Federal agencies and applicants are only required to provide the information listed in NOAA's Federal Consistency Regulations unless otherwise described in the Maine Guide to Federal Consistency Review, as approved by NOAA.

# I. Applicant Information: Project/Activity Name:

Yachtsman Marina Dredging					
Contact Name:	Authorized Agent (if applicable):				
Shawn Dumas (on behalf of KPT Marine, LLC, Applicant)	Walsh Engineering Associates	eering Associates, Inc. (c/o - Leyna Tobey)			
Federal Agency:					
N/A					
Address:					
57 Ocean Avenue					
City:	State:	Zip Code:			
Kennebunkport	Maine	04046			
Email:	Phone Number:				
leyna@walsh-eng.com (Authorized Agent)	207-553-9898 (Authorized Aç	gent)			
II. Federal Consistency Category:					
☐ Federal Agency Activity (15 CFR Part 930, s	ubpart C)				
■ Federal License or Permit Activity (15 CFR	Part 930, subpart D)				
☐ Outer Continental Shelf Activity (15 CFR Page 15)	art 930, subpart E)				
☐ Federal Financial Assistance Activity to State/Local Government (15 CFR Part 930, subpart F)					
III. Summary Description:					
The project includes dredging of the Kenr provide adequate depth for navigation.	nebunk River at the `	Yachtsman Marina to			

#### IV. Select enforceable policies relevant to project or activity:

	Natural Resources Protection Act (38 M.R.S. §§480-A to 480-S; and 480-U to 480-HH)
	Site Location of Development Law (38 M.R.S. §§481 to 485-A; 486-A, -B; 487-A to 490-FF)
	Maine Metallic Mineral Mining Act (38 M.R.S. §§490-LL to 490-TT)
	MaineDOT Traffic Movement Permit Law (23 M.R.S. §704-A)
	Erosion Control and Sedimentation Law (38 M.R.S. §420-C)
	Expedited Permitting of Grid-scale Wind Energy Development (35-A M.R.S. §§3451-3459)
	Solar Energy Development Decommissioning Law (35-A M.R.S. chapter 34-D)
	Storm Water Management Law (38 M.R.S. §420-D)
	Maine Waterway Development and Conservation Act (38 M.R.S. §§630 to 636-A; 640)
	Protection and Improvement of Air Law (38 M.R.S. §§581 to 610-A, -B)
	Protection and Improvement of Waters Act (38 M.R.S. §§361-A, 362, 362-A, 363-D, 372; 410-
	N; 411 to 424; 451, 451-A, 452; 464 to 470)
	Nutrient Management Act (7 M.R.S. §§4201 to 4214)
	Land Use Regulation Law (12 M.R.S. §§681 to 689)
	Maine Hazardous Waste, Septage and Solid Waste Management Act (38 M.R.S. §§1301 to
	1310-BB; 1316 to 1316-L; 1317 to 1319-Y)
	Uncontrolled Hazardous Substance Sites Law (38 M.R.S. §§1362, 1367, 1367-B)
	Asbestos Law (38 M.R.S. §§1273 and 1281)
	Lead Abatement Law (38 M.R.S. §§1296 and 1298(3))
	Sale of Consumer Products Affecting the Environmental Law (38 M.R.S. §§1608 and 1609-10)
	Mercury-Added Products and Services Law (38 M.R.S. §§1661 to 1661-C; 1665-A, -B; 1672
	Solid Waste Management and Recycling Law (38 M.R.S. §§2101; 2133, sub-§2(A); 2165
	Priority Toxic Chemical Use Reduction Law (38 M.R.S. §§2321 to 2330)
	Wellhead Protection Law (38 M.R.S. §§1391 to 1399)
	Nuclear Facility Decommissioning Laws (PL 1999 c. 739; PL 1999 c. 741)
	Oil Discharge Prevention & Pollution Control Law (38 M.R.S. §§541 to 560)
	Oil Storage Facilities and Ground Water Protection Law (38 M.R.S. §§561; 562-A; 563, sub-
	\$1(A) and 2; 563-A to -B; 564; 565-A; 566-A; 568; 568-A to -B; 569-C; 570; 570-C to -G, I to M
	Maine Endangered Species Act (12 M.R.S. §12801 to 12810; 12 M.R.S. §6971 to 6976; 12
	M.R.S. §10001, sub-§§19 and 62)
	General Licensing and Enforcement Authorities; Fees (38 M.R.S. §§341-D; 344 to 349; 352 to 353; 353-A, -B)
	Maine Rivers Act (12 M.R.S. §§403; 407)
H	Marine Resources Law (12 M.R.S. §§6171 to 6192; 6432-A)
H	Importing of Certain Marine Organisms (12 M.R.S. §6071)
H	Aquaculture Leasing Laws (12 M.R.S. §6071-A; 12 M.R.S. §6072; 12 M.R.S. §6072-A; 12
	M.R.S. §6073)
	Subdivision Law (30-A M.R.S. §§4401 to 4408)
	Mandatory Shoreland Zoning Law (38 M.R.S. §§435 to 448)
	Coastal Management Policies Act (38 M.R.S. §§1801 to 1802)
	Coastal Barrier Resources System Act (38 M.R.S. §§1901 to 1905)
	<u> </u>

# V. Supporting Documentation. Please list all maps, diagrams, reports, and other materials below:

Copies of the U.S. Army Corps of Engineers Section 408 Permit and Individual Standard Permit applications and the Maine Department of Environmental Protection Natural Resources Protection Act (NRPA) Individual Permit application are attached to this Federal Consistency Submission Form. These applications include a project description, dredging plans, an alternatives analysis, and more.

# VI. Other Coordination. Please list all agencies and contacts required to review this project below:

U.S. Army Corps of Engineers: Section 408 Permit, Individual Standard Permit Maine DEP: NRPA Individual Permit Application

Town of Kennebunkport: Kennebunk River Committee Approval, Harbor Master Approval, Activities and Land Use Permit, Site Plan Review, Flood Hazard Development Permit Review

FEDERAL AGENCY CONSISTENCY DETERMINATION.
Based upon the information, data, and analysis included herein, the federal agency or its
authorized agent finds the proposed activity is consistent to the maximum extent practicable
with the enforceable policies of the Maine Coastal Program.
FEDERAL AGENCY NEGATIVE DETERMINATION.
Based upon the information, data, and analysis included herein, the federal agency or its
authorized agent finds the proposed activity will not have any reasonably foreseeable effects
on Maine's coastal uses or resources.
NON-FEDERAL APPLICANT CONSISTENCY CERTIFICATION.
Based upon the information, data, and analysis included herein, the non-federal applicant
certifies that the proposed activity complies with the enforceable policies of Maine Coastal
Program and will be conducted in a manner consistent with such program.

Signature:	Leyna L. Tobery	Digitally signed by Leyna Tobey, PE Date: 2025.01.14 13:31:41-05'00'	
Printed Name:		Date:	
Leyna Tobey		1/14/2025	

USACE Section 408 Permit Application (Submitted on November 22, 2024)

## Army Corp of Engineers Section 408

For

Yachtsman Marina 57 Ocean Ave Kennebunkport, ME 04046

November 22, 2024

### **Applicant**

KPT Marine, LLC P.O. Box 2734 Kennebunkport, Maine

Prepared By:



One Karen Drive, Suite 2A Westbrook, Maine 207.553.9898



November 22, 2024

U.S. Army Corps of Engineers – Maine Project Office Heather S. Stukas – Project Manager 442 Civic Center Drive, Suite 350 Augusta, ME 04330

RE: Section 408 Permit
Yachtsman Marina Dredging
57 Ocean Avenue
Kennebunkport, Maine

Dear Ms. Stukas:

Walsh Engineering Associates, Inc. (WEA) is requesting permission for a <u>single-phased review</u> for a private entity (KPT Marine, LLC; Applicant) to make alterations adjacent to, and to temporarily occupy, a U.S. Army Corps of Engineers (USACE) Federally Authorized Civil Work Project under 33 USC 408 (Section 408). The applicant is proposing to mechanically dredge a portion of the Kennebunk River adjacent to, but not within, the Kennebunk River Federal Navigation Project (FNP). The proposed dredging actions are not anticipated to be injurious to the public interest or impair the usefulness of the USACE project.

The Yachtsman Marina is located at 57 Ocean Avenue in Kennebunkport, Maine with 600 feet of frontage on the Kennebunk River. The Town of Kennebunkport Assessor's Office identifies the parcel as Map 10, Block 1, Lot 3. The facility consists of an active marina with 58 boat slips.

The shoaling that is occurring in the Yachtsman Marina area makes vessels more susceptible to groundings and exposes them to hazardous conditions when tides and weather create rough seas. Bathymetric surveys of the FNP have identified sufficient shoaling that presents a navigational hazard.

#### **Proposed Action**

The Applicant is proposing to mechanically dredge the following:

- Proposed dredged volume = 6,400 cubic yards of silt and sand
- Area of dredge = 61,000 square feet (1.4 acres)
- Proposed dredge depth = elevation -6.0 feet mean low water, with about 1 foot of over-dig

The purpose of this project is to dredge the shoaled areas of the FNP to restore safe vessel navigation at the Yachtsman Marina, and to dispose of dredged material in the most appropriate location. The dredged material will be transported by barge to an open water placement disposal site known as the Isle of Shoals North Disposal Site. Please refer to Figure 1 – Plan View, Figure



2 – Section Views, and Figure 3 – Section 408 Plan, attached to this letter, for detailed dredging information.

#### Alteration, Occupation, and Use of the FNP

Federal Navigation Projects are authorized, constructed, and maintained on the premise that they will be accessible and available to all on equal terms. These Projects include a wide array of channels and harbors that provide for the needs of fishing vessels, commercial shippers, recreational boaters, and national defense.

Given the anticipated timing for receiving USACE Individual Standard Permit Approval, Maine Department of Environmental Protection (DEP) Natural Resources Protection Act (NRPA) Approval, and a Disposal Authorization, WEA anticipates that the dredging equipment would temporarily occupy the area during the winter 2025-2026 dredge window. WEA will be working closely with the Yachtsman Marina and the designated dredging company to ensure the alteration of the FNP by dredging will be in the manner and amount that has been designated and approved. The dredge will only temporarily occupy the FNP for the amount of time needed to dredge the area (anticipated to be two days).

A 1976 USACE map showing the original limits of the Kennebunk River FNP is attached to this letter, as well as an updated map from 2020 showing revised coordinates for the upstream limits of the FNP.

#### Operation, Maintenance, and Repair

Sand shoals accumulate rapidly in this area of the Kennebunk River, creating the need for regular maintenance dredging. The Yachtsman Marina site has an extensive history of dredging. The proposed dredge area is coincidental with the area that was previously permitted under Maine DEP Permit #L-18612-4E-A-N in 1994. Since that time, the Yachtsman Marina was dredged in 2005 under Permit ##L-18612-4E-B-N, and in Winter 2015-2016 under Maine DEP's Permit by Rule (PBR) process and U.S. Army Corps of Engineers (USACE) Permit #NAE-2004-319. Any dredging that takes place is only a temporary measure until the Yachtsman Marina identifies the need for additional dredging in the future.

#### Potential Impacts to Usefulness of the FNP

No potential impacts to the usefulness of the FNP are anticipated. The project is not anticipated to be injurious to the public interest.

#### **Statement of No Objection**

Please see the Statement of No Objection Letter from the project's Non-Federal Sponsor, the Town of Kennebunkport, attached to this letter.

#### **Endangered Species**

The National Marine Fisheries Service and the U.S. Fish and Wildlife Service have been consulted to ensure that the proposed activity will not significantly affect any species or critical habitat designated as endangered or threatened pursuant to the Endangered Species Act (ESA) of 1973. It



2 – Section Views, and Figure 3 – Section 408 Plan, attached to this letter, for detailed dredging information.

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#### **Endangered Species**

The National Marine Fisheries Service and the U.S. Fish and Wildlife Service have been consulted to ensure that the proposed activity will not significantly affect any species or critical habitat designated as endangered or threatened pursuant to the Endangered Species Act (ESA) of 1973. It



is our determination that the project is not likely to adversely affect threatened or endangered species.

#### **Cultural Resources**

The Maine Historic Preservation Commission (MHPC) and the Tribal Historic Preservation Officers (THPO) of Maine have been notified regarding this project. Copies of these notifications are included with this letter. Any responses received from the MHPC and THPO will be forwarded to the project manager assigned to this project.

#### **Essential Fish Habitat Assessment**

According to the National Oceanic and Atmospheric Administration (NOAA) Fisheries Essential Fish Habitat (EFH) Mapper, the project location is mapped within a New England/Mid-Atlantic EFH for the following species: Acadian redfish (larvae); haddock (juvenile); little skate (adult); monkfish (eggs, larvae, juvenile, adult); silver hake (eggs, larvae, adult); and winter flounder (eggs). The project is likely to have short-term and localized impacts to EFH, with no significant impacts to these habitats anticipated.

#### Additional Requirements – Water Quality Certification

The Maine DEP "has combined the decision concerning water quality certification with the review of an application for a state permit that already requires compliance with state water quality standards...the issuance of the order approving the project constitutes both the state permit and the water quality certification." The project team is planning to file a Maine DEP NRPA Permit Application concurrently with this Section 408 Application. In accordance with the statement quoted above, the NRPA Permit Approval will constitute both the state permit and the Water Quality Certification and can be provided to the USACE upon receipt.

This Section 408 Permit Application is being submitted concurrently with a USACE Individual Standard Permit Application for the project. If you have any questions or concerns with this project, please feel free to contact me at (207) 553-9898 or by e-mail at leyna@walsh-eng.com. We look forward to working with you on this project.

Respectfully,

Leyna Tobey, PE – Project Manager

Leyna L. Tobery

Walsh Engineering Associates, Inc.

cc. KPT Marine, LLC; Shawn Dumas

Enc. Section 408 Project Plans

Figure 1 – Dredging Plan View, Figure 2 – Dredging Section View, Figure 3 – Section 408 Plan

Kennebunk River FNP Maps

USACE 1976 Kennebunk River FNP Map, USACE 202 Kennebunk River FNP Map

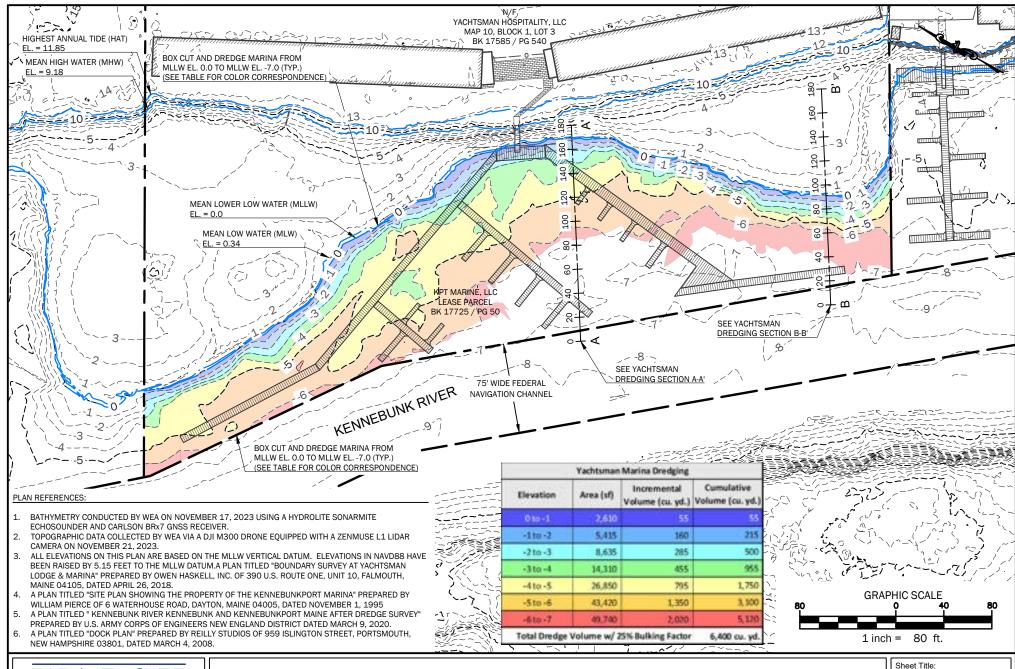
Statement of No Objection Letter from Non-Federal Sponsor

Town of Kennebunkport Letter dated October 31, 2024



#### Cultural Resources Correspondence

MHPC Notification Letter dated October 25, 2024 THPO Notification Letter dated October 25, 2024 Passamaquoddy Tribe Response Letter dated November 5, 2024 MHPC Response Letter dated November 6, 2024





#### YACHTSMAN MARINA DREDGING

57 OCEAN AVE. KENNEBUNKPORT. ME 04046

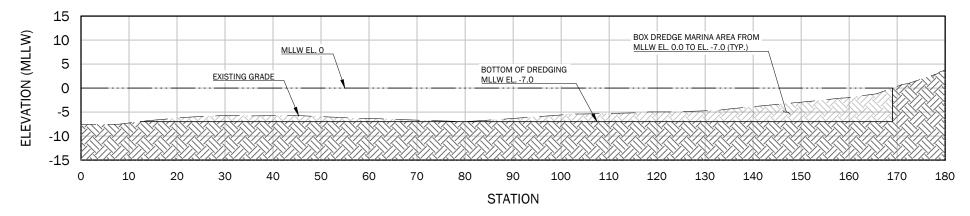
PLAIN VIEW		
Job No.:	643.1	
Date:	OCT. 29, 2024	
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Checked:	WRW	

FIG 1:

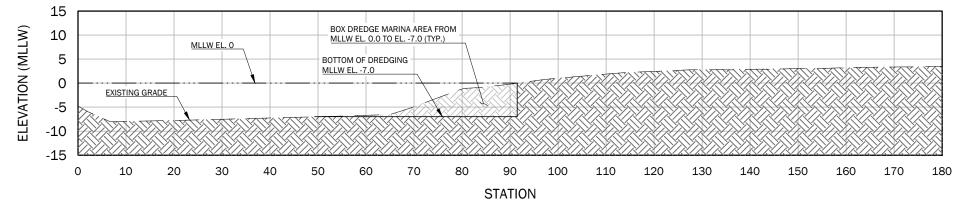
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One Karen Dr., Suite 2A | Westbrook, Maine 04092 ph: 207.553.9898 | www.walsh-eng.com

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## Yachtsman Dredging Section A-A'



Yachtsman Dredging Section B-B'



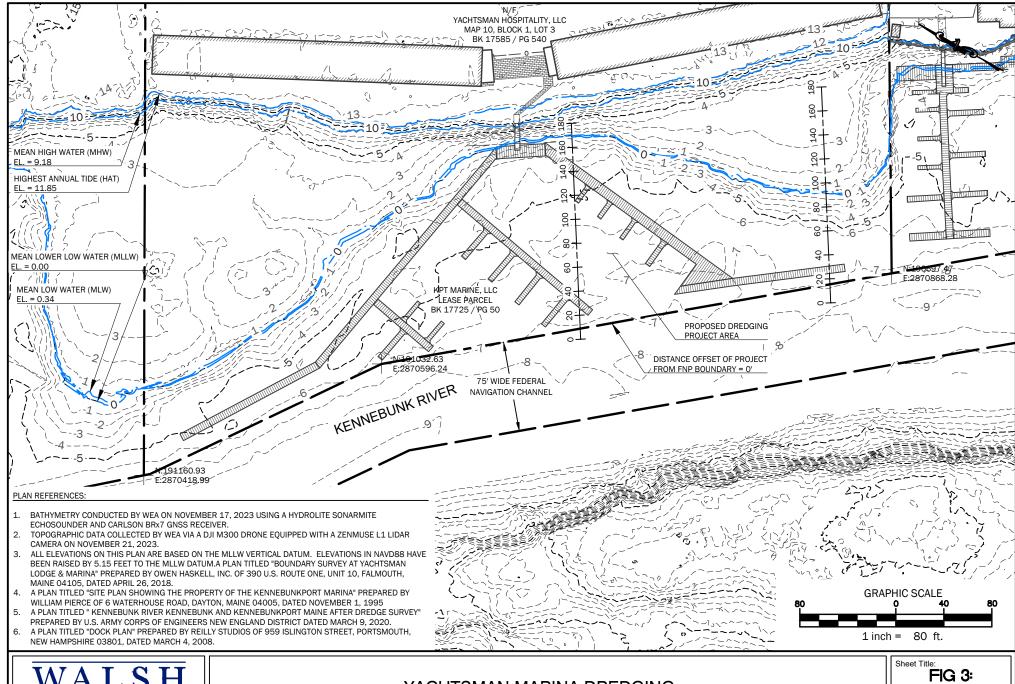


#### YACHTSMAN MARINA DREDGING

57 OCEAN AVE. KENNEBUNKPORT, ME 04046

SECTION VIEW           Job No.:         643.1           Date:         OCT. 29, 2024           Scale:         1" = 20"           Drawn:         CAR/MNW           Checked:         WRW	Sheet Title: FIG 2:		
Date:         OCT. 29, 2024           Scale:         1" = 20'           Drawn:         CAR/MNW	SECT	ION VIEW	
Scale:         1" = 20'           Drawn:         CAR/MNW	Job No.:	643.1	
Drawn: CAR/MNW	Date:	OCT. 29, 2024	
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	Checked:	WRW	

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#### YACHTSMAN MARINA DREDGING

57 OCEAN AVE. KENNEBUNKPORT, ME 04046 
 SEC.
 408 PLAN

 Job No.:
 643.1

 Date:
 OCT. 29, 2024

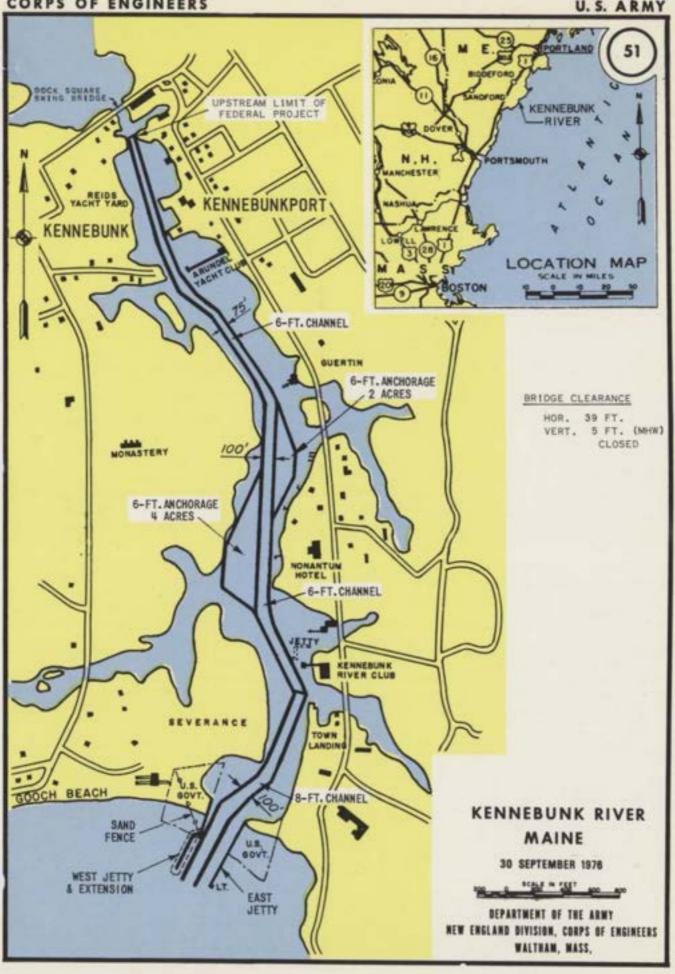
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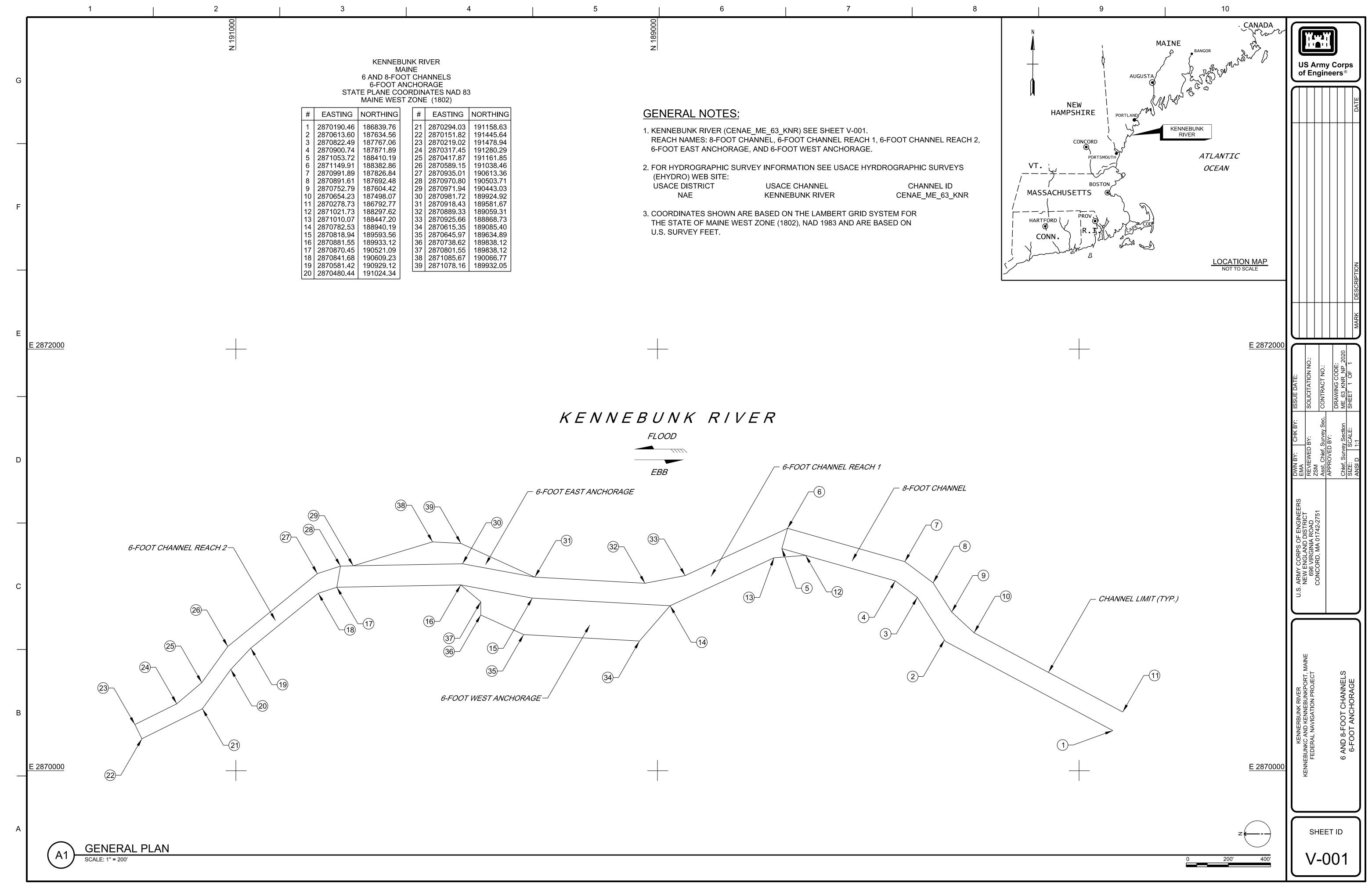
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 CAR/MNW

 Checked:
 WRW

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### TOWNOFKENNEBUNKPORT, MAINE

- INCORPORATED 1653 -

October 31, 2024

U.S. Army Corps of Engineers – Maine Project Office Heather S. Stukas – Project Manager 442 Civic Center Drive, Suite 350 Augusta, ME 04330

RE: Statement of No Objection from the Non-Federal Sponsor

Dear Ms. Stukas:

Walsh Engineering Associates, Inc. (WEA) is requesting permission for a private entity (the Yachtsman Marina, Applicant) to make alterations adjacent to, and temporarily occupy, a U.S. Army Corps of Engineers (USACE) Federally Authorized Civil Work Project under 33 USC 408 (Section 408).

As I understand, the Yachtsman Marina (YM) is seeking to mechanically dredge the shoaled areas of the Kennebunk River within the Yachtsman Marina, which is adjacent to the USACE's Federal Navigation Project, in order to restore safe vessel navigation at the marina. The shoaling that is occurring in the YM's area makes vessels more susceptible to groundings and exposes them to hazardous conditions when tides and weather create rough seas. Bathymetric surveys of the Federal Navigation Project have identified sufficient shoaling that presents a navigational hazard.

The proposed dredging actions are not anticipated to be injurious to the public interest or impair the usefulness of the USACE Federal Navigation Project. This Statement of No Objection does not grant the project permission to move forward with construction. Once the AYC receives USACE Section 408 Approval, they will proceed with filing the following project permits: USACE General Permit Pre-Construction Notification; Maine DEP Natural Resources Protection Act (NRPA) Permit; and Town of Kennebunkport Activities and Land Use, Site Plan Review, Flood Hazard Development, River Committee Approval, and Harbor Master Approval applications.

Sincerely,

Laurie A. Smith Town Manager

Cc: Jamie Houtz, Kennebunk River Harbormaster

6 Elm Street, P.O. Box 566, Kennebunkport, Maine 04046 Tel: (207) 967-4243 Fax: (207) 967-8470



October 25, 2024

Maine Historic Preservation Commission Mr. Kirk F. Mohney, Director 65 State House Station Augusta, Maine 04333-0065 MHPCprojectreview@maine.gov

VIA: Transmitted via email as noted above

RE: Yachtsman Marina Dredging – Project Review Request 57 Ocean Ave, Kennebunkport, ME 04046

Map 10, Block 1, Lot 3

On behalf of the Yachtsman Marina (Applicant), Walsh Engineering Associates, Inc. (WEA) intends to file permit applications with the Maine Department of Environmental Protection (DEP) and the U.S. Army Corps of Engineers (USACE) for maintenance dredging activities in the Kennebunk River at 57 Ocean Avenue in Kennebunkport, Maine. WEA is requesting that the Maine Historic Preservation Commission (MHPC) review the area for any known historic and/or archaeological resources. A site location map is attached for your review.

If you have any questions or concerns with this project, please feel free to contact me at (207) 553-9898 or by e-mail at leyna@walsh-eng.com. Thank you in advance for your time.

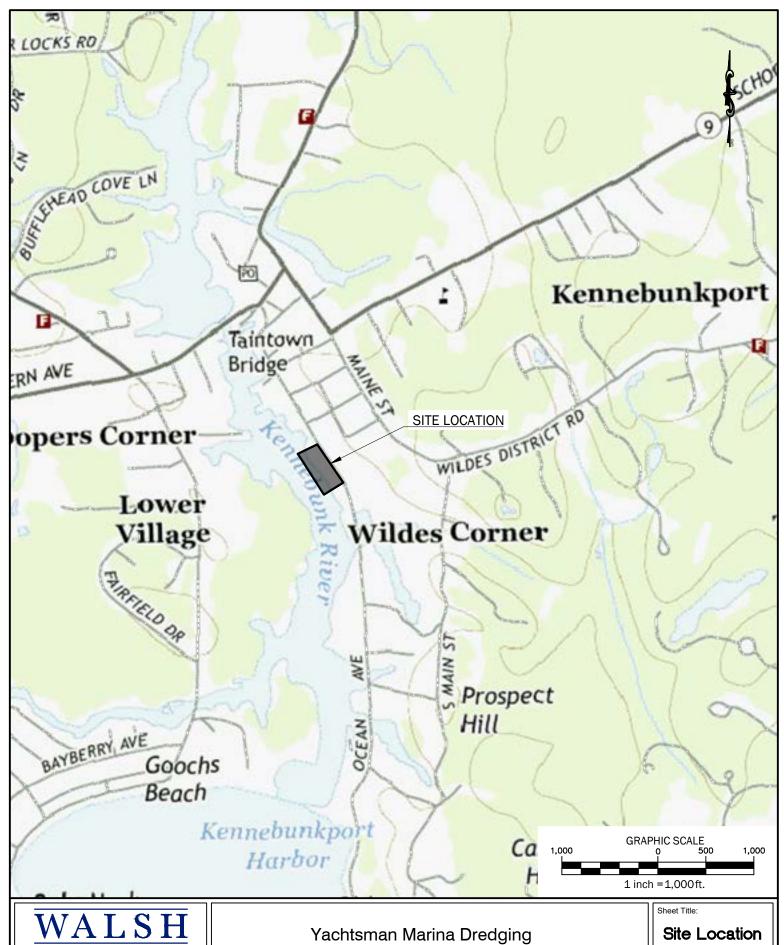
Respectfully,

Leyna Tobey, Project Manager

Leyna L. Tobery

Walsh Engineering Associates, Inc.

Enc: Site Location Map



# engineering associates, inc.

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Yachtsman Marina 57 Ocean Avenue Kennebunkport, Maine 04046 Job No.: Date: OCTOBER 2024 1" = 1,000' Scale: Drawn: LLT Checked: WRW



October 25, 2024

Houlton Band of Maliseet Indians Isaac St. John, THPO 88 Bell Road, Littleton, Maine 04730 istjohn@maliseets.com

Passamaquoddy Tribe of Indians Donald Soctomah, THPO Pleasant Point Reservation P.O. Box 343, Perry, Maine 04667 soctomah@gmail.com

Passamaquoddy Tribe of Indians Donald Soctomah, THPO Indian Township Reservation P.O. Box 301, Princeton, Maine 04668 soctomah@gmail.com

VIA: Transmitted via email as noted above

RE: Yachtsman Marina Dredging – Project Review Request 57 Ocean Ave, Kennebunkport, ME 04046 Map 10, Block 1, Lot 3

On behalf of the Yachtsman Marina (Applicant), Walsh Engineering Associates, Inc. (WEA) intends to file permit applications with the Maine Department of Environmental Protection (DEP) and the U.S. Army Corps of Engineers (USACE) for maintenance dredging activities in the Kennebunk River at 57 Ocean Avenue in Kennebunkport, Maine. WEA is requesting that the Maine Tribal Historic Preservation Offices (THPO) review the area for any known historic and/or archaeological resources. A site location map is attached for your review.

If you have any questions or concerns with this project, please feel free to contact me at (207) 553-9898 or by e-mail at leyna@walsh-eng.com. Thank you in advance for your time.

Respectfully,

Leyna Tobey, Project Manager Walsh Engineering Associates, Inc.

Leyna L. Tobery

Enc: Site Location Map

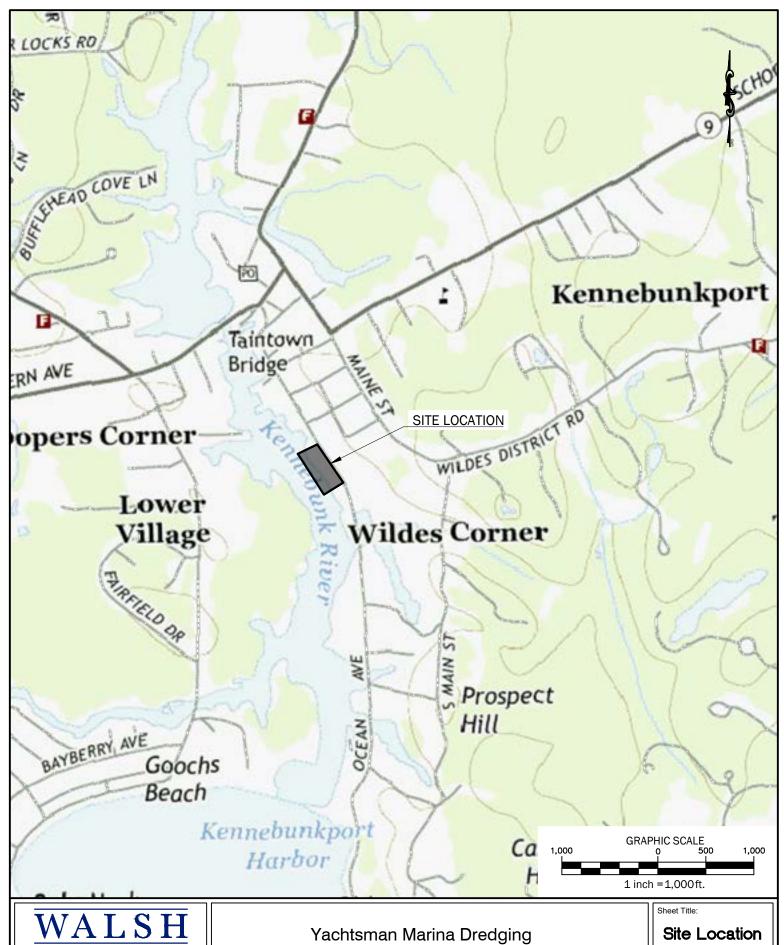
7 Northern Road, Presque Isle, Maine 04769

chris.sockalexis@penobscotnation.org

Mi'kmaq Nation

Jenny Gaenzle, THPO

igaenzle@micmac-nsn.gov



# engineering associates, inc.

One Karen Dr., Suite 2A | Westbrook, Maine 04092 ph: 207.553.9898 www.walsh-eng.com

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Yachtsman Marina 57 Ocean Avenue Kennebunkport, Maine 04046 Job No.: Date: OCTOBER 2024 1" = 1,000' Scale: Drawn: LLT Checked: WRW

# Tribal Historic Preservation Office Passamaquoddy Tribe

PO Box 159 Princeton, Me. 04668 207-214-4051

November 5, 2024

Leyna Tobey, PE\*

**Project Manager | Civil Engineer** 

Walsh

One Karen Drive, Suite 2A

Westbrook, ME 04092

• Re: Kennebunk River at 57 Ocean Avenue in Kennebunkport

#### Dear **Leyna**;

The Passamaquoddy THPO has reviewed the following application regarding the historic properties and significant religious and cultural properties in accordance with NHPA, NEPA, AIRFA, NAGPRA, ARPA, Executive Order 13007 Indian Sacred Sites, Executive Order 13175 Consultation and Coordination with Indian Tribal Governments, and Executive Order 12898 Environmental Justice.

The Project listed above will not have an impact on cultural concerns. If any artifacts or human remains are uncovered please stop and notify this office and the State Historic Preservation Office.

Sincerely;

Donald Soctomah THPO Soctomah@gmail.com



October 25, 2024

Maine Historic Preservation Commission Mr. Kirk F. Mohney, Director 65 State House Station Augusta, Maine 04333-0065 MHPCprojectreview@maine.gov



VIA: Transmitted via email as noted above

RE: Yachtsman Marina Dredging - Project Review Request

57 Ocean Ave, Kennebunkport, ME 04046

Map 10, Block 1, Lot 3

On behalf of the Yachtsman Marina (Applicant), Walsh Engineering Associates, Inc. (WEA) intends to file permit applications with the Maine Department of Environmental Protection (DEP) and the U.S. Army Corps of Engineers (USACE) for maintenance dredging activities in the Kennebunk River at 57 Ocean Avenue in Kennebunkport, Maine. WEA is requesting that the Maine Historic Preservation Commission (MHPC) review the area for any known historic and/or archaeological resources. A site location map is attached for your review.

If you have any questions or concerns with this project, please feel free to contact me at (207) 553-9898 or by e-mail at leyna@walsh-eng.com. Thank you in advance for your time.

Respectfully,

Leyna Tobey, Project Manager

Leyna L. Tobers

Walsh Engineering Associates, Inc.

Enc: Site Location Map

Based on the information submitted, I have concluded that there will be no historic properties affected by the proposed undertaking, as defined by Section 106 of the National Historic Preservation Act.

Consequently, pursuant to 36 CFR 800.4(d)(1), no further Section 106

consultation is required unless additional resources are discovered during project implementation pursuant to 36 CFR 800.13.

Kirk F. Mohney,

State Historic Preservation Officer

Maine Aistoric Preservation Commission

USACE Individual Standard Permit Application (Submitted on November 22, 2024)

# New England District of the U.S. Army Corps of Engineers Individual Standard Permit Application

For

Yachtsman Marina 57 Ocean Ave Kennebunkport, Maine

November 22, 2024

### **Applicant**

KPT Marine, LLC P.O. Box 2734 Kennebunkport, Maine

Prepared By:



One Karen Drive, Suite 2A Westbrook, Maine 207.553.9898



November 22, 2024

U.S. Army Corps of Engineers – New England District c/o Ms. Heather S. Stukas 442 Civic Center Drive, Suite 350 Augusta, ME 04330

RE: New England District of USACE Individual Standard Permit Application Yachtsman Marina Kennebunkport, Maine 04046

Dear Heather,

On behalf of KPT Marine, LLC (Applicant), Walsh Engineering Associates, Inc. (WEA), is pleased to submit the enclosed Individual Standard Permit Application to the New England District of the United States Army Corps of Engineers (USACE) for the proposed dredging activities to take place in the Kennebunk River located adjacent to the Yachtsman Marina.

The Yachtsman Marina is located at 57 Ocean Ave in Kennebunkport, Maine, with 600 feet of frontage along the Kennebunk River. The Town of Kennebunkport Assessor's Office identifies the parcel as Map 10, Block 1, Lot 3. The facility consists of an active marina with 58 boat slips. The proposed dredge area is coincidental with the area that was previously permitted under Maine DEP Permit #L-18612-4E-A-N in 1994. Since that time, the Yachtsman Marina was dredged in 2005 under Permit ##L-18612-4E-B-N, and in Winter 2015-2016 under Maine DEP's Permit by Rule (PBR) process and U.S. Army Corps of Engineers (USACE) Permit #NAE-2004-319.

As described in this application, a USACE Section 408 Permit is required to conduct the dredging work, as the project is located adjacent to the Kennebunk River Federal Navigation Project; a Section 408 Permit application for the project was submitted to the USACE concurrently with this Individual Standard Permit Application. In addition, this application is being submitted concurrently with a Maine DEP Natural Resources Protection Act (NRPA) Application.

On behalf of the applicant, thank you in advance for your review of this application. We look forward to working with you and the department to make this project successful.

Respectfully,

Leyna Tobey, PE – Project Manager Walsh Engineering Associates, Inc.

Lugna L. Toberg

cc. KPT Marine, LLC; Shawn Dumas

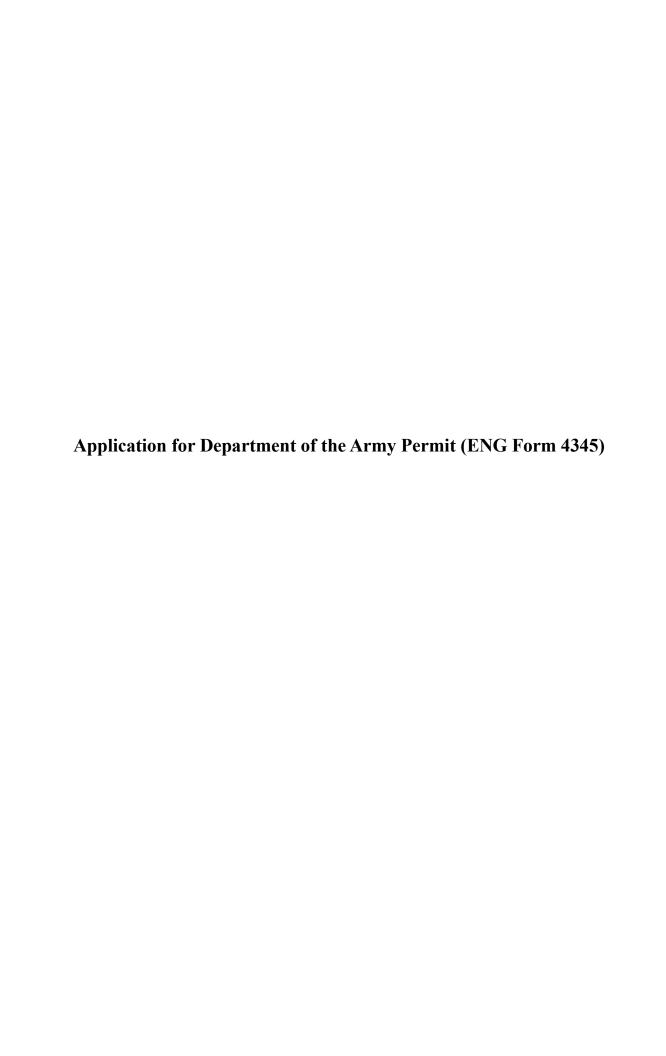
Enc. Individual Standard Permit Application & Supporting Documents

# Table of Contents USACE – Individual Standard Permit Application

### Yachtsman Marina Kennebunkport, ME 04046

### Application for Department of the Army Permit (ENG Form 4345) Agent Authorization

Activities Description	Attachment 1
Dredging Figures	Attachment 2
Alternatives Analysis	Attachment 3
Site Conditions Report	Attachment 4
Historic Sites	Attachment 5
Abutters List	Attachment 6
Construction and Erosion Control Plan	Attachment 7
Sampling & Analysis Plan	Attachment 8
List of Authorizations Required for Project	Attachment 9
Transportation Route	Attachment 10



#### U.S. Army Corps of Engineers (USACE)

#### APPLICATION FOR DEPARTMENT OF THE ARMY PERMIT

For use of this form, see 33 CFR 325. The proponent agency is CECW-CO-R.

Form Approved -OMB No. 0710-0003 Expires: 08-31-2023

The public reporting burden for this collection of information, OMB Control Number 0710-0003, is estimated to average 11 hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding the burden estimate or burden reduction suggestions to the Department of Defense, Washington Headquarters Services, at <a href="whs.mc-alex.esd.mbx.dd-dod-information-collections@mail.mil">whs.mc-alex.esd.mbx.dd-dod-information-collections@mail.mil</a>. Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to any penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number. PLEASE DO NOT RETURN YOUR APPLICATION TO THE ABOVE EMAIL.

#### PRIVACY ACT STATEMENT

Authorities: Rivers and Harbors Act, Section 10, 33 USC 403; Clean Water Act, Section 404, 33 USC 1344; Marine Protection, Research, and Sanctuaries Act, Section 103, 33 USC 1413; Regulatory Programs of the Corps of Engineers; Final Rule 33 CFR 320-332. Principal Purpose: Information provided on this form will be used in evaluating the application for a permit. Routine Uses: This information may be shared with the Department of Justice and other federal, state, and local government agencies, and the public and may be made available as part of a public notice as required by Federal law. Submission of requested information is voluntary, however, if information is not provided the permit application cannot be evaluated nor can a permit be issued. One set of original drawings or good reproducible copies which show the location and character of the proposed activity must be attached to this application (see sample drawings and/or instructions) and be submitted to the District Engineer having jurisdiction over the location of the proposed activity. An application that is not completed in full will be returned. System of Record Notice (SORN). The information received is entered into our permit tracking database and a SORN has been completed (SORN #A1145b) and may be accessed at the following website: http://dpcld.defense.gov/Privacy/SORNsIndex/DOD-wide-SORN-Article-View/Article/570115/a1145b-ce.aspx

and may be accessed at the following website: <a href="http://dpcld.defense.gov/Privac">http://dpcld.defense.gov/Privac</a>	y/SORNsIndex/DOD-wide-SORN-Article-View/Article/570115/a1145b-ce.aspx			
(ITEMS 1 THRU 4 TO B	E FILLED BY THE CORPS)			
1. APPLICATION NO. 2. FIELD OFFICE CODE	3. DATE RECEIVED 4. DATE APPLICATION COMPLETE			
(ITEMS BELOW TO BE	FILLED BY APPLICANT)			
5. APPLICANT'S NAME	8. AUTHORIZED AGENT'S NAME AND TITLE (agent is not required)			
First - Shawn Middle - Last - Dumas	First - Leyna Middle - L. Last - Tobey			
Company - KPT Marine, LLC	Company - Walsh Engineering Associates, Inc.			
E-mail Address - shawn@kennebunkportmarina.com	E-mail Address - leyna@walsh-eng.com			
6. APPLICANT'S ADDRESS:	9. AGENT'S ADDRESS:			
Address- P.O. Box 2734	Address- 1 Karen Drive, Suite 2A			
City - Kennebunkport State - Maine Zip - 04046 Country - USA	City - Westbrook State - Maine Zip - 04092 Country - USA			
7. APPLICANT'S PHONE NOs. w/AREA CODE	10. AGENTS PHONE NOs. w/AREA CODE			
a. Residence b. Business c. Fax 207-590-1658	a. Residence b. Business c. Fax 207-553-9898			
STATEMENT O	AUTHORIZATION			
11. I hereby authorize, <u>Walsh Engineering Associates, Inc.</u> to act in my behalf as supplemental information in support of this permit application.	my agent in the processing of this application and to furnish, upon request,			
See Attached A	Agent Authorization			
SIGNATURE OF APPLICANT DATE				
NAME, LOCATION, AND DESCR	IPTION OF PROJECT OR ACTIVITY			
12. PROJECT NAME OR TITLE (see instructions) Yachtsman Marina Dredging				
13. NAME OF WATERBODY, IF KNOWN (if applicable)	14. PROJECT STREET ADDRESS (if applicable)			
Kennebunk River	Address 57 Ocean Ave			
15. LOCATION OF PROJECT	Warner Handley and Ord Main and Ord Odd C			
Latitude: •N 43°21'25.51" Longitude: •W 70°28'28.17" City - Kennebunkport State- Maine Zip- 04046				
16. OTHER LOCATION DESCRIPTIONS, IF KNOWN (see instructions)				
State Tax Parcel ID Map 10, Block 1, Lot 3 Municipality Kennebunkport				
Section - Township -	Range -			

17	DIRECTIO	NS TO	THE	SITE

From Portland, take I-95 South; Exit 32, Route ME-111, then onto Precourt Street; turn right onto US-1 South, then left onto Log Cabin Road; left onto Maine Street; right onto ME-9; then 2nd left onto Ocean Ave.

#### 18. Nature of Activity (Description of project, include all features)

The Applicant is proposing to mechanically dredge the following:

- •Proposed dredged volume = 6,400± cubic yards of silt and sand
- •Area of dredge = 61,000 square feet (1.4 acres)
- •Proposed dredge depth = elevation -6.0 plus a one foot overdig

The dredged material would be transported by barge to the Isle of Shoals North (IOSN) open water disposal site. Please refer to Figure 1 - Plan View and Figure 2 - Section Views for detailed information.

#### 19. Project Purpose (Describe the reason or purpose of the project, see instructions)

The applicant is proposing to mechanically dredge approximately 6,400± cubic yards of sediment from the area in front of the Yachtsman Marina, including in and around the boat slips, to provide adequate depth for navigation and berthing. Silt, sand, and other natural deposits have impacted the marina of the Yachtsman Marina and have limited boat navigation and berthing depths, especially during periods of low tide.

#### USE BLOCKS 20-23 IF DREDGED AND/OR FILL MATERIAL IS TO BE DISCHARGED

#### 20. Reason(s) for Discharge

An alternatives analysis is attached to this application, describing how onshore disposal and beneficial use of dredged materials are infeasible for this project. As a result, the dredged material is proposed to be transported by barge to the Isle of Shoals North (IOSN) open water disposal site.

21. Type(s) of Material Being Discharged and the Amount of Each Type in Cubic Yards:

Type Type Type Type Amount in Cubic Yards Amount in Cubic Yards Amount in Cubic Yards

6,400 CY - silt and sand

22. Surface Area in Acres of Wetlands or Other Waters Filled (see instructions)

Acres 61,000 square feet (1.4 acres)

or

Linear Feet

23. Description of Avoidance, Minimization, and Compensation (see instructions)

Walsh Engineering Associates will be working closely with the Yachtsman Marina and the selected dredging contractor to ensure the dredging will be conducted in the manner and amount that has been designated and approved.

ENG FORM 4345, SEP 2022 Page 2 of 3

24. Is Any Portion of the V	Nork Already Complete?	Yes X No IF YES, DI	ESCRIBE THE COMPLE	TED WORK	
•				e than can be entered here, please att	ach a supplemental list).
a. Address- See att	tached 150-foo	ot abutters list	t		
City -		State -		Zip -	
b. Address-					
City -		State -		Zip -	
c. Address-					
City -		State -		Zip -	
d. Address-					
a. Address					
City -		State -		Zip -	
e. Address-					
City -		State -		Zip -	
26. List of Other Certificat	es or Approvals/Denials rece	eived from other Federal, S	tate, or Local Agencies fo	or Work Described in This Ap	plication.
AGENCY	TYPE APPROVAL*	IDENTIFICATION NUMBER	DATE APPLIED	DATE APPROVED	DATE DENIED
Maine DEP	NRPA				
Town of Kennebunkpor	Site Plan Review				
Town of Kennebunkpor	Flood Hazard Developmen				
Town of Kennebunkpor	Activities and Land Use				
* Would include but is not	restricted to zoning, building,	and flood plain permits			
27. Application is hereby	made for permit or permits to	authorize the work describ	ed in this application. I c	ertify that this information in	this application is complete
Sugra L Tobera	r I possess the author / signed by Leyna Tobey, PE 024.11.20 08:14:19-05'00'	11/20/2024		ting as the duly authorized ag Agent Authorization	• •
d d	. C. APPLICANT			JRE OF AGENT	DATE
	e signed by the person wh statement in block 11 has			applicant) or it may be sig	ned by a duly

knowingly and willfully falsifies, conceals, or covers up any trick, scheme, or disguises a material fact or makes any false, fictitious or fraudulent statements or representations or makes or uses any false writing or document knowing same to contain any false, fictitious or fraudulent statements or entry, shall be fined not more than \$10,000 or imprisoned not more than five years or both.

18 U.S.C. Section 1001 provides that: Whoever, in any manner within the jurisdiction of any department or agency of the United States

statements of entry, shall be lined not more than \$10,000 or imprisoned not more than two years of both.



#### To Whom It May Concern,

Sincerely,

By this letter, the undersigned, a representative of KPT Marine, LLC, authorizes Walsh Engineering Associates, Inc. to act as the agent for the undersigned in the preparation and submission of all Federal, State, and Local permit applications and relevant documents and correspondence for all necessary permits for the maintenance dredging of the property at 57 Ocean Avenue in Kennebunkport, Maine; to attend meetings and site visits; to appear before all boards, commissions, and committees, and to provide such other services as are necessary and appropriate in furtherance of the aforementioned project.

Shawn Dumas
Signature
Shawn Dumas Operations Manager
Printed Name and Title
10/31/2024
Date

## **Attachment 1 – Activities Description**

- 1.1 Site Location Plan
  - 1.2 Photo Log
- 1.3 Disposal Site Locus (Isle of Shoals North)
  - 1.4 Kennebunk River FNP Map (1976)
- 1.5 Updated Kennebunk River FNP Map (2020)

### 1.0 Activities Description

The Yachtsman Marina is located at 57 Ocean Avenue in Kennebunkport, Maine, with 600 feet of frontage along the Kennebunk River. The Town of Kennebunkport's Assessor's Office identifies the parcel as Map 10, Block 1, Lot 3. The facility consists of an active marina with 58 boat slips.

#### **Existing Conditions**

The Yachtsman Marina is located approximately 0.75-mile from the mouth of the Kennebunk River. The Kennebunk River flows generally southeast, past the towns of Lyman, Arundel, Kennebunk, and Kennebunkport. It enters the Atlantic Ocean in Kennebunkport, approximately 0.5-mile downstream from the town center. The surrounding area, with its high density of marinas and other waterfront uses, has an extensive history of dredging. The Yachtsman Marina dredging activities date back to the 1970s, with the most recent permits issued for maintenance dredging in 2016. Silt, sand, and other natural deposits have impacted the marina of the Yachtsman Marina and have limited boat navigation and berthing depths, especially during periods of low tide.

#### **Proposed Project**

The applicant is proposing to mechanically dredge approximately 6,400± cubic yards of sediment from the area in front of the Yachtsman Marina, including in and around the boat slips, to provide adequate depth for navigation and berthing.

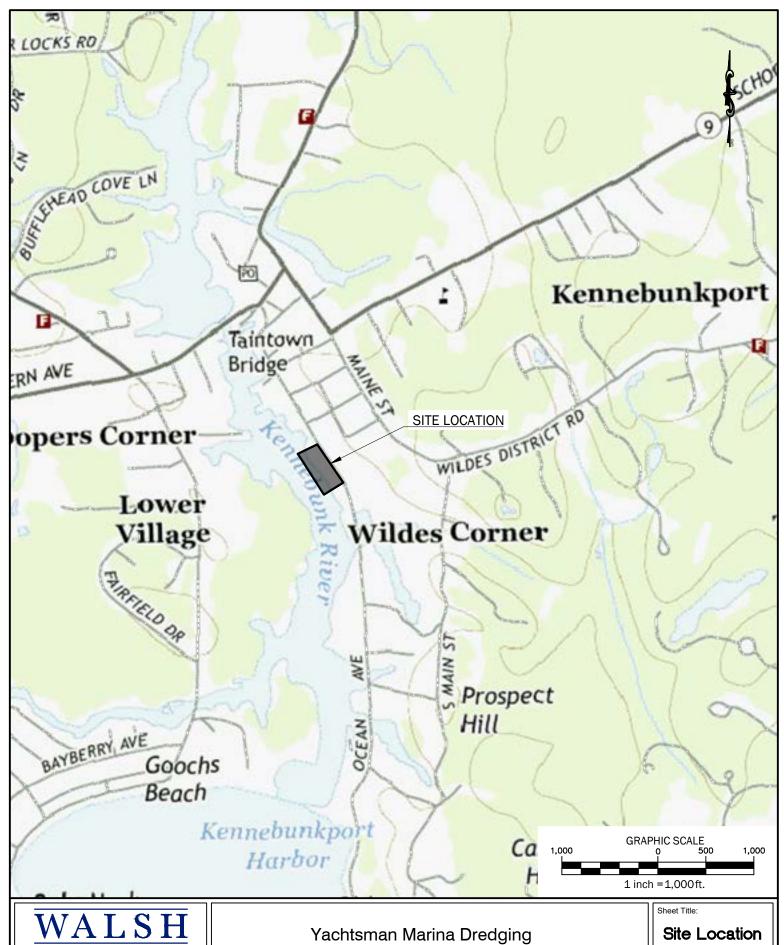
The area of the dredge will be approximately 61,000 square feet (1.4-acres). The proposed dredge depth will be to elevation -6.0 feet mean low water, with about one foot of over-dig. It is anticipated that dredging will coincide with neighboring marinas performing dredging at the same approximate time (see "Adjacent Dredging Projects" section below). The material will be transported by barge to the Isle of Shoals North Disposal Site (IOSN). The IOSN is located approximately 15 nautical miles east of Portsmouth, New Hampshire, in the Gulf of Maine.

The proposed dredge area is coincidental with the area that was previously permitted under Maine DEP Permit #L-18612-4E-A-N in 1994. Since that time, the Yachtsman Marina was dredged in 2005 under Permit ##L-18612-4E-B-N, and in Winter 2015-2016 under Maine DEP's Permit by Rule (PBR) process and U.S. Army Corps of Engineers (USACE) Permit #NAE-2004-319.

Given the timing for receiving permit approvals from Maine DEP and USACE, WEA anticipates that the work will occur during the winter 2025-2026 dredge window.

#### **Adjacent Dredging Projects**

The dredging of the Yachtsman Marina will coincide with similar dredging work at three adjacent marinas on the Kennebunk River, including the Arundel Yacht Club, the Kennebunkport Marina, and the Kennebunk River Club.



## engineering associates, inc.

One Karen Dr., Suite 2A | Westbrook, Maine 04092 ph: 207.553.9898 www.walsh-eng.com

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Yachtsman Marina 57 Ocean Avenue Kennebunkport, Maine 04046 Job No.: Date: OCTOBER 2024 1" = 1,000' Scale: Drawn: LLT Checked: WRW





#### Yachtsman Marina Dredge

Kennebunkport, ME

Photo No. 1

**Date:** 10/20/2020

Site Location:

Yachtsman Marina

**Description:** 

View from the southeast side of the marina.



Photo No. 2

**Date:** 10/20/2020

Site Location:

Yachtsman Marina

**Description:** 

View from north-west side of the marina.



### Photo No. 3

**Date:** 10/20/2020

#### Site Location:

Yachtsman Marina

#### Description:

Aerial view of marina.



#### Photo No. 4

#### Date:

2021

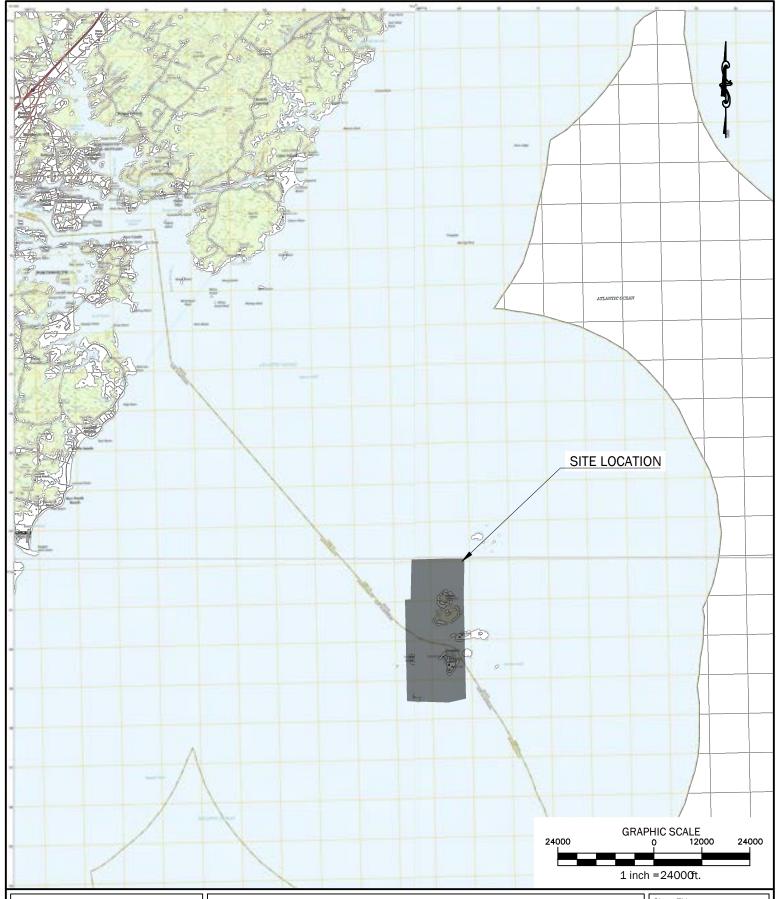
### Site Location:

Yachtsman Marina

## Description:

Boat slips in the marina.







One Karen Dr., Suite 2A | Westbrook, Maine 04092 ph: 207.553.9898 | www.walsh-eng.com

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## Arundel Yacht Club Dredging

Arundel Yacht Club 51 Ocean Avenue Kennebunkport, Maine 04046

# Sheet Title: Dredge Disposal Site Location

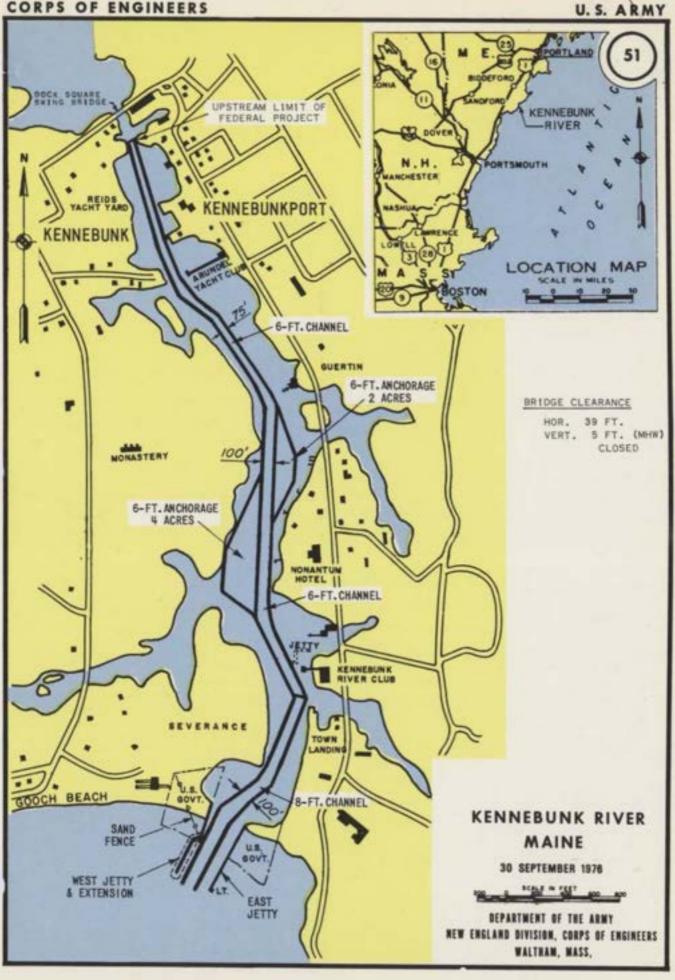
 Job No.:
 782

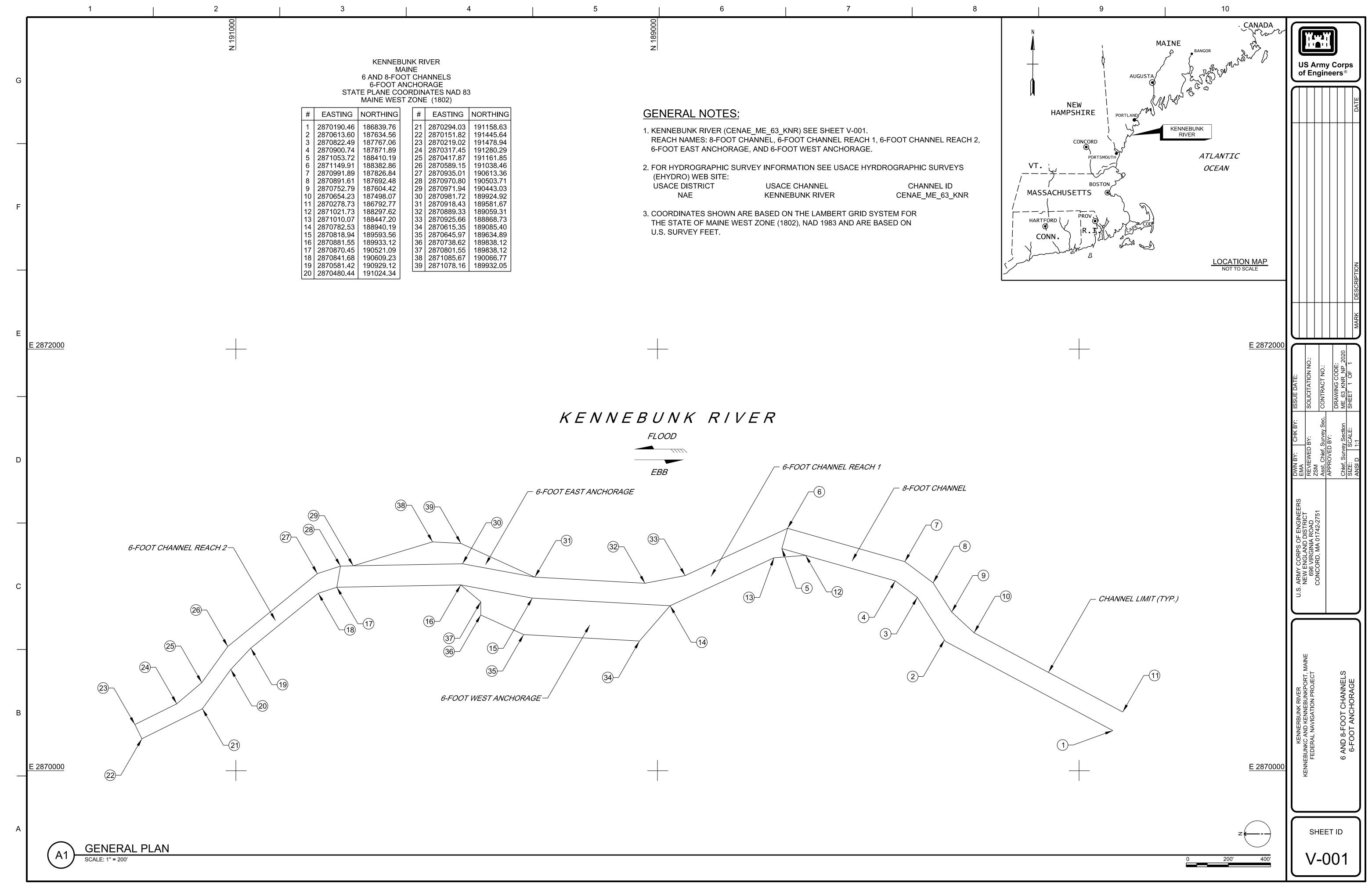
 Date:
 January 2022

 Scale:
 1" = 24,000'

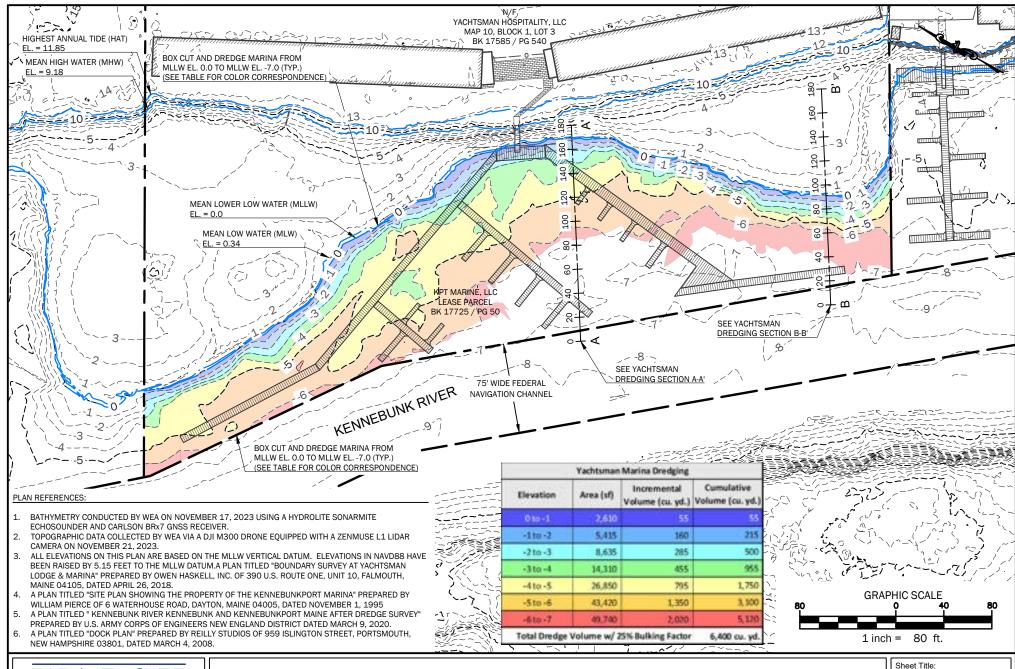
 Drawn:
 KEW

 Checked:
 WRW











#### YACHTSMAN MARINA DREDGING

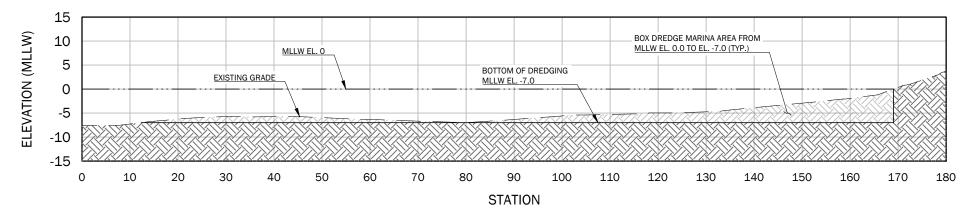
57 OCEAN AVE. KENNEBUNKPORT. ME 04046

PLAN VIEW					
Job No.:	643.1				
Date:	OCT. 29, 2024				
Scale:	1" = 80'				
Drawn:	CAR/MNW				
Checked:	WRW				

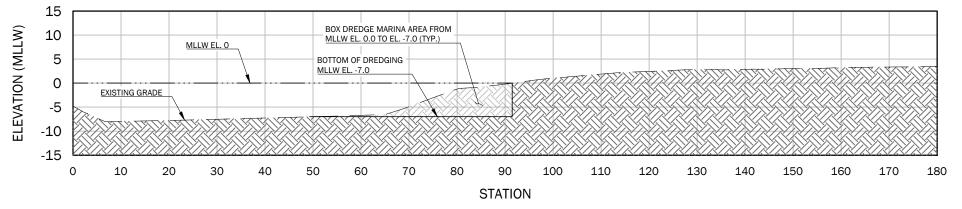
FIG 1:

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## Yachtsman Dredging Section A-A'



Yachtsman Dredging Section B-B'





#### YACHTSMAN MARINA DREDGING

57 OCEAN AVE. KENNEBUNKPORT, ME 04046

HG 2:				
SECT	ON VIEW			
Job No.:	643.1			
Date:	OCT. 29, 2024			
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Drawn:	CAR/MNW			
Checked:	WRW			
	-			

1 - Yachtsman Marina Dredge\3, CAD\643.1 - BASE.dwg plot date: 10/29/2024 8:52 AM



### 3.0 Alternatives Analysis

#### **Dredging Alternatives Analysis**

WEA studied several alternatives for the Yachtsman Marina dredging project, all evaluated against its purpose and need. The project's purpose is to dredge and dispose of dredged material from the site in an efficient, environmentally cautious, and effective manner; the project's need is to provide the Yachtsman Marina with safe navigation and anchoring conditions for watercraft.

The existing conditions and dredging alternatives analysis are described in the following narrative:

#### **Existing Conditions**

The Yachtsman Marina (site) encompasses approximately 1.70 acres of land. Ocean Avenue and Silas Perkins Park border the property to the north; Ocean Avenue borders the site to the east; the Kennebunkport Marina is located south of the property; and the Kennebunk River borders the property to the west.

#### Alternative 1 – No Action

WEA investigated the possibility of not dredging, however, the project's purpose is to provide effective navigation for watercraft and boat slips at the Yachtsman Marina. If Alternative 1 is utilized, the club members and guest mariners will not be able to safely navigate to the boat slips. The area would continue to fill in with sediment and eventually the mooring and docking space would become unusable. Alternative 1 is not practicable as it would eventually force the Yachtsman Marina to close due to unsafe navigation and does not satisfy the project need.

#### Alternative 2 – Reduced Dredge

WEA investigated the option of dredging 50% less than the proposed amount of 6,400 cubic yards. Though there may be a slight environmental benefit to dredging less (a smaller area would be disturbed and the length of dredging activities would be reduced), the dredged area would quickly fill in again within a few years, requiring the area to be dredged again sooner than if the area was dredged to elevation -6.0 feet. Again, this would not allow the club members and others to navigate or use the docks in a safe manner. Alternative 2 would not advance the project's need.

#### **Alternative 3 – Full Dredge**

WEA investigated the option of fully dredging the marina to the proposed elevation of -6.0 feet mean low water, totaling 6,400 cubic yards of dredge material. The dredging will provide adequate sediment removal for boat owners to navigate safely for 6-8 years at the current rate of sedimentation, and therefore has been selected as the most appropriate alternative for this project to meet the project's purpose and need.

#### **Selection**

Given the information above, Alternative 3 was selected as the most appropriate alternative for the project. This alternative will provide the maximum efficiency of dredging and will optimize the time between necessary dredging events.

#### **Dredge Material Disposal Alternatives Analysis**

The USACE approved a Sampling and Analysis Plan (SAP) for the project on January 21, 2022, which provided proposed sediment sampling locations, methods, and testing criteria to determine disposal suitability. The sampling results were submitted to the USACE for the Yachtsman Marina and the nearby Arundel Yacht Club, Kennebunkport Marina, and Kennebunk River Club. The USACE issued a Suitability Determination for all 4 sites on June 10, 2024, which documents the suitability of the dredged material for disposal at the Isle of Shoals North (IOSN) open water disposal site.

It is WEA's understanding that the USACE requires Individual Standard Permit applicants to conduct an alternatives analysis to evaluate options for disposal of dredged material. In order of disposal method preference, the USACE favors onshore disposal, followed by beneficial use, and then open water placement.

The dredge material disposal alternatives analysis is described in the following narrative:

#### Alternative A – Onshore Disposal

#### Onshore Disposal - Storage of Material at the Yachtsman Marina

WEA investigated the option of onshore disposal of the 6,400 cubic yards of dredged materials from the Yachtsman Marina. The Yachtsman Marina encompasses approximately 1.70 acres of land, as shown in the aerial site map attached to this Alternatives Analysis as Figure 1. Due to the layout of the Yachtsman Marina lot, there is minimal space available to conduct onshore disposal operations at the site.

Logistically, to conduct onshore disposal of the dredged material, the following steps would need to be taken:

- Use barge-mounted dredging equipment to dredge sediment.
- Place the dredged material onshore into a stockpile or a large container from the dredge barge.
  - As shown in the attached aerial site map, the largest area available for a stockpile of dredged materials is located within a 26-foot by 26-foot grassed area between the Yachtsman Marina/Hotel buildings. If a 4-foot walkway is kept clear around the stockpile, the allowable diameter of the stockpile would be 18 feet (therefore the allowable radius would be 9 feet). Using the following standard soil stockpile volume equation, the required height of a 6,400 cubic yard (172,800 cubic feet) stockpile would need to be 2,037 feet tall, which is infeasible.

    - Volume =  $\frac{1}{3} \times \pi \times Radius^2 \times Height \rightarrow$  Height = Volume × 3 ×  $\frac{1}{\pi} \times \frac{1}{Radius^2} \rightarrow$  Height = 172,800ft<sup>3</sup> × 3 ×  $\frac{1}{\pi} \times \frac{1}{(9ft)^2} = 2,037$  ft
  - In addition, this step is infeasible due to the layout of the Yachtsman Marina's dock/boat slips; the closest a dredge barge could get to the "open space" located to the between the Yachtsman Marina buildings is at least 70 feet away, requiring the dredging equipment to have a very large reach.

- Give the dredged sediment appropriate time to dewater.
- Load dried dredged sediment into dump trucks or roll-off containers and haul offsite to a final disposal location.
  - O Dump trucks have an approximately 20 cubic yard capacity and roll-off containers have a maximum capacity of 40 cubic yards. With these capacities, the hauling and disposal of the dried dredged sediment would require approximately 320 or 160 truckloads, respectively. The hauling of sediment would be infeasible due to major increases in project duration and costs.
  - In addition, because the proposed and allowable dredging window occurs during winter, local roadways will be posted for heavy truck traffic, which would likely require hauling vehicles to reduce the quantity of sediment they can transport at once.

As documented above, onshore disposal of dredged sediment using the Yachtsman Marina site is infeasible due to site constraints and sediment hauling duration/costs. As mentioned, an aerial map of the site is included as Figure 1 in this Alternatives Analysis for reference.

#### Onshore Disposal - Storage of Material at Alternative Locations on the Kennebunk River

The proposed dredge volume for the Yachtsman Marina is 6,400 cubic yards, or 172,800 cubic feet. Area estimates for storing the dredged material in a stockpile or in roll-off dumpsters for dewatering are described below. Dewatering the dredged sediment could take anywhere from a couple days to a couple weeks.

#### Storage via Stockpile

It is assumed that acceptable side slopes for a stockpile of wet, silty sediment would be between 4:1 and 5:1 (horizontal to vertical), and an acceptable stockpile height would be between 20 and 25 feet. Using these criteria and the estimated dredge volume of 172,800 cubic feet, the diameter of the stockpile needed to store the dredged material would be approximately 180 feet. It is assumed that around 20 feet of additional space would be required around the perimeter of the stockpile for erosion and sedimentation controls, dewatering materials, and equipment access, increasing the diameter of the storage area to 220 feet. Figure 2, included with this Alternatives Analysis, shows what a 220-foot diameter stockpile would look like on nearby facilities with open space along the Kennebunk River; there are no facilities with adequate space to accommodate the stockpile storage area. In addition, the Yachtsman Marina does not have control or interest in any of the nearby facilities along the Kennebunk River shown in Figure 2, with the exception of the Kennebunkport Marina at 67 Ocean Avenue, which also does not have adequate space to accommodate the stockpile storage area.

#### Storage via Roll-Off Dumpster

The largest readily available roll-off dumpster size is 40 cubic yards. It is assumed that wet sediment dumped into a roll-off dumpster to dewater would contain about 20-percent water, which would reduce the soil capacity in the dumpster to 32 cubic yards. With this assumption, it would require 200 dumpsters to store 6,400 cubic yards of sediment. Each roll-off dumpster is 22 feet long by 7.5 feet wide; adding a 5-foot walking area around the roll-off would increase the footprint of each roll-off to 27 feet by 12.5 feet, or 337.5 square feet. The total space required for 200 roll-off dumpsters would be approximately 67,500 square feet. Figure 3, included with this Alternatives

Analysis, shows what an 67,500 square foot roll-off dumpster storage area would look like on nearby facilities with open space along the Kennebunk River; there are no facilities with adequate space to accommodate the roll-off storage area. In addition, the Yachtsman Marina does not have control or interest in any of the nearby facilities along the Kennebunk River shown in Figure 3, with the exception of the Kennebunkport Marina at 67 Ocean Avenue, which also does not have adequate space to accommodate the roll-off storage area.

#### Onshore Disposal – Disposal Location Alternatives

As stated above, it is infeasible to get the dredged material onshore for dewatering and subsequent hauling to a disposal location at the Yachtsman Marina and other nearby facilities along the Kennebunk River. As a result, the following onshore disposal location alternatives are also considered infeasible:

#### Landfill

- o This alternative is also infeasible due to the estimated cost to dispose of the material at a landfill. Tipping and hauling fees for material disposal would likely be between \$75 and \$100 per cubic yard, totaling around \$480,000 to \$640,000 for disposal of 6,400 cubic yards of material.
- The Juniper Ridge Landfill in Alton/Old Town, Maine and the Waste Management Crossroads Landfill in Norridgewock, Maine currently do not have sufficient capacity to accommodate the dredge materials and the increase in daily traffic to dispose of the dredge materials. The Waste Management Turnkey Landfill in Rochester, NH could accommodate the materials, however, as documented above, this option is both infeasible due to inability to get the dredge material upland, and cost prohibitive.

#### • Well injection

- O The Environmental Protection Agency's "General Information About Injection Wells" webpage states that injected fluids may include "water, wastewater, brine (salt water), or water mixed with chemicals." The dredged materials will consist of silty sediment and therefore well injection is not a feasible disposal alternative.
- o In addition, the Maine Department of Environmental Protection's Underground Injection Control (UIC) Program webpage states that Class I, II, III, and IV injections wells are prohibited in Maine.

#### • Incineration

O This alternative is also infeasible due to the estimated cost to incinerate soils. Hauling and incineration fees would likely be around \$700 per cubic yard, totaling around \$4.5M for the incineration of 6,400 cubic yards of material. (Source: Federal Remediation Technologies Roundtable Screening Matrix and Reference Guide, Version 4.0, Section 4.22 Incineration.) In addition, it appears that the closest soil incineration facilities to the Yachtsman Marina are in Illinois or Arkansas.

#### • Spread of material over open ground

O This alternative is also infeasible because the Yachtsman Marina does not have access to a land area appropriate for spreading the material over open ground. Spreading 172,800 cubic feet of soil across a land area would consist of: 1 foot of sediment spread across a 172,800 square foot (~4 acre) land area; or 6 inches of sediment spread across a 345,600 square foot (~7.9 acre) land area.

- Additional biological, chemical, or physical treatment of intermediate or final waste streams
  - Additional treatment of the dredged sediment would not increase the feasibility of onshore disposal.

#### Alternative B – Beneficial Use

WEA used the USACE's New England District Beneficial Use Planning Tool (Tool) to identify potential beneficial use dredge material disposal sites within a 30-mile radius of the project site, which is the distance from the Yachtsman Marina to the IOSN open water disposal site. The Tool identified 17 potential beneficial use sites; an analysis of the suitability of each of these sites is as follows:

- Beach Nourishment (4 sites Wells Beach, Drakes Island Beach, Camp Ellis, Western Beach)
  - A representative from the USACE confirmed that all beach nourishment projects require sand, whereas the dredged material from the Kennebunk River will be primarily silt. Therefore, beneficial use of dredged material at the beach nourishment sites is infeasible.
- Construction and Industrial or Commercial Uses (2 sites Cobble Berm in Ogunquit, ME and Dune Erosion/Stormwater Improvements in Wells, ME)
  - The two construction projects require cobble and sand materials, respectively, whereas the material dredged from the Kennebunk River will be primarily silt.
     Therefore, beneficial use of dredged material at the construction sites is infeasible.
- Nearshore Berm (6 sites Wallis Sands, Wells, Goochs Beach, Kennebunk River, Saco, and Little River Rock Disposal Sites)
  - A representative from the USACE confirmed that all nearshore berm projects require sand, whereas the dredged material from the Kennebunk River will be primarily silt. Therefore, beneficial use of dredged material at nearshore berm sites is infeasible.
- Salt Marshes (5 sites Piscataqua, Ogunquit/Rachel Carson National Wildlife Refuge, Webhannet, and Little River Salt Marsh Priority Areas Accepting Sediment; and Goosefare Salt Marsh)
  - Piscataqua Salt Marsh Priority Area: A representative from the New Hampshire Division of Environmental Services (NHDES) stated that the Piscataqua Salt Marsh is not a potential dredge disposal site.
  - Ogunquit/Rachel Carson National Wildlife Refuge, Webhannet, and Little River Salt Marsh Priority Areas Accepting Sediment and Goosefare Salt Marsh: A representative from the U.S. Fish and Wildlife Service (USFWS) stated that the State of Maine's current regulations and permitting processes do not allow the use of dredged materials on salt marshes.
  - o Beneficial use of dredged material at salt marsh sites is infeasible.

A summary of the 17 potential beneficial use sites is included as Table 1, attached to this Alternatives Analysis along with a list of references and copies of relevant email communications.

#### Alternative C – Open Water Placement

#### Open Water Placement - Saco Bay Open Water Disposal Site

In order to get Maine DEP's approval for disposal at the Saco Bay Open Water Disposal Site, additional benthic environment testing of the river sediment is required. The time it will take to conduct the additional sediment testing and analysis, to receive an updated Suitability Determination for Saco Bay from the USACE, and to receive permit approvals for dredging from the USACE and Maine DEP would push the dredging activities to the Winter 2026-2027 dredge window. The Yachtsman Marina has a critical need to conduct their maintenance dredging in the Winter 2025-2026 dredge window, as boats at their marina are already experiencing navigation challenges due to river sediment accumulation at the marina. As a result, consideration of the Saco Bay Disposal Site is not a feasible alternative for this round of maintenance dredging.

#### Open Water Placement – Isle of Shoals North Open Water Disposal Site

As stated above, the USACE issued a Suitability Determination for the Yachtsman Marina and the nearby Arundel Yacht Club, Kennebunkport Marina, and Kennebunk River Club on June 10, 2024, which documents the suitability of the dredged material for disposal at the IOSN open water disposal site.

#### Selection

Due to the infeasibility of disposing of dredged material onshore and there being no beneficial use sites suitable for disposal, Alternative C, open water placement at IOSN, was selected as the most appropriate alternative for the project.

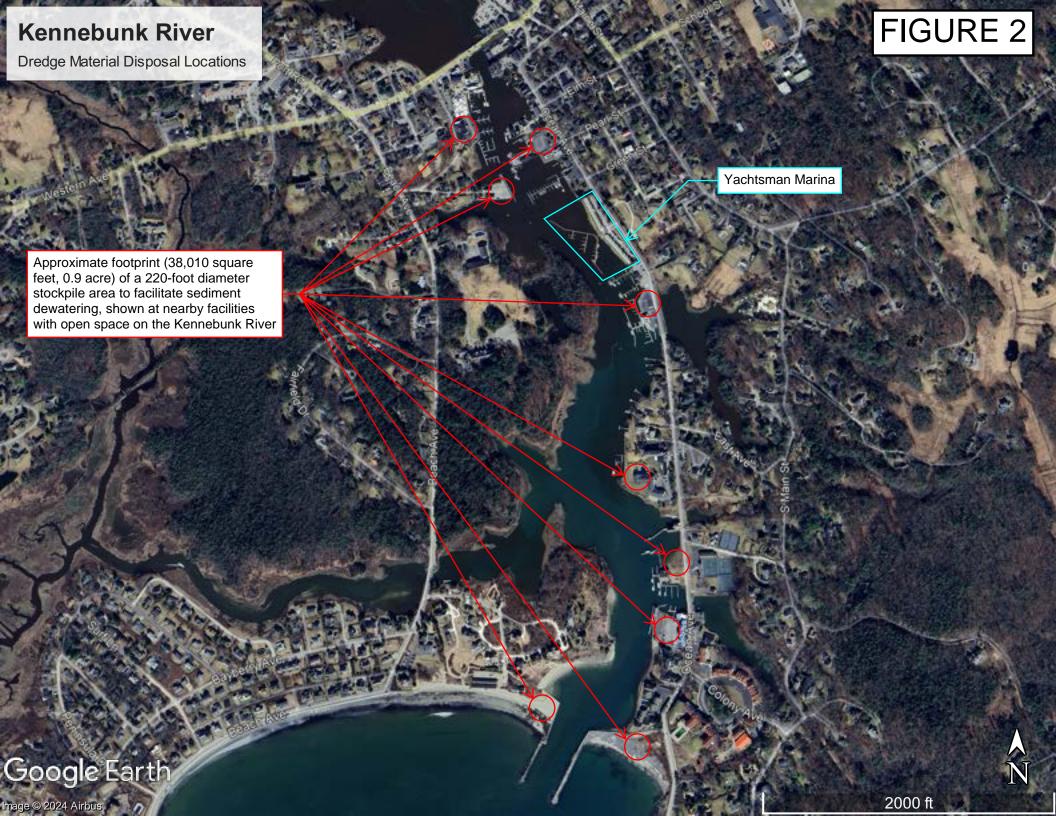
## **Figures**

Figure 1: Yachtsman Marina Site Aerial Map

Figure 2: Kennebunk River – Stockpile Locations

Figure 3: Kennebunk River – Roll-Off Dumpster Locations





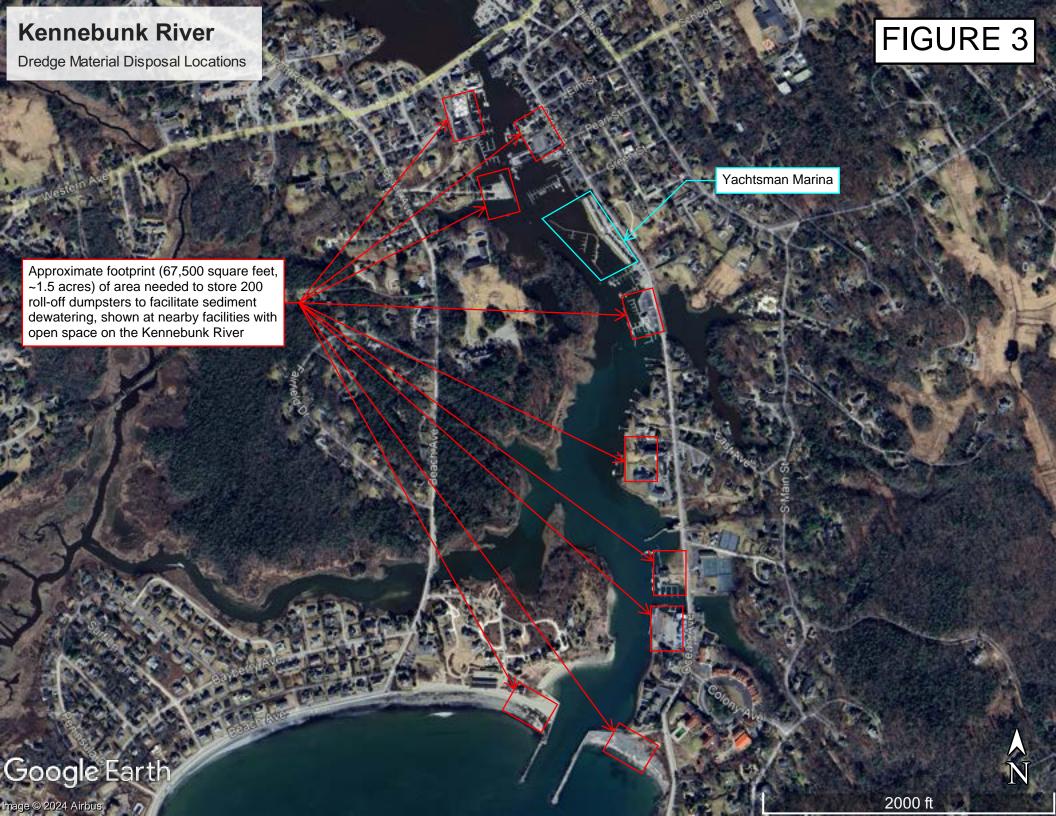




Table 1: Dredge Material Disposal Beneficial Use Alternatives – Yachtsman Marina

## <u>Table 1</u> <u>Dredge Material Disposal Beneficial Use Alternatives - Yachtsman Marina</u> Summary Table & References

Project Name <sup>1</sup>	Project Category	<u>Location</u>	<u>Coordinates</u>	Contact	Feasible Disposal Location?	Reasoning
Wells Beach	Beach Nourishment	Wells, ME	43.311208N -70.561063W	USACE	No	Beach nourishment projects require sand; dredged material from the Kennebunk River will be primarily silt. 4,5
Drakes Island Beach	Beach Nourishment	Wells, ME	43.321900N -70.552082W	USACE	No	Beach nourishment projects require sand; dredged material from the Kennebunk River will be primarily silt. <sup>4,5</sup>
Camp Ellis	Beach Nourishment	Saco, ME	43.466204N -70.381264W	USACE	No	This beach nourishment project requires "sandy shoal material," and dredged material from the Kennebunk River will be primarily silt. 4,5,6
Western Beach	Beach Nourishment	Scarborough, ME	43.539528N -70.321888W	USACE	No	Beach nourishment projects require sand; dredged material from the Kennebunk River will be primarily silt. 4,5
Cobble Berm	Construction and Industrial or Commercial Uses	Ogunquit, ME	43.236523N -70.589087W	USACE	No	Project requires cobble, and dredged material from the Kennebunk River will be primarily silt.
Dune Erosion and Stormwater Improvements	Construction and Industrial or Commercial Uses	Wells, ME	43.248998N -70.595158W	USACE	No	Dune requires sand, and dredged material from the Kennebunk River will be primarily silt.
Wallis Sands Disposal Site	Nearshore Berm	Rye, NH	43.020324N -70.726276W	USACE	No	Nearshore berm projects require sand, and dredged material from the Kennebunk River will be primarily silt. 4,5
Wells Nearshore Disposal Site	Nearshore Berm	Wells, ME	43.307605N -70.560229W	USACE	No	20,000 CY of dredged "sandy" material from the 2020 Wells Harbor federal navigation project was placed here; however, nearshore berm projects require sand, and dredged material from the Kennebunk  River will be primarily silt. 4,5,6
Goochs Beach Nearshore Site	Nearshore Berm	Kennebunkport, ME	43.345503N -70.481053W	USACE	No	20,000 CY of dredged material from the 2020 Kennebunk/Kennebunkport federal navigation project was placed here; however, nearshore berm projects require sand, and dredged material from the Kennebunk River will be primarily silt. 4,5,6
Kennebunk River Disposal Site	Nearshore Berm	Kennebunkport, ME	43.345134N -70.479100W	USACE	No	Nearshore berm projects require sand, and dredged material from the Kennebunk River will be primarily silt. <sup>4,5</sup>
Saco Nearshore Disposal Site	Nearshore Berm	Saco, ME	43.467543N -70.366173W	USACE	No	Nearshore berm projects require sand, and dredged material from the Kennebunk River will be primarily silt. <sup>4,5</sup>
Little River Rock Nearshore	Nearshore Berm	Saco, ME	43.518925N -70.364468W	USACE	No	Nearshore berm projects require sand, and dredged material from the Kennebunk River will be primarily silt. <sup>4,5</sup>
Piscataqua Salt Marsh Priority Area <sup>2</sup>	Salt Marsh Priority Area	Rye, NH		USFWS	No	Piscataqua Salt Marsh is not a potential dredge disposal site. <sup>7</sup>
Ogunquit Salt Marsh Priority Area/Rachel Carson National Wildlife Refuge <sup>3</sup>	Salt Marsh Priority Area	Ogunquit/Wells, ME		USFWS	No	Maine state permitting does not allow the use of dredged materials on salt marshes. <sup>8</sup>

## <u>Table 1</u> <u>Dredge Material Disposal Beneficial Use Alternatives - Yachtsman Marina</u> Summary Table & References

Project Name <sup>1</sup>	Project Category	<u>Location</u>	<u>Coordinates</u>	Contact	Feasible Disposal Location?	Reasoning
Webhannet Salt Marsh Priority Area <sup>3</sup>	Salt Marsh Priority Area	Wells, ME		USFWS	No	Maine state permitting does not allow the use of dredged materials on salt marshes. <sup>8</sup>
Little River Salt Marsh Priority Area <sup>3</sup>	Salt Marsh Priority Area	Wells, ME		USFWS	No	Maine state permitting does not allow the use of dredged materials on salt marshes. <sup>8</sup>
Goosefare Salt Marsh	Wetland Habitats/Salt Marsh	Saco, ME	43.493752N -70.392875W	USFWS	No	Maine state permitting does not allow the use of dredged materials on salt marshes. <sup>8</sup>

#### References:

- 1. USACE New England District Beneficial Use Planning Tool: https://www.arcgis.com/apps/dashboards/4f1c828081684605af2972cb6297dacf
- 2. New Hampshire Saltmarsh Restoration Priorities for the Saltmarsh Sparrow: https://acjv.org/documents/NH\_SALS\_comp\_guidance\_doc.pdf
- 3. Maine Saltmarsh Restoration Priorities for the Saltmarsh Sparrow: https://acjv.org/documents/ME\_SALS\_comp\_guidance\_doc.pdf
- 4. Email Correspondence Between WEA and USACE, dated August 13, 2024 (attached).
- 5. Email Correspondence Between WEA and USEPA, dated August 14, 2024 (attached).
- 6. USACE Update Report Maine, dated January 31, 2024: https://www.nae.usace.army.mil/Portals/74/ME-UpdateReport\_31Jan2024.pdf
- 7. Email Correspondence Between WEA and NHDES, dated August 19, 2024 (attached).
- 8. Email Correspondence Between WEA and USFWS, dated August 14, 2024 (attached).

## References

- 1. Email Correspondence Between WEA and USACE, dated August 13, 2024.
- 2. Email Correspondence Between WEA and USEPA, dated August 14, 2024.
- 3. Email Correspondence Between WEA and NHDES, dated August 19, 2024.
- 4. Email Correspondence Between WEA and USFWS, dated August 14, 2024.

#### **Leyna Tobey**

From: Hopkins, Aaron D CIV USARMY CENAE (USA) <Aaron.D.Hopkins@usace.army.mil>

**Sent:** Tuesday, August 13, 2024 12:44 PM

**To:** Leyna Tobey; Saloio, Gabriella J CIV USARMY CEHQ (USA)

**Subject:** RE: Beneficial Use Sites for Dredging

Hi Leyna,

I got your voicemail the other day and I apologize for not returning your call yet.

Great to see that you used the Beneficial Use of Dredged Material Planning Tool as a screening step for your project. You are correct about the beach nourishment sites needing sandy material – and the same can be said for the nearshore berm sites you identified in the Planning Map as those are intended to be feeder berms for the adjacent beaches. The openwater sites in your list are included in the Planning Map to compare openwater disposal alternatives and are not considered beneficial use themselves. That leaves the five salt marsh sites on your list which are all potential restoration sites from the USFWS. I would suggest you reach out to the contacts in the Atlantic Coast Joint Venture reference at USFWS or Maine Dept of Inland Fisheries and Wildlife to see if there are any potential beneficial uses for your project at those sites. We were able to provide some dredged material recently to the Rachel Carson National Wildlife Refuge in Wells, ME for a small beneficial use project.

Aaron

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

From: Leyna Tobey <leyna@Walsh-eng.com> Sent: Tuesday, August 13, 2024 10:54 AM

To: Saloio, Gabriella J CIV USARMY CEHQ (USA) <Gabriella.J.Saloio@usace.army.mil>; Hopkins, Aaron D CIV USARMY

CENAE (USA) < Aaron.D. Hopkins@usace.army.mil>

Subject: [Non-DoD Source] Beneficial Use Sites for Dredging

Good morning Gabriella and Aaron,

I am working on permitting a dredging project for several marinas on the lower Kennebunk River in Kennebunk, ME, and am currently conducting an alternatives analysis on where to dispose of the 25,000 CY of silty dredge material. I used the Army Corp's Beneficial Use of Dredged Material Planning Tool and found the potential disposal locations in the attached spreadsheet within a 30-mile radius of the project site.

As Gabriella is listed as the ACOE contact for several of the disposal locations and Aaron is listed at the contact for the DAMOS Beneficial Use Planning Map, I was hoping either of you would be able to provide me with some details for the disposal sites listed in the attached spreadsheet (e.g. if they are accepting materials, what types of materials they are accepting, timeline for acceptance, etc.) or could point me in the right direction to another

contact to reach out to. (Note that the attached spreadsheet does not include any beach nourishment projects, as those projects are assumed to need sand and the material we will be dredging is primarily silt.)

Please give me a call to discuss if that would be easier. Thanks in advance!

Leyna

Leyna Tobey, PE\* Project Manager | Civil Engineer \*Licensed in MA



One Karen Drive, Suite 2A Westbrook, ME 04092 P: (207) 553-9898, Ext 105 www.walsh-eng.com









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#### Leyna Tobey

From: Wolf, Steven <Wolf.Steven@epa.gov>
Sent: Wednesday, August 14, 2024 10:18 AM

To: Leyna Tobey
Cc: Sterling, Alexa

**Subject:** FW: Dredged Material Disposal Inquiry

**Attachments:** 2024-08-12 Dredge Disposal Alternatives Analysis\_to EPA.xlsx

Hi Leyna, EPA co-manages the ocean dredged material disposal sites with the Army Corps – the goal of the alternatives analysis is to evaluate other uses of the dredged material rather than just straight disposal. The nearshore sites are considered "beneficial" in that material placed at those sites is integrated into coastal sediment transport and can actually nourish beaches with material under the right hydrodynamic conditions. Unfortunately, as I recall, the material from the projects you referenced contains too high a percentage of fine-grained material to be placed at the nearshore sites. For evaluating the feasibility of using the material as part of salt marsh restoration, I'd direct you back to the Corps and to ME and NH state agencies. I'd suggest starting with Todd Randall at the New England District Corps (todd.a.randall@usace.army.mil) who could provide information on any federal marsh restoration projects as well as the contact information for the states folks involved in marsh restoration. Feel free to reach back it you need additional information - Steve

Steven Wolf | US Environmental Protection Agency, Region 1 (New England) 5 Post Office Square, Suite 100, Mail Code OEP06-1 Boston, MA 02109-3912 Office: 617-918-1617 Mobile: 978-201-1928 wolf.steven@epa.gov

From: Leyna Tobey <leyna@Walsh-eng.com> Sent: Tuesday, August 13, 2024 12:12 PM

To: Sterling, Alexa <Sterling.Alexa@epa.gov>; Wolf, Steven <Wolf.Steven@epa.gov>

Subject: Dredged Material Disposal Inquiry

**Caution:** This email originated from outside EPA, please exercise additional caution when deciding whether to open attachments or click on provided links.

Good afternoon Alexa and Steven,

I am working on permitting a dredging project for several marinas on the lower Kennebunk River in Kennebunk, ME, and am currently conducting an alternatives analysis on where to dispose of the 25,000 CY of silty dredge material. I used the Army Corp's Beneficial Use of Dredged Material Planning Tool and found the potential disposal locations in the attached spreadsheet within a 30-mile radius of the project site.

As you are both listed on the EPA's website for dredged material disposal, I was hoping either of you would be able to provide me with some details for the disposal sites listed in the attached spreadsheet (e.g. if they are accepting materials, what types of materials they are accepting, timeline for acceptance, etc.) or could point me in the right direction to another contact to reach out to. (Note that the attached spreadsheet does not include any beach nourishment projects, as those projects are assumed to need sand and the material we will be dredging is primarily silt.)

Please give me a call to discuss if that would be easier. Thanks in advance!

Leyna

#### Leyna Tobey, PE\* Project Manager | Civil Engineer \*Licensed in MA



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#### **Leyna Tobey**

From: Lucey, Kevin <kevin.p.lucey@des.nh.gov>
Sent: Monday, August 19, 2024 11:59 AM
To: Leyna Tobey; tracy@rockinghamccd.org
Subject: RE: Piscataqua Saltmarsh Restoration Inquiry

Follow Up Flag: Follow up Flag Status: Flagged

#### Hi Leyna,

There are only 3 NH sites listed as Beneficial Use Sites (Seabrook Beach, Hampton Beach, and Wallis Sands Offshore Berm). The "Piscataqua Salt Marsh" is not a potential dredge disposal site. Its included on the USACE mapper because it is a USFWS Priority for Salt Marsh. NH has not yet undertaken any sediment placement projects on tidal wetlands.

I don't know much about it, but I understand that there is a dredge sediment reuse project at the Webhannet Salt Marsh in Wells.

Good luck, Kevin Lucey, Habitat Coordinator Coastal Program | Watershed Management Bureau | Water Division New Hampshire Department of Environmental Services 222 International Drive, Suite 175 Portsmouth, NH 03801

603-559-0026

kevin.p.lucey@des.nh.gov

From: Leyna Tobey <leyna@Walsh-eng.com> Sent: Tuesday, August 13, 2024 1:53 PM

**To:** Lucey, Kevin < kevin.p.lucey@des.nh.gov>; tracy@rockinghamccd.org

Subject: Piscataqua Saltmarsh Restoration Inquiry

**EXTERNAL:** Do not open attachments or click on links unless you recognize and trust the sender.

Good afternoon Tracy and Kevin,

I am working on permitting a dredging project for several marinas on the lower Kennebunk River in Kennebunk, ME, and am currently conducting an alternatives analysis on where to dispose of the 25,000 CY of silty dredge material. I used the Army Corp's Beneficial Use of Dredged Material Planning Tool (here) and found that the Piscataqua Saltmarsh is listed as a potential dredge material disposal location.

I saw that you were both listed as contacts for the project on the New Hampshire Saltmarsh Restoration Priorities for the Saltmarsh Sparrow <u>document</u>, and I was hoping either of you would be able to provide me with some details regarding whether you are accepting materials for the Saltmarsh, what types of materials are being accepted, timeline for material acceptance, etc. Or, if you are not the right contacts to be reaching out to, could you please point me in the right direction of who I should be contacting?

Please give me a call to discuss if that would be easier. Thanks in advance!

Leyna

Leyna Tobey, PE\*
Project Manager | Civil Engineer
\*Licensed in MA

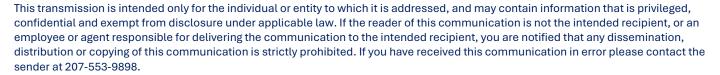


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#### Leyna Tobey

From: Sanders, Nicole A < nicole\_sanders@fws.gov> Sent: Wednesday, August 14, 2024 9:50 AM To: Leyna Tobey; danielle.dauria@maine.gov Cc:

Adamowicz, Susan; Stromayer, Karl

**Subject:** RE: [EXTERNAL] Webhannet Saltmarsh Restoration Inquiry

Hi Leyna,

Thank you for reaching out! Right now, in Maine, state permitting does now allow the use of dredged materials on salt marshes. We are going to pilot the first thin-layer placement on Refuge land in Maine but the reason we are able to do this is because ours is a true pilot study permitted under an innovate pilot program with the Maine DEP. This permitting pathway operates under a pilot solid waste permit. We initiated conversations with the Army Corps and regulators years prior to getting our small (~1,000 cy) amount of clean, sandy sediment. Though it's certainly not out of the question to apply for another thin-layer placement project, it will not be a fast process, and DEP may not permit it at all based on the current regulatory processes. Usually for a pilot, there is only a small amount of sediment used 1-2,000 cubic yards over a ~2 acre area. Still, they may consider scaling up, which is an important part of learning and attempting new restoration techniques in Maine. And, there are salt marsh areas that we have conceptually considered for future thinlayer projects. All comes down to the permitting process! Once our refuge manager, Karl, has returned from annual leave myself, Sue, and Karl can discuss viable options and get back to you. Thanks again for reaching out and thinking of us.

Best, Nicole

From: Leyna Tobey < leyna@Walsh-eng.com> Sent: Tuesday, August 13, 2024 2:00 PM

To: Sanders, Nicole A <nicole\_sanders@fws.gov>; danielle.dauria@maine.gov

Subject: [EXTERNAL] Webhannet Saltmarsh Restoration Inquiry

This email has been received from outside of DOI - Use caution before clicking on links, opening attachments, or responding.

Good afternoon Nicole and Danielle,

I am working on permitting a dredging project for several marinas on the lower Kennebunk River in Kennebunk, ME, and am currently conducting an alternatives analysis on where to dispose of the 25,000 CY of silty dredge

material. I used the Army Corp's Beneficial Use of Dredged Material Planning Tool (<u>here</u>) and found that the Webhannet River Complex Saltmarsh is listed as a potential dredge material disposal location.

I saw that you were both listed as contacts for the project on the Maine Saltmarsh Restoration Priorities for the Saltmarsh Sparrow <u>document</u>, and I was hoping either of you would be able to provide me with some details regarding whether you are accepting materials for the project(s), what types of materials are being accepted, timeline for material acceptance, etc. Or, if you are not the right contacts to be reaching out to, could you please point me in the right direction of who I should be contacting?

Please give me a call to discuss if that would be easier. Thanks in advance!

Leyna

Leyna Tobey, PE\*
Project Manager | Civil Engineer
\*Licensed in MA



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## **Attachment 4 – Site Conditions Report**

- 4.1 Maine IF&W Beginning with Habitat Map
  - 4.2 USFWS IPaC Official Species List
  - 4.3 NOAA Fisheries EFH Mapper Report
- 4.4 NOAA Fisheries Greater Atlantic Region ESA Section 7 Map

## **4.0 Site Conditions Report**

The dredging activity will occur at the Yachtsman Marina within the Kennebunk River, which is located approximately 0.75 miles from the mouth of the Kennebunk River.

The shoreline area southeast of the Yachtsman Marina consists of medium riprap placed to prevent bank erosion. The sandy area in front of those walls is completely covered at high tide and is partially exposed at low tide. Minimal rockweed was observed in this area, but no other plant or marine species were noted.

According to the Maine Department of Inland Fisheries & Wildlife (IF&W) Beginning with Habitat website (https://www.maine.gov/ifw/fish-wildlife/wildlife/beginning-with-habitat/maps/index.html), the dredging location is bordered to the northwest and southeast by wetlands identified by the National Wetland Inventory (NWI). The area of the dredging is located in a relatively small area of the Kennebunk River's shellfish growing area.

According to the U.S. Department of Fish & Wildlife Service (USFWS) Information for Planning and Consultation (IPaC) website (https://ipac.ecosphere.fws.gov/), the following are listed species that may occur in the area of the property: the Northern Long-eared Bat, Tricolored Bat, and the Monarch Butterfly.

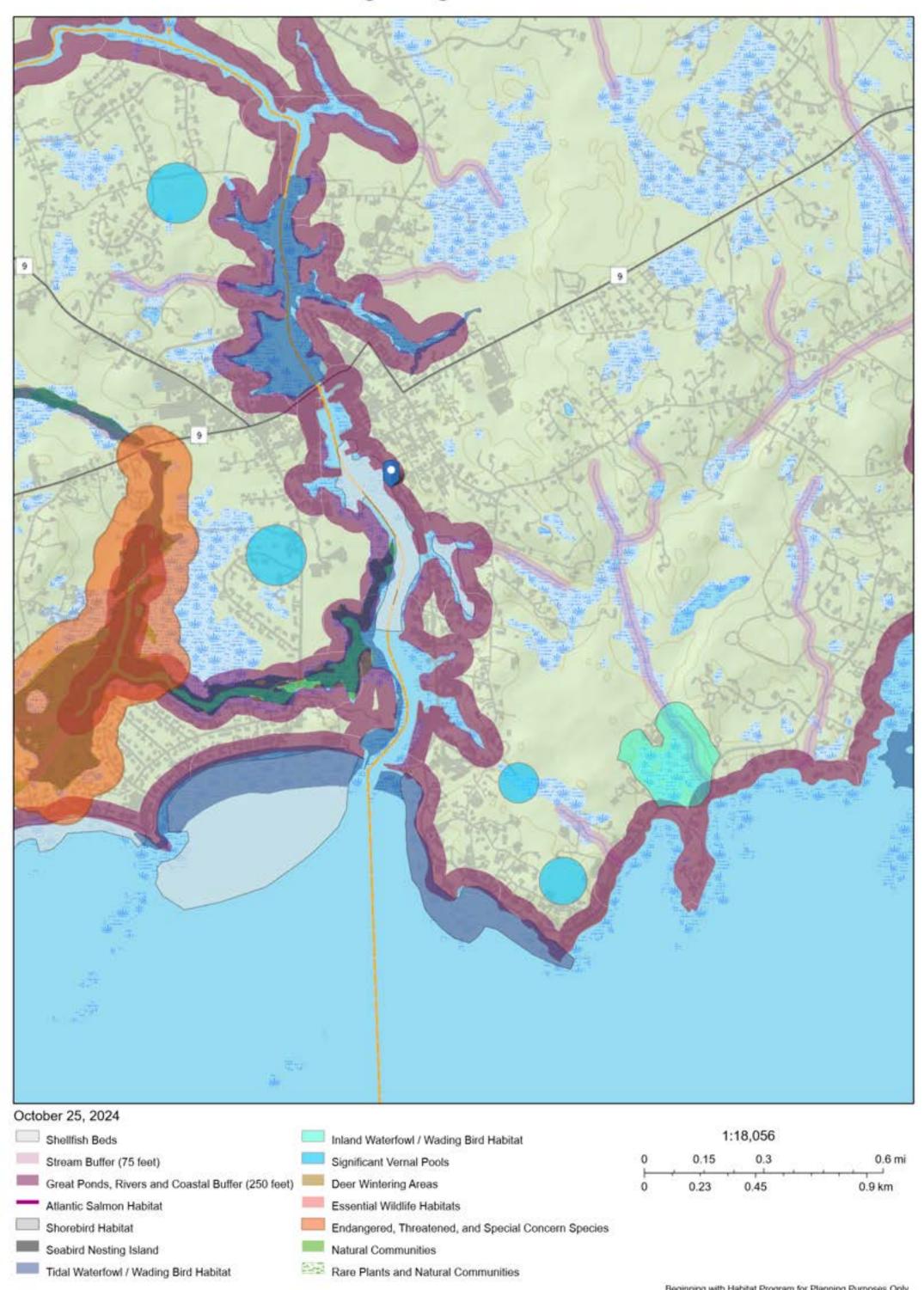
According to the National Oceanic and Atmospheric Administration (NOAA) Fisheries Essential Fish Habitat (EFH) Mapper, the project location is mapped within a New England/Mid-Atlantic EFH for the following species: Acadian redfish (larvae); haddock (juvenile); little skate (adult); monkfish (eggs, larvae, juvenile, adult); silver hake (eggs, larvae, adult); and winter flounder (eggs). The project is likely to have short-term and localized impacts to EFH, with no significant impacts to these habitats anticipated.

According to the NOAA Fisheries Greater Atlantic Region Endangered Species Act (ESA) Section 7 Mapper (Section 7 Mapper), adult and subadult Atlantic sturgeon (threatened/endangered) and adult shortnose sturgeon (endangered) migrate and forage in the Kennebunk River within the limits of the project boundary. The migrating and foraging time of year for the Atlantic sturgeon is identified as all year, however, the Section 7 Mapper notes that the Atlantic sturgeon exhibit seasonal coastal movements in the spring and fall; the migrating and foraging time of year for the shortnose sturgeon is identified as April 1 to November 30.

The Yachtsman Marina dredging work is proposed to take place in winter 2025-2026 and to avoid disturbances to EFH and sturgeon populations to the maximum extent possible. Based on the resource mapping shown, the project will have minimal impact on existing natural resources.

The Kennebunk River (Assessment Unit ID ME0106000301\_622 R01) is listed on the Maine Department of Environmental Protection's (DEP's) Final 2018/2020/2022 Integrated Water Quality Report as a Delisted Category 5 Waterbody, as a Total Maximum Daily Load (TMDL) for E. coli was approved for the river in 2009. The proposed dredging activities will not discharge any bacteria into the river.

## Beginning With Habitat





# United States Department of the Interior



# FISH AND WILDLIFE SERVICE

Maine Ecological Services Field Office P. O. Box A East Orland, ME 04431

Phone: (207) 469-7300 Fax: (207) 902-1588

In Reply Refer To: 10/25/2024 18:30:18 UTC

Project Code: 2025-0011334

Project Name: Yachtsman Marina Dredging

Subject: List of threatened and endangered species that may occur in your proposed project

location or may be affected by your proposed project

#### To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the IPaC system by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 *et seq.*), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2) (c)). For projects other than major construction activities, the Service suggests that a biological

evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

Project code: 2025-0011334

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:

https://www.fws.gov/sites/default/files/documents/endangered-species-consultation-handbook.pdf

**Migratory Birds**: In addition to responsibilities to protect threatened and endangered species under the Endangered Species Act (ESA), there are additional responsibilities under the Migratory Bird Treaty Act (MBTA) and the Bald and Golden Eagle Protection Act (BGEPA) to protect native birds from project-related impacts. Any activity, intentional or unintentional, resulting in take of migratory birds, including eagles, is prohibited unless otherwise permitted by the U.S. Fish and Wildlife Service (50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)). For more information regarding these Acts, see https://www.fws.gov/program/migratory-bird-permit/what-we-do.

The MBTA has no provision for allowing take of migratory birds that may be unintentionally killed or injured by otherwise lawful activities. It is the responsibility of the project proponent to comply with these Acts by identifying potential impacts to migratory birds and eagles within applicable NEPA documents (when there is a federal nexus) or a Bird/Eagle Conservation Plan (when there is no federal nexus). Proponents should implement conservation measures to avoid or minimize the production of project-related stressors or minimize the exposure of birds and their resources to the project-related stressors. For more information on avian stressors and recommended conservation measures, see https://www.fws.gov/library/collections/threats-birds.

In addition to MBTA and BGEPA, Executive Order 13186: *Responsibilities of Federal Agencies to Protect Migratory Birds*, obligates all Federal agencies that engage in or authorize activities that might affect migratory birds, to minimize those effects and encourage conservation measures that will improve bird populations. Executive Order 13186 provides for the protection of both migratory birds and migratory bird habitat. For information regarding the implementation of Executive For information regarding the implementation of Executive Order 13186, please visit https://www.fws.gov/partner/council-conservation-migratory-birds.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Code in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

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## Attachment(s):

- Official Species List
- USFWS National Wildlife Refuges and Fish Hatcheries
- Bald & Golden Eagles
- Migratory Birds
- Wetlands

# **OFFICIAL SPECIES LIST**

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

Maine Ecological Services Field Office P. O. Box A East Orland, ME 04431 (207) 469-7300

## **PROJECT SUMMARY**

Project Code: 2025-0011334

Project Name: Yachtsman Marina Dredging
Project Type: Navigation Channel Improvement

Project Description: Maintenance dredge of Kennebunk River

**Project Location:** 

The approximate location of the project can be viewed in Google Maps: <a href="https://www.google.com/maps/@43.3569549">https://www.google.com/maps/@43.3569549</a>,-70.47482428275957,14z



Counties: York County, Maine

## **ENDANGERED SPECIES ACT SPECIES**

Project code: 2025-0011334

There is a total of 3 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries<sup>1</sup>, as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

1. <u>NOAA Fisheries</u>, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

## **MAMMALS**

NAME	STATUS
Northern Long-eared Bat Myotis septentrionalis	Endangered
No critical habitat has been designated for this species.	
Species profile: <a href="https://ecos.fws.gov/ecp/species/9045">https://ecos.fws.gov/ecp/species/9045</a>	
Tricolored Bat <i>Perimyotis subflavus</i>	Proposed
No critical habitat has been designated for this species.	Endangered
Species profile: <a href="https://ecos.fws.gov/ecp/species/10515">https://ecos.fws.gov/ecp/species/10515</a>	Ü
INSECTS	
NAME	STATUS
Managala Dautanfla Danasa alaniana	C J: J-4-

Monarch Butterfly *Danaus plexippus* 

Candidate

No critical habitat has been designated for this species. Species profile: <a href="https://ecos.fws.gov/ecp/species/9743">https://ecos.fws.gov/ecp/species/9743</a>

#### **CRITICAL HABITATS**

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

YOU ARE STILL REQUIRED TO DETERMINE IF YOUR PROJECT(S) MAY HAVE EFFECTS ON ALL ABOVE LISTED SPECIES.

# USFWS NATIONAL WILDLIFE REFUGE LANDS AND FISH HATCHERIES

Any activity proposed on lands managed by the <u>National Wildlife Refuge</u> system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

THERE ARE NO REFUGE LANDS OR FISH HATCHERIES WITHIN YOUR PROJECT AREA.

## **BALD & GOLDEN EAGLES**

Bald and golden eagles are protected under the Bald and Golden Eagle Protection Act<sup>1</sup> and the Migratory Bird Treaty Act<sup>2</sup>.

Any person or organization who plans or conducts activities that may result in impacts to bald or golden eagles, or their habitats<sup>3</sup>, should follow appropriate regulations and consider implementing appropriate conservation measures, as described in the links below. Specifically, please review the "Supplemental Information on Migratory Birds and Eagles".

- 1. The Bald and Golden Eagle Protection Act of 1940.
- 2. The Migratory Birds Treaty Act of 1918.

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#### 3. 50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)

There are likely bald eagles present in your project area. For additional information on bald eagles, refer to <u>Bald Eagle Nesting and Sensitivity to Human Activity</u>

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, see the PROBABILITY OF PRESENCE SUMMARY below to see when these birds are most likely to be present and breeding in your project area.

NAME BREEDING SEASON

#### Bald Eagle Haliaeetus leucocephalus

Breeds Oct 15 to Aug 31

This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.

https://ecos.fws.gov/ecp/species/1626

## PROBABILITY OF PRESENCE SUMMARY

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read "Supplemental Information on Migratory Birds and Eagles", specifically the FAQ section titled "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

#### **Probability of Presence (■)**

Green bars; the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during that week of the year.

## **Breeding Season** (

Yellow bars; liberal estimate of the timeframe inside which the bird breeds across its entire range.

## Survey Effort (|)

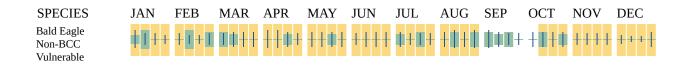
Vertical black lines; the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps.

## No Data (-)

A week is marked as having no data if there were no survey events for that week.

■ probability of presence ■ breeding season | survey effort − no data

Project code: 2025-0011334 10/25/2024 18:30:18 UTC



Additional information can be found using the following links:

- Eagle Management <a href="https://www.fws.gov/program/eagle-management">https://www.fws.gov/program/eagle-management</a>
- Measures for avoiding and minimizing impacts to birds <a href="https://www.fws.gov/library/collections/avoiding-and-minimizing-incidental-take-migratory-birds">https://www.fws.gov/library/collections/avoiding-and-minimizing-incidental-take-migratory-birds</a>
- Nationwide conservation measures for birds <a href="https://www.fws.gov/sites/default/files/documents/nationwide-standard-conservation-measures.pdf">https://www.fws.gov/sites/default/files/documents/nationwide-standard-conservation-measures.pdf</a>
- Supplemental Information for Migratory Birds and Eagles in IPaC <a href="https://www.fws.gov/media/supplemental-information-migratory-birds-and-bald-and-golden-eagles-may-occur-project-action">https://www.fws.gov/media/supplemental-information-migratory-birds-and-bald-and-golden-eagles-may-occur-project-action</a>

# **MIGRATORY BIRDS**

Certain birds are protected under the Migratory Bird Treaty Act<sup>1</sup> and the Bald and Golden Eagle Protection Act<sup>2</sup>.

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats<sup>3</sup> should follow appropriate regulations and consider implementing appropriate conservation measures, as described in the links below. Specifically, please review the "Supplemental Information on Migratory Birds and Eagles".

- 1. The Migratory Birds Treaty Act of 1918.
- 2. The Bald and Golden Eagle Protection Act of 1940.
- 3. 50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, see the PROBABILITY OF PRESENCE SUMMARY below to see when these birds are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON
American Oystercatcher <i>Haematopus palliatus</i>	Breeds Apr 15
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA	to Aug 31
and Alaska.	J
https://ecos.fws.gov/ecp/species/8935	

NAME	BREEDING SEASON
Bald Eagle <i>Haliaeetus leucocephalus</i> This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. <a href="https://ecos.fws.gov/ecp/species/1626">https://ecos.fws.gov/ecp/species/1626</a>	Breeds Oct 15 to Aug 31
Black-billed Cuckoo <i>Coccyzus erythropthalmus</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. <a href="https://ecos.fws.gov/ecp/species/9399">https://ecos.fws.gov/ecp/species/9399</a>	Breeds May 15 to Oct 10
Blue-winged Warbler <i>Vermivora cyanoptera</i> This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA <a href="https://ecos.fws.gov/ecp/species/9509">https://ecos.fws.gov/ecp/species/9509</a>	Breeds May 1 to Jun 30
Bobolink <i>Dolichonyx oryzivorus</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. <a href="https://ecos.fws.gov/ecp/species/9454">https://ecos.fws.gov/ecp/species/9454</a>	Breeds May 20 to Jul 31
Canada Warbler <i>Cardellina canadensis</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. <a href="https://ecos.fws.gov/ecp/species/9643">https://ecos.fws.gov/ecp/species/9643</a>	Breeds May 20 to Aug 10
Chimney Swift <i>Chaetura pelagica</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. <a href="https://ecos.fws.gov/ecp/species/9406">https://ecos.fws.gov/ecp/species/9406</a>	Breeds Mar 15 to Aug 25
Eastern Whip-poor-will <i>Antrostomus vociferus</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. <a href="https://ecos.fws.gov/ecp/species/10678">https://ecos.fws.gov/ecp/species/10678</a>	Breeds May 1 to Aug 20
Grasshopper Sparrow <i>Ammodramus savannarum perpallidus</i> This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA <a href="https://ecos.fws.gov/ecp/species/8329">https://ecos.fws.gov/ecp/species/8329</a>	Breeds Jun 1 to Aug 20
Hudsonian Godwit <i>Limosa haemastica</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. <a href="https://ecos.fws.gov/ecp/species/9482">https://ecos.fws.gov/ecp/species/9482</a>	Breeds elsewhere
Least Tern <i>Sternula antillarum antillarum</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. <a href="https://ecos.fws.gov/ecp/species/11919">https://ecos.fws.gov/ecp/species/11919</a>	Breeds Apr 25 to Sep 5

**BREEDING** NAME **SEASON** Lesser Yellowlegs *Tringa flavipes* Breeds This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA elsewhere and Alaska. https://ecos.fws.gov/ecp/species/9679 Pectoral Sandpiper *Calidris melanotos* Breeds This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA elsewhere and Alaska. https://ecos.fws.gov/ecp/species/9561 Prairie Warbler *Setophaga discolor* Breeds May 1 This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA to Jul 31 and Alaska. https://ecos.fws.gov/ecp/species/9513 Prothonotary Warbler Protonotaria citrea Breeds Apr 1 to This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA Jul 31 and Alaska. https://ecos.fws.gov/ecp/species/9439 Purple Sandpiper Calidris maritima **Breeds** This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA elsewhere and Alaska. https://ecos.fws.gov/ecp/species/9574 Red-headed Woodpecker Melanerpes erythrocephalus Breeds May 10 This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA to Sep 10 and Alaska. https://ecos.fws.gov/ecp/species/9398 **Breeds** Ruddy Turnstone *Arenaria interpres morinella* This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions elsewhere (BCRs) in the continental USA https://ecos.fws.gov/ecp/species/10633 **Breeds** Rusty Blackbird *Euphagus carolinus* This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions elsewhere (BCRs) in the continental USA https://ecos.fws.gov/ecp/species/9478 Saltmarsh Sparrow *Ammospiza caudacuta* Breeds May 15 This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA to Sep 5 and Alaska. https://ecos.fws.gov/ecp/species/9719 Scarlet Tanager Piranga olivacea Breeds May 10 This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions to Aug 10 (BCRs) in the continental USA https://ecos.fws.gov/ecp/species/11967

NAME	BREEDING SEASON
Semipalmated Sandpiper <i>Calidris pusilla</i> This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA <a href="https://ecos.fws.gov/ecp/species/9603">https://ecos.fws.gov/ecp/species/9603</a>	Breeds elsewhere
Short-billed Dowitcher <i>Limnodromus griseus</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. <a href="https://ecos.fws.gov/ecp/species/9480">https://ecos.fws.gov/ecp/species/9480</a>	Breeds elsewhere
Whimbrel <i>Numenius phaeopus hudsonicus</i> This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA <a href="https://ecos.fws.gov/ecp/species/11991">https://ecos.fws.gov/ecp/species/11991</a>	Breeds elsewhere
Willet <i>Tringa semipalmata</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. <a href="https://ecos.fws.gov/ecp/species/10669">https://ecos.fws.gov/ecp/species/10669</a>	Breeds Apr 20 to Aug 5
Wood Thrush <i>Hylocichla mustelina</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. <a href="https://ecos.fws.gov/ecp/species/9431">https://ecos.fws.gov/ecp/species/9431</a>	Breeds May 10 to Aug 31

## PROBABILITY OF PRESENCE SUMMARY

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read "Supplemental Information on Migratory Birds and Eagles", specifically the FAQ section titled "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

### **Probability of Presence (■)**

Green bars; the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during that week of the year.

### **Breeding Season** (**•**)

Yellow bars; liberal estimate of the timeframe inside which the bird breeds across its entire range.

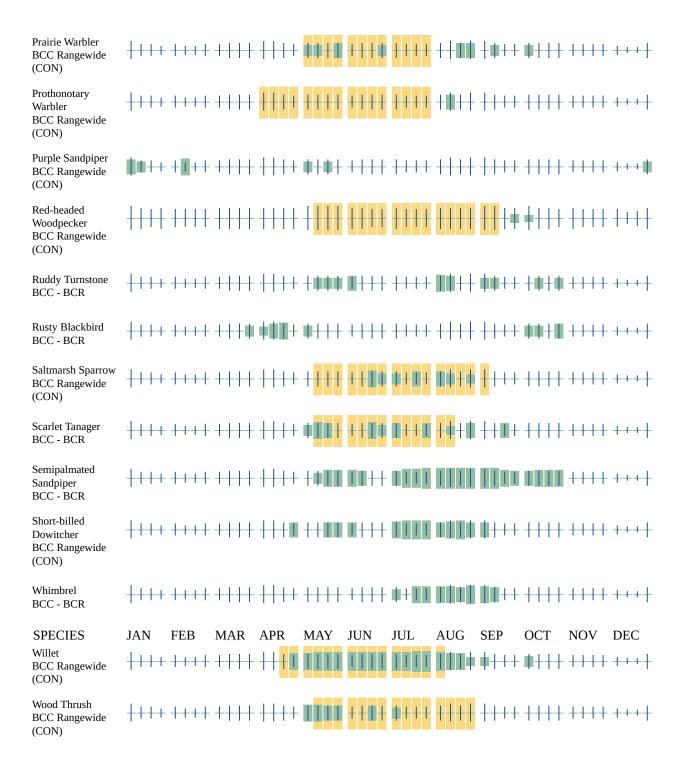
#### Survey Effort (|)

Vertical black lines; the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps.

#### No Data (-)

A week is marked as having no data if there were no survey events for that week.

■ probability of presence ■ breeding season | survey effort — no data **SPECIES** JAN FEB MAR APR MAY JUN JUL AUG **SEP** OCT NOV DEC American ++++ ++++ ++++ + ++|| || || || || || Oystercatcher BCC Rangewide (CON) **Bald Eagle** Non-BCC Vulnerable Black-billed ┼┼┼┼╶┼┼┼┼╶┼┼┼┼╶┼┼┼ Cuckoo BCC Rangewide (CON) Blue-winged ┼┼┼┼╶┼┼┼┼╶┼┼┼┼<mark>╏╏╏╏</mark> Warbler BCC - BCR Bobolink ++++ ++++ ++++ ++++ || || || || || || BCC Rangewide (CON) Canada Warbler ┼┼┼┼ ┼┼┼┼ ┼┼┼┼ **┆╏╏╏** BCC Rangewide (CON) Chimney Swift BCC Rangewide (CON) Eastern Whip-poorwill BCC Rangewide (CON) Grasshopper Sparrow BCC - BCR Hudsonian Godwit BCC Rangewide (CON) Least Tern BCC Rangewide (CON) Lesser Yellowlegs ++++ ++++ ++++ •+++ ••••• BCC Rangewide (CON) **SPECIES FEB** MAR APR MAY JUN JUL AUG SEP NOV **JAN** OCT DEC Pectoral Sandpiper BCC Rangewide (CON)



#### Additional information can be found using the following links:

- Eagle Management https://www.fws.gov/program/eagle-management
- Measures for avoiding and minimizing impacts to birds <a href="https://www.fws.gov/library/collections/avoiding-and-minimizing-incidental-take-migratory-birds">https://www.fws.gov/library/collections/avoiding-and-minimizing-incidental-take-migratory-birds</a>

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Nationwide conservation measures for birds <a href="https://www.fws.gov/sites/default/files/documents/nationwide-standard-conservation-measures.pdf">https://www.fws.gov/sites/default/files/documents/nationwide-standard-conservation-measures.pdf</a>

Supplemental Information for Migratory Birds and Eagles in IPaC <a href="https://www.fws.gov/media/supplemental-information-migratory-birds-and-bald-and-golden-eagles-may-occur-project-action">https://www.fws.gov/media/supplemental-information-migratory-birds-and-bald-and-golden-eagles-may-occur-project-action</a>

# **WETLANDS**

Impacts to <u>NWI wetlands</u> and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local <u>U.S. Army Corps of Engineers District</u>.

Please note that the NWI data being shown may be out of date. We are currently working to update our NWI data set. We recommend you verify these results with a site visit to determine the actual extent of wetlands on site.

ESTUARINE AND MARINE DEEPWATER

• E1UBL

ESTUARINE AND MARINE WETLAND

■ E2US3N

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# **IPAC USER CONTACT INFORMATION**

Agency: Private Entity
Name: Leyna Tobey
Address: One Karen Drive

Address Line 2: Suite 2A City: Westbrook

State: ME Zip: 04092

Email leyna@walsh-eng.com

Phone: 2075539898

# **EFH Mapper Report**

#### **EFH Data Notice**

Essential Fish Habitat (EFH) is defined by textual descriptions contained in the fishery management plans developed by the regional fishery management councils. In most cases mapping data can not fully represent the complexity of the habitats that make up EFH. This report should be used for general interest queries only and should not be interpreted as a definitive evaluation of EFH at this location. A location-specific evaluation of EFH for any official purposes must be performed by a regional expert. Please refer to the following links for the appropriate regional resources.

Greater Atlantic Regional Office Atlantic Highly Migratory Species Management Division

#### **Query Results**

Degrees, Minutes, Seconds: Latitude = 43° 21' 26" N, Longitude = 71° 31' 30" W

Decimal Degrees: Latitude = 43.357, Longitude = -70.475

The query location intersects with spatial data representing EFH and/or HAPCs for the following species/management units.

## \*\*\* W A R N I N G \*\*\*

Please note under "Life Stage(s) Found at Location" the category "ALL" indicates that all life stages of that species share the same map and are designated at the queried location.

#### **EFH**

Link	Data Caveats	Species/ Management Unit	Lifestage(s) Found at Location	Management Council	FMP
<u>"</u>	0	Acadian Redfish	Larvae	New England	Amendment 14 to the Northeast Multispecies FMP
<u>"</u>	0	Haddock	Juvenile	New England	Amendment 14 to the Northeast Multispecies FMP
P	•	Little Skate	Adult	New England	Amendment 2 to the Northeast Skate Complex FMP
P	0	Monkfish	Adult, Eggs/Larvae, Juvenile	New England	Amendment 4 to the Monkfish FMP
<u>"</u>	0	Silver Hake	Adult, Eggs/Larvae	New England	Amendment 14 to the Northeast Multispecies FMP
P	0	Winter Flounder	Eggs	New England	Amendment 14 to the Northeast Multispecies FMP

#### **Pacific Salmon EFH**

No Pacific Salmon Essential Fish Habitat (EFH) were identified at the report location.

1 of 2 10/25/2024, 10:29 AM

#### **Atlantic Salmon**

No Atlantic Salmon were identified at the report location.

## **HAPCs**

No Habitat Areas of Particular Concern (HAPC) were identified at the report location.

## **EFH Areas Protected from Fishing**

No EFH Areas Protected from Fishing (EFHA) were identified at the report location.

Spatial data does not currently exist for all the managed species in this area. The following is a list of species or management units for which there is no spatial data.

\*\*For links to all EFH text descriptions see the complete data inventory: open data inventory -->

All EFH species have been mapped for the Greater Atlantic region, Atlantic Highly Migratory Species EFH,

Bigeye Sand Tiger Shark,

Bigeye Sixgill Shark,

Caribbean Sharpnose Shark,

Galapagos Shark,

Narrowtooth Shark,

Sevengill Shark,

Sixgill Shark,

Smooth Hammerhead Shark,

Smalltail Shark

2 of 2 10/25/2024, 10:29 AM



# Drawn Action Area & Overlapping S7 Consultation Areas

## Area of Interest (AOI) Information

Area: 5.69 acres

Oct 25 2024 10:31:05 Eastern Daylight Time



1 of 2 10/25/2024, 10:32 AM

## Summary

Name	Count	Area(acres)	Length(mi)
Atlantic Sturgeon	2	9.37	N/A
Shortnose Sturgeon	1	4.69	N/A
Atlantic Salmon	0	0	N/A
Sea Turtles	0	0	N/A
Atlantic Large Whales	0	0	N/A
In or Near Critical Habitat	0	0	N/A

# Atlantic Sturgeon

#	Feature ID	Species	Lifestage	Behavior	Zone	From	Until	From (2)	Until (2)	Area(acres
1	ANS_C50_ ADU_MAF	Atlantic sturgeon	Adult	Migrating & Foraging	N/A	01/01	12/31	N/A	N/A	4.68
2	ANS_C50_ SUB_MAF	Atlantic sturgeon	Subadult	Migrating & Foraging	N/A	01/01	12/31	N/A	N/A	4.68

# Shortnose Sturgeon

#	Feature ID	Species	Life Stage	Behavior	Zone	From	Until	From (2)	Until (2)	Area(acres	
1	SNS_C50_ ADU_MAF	Shortnose sturgeon	Adult	Migrating & Foraging	N/A	04/01	11/30	N/A	N/A	4.69	

2 of 2

# **Attachment 5 – Historic Sites**

- 5.1 MHPC Notification
- 5.2 MHPC Response
- 5.3 THPO Notification
- 5.4 THPO Responses Received to Date

## **5.0 Historic Sites**

As required by the U.S. Army Corps of Engineers (USACE), the Maine Historic Preservation Commission (MHPC) and the Tribal Historic Preservation Officers (THPO) of Maine have been notified regarding this project. Copies of these notifications are included with this section. Any responses received from the MHPC and THPO will be forwarded to the project manager assigned to this project.



October 25, 2024

Maine Historic Preservation Commission Mr. Kirk F. Mohney, Director 65 State House Station Augusta, Maine 04333-0065 MHPCprojectreview@maine.gov

VIA: Transmitted via email as noted above

RE: Yachtsman Marina Dredging – Project Review Request 57 Ocean Ave, Kennebunkport, ME 04046

Map 10, Block 1, Lot 3

On behalf of the Yachtsman Marina (Applicant), Walsh Engineering Associates, Inc. (WEA) intends to file permit applications with the Maine Department of Environmental Protection (DEP) and the U.S. Army Corps of Engineers (USACE) for maintenance dredging activities in the Kennebunk River at 57 Ocean Avenue in Kennebunkport, Maine. WEA is requesting that the Maine Historic Preservation Commission (MHPC) review the area for any known historic and/or archaeological resources. A site location map is attached for your review.

If you have any questions or concerns with this project, please feel free to contact me at (207) 553-9898 or by e-mail at leyna@walsh-eng.com. Thank you in advance for your time.

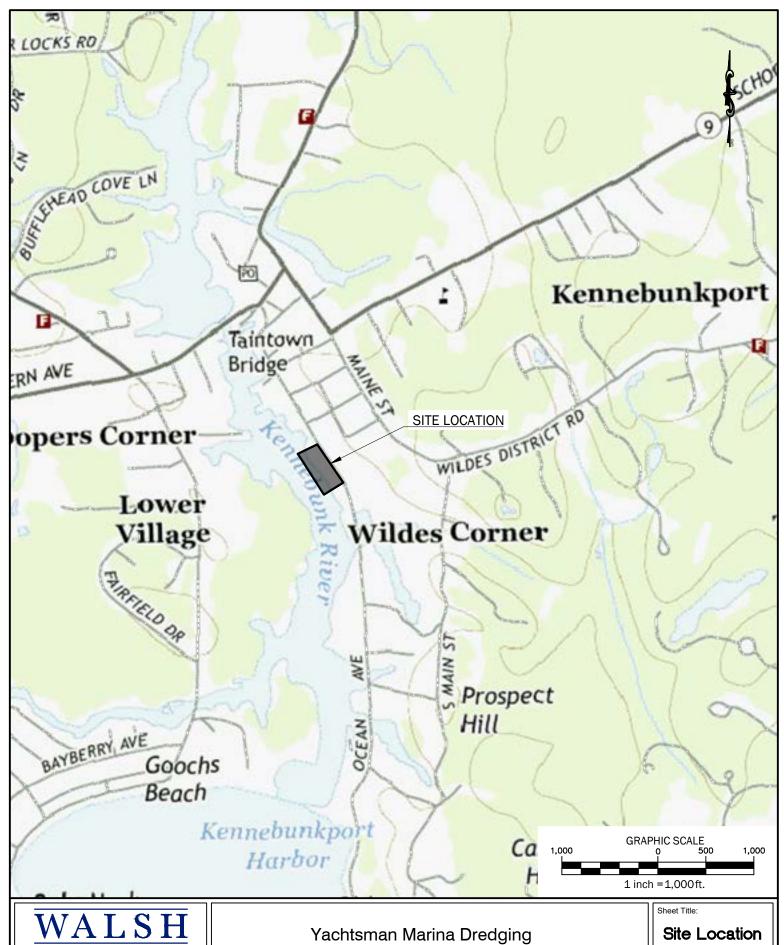
Respectfully,

Leyna Tobey, Project Manager

Leyna L. Tobery

Walsh Engineering Associates, Inc.

Enc: Site Location Map



# engineering associates, inc.

One Karen Dr., Suite 2A | Westbrook, Maine 04092 ph: 207.553.9898 www.walsh-eng.com

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Yachtsman Marina 57 Ocean Avenue Kennebunkport, Maine 04046 Job No.: Date: OCTOBER 2024 1" = 1,000' Scale: Drawn: LLT Checked: WRW



October 25, 2024

Maine Historic Preservation Commission Mr. Kirk F. Mohney, Director 65 State House Station Augusta, Maine 04333-0065 MHPCprojectreview@maine.gov



VIA: Transmitted via email as noted above

RE: Yachtsman Marina Dredging - Project Review Request

57 Ocean Ave, Kennebunkport, ME 04046

Map 10, Block 1, Lot 3

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If you have any questions or concerns with this project, please feel free to contact me at (207) 553-9898 or by e-mail at leyna@walsh-eng.com. Thank you in advance for your time.

Respectfully,

Leyna Tobey, Project Manager

Leyna L. Tobers

Walsh Engineering Associates, Inc.

Enc: Site Location Map

Based on the information submitted, I have concluded that there will be no historic properties affected by the proposed undertaking, as defined by Section 106 of the National Historic Preservation Act.

Consequently, pursuant to 36 CFR 800.4(d)(1), no further Section 106

Consequently, pursuant to 36 CFR 800.4(d)(1), no infinite section for consultation is required unless additional resources are discovered during project implementation pursuant to 36 CFR 800.13.

Kirk F. Mohney,

State Historic Preservation Officer

Maine Aistoric Preservation Commission



October 25, 2024

Houlton Band of Maliseet Indians Isaac St. John, THPO 88 Bell Road, Littleton, Maine 04730 istjohn@maliseets.com

Passamaquoddy Tribe of Indians Donald Soctomah, THPO Pleasant Point Reservation P.O. Box 343, Perry, Maine 04667 soctomah@gmail.com

Passamaquoddy Tribe of Indians Donald Soctomah, THPO Indian Township Reservation P.O. Box 301, Princeton, Maine 04668 soctomah@gmail.com

VIA: Transmitted via email as noted above

RE: Yachtsman Marina Dredging – Project Review Request 57 Ocean Ave, Kennebunkport, ME 04046 Map 10, Block 1, Lot 3

On behalf of the Yachtsman Marina (Applicant), Walsh Engineering Associates, Inc. (WEA) intends to file permit applications with the Maine Department of Environmental Protection (DEP) and the U.S. Army Corps of Engineers (USACE) for maintenance dredging activities in the Kennebunk River at 57 Ocean Avenue in Kennebunkport, Maine. WEA is requesting that the Maine Tribal Historic Preservation Offices (THPO) review the area for any known historic and/or archaeological resources. A site location map is attached for your review.

If you have any questions or concerns with this project, please feel free to contact me at (207) 553-9898 or by e-mail at leyna@walsh-eng.com. Thank you in advance for your time.

Respectfully,

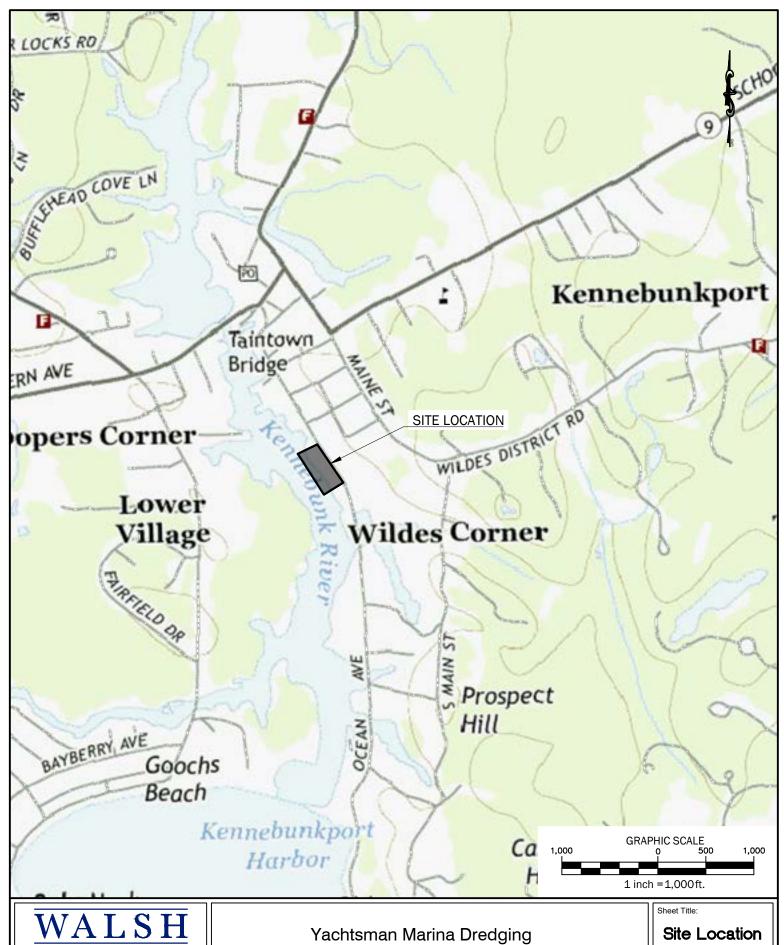
Leyna Tobey, Project Manager Walsh Engineering Associates, Inc.

Leyna L. Tobery

Enc: Site Location Map

Mi'kmaq Nation Jenny Gaenzle, THPO 7 Northern Road, Presque Isle, Maine 04769 jgaenzle@micmac-nsn.gov

Penobscot Nation Chris Sockalexis, THPO Cultural and Historic Preservation Dept. 12 Wabanaki Way, Indian Island, Maine 04468 chris.sockalexis@penobscotnation.org



# engineering associates, inc.

One Karen Dr., Suite 2A | Westbrook, Maine 04092 ph: 207.553.9898 www.walsh-eng.com

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Yachtsman Marina 57 Ocean Avenue Kennebunkport, Maine 04046 Job No.: Date: OCTOBER 2024 1" = 1,000' Scale: Drawn: LLT Checked: WRW

# Tribal Historic Preservation Office Passamaquoddy Tribe

PO Box 159 Princeton, Me. 04668 207-214-4051

November 5, 2024

Leyna Tobey, PE\*

**Project Manager | Civil Engineer** 

Walsh

One Karen Drive, Suite 2A

Westbrook, ME 04092

• Re: Kennebunk River at 57 Ocean Avenue in Kennebunkport

## Dear **Leyna**;

The Passamaquoddy THPO has reviewed the following application regarding the historic properties and significant religious and cultural properties in accordance with NHPA, NEPA, AIRFA, NAGPRA, ARPA, Executive Order 13007 Indian Sacred Sites, Executive Order 13175 Consultation and Coordination with Indian Tribal Governments, and Executive Order 12898 Environmental Justice.

The Project listed above will not have an impact on cultural concerns. If any artifacts or human remains are uncovered please stop and notify this office and the State Historic Preservation Office.

Sincerely;

Donald Soctomah THPO Soctomah@gmail.com





#### **Subject Property:**

Parcel Number: 10-1-3

CAMA Number: 10-1-3 Vision ID: 3427

Property Address: 57 OCEAN AVENUE

Mailing Address: YACHTSMAN HOSPITALITY, LLC

2 LIVEWELL DRIVE, #203 KENNEBUNK. ME 04043

Abutters:

Parcel Number: 10-1-15

CAMA Number: 10-1-15

Vision ID: 3441

Property Address: 53 OCEAN AVENUE

Parcel Number: 10-1-2

CAMA Number: 10-1-2

Vision ID: 3426

Property Address: 67 OCEAN AVENUE

Parcel Number: 10-1-4

CAMA Number: 10-1-4 Vision ID: 525

Property Address: OCEAN AVENUE

Parcel Number: 10-1-5 CAMA Number: 10-1-5

Vision ID: 3428

Property Address: 51 OCEAN AVENUE

Parcel Number: 10-2-2

CAMA Number: 10-2-2 Vision ID: 546

Property Address: OCEAN AVENUE

. .

Parcel Number: 10-5-10 CAMA Number: 10-5-10

Vision ID: 587

Property Address: 52 OCEAN AVENUE

Parcel Number: 10-5-11

CAMA Number: 10-5-11

Vision ID: 588

Property Address: 5 GREENE STREET

Parcel Number: 10-5-12

CAMA Number: 10-5-12

Vision ID: 3465

10/28/2024

Property Address: 60 OCEAN AVENUE

Mailing Address: KENNEBUNKPORT, TOWN OF

PO BOX 566

KENNEBUNKPORT, ME 04046

Mailing Address: KPT MARINE, LLC

PO BOX 2734

KENNEBUNKPORT, ME 04046

Mailing Address: KENNEBUNKPORT, TOWN OF

PO BOX 566

KENNEBUNKPORT, ME 04046

Mailing Address: ARUNDEL YACHT CLUB

PO BOX 328

KENNEBUNKPORT, ME 04046-0328

Mailing Address: KENNEBUNKPORT CONSERVATION

TRUST

PO BOX 7004

CAPE PORPOISE, ME 04014-07004

Mailing Address: MAHONEY FAMILY REVOCABLE TRUST

**52 OCEAN AVENUE** 

KENNEBUNKPORT, ME 04046

Mailing Address: STOHLMAN, SUZANNE

PO BOX 127

KENNEBUNKPORT, ME 04046

Mailing Address: MARQUIS, ALFRED C JR & JULIE A

PO BOX 1835

KENNEBUNKPORT, ME 04046





Vision ID:

10/28/2024

# 150 feet Abutters List Report

Kennebunkport, ME October 28, 2024

Parcel Number: 10-5-13 CAMA Number: 10-5-13

10-5-13 590

Vision ID: 590
Property Address: 66 OCEAN AVENUE

Froperty Address. 00 OCEAN AVENUE

3466

Property Address: 68 OCEAN AVENUE

Parcel Number: 10-5-14 Mailing Address: WINSTANLEY, ADAM D

CAMA Number: 10-5-14 150 BAKER AVENUE SUITE 303

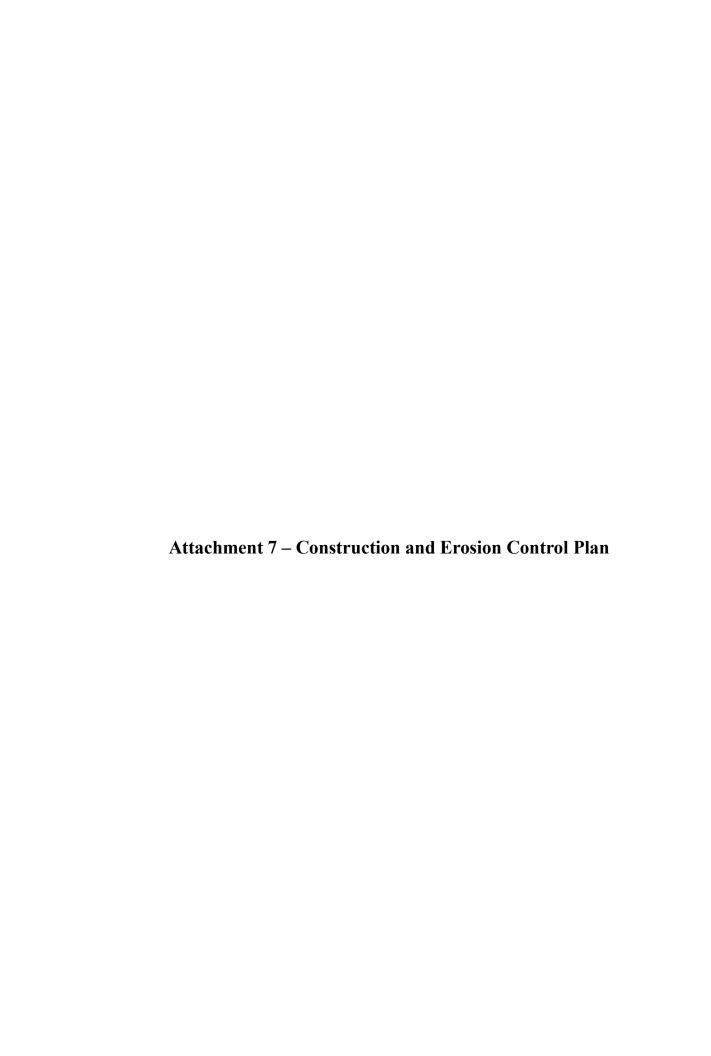
CONCORD MA 01742

4807 MARBLE HILL DRIVE

LAFAYETTE HILL, PA 19444

CONCORD, MA 01742

Mailing Address: DORAN, WILLIAM M & SUSAN L



## 7.0 Construction & Erosion Control Plan

### **Construction**

The dredging will be conducted utilizing a floating barge and dredging crane with a clamshell bucket. The barge will access the project area from traveling upriver from the Kennebunk River Breakwater. The area of the dredge will be approximately 61,000 square feet (1.4 acres). The proposed dredge depth will be to elevation -6.0 feet mean low water, with about one foot of overdig. It is anticipated that dredging will coincide with neighboring marinas performing dredging at the same approximate time, including the Arundel Yacht Club, the Kennebunkport Marina, and the Kennebunk River Club. The material will be transported by barge to the Isle of Shoals North Disposal Site (IOSN). The IOSN is located approximately 15 nautical miles east of Portsmouth, New Hampshire, in the Gulf of Maine.

## **Erosion & Sedimentation Control**

The dredging will be conducted from a floating barge using a dredging crane with a clamshell bucket. The dredged material will be placed on the barge and brought to the IOSN open water placement site for disposal. There will be no storage of the dredged material on land which negates the need for erosion and sedimentation control measures in this regard. No formal erosion control measures are proposed for the project. However, turbidity curtains will be implemented, if deemed necessary, around the proposed dredging area to mitigate the travel of sediment during the in-water disturbance.

# Attachment 8 – Sampling and Analysis Plan

- $8.1-Final\ Sampling\ and\ Analysis\ Plan$
- 8.2 Suitability Determination for IOSN

# 8.0 Sampling and Analysis Plan

The U.S. Army Corps of Engineers (USACE) approved a Sampling and Analysis Plan (SAP) for the project on January 21, 2022, which provided proposed sediment sampling locations, methods, and testing criteria to determine disposal suitability. The sampling results were submitted to the USACE for the Yachtsman Marina and the nearby Arundel Yacht Club, Kennebunkport Marina, and Kennebunk River Club. The USACE issued a Suitability Determination for all 4 sites on June 10, 2024, which documents the suitability of the dredged material for disposal at the Isle of Shoals North (IOSN) open water disposal site.

The SAP and USACE's Suitability Determination are included as an attachment to this permit section for reference.

**FINAL** Sampling and Analysis Plan for Yachtsman Marina, Kennebunkport, ME, File Number NAE-2004-00319

1. **Project Description:** The applicant is proposing to mechanically dredge approximately 6,300 cubic yards (CY) of material from shoaled areas totaling 1.4 acres within the property's marina basin located in the town of Kennebunkport, ME (Figures 1 and 2). This area will be dredged to the proposed depth of -6 feet at mean lower low water (MLLW) plus one foot of allowable overdepth. The applicant proposes to dispose of this material at the Isles of Shoals North Disposal Site (IOSN).

This sampling and analysis plan (SAP) has been developed by the New England District (NAE) U.S. Army Corps of Engineers (USACE) to gather information to support a dredged material suitability determination for the open water disposal alternative associated with this project. This sampling and analysis effort will be divided into two phases. The first phase will include sampling and testing of dredge site sediment for grain size and bulk chemistry in order to identify contaminants of concern. The second phase will include sampling of dredge site sediment and water for elutriate and biological testing in order to evaluate the material for placement at IOSN. The results of biological testing will be evaluated against the most recent NAE dataset for the IOSN reference area. All sampling and analysis activities described in this plan shall follow the requirements set forth in the "Regional Implementation Manual for the Evaluation of Dredged Material Proposed for Disposal in New England Waters" (RIM) dated May 6, 2004. copy of the RIM may be downloaded from the NAE website: http://www.nae.usace.army.mil/Missions/Regulatory/ DredgedMaterialProgram/RegionalImplementationManual.aspx

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

Project Setting: The property is associated with the Yachtsman Hotel & Marina Club located on the eastern bank of the Kennebunk River approximately 0.3 miles north of the river's mouth in Kennebunkport, ME (Figure 1). The marina offers boat dockage to the Yachtsman Hotel's guests. The Marina is now leased to and managed by the adjacent Kennebunkport Marina located to the south. The Applicant is proposing to dredge the leased area to connect the two Marinas. Land use in the surrounding area includes a mix of residential properties and marina facilities. The adjacent Kennebunkport Marina offers boat slips and full mechanical services and repairs and has a boat ramp. The Arundel Yacht Club

**FINAL** Sampling and Analysis Plan for Yachtsman Marina, Kennebunkport, ME, File Number NAE-2004-00319

is approximately 500 feet north of the property. Chicks Marina, which has a fuel dock, is adjacent to the southern property boundary of the Kennebunkport Marina, approximately 800 feet south of the Yachtsman property. Downtown Kennebunkport, an area with several restaurants, retail shops, and marine services, is approximately 1,500 feet north of the property. The Kennebunkport River Federal Navigation Project (FNP) -6 foot MLLW channel is located directly adjacent to the western boundary of the project area.

Water Quality: Water Quality in the project area is dictated by tidal exchange with the Gulf of Maine with freshwater input from the Kennebunk River to the north and a series of overboard discharge pipes within the Yachtsman Marina property (Figure 3). The 2014 Environmental Assessment for dredging of the Kennebunk River FNP noted that there have been reported increases of bacterial counts in the water, attributed to faulty septic systems, agriculture, and overboard discharges. Tidal waters of the Kennebunk River are classified as SB by the Maine Department of Environmental Protection (MEDEP). Class SB waters must be of such quality that they are suitable for the designated uses of recreation in and on the water, fishing, aquaculture, propagation and harvesting of shellfish, industrial process and cooling water supply, hydroelectric power generation, navigation and as habitat for fish and other estuarine and marine life M.R.S. (38)https://www.mainelegislature.org/legis/statutes/38/title38sec465-B.html).

Dredge History and Existing Testing Data: The project area was last dredged in 2015 when approximately 3,914 CY of material were removed to a depth of -5 feet Mean Low Water (MLW) and placed at the Cape Arundel Disposal Site (CADS). Sampling and testing of this material in 2014 documented sediments from two samples along the shoreline in the middle of the basin to be predominately fine grained (passing the No. 200 sieve) while the remaining four samples, located away from the shoreline, were predominately sand with some silt. A review of the associated chemistry data found elevated levels of pesticides (total DDX [4,4'-DDD + 4,4'-DDE + 4,4'-DDT]) and total high molecular weight polyaromatic hydrocarbons (HPAHs). A review of the associated biological testing data found sediment from the project area not likely to be acutely toxic to benthic organisms. A suitability determination from 2014 for the project area found sediments suitable for open water disposal at CADS. A residual dredging event of 100 CY was authorized by USACE in 2020 and the material was placed upland.

<u>Spill Data</u>: Based on information provided by the applicant and a review of the Maine Department of Environmental Protection (MEDEP) Oil and Hazardous Waste Spill Database (<a href="https://www.maine.gov/dep/spills/index.html">https://www.maine.gov/dep/spills/index.html</a>), NAE determined that there have been several small diesel, gasoline, and oil spills within the surrounding area of the project site since the area was last dredged. <a href="https://xii.org/Risk Ranking">Risk Ranking</a>: Following the tier one review of the site characteristics, location,

and the available historical data, the proposed project was given a **low-moderate** risk ranking according to the following matrix.

Table 1: Project Risk Ranking

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

**Sample Collection:** In the first phase of testing the applicant shall collect 3. sediment cores from five locations within the proposed dredge areas as specified in Table 2 (also see Figure 3). These locations were selected based on information from the CSM described above, the low to moderate risk ranking for the project, and shoaled areas identified in the project conditions survey submitted by the applicant. All core samples shall be collected to the proposed dredge depth plus overdredge amount using inert core liners. Estimated core lengths based on the bathymetry provided by the applicant are provided in Table 2, but the actual required core lengths shall be determined at the time of the sampling effort using measured water depths at each location corrected to MLLW. In order to ensure that the core samples adequately represent the dredge interval at each location, all cores to be used for this project shall have a recovered length that is within 75% of the core penetration depth. In addition, any cores that display significant disturbance such as compaction or wash out shall be disregarded. If the cores from any location do not meet the acceptability criteria after six attempts, then the applicant should retain the best core from that location and contact NAE for further guidance. The penetration and recovery for the core used for the chemistry and grain size samples should be recorded on the sample log.

Upon collection, all cores shall be measured and maintained in an upright position for a minimum of 15 minutes to allow any fine-grained material to settle. After a core has settled, it shall be re-measured before any overlying water is drained, taking care to not include overlying water with sediment flocculant in the measurement. All cores shall be split lengthwise, photographed with a stadia rod for scale, and described in accordance with ASTM D 2488 (Standard Practice for Description and Identification of Soils). Samples shall be collected from the dredge interval (dredge depth + overdepth) within each core for grain size and bulk chemical analysis as described in the sections below. If the dredge interval within a core is homogenous then the entire length may be composited as a single sample with the chemistry/grain size sample interval noted on the

sampling log. If any core shows significant stratification or obvious signs of contamination, then subsamples shall be collected from each layer and noted on the sampling log and the applicant shall consult NAE for guidance prior to the start of analysis. The term "significant stratification" includes any distinct change in sediment composition that could represent a change in depositional history or waterway usage such as a change in color or lithology. Compositing of dissimilar sediment layers without prior approval from NAE will result in the rejection of any resulting data products.

All sediments held for testing shall be stored in accordance with the requirements in Table 3 (from Table 8-9 in *Evaluation of Dredged Material Proposed for Ocean Disposal, Testing Manual, 1991).* Sample chain of custody forms shall be maintained by the applicant and submitted to NAE with the data package described in section 5 of this SAP.

Based on the results of the grain size and bulk chemistry sediment testing, NAE will provide the applicant with a biological testing compositing plan. In the second phase of testing, dredge area sediment shall be collected from the same sample locations described in Table 2 and composited according to NAE's biological testing compositing plan. Sufficient amounts of sediment and water shall be collected for elutriate preparation and analysis, water column toxicity testing, 10-day whole sediment toxicity testing, and 28-day bioaccumulation testing according to the sections below. Sediment cores from each station shall be collected using inert core liners and may be transferred directly into food grade polyethylene pails after core recovery has been measured. In addition, the applicant shall collect dredge site water from a central location within the proposed project area. All water samples shall be collected from the middle of the water column using either a non-contaminating pump or a discrete water sampler.

Please note that the applicant is not required to collect sediment or water samples from the IOSN reference site as the results of the biological testing will be compared to recent reference site data collected by NAE.

Again, all sediment and water samples held for testing shall be stored in accordance with the requirements in Table 3 (from Table 8-2 in Evaluation of Dredged Material Proposed for Ocean Disposal, Testing Manual, 1991). Sample chain of custody forms shall be maintained by the applicant and submitted to NAE with the data package described in section 5 of this SAP.

Vessel positioning shall be achieved using a Global Positioning System (GPS) that has been calibrated on site using a known reference point. The required horizontal accuracy at each sample location shall be 10 feet or less. All coordinate data shall be reported in geographic NAD 83 decimal degree format. All depth data shall be reported in tenths of feet. Water depths at each location

are to be determined with an accuracy of  $\pm 0.1$  feet (relative to MLLW). All depth data shall be reported in tenths of feet.

For phase one sampling, sample data including date, time, latitude, longitude, GPS accuracy at each sample station, measured water depth, tidal correction, core penetration, recovery, and chemistry sample intervals(s) shall be recorded in a sampling log (Figure 4 or equivalent) and provided to NAE with the applicant's core descriptions and photographs.

For phase two sampling, all sample data including date, time, latitude, longitude, GPS accuracy at each sample station, measured water depth, tidal correction, number of cores collected at each station, core lengths, and a general description of the sediment shall be recorded in a sampling log and provided to NAE. Note that if any of the phase two cores are significantly different from the material that was sampled during phase one, a representative core should be photographed and described and NAE should be consulted for guidance.

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

Grain Size and Bulk Sediment Chemistry: All samples from the proposed dredge footprint shall be individually analyzed for grain size and bulk sediment chemistry. Testing parameters, analytical methods, and reporting limits to be used are outlined in Table 4. The listed analytical methods are recommended but can be replaced by other methods that will provide the required reporting limits. Additional guidance on the physical and chemical analysis of sediments can be found in chapter 5 of the RIM. NAE will provide the applicant with a compositing plan for biological testing based on sample proximity, physical characteristics recorded during the core description process, and the results of grain size and bulk chemistry analysis.

<u>Elutriate Chemistry:</u> Elutriate samples shall be prepared from the dredge area water and sediments according to the project compositing plan. The elutriate samples and clean seawater (provided by the applicant's testing facility) used for dilutions in the suspended phase particulate bioassays shall undergo chemical analysis according to the testing parameters, analytical methods, and reporting limits outlined in Table 5. The listed analytical methods are recommended but can be replaced by other methods that will give the required reporting limits.

Additional guidance can be found in Section 6.1 of the RIM and Section 9.4 of the Green Book.

<u>Water Column Toxicity Testing:</u> Suspended phase particulate bioassays shall be performed on each composite sample in accordance with the requirements specified in Section 6.2 of the RIM, and Section 11.1 of the Green Book. Refer to the RIM for guidance in selecting the test species. Clean seawater provided by the applicant's testing facility shall be used as both control and dilution water.

Please note that excessive ammonia concentrations in the elutriate samples may cause a toxic response that is not of interest to the SPP bioassay, which focuses on persistent contaminants. To account for this scenario, the US Environmental Protection Agency (EPA) and NAE have devised a protocol to determine if ammonia is the driver of toxicity in situations where unionized ammonia is present at concentrations above the applicable water quality criteria (WQC). In order to facilitate this protocol, the applicant may choose to have their laboratory measure total ammonia in the undiluted elutriate samples prior to SPP bioassay initiation and calculate the unionized ammonia concentrations based on measurements of pH, temperature, and salinity. If the calculated unionized ammonia concentrations are greater than the applicable WQC, the testing facility should immediately notify the applicant and seek guidance from NAE on projectspecific procedures for preparation of additional elutriate samples requiring treatment for ammonia reduction and the need for additional SPP testing. This protocol is not a requirement, but NAE recommends it to prevent a 'false positive' toxicity result that would limit the applicant's disposal alternatives.

10-Day Whole Sediment Toxicity Testing: 10-day whole sediment toxicity testing shall be performed on each composite sample in accordance with the requirements specified in Chapter 7.1 of the RIM, Section 11.2 of the Green Book, and Methods for Assessing the Toxicity of Sediment-Associated Contaminants with Estuarine and Marine Amphipods, 1994. The bioassay test shall use two species of test animals, the amphipod *Leptocheirus plumulosus* and the mysid shrimp *Americamysis bahia*. If alternate species are selected from the RIM then contact NAE prior to sampling to coordinate necessary reference data collection.

<u>28-Day Bioaccumulation Testing:</u> 28-day bioaccumulation testing shall be performed on each composite sample in accordance with the requirements specified in Chapter 7.2 of the RIM and Section 12.1 of the Green Book. The bioaccumulation test shall use a bivalve, Macoma nasuta, and the polychaete Nereis virens as test animals. If alternate species are selected from the RIM then contact NAE prior to sampling to coordinate necessary reference data collection. At the end of the 28-day test, the tissues of the survivors shall be tested for the project contaminants of concern according to Tables 8 and 9 of the RIM. The contaminants of concern will be determined from the bulk sediment chemistry

testing described above.

- 5. **Reporting requirements:** All sediment testing data is required to be submitted electronically in the electronic data deliverable (EDD) format available on the NAE website (<a href="http://www.nae.usace.army.mil/Missions/Disposal-Area-Monitoring-System-DAMOS/Electronic-Data-Deliverables.aspx">http://www.nae.usace.army.mil/Missions/Disposal-Area-Monitoring-System-DAMOS/Electronic-Data-Deliverables.aspx</a>). Hard copydata submission is also required but may be substituted with a printer friendly, easy-to-read format (e.g., PDF, MS Word). Any analytes not detected shall be reported as half the method detection limit (MDL) and qualified with a "U". RIM quality control summary tables are required to be submitted with each project dataset. These tables are found in Appendix II of the RIM.
- 6. **Contact Information:** Questions about this plan should be directed to Gabriella Saloio (phone: 978-318-8138 e-mail: <a href="mailto:Gabriella.J.Saloio@usace.army.mil">Gabriella.J.Saloio@usace.army.mil</a>)

Gabriella Saloio

Biologist

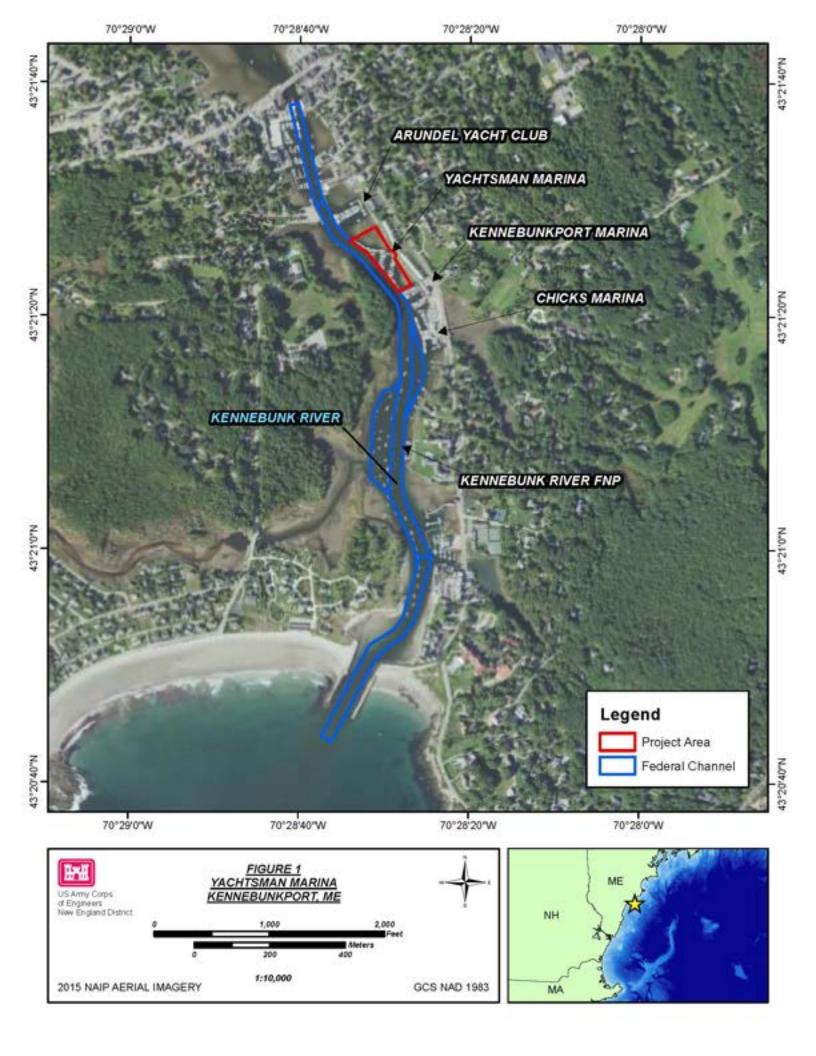
New England District

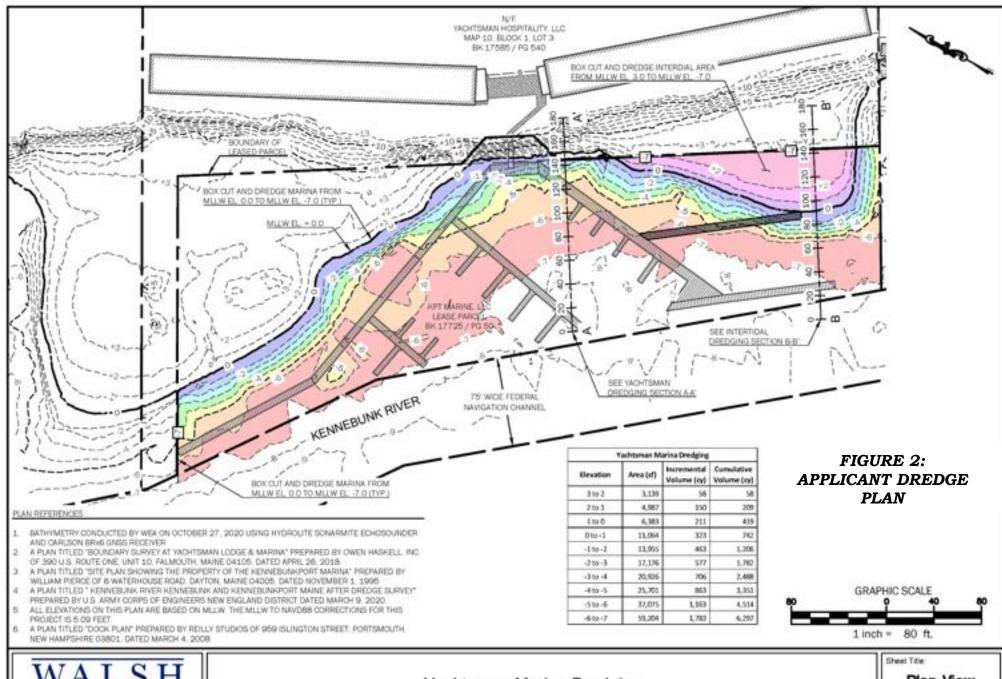
U.S. Army Corps of Engineers

Gabriella Saloio

Table 2: Yachtsman Marina Sample Locations

Station	Latitude (NAD 83)	Longitude (NAD 83)	Survey Depth (Feet MLLW)	Project Depth (Feet MLLW)	Overdepth (Feet)	Estimated Core length (Feet)
Y-1	-70.475778	43.357352	-1.2	-6.0	1.0	5.8
Y-2	-70.475316	43.357253	-0.8	-6.0	1.0	6.2
Y-3	-70.474885	43.357021	-4.1	-6.0	1.0	2.9
Y-4	-70.474671	43.356732	-4.3	-6.0	1.0	2.7
Y-5	-70.474369	43.356289	-1.0	-6.0	1.0	6.0







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# Yachtsman Marina Dredging

Kennebunkport Marina 59 Ocean Ave Kennebunkport, Maine 04046

# Plan View Job No. 643.1 Date: May 2021 Scale: 1" = 20' Drawn: CAR Checked: WRW

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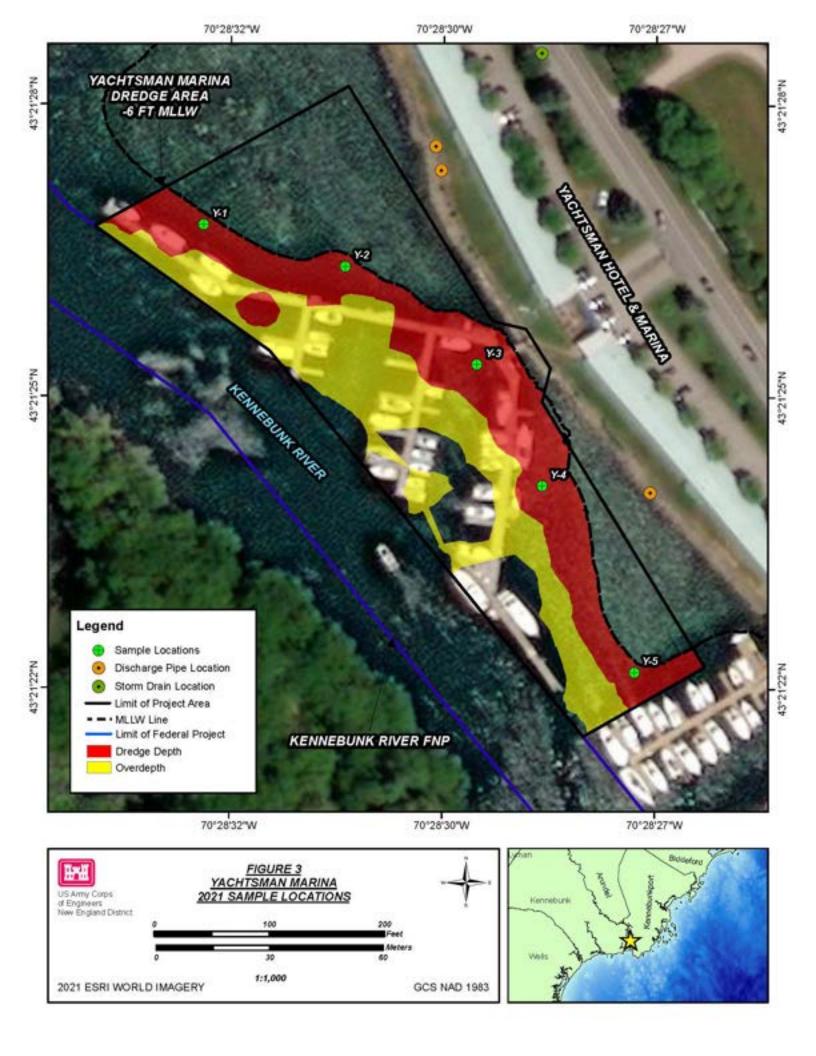


TABLE 3: RECOMMENDED PROCEDURES FOR SAMPLE COLLECTION, PRESERVATION, AND STORAGE

Collection Analyses Method		Sample <u>Volume</u>	<u>Container</u>	Preservation Technique	Storage Conditions	Holding Timeb
Sediment						
Chemical/Physica	l Analyses					
Metals	Grab/corer	200 mL	Precleaned polyethylene jar <sup>c</sup>	Refrigerate. Dry ice <sup>b</sup> or freezer storage is recommended for extended holding times.	≤ 4° Cc	Hg - 28 days Others - 6 Months <sup>d</sup>
Organic Compounds	Grab/corer	475 mL	Solvent-rinsed glass jar with Teflon lid <sup>c</sup>	Refrigerate. Dry ice <sup>b</sup> or freezer storage is recommended for extended holding times.	≤ 4° C/dark <sup>d</sup>	14 days <sup>e</sup>
Particle Size	Grab/corer	75 mL	Whirl-pac bag <sup>b</sup>	Refrigerate	≤ 4° C	Undetermined
Total Organic Carbon	Grab/corer	3 L	Heat treated glass vial with Teflon lined lid <sup>c</sup>	Refrigerate. Dry ice <sup>c</sup> or freezer storage is recommended for extended holding times.	≤ 4° C°	14 days
Sediment from Which Elutriate is Prepared	Grab/corer	Dependent on tests performed	Glass with Teflon lined lid	Completely fill and Refrigerate	≤ 4° C/dark/airtight	Undetermined
<b>Biological Tests</b>						
Dredged Material	Grab/corer	12-15 L per sample	Plastic bag or container <sup>e</sup>	Completely fill and Refrigerate; sieve	≤ 4° C/dark/airtight	14 days <sup>i f</sup>
Reference Sediment	Grab/corer	45-50 L per test	Plastic bag or container <sup>e</sup>	Completely fill and Refrigerate; sieve	≤ 4° C/dark/airtight	14 days <sup>i f</sup>
Control Sediment	Grab/corer	21-25 L per test	Plastic bag or container <sup>e</sup>	Completely fill and Refrigerate; sieve	≤ 4° C/dark/airtight	14 days <sup>i f</sup>
Water and Elutria	te					
Chemical/Physica	1 Analyses					
Metals		Discrete sampler or pump	1 L	Acid-rinsed polyethylene or glass jar	pH <2 with HNO <sub>3</sub> d	4° C ± 2° Cd

TABLE 3: RECOMMENDED PROCEDURES FOR SAMPLE COLLECTION, PRESERVATION, AND STORAGE (CONTINUED)

Discrete sampler or pump	4 L	Amber glass bottled	Airtight seal; refrigerate	4° C ± 2° C <sup>d</sup>	5 days <sup>d</sup>
Trawl/ Teflon coated grab	30 g	Double Ziploc <sup>c</sup>	Handle with non-metallic forceps; plastic gloves; dry icec	≤ -20° C°	Hg - 14 days Others - 6 months <sup>i</sup>
Trawl/ Teflon coated grab	100 g	Hexane-rinsed double aluminum foil and double Ziploc <sup>c</sup>	Handle with hexane-rinsed stainless steel forceps; dry icec	≤ -20° C°	10 days <sup>i e</sup>
Trawl/ Teflon coated grab	50 g	Heat cleaned aluminum foil and watertight plastic bag <sup>i</sup>	Covered ice chest <sup>d</sup>	≤ -20° Ci	10 days <sup>i e</sup>
Trawl/ Teflon coated grab	50 g	Hexane-rinsed double aluminum foil and double Ziploc <sup>c</sup>	Handle with hexane-rinsed stainless steel forceps; dry icec	≤ -20° Ci	10 days <sup>i e</sup>
Trawl/ Teflon coated grab	50 g	Hexane-rinsed aluminum foil	Handle with hexane-rinsed stainless steel forceps; quick freeze	20° C	Undetermined
	or pump  Trawl/ Teflon coated grab  Trawl/ Teflon coated grab	or pump  Trawl/ Teflon coated grab  Trawl/ Teflon 50 g	Trawl/ Teflon coated grab  Trawl/ Teflon coated grab	Trawl/ Teflon coated grab  To g  Hexane-rinsed double aluminum foil and watertight plastic bagi  Hexane-rinsed double aluminum foil and double Ziplocc  Handle with hexane-rinsed stainless steel forceps; dry icec  Handle with hexane-rinsed stainless steel forceps; dry icec  Handle with hexane-rinsed stainless steel forceps; dry icec  Handle with hexane-rinsed stainless steel forceps; quick	Trawl/ Teflon coated grab  Trawl / Teflon coated grab  Tr

<sup>&</sup>lt;sup>a</sup> This table contains only a summary of collection, preservation, and storage procedures for samples. The cited references should be consulted for a more detailed description of these procedures.

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

c NOAA (1989).

d Tetra Tech (1986a)

e Sample may be held for up to one year if maintained ≤ -20° C

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

g NOAA (1989).

<sup>&</sup>lt;sup>h</sup> Plumb (1981).

i Tetra Tech (1986b)

# TABLE 4: BULK SEDIMENT TESTING PARAMETERS

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

#### TABLE 4: BULK SEDIMENT TESTING PARAMETERS (CONTINUED)

#### PCB CONGENERS

Analytical Method: NOAA (1993), 8082A

Reporting Limit: 1 ppb

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

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

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

**FINAL** Sampling and Analysis Plan for Yachtsman Marina, Kennebunkport, ME, File Number NAE-2004-00319

#### TABLE 5: ELUTRIATE TESTING PARAMETERS

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

#### Reference:

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

# FIGURE 4: EXAMPLE CORE LOG DATA SHEET

PROJECT NAME:		DATE:
PROJECT LOCATION:	SEA STATE:	
	OSITIONING EQUIPMENT:	
SAMPLING EQUIPMENT:		
SAMPLING PERSONNEL:	LOGGI	ED BY:
CORE ID:		TIME:
	LONGITUDE:	
MEASURED WATER DEPTH:	CORRECTED WA	TER DEPTH:
	ACTUAL PENETRATION:	
SAMPLE INTERVAL(S):		
CORE PHOTO:	CORE DES	CRIPTION:
Insert core photograph with scale	Invest field notes and 4	STM description of core
inseri core protograpii wiin scale	inseri fieta notes ana A	S1s1 description of core

CENAE-PDE 10 June 2024

**FINAL** Suitability Determination for Maintenance Dredging of the Kennebunk River Projects, Kennebunkport, Maine

#### **Summary:**

This determination addresses the suitability of shoaled sediments within four project areas along the Kennebunk River, in Kennebunkport, Maine (ME): Arundel Yacht Club (AYC), Yachtsman Marina, Kennebunkport Marina, and Kennebunk River Club (KBRC) for unconfined open water disposal at the Isle of Shoals North Disposal Site (IOSN) (Figure 1). The New England District (NAE) of the US Army Corps of Engineers (USACE) finds that sufficient data have been provided to satisfy the evaluation and testing requirements of Section 103 of the Marine Protection Research and Sanctuaries Act (MPRSA). Based on an evaluation of the project sites and the material proposed to be dredged, NAE finds these sediments suitable for unconfined open water disposal at IOSN as proposed.

#### 1. Project Description:

The applicants are proposing to mechanically dredge shoaled areas from four project areas along the Kennebunk River in Kennebunkport, ME.

- The Arundel Yacht Club is proposing to dredge approximately 8,031 cubic yards (cy) from shoaled areas totaling just over 1 acre within the property's marina basin (Figures 1, 2, and 6).
- The Yachtsman Marina is proposing to dredge approximately 6,400 cy of shoaled material from areas totaling 1.4 acres within the property's marina basin (Figures 1, 3, and 7).
- The Kennebunkport Marina is proposing to dredge approximately 3,675 cy of shoaled material from 0.8 acres within the property's marina basin (Figures 1, 4, and 8).
- The Kennebunk River Club is proposing to dredge a total of approximately 8,935 cy of shoaled material: 3,026 cy of material will be removed from the 0.4 acre north marina basin, and 5,909 cy will be removed from the 0.8 acre south marina basin (Figures 1, 5, and 9).

All areas will be dredged to the authorized project depth of -6 feet at mean lower low water (MLLW) plus 1 foot of allowable overdepth. The applicant requested that disposal of the proposed dredge material be evaluated for IOSN as a potential alternative for this project.

**Table 1: Project Area Summary** 

Project Area	File Number	Project Depth (ft MLLW) plus 1 ft OD	Dredge Volume (cy)	Acreage
Arundel Yacht Club	NAE-2022-00288	-6.0	8,031	1.0
Yachtsman Marina	NAE-2004-00319	-6.0	6,400	1.4
Kennebunkport Marina	NAE-2005-00280	-6.0	3,675	0.8
Kennebunk River Club – North Marina Basin	NAD 0007 0704	-6.0	3,026	0.4
Kennebunk River Club – South Marina Basin	NAE-2007-2704	-6.0	5,909	0.8

#### 2. Conceptual Site Model:

USACE reviewed historic testing data, previous environmental assessments, water quality data, and adjacent land use information to develop a conceptual site model (CSM) for the Kennebunk River projects (Figure 10). NAE used this CSM to characterize the system and to identify potential sources of contamination, site-specific contaminants of concern, exposure pathways, and biological receptors to inform this suitability determination.

<u>Project Setting:</u> All four projects are located along the eastern shoreline of the Kennebunk River in Kennebunkport, ME. The Arundel Yacht Club is located farthest upriver (approximately 0.8 miles from the river's mouth), the Yachtsman Marina and Kennebunkport Marina are adjacent to each other just to the south of Arundel Yacht Club, and the Kennebunk River Club is located farther down river, about 0.25 miles from the mouth of the river (Figure 1).

The Arundel Yacht Club building was constructed in 1806 and served as a rope making facility until 1816. Sanborn maps from 1911 show that the property was used as a boat house, carriage house, and wagon shed prior to the establishment of the yacht club in 1957. The yacht club provides dockage for up to fifty recreational boats and has a launch for small sailboats. There are no repair or fuel facilities on the property. The Yachtsman Marina offers boat dockage to the Yachtsman Hotel guests. The Marina is now leased to and managed by the adjacent Kennebunkport Marina, located directly to the south. The applicant is proposing to dredge the leased area to connect the two marinas. The Kennebunkport Marina is a year-round facility offering slips, full mechanical services, a ship store, engine sales, power boat and canoe rentals, as well as a boat ramp. The Kennebunk River Club provides seasonal dockage for recreational vessels, as well as shoreside facilities for social and recreational functions.

Land use in the surrounding area is largely a mix of residential property, many with private docks, and other marina facilities. Chicks Marina, which has a fuel dock, is adjacent to Kennebunkport Marina. Downtown Kennebunkport, which has several restaurants, retail shops, and marine services, is approximately 1,000 feet north of Arundel Yacht Club. The Kennebunkport River Federal Navigation Project (FNP) -6 foot MLLW channel is located directly adjacent to the western boundary of the project areas.

Water Quality: Water Quality in the project area is dictated by tidal exchange with the Gulf of Maine with freshwater input from the Kennebunk River to the north and a series of stormwater discharge pipes within the marina properties along the river (Figures 6-9). Tidal waters of the Kennebunk River are classified as SB by the Maine Department of Environmental Protection (MEDEP). Class SB waters must be of such quality that they are suitable for the designated uses of recreation in and on the water, fishing, aquaculture, propagation and harvesting of shellfish, industrial process and cooling water supply, hydroelectric power generation, navigation and as habitat for fish and other estuarine and marine life (38 M.R.S. § 465(B)(2) https://www.mainelegislature.org/legis/statutes/38/title38sec465-B.html).

<u>Dredge History and Existing Testing Data:</u> The Arundel Yacht Club was last dredged in 2017 when approximately 1,800 cy of material were removed to a depth of -6 feet at Mean Low Water (MLW) and placed at the Cape Arundel Disposal Site (CADS). Sampling and testing of this material in 2003 documented sediments to be predominately fine grained. A review of the associated chemistry data found cadmium, copper, and mercury detected at concentrations with the potential to cause toxicity based on current sediment screening guidelines. Based on the results of elutriate, toxicity, and bioaccumulation studies, NAE found the material from the Arundel Yacht Club suitable for placement at CADS in a 2015 suitability determination.

The Yachtsman Marina was last dredged in 2015 when approximately 3,914 cy of material were removed to a depth of -5 feet MLW and placed at CADS. Sampling and testing of this material in 2014 documented sediments from two samples along the shoreline in the middle of the basin to be predominately fine grained while the remaining four samples, located away from the shoreline, were predominately sand with some silt. A review of the associated chemistry data found levels of total DDX (sum of 4,4'-DDD + 4,4'-DDE +4,4'-DDT) and total high hydrocarbons molecular weight polyaromatic (HPAHs) detected concentrations with the potential to cause toxicity based on current sediment screening guidelines. Based on the results of elutriate, toxicity, bioaccumulation studies, NAE found the material from the Yachtsman Marina suitable for placement at CADS in a 2014 suitability determination. In addition,

a residual dredging event of 100 cy was authorized by USACE in 2020 and this material was placed upland.

The Kennebunkport Marina was last dredged in 2015 when approximately 1,500 cy of material were removed to a depth of -5 feet MLW and placed at CADS. Sampling and testing of this material in 2014 documented predominately fine grained sediments with little sand. A review of the associated chemistry data found total DDX and total HPAHs detected at concentrations with the potential to cause toxicity based on current sediment screening guidelines. Based on the results of elutriate, toxicity, and bioaccumulation studies, NAE found the material from the Kennebunkport Marina suitable for placement at CADS in a 2014 suitability determination.

The Kennebunk River Club was last dredged in 2009 when 7,609 cy of fine grained material were mechanically removed and placed at CADS. A review of the associated chemistry data found cadmium, total HPAHs, total DDX, and total chlordane detected at concentrations with the potential to cause toxicity based on current sediment screening guidelines. Based on the results of elutriate, toxicity, and bioaccumulation studies, NAE found the material from the Kennebunk River Club suitable for placement at CADS in a 2009 suitability determination.

<u>Spill Data:</u> Based on information provided by the applicant and a review of the MEDEP Oil and Hazardous Waste Spill Database (<a href="https://www.maine.gov/dep/spills/index.html">https://www.maine.gov/dep/spills/index.html</a>) and the U.S. Coast Guard's National Response Center website, NAE determined that there have been several small sheens, diesel, gasoline, and oil spills within the vicinity of the project sites since 2009.

<u>Disposal Site:</u> IOSN is located approximately 23 miles south of the project locations. IOSN is regularly monitored by the NAE Disposal Area Monitoring System (DAMOS) Program. The most recent DAMOS report on IOSN was based on a 2022 survey of the site (USACE, 2023).

<u>Risk Ranking:</u> Based on the site characteristics and the available testing data outlined above, all four projects were given a **low-moderate** risk ranking according to the following matrix in Table 2.

Table 2: Project Risk Ranking

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

# 3. Sampling, Testing, and Analysis:

NAE prepared sampling and analysis plans (SAPs) in January of 2022 for the Kennebunkport (three samples) and Yachtsman Marinas (five samples) and in May 2022 for the Arundel Yacht Club (four samples) that called for the collection of samples for bulk sediment chemistry and grain size, as well as full biological testing, including elutriate preparation and analysis, water column toxicity testing, 10-day whole sediment toxicity testing, and 28-day bioaccumulation testing. The applicants collected sediment cores from these three marina basins in July of 2022 (Table 3, Figures 6 through 8) for chemistry and grain size analysis. In addition, NAE prepared a biological testing SAP in June of 2020 for the Kennebunk River Club using bulk sediment chemistry and grain size data collected in December of 2018 which was also used in this evaluation (Table 3, Figure 9).

**Table 3: Core Locations** 

Sample Location	Latitude	Longitude	Project Depth with Overdepth (ft MLLW)	Water Depth (ft MLLW)	Required Core Length (ft)	Recovery/ Penetration (ft)	Sample Interval (ft)
			Arundel Yach	ıt Club			
AYC-1	43.35831	-70.47582	-7.0	-3.9	3.1	3.2/3.2	0-3.2
AYC-2	43.35800	-70.47561	-7.0	-2.1	4.9	2.4/2.4	0-2.4
AYC-3	43.35793	-70.47634	-7.0	-3.2	3.8	0.75/1.0	0-0.75
AYC-4	43.35811	-70.47638	-7.0	-3.0	4.0	4.0/4.1	0-4.0
			Yachtsman N	Iarina			
Y-1	43.35735	-70.47578	-7.0	-1.5	5.5	3.5/3.5	0-3.5
Y-2	43.35724	-70.47533	-7.0	-1.2	5.8	2.5/2.5	0-2.5
Y-3	43.35701	-70.47488	-7.0	-4.2	2.8	2.7/2.7	0-2.7
Y-4	43.35673	-70.47467	-7.0	-4.4	2.6	3.4/3.4	0-2.6
Y-5	43.35629	-70.47437	-7.0	-1.0	6.0	6.1/6.1	0-6.0
			Kennebunkpor	t Marina			
K-1	43.35587	-70.47367	-7.0	-1.8	5.2	4.2/4.2	0-4.2
K-2	43.35607	-70.47394	-7.0	-4.8	2.2	3.1/3.1	0-2.2
K-3	43.35634	-70.47400	-7.0	-1.7	5.3	4.2/4.3	0-4.2
			Kennebunk Rit	er Club			
KBRC-A	43.34975	-70.47269	-7.0	-2.5	5.0	4.5/4.5	0-4.5
KBRC-B	43.34982	-70.47327	-7.0	-4.0	3.0	3.0/3.0	0-3.0
KBRC-C	43.35007	-70.47322	-7.0	-2.0	4.0	5.0/5.0	0-5.0
KBRC-D	43.35008	-70.47340	-7.0	-5.0	1.0	2.0/2.0	0-2.0
KBRC-E	43.35046	-70.47323	-7.0	-2.5	6.0	4.5/4.5	0-4.5
KBRC-F	43.35039	-70.47352	-7.0	-2.0	4.0	5.0/5.0	0-5.0
KBRC-G	43.35063	-70.47326	-7.0	-1.0	2.0	6.0/6.0	0-6.0
KBRC-H	43.35055	-70.47354	-7.0	-4.0	3.0	3.0/3.0	0-3.0
KBRC-I	43.35082	-70.47331	-7.0	-1.5	6.0	5.5/5.5	0-5.5

# Physical and Chemical Analysis of Sediments

Samples were largely composed of fines with little to some fine sand though several stations from the Yachtsman Marina and Kennebunk River Club were composed of fine sand with little to some fines. Grain size data are presented in Table 4 and core logs are provided in Appendix A.

**Table 4: Grain Size Results** 

Somalo ID	%Gravel		%Sand		%Fines		
Sample ID	76Gravei	Coarse	Medium	Fine	%Filles		
Arundel Yacht Club							
AYC-1	0.1	1.7	6.4	13.1	78.7		
AYC-2	3.1	2.2	12.5	31.4	50.8		
AYC-3	0.4	0.9	5.2	14.4	79.1		
AYC-4	3.6	0.8	4.5	10.7	80.4		
	Yach	ıtsman Mar	ina				
Y-1	4.9	0.8	6.0	64.7	23.6		
Y-2	0.3	1.5	9.8	60.6	27.8		
Y-3	2.3	1.7	5.7	20.6	69.7		
Y-4	0.0	0.8	5.4	26.5	67.3		
Y-5	1.0	1.2	4.4	80.6	12.8		
	Kenne	bunkport M	arina				
K-1	0.1	0.6	4.4	43.9	51.0		
K-2	0.0	1.2	7.9	28.9	62.0		
K-3	2.4	1.5	8.0	19.7	68.4		
	Kenne	bunk River	Club				
KBRC-A	0.0	1.0	4.0	32.0	62.7		
KBRC-B	0.1	1.0	7.0	40.0	51.6		
KBRC-C	0.0	1.0	2.0	61.0	35.6		
KBRC-D	0.0	1.0	4.0	56.0	38.6		
KBRC-E	0.0	0.0	3.0	71.0	25.9		
KBRC-F	0.2	1.0	1.0	81.0	16.6		
KBRC-G	0.2	1.0	4.0	61.0	33.8		
KBRC-H	0.6	2.0	4.0	64.0	29.7		
KBRC-I	0.7	2.0	10.0	45.0	43.4		

As no project specific contaminants of concern were identified in the CSM, samples were analyzed for the standard suite of contaminants specified in the Regional Implementation Manual for the Evaluation of Dredged Material Proposed for Disposal in New England Waters (RIM) (EPA/USACE, 2004).

To examine the sediment concentrations in an ecologically meaningful context, NAE used Sediment Quality Guidelines (SQGs) to screen the chemical concentrations found in the sediment samples from the Kennebunk River project areas samples. Applicable SQG screening values for marine and estuarine sediments are the National Oceanic and Atmospheric Administration (NOAA) effects-range low (ERL) and effects-range median (ERM). It is important to understand that these values were not derived as toxicity pass-fail thresholds. Rather, ERL and ERM values are empirically derived guidelines based on a large number of studies nationwide that identify contaminant levels that indicate probability of toxic effects to inform decision making (Long et al., 1998). Effects are considered unlikely at concentrations below the ERL with an increased

probability of toxic effects as concentrations increase. At concentrations above the ERM toxic effects are considered likely. For samples with sediment concentrations that fall between the ERL and ERM levels, consideration is given to both the number of contaminants that exceed ERL values and where the concentrations fall in the range between ERL and ERM values in assessing the probability of toxic effects and the potential need for additional testing.

Metals concentrations were largely below the ERL with many concentrations also less than the IOSN reference concentrations in all four project areas. Arsenic was detected at concentrations just above the ERL and reference value at stations AYC-1 and AYC-4, though both stations were below the established natural background level, 16 mg/kg, in Maine sediments (MEDEP, 2018). Nickel concentrations at Arundel Yacht Club stations AYC-1 and AYC-4 and Yachtsman Marina station Y-3 were also slightly greater than the ERL and IOSN reference value. The lead concentration in the Kennebunkport Marina station K-1 was greater than both the ERL and reference value. All metal concentrations in the Kennebunk River Club samples were below the ERL.

A few individual low molecular weight polyaromatic hydrocarbons (LPAHs) were found at concentrations above their respective ERLs, including acenaphthene and fluorene at station K-2 in the Kennebunkport Marina, acenaphthene, anthracene, and fluorene at stations KBRC-A and B in the Kennebunk River Club, and all individual LPAHs except for naphthalene at the Arundel Yacht Club station AYC-2. Additionally, the total LPAH concentration at AYC-2 was greater than the ERL and IOSN reference value. Individual HPAHs benzo(a)anthracene and fluoranthene were found at concentrations greater than their respective ERLs at stations AYC-2, KBRC-A, and KBRC-B. Pyrene and chrysene were also found above the ERL at KBRC-B and pyrene was found above the ERL in station KBRC-C. Total HPAH concentrations were found above the ERL at stations AYC-2 at the Arundel Yacht Club and stations KBRC-A, B, and C in the Kennebunk River Club. All PAH concentrations were below ERL values in all samples from the Yachtsman Marina.

The pesticides 4,4'-DDD, 4,4'-DDE, and 4,4'-DDT as well as total DDX concentrations were found at concentrations greater than the ERL at stations K-1 and 2 at the Kennebunkport Marina and stations AYC-1 and 2 at the Arundel Yacht Club, where station AYC-4 also had 4,4'-DDE, 4,4'-DDT, and total DDX at concentrations over the ERL. Stations Y-1 and 2 at the Yachtsman Marina contained concentrations of 4,4'-DDE and total DDX that were greater than the ERL and the concentration of 4,4'-DDD was also above the ERL at station Y-2. Total DDX was found in concentrations above the ERL in all the Kennebunk River Club stations except for KBRC-F. 4,4'-DDT concentrations were also greater than the ERL in stations KBRC-B, KBRC-C, and KBRC-I and 4,4'-DDD exceeded the ERL in station KBRC-C. Dieldrin was found at concentrations

greater than the ERL at Kennebunk River Club stations KBRC-A, B, D, E, and I and total chlordane was found at concentrations greater than the ERL at all stations in the Kennebunk River Club project area except for KBRC-E and KBRC-G.

Individual polychlorinated biphenyls (PCBs) were generally not detected. Where detected, total PCBs were found at concentrations well below the ERL at all stations sampled.

A summary of the bulk sediment chemistry data is presented in Table 5 with comparison to the ERL/ERM values and reference concentrations for IOSN. The full bulk chemistry results are presented in Appendix B.

 $\textbf{FINAL} \ \ \text{Suitability Determination for Maintenance Dredging of the Kennebunk River Projects, Kennebunkport, Maine and Maintenance Dredging of the Kennebunk River Projects, Kennebunkport, Maine Dredging Order Projects, Kennebunkport, Maine Dredging Order Projects, Kennebunkport, Maine Dredging Order Projects, Maine Dredging$ 

Table 5. Summary of Bulk Sediment Chemistry Results

							Kennebunkport Marina					Yachtsman Marina										
					IOSI	V	K-1		K-2		K-3		Y-1		Y-2		Y-3		Y-4		Y-5	
Parameter	CAS Number	Units	ERL	ERM	Value	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Physical																						
Total organic carbon	14762744	%			1.28		0.37		3.04		2.32		0.93		0.72		1.90		1.19		0.20	
Metals																						
Arsenic	7440382	mg/kg	8.2	70	9.66		2.85		6.68		6.34		6.65		3.20		7.96		4.54		0.984	
Cadmium	7440439	mg/kg	1.2	9.6	0.072		0.295		0.410		0.344		0.225		0.235		0.388		0.430		0.093	
Chromium	7440473	mg/kg	81	370	31.5		21.9		27.1		26.4		17.7		14.7		33.6		23.1		6.71	
Copper	7440508	mg/kg	34	270	10.9		14.2		16.7		15.4		12.5		8.64		18.3		9.82		1.59	
Lead	7439921	mg/kg	46.7	218	18.1		134		21.9		17.1		12.4		12.9		20.2		7.79		1.81	
Mercury	7439976	mg/kg	0.150	0.710	0.032		0.051		0.063		0.047		0.045		0.051		0.052		0.011	J	0.005	J
Nickel	7440020	mg/kg	20.9	51.6	20.8		9.17		15.6		15.4		11.3		8.37		21.4		15.1		3.81	
Zinc	7440666	mg/kg	150	410	60.6		56.6		67.4		57.2		42.2		37.6		71.2		45.2		10.2	
PAHs																						
Total LPAH	SUMLPAH	ug/kg	552	3,160	48.2		185		225		225		188		191		118		7.87		8.67	
Total HPAH	SUMHPAH	ug/kg	1,700	9,600	260		1238		1697		1664		1336		1338		863		33.3		48.3	
Pesticides																						
4,4`-DDD	72548	ug/kg	2	20	0.020	U	4.98	J	4.66	J	0.112	UJ	1.16	J	2.86	J	0.093	UJ	0.016	UJ	0.013	UJ
4,4`-DDE	72559	ug/kg	2.2	27	0.066		2.23		4.53	J	0.068	U	2.50	J	2.78		0.057	U	0.010	U	0.008	U
4,4`-DDT	50293	ug/kg	1	7	0.026	U	1.44		1.44		0.148	U	0.960		0.808		0.123	U	0.020	U	0.017	U
Total DDX	SUMDDX	ug/kg	1.58	46.1	0.112		8.65		10.6		0.328	U	4.62		6.45		0.272	U	0.045	U	0.038	U
Dieldrin	60571	ug/kg	0.02	8	0.040	U	0.031	U	0.038	U	0.226	U	0.038	U	0.031	U	0.187	U	0.031	U	0.026	U
Total Chlordane	SUMCHLOR	ug/kg	0.5	6	0.300	U	0.233	U	0.289	U	1.710	U	0.285	U	0.234	U	1.42	U	0.233	U	0.198	U
PCBs																						
Total PCBs	SumNOAA18	ug/kg	22.7	180	4.02	U	8.34		3.98		2.77		1.92		2.33		3.56		1.56	U	1.33	U

 $\textbf{FINAL} \ \ \text{Suitability Determination for Maintenance Dredging of the Kennebunk River Projects, Kennebunkport, Maine and Maintenance Dredging of the Kennebunk River Projects, Kennebunkport, Maine Dredging Order Projects, Kennebunkport, Maine Dredging Order Projects, Kennebunkport, Maine Dredging Order Projects, Maine Dredging$ 

Table 5. Summary of Bulk Sediment Chemistry Results, cont.

						Arundel Yacht Club							
				IOSI	V	AYC-1		AYC-2	?	AYC-	3	AYC-4	-
CAS Number	Units	ERL	ERM	Value	Q	Result	Q	Result	Q	Result	Q	Result	Q
14762744	%			1.28		1.14		1.15		8.46		2.64	
7440382	mg/kg	8.2	70	9.66		9.75		6.72		7.78		10.3	
7440439	mg/kg	1.2	9.6	0.072		0.335		0.330		0.453		0.613	
7440473	mg/kg	81	370	31.5		41.6		26.2		25.6		38.1	
7440508	mg/kg	34	270	10.9		29.4		15.7		25.6		24.3	
7439921	mg/kg	46.7	218	18.1		30.9		26.1		21.4		33.7	
7439976	mg/kg	0.150	0.710	0.032		0.064		0.086		0.059	J	0.108	
7440020	mg/kg	20.9	51.6	20.8		25.4		13.0		15.0		22.7	
7440666	mg/kg	150	410	60.6		101		58.1		68.6		98.0	
SUMLPAH	ug/kg	552	3,160	48.2		189		654		90.9		104	
SUMHPAH	ug/kg	1,700	9,600	260		1482		3341		411		986	
72548	ug/kg	2	20	0.020	U	3.87	J	4.34	J	0.274	UJ	1.99	J
72559	ug/kg	2.2	27	0.066		7.51	J	5.74		0.167	U	4.37	J
50293	ug/kg	1	7	0.026	U	1.62	J	2.60		0.360	U	1.51	J
SUMDDX	ug/kg	1.58	46.1	0.112		13.0		12.7		0.801	U	7.87	
60571	ug/kg	0.02	8	0.040	U	0.23	U	0.15	U	0.550	U	0.225	U
SUMCHLOR	ug/kg	0.5	6	0.300	U	1.72	U	1.11	U	4.2	U	1.7	U
SumNOAA18	ug/kg	22.7	180	4.02	U	3.95		8.87		5.59	U	2.29	U
	Number  14762744  7440382  7440473  7440473  7440473  7440508  7439976  7440020  7440666  SUMLPAH  SUMHPAH  72548  72559  50293  SUMDDX  60571  SUMCHLOR	Number Units  14762744 %  7440382 mg/kg 7440439 mg/kg 7440508 mg/kg 7439921 mg/kg 7440020 mg/kg 7440666 mg/kg 7440666 mg/kg  SUMLPAH ug/kg SUMLPAH ug/kg 50293 ug/kg SUMCHLOR ug/kg	Number Units ERL  14762744 %  7440382 mg/kg 8.2  7440439 mg/kg 1.2  7440473 mg/kg 81  7440508 mg/kg 46.7  7439921 mg/kg 40.5  7440020 mg/kg 20.9  7440666 mg/kg 150  SUMLPAH ug/kg 552  SUMHPAH ug/kg 552  SUMHPAH ug/kg 1,700  72548 ug/kg 2  72559 ug/kg 2.2  50293 ug/kg 1  SUMDDX ug/kg 1.58  60571 ug/kg 0.5	Number         Units         ERL         ERM           14762744         %	CAS Number Units ERL ERM Value  14762744 % 1.28  7440382 mg/kg 8.2 70 9.66 7440439 mg/kg 1.2 9.6 0.072 7440473 mg/kg 81 370 31.5 7440508 mg/kg 34 270 10.9 7439921 mg/kg 46.7 218 18.1 7439976 mg/kg 0.150 0.710 0.032 7440020 mg/kg 150 410 60.6  SUMLPAH ug/kg 552 3.160 48.2 SUMLPAH ug/kg 552 3.160 48.2 SUMLPAH ug/kg 1,700 9,600 260  72548 ug/kg 2 20 0.020 72559 ug/kg 2.2 27 0.066 50293 ug/kg 1 7 0.026 SUMDDX ug/kg 1.58 46.1 0.112 60571 ug/kg 0.02 8 0.040 SUMCHLOR ug/kg 0.5 6 0.300	Number Units ERL ERM Value Q  14762744 %	CAS Number Units ERL ERM Value Q Result  14762744 % 1.28 1.14  7440382 mg/kg 8.2 70 9.66 9.75  7440439 mg/kg 1.2 9.6 0.072 0.335  7440473 mg/kg 81 370 31.5 41.6  7440508 mg/kg 34 270 10.9 29.4  7439921 mg/kg 46.7 218 18.1 30.9  7439976 mg/kg 0.150 0.710 0.032 0.064  7440020 mg/kg 20.9 51.6 20.8 25.4  7440666 mg/kg 150 410 60.6 101  SUMLPAH ug/kg 552 3.160 48.2 189  SUMLPAH ug/kg 552 3.160 48.2 189  SUMLPAH ug/kg 2 20 0.020 U 3.87  72559 ug/kg 2.2 27 0.066 7.51  50293 ug/kg 1 7 0.026 U 1.62  SUMDDX ug/kg 1.58 46.1 0.112 13.0  60571 ug/kg 0.02 8 0.040 U 0.23  SUMCHLOR ug/kg 0.5 6 0.300 U 1.72	CAS Number Units ERL ERM Value Q Result Q 14762744 % 1.28 1.14 1.4 1.4 1.4 1.4 1.4 1.4 1.4 1.4 1.	CAS Number Units ERL ERM Value Q Result Q Result 14762744 % 1.28 1.14 1.15  7440382 mg/kg 8.2 70 9.66 9.75 6.72  7440439 mg/kg 1.2 9.6 0.072 0.335 0.330  7440473 mg/kg 81 370 31.5 41.6 26.2  7440508 mg/kg 34 270 10.9 29.4 15.7  7439921 mg/kg 46.7 218 18.1 30.9 26.1  7439976 mg/kg 0.150 0.710 0.032 0.064 0.086  7440020 mg/kg 20.9 51.6 20.8 25.4 13.0  7440666 mg/kg 150 410 60.6 101 58.1  SUMLPAH ug/kg 552 3.160 48.2 189 654  SUMLPAH ug/kg 552 3.160 48.2 189 654  SUMHPAH ug/kg 2 20 0.020 U 3.87 J 4.34  72548 ug/kg 2 20 0.020 U 3.87 J 4.34  72559 ug/kg 2.2 27 0.066 7.51 J 5.74  50293 ug/kg 1 7 0.026 U 1.62 J 2.60  SUMDDX ug/kg 1.58 46.1 0.112 13.0 12.7  60571 ug/kg 0.02 8 0.040 U 0.23 U 0.15  SUMCHLOR ug/kg 0.5 6 0.300 U 1.72 U 1.11	CAS Number Units ERL ERM Value Q Result	CAS Number Units ERL ERM Value Q Result	CAS Number Units ERL ERM Value Q Result	CAS Number Units ERL ERM Value Q Result

Table 5. Summary of Bulk Sediment Chemistry Results, cont.

Total LPAH SUMLPAF Total HPAH SUMHPAF Pesticides	mg/kg mg/kg mg/kg mg/kg mg/kg mg/kg mg/kg	1.2 81 34 46.7 0.150 20.9 150	70 9.6 370 270 218 0.710 51.6 410	9.66 0.072 31.5 10.9 18.1 0.032 20.8 60.6		5.34 0.463 27.5 13.7 18.8 0.062 15.9 68.9	Q Q	4.98 0.433 26.0 13.8 17.8 0.054	Q Q	Result  3.52 0.300 20.0 9.34 12.2 0.052 11.4	0	Result  3.30 0.350 20.5 9.52 13.3 0.053	Q	Result	S 0	3.34 0.277 18.0 8.28 11.5	Q Q	2.82 0.237 16.5 7.16 9.29	Q Q	Fig. 13.6 17.7	Q Q	1.58 0.119 11.0 5.32 4.81
Parameter         Number           Physical         1476274           Total organic carbon         1476274           Metals         7440382           Arsenic         7440382           Cadmium         7440473           Chromium         7440473           Copper         7440508           Lead         7439921           Mercury         743997           Nickel         7440020           Zinc         744066           PAHS         Total LPAH           Total HPAH         SUMLPAH           Total HPAH         SUMLPAH           Pesticides         SUMHPAH	mg/kg mg/kg mg/kg mg/kg mg/kg mg/kg mg/kg mg/kg	8.2 1.2 81 34 46.7 0.150 20.9 150	70 9.6 370 270 218 0.710 51.6 410	1.28 9.66 0.072 31.5 10.9 18.1 0.032 20.8 60.6	Q	5.34 0.463 27.5 13.7 18.8 0.062 15.9	Q	4.98 0.433 26.0 13.8 17.8 0.054 14.5	Q	3.52 0.300 20.0 9.34 12.2 0.052	Q	3.30 0.350 20.5 9.52 13.3	Q	2.47 0.229 15.6 18.6 8.67	Q	3.34 0.277 18.0 8.28	Q	2.82 0.237 16.5 7.16	Q	5.12 0.451 24.8 13.6	Q	1.58 0.119 11.0 5.32
Physical   1476274   Metals   Arsenic   7440382   Cadmium   7440435   Chromium   7440473   Chromium   7440473   Chromium   7440473   Chromium   7440506   Chromium   7439976   Chromium   7439977   Chromium   7439977   Chromium   7439977   Chromium   7439977   Chromium   7439977   Chromium   7439977   Chromium   7440666   Chromium   7440666	mg/kg mg/kg mg/kg mg/kg mg/kg mg/kg mg/kg mg/kg mg/kg	1.2 81 34 46.7 0.150 20.9 150	9.6 370 270 218 0.710 51.6 410	9.66 0.072 31.5 10.9 18.1 0.032 20.8 60.6		5.34 0.463 27.5 13.7 18.8 0.062 15.9		4.98 0.433 26.0 13.8 17.8 0.054 14.5		3.52 0.300 20.0 9.34 12.2 0.052		3.30 0.350 20.5 9.52 13.3		2.47 0.229 15.6 18.6 8.67		3.34 0.277 18.0 8.28		0.237 16.5 7.16		5.12 0.451 24.8 13.6		0.119 11.0 5.32
Total organic carbon         1476274           Metals         744038:           Arsenic         744038:           Cadmium         744043           Chromium         744047           Copper         744050           Lead         743992           Mercury         743997           Nickel         744002           Zinc         744066           PAHs         SUMLPAH           Total LPAH         SUMLPAH           Total HPAH         SUMLPAH           Pesticides         SUMLPAH	mg/kg mg/kg mg/kg mg/kg mg/kg mg/kg mg/kg mg/kg mg/kg	1.2 81 34 46.7 0.150 20.9 150	9.6 370 270 218 0.710 51.6 410	9.66 0.072 31.5 10.9 18.1 0.032 20.8 60.6		5.34 0.463 27.5 13.7 18.8 0.062 15.9		4.98 0.433 26.0 13.8 17.8 0.054 14.5		3.52 0.300 20.0 9.34 12.2 0.052		3.30 0.350 20.5 9.52 13.3		2.47 0.229 15.6 18.6 8.67		3.34 0.277 18.0 8.28		0.237 16.5 7.16		5.12 0.451 24.8 13.6		0.119 11.0 5.32
Metals           Arsenic         744038;           Cadmium         744043;           Chromium         744047;           Copper         744050;           Lead         743992;           Mercury         743997;           Nickel         744066;           PAHs         Total LPAH           Total HPAH         SUMLPAE           Total HPAH         SUMLPAE           Pesticides         SUMLPAE	mg/kg mg/kg mg/kg mg/kg mg/kg mg/kg mg/kg mg/kg mg/kg	1.2 81 34 46.7 0.150 20.9 150	9.6 370 270 218 0.710 51.6 410	9.66 0.072 31.5 10.9 18.1 0.032 20.8 60.6		0.463 27.5 13.7 18.8 0.062 15.9		0.433 26.0 13.8 17.8 0.054 14.5		0.300 20.0 9.34 12.2 0.052		0.350 20.5 9.52 13.3		0.229 15.6 18.6 8.67		0.277 18.0 8.28		0.237 16.5 7.16		0.451 24.8 13.6		0.119 11.0 5.32
Cadmium         7440438           Chromium         7440473           Copper         7440508           Lead         743992           Mercury         743997           Nickel         744002           Zinc         744066           PAHs         Total LPAH           Total HPAH         SUMLPAF           Total HPAH         SUMLPAF           Pesticides         SUMHPAF	mg/kg mg/kg mg/kg mg/kg mg/kg mg/kg mg/kg	1.2 81 34 46.7 0.150 20.9 150	9.6 370 270 218 0.710 51.6 410	0.072 31.5 10.9 18.1 0.032 20.8 60.6		0.463 27.5 13.7 18.8 0.062 15.9		0.433 26.0 13.8 17.8 0.054 14.5		0.300 20.0 9.34 12.2 0.052		0.350 20.5 9.52 13.3		0.229 15.6 18.6 8.67		0.277 18.0 8.28		0.237 16.5 7.16		0.451 24.8 13.6		0.119 11.0 5.32
Chromium         7440473           Copper         7440950           Lead         7449991           Mercury         7439976           Nickel         7440020           Zinc         7440666           PAHs         SUMLPAH           Total LPAH         SUMLPAH           Total HPAH         SUMLPAH           Pesticides	mg/kg mg/kg mg/kg mg/kg mg/kg mg/kg mg/kg	81 34 46.7 0.150 20.9 150	370 270 218 0.710 51.6 410	31.5 10.9 18.1 0.032 20.8 60.6		27.5 13.7 18.8 0.062 15.9		26.0 13.8 17.8 0.054 14.5		20.0 9.34 12.2 0.052		20.5 9.52 13.3		15.6 18.6 8.67		18.0 8.28		16.5 7.16		24.8 13.6		11.0 5.32
Copper         7440508           Lead         7439921           Mercury         7439927           Nickel         7440020           Zinc         7440666           PAHs         SUMLPAH           Total LPAH         SUMLPAH           Total HPAH         SUMLPAH           Pesticides         SUMLPAH	mg/kg mg/kg mg/kg mg/kg mg/kg	34 46.7 0.150 20.9 150 552	270 218 0.710 51.6 410	10.9 18.1 0.032 20.8 60.6		13.7 18.8 0.062 15.9		13.8 17.8 0.054 14.5		9.34 12.2 0.052		9.52 13.3		18.6 8.67		8.28		7.16		13.6		5.32
Lead         743992           Mercury         7439976           Nickel         7440020           Zinc         7440666           PAHS         SUMLPAH           Total LPAH         SUMLPAH           Total HPAH         SUMHPAH           Pesticides         SUMHPAH	mg/kg mg/kg mg/kg mg/kg	46.7 0.150 20.9 150 552	218 0.710 51.6 410	18.1 0.032 20.8 60.6		18.8 0.062 15.9		17.8 0.054 14.5		12.2 0.052		13.3		8.67								
Lead         743992           Mercury         7439976           Nickel         7440020           Zinc         7440666           PAHS         Total LPAH         SUMLPAH           Total HPAH         SUMHPAH           Pesticides         SUMHPAH	mg/kg mg/kg mg/kg mg/kg	46.7 0.150 20.9 150 552	0.710 51.6 410	0.032 20.8 60.6		0.062 15.9		0.054 14.5		0.052						11.5		9.29		17.7		4.81
Nickel         7440020           Zinc         7440666           PAHs         Total LPAH           SUMLPAE         SUMLPAE           Total HPAH         SUMLPAE           Pesticides	mg/kg mg/kg ug/kg	20.9 150 552	51.6 410	20.8 60.6		15.9		14.5				0.053		0.022								
Zinc         7440666           PAHs	mg/kg ug/kg	150 552	410	60.6						11.4				0.032		0.067		0.046		0.056		0.023
PAHS  Total LPAH SUMLPAH  Total HPAH SUMHPAH  Pesticides	ug/kg	552				68.9				11.4		11.3		8.57		9.92		8.67		13.4		6.12
Total HPAH SUMHPAH Pesticides			3,160					67.7		48.3		50.9		37.2		50.5		39.9		78.2		28.9
Total HPAH SUMHPAH Pesticides			3,160																			
Pesticides	ug/kg			48.2		316		321		208		106		114		101		127		217		104
		1,700	9,600	260		2644		4212		2028		866		838		756		653		1301		567
4,4`-DDD 72548	ug/kg	2	20	0.020	U	1.30		1.90		2.10		1.30		1.00		1.20		0.880		1.70		0.680
4,4`-DDE 72559	ug/kg	2.2	27	0.066		1.90		1.30		1.40		1.30		0.790		1.40		1.30		2.00		0.400
4,4`-DDT 50293	ug/kg	1	7	0.026	U	0.850		1.50		4.00		0.750		0.620		0.900		0.530		2.20		0.028
Total DDX SUMDDX	ug/kg	1.58	46.1	0.112		4.05		4.70		7.50		3.35		2.41		3.50		2.71		5.90		1.11
Dieldrin 60571	ug/kg	0.02	8	0.040	U	0.460		0.850		0.026	U	1.00		1.20		0.026	U	0.026	U	0.610		0.026
Total Chlordane SUMCHLO	ug/kg	0.5	6	0.300	U	1.4		0.95		1.8		1.8		0.044	U	0.265		1.54		1.04		1.25
PCBs																						
Total PCBs SumNOAA	s ug/kg	22.7	180	4.02	U	1.4		2.1		1.2		0.751		0.326	U	0.326	U	0.831		1.3		0.706
Notes: Yellow indicates an exceedance of the ERI																						
Red indicates an exceedance of the ERM																						
U= Compound was analyzed for but was r	ot detected	(non-det	ect)																			
J= Indicates an estimated value																						
Non-detects reported as half the MDL																						
Reference site data from DAMOS monitori			SN)																			
Total PCBs were calculated using the NO																						
Total Chlordane is a sum of alpha and ga	nma chlord	ane, cis a	and trans	nonachle	or, an	d oxychlor	lane	; IOSN valu	ıe is	a sum of or	ıly a	lpha and ga	mm	a chlordan	2							

# Elutriate Chemistry and Biological Analysis of Sediments

Based on the lithology, chemistry results, and location of sample stations, NAE provided the applicant with a compositing plan for biological testing following the tiered testing protocol outlined in the Evaluation of Dredged Material Proposed for Ocean Disposal – Testing Manual (Green Book, EPA/USACE, 1991). Sediment and water for biological testing were collected by the applicant in February of 2023 to characterize the potential risk associated with open water placement of the dredged material from the four Kennebunk River projects. Sediment was collected from ten representative sample locations across all four project areas to create one composite sample (Table 2 and Figures 6 through 9). The composite sample for biological testing was comprised of sediment from stations AYC-1, 2, and 4 from the Arundel Yacht Club, Y-2 and 3 from the Yachtsman Marina, K-1 and 2 from the Kennebunkport Marina, and KBRC-B, C, and E from the Kennebunk River Club. Site water was also collected from a central location within each proposed project area and composited. The biological testing samples were collected according to the compositing plan to determine the potential for the dredged sediment to cause adverse effects to the biological receptors identified in the CSM. Compliance with water quality criteria was determined through elutriate testing, sediment toxicity was measured through a 10-day whole sediment acute toxicity test, human health risk was determined through a 28-day bioaccumulation test, and water column toxicity was determined through a suspended particulate phase test as described in the Green Book (USEPA/USACE, 1991).

#### **Evaluating Potential Effects to Benthic Organisms**

The CSM identified the uptake of contaminants from placed dredged material at IOSN as a primary exposure pathway for project sediments and the potential for acute toxicity was determined through a 10-day whole sediment acute toxicity test as described in the Green Book (EPA/USACE, 1991).

Mean mortality in the control samples of the 10-day whole sediment acute toxicity tests was less than 10% for the amphipod (*Leptocheirus plumulosus*) and the mysid (*Americamysis bahia*); therefore, the tests were valid based on criteria established in the testing protocol.

Mean survivability for *A. bahia* and *L. plumulosus* was 97% and 95%, respectively. Results were not statistically different when compared to survivability in the IOSN reference sediment. The material proposed to be dredged is not considered acutely toxic to the mysids or amphipods used in this assessment.

Results from the 10-day whole sediment toxicity test are summarized in Table 6.

Table 6: Mean Survivability in the 10-day Whole Sediment Toxicity Test

Organism	Lab Control	IOSN Reference	Comp 1
A. bahia	98%	98%	97%
L. plumulosus	98%	93%	95%

#### Evaluating Potential Effects to Human Health

In order to assess the potential risk to human health through the exposure pathways identified in the CSM, a 28-day bioaccumulation test was performed with the clam, *Macoma nasuta*, and marine polychaete worm, *Nereis virens*, using sediments from the composite sample.

Results showed statistically significant increases of certain contaminants of concern (COCs) in tissue samples from clams exposed to project sediments when compared to tissue samples from clams exposed to reference area sediments including three metals (copper, lead, and nickel), several individual PAHs, three PCB congeners, and two pesticides (4,4'-DDD and 4,4'-DDE). Generally, COC concentrations were only slightly higher in the composite tissue sample than in the pre-test or IOSN reference tissue. Anthracene, benzo(a)anthracene, benzo(b)fluoranthene, and chrysene concentrations were 5 times higher in the composite tissue sample than in the IOSN reference site tissue concentrations. Fluoranthene, pyrene and 4,4'-DDD concentrations were more than 10 times higher in the composite tissue sample than in the IOSN reference site tissue concentrations. Copper, nickel, fluorene, naphthalene, and PCB 52 were detected at concentrations less than were detected in the pre-test tissue, which reflects the initial contaminant load in the wild caught specimens prior to the test initiation, suggesting that these contaminants may not be attributable to site conditions. However, these analytes were conservatively included in subsequent risk modeling.

Significant increases in worm tissue samples as compared to reference area tissue samples included five metals (cadmium, chromium, lead, nickel, and zinc), several individual PAHs, two PCB congeners, and one pesticide (4,4'-DDD). Generally, COC concentrations were only slightly higher in the composite tissue sample than in the pre-test or IOSN reference tissue. Pyrene was 5 times higher in the composite tissue sample than the IOSN reference site tissue concentrations. Benzo(k)fluoranthene, fluoranthene, and PCB 105 were more than 10 times higher in the composite tissue sample than the IOSN reference site tissue concentrations. Chromium, lead, nickel, anthracene, naphthalene, and 4,4'-DDD were detected at concentrations less than were detected in the pre-test tissue, which reflects the initial contaminant load in the wild caught

specimens prior to the test initiation, suggesting that these contaminants may not be attributable to site conditions, however these analytes were conservatively included in the subsequent risk modeling.

Based on these results, the tissue burden data were analyzed with the EPA Bioaccumulation Evaluation Screening Tool (BEST) model to determine the toxicological significance of bioaccumulation from exposure to the dredged sediment. The BEST model includes an evaluation of the non-carcinogenic risk, carcinogenic risk, and any observed exceedances of Food and Drug Administration (FDA) thresholds to determine potential adverse impacts to human health from the consumption of lobster, fish, or shellfish exposed to project sediments. Consideration was also given to the number of contaminants that were statistically elevated in comparison to the reference tissue concentrations and to the magnitude of those concentrations in comparison to the reference tissue concentrations and comparable organisms living in the vicinity of the disposal site according to the factors outlined in the Ocean Testing Manual (USEPA/USACE, 1991).

For both *Macoma nasuta* and *Alitta virens*, modeling based on the tissue contaminant loads measured in the composite sample found that all contaminants were below the EPA Hazard Quotient for non-carcinogenic risk of 1.0, below the EPA carcinogenic risk threshold (1 x 10<sup>-4</sup>), and were also less than established FDA action levels. Statistically elevated concentrations of contaminants in the tissue samples that could not be evaluated using the BEST model were compared to background invertebrate concentrations in the NOAA Mussel Watch dataset (NCCOS, 2023) and all concentrations were found to be less than the dataset concentrations.

Based on this analysis, there is no unacceptable risk to the receptors identified in the CSM from the bioaccumulation of contaminants through exposure to the dredged material from the projects. BEST model outputs and tissue data are provided in Appendix C.

# **Evaluating Potential Effects to Fish and Marine Invertebrates**

The CSM identified the uptake of contaminants from the water column during the placement of dredged material at IOSN as a primary exposure pathway for project sediments. Elutriate samples were prepared from the site composite sediment sample and site water and the potential for water column toxicity was determined through a suspended particulate phase (SPP) toxicity test as described in the Green Book (USEPA/USACE, 1991).

The results from the SPP toxicity test were used to determine the median lethal concentration (LC<sub>50</sub>) for the three target species exposed to the sediment elutriates. All three species, the mysid,  $A.\ bahia$ , the minnow,  $Menidia\ beryllina$ ,

and the mussel, *Mytilus edulis*, showed no adverse effects on survival after exposure to the elutriate from the composite sample (Table 7).

Table 7: LC<sub>50</sub> Values in Suspended Phase Toxicity Test

Composite	A. bahia	M. beryllina	M. edulis
	LC <sub>50</sub> (%)	LC <sub>50</sub> (%)	LC <sub>50</sub> (%)
Composite 1	>100%	>100%	>100%

To determine if the discharge of dredged material would meet the limiting permissible concentration (LPC), NAE utilized the Short-Term Fate (STFATE) numerical model to analyze the disposal cloud as it descends through the water column after release from a scow. Results of the STFATE evaluation using the lowest LPC (LC $_{50}$  of 100% and an application factor of 0.01) predicted that the water column would attain the LPC within four hours of disposal at IOSN. Additionally, all contaminants of concern in the elutriate samples were below the federal and Maine water quality criteria. Elutriate chemistry concentrations are presented in Appendix D.

# 4. Suitability Determination:

Based on the weight of evidence, including the CSM, sediment chemistry results, biological testing results, and the subsequent risk modeling, no significant adverse impacts through the exposure pathways identified in the conceptual site model were found for the Arundel Yacht Club, Kennebunkport Marina, Yachtsman Marina, and Kennebunk River Club. Based on the testing and evaluation requirements set forth in Section 103 of the MPRSA, the sediments to be dredged are considered suitable for unconfined open water disposal at IOSN.

This suitability determination was coordinated with EPA Region 1 and MEDEP. MEDEP concurred with the determination and EPA Region 1 conducted an individual evaluation of the project and documented their findings in a separate memo.

Digitally signed by BARRA.BRILEY.KATHERINE.1 617990837 Date: 2024.06.10 12:19:48

Briley K. Barra Technical Specialist Dredged Material Management Team USACE-New England District Digitally signed by LOYD.RICHARD.B.12746 69540 Date: 2024.06.12

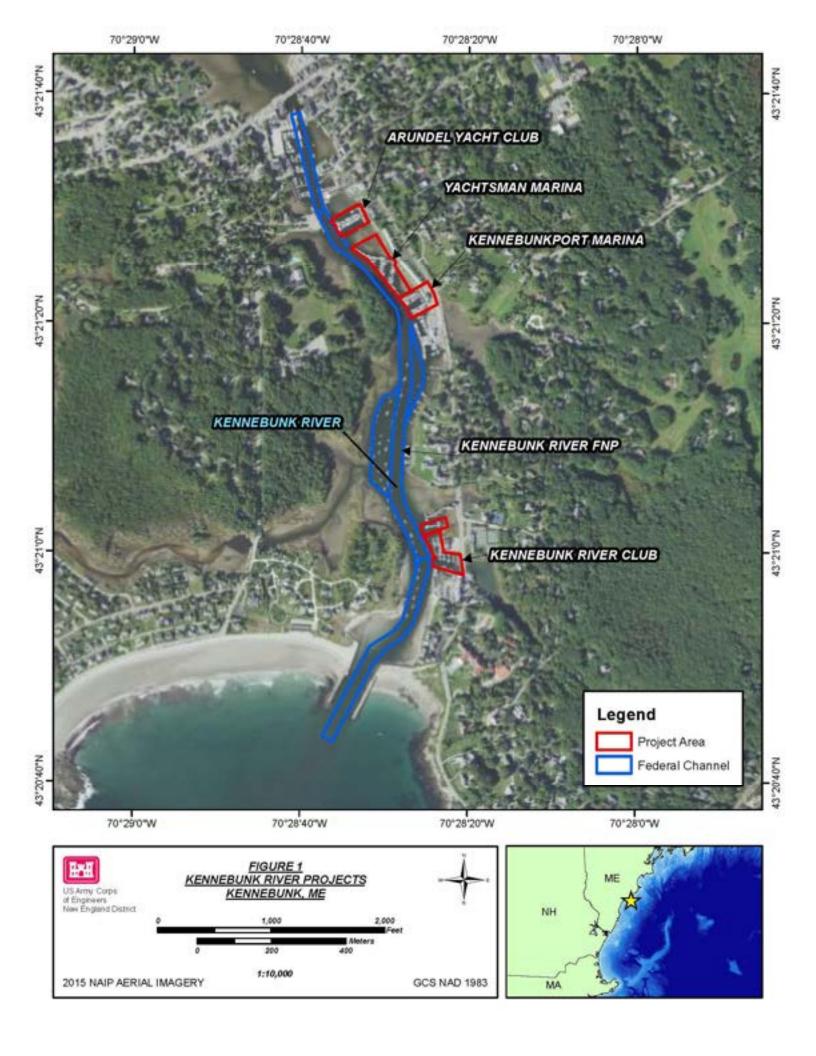
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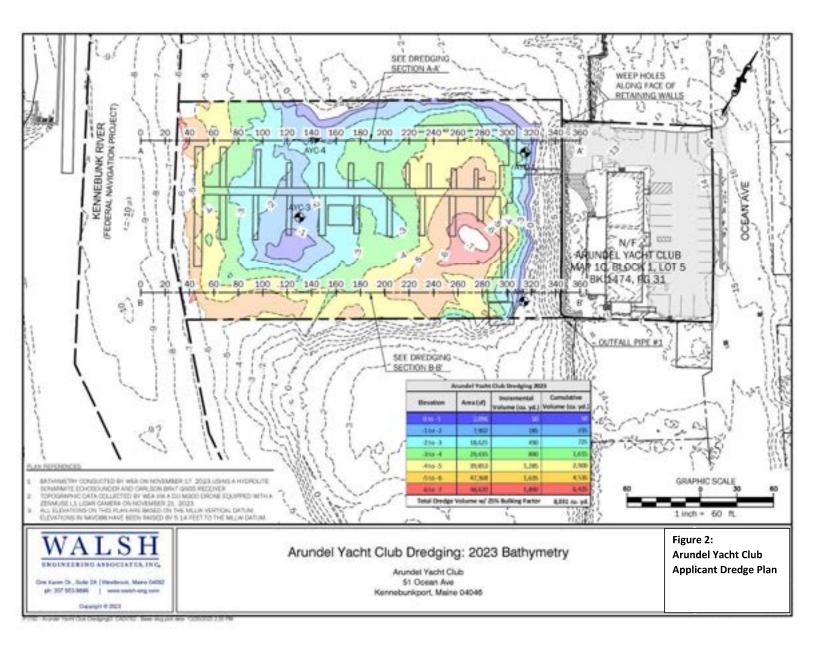
Richard B. Loyd Chief Environmental Resources and Marine Programs Section USACE-New England District

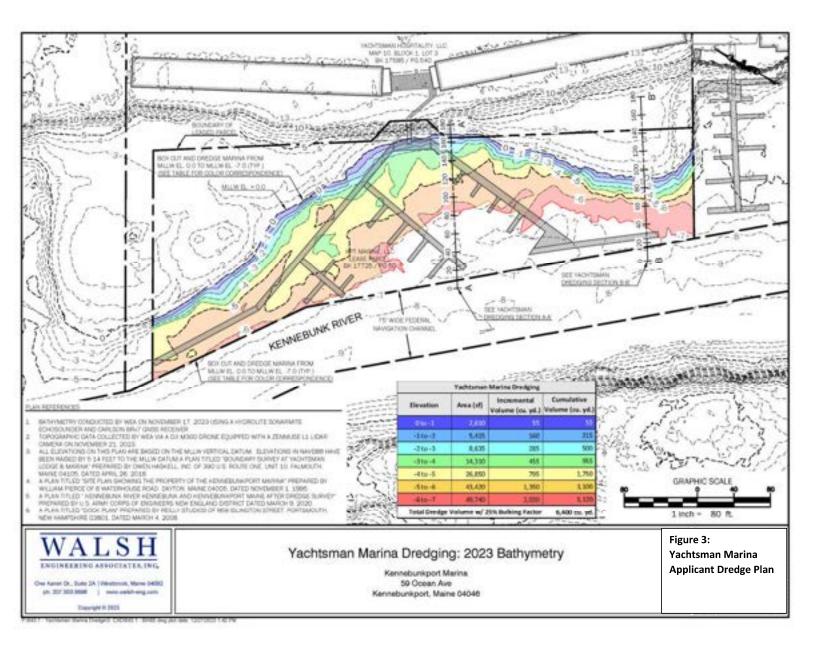
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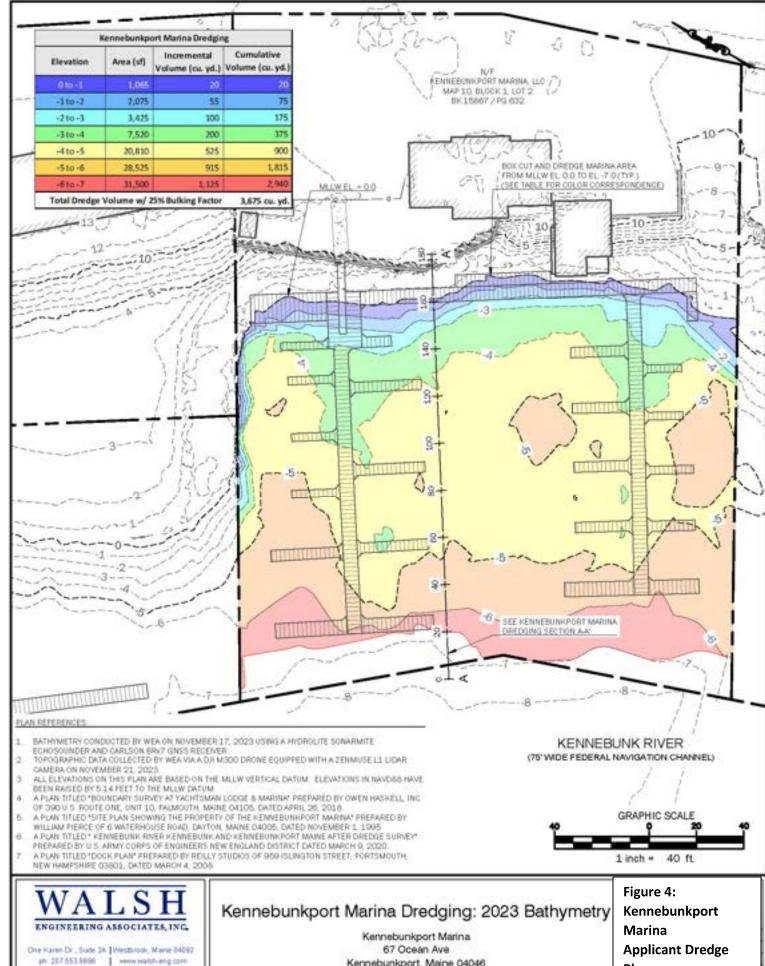
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- USEPA/USACE 1991. Evaluation of Dredged Material Proposed for Ocean Disposal Testing Manual. Environmental Protection Agency, Office of Water and Department of the Army, United States Army Corps of Engineers. Washington, D.C.





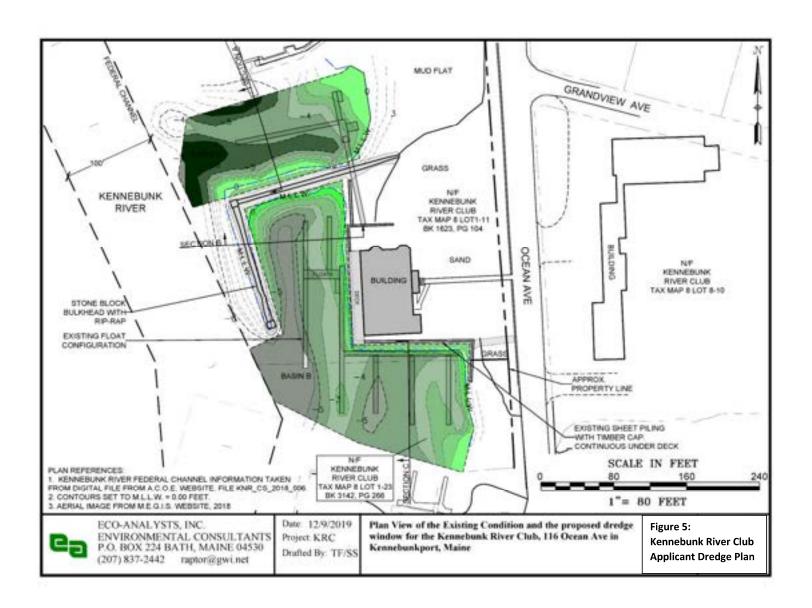


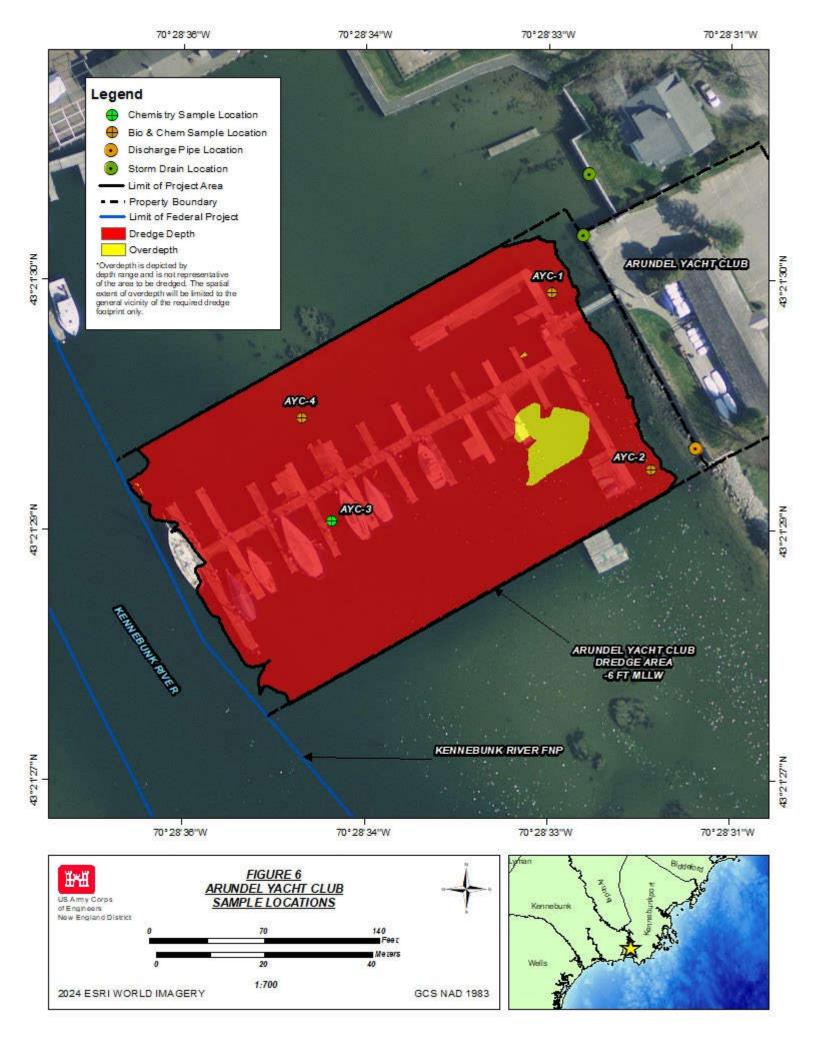


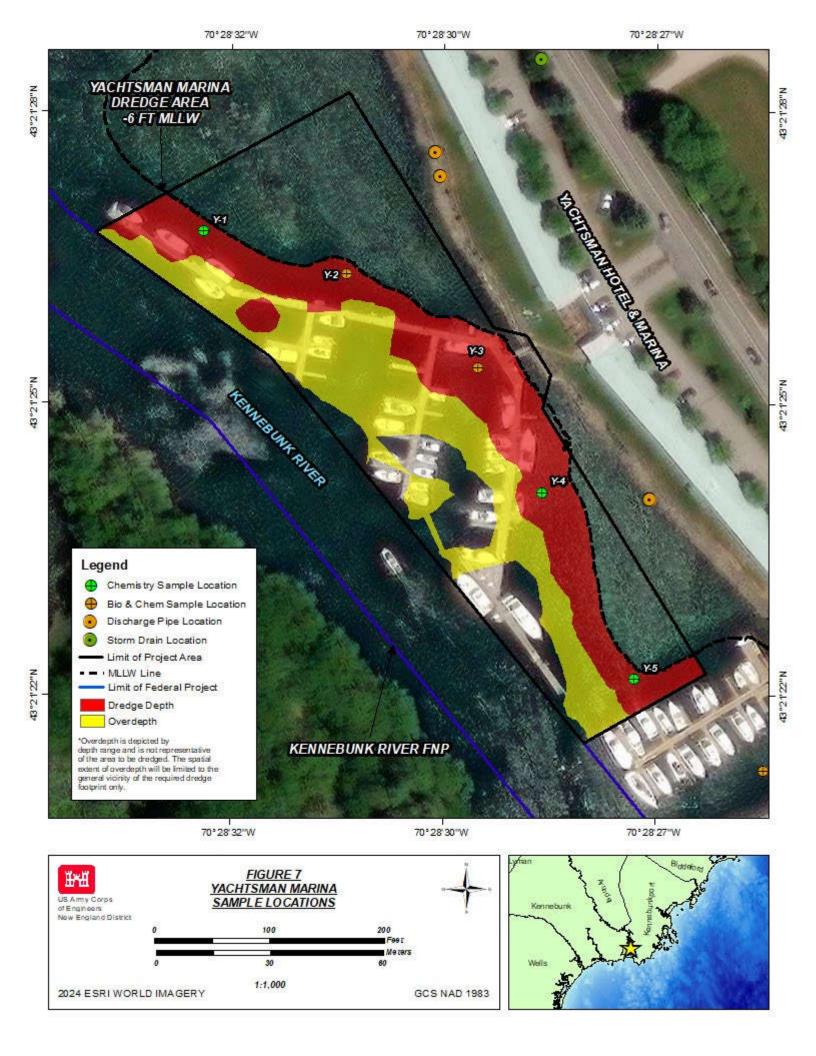
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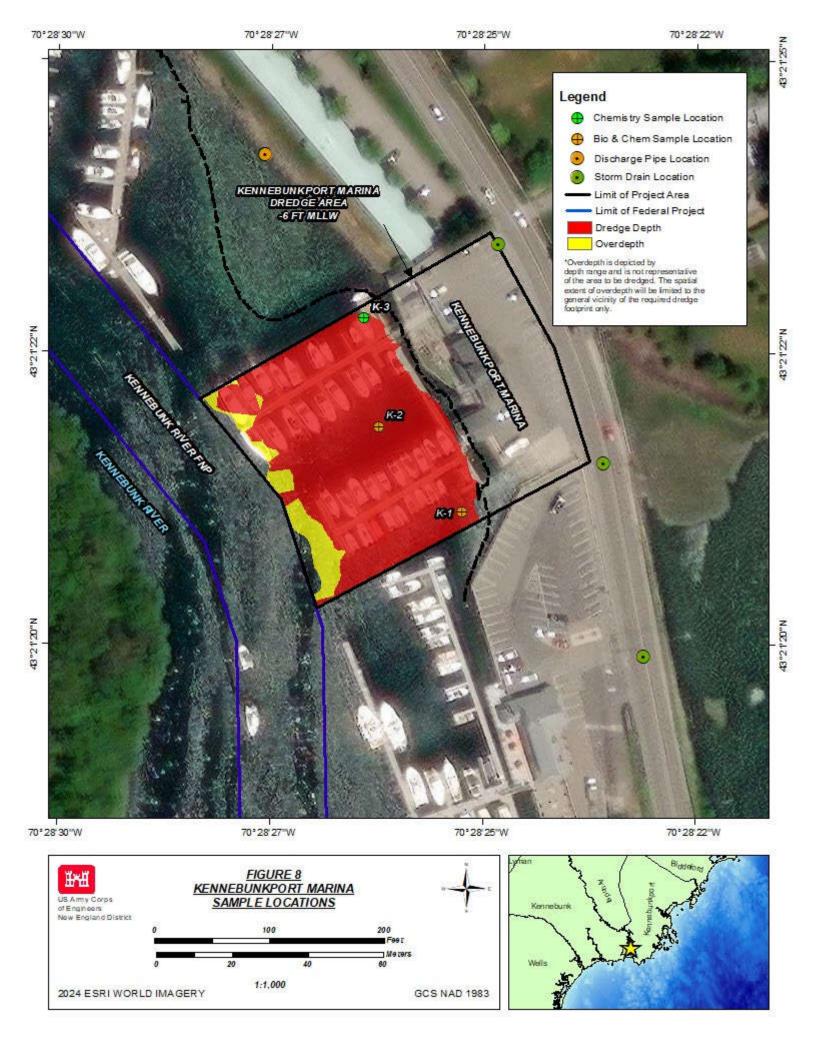
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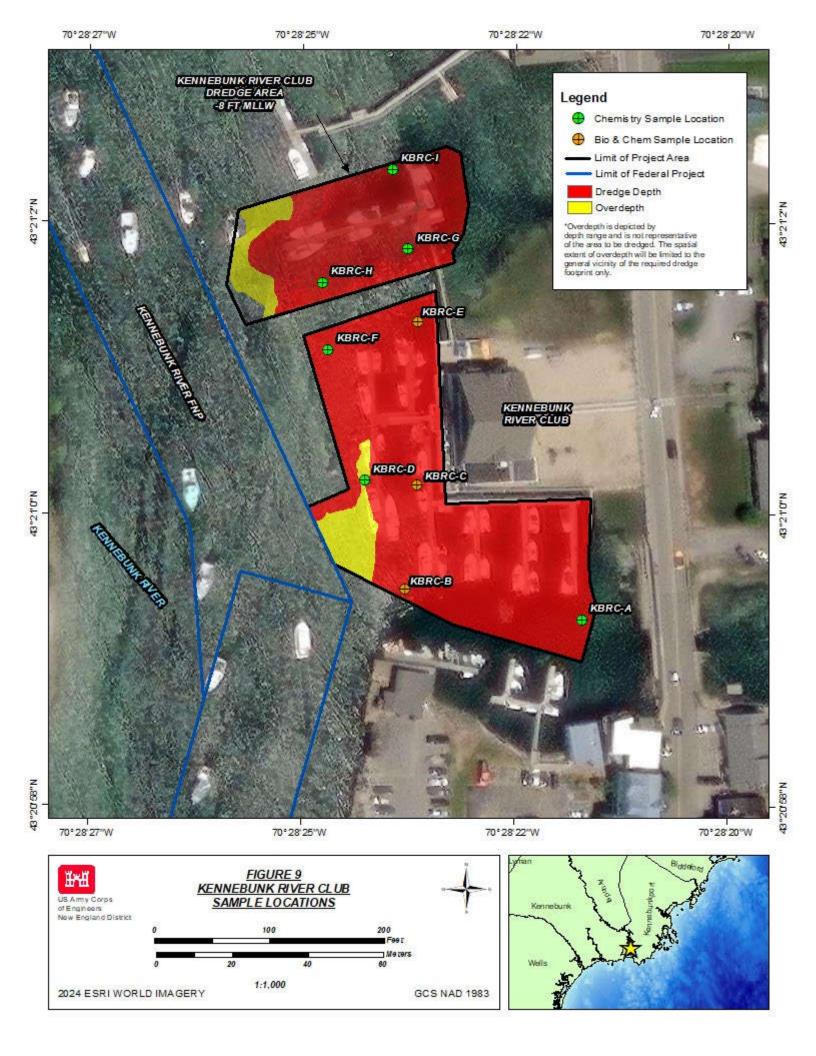
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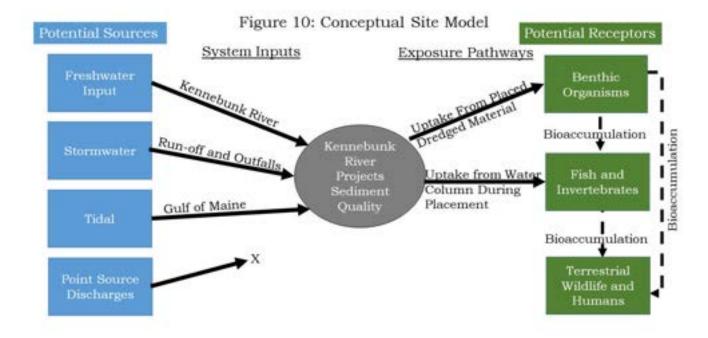












# Appendix A Core Logs and Photographs

Project: Arundel Yacht Club		Date:	022
Sampling Personnel: Dustin J Kach			
Weather: <u>Light Winds, Clear Skies</u>			
Location Method: DGPS: 1 meter ac	ccuracy		
	•		
Sample ID: AYC-1		Time:1	:06 pm
Sampler Type: VibraCore Sample	er		
Depth:			
Coordinates: <u>Latitude: 43.35831</u>		<b>Longitude: -</b> 7	0.47582
Penetration: 3.2' R	Recovery: 3.2'		No. Attempts: 3
Material Description: 0-3.1, composited	d. Dark silt/mud with	shell debris.	

# **Core Photo**



Project: Arunder Yacht Club	Date:
Sampling Personnel: Dustin J Kach	
Weather: Light Winds, Clear Skies	
Location Method: DGPS: 1 meter accuracy	
<u> </u>	
Sample ID: <u>AYC-2</u>	Time: 12:20 pm
Sampler Type: VibraCore Sampler	
Depth:	
Coordinates: Latitude: 43.35800	<b>Longitude:</b> -70.47561
Penetration: 2.4' Recovery:	2.4' No. Attempts: 9
Material Description: <u>0-2.4' composited. Hard p</u>	acked sand with shell debris. Multiple attempts were

# **Core Photo**

made refusal was reached after 2.4' penetration.



Project: Arundel Yacht Cli	ub	Date: <u>7/26/2022</u>	
Sampling Personnel:Dustin J K	Kach		
Weather: <u>Light Winds, Clea</u>	nr Skies		
Location Method:DGPS: 1 :	meter accuracy		
Sample ID: <u>AYC-3</u>		Time: 12:55 pm	
Sampler Type:VibraCore	e Sampler		
Depth:			
Coordinates: <u>Latitude: 43.357</u>	93	<b>Longitude:</b> -70.47634	
Penetration: 1'	Recovery: 9"	No. Attempts:	16

Material Description: 0-9" composited. Hard substrate encountered a lot of wood debris and shell material. We attempted to call ACOE contacts during sampling, messages were left but no one returned the calls that day. We kept the largest core and did not cut it because we did not want to lose any material. Sample was extruded directly into bucket for compositing. We attempted multiple cores within a 10' radius of the location and saved the best one. Multiple attempts were made refusal was reached after 1' penetration.

#### **Core Photo**



Project: Arundel Yacht Club		Date: _	7/26/2022
Sampling Personnel:	h		
Weather: <u>Light Winds, Clear S</u>	kies		
Location Method: DGPS: 1 met	ter accuracy		
Sample ID: <u>AYC-4</u>		Time: _	12:35 pm
Sampler Type: VibraCore Sa	ampler		
Depth:			
Coordinates: <u>Latitude: 43.35811</u>		Longiti	ıde: -70.47638
Penetration: 4.1'	Recovery:	4.0'	No. Attempts: 5
Material Description: 0-4.0 compo	sited. Dark silt w	vith hard packed sa	and at bottom of core.

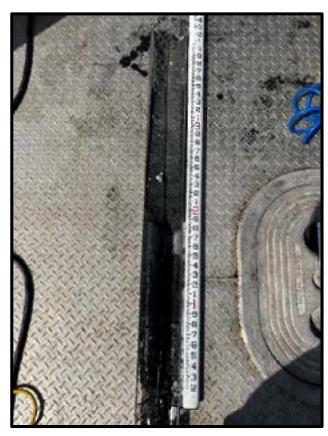
# **Core Photo**



Project: Kennebunkport	Marina	Date: <u>1/26/2022</u>	
Sampling Personnel: <u>Dustin</u>	J Kach		
Weather: Light Winds, C	lear Skies		
	•		
Sample ID: <u>K-1</u>		Time: 9:38 am	
Sampler Type: VibraC	Core Sampler		
Depth:		_	
Coordinates: <u>Latitude: 43.3</u>	35587	<b>Longitude:</b> -70.47367	
Penetration: 4.2'	Recovery:4	1.2' No. Attempts: <u>6</u>	
Material Description: <u>0-4.2'</u>	composited. Dark silt with	h hard packed sand at bottom of core. Multip	<u>ple</u>

# **Core Photo**

attempts were made refusal was reached after 4.2' penetration.



Project: Kennebunkport Marina	Date: <u>7/26/2022</u>
Sampling Personnel: <u>Dustin J Kach</u>	
Weather: Light Winds, Clear Skies	
Location Method: DGPS: 1 meter accuracy	
Sample ID: <u>K-2</u>	Time: _9:47 am
Sampler Type: VibraCore Sampler	
Depth:4.8' MLLW	
Coordinates: <u>Latitude: 43.35607</u>	<b>Longitude:</b> -70.47394
Penetration: 3.1' Recovery: 3.1'	No. Attempts: 3

# **Core Photo**

Material Description: <u>0-2.2</u>' composited. Dark silt with hard packed sand towards bottom of core.



Project:	Kennebunkport Marina	<u>1                                    </u>		Date:	
Sampling Per	sonnel: <u>Dustin J Kach</u>				
Weather:	Light Winds, Clear Ski	ies			
<b>Location Met</b>	hod: DGPS: 1 meter	r accuracy			
Sample ID: _	K-3			Time: 10:05 am	
Sampler Type	e: <u>VibraCore San</u>	npler			
Depth:	-1.7' MLLW				
Coordinates:	<b>Latitude:</b> 43.35634			Longitude: -70.474	
Penetration: _	4.3'	Recovery:	4.2'	No. Attempts: <u>7</u>	
	cription: <u>0-4,2' compose</u>			packed sand at bottom of core. Mul	tiple

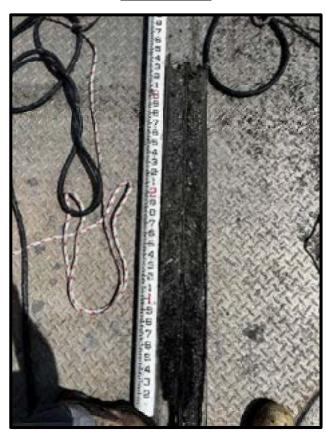
# **Core Photo**



Project: Yachtsman Marina	<b>Date</b> : <u>7/26/2022</u>
Sampling Personnel: <u>Dustin J Kach</u>	
Weather: Light Winds, Clear Skies	
Location Method: DGPS: 1 meter accuracy	
Sample ID: Y-1	Time: 11:29 am
Sampler Type: VibraCore Sampler	
Depth:1.5' MLLW	
Coordinates: <u>Latitude</u> : 43.35735	<b>Longitude:</b> -70.47578
Penetration: 3.5' Recovery:	3.5' No. Attempts: <u>8</u>
Material Description: <u>0-3.5</u> ° composited. Compa	act sand with shell debris. Multiple attempts were

# **Core Photo**

made refusal was reached after 3.5' penetration.



Project:	Yachtsman Marina			Date: <u>7/26/2022</u>	
Sampling Pers	sonnel: <u>Dustin J Kach</u>				
Weather:	Light Winds, Clear Sk	ies			
Location Metl	hod: DGPS: 1 mete	er accuracy			
Sample ID:	Y-2			Time: _11:15 am	
Sampler Type	e:VibraCore Sar	npler			
Depth:	-1.2' MLLW				
Coordinates:	<b>Latitude:</b> 43.35724			<b>Longitude: -</b> 70.47533	
Penetration: _	2.5'	Recovery:	2.5'	No. Attempts: 8	
	ription: 0-2.5' compos	_		Multiple attempts were made refusa	l was

# **Core Photo**



Project: Yachtsman Marina	<b>Date</b> : <u>7/26/2022</u>
Sampling Personnel: Dustin J Kach	
Weather: Light Winds, Clear Skies	
Location Method: DGPS: 1 meter accur	racv
Sample ID: Y-3	Time: 11:02 am
Sampler Type: VibraCore Sampler	
Depth:4.2' MLLW	
Coordinates: <u>Latitude</u> : 43.35701	<b>Longitude: -</b> 70.47488
Penetration: 2.7' Reco	overy: 2.7' No. Attempts: 5

# **Core Photo**

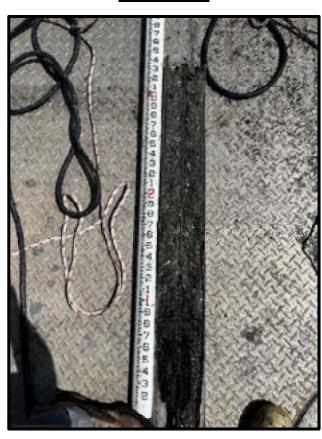
Material Description: <u>0-2.7</u>' composited. Dark silt with hard packed sand at bottom of core.



Project: Yachtsman Marina	Date: <u>7/26/2022</u>
Sampling Personnel: <u>Dustin J Kach</u>	
Weather: Light Winds, Clear Skies	
Location Method: DGPS: 1 meter accuracy	
Sample ID: Y-4	Time: 10:54 am
Sampler Type: VibraCore Sampler	
Depth:4.4' MLLW	
Coordinates: Latitude: 43.35673	<b>Longitude: -</b> 70.47467
Penetration: 3.4' Recovery: 3.4'	No. Attempts: <u>4</u>

# **Core Photo**

Material Description: <u>0-2.6</u>' composited. Dark silt with hard packed sand at bottom of core.



Project: Yachtsman Marina	Date: <u>///26/2022</u>
Sampling Personnel:	
Weather: Light Winds, Clear Skies	
Location Method: DGPS: 1 meter accuracy	
Sample ID: Y-5	Time: 10:40 am
Sampler Type: VibraCore Sampler	
Depth:1.0' MLLW	
Coordinates: <u>Latitude: 43.35629</u>	<b>Longitude: -</b> 70.47437
Penetration: 6.1' Recovery:	6.1' No. Attempts: <u>3</u>

# **Core Photo**

Material Description: <u>0-6.0</u>' composited. Dark silt with hard packed sand at bottom of core.



# Appendix B Bulk Sediment Chemistry Results

Part																																					
Column												T																		К							
State   Stat			1	1	1	IO:	SN	K-1	1	K-2	K-3		Y-1	Y-2	Y-	3	Y-4	Y-5		AYC-1	AYC-2	2	AYC-3	AYC	-4 KE	RC-A	KBRC-E	KBR	C-C	KBRC-D				KBRO	>H KBR	C-I	KBRC-F
State	Parameter	CAS Number	Units	ERL	ERM	Value	0	Result	O Res	sult Q	Result	O Re	sult Q	Result	O Result	0	Result C	Result	Q R	esult (	Result	Q R	esult C	Result	Q Rest	ult O	Result	Q Result	0 1	Result 1	Result	0	Result	Q Result	Q Result	O F	Result Q
Second Property   Second Pro																																					
Second   S		14762744	%			1.28		0.37	3.0	D4	2.32	0	.93	0.72	1.90		1.19	0.20		1.14	1.15		8.46	2.64			-	_	$\perp$	-			-	_	-	$\perp$	
Column																$\perp$																					
The column			mg/kg		70	9.66	_									-			9	9.75		- 3	7.78	10.3													
Teach   Teac			mg/kg				_									-																					
The column   The					370	10.0	+-									+																					
Column					218	18.1	_	134								+																					
The column   The	Mercury	7439976						0.051								_	0.011		JO	0.064				0.108	0.0	52					0.032			0.046		-	0.023
Transfer   Property	Nickel	7440020			51.6	20.8	-	9.17	15	.6	15.4			8.37	21.4		15.1	3.81			13.0		15.0	22.7				11.4	-	11.3	8.57			8.67			
Company   Comp	Zinc	7440666						56.6	67	.4	57.2	4	2.2	37.6	71.2		45.2	10.2		101	58.1		68.6	98.0	68.	9	67.7	48.3	T	50.9	37.2	-	50.5	39.9	78.2		28.9 J
Company																																					
Column									J 20	0.4						J					23.4						18.2										
Column																					71.1					0	1.25										
Column							_		34	1.5						-					119				90.	3	143.0		-								
Proceedings							4		25	.5						-					37.4				J 37.	8	30.6										
The part				240	1500	26.0	+														381																
Property							+														654																
Company							+									$\vdash$					326					1	522		$\boldsymbol{ o}$								
Company   Comp		50328				23.4	1	129	16	50	130	1	32 J	130	85.3	$\vdash$	3.12 J	4.60		140		- 3	35.7	90.0	17			J 146		80 -	J 76.8			J 58	J 129	J	51.8 J
Property of the Property of			ug/kg																																J 201		
Princip   Prin																																					
Second Column   1970   1985																П											251		J								
Part					2,800											$\perp$											455		L.J								
Control   Cont							+									+					56.6				11.	o J	15.5	J 10.0	UJ								
Column					5,100		+-									+					702				71	0 1	97 F	Z04	-								
Part					0.600		+-									+											87.5	J 60.5	3								
Act   Color					9.600		_									+					3341				264	4	4212	2028	_								
The column   The		GOMIN AND	OR) AR	1,100	3,000	200	_	1200	10	27	1001	- 1	,00	1000	000	-	00.0	1000	1	1102	0011		111	500	-	_	1212	2020		000	000	-	700	030	1001		001
Column   C		72548	ug/kg	2	20	0.020	U	4.98	J 4.6	66 J	0.112	UJ 1	.16 J	2.86	J 0.093	UJ	0.016 U	J 0.013	UJ 3	3.87	4,34	J 0	1.274 U	J 1.99	J 1.3	0	1.90	2.10		1.30	1.00	-	1.20	0.880	1.70		0.680
Teal Plant   Section   S	4,4"-DDE	72559	ug/kg	2.2	27	0.066	5	2.23	4.5	53 J	0.068	U 2	.50 J	2.78	0.057	U	0.010 t	0.008	U 7	7.51	5,74	- 0	1.167 U	4.37	J 1.9	0	1.30	1.40		1.30	0.790	-	1.40	1.30	2.00		0.400
Column   C	4,4'-DDT				7	0.026	U	1.44	1.4	44		U 0.	960	0.808		U	0.020 1	0.017	U	1.62	2.60			1.51	J 0.8	50	1.50	4.00		0.750	0.620		0.900	0.530	2.20		
Company   Comp					46.1			8.65	10	0.6		U 4	62	6.45		U				13.0	12.7			7.87	4.0	6	4.70	7.50		3.35	2.41		3.50	2.71	5.90		
Commendation					_											U																					
Common   C					-																																
Expension   Section   Se																									11 0.4	50 U	0.007			1.00	1.30				U 0.007		
Expending   Control   Co				V.V.		0.036	0	0.021	11 0.0	35 11	0.226	11 0	035 U			ŭ	0.021	0.024	0 0	1208 1				0.206	11 0.00	79 II	0.009	0.020		0.009	0.009				U 0.009		
England   Common Comm	Endosulfan II	33213659				0.019	U	0.015	U 0.0	18 U	0.106	U 0.	018 U	0.015	U 0.088	Ü	0.015 L	0.013	UO	0.107	0.069	UO	.260 U	0.106	U 0.0	19 U	0.019	U 0.019	Ü	1.20	0.019	Ü	0.019	U 0.019	U 0.740		0.019 U
Expensive market   1987   1988   19	Endrin	72208				0.022	U	0.017	U 0.0	21 U	0.123	U 0.	021 U	0.017	U 0.102	U	0.017 L	0.014	U 0	0.124 1	0.080	U 0	.300 U	0.123	U 0.03	27 U	0.027	U 0.430		0.760	0.027	U	0.027	U 0.770	1.90		0.027 U
Experiment   1974   1												U 0.	038 U							0.23 1		U 0	1.555 U	0.228													
Exemplement   1974   Wight   Co.53   Co.57																																					
Indiana   Control   Cont							, ,			102				0,000																							
Company   Comp				_	_	0.354	U		U 0.3	41 U	2.015	U 0.	337 U.			U	0.274 L							2.02	U 0.0	99 U					U 0.010			U 0.010	U 0.010		
Companies				-	-	0.059			U 0.0	157 U	0.338	U 02	057 Uu			- 0	0.046 1							0.338	U 0.0	13 U					0.013			U 0.013	U 0.013		
Figure   Control   Contr				+	+											- 11																					
Teach Section   Processing				1	1											II.																					
Charles	trans-Nonachlor	39765805				0.018	Ü	0.014	U 0.0	17 U	0.100	U O	017 U	0.014	U 0.083	Ü	0.014 L	0.012	UO	0.101	0.065	U 0	.244 U	0.100	U 0.0	9 U	0.010	U 0.010	Ü	0.010	0.010	Ü	0.010	U 0.010	U 0.010	U	0.200 UJ
Change   C	Total Chlordane	SUNCHLOR	ug/kg	0.5	- 6	0.300	U	0.233	U 0.2	89 U	1.710	U 0.	285 U	0.234	U 1.42	U	0.233 L	0.198	U 1	1.72	1.11	U	4.2 U	1.7	U 1.4		0.95	1.8		1.8	0.044	U	0.265	1.54	1.04		1.25
Property																																					
Characteristics   Characteri				_	_						0.059																				U 0.015						
Column   C				-	-	0.076		0.030	U 0.0	37 U	0.043	U 0.	036 U	0.030	U 0.036	U	U.030 L	0.025	U O	0.044 1	0.028	0 0	1.105 U	0.043	U 0.0	17 U	0.017	U 0.017	U	0.017	0.017	U	0.017	U 0.017	U 0.017		
				-	-	0.129	, ,	0.050	U 0.0	102 U	0.074	U 0.	002 U	0.050	U 0.061	U	0.050 L	0.043	U 0	1.074	0.048	0 0	.179 U	0.073	U 0.0	13 U	0.015	U 0.015	U U	0.015	0.015	U	0.015	U 0.015	U 0.015		
1.00   1.00					_			0.036	11 0.0	168 T	0.082	U 0.	067 U		U 0.068	- U	0.036 1		11 0	1.081	0.393			0.082							0.008	11	0.008		U 0.008		
Column   C					_			0.308	1 02	48 .1	0.046	U O	038 11		U 0.038	Ü	0.031		U	1.046	0.506			0.046							0.009	U	0.010		U 0.009		
PG 1971   PG 1987   PG 1					_																																
Part									J 0.0	30 U	0.035	U O	029 U			Ú				0.035					U 0.0	07 U					U 0.007						
Part   18			ug/kg			0.123	U			59 U	0.070	U O	059 U			J			UO	0.357		0	1.170 U								0.006			U 0.006	U 0.006		
Heat   125																																					
Fig. 138   35665282   Jug/lag   0.088   U 0.992   0.055   0.056   0.088   U 0.992   0.057   0.016   U 0.090   U 0.		31508006					U	0.571	0.0	56 U	0.066	U O	056 U	0.046	U 0.055	Ü	0.045 L	0.039		0.067	0.590			0.066	U 0.0	11 U		0.011			0.011	U	0.011	U 0.011			
CE   15   3006327		38380073					0	0.053	U 0.0	66 U	0.078	U 0.	066 U	0.054	U 0.065	U	0.053 L	0.046		0.079	0.051			0.078	U 0.00	os u		U 0.005			0.005	U	0.005	U 0.005			
REF   170   SSOCKSSS   Mark   Cont				-	-		5 U					J 0.	042 U			J									U 0.28	50		0.230									
Fig. 189   38665269   19g/kg   0.609   U   0.256   J   0.003   U   0.007   U   0.003   U   0.007   U   0.003   U   0.007   U				-	-		U U					U 0.	087 U			J J									U 0.20	5U		0.220									
Fig. 1848   Sp6-5969   ug/lg   0.075   U 0.015   U 0.02   U 0.027   U 0.015   U 0.02   U 0.027   U 0.006   U 0.006					+		· U									- 0		0.022																			
					_		1 12									- U																					
CE   187   S266/3699   ug/kg   0.099   V   0.213   J   0.048   U   0.059   V   0.077   U   0.089   V   0.077   U   0.089   V   0.077   U   0.089   V   0.078   U   0.078   U				_	_											Ü																					
F23 195				_	_											ŭ				0.057																	
PCB 209 2051243 ug/kg 0.151 U 0.059 U 0.073 U 0.073 U 0.073 U 0.073 U 0.075 U		52663782				0.129	Ú	0.050	U 0.0	62 U	0.074	U O	062 U	0.051	U 0.061	Ü	0.050 L	0.043	U 0	0.075	0.048	U 0	.180 U	0.074	U 0.0	09 U	0.009	U 0.009			U 0.009	Ü	0.009	U 0.009	U 0.009	U C	0.009 U
PCB 209 2051243 ug/kg 0.151 U 0.059 U 0.073 U 0.086 U 0.072 U 0.086 U 0.072 U 0.059 U 0.072 U 0.059 U 0.072 U 0.059 U 0.050 U 0.085 U 0.085 U 0.085 U 0.085 U 0.005 U						0.132	U	0.051	U 0.0	64 U	0.075	U O	063 U	0.052		U	0.051 L		UO	0.076	0.049							U 0.011	U			U	0.011	U 0.011	U 0.011		
Total PCBs SumModel 8 Ug/kg 22.7 180 4.02 U 8.34 3.98 2.77 1.92 2.33 3.56 1.56 U 1.33 U 3.95 8.87 5.59 U 2.29 U 1.4 2.1 1.2 0.751 0.326 U 0.326 U 0.326 U 0.331 1.3 0.706			ug/kg												U 0.072																				U 0.005		
	Total PCBs	Sun/VOAA18	ug/kg	22.7	180	4.02	U	8.34	3.5	98	2.77	- 1	92	2.33	3.56		1.56 L	1.33	U 3	3.95	8.87		5.59 U	2.29	U 1.4	1	2.1	1.2		0.751	0.326	U	0.326	U 0.831	1.3		0.706

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# Appendix C Tissue Concentrations and BEST Model Output

# TABLE C-1 STATISTICAL COMPARISONS OF N. virens BODY BURDENS VS. IOSN 2019 REFERENCE DATA

Compound	Units	<b>Pre-Test</b> <sup>d</sup> Mean Qual	IOSN 2019 Mean Qual	Composite Mean Qual
Trace Metals		<u> </u>	ì	`
Arsenic, total	mg/Kg	2.00	2.25	2.02 NS
Cadmium, total	mg/Kg	0.0300 b	0.0252 b	0.0338 bS
Chromium, total	mg/Kg	0.620 в	0.0686 b	0.551 bS
Copper, total	mg/Kg	1.49	1.20	1.12 NS
Lead, total	mg/Kg mg/Kg	0.195 0.0110 b	0.0744 0.0156 b	0.191 S 0.00662 abNS
Mercury, total Nickel, total	mg/Kg	0.476	0.0150 0	0.0002 abNS 0.232 S
Zinc, total	mg/Kg	13.1	18.6	14.1 NS/S e
PAH Compounds				
Acenaphthene	μg/Kg	0.620 a	0.563 ab	0.883 abNS
Acenaphthylene	μg/Kg	0.381 a	0.286 a	4.22 aNS
Anthracene Benzo(a)anthracene	μg/Kg μg/Kg	0.903 ab 0.775 a	0.310 a 0.581 a	0.610 abS 0.766 ac
Benzo(a)pyrene	μg/Kg μg/Kg	0.813 a	0.610 a	0.805 ac
Benzo(b)fluoranthene	μg/Kg	1.08 a	0.807 a	2.43 aS
Benzo(k)fluoranthene	μg/Kg	0.493 a	0.371 a	6.45 aS
Benzo(g,h,i)perylene	μg/Kg	0.345 a	0.259 a	0.427 abS
Chrysene	μg/Kg	0.752 a	0.564 a	1.14 abS
Dibenz(a,h)anthracene	μg/Kg	0.400 a	0.300 a	0.396 ac
Fluoranthene	μg/Kg	0.610 a	0.569 ab	6.71 bS
Fluorene Indeno(1,2,3-ed)pyrene	μg/Kg	1.07 b 0.810 a	0.431 ab 0.608 a	2.05 bS 0.802 ac
Naphthalene	μg/Kg μg/Kg	1.64 b	0.651 ab	1.60 abS
Phenanthrene	μg/Kg	0.677 a	2.04 b	0.861 abNS
Pyrene	μg/Kg	0.898 a	0.674 a	6.23 bS
Total PAHs	μg/Kg	12.3	9.63	36.4
PCB Congeners				
PCB 008 PCB 018	μg/Kg	0.0638 a 0.0465 a	0.0480 a 0.0349 a	0.0632 ac 0.0460 ac
PCB 018 PCB 028	μg/Kg μg/Kg	0.0463 a 0.0790 a	0.0549 a 0.0593 a	0.0460 ac 0.0784 ac
PCB 044	μg/Kg μg/Kg	0.0880 a	0.0661 a	0.0873 ac
PCB 052	μg/Kg	0.0491 a	0.0369 a	0.136 abS
PCB 066	μg/Kg	0.0462 a	0.0347 a	0.0457 ac
PCB 101	μg/Kg	0.0752 a	0.0564 a	0.0745 ac
PCB 105	μg/Kg	0.0675 a	0.0506 a	0.810 aS
PCB 118	μg/Kg	0.0713 a	0.0534 a	0.0706 ac
PCB 128 PCB 138	μg/Kg	0.0842 a 0.305 ab	0.0632 a 0.331 ab	0.0834 ac 0.462 aNS
PCB 153	μg/Kg μg/Kg	0.628 b	0.763	0.462 aNS 0.857 aNS
PCB 170	μg/Kg μg/Kg	0.0413 a	0.0310 a	0.0409 ac
PCB 180	μg/Kg	0.0423 a	0.0318 a	0.0419 ac
PCB 187	μg/Kg	0.256 a	0.0456 a	0.0601 ac
PCB 195	μg/Kg	0.0795 a	0.0596 a	0.0786 ac
PCB 206	μg/Kg	0.0810 a	0.0608 a	0.0802 ac
PCB 209 Total PCBs	μg/Kg	0.0928 a 4.39	0.0697 a 3.79	0.0920 ac 6.42
	μg/Kg	4.39	3.79	0.42
Pesticides Aldrin	μα/V α	0.0404 a	0.0605 a	0.0400 ac
cis-Chlordane	μg/Kg μg/Kg	0.0404 a 0.0870 a	0.131 a	0.0400 ac 0.0863 ac
trans-Chlordane	μg/Kg	0.0245 a	0.0369 a	0.0243 ac
cis-Nonachlor	μg/Kg	0.0117 a	0.0176 a	0.0116 ac
trans-Nonachlor	μg/Kg	0.0108 a	0.0161 a	0.0106 ac
Oxychlordane	μg/Kg	0.0501 a	0.0752 a	0.0495 ac
Total Chlordanes	μg/Kg	0.184	0.277	0.182
4,4'-DDT	μg/Kg	0.0159 a	0.0238 a	0.0158 ac
4,4'-DDD 4,4'-DDE	μg/Kg μg/Kg	3.29 ab 0.00737 a	0.0182 a 0.0111 a	0.665 S 0.00728 ac
Total DDT	μg/Kg μg/Kg	3.32	0.0531	0.688
Dieldrin	μg/Kg μg/Kg	0.0243 a	0.0365 a	0.0241 ac
alpha-Endosulfan	μg/Kg	0.0222 a	0.0334 a	0.0220 ac
beta-Endosulfan	μg/Kg	0.0115 a	0.0173 a	0.0113 ac
Total Endosulfans	$\mu g/Kg$	0.0337	0.0507	0.0333
Endrin	μg/Kg	0.0132 a	0.0199 a	0.0131 ac
Heptachlor	μg/Kg	0.0253 a	0.0379 a	0.0250 ac
Heptachlor epoxide Hexachlorobenzene	μg/Kg μg/Kg	0.0520 a 0.217 a	0.0780 a 0.326 a	0.0515 ac 0.215 ac
Lindane (gamma-BHC)	μg/Kg μg/Kg	0.217 a 0.0365 a	0.326 a 0.0548 a	0.215 ac 0.0361 ac
Methoxychlor	μg/Kg μg/Kg	0.0575 a	0.843 a	0.0568 ac
Toxaphene	μg/Kg	1.05 a	1.58 a	1.04 ac
		-	-	-

#### Notes

Mean concentrations are reported to 3 significant figures.

a = COC not detected (below MDL) in at least one replicate; mean value was calculated using one-half of the project specific MDL for non-detected values.

b = COC concentration estimated (detected below RL but above MDL) in at least one replicate; mean value calculated using estimated value.

c = COC was not detected in either the dredge tissue replicates or in the historic reference tissue, therefore was eliminated from further evaluation.

<sup>&</sup>lt;sup>d</sup> Pre-test tissue represents the mean of three replicates, whereas the reference and site composites represent a mean of 5 replicates.

<sup>&</sup>lt;sup>e</sup> Analysis conducted after removal of a statistical outlier.

# TABLE C-2 STATISTICAL COMPARISONS OF *M. nasuta* BODY BURDENS VS. IOSN 2019 REFERENCE DATA

Compound	Units	Pre-Test <sup>d</sup> Mean Qual	IOSN 2019 Mean Qual	Composite Mean Qual
Trace Metals			,	
Arsenic, total	mg/Kg	2.59	3.49	2.54 NS
Cadmium, total	mg/Kg	0.0297 b	0.0290 Ь	0.0266 bNS
Chromium, total	mg/Kg	0.465	0.334 b	0.434 bNS
Copper, total	mg/Kg mg/Kg	3.10 0.129	1.77 0.349	2.71 S 0.452 S
Lead, total Mercury, total	mg/Kg mg/Kg	0.00185 a	0.00170 a	0.432 S 0.00208 ac
Nickel, total	mg/Kg	0.713	0.521	0.570 NS/S <sup>c</sup>
Zinc, total	mg/Kg	11.6	11.8	12.8 NS
PAH Compounds				
Acenaphthene	μg/Kg	1.07 ab	0.453 a	1.56 abNS
Acenaphthylene	μg/Kg	0.378 a	0.279 a	0.381 ac
Anthracene Benzo(a)anthracene	μg/Kg μg/Kg	0.853 ab 1.32 ab	0.302 a 0.565 a	2.69 bS 5.40 bS
Benzo(a)pyrene	μg/Kg	0.805 a	0.594 a	1.74 abS
Benzo(b)fluoranthene	μg/Kg	1.07 a	0.786 a	4.41 bS
Benzo(k)fluoranthene	μg/Kg	0.490 a	0.455 ab	1.25 abS
Benzo(g,h,i)perylene	μg/Kg	0.342 a	0.518 ab	0.820 abNS
Chrysene	μg/Kg	2.01 b	0.550 a	2.92 bS
Dibenz(a,h)anthracene Fluoranthene	μg/Kg α/V.α	0.559 ab 2.57 b	2.97 b 2.12 b	0.400 aNS 26.6 S
Fluorene	μg/Kg μg/Kg	2.11 b	0.253 a	1.74 bS
Indeno(1,2,3-cd)pyrene	μg/Kg	0.803 a	3.54 b	0.985 abNS
Naphthalene	μg/Kg	3.78 b	0.390 a	1.77 bS
Phenanthrene	μg/Kg	4.09 b	1.97 b	6.92 bS
Pyrene	μg/Kg	2.86 b	1.63 b	20.8 S
Total PAHs	μg/Kg	25.1	17.4	80.4
PCB Congeners				
PCB 008	μg/Kg	0.0633 a	0.0467 a	0.0639 ac
PCB 018	μg/Kg	0.0461 a	0.0340 a	0.0465 ac
PCB 028	μg/Kg	0.0783 a	0.0578 a	0.0791 ac 0.0883 ac
PCB 044 PCB 052	μg/Kg μg/Kg	0.0873 a 2.09	0.0644 a 0.0359 a	0.0883 ac 0.172 aS
PCB 066	μg/Kg μg/Kg	0.0457 a	0.0339 a 0.0338 a	0.172 as 0.0462 ac
PCB 101	μg/Kg μg/Kg	0.0745 a	0.0550 a	0.0754 ac
PCB 105	μg/Kg	0.0668 a	0.0493 a	0.0675 ac
PCB 118	μg/Kg	0.0708 a	0.0522 a	0.142 abS
PCB 128	μg/Kg	0.0835 a	0.0616 a	0.0843 ac
PCB 138	μg/Kg	0.392 a	0.0394 a	0.0539 ac
PCB 153 PCB 170	μg/Kg α/V.α	0.111 a 0.0410 a	0.0820 a 0.0303 a	0.142 abS 0.0414 ac
PCB 170	μg/Kg μg/Kg	0.0410 a 0.0419 a	0.0309 a	0.0414 ac 0.0423 ac
PCB 187	μg/Kg	0.0603 a	0.0445 a	0.0607 ac
PCB 195	μg/Kg	0.0787 a	0.0580 a	0.0794 ac
PCB 206	μg/Kg	0.0803 a	0.0594 a	0.0810 ac
PCB 209	μg/Kg	0.0920 a	0.0680 a	0.0929 ac
Total PCBs	μg/Kg	7.22	1.81	2.92
Pesticides				
Aldrin	μg/Kg	0.0200 a	0.0296 a	0.0202 ac
cis-Chlordane	μg/Kg	0.0432 a	0.0638 a	0.0436 ac
trans-Chlordane cis-Nonachlor	μg/Kg	0.0122 a 0.00582 a	0.0180 a 0.00870 a	0.0123 ac 0.00587 ac
trans-Nonachlor	μg/Kg μg/Kg	0.00582 a 0.00533 a	0.00870 a 0.00780 a	0.00538 ac
Oxychlordane	μg/Kg μg/Kg	0.0248 a	0.0366 a	0.0250 ac
Total Chlordanes	μg/Kg	0.0913	0.135	0.0922
4,4'-DDT	μg/Kg	0.00788 a	0.0117 a	0.00796 ac
4,4'-DDD	μg/Kg	0.00598 a	0.00880 a	0.391 S
4,4'-DDE	μg/Kg	0.00365 a	0.219 Ь	0.499 S
Total DDT	μg/Kg	0.0175	0.240	0.898
Dieldrin alpha-Endosulfan	μg/Kg μg/Kg	0.0121 a 0.0110 a	0.0178 a 0.0163 a	0.0122 ac 0.0111 ac
beta-Endosulfan	μg/Kg μg/Kg	0.00568 a	0.00840 a	0.0111 ac 0.00573 ac
Total Endosulfans	μg/Kg μg/Kg	0.0167	0.0247	0.0168
Endrin	μg/Kg	0.00653 a	0.00970 a	0.00662 ac
Heptachlor	$\mu g/Kg$	0.0125 a	0.0186 a	0.0127 ac
Heptachlor epoxide	μg/Kg	0.0257 a	0.0381 a	0.0260 ac
Hexachlorobenzene	μg/Kg	0.108 a	0.159 a	0.109 ac
Lindane (gamma-BHC) Methoxychlor	μg/Kg ug/Kg	0.0181 a 0.0285 a	0.0267 a 0.411 a	0.0183 ac 0.0287 ac
Toxaphene	μg/Kg μg/Kg	0.0283 a 0.518 a	0.411 a 0.767 a	0.0287 ac 0.524 ac
2piteite	MP/17E	1 0.5.5 %		1 0.527 40

#### Notes:

Mean concentrations are reported to 3 significant figures.

NS = Not Significant - mean tissue body burden was not statistically different from the associated reference site mean body burden. Statistical significance accepted at  $\alpha$ =0.05. S = Significant - mean tissue body burden was statistically different, greater than the associated reference site mean body burden. Statistical significance accepted at  $\alpha$ =0.05.

a = COC not detected (below MDL) in at least one replicate; mean value was calculated using one-half of the project specific MDL for non-detected values.

b = COC concentration estimated (detected below RL but above MDL) in at least one replicate; mean value calculated using estimated value.

c = COC was not detected in either the dredge tissue replicates or in the historic reference tissue, therefore was eliminated from further evaluation.

 $<sup>^{\</sup>rm d}$  Pre-test tissue represents the mean of three replicates, whereas the reference and site composites represent a mean of 5 replicates.

<sup>&</sup>lt;sup>e</sup> Analysis conducted after removal of a statistical outlier.

# **BRAMS**

Project name: Yachtsman Marina, Kennebunkport, ME

**Project number:** 

Model filename: EPA Reg 1 Template wChemical List.best

Chemical filename: Chemical\_List\_for\_EPA\_Reg1\_template (in progress).xlsx

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Nereis virens	12

#### **Human Subreport**

Human: Adult Angler

Total Estimated Risks From Organics(see EPA Table Xa)

Receptor: Adult Angler
Organism: Macoma nasuta

		Cancer Risk	Non-Cancer Risk
Composite (10 Stations at		Fish	n Fillet
	Test	6.01E-6	3.72E-2
	Reference	1.66E-6	1.74E-2
		Nerei	s virens
	Test	0	0
	Reference	0	0
		Macon	na nasuta
	Test	6.23E-6	3.84E-2
	Reference	1.72E-6	1.8E-2
		Total	Lobster
	Test	3.1E-5	1.92E-1
	Reference	8.57E-6	9E-2

	Cancer Risk	Non-Cancer Risk
	Lobster He	patopancreas
Test	2.14E-5	1.33E-1
Reference	5.91E-6	6.21E-2
	Lobste	er Muscle
Test	9.62E-6	5.96E-2
Reference	2.66E-6	2.79E-2

#### Total Estimated Risks From Organics(see EPA Table Xa)

Receptor: Adult Angler
Organism: Nereis virens

		Cancer Risk	Non-Cancer Risk			
Composite (10 Stations at		Fish Fillet				
	Test	5.09E-6	8.9E-2			
	Reference	1.63E-6	3.72E-2			
		Nerei	s virens			
	Test	6.12E-6	1.08E-1			
	Reference	1.97E-6	4.51E-2			
		Macoma nasuta				
	Test	0	0			
	Reference	0	0			
		Total	Lobster			
	Test	2.63E-5	4.59E-1			
	Reference	8.39E-6	1.92E-1			
		Lobster He	patopancreas			
	Test	1.81E-5	3.17E-1			
	Reference	5.79E-6	1.32E-1			
		Lobste	er Muscle			
	Test	8.14E-6	1.42E-1			
	Reference	2.6E-6	5.95E-2			

# Seafood Non-Cancer Risks (see EPA Table 6a, Columns F & G)

Receptor: Adult Angler
Organism: Macoma nasuta

			Non-Cancer Risk		
Composite (10 Stations at	Connor	Test	0		
4 Marinas Mud)	Copper	Reference	0		
	Load	Test	0		
	Lead	Reference	0		
	Niekol	Test	0		
	Nickel	Reference	0		

# Seafood Non-Cancer Risks (see EPA Table 6a, Columns F & G)

Receptor: Adult Angler
Organism: Nereis virens

			Non-Cancer Risk
Composite (10 Stations at	Cadmium	Test	2.9E-3
4 Marinas Mud)	Cadmium	Reference	2.16E-3
	Chromium	Test	1.57E-2
	Chromium	Reference	1.96E-3
	Load	Test	0
	Lead	Reference	0
	Niekol	Test	0
	Nickel	Reference	0
	7in o	Test	4.02E-3
	Zinc	Reference	5.31E-3

# FDA Action Limit/Tolerance (see EPA Table 3, Columns D & E)

Receptor: Adult AnglerOrganism: Macoma nasuta

	Contaminant	FDA Action Level (mg/kg)	Steady State Corrected Mean Tissue Concentration (mg/kg)
Composite (10 Stations	Total PCBs	2E3	6.47E0
Composite (10 Stations	Mercury	1E0	2.08E-3
Composite (10 Stations	Total DDT	5E3	1.56E0
Composite (10 Stations	Total Chlordanes	3E2	1.53E-1

# FDA Action Limit/Tolerance (see EPA Table 3, Columns D & E)

Receptor: Adult Angler
Organism: Nereis virens

	Contaminant	FDA Action Level (mg/kg)	Steady State Corrected Mean Tissue Concentration (mg/kg)
Composite (10 Stations	Total PCBs	2E3	1.42E1
Composite (10 Stations	Mercury	1E0	6.62E-3
Composite (10 Stations	Total DDT	5E3	1.36E0
Composite (10 Stations	Total Chlordanes	3E2	3.04E-1

Ecological Effects Level (see EPA Table 8a.1, Columns D & E)

Receptor: Adult Angler
Organism: Macoma nasuta

	Contaminant	Ecological Effect Level (mg/kg)	Steady State Corrected Mean Tissue Concentration (mg/kg)
Composite (10 Stations	Anthracene	3.75E3	2.69E0
Composite (10 Stations	Benzo(a)pyrene	8E3	3.47E0
Composite (10 Stations	PAH Total	1E4	8.04E1
Composite (10 Stations	Total PCBs	4E3	6.47E0
Composite (10 Stations	Aldrin	2.99E2	2.02E-2
Composite (10 Stations	Dieldrin	4.37E0	1.64E-2
Composite (10 Stations	Endosulfans	2.86E0	1.69E-2
Composite (10 Stations	Arsenic	1.26E1	2.54E0
Composite (10 Stations	Cadmium	3.03E0	2.66E-2
Composite (10 Stations	Chromium	1.18E1	4.34E-1
Composite (10 Stations	Copper	9.6E0	2.71E0
Composite (10 Stations	Lead	1.19E1	4.52E-1
Composite (10 Stations	Mercury	2E-1	2.08E-3
Composite (10 Stations	Nickel	3.8E0	5.7E-1
Composite (10 Stations	Zinc	1.52E3	1.28E1
Composite (10 Stations	Total DDT	3E3	1.56E0

# Ecological Effects Level (see EPA Table 8a.1, Columns D & E)

Receptor: Adult Angler
Organism: Nereis virens

	Contaminant	Ecological Effect Level (mg/kg)	Steady State Corrected Mean Tissue Concentration (mg/kg)
Composite (10 Stations	Anthracene	3.75E3	6.1E-1
Composite (10 Stations	Benzo(a)pyrene	8E3	1.61E0
Composite (10 Stations	PAH Total	1E4	3.64E1
Composite (10 Stations	Total PCBs	4E3	1.42E1
Composite (10 Stations	Aldrin	2.99E2	4E-2
Composite (10 Stations	Dieldrin	4.37E0	3.25E-2
Composite (10 Stations	Endosulfans	2.86E0	3.33E-2
Composite (10 Stations	Arsenic	1.26E1	2.02E0
Composite (10 Stations	Cadmium	3.03E0	3.38E-2
Composite (10 Stations	Chromium	1.18E1	5.51E-1
Composite (10 Stations	Copper	9.6E0	1.12E0
Composite (10 Stations	Lead	1.19E1	1.91E-1
Composite (10 Stations	Mercury	2E-1	6.62E-3
Composite (10 Stations	Nickel	3.8E0	2.32E-1
Composite (10 Stations	Zinc	1.52E3	1.41E1
Composite (10 Stations	Total DDT	3E3	1.36E0

# FDA Level of Concern (see EPA Table 7a, Columns B & D)

Receptor: Adult Angler
Organism: Macoma nasuta

	Contaminant	FDA Level of Concern(mg/kg)	Steady State Corrected Mean Tissue Concentration (mg/kg)
Composite (10 Stations	Arsenic	8.6E1	2.54E0
Composite (10 Stations	Cadmium	3.7E0	2.66E-2
Composite (10 Stations	Chromium	1.3E1	4.34E-1
Composite (10 Stations	Lead	1.7E0	4.52E-1
Composite (10 Stations	Nickel	8E1	5.7E-1

#### FDA Level of Concern (see EPA Table 7a, Columns B & D)

Receptor: Adult Angler
Organism: Nereis virens

	Contaminant	FDA Level of Concern(mg/kg)	Steady State Corrected Mean Tissue Concentration (mg/kg)
Composite (10 Stations	Arsenic	8.6E1	2.02E0
Composite (10 Stations	Cadmium	3.7E0	3.38E-2
Composite (10 Stations	Chromium	1.3E1	5.51E-1
Composite (10 Stations	Lead	1.7E0	1.91E-1
Composite (10 Stations	Nickel	8E1	2.32E-1

#### **Selected Chemicals**

#### **Invertebrate Name**

Macoma nasuta

	Composite (10
118	X
153	X
4,4'-DDD	Х
4,4'-DDE	Х
Anthracene	X
Benzo(a)anthracene	X
Benzo(a)pyrene	×
Benzo(b)fluoranthene	×
Benzo(k)fluoranthene	×
Chrysene	×
Fluoranthene	X
Fluorene	X
Naphthalene	X
PAH Total	×
Phenanthrene	X
Pyrene	X
Total DDT	Х
Total PCBs	Х
Copper	Х
Lead	Х
Nickel	Х

	Composite (10
105	Х
4,4'-DDD	Х
52	Х
Anthracene	X
Benzo(b)fluoranthene	Х
Benzo(g,h,i)perylene	Χ
Benzo(k)fluoranthene	X
Chrysene	X
Fluoranthene	X
Fluorene	X
Naphthalene	X
PAH Total	Χ
Pyrene	X
Total DDT	X
Total PCBs	X
Cadmium	X
Chromium	X
Lead	Х
Nickel	Х
Zinc	X

Software version: BRAMS 4.0 Last date: 11/28/2023

User name: \*

## Appendix D Elutriate Chemistry Results

Kennebunkport River Projects			ME WQC	Elutriate Average	Q	Site Water Average	Q	Lab Water Average	Q
Parameter	CAS Number	Units							
Metals									
Arsenic	7440382	ug/L	69	3.67		1.22		0.140	U
Cadmium	7440439	ug/L	33	0.295	U	0.30	U	0.295	U
Hexavalent Chromium	18540299	ug/L	1108	1.50	U	1.50	U	1.50	U
Copper	7440508	ug/L	5.78	1.92	U	1.92	U	1.92	U
Lead	7439921	ug/L	221	1.72	U	1.72	U	1.72	U
Mercury	7439976	ug/L	2.1	0.010	U	0.010	U	0.010	U
Nickel	7440020	ug/L	75	2.78	U	2.78	U	2.78	U
Selenium	7782492	ug/L	291	0.115	*	0.065	Ū	0.560	U
Silver	7440224	ug/L	2.24	0.815	U	0.82	U	0.815	U
Zinc	7440666	ug/L	95	17.1	U	17.1	U	17.1	U
Industrial Chemicals	1110000	<u> </u>	, ,	2112		2772		2772	
Pentachlorophenol	87865	ug/L	13	0.290	U	0.224	U	0.222	U
Pesticides	0.000	~6/ 12	10	5.250	Ť	5.221	Ť	0.222	Ť
4,4`-DDT	50293	ug/L	0.13	0.00012	U	0.00008	U	0.00008	U
Aldrin	309002	ug/L ug/L	1.3	0.00012	U	0.00016	U	0.00016	U
Alpha-Chlordane (cis)	5103719	ug/L	1.0	0.00023	U	0.00008	U	0.00008	U
Dieldrin	60571	ug/L	0.71	0.000011	U	0.00004	U	0.00004	U
Chlorpyrifos	2921882	ug/L ug/L	0.011*	0.00001	U	0.00004	U	0.00004	U
Endosulfan I	959988	ug/L ug/L	0.034	0.00011	U	0.00008	U	0.00008	U
Endosulfan II	33213659		0.034	0.00011	U	0.00003	U	0.00003	U
Endosulari ii Endrin	72208	ug/L	0.034	0.00010	U	0.00007	U	0.00007	U
	5103742	ug/L	0.037	0.00012	U	0.00008	U	0.00008	U
Gamma-Chlordane (trans)		ug/L	0.052		U		U		U
Heptachlor	76448	ug/L	0.053	0.00008		0.00006		0.00006	_
Heptachlor epoxide	1024573	ug/L	0.053	0.00010	U	0.00007	U	0.00007	U
Lindane	58899	ug/L	0.16	0.00007	U	0.00005	U	0.00005	U
Toxaphene	8001352	ug/L	0.21	0.00365	U	0.00257	U	0.00257	U
Chlordane (alpha + gamma)	SUMCHLOR	ug/L	0.09	0.00016	U	0.00011	U	0.00011	U
PCBs	24002407			0.00010		0.00007		0.00007	
PCB 008	34883437	ug/L		0.00010	U	0.00007	U	0.00007	U
PCB 018	37680652	ug/L		0.00013	U	0.00009	U	0.00009	U
PCB 028	7012375	ug/L		0.00013	U	0.00009	U	0.00009	U
PCB 044	41464395	ug/L		0.00008	U	0.00006	U	0.00006	U
(PCB 049)	41464408	ug/L		0.00028	J	0.00005	U	0.00005	U
PCB 052	35693993	ug/L		0.00037	J	0.00005	U	0.00005	U
PCB 066	32598100	ug/L		0.00010	U	0.00007	U	0.00007	U
(PCB 087)	38380028	ug/L		0.00013	U	0.00009	U	0.00009	U
PCB 101	37680732	ug/L		0.00016	U	0.00011	U	0.00011	U
PCB 105	32598144	ug/L		0.00011	U	0.00008	U	0.00008	U
PCB 118	31508006	ug/L		0.00009	U	0.00006	U	0.00006	U
PCB 128	38380073	ug/L		0.00011	U	0.00008	U	0.00008	U
PCB 138	35065282	ug/L		0.00008	U	0.00005	U	0.00005	U
PCB 153	35065271	ug/L		0.00009	*	0.00004	U	0.00004	U
PCB 170	35065306	ug/L		0.00012	U	0.00008	U	0.00008	U
PCB 180	35065293	ug/L		0.00010	U	0.00007	U	0.00007	U
(PCB 183)	52663691	ug/L		0.00011	U	0.00007	U	0.00007	U
(PCB 184)	74472483	ug/L		0.00010	U	0.00007	U	0.00007	U
PCB 187	52663680	ug/L		0.00007	U	0.00005	U	0.00005	U
PCB 195	52663782	ug/L		0.00006	U	0.00004	U	0.00004	U
PCB 206	40186729	ug/L		0.00013	U	0.00009	U	0.00009	U
PCB 209	2051243	ug/L		0.00006	U	0.00004	U	0.00004	U
Total PCBs	SumNOAA18	ug/L	0.03	0.00416		0.00243	U	0.00243	U
Notes	i '				•		•		•

Notes

Non-detects are reported as 1/2 the MDL

Half the MDL was used for U-qualified values to calculate summary and average values

Yellow=exceedance of water quality criteria

Total PCBs were calculated using the NOAA 18 method

Total PCB WQC is for chronic exposure as no acute exposure value available

U: Compound was analyzed for but was not detected (non-detect)

J: Indicates an estimated value

<sup>\*</sup> indicates average includes detects and non-detects



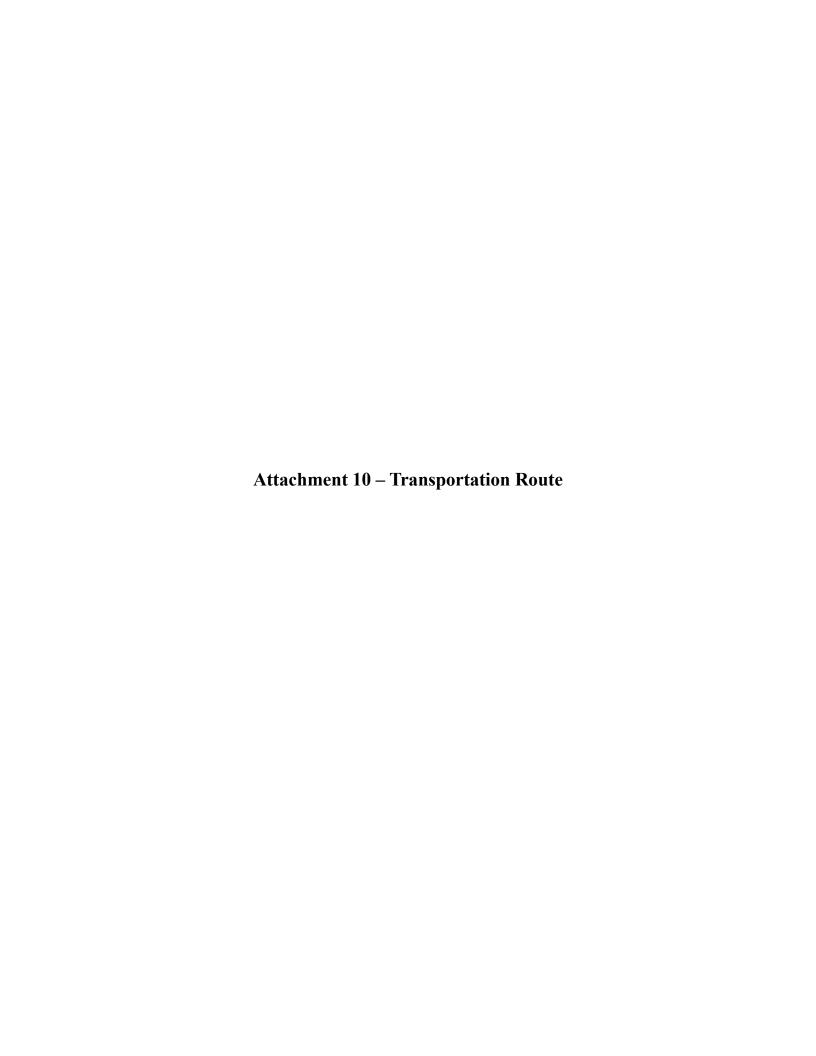
#### 9.0 List of Authorizations Required for Project

The following authorizations are required by federal, state, and local agencies to conduct the proposed dredging work at the Yachtsman Marina:

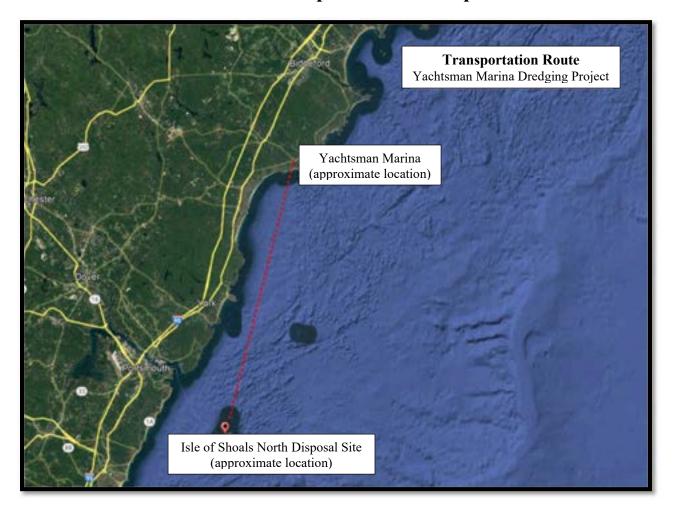
Authorization	Regulatory Entity	Status
Individual Standard Permit	U.S. Army Corps of Engineers	Application included herein
Section 408	U.S. Army Corps of Engineers	Submitted concurrently with this Individual Standard Permit
Individual NRPA Permit	Maine Department of Environmental Protection	Submitted concurrently with this Individual Standard Permit
Kennebunk River Committee Approval	Town of Kennebunkport/Kennebunk	To be submitted in late winter/early spring 2025
Kennebunk River Harbor Master Approval	Town of Kennebunkport/Kennebunk	To be submitted in late winter/early spring 2025
Activities and Land Use Permit	Town of Kennebunkport	To be submitted following Kennebunk River Committee/ Harbor Master approval
Site Plan Review	Town of Kennebunkport	To be submitted following Kennebunk River Committee/ Harbor Master approval
Flood Hazard Development Permit	Town of Kennebunkport	To be submitted following Kennebunk River Committee/ Harbor Master approval

#### **Water Quality Certification**

The Maine Department of Environmental Protection (DEP) "has combined the decision concerning water quality certification with the review of an application for a state permit that already requires compliance with state water quality standards...the issuance of the order approving the project constitutes both the state permit and the water quality certification." The project team is filing a Maine DEP Natural Resources Protection Act (NRPA) Permit Application concurrently with this Pre-Construction Notification Application. In accordance with the statement quoted above, the NRPA Permit Approval will constitute both the state permit and the Water Quality Certification and can be provided to the USACE upon receipt.



#### 10.0 Isle of Shoals North Disposal Site Transportation Route



<u>Location</u>: The Isle of Shoals North (IOSN) Disposal Site is located in the Gulf of Maine, approximately 20 km (10.8 nmi) east of Portsmouth, New Hampshire, 17.7 km (9.55 nmi) southeast of Kittery, Maine, and 11.2 km (6.04 nmi) north of Eastern Island, the closest within the Isle of Shoals. The site is defined as a 2,600 m (8,530 ft) diameter circle on the seafloor with its center located at 70° 26.995' W and 43° 1.142' N.

<u>Route:</u> From the Yachtsman Marina, navigate in a southerly direction towards the mouth of the Kennebunk River, then in a southwestern direction through the Gulf of Maine to the IOSN Disposal Site. The total transportation route distance from the Kennebunkport Marina to the IOSN Disposal Site is 23 nautical miles.

<u>Estimated Number of Trips to IOSN:</u> The estimated quantity of dredge material expected to be removed from the Yachtsman Marina is 6,400 cubic yards. It is estimated that the dredge scow that will be used to transport sediment to the IOSN Disposal Site will have between 500 and 600 cubic yards of capacity, which would result in 11 to 13 trips to the IOSN Disposal Site.

Maine DEP NRPA Individual Permit Application (Submitted on November 22, 2024)

# Maine DEP Natural Resources Protection Act (NRPA) Permit Application

For

Yachtsman Marina 57 Ocean Ave Kennebunkport, Maine

November 22, 2024

#### **Applicant**

KPT Marine, LLC P.O. Box 2734 Kennebunkport, Maine

Prepared By:



One Karen Drive, Suite 2A Westbrook, Maine 207.553.9898



November 22, 2024

Maine Department of Environmental Protection 312 Canco Road Portland, Maine 04103

RE: Individual NRPA Permit Application Yachtsman Marina Kennebunkport, Maine 04046

To Whom it May Concern,

On behalf of KPT Marine, LLC (Applicant), Walsh Engineering Associates, Inc. (WEA), is pleased to submit the enclosed Natural Resources Protection Act (NRPA) application for the proposed dredging activities to take place in the Kennebunk River located adjacent to the Yachtsman Marina.

The Yachtsman Marina is located at 57 Ocean Ave in Kennebunkport, Maine, with 600 feet of frontage along the Kennebunk River. The Town of Kennebunkport Assessor's Office identifies the parcel as Map 10, Block 1, Lot 3. The facility consists of an active marina with 58 boat slips. The proposed dredge area is coincidental with the area that was previously permitted under Maine DEP Permit #L-18612-4E-A-N in 1994. Since that time, the Yachtsman Marina was dredged in 2005 under Permit ##L-18612-4E-B-N, and in Winter 2015-2016 under Maine DEP's Permit by Rule (PBR) process and U.S. Army Corps of Engineers (USACE) Permit #NAE-2004-319.

A copy of this application has been sent to the USACE Maine Project Office, as well as the Town of Kennebunkport Planning & Code Enforcement Department. WEA has notified the applicable abutting parties of the proposed development and has provided the notice of intent to file to the *Portland Press Herald* for publication. On behalf of the applicant, thank you in advance for your review of this application. We look forward to working with you and the department to make this project successful.

Respectfully,

Leyna Tobey, PE – Project Manager Walsh Engineering Associates, Inc.

Leyna L. Toberg

cc. KPT Marine, LLC; Shawn Dumas

Enc. NRPA Application & Supporting Documents

## Table of Contents Maine DEP – NRPA Application

#### Yachtsman Marina Kennebunkport, ME 04046

NRPA Permit Application Proof of Payment Agent Authorization Certificate of Good Standing Deed/Lease

Activities Description	Attachment 1
Alternatives Analysis	
Site Location Map	
Photo Log	
Site Plan	
Additional Plan (Section Views)	
Construction Plan	
Erosion and Sedimentation Control Plan	
Site Conditions Report	Attachment 9
Notice of Intent to File	
Historic Sites	Attachment 11
Functional Assessment	Attachment 12
Wetland Compensation Plan	Attachment 13
Sampling and Analysis Plan	Attachment 14
Disposal Site Transportation Route	Attachment 15
Notice to Fisherman	Attachment 16
<u>Appendices</u>	
MDEP Visual Evaluation Field Survey Checklist	Appendix A
MDEP Coastal Wetland Field Survey Checklist	
Supplemental Information for Dredging Activities	Appendix C
Sediment Sampling Results	Appendix D

Department of Environmental Protection Bureau of Land Resources 17 State House Station Augusta, Maine 04333 Telephone: 207-287-7688

FOR DEP USE	
ATS #	
L	
Total Fees:	
Date Received:	

#### APPLICATION FOR A NATURAL RESOURCES PROTECTION ACT PERMIT

<sup>1</sup> Name of Applicant: KPT Marine, LLC (c/o Shawn Dumas)					<sup>5</sup> Name of Agent: Walsh Engineering Associates, Inc.				
<sup>2</sup> Applicant's Mailing Address: PO Box 2734, Kennebunkport, ME 04046			)4046	<sup>6</sup> Agent's Mailing Address:  1 Karen Drive, Suite 2A Westbrook, Maine 04092					
<sup>3</sup> Applicant's Daytime Ph	one: 207-590-1	1658	3	Agent's	Dayti	ime Phon	ie: 20	7-55	3-9898
<sup>4</sup> Applicant's Email Addr shawn@kenneb		ı.co		_		il Addres @walsh		.com	
<sup>9</sup> Location of Activity (ne 57 Ocean Av	arest Road, Street	t, Rt.	#): <sup>1</sup>	<sup>10</sup> Town:	Kenn	nebunkp	oort	<sup>1</sup> Coun	ty: York
12 Type of Resource: (Check all that apply)  □ Great Pond □ Great Wetland □ Freshwater Wetl □ Wetland Special □ Significant Wild □ Fragile Mountain			d gnificance	13 Name of Resource: Kennebunk River  14 Amount of Impact (sq. ft.): 61,000 SF (1.4 acres) Fill: 0 CY Dredging/Veg Removal/Other: 6,400 CY				, ,	
15 Type of Wetland:	☐ Forested					ESHWAT			
(Check all that apply)	ll that apply) □ Scrub Shrub □ Emergent □ 0-4, □ Wet Meadow □ 5,000		Tier 1  □ 0 - 4,999 sq.: □ 5,000 - 9,999 □ 10,000 - 14,9	ft. 9 sq. ft. 15,000 – 43,560 sq. ft. $\square > 43,560$ sq. ft. $\square$ Smaller than 43,		→ 23,560 sq. ft. or → Smaller than 43,560 sq. ft., not eligible for			
Dredging of the Kennebu	<sup>16</sup> Proposed Start Date <u>and</u> Brief Activity Description:  Dredging of the Kennebunk River at the Yachtsman Marina to provide adequate depth for navigation; Winter 2025-2026.								
<sup>17</sup> Size of Lot or Parcel & UTM Locations:	square	e feet,	, or <u>1.70 acr</u> es	UTM N	orthing	g: 4801 <u>524.</u>	69 m N,	UTM E	Easting: 19 T 380503.11 m E
18 Title, Right or Interest: ☐ Own 🖾 Leas		e Opt	tion 🔲 W	ritten Ag	greeme	ent			
<sup>19</sup> Deed Reference Number Book: 17585	Page: 540			<sup>20</sup> Map and Lot Numbers: Map: 10 Block: 1 Lot: 3					
<sup>21</sup> DEP Staff Previously C	Alex C	Sir Grob	ois Iewski	22 Part of a larger project: After-the-Fact: ☐ Yes ☑ No ☐ Yes ☑ No					
23 Resubmission of Applic ■ Yes □ No		If ye	s, previous appli	ication #:		Previous	proje	ct mar	nager:
Written Notice of Viola  ☐ Yes ☑ No	ation?		es, name of DEP olved:	enforce	ment s	staff 25		ous W l Yes	etland Alteration: ☑ No
<sup>26</sup> <b>Detailed Directions to t</b> turn right onto US-1 South,	he Project Site: If then left onto Log	From Cabin	Portland, take I-9 n Road; left onto N	5 South; Maine Str	exit 32 eet;rig	2, route M ht onto M	IE-111 E-9; th	, then onen 2nd	onto Precourt Street; d left onto Ocean Ave
TIER 1				TIER 2	2/3 AN	ND INDI	VIDU.	AL PE	ERMITS
☐ Photos of Area ☐ Statement of Avoidance & Minimization ☐ Statement/Copy of cover letter to MHPC ☐ Wetlands Delinea (Attachment 1) th Information listed  ✓ Alternatives Analy			opographic Map opy of Public Notic formation Meeting (etlands Delineation attachment 1) that conformation listed un-	Functional Assessment (Attachment 3), if required  In Documentation ion Report at contains the under Site Conditions arise (Attachment 2)  In Functional Assessment (Attachment 3), if required  In Compensation Plan (Attachment 4), if required  In Appendix A and others, if required  In Statement/Copy of cover letter to MHPC  In Description of Previously Mined					
)	impacts were Avoided/Minimized  FEES, CERTIFICATIONS AND SIGNATURES LOCATED ON PAGE 2								

<sup>28</sup> FEES							
FEE: I will pay the Natural Resources Protection Act Permit fee (https://www.maine.gov/dep/feeschedule.pdf) by:							
☑ Credit Card – Pay online through the <u>Payment Portal</u> . (Attach payment confirmation when filing this application form.)							
□ Check – Fill in all the information below and mail a copy of this form (without attachments) and a check made payable to "Treasurer, State of Maine," to: Maine DEP, 17 State House Station, Augusta, ME 04333-0017.							
Name:	Phone:	Ext.	Check #:	Email Filing Date:			

## IMPORTANT IF THE SIGNATURE BELOW IS NOT THE APPLICANT'S SIGNATURE, ATTACH LETTER OF AGENT AUTHORIZATION SIGNED BY THE APPLICANT.

By signing below the applicant (or authorized agent), certifies that he or she has read and understood the following:

#### **DEP SIGNATORY REQUIREMENT**

#### PRIVACY ACT STATEMENT

Authority: 33 USC 401, Section 10; 1413, Section 404. Principal Purpose: These laws require permits authorizing activities in or affecting navigable waters of the United States, the discharge of dredged or fill material into waters of the United States, and the transportation of dredged material for the purpose of dumping it into ocean waters. Disclosure: Disclosure of requested information is voluntary. If information is not provided, however, the permit application cannot be processed nor a permit be issued.

#### **CORPS SIGNATORY REQUIREMENT**

USC Section 1001 provides that: Whoever, in any manner within the jurisdiction of any department or agency of the United States knowingly and willfully falsifies, conceals, or covers up any trick, scheme, or disguises a material fact or makes any false, fictitious or fraudulent statements or representations or makes or uses any false writing or document knowing same to contain any false, fictitious or fraudulent statements or entry shall be fines not more than \$10,000 or imprisoned not more than five years or both. I authorize the Corps to enter the property that is subject to this application, at reasonable hours, including buildings, structures or conveyances on the property, to determine the accuracy of any information provided herein.

#### **DEP SIGNATORY REQUIREMENT**

"I certify under penalty of law that I have personally examined the information submitted in this document and all attachments thereto and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe the information is true, accurate, and complete. I authorize the Department to enter the property that is the subject of this application, at reasonable hours, including buildings, structures or conveyances on the property, to determine the accuracy of any information provided herein. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

Further, I hereby authorize the DEP to send me an electronically signed decision on the license I am applying for with this application by emailing the decision to the address located on the front page of this application (see #4 for the applicant and #8 for the agent)."

Leyna L. Tobery	Tobey, PE 34-05'00'	Date: 11/20/2024	
SIGNATURE OF AC	GENT/APPLICANT		
Signature of Agent: _	See Attached Agent Authorization	Date:	

NOTE: Any changes in activity plans must be submitted to the DEP and the Corps in writing and must be approved by both agencies prior to implementation. Failure to do so may result in enforcement action and/or the removal of the unapproved changes to the activity.

#### State of Maine DEP Payment Receipt

Contact Informa: Leyna Tobey - 1 Karen Drive, Suite 2A, Westbrook, ME, 04092

(207) 553-9898

leyna@walsh-eng.com

Product	Reference Number	Customer Number	Payment Amount	Comments
Natural Resources Protection Act (Individual Permit)	New Application		\$679.00	Yachtsman Marina Dredging NRPA Individual Permit Code: 4E. Processing Fee: \$543; Licensing Fee: \$136; Total: \$679

Receipt ID: 8322

**Transaction Date:** 11/11/2024 2:50:39 PM

Transaction Summary				
Payment	\$679.00			
Service Fee	\$2.00			
Total	\$681.00			

Thank you for your successful transaction.

If you have questions or concerns, please call (207) 287-7688

or Email: Payments.DEP@maine.gov

Print

#### To Whom It May Concern,

Sincerely,

By this letter, the undersigned, a representative of KPT Marine, LLC, authorizes Walsh Engineering Associates, Inc. to act as the agent for the undersigned in the preparation and submission of all Federal, State, and Local permit applications and relevant documents and correspondence for all necessary permits for the maintenance dredging of the property at 57 Ocean Avenue in Kennebunkport, Maine; to attend meetings and site visits; to appear before all boards, commissions, and committees, and to provide such other services as are necessary and appropriate in furtherance of the aforementioned project.

Shawn Dumas
Signature
Shawn Dumas Operations Manager
Printed Name and Title
10/31/2024
Date

KENNEBUNK, ME 04043

## **Information Summary**

Subscriber activity report

This record contains information from the CEC database and is accurate as of: Fri Oct 25 2024 13:54:31. Please print or save for your records.

Legal Name	Charter Number	Filing Type	Status				
KPT MARINE, LLC	20102989DC	LIMITED LIABILITY COMPANY	GOOD STANDING				
Filing Date	<b>Expiration Date</b>	Jurisdiction					
05/04/2010	N/A	MAINE					
Other Names		(A=Assumed ; F=For	mer)				
KENNEBUNKPO	ORT BOAT CLUB	A					
KENNEBUNKPC	ORT MARINA	A					
KENNEBUNKPC	ORT YACHT CLUB	A					
WEBHANNET R	IVER BOAT YARD	A					
Principal Home	Office Address						
Physical		Mailing					
67 OCEAN AVEN	NUE	PO BOX 2734					
KENNEBUNKPC	ORT, ME 04046	KENNEBUNKPORT, ME 04046					
Clerk/Registere	d Agent						
Physical		Mailing					
STEPHEN Y HODSDON HODSDON & AYER 56 PORTLAND ROAD		STEPHEN Y HODSDON HODSDON & AYER 56 PORTLAND ROAD					

New Search

KENNEBUNK, ME 04043

10/25/2024, 1:55 PM 1 of 2

#### Click on a link to obtain additional information.

List of Filings <u>View list of filings</u>

**Obtain additional information:** 

Certificate of Existence (Good Standing) (more info) (\$30.00)

Certificate of Legal Existence (more info)

Short Form without amendments amendments (\$30.00) (\$30.00)

Short Form without Long Form with

amendments amendments (\$30.00) (\$30.00)

You will need Adobe Acrobat version 3.0 or higher in order to view PDF files. If you encounter problems, visit the <u>troubleshooting page</u>.



If you encounter technical difficulties while using these services, please contact the <u>Webmaster</u>. If you are unable to find the information you need through the resources provided on this web site, please contact the Division of Corporations, UCC & Commissions Reporting and Information Section at 207-624-7752 or e-mail.

© Department of the Secretary of State

2 of 2 10/25/2024, 1:55 PM



Bk 17585 PG 540 Instr # 2017044719 10/19/2017 03:42:54 PM Pages 3 YORK CO

## MAINE SHORT FORM QUITCLAIM DEED WITH QUITCLAIM COVENANT

KNOW ALL BY THESE PRESENTS that US HOTELS NEW ENGLAND, LLC, a Delaware limited liability company, formerly known as HIOS HOSPITALITY LLC, a Delaware limited liability company, of Coral Gables, Florida, for consideration paid, hereby grants to YACHTSMAN HOSPITALITY, LLC, a Maine limited liability company, with a mailing address of 7 Drydock Avenue, Boston, Massachusetts 02210, with QUITCLAIM COVENANT, a certain lot or parcel of land together with all buildings and improvements situated thereon, located in the Town of Kennebunkport, York County, Maine, being more particularly described in **Exhibit A** attached hereto and made a part hereof.

ALSO HEREBY conveying all rights, easements and privileges pertaining thereto.

Meaning and intending to convey the property conveyed to HIOS Hospitality, LLC by virtue of that certain deed from The Yachtsman Lodge & Marina, LLC recorded on January 14 2005 in the York County Registry of Deeds in Book 14350, Page 113.

IN WITNESS WHEREOF the US HOTELS NEW ENGLAND, LLC has caused this this instrument to be executed by Frank Espinosa, its duly authorized President this \_\_\_\_\_\_ day of October, 2017.

US HOTELS NEW ENGLAND, LLC, a Delaware limited liability company, formerly known as HIOS HOSPITALITY LLC, a Delaware limited liability company  By:
Frank Espinosa, President

ļ

STATE OF FLORIDA	)
COUNTY OF MIAMI-DADE	)SS: )
The foregoing instrument was acknowledged before me this day of, 2017, by Frank Espinosa, as President of and for US HOTELS NEW ENGLAND, LLC, a Delaware limited liability company, formerly known as HIOS HOSPITALITY LLC, a Delaware limited liability company, who is personally known to me or has produced the following identification	
(NOTARY SEAL)	Signature of Notary Public-State of Florida Print Name: Expires
JORGE DEL VALLE Commission # FF 04503 Expires November 5, 20 Booded Thru Tray Fain Insurance 800-	7 7 7 86.7019

### Exhibit A (Yachtsman)

A certain lot or parcel of land together with the buildings thereon, situated in the Town of Kennebunkport, in said County of York, and State of Maine, on the westerly side of Ocean Avenue, formerly known as Water Street, bounded and described as follows:

Beginning at an iron pipe driven into the ground on the westerly side of said Ocean Avenue (formerly Water Street), at the southeasterly comer of land now or formerly of one Day, formerly of one Maling; thence South 15° 32' East by said street, 618.23 feet, more or less, to an iron pipe driven into the ground and land formerly of one Talbot, later of one Timson, and now or formerly of one Rafaniello; thence South 77° 14' West by said Refaniello land 83.2 feet to an iron pipe driven into the ground at the top of the bank of the Kennebank River; thence in the same course and by said Rafaniello land to the channel of Kennebank River or as far westerly as I may own; thence northerly by and up said river to said Day land; thence about North 78° 09' East by said Day land to an iron pipe driven into the ground near the top of the bank; thence same course and by said Day land 13.33 feet to the point of beginning.

The above bearings refer to the 1961 magnetic meridian.

#### MARINA LAND LEASE

from

YACHTSMAN HOSPITALITY LLC

LANDLORD

to

KPT MARINE, LLC

TENANT

This Marina Land Lease (the "Lease") is made and entered into as of May 1, 2018 (the "Effective Date"), by and between YACHTSMAN HOSPITALITY LLC, a Maine limited liability company, having a mailing address of 2 Livewell Drive, Suite 201, Kennebunk, Maine 04043 (the "Landlord") and KPT MARINE, LLC, a Maine limited liability company with a place of business at 69 Ocean Avenue, Kennebunkport, Maine (the "Tenant").

#### RECITALS

WHEREAS, Landlord owns certain property formerly operated as the Yachtsman Lodge & Marina, consisting of a one-story motel building with an accompanying marina located on an approximately 1.7± acre parcel with an address of 57 Ocean Avenue, Kennebunkport, Maine, which real property is more particularly described in that certain deed from US Hotels New England, LLC to Landlord, dated October 11, 2017 and recorded in the York County Registry of Deeds in Book 17585, Page 540 (the "Yachtsman Property").

WHEREAS, pursuant to the terms and conditions of that certain Amendment and Restatement of Marina Purchase and Sale Agreement between Landlord and Tenant of even date herewith ("Purchase Agreement") the Landlord has agreed to lease to Tenant that portion of the Yachtsman Property depicted in Exhibit A attached hereto ("Survey"), which portion has been used for marina purposes and consists of certain land situated between the shore of the Yachtsman Property and the channel of the Kennebunk River, which portion is as generally depicted on the Survey (the "Marina Land").

WHEREAS, the Landlord has agreed to grant to Tenant, its successors and assigns, certain easements, which easements are appurtenant to Tenant's leasehold estate established under this Lease over the remaining portion of the Yachtsman Property (hereinafter, the "Hotel Property") for (a) the maintenance, operation, repair and replacement of any portion of the docks, ramps and related appurtenances not situated on the Marina Land, (b) pedestrian access from the Hotel Property to the Marina Land, (c) parking spaces for users of the Marina Land, all as more particularly described herein (the "Marina Easements," and referred to together with this Lease as the "Marina Real Property").

WHEREAS, in addition to acquiring the rights to the Marina Land under this Lease, Tenant is simultaneously herewith purchasing the existing floating docks and ramps and related appurtenances associated with marina operations as operated during the 2017 season, (collectively, the "Marina Assets," and referred to together with the Marina Real Property as the "Marina Property").

#### **AGREEMENT**

NOW, THEREFORE, in consideration of the mutual promises hereinafter set forth, and for other good and valuable consideration, the receipt and sufficiency whereof is hereby acknowledged, the Landlord and the Tenant hereby agree as follows:

1. <u>Definitions</u>. In addition to the terms defined in the Recitals, the following terms shall have the meanings hereinafter set forth:

"Base Rent" means the minimum annual Base Rent for the applicable portion of the term as set forth in Section 4.

"Consent" means any party's written consent to any action which by this Lease such party must give or may withhold.

"Financial Institution" means a bank, national bank, savings bank, trust company, insurance company, real estate investment trust, pension fund or any other institutional banking, lending or other similar financial institution, together with the financial institutions involved in any public offering, so called, of a securitized mortgage with respect to the Tenant's leasehold interest in the Premises.

"Governmental Authorities" means all federal, state, municipal and local governments, and all agencies, departments, instrumentalities, commissions, boards, bureaus and offices thereof having or claiming jurisdiction over the Premises or the Improvements.

"Impositions" is defined in Section 6.1.

"Improvements" means existing floating docks and ramps and related appurtenances associated with marina operations, utilities, structures and other improvements constructed on the Premises by or on behalf of the Tenant, excluding signs, trade fixtures, movable machinery and equipment.

"Leasehold Mortgage" means any mortgage, deed of trust or other form of collateral assignment or collateral security instrument pursuant to which Tenant's interest in this Lease and in the Property is mortgaged, collaterally assigned or otherwise encumbered or conveyed to a Leasehold Mortgagee to secure any obligation of Tenant to the Tenant of such mortgage, deed of trust or other instrument, together with all amendments, modifications or extensions thereto and all consolidations or refinancings thereof.

"Leasehold Mortgagee" means any Tenant (and subsequent assignees thereof) of a Leasehold Mortgage which is a Financial Institution.

"Premises" means the Marina Land leased to Tenant pursuant to this Lease, which is more particularly described in Exhibit A attached hereto.

"Property" means the Premises and the Improvements, if any.

"Public Improvements" means those certain water, sewerage, drainage, electric, gas, telephone and other applicable utility lines or conduits located on the Premises, all of which serve or are intended to serve the Premises.

"Purchase Option" is defined in Section 35.

"Unavoidable Delays" means delays which result from fire or other casualty, acts of God, war, civil commotion, governmental regulations, embargo, riots, strikes, picketing and all other causes or events which are beyond the reasonable control of any party hereto. The lack of funds shall not be considered as an Unavoidable Delay.

#### 2. Lease of Premises.

- 2.1 <u>Demise</u>. For and in consideration of the rents hereinafter reserved by Landlord and the covenants, terms and agreements hereinafter contained on the part of Tenant to be paid, kept and performed, Landlord hereby leases to Tenant and Tenant hereby leases from Landlord the Premises.
- 2.2 <u>Disclaimer</u>. The foregoing demise is made "AS IS, WHERE AS, AND WITH ALL FAULTS." The Landlord provides no representations, warranties or assurances of any nature with respect to the Premises, including express or implied warranties of habitability or suitability of the Premises for any purpose of any nature whatsoever. The foregoing demise is subject to:
  - (a) All restrictions, regulations and statutes, and amendments and additions thereto, of any and all Governmental Authorities having jurisdiction thereof;
  - (b) All covenants, restrictions, easements, reservations and agreements affecting the Premises, whether or not of record;
    - (c) Any state of facts which an accurate survey may show;
  - (d) Building restrictions and regulations, land use, subdivision and zoning laws, ordinances and regulations and any amendments thereto in force and effect;
  - (e) All taxes, assessments, water charges and sewer rents accrued or unaccrued, fixed or not fixed; and
  - (f) The condition and state of repair of the Premises and the existing structures located thereon.
- 2.3 <u>Due Diligence</u>. Tenant further acknowledges that Tenant has been provided with the opportunity to investigate and inspect the Premises, the status of approvals, environmental compliance and Public Improvements, and that Tenant is relying solely on its own opinion as to the status of the Premises. The Lease of the Property is made on "AS IS WHERE IS" basis and Landlord makes no representations, express or implied regarding the Premises or its suitability for Tenant. Landlord disclaims all warranties, expressed or implied, as to the condition of the Property. The location of the boundaries of the Premises is as set forth on the Survey. Tenant further acknowledges and agrees that any inaccuracy or noncompliance is at Tenant's risk, and

that such variances shall not constitute grounds for any actions for rescission, damages or diminution of the Tenant's obligations under this Lease.

#### 3. <u>Term</u>.

- 3.1 Term. The term of this Lease shall commence as of the Effective Date, and, subject to the terms herein, shall continue for an initial term of thirty (30) years ("Initial Term").
- 3.2 Extended Term. The term of this Lease shall be automatically extended for six additional terms of ten (10) years each (each an "Extended Term") without any further notice to or action by the parties, unless the Tenant shall provide the Landlord with written notice of termination of this Lease on or before the expiration of the Initial Term or any Extended Term. The Initial Term and each Extended Term are collectively referred to herein as the "Term."

#### 4. Base Rent.

- 4.1 <u>Initial Term Base Rent</u>. The Base Rent for the Initial Term shall be \$\_\_\_\_\_\_. The Base Rent has been fully paid under the Purchase Agreement in a single installment paid at Closing of the transaction contemplated thereby.
- 4.2 <u>Extended Term Base Rent</u>. The Base Rent for each Extended Term shall be One Dollar (\$1.00) payable at any time during the first year of the Extended Term.

#### 5. Additional Rent.

It is the intention and agreement of the parties that the Base Rent shall be net to Landlord, and free from all set-off or deductions. Tenant agrees to pay or cause to be paid as additional rent, ("Additional Rent") and shall save Landlord harmless from and against, all Impositions (as defined herein), insurance premiums, utilities, maintenance and repair costs, and expenses and obligations of every kind and nature whatsoever relating to the Premises which may arise or become due after the Effective Date.

#### 6. Payment of Taxes, Assessments, Etc.

delinquent, all real estate taxes, general or special assessments and all other assessments and other similar charges assessed against or levied upon or payable with respect to the Premises, as well as all water and sewer bills, rates and charges for public utilities, and all other governmental charges in the nature of real estate taxes, general and special, of any kind and nature whatsoever which at any time during the term of this Lease may be assessed, levied, imposed upon, or become due or payable out of or in respect of, or become a lien on the Premises or any part thereof (all such charges described in this Subsection 6.1 being hereinafter collectively referred to as "Impositions", and any of the same being hereinafter referred to as an "Imposition." In the event any Impositions are not assessed, taxed or otherwise charged to the Premises as a separate parcel, then the parties shall exercise reasonable, good faith efforts to apportion the Impositions based on the relative

acreage of the Premises and the Hotel Property, the value if improvements located on each parcel and the use or consumption of any services by each parcel. Good faith efforts shall include, without limitation, setting up separate metering for utilities, considering assessed values or taxes for similar marina assets taxed by the municipality or other taxing authorities, and taking other commercially customary measures to segregate Impositions related to the Premises from Impositions related to the Hotel Property. In the event the parties cannot agree as to the allocation of Impositions, the parties shall exercise good faith, commercially reasonable efforts to have the imposition separately assessed, taxed or charged to the Premises and the Hotel Property.

- 6.2 Evidence of Payment. Tenant shall furnish (or cause to be furnished) to Landlord with respect to each payment of Impositions within ten (10) days of the Tenant's receipt of Landlord's request for same the official receipt of the appropriate taxing authority, if any, or other evidence reasonably satisfactory to Landlord, evidencing the full payment of all Impositions on a timely basis.
- 6.3 Tax Abatement and Protest. Upon prior notice to Landlord, Tenant shall have the right to contest the amount or validity, in whole or in part, of any Imposition, or to seek a reduction in the valuation of the Property (or any portion thereof) as assessed for taxation purposes by appropriate proceedings diligently conducted in good faith so long as neither the Property nor any part thereof would by reason of such postponement or deferment be in imminent danger of being forfeited or any tax lien ripening, and provided that the amount of the contested Imposition shall be deposited with Landlord.
- Landlord's Cooperation with Tenant. Landlord shall join in any proceeding 6.4 referred to in Subsection 6.3 if, in Tenant's reasonable opinion, the provisions of any law, rule or regulation at the time in effect shall require that such a proceeding be brought by and/or in the name of Landlord, in which event Landlord shall, upon Tenant's written request and at no cost to Landlord, join in such proceedings or permit the same to be brought by Tenant in the Landlord's name and on the Landlord's behalf. The Landlord agrees to cooperate fully, and at no cost to Landlord, with the Tenant in connection with the foregoing including, without limitation, in the furnishing of such documents, information and other materials as Tenant shall reasonably deem necessary with respect to the foregoing tax abatement and/or protest. Tenant covenants that Landlord shall not suffer or sustain any costs or expenses or any liabilities in connection with Landlord's participation at Tenant's request in any such proceedings relating to the Improvements and the Property, with the Tenant's obligations to pay all of same to be deemed additional rent hereunder. In the event that a credit, refund or award is obtained by the Tenant, the Tenant shall be entitled to retain out of such award payment of all costs and expenses incurred by the Tenant including, without limitation, professional, appraisal, consulting and legal fees incurred in obtaining such refund or award. Tenant shall be also entitled to the full amount of any refund of any Imposition and penalties and interest thereon received by Landlord which shall have been paid by or on behalf of the Tenant or for Tenant's account or which shall have been paid by Landlord and previously reimbursed in full by Tenant.

#### 7. Surrender of the Property.

- 7.1 Surrender of Premises and Property. Tenant shall, upon the expiration or sooner termination of this Lease, surrender and deliver up the Property into the possession and use of Landlord, free and clear of all leases and occupancies and free and clear of all liens, encumbrances and rights of any third parties other than those created by the Landlord apart from this Lease, without any payment or allowance whatever by Landlord for the Property.
- 7.2 <u>Title to Improvements</u>. Until the expiration or sooner termination of this Lease, title to, and ownership of, the Improvements shall vest in Tenant. Upon the expiration or sooner termination of this Lease, Tenant's title to and ownership of the Improvements shall automatically terminate and absolute and unconditional title to and ownership of the Improvements shall automatically vest in Landlord free and clear of all interests of Tenant and of all those otherwise claiming by through or under Tenant, and without any payment therefor and Landlord's title thereto shall be unlimited. Notwithstanding the foregoing, if requested by Landlord, Tenant will execute, acknowledge and deliver such documents and instruments in recordable form which Landlord may at any time reasonably require to confirm the aforesaid termination of Tenant's title, interest and estates and Landlord may, at its cost, record or cause the same to be recorded, but the execution, acknowledgment and delivery of such documents or instruments by Tenant or the failure of Tenant to execute, acknowledge, delivery or record any of the same shall not be a condition precedent to Landlord securing unlimited and absolute fee title to the aforesaid Improvements.
- 7.3 Rights of Leasehold Mortgagee, Etc. The provisions of this Section 7 shall survive the expiration or termination of this Lease, and, in the event there is a Leasehold Mortgagee, shall be subject to the provisions of Section 20. In the event this Lease terminates and a new lease is executed under Section 20, title to the Improvements will automatically be deemed conveyed to and vested in the Tenant under the new lease with the Landlord (subject to the provisions of this Section) and subject however to the terms of the new replacement lease. No landlord's lien, so called, shall attach or apply to such removable items.

#### 8. Repairs and Maintenance.

- 8.1 <u>Maintenance of the Property</u>. Throughout the Term of this Lease, Tenant shall maintain the Property in good order, condition and repair consistent with industry standards for similar properties and in compliance with the requirements of all Governmental Authorities, excepting reasonable wear and tear and damage by fire, insured against casualty or condemnation.
- 8.2 <u>Provisions Applicable to the Landlord</u>. Landlord shall not be required to furnish any services or facilities or to make or perform any maintenance, repairs or replacements in, to or about the Premises.
- 8.3 <u>Landlord's Liability</u>. Tenant is and shall be in exclusive control and possession of the Premises and of all Improvements on the Premises as provided herein, and Landlord shall not in any event whatsoever be liable for any injury or damage to any property or to any person happening on, in or about the Premises or the appurtenances thereto, or for any injury or damage to the Premises or the Improvements, or to any property, whether belonging to Tenant or any other

person, caused by any fire, breakage, leakage, defect or bad condition in any part or portion of the Premises or of the Improvements on the Premises or appurtenances, or from gas, electricity, water, rain or snow that may leak into, issue or flow from or onto any part of the Premises or the Improvements from the drains, pipes or plumbing work of the same, or from any place or quarter, or due to the use, misuse or abuse of all or any of the Improvements any kind whatsoever which may exist or hereafter be erected or constructed in or on the Premises, or from any kind of injury which may arise from any other cause whatsoever on the Premises or in or on the Improvements or appurtenances, including defects in construction of any Improvements, latent or otherwise.

#### 8.4 Right to Repair.

- (a) Tenant shall keep the Marina Property in good condition and repair. In the event Tenant is not maintaining the Marina Property in good condition and repair, Landlord shall provide notice of such failure to Tenant, and Tenant shall have thirty (30) days to undertake repairs and maintenance necessary to return the Marina Property to good condition. Any dispute regarding maintenance of the Marina Property will be resolved as provided below.
- (b) Landlord shall keep the Hotel Property in good condition and repair. In the event Landlord is not maintaining the Hotel Property in good condition and repair, Tenant shall provide notice of such failure to Landlord, and Landlord shall have thirty (30) days to undertake repairs and maintenance necessary to return the Hotel Property to good condition. Any dispute regarding maintenance of the Hotel Property will be resolved as provided below.
- In the event there is a dispute regarding the maintenance of the Marina Property (c) pursuant to subsection (c) above or the Hotel Property pursuant to subsection (d) above, then the dispute shall be subject to resolution in accordance with the following procedure. Either party may send the other a written dispute notice invoking the procedure set forth in this subsection and describing in reasonable detail the nature of nature of the dispute ("Dispute Notice"). The parties shall meet in person within thirty (30) days following receipt of the Dispute Notice and exercise good faith efforts to resolve the dispute to the parties mutual satisfaction ("Negotiation Period"). In the event the parties are unable to reach agreement prior to expiration of the Negotiation Period, then the parties shall appoint a mutually acceptable independent expert to determine whether maintenance is required and the nature and extent of the maintenance order to put, and keep, the Marina Property ("Marina Expert") or the Hotel Property ("Hospitality Expert"), as applicable, in good condition and repair, based upon the general condition at which the best maintained properties of similar nature are maintained in Kennebunkport, Maine ("Maintenance Determination"). The Marina Expert and the Hospitality Expert are generally referred to herein as the "Maintenance Expert," as applicable. In the event the parties cannot agree upon the Maintenance Expert within twenty (20) days following expiration of the Negotiation Period, then each shall appoint an expert and the two experts so chosen shall select a Maintenance Expert, who shall be responsible for making a written report to the parties setting forth the Maintenance Determination within a reasonable time following his appointment, but not longer than sixty (60) days. The determination of the Maintenance Expert shall be final and binding upon the parties. The party upon which the Dispute Notice was served shall promptly perform all maintenance and repairs work in accordance with the Maintenance Determination with such work to be completed

within ninety (90) days, seasonal and weather conditions permitting. In the event the work is not timely completed, the other party shall have the right (but not the obligation) to perform the work and be reimbursed by the owner of the property subject to the maintenance and repair work upon demand.

#### 9. Compliance with Laws.

- 9.1 <u>Compliance</u>. Throughout the Term of this Lease, Tenant, at its own sole cost and expense, shall comply with all present and future laws, ordinances, orders, rules, regulations and requirements of all Governmental Authorities with respect to the Premises, it being the intention of the parties that Tenant shall and does hereby assume the entire responsibility for, and shall and does hereby relieve Landlord from the responsibility of complying with all such laws, ordinances, orders, rules, regulations and requirements of all Governmental Authorities.
- 9.2 Right to Contest. Notwithstanding anything contained herein to the contrary, Tenant may, at its sole cost and expense, contest by due legal proceedings diligently prosecuted in good faith the validity of any such law, ordinance, order, rule, regulation or requirement and may postpone compliance therewith during such contest; provided, however, that such postponement shall not subject Landlord to any fine or penalty or to prosecution for a crime, or cause the Premises, the Improvements or any part thereof, to be condemned or vacated and the enforcement of such contested law, ordinance, rule, regulation or requirement is stayed or enjoined during such contest. In connection with any contest permitted by this Section, Landlord, without any cost or expense to it, shall provide its reasonable cooperation with respect to any such contest to the extent requested by Tenant, and in connection therewith, Landlord agrees that Tenant may join Landlord in such proceedings as a co-party with Tenant; provided, however, that Tenant shall indemnify and hold Landlord harmless from any damages, costs, expenses (including Landlord's reasonable attorneys' fees and expenses and other fees of third parties), judgments, settlements, losses and any other amounts of a similar nature which Landlord may incur or may be imposed upon Landlord to the extent the same shall arise in connection with any such cooperation or prosecution.
- 9.3 <u>Hazardous Use Restriction</u>. Tenant shall not use or occupy, or permit or suffer the Premises, or the Improvements on the Premises or any part thereof to be used or occupied, (i) for any use other than a lawful use, or (ii) for any non-retail or non-commercial use considered extrahazardous by Tenant's or Landlord's insurance carrier or based upon industry standards unless, in the case of such hazardous use, insurance reasonably satisfactory to Landlord consistent with industry practice covering any such hazard is provided for the benefit of Landlord and Tenant.

#### 10. Public Liability Insurance.

10.1 <u>Public Liability Insurance</u>. Tenant, at no cost or expense to the Landlord, shall, throughout the Term of this Lease, and all extensions thereof, procure and maintain or cause any other occupant to procure and maintain comprehensive general public liability insurance against claims for bodily injury, death or property damage occurring upon, in or about the Property, with commercially reasonable coverage limits based upon industry standards for real estate premises of

the same type as the Premises.

- 10.2 Fire and Extended Coverage Insurance. Tenant, at no cost or expense to the Landlord, shall, throughout the Term of this Lease, and any extensions thereof, keep (or cause any other occupant to keep) the Improvements insured against loss or damage by fire, windstorm, and other elements, and against loss or damage by such other, further and additional risks as now are or hereafter may be embraced by the standard extended coverage forms, or endorsements, in each case to full insurable value. The policy shall also contain a so-called "Agreed Amount Endorsement" which shall waive any and all co-insurance provisions under the policy as it applies to any of the coverages.
- 10.3 <u>Insurance Policy</u>. All insurance provided for in this Section shall, as applicable, be effected under valid and enforceable policies issued by financially sound insurance companies having a Best's rating of at least A and which are authorized to do business in the jurisdiction in which the Property is located. Within thirty (30) days following the Effective Date, and thereafter throughout the Term, prior to the expiration dates of the expiring policies theretofore furnished pursuant to this Section, a certificate of insurance shall be delivered by or on behalf of the Tenant to Landlord.
- Section 10.1 shall name Tenant as the named insured and Landlord and Landlord's mortgagees as additional insureds as their interests may appear. Any policies of insurance provided for or contemplated by Section 10.2 shall name Tenant as the named insured. No other person shall be named as an insured or additional named insured with respect to the fire and extended coverage insurance except the holder of a Leasehold Mortgage may also be named as an additional named insured. Tenant may also name the Leasehold Mortgagee, as mortgagee and loss payee on the fire and extended coverage insurance, and additional insured with respect to public liability insurance. Landlord shall at all times be named as a certificate holder entitled to at least 30 days notice of cancellation.
- 10.5 <u>Release and Waiver</u>. Each of Landlord and Tenant hereby releases the other from any and all liability for any loss or damage caused by fire or any of the extended coverage casualties or any other casualty or risk insured against, even if such fire, loss or other casualty shall be brought about by the fault or negligence of the other party, or any persons claiming under such other party.
- 10.6 Adjustment of Loss. Losses under each policy of insurance provided for or contemplated by Section 10.2 in an amount greater than \$50,000 shall be adjusted with the insurers and/or underwriters by Tenant, with the Consent of Landlord if the loss occurs during Landlord's Fire Loss Period. All costs and expenses of Tenant of collecting or recovering any insurance proceeds under such policies including, but not limited to, any and all reasonable fees of attorneys, appraisers and adjusters, shall be deducted from such insurance proceeds (the resulting proceeds after such cost shall be referred to as "Net Proceeds") before being applied as provided herein.

- 10.7 <u>Additional Insurance</u>. At all times during the Term of this Lease, at its own cost and expense, Tenant shall provide and keep in force such other reasonably obtainable insurance and in such amounts as may from time to time be reasonably required by Landlord consistent with general industry standards against other insurable hazards which, at the time, are commonly insured against in the case of construction and alteration of Improvements and/or in the case of Premises similarly situated to the Premises, due regard being or to be given to the type of Improvements their construction, use, occupancy and location.
- 10.8 <u>Easement and Purchase Insurance Requirements</u>. The foregoing shall be in addition to and not in limitation of the insurance required under the Purchase Agreement and the Marina Easements.

#### 11. Damage or Destruction by Fire or other Casualty.

- 11.1 <u>Damage to Property</u>. In the event of any damage to the Improvements caused by fire, the elements or any other casualty to an extent not covered by Section 11.2, Tenant shall promptly give notice to Landlord and shall, upon request by Landlord, then, with reasonable diligence (subject to Unavoidable Delays), repair and restore, or cause subtenants or occupants thereof to repair and restore, the Improvements or the portion thereof so damaged, as nearly as possible, to the condition, size and value the same were in immediately prior to such damage, provided that such obligation to restore shall not be limited to the amount of the insurance proceeds available to Tenant.
- 11.2 <u>No Rent Abatement</u>. Upon the occurrence of any such fire, casualty or other damage to the Improvements or any other similar cause, there shall be no abatement of Base Rent or other payments hereunder, and the obligations of Tenant hereunder shall continue in full force and effect. Tenant agrees, if necessary, to utilize all loss of rent insurance proceeds to pay the Base Rent and other charges due under this Lease.
- 11.3. Proceeds Payable to Mortgagee. Any Mortgagee holding a Leasehold Mortgage, may, in accordance with the terms of any such mortgage, require that the insurance proceeds be paid to it; provided however, if any Mortgagee receives insurance proceeds in accordance with this Section 11.3, the Tenant shall still be required to (i) create the complete fund described above by depositing into the joint escrow account sufficient amounts to assure and complete the payment for the reconstruction and repair work, and (ii) complete the reconstruction and repair work as described in this Article 11.

#### 12. Tenant Improvements and Alterations.

12.1 <u>Right to Make Tenant Alterations</u>. Tenant shall have the right at any time and from time to time during the term of this Lease to make, or to permit any other occupant to make, at no cost or expense to Landlord, Tenant Alterations (as that term is hereinafter defined) without any consent or approval from Landlord. No alterations may be made other than Tenant Alterations. Provided however Tenant may not make any Tenant Alterations which would impair the structural integrity of the Improvements or materially diminish its value.

- 12.2 <u>Provisions Applicable to Tenant Alterations</u>. Tenant will comply (and cause any other occupant to comply) with each of the following provisions:
- (a) All Improvements and all Tenant Alterations shall be commenced and completed in a reasonable and timely manner (subject to Unavoidable Delays) using good quality materials and in a good and workmanlike manner.
- (b) All Improvements and all Tenant Alterations shall be made in compliance with all applicable laws and ordinances and with all applicable licenses, permits, authorizations and approvals and with all applicable rules, regulations, orders and requirements of all Governmental Authorities.
- (c) Prior to the commencement of the construction of any Improvements, Tenant shall prepare or cause to be prepared plans and specifications, copies of which shall be submitted to Landlord for its consent prior to the commencement of construction together with evidence of ability to fund the cost of such construction satisfactory to Landlord, and shall procure (or cause any other occupant to procure) all applicable permits, consents and approvals of all Governmental Authorities, as may be required or customary in connection therewith, including, without limitation, the payment of any charges in connection therewith, and shall promptly deliver copies thereof to Landlord. Tenant shall pay or cause to be paid all costs, expenses and liabilities arising out of or in connection with or by reason of any Improvements or any Tenant's Alterations.
- (d) Title to all Improvements and all Tenant Alterations when made, erected, constructed, installed or placed upon or under the Premises shall be governed by the terms and provisions of Section 7.2 of this Lease.
- 12.3 <u>Cooperation of Landlord</u>. Landlord agrees that, at the request of Tenant, and at Tenant's sole cost, Landlord will either (a) file any appropriate applications or petitions in which Tenant will join or (b) join in any applications or petitions filed by Tenant required to obtain all necessary public and final approvals, zoning and other permits, consents or approvals required at any time from Governmental Authorities to permit construction of the Improvements or any Tenant's Alterations. Tenant shall be solely responsible for the preparation, filing and processing of all such applications or petitions.

#### 13. Leasehold Mortgages; Prohibition against Liens.

Premises by a Financial Institution, the Tenant is hereby given the right by the Landlord in addition to any other rights herein granted, without the Landlord's prior written consent, to mortgage, collaterally assign, or otherwise encumber and grant security interests in all or any part of its interests in this Lease, or any part or parts thereof, under one or more Leasehold Mortgage(s), and to assign this Lease, or any part or parts thereof, and any subleases as collateral security for such Leasehold Mortgage(s), upon the condition that all rights acquired under such Leasehold Mortgage(s) shall be subject to each and all of the covenants, conditions and

restrictions set forth in this Lease, and to all rights and interests of the Landlord herein, none of which covenants, conditions or restrictions is or shall be waived by the Landlord by reason of the right given to Tenant to grant Leasehold Mortgages with respect to such interest in this Lease, except as expressly provided herein. Notwithstanding anything contained herein to the contrary, no Leasehold Mortgage may be obtained by Tenant or any of its successors or assigns without Landlord's consent other than in connection with the provision of financing for the Project by a Financial Institution. No Leasehold Mortgage given by the Tenant under the provisions of this paragraph shall be deemed to be an assignment of this Lease so as to require the assumption of said obligations and liabilities by the Financial Institution until and unless the Financial Institution, or any third party obtaining the Tenant's interest under this Lease through foreclosure of the Leasehold Mortgage takes possession of all or any portion of the Premises as a successor to the Tenant, in which case the Financial Institution, or any such third party, shall assume all Tenant's obligations hereunder.

- 13.2 <u>Discharge of Lien</u>. Except in the case of a Leasehold Mortgage granted to a Leasehold Mortgagee, and except for liens, encumbrances or charges created with the agreement of Landlord (which agreement may be given or withheld in Landlord's sole discretion), Tenant shall not create or permit to be created or to remain, and shall discharge or bond in a manner reasonably satisfactory to Landlord (or cause to be so discharged or bonded) any mechanic's, laborer's or materialman's lien, or any other lien or encumbrance which constitutes a lien, encumbrance or charge upon the Property. Any mechanic's, laborer's or materialman's lien shall be discharged or bonded in accordance with Section 13.2 hereof.
- 13.3 <u>Utility Easements</u>. Landlord agrees to join in the execution of any utility easement required for the development, use or operation of the proposed provided such easement is an easement on the customary terms generally utilized by such utility company which do not affect the use and enjoyment or market value of the Property, and if obtainable, has a non-recourse provision for the benefit of Landlord (with any liability of Landlord thereunder being limited to Landlord's interest in the Property and with no personal liability on the part of Landlord or its partners, shareholders, members or other beneficial owners) and with Landlord to not have any liabilities, obligations or duties until Landlord becomes the owner of the Improvements. Such easement must also be reasonably satisfactory to Landlord and, if obtainable, expire and terminate at Landlord's option upon the expiration or termination of the term of this Lease.
- 13.4 <u>Landlord's Right to Discharge</u>. If any mechanic's, laborer's or materialman's lien or attachment, levy, judgment lien or writ of execution shall at any time be filed against the Property or any part thereof, for labor, work, materials or supplies provided or alleged to have been provided by or on behalf of Tenant or any other creditor's claim against Tenant, Tenant, within thirty (30) days after written notice from Landlord or any other party to Tenant of the filing of same, shall cause the same to be discharged or bonded in full in such a manner that any title insurance company will either not take an exception for same or will insure over such mechanic's lien. If Tenant shall fail to cause such lien, attachment, levy, judgment lien or writ of execution to be discharged or bonded, then, in addition to any other right or remedy, upon thirty (30) days notice to Tenant, Landlord may, but shall not be obligated to, procure the discharge of such lien, attachment, levy, judgment lien or writ of execution by payment or by bonding proceedings.

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However, so long as Tenant is contesting in good faith, by virtue of appropriate proceedings, the validity or amount of such lien and has bonded the same, then Landlord agrees not to discharge such lien by payment to the lienor. Any and all amounts so paid and all other costs incurred by Landlord including, but not limited to, reasonable counsel fees, together with interest thereon at two percent over the prime rate as published in the Wall Street Journal, or any successor thereto from the respective dates of Landlord's making of such payments, shall be paid by Tenant to Landlord on demand as additional rent hereunder.

13.5 Consent of Landlord Not Implied. Nothing contained in this Lease shall be deemed or construed in any way as constituting the knowledge, approval, consent or request of Landlord, express or implied by inference or otherwise, to any contractor, subcontractor, laborer, materialman, architect or engineer for the performance of any labor or the furnishing of any materials or services for or in connection with the Property or any part thereof. Notice is hereby given that Landlord shall not be liable for any labor or materials or services furnished or to be furnished to Tenant upon credit, and that no mechanic's or other lien for any such labor, materials or services shall attach to or affect the fee or reversionary or other estate or interest of Landlord in the Property or in this Lease.

#### 14. Cooperation of Landlord.

Landlord covenants and agrees that Landlord will from time to time upon Tenant's reasonable request and at the Tenant's sole cost as additional rent join with Tenant in all applications, petitions and proceedings required for Tenant to secure all permits, consents and approvals for the construction and operation of the Improvements and any Tenant Alterations from Governmental Authorities provided that the same shall be at no cost to Landlord, and subject to Tenant's compliance with the terms of the Lease.

#### 15. Unavoidable Delays.

In any case where either party hereto is required to do any act, delays caused by or resulting from Act of God, war, civil commotion, fire or other casualty, labor difficulties, general shortages of labor, materials or equipment, government regulations or any other Unavoidable Delays shall not be counted in determining the time when the performance of such act must be completed, whether such time be designated by a fixed time, a fixed period of time or "a reasonable time." In any case where work is to be paid for out of insurance proceeds or condemnation awards, due allowance shall be made, both to the party required to perform such work and to the party required to make such payment, for delays in the collection of such proceeds and awards. Notwithstanding the foregoing or any other provision of this Lease, the concept of Unavoidable Delay shall not apply to the payment of Base Rent, Impositions, additional rent or any other payments under this Lease.

#### 16. Indemnification of Landlord.

Tenant shall indemnify, defend with counsel reasonably satisfactory to Landlord and hold Landlord harmless from and against all liabilities, obligations, damages, suits, fines, penalties,

claims, demands, costs, charges, judgments and expenses, including, but not limited to, reasonable attorneys' fees, which may be imposed upon or asserted against Landlord or Landlord's interest in the Property by reason of or in connection with (a) any default by Tenant under this Lease or (b) any act or omission of Tenant and its respective agents, servants, contractors or employees during the term of this Lease on or about the Property, or (c) any act arising out of the use Premises not caused by Landlord. This indemnity shall survive the termination of this Lease.

#### 17. Condemnation.

- 19.1 <u>Voluntary Conveyance</u>. Neither party to this Lease will voluntarily convey any interest related to this Lease to any Governmental Authority or public utility under threat of a taking of all or any portion of the Property under power of eminent (a "Taking") in lieu of formal proceedings without first providing at least 10 days prior written notice to the other of any request or intention to do so. For the purposes of this Section, all amounts paid pursuant to any agreement with any condemning authority which has been made in settlement of or under threat of any condemnation or other eminent domain proceeding affecting the Property shall be deemed to constitute an award made in such proceeding.
- 19.2 Effect of Taking. If during the term hereof there shall be a Taking which prevents or substantially impairs the use of the Property in whole or part for the uses and purposes then being made or proposed to be made by Tenant, then the Tenant's Leasehold Estate shall cease and terminate as of the Date of Taking as to the Property so taken. If Tenant's Leasehold Estate is so terminated in whole or in part, all Rent and other charges payable by Tenant to Landlord hereunder attributable to the Land, or portion thereof taken, shall be paid by Tenant up to and prorated through the Date of Taking.

#### 19.3 Allocation of Award.

- (a) If, at any time during the continuance of this Lease, all or any portion of the Property is taken, appropriated or condemned by reason of eminent domain, the Landlord and Tenant shall divide the proceeds and awards in the condemnation proceedings, abate the rent, and make other adjustments in a just and equitable manner under the circumstances. If the parties cannot agree on a just and equitable division, annual abatement of rent, or other adjustments within 30 days after the award has been made, the disputed matters shall be submitted to arbitration in accordance with the dispute resolution provisions of Section 38 of this Lease. If legal title to the entire Property is wholly taken by condemnation, the Lease shall be cancelled.
- (b) Although title to the Improvements placed by the Tenant upon the Property will pass to the Landlord, for purpose of condemnation, the fact that Tenant placed the Improvements on the Property shall be taken into account. The deprivation of the Tenant's use of the Improvements shall, together with the remaining term of the Lease, be an item of damage in determining the Tenant's portion of the condemnation award; provided, however, the projected revenues (or other sources of income) from the business operations of the Tenant over the remaining term of the Lease shall not be considered items of damages for such purposes.

The deprivation of the Landlord's income stream for the remaining term of the Lease and the residual value of the Improvements shall be items of damage in determining the Landlord's portion of the condemnation award. It is the general intent of this Section that, upon condemnation, the parties shall share in their awards to the extent that their respective interests are depreciated, damaged, or destroyed by the exercise of the right of eminent domain. If the condemnation is total, the condemnation award shall be allocated so that the then value of the property, as if it were unimproved property, is allocated to the Landlord, and the then value of the Improvements thereon is allocated between the Landlord and Tenant after giving due consideration to the number of years remaining in the term of this Lease and the condition of the Improvements at the time of commendation.

(c) A Leasehold Mortgagee shall have the right to participate in any condemnation proceeding affecting the Property.

#### 18. <u>Landlord's Mortgages</u>.

- 18.1 <u>Fee Mortgagees of Landlord</u>. Landlord shall not have the right to mortgage its interest in the Property and shall exercise best efforts to have any existing mortgage modified to exclude the Premises.
- ("Tenant's Purchase Option") set forth below, nothing contained in this Lease shall be deemed in any way to limit, restrict or otherwise affect Landlord's absolute right at any time or times to convey its interest in the Property, subject to this Lease, and, in connection therewith, to assign its interest in this Lease, and the rent or other sums and charges payable hereunder by Tenant to Landlord, to a transferee designated by Landlord in a notice to Tenant. In such case, upon receipt of such notice, Tenant shall pay the rent and the other sums and charges payable by Tenant to Landlord at the address mentioned in any such notice; provided, however, that the Tenant or assignee shall assume and perform all of the obligations of Landlord under this Lease arising thereafter, subject to the limitations on the personal liability of Landlord set forth herein, and thereafter the prior Landlord shall be released from any further liability for the performance of Landlord's obligations under this Lease arising thereafter.

#### 19. Assignments and Transfer of Tenant's Interest.

Tenant may, with the Consent of Landlord which such Consent may not be unreasonably withheld, sell, assign, transfer or otherwise convey its interest in the Improvements or in this Lease or the term hereof or the leasehold estate created hereunder or any interest in any of the same or permit any other person to use and occupy the Property pursuant to the terms hereof. Tenant agrees to promptly give written notice to Landlord of any such sale, assignment, transfer or other conveyance, provided that such right shall not be deemed to be a consent to any liens or encumbrances otherwise prohibited hereunder. Tenant shall also provide Landlord upon request with complete and accurate copies of all executed documents with respect to the foregoing transfers (including, without limiting the generality of the foregoing, all riders, exhibits, addenda, letter agreements or other documents executed with respect thereto). Notwithstanding the

foregoing, Tenant is obligated to provide Landlord with a copy of the documents which are recorded in the Registry of Deeds or other applicable recording office. In connection with any such sale, assignment, transfer or other conveyance (excluding all Leasehold Mortgages), the assignee or other transferee shall execute and deliver to Landlord an assumption instrument pursuant to which such assignee or other transferee agrees that it has effective as of the effective date of such instrument assumed all of the obligations, liabilities and duties of Tenant under this Lease and has become liable therefor to Landlord, including all obligations of Tenant which arose or accrued prior to the date of the sale, assignment, transfer or other conveyance. In the event for any reason any such assignment or other transferee fails to execute such assumption instrument, the acceptance of any such assignment or other transfer shall establish that such assignee or other transferee has agreed to the foregoing and has assumed all such liabilities, obligations and duties. Notwithstanding the foregoing, no lease of all or any portion of the Premises, nor any sublease of all or any portion of the Premises, nor any sublease of all or any portion any liability, whether past, present, or future, under this Lease and Tenant shall continue to remain primarily liable under this Lease.

#### 20. Estoppel Certificates.

- 20.1 Estoppel Certificate of Tenant. Tenant agrees at any time and from time to time, within twenty (20) days of written request from Landlord, to execute, acknowledge and deliver, without charge, to Landlord, or to any person designated by Landlord, a statement in writing certifying that this Lease is unmodified (or if there have been modifications, identifying the same by the date thereof and specifying the general nature thereof), that Tenant has not received in the sixty (60) days prior to the date of the certificate any notice of default or notice of termination of this Lease (or if Tenant has received such a notice, that it has been revoked or the default cured, as applicable, if such be the case), that to Tenant's knowledge Landlord is not in default in the payment or performance of any of Landlord's obligations under this Lease (or if a default does exist, specifying the same), that Tenant, to its knowledge, has no claims or offsets against Landlord hereunder (or if Tenant has any such claims, specifying the same), and the dates to which the rent and other sums and charges payable by Tenant hereunder have been paid, and to such other matters as Landlord may reasonably request.
- 20.2 Estoppel Certificate of Landlord. Landlord agrees at any time and from time to time, within twenty (20) days of written request from Tenant, to execute, acknowledge and deliver, without charge, to Tenant, or to any person designated by Tenant (including, without limitation, any Leasehold Mortgagee), a statement in writing certifying that this Lease is unmodified (or if there be modifications, identifying the same by the date thereof and specifying the general nature thereof), that no notice of default or notice of termination of this Lease has been served on Tenant in the sixty (60) days prior to the date of the certificate (or if Landlord has served such notice, that the same has been revoked or, if Landlord has knowledge of same, that the default has been cured, as applicable, if such be the case), that to Landlord's knowledge no Event of Default does exist (or if a default does exist, specifying the same) and the dates to which the rent and other sums and charges payable by Tenant hereunder have been paid, and to such other matters as Tenant may reasonably request. Such certificate may be relied upon by any person to whom it is addressed

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#### 21. Events of Default, Lease Termination.

- Events of Default. If default shall be made by Tenant in the performance of or 21.1 compliance with any of the covenants, agreements, terms or conditions contained in this Lease ("Event of Default") and such default shall continue for a period of thirty (30) days after written notice thereof from Landlord to Tenant, or, in the case of a default or a contingency, although curable, which cannot with due diligence be cured within such period of thirty (30) days, Tenant fails to proceed with all due diligence within such period of thirty (30) days to commence to cure the same and thereafter to prosecute the curing of such default with all due diligence (it being intended that in connection with a default not susceptible of being cured with due diligence within thirty (30) days that the time for Tenant within which to cure the same shall be extended for such period as may reasonably be necessary to complete the curing thereof with all due diligence), then and in any such Event of Default, Landlord, at any time thereafter during the continuance of such Event of Default, may exercise all rights and remedies permitted hereunder for such default and breach, including without limitation, any summary eviction proceedings, and may, in its discretion, give written notice to Tenant stating that this Lease and the term hereby demised shall terminate on the date specified in such notice without waiving any claims for Base Rent and, subject to the exercise of any rights of a Leasehold Mortgagee pursuant to Section 19 and/or 35 of this Lease and the expiration of any cure period, so-called, set forth therein, this Lease shall terminate and all rights of Tenant under this Lease shall terminate and the remaining provisions of this Article with respect to the remedies of Landlord shall apply.
- 21.1 Remedies of Landlord. Upon any termination of this Lease pursuant to Section 21.1, Tenant shall quit and peaceably surrender the Property to Landlord, without any payment therefor by Landlord. Landlord, in addition to all other remedies herein reserved to it and all other remedies permitted hereunder, upon or at any time after such termination may, without further notice, enter upon and re-enter the Premises and Property and possess and repossess itself thereof by summary proceedings, ejectment or other legal proceedings, and may dispossess Tenant and remove Tenant from the Property and may have, hold and enjoy the Property and the right to receive all rental income of and from the same, and Tenant shall have no further right, title and interest thereof of any kind whatsoever.
- 21.4 <u>Waiver Not Implied.</u> No failure by Landlord or Tenant to insist upon the strict performance of any covenant, agreement, term or condition of this Lease or to exercise any right or remedy consequent upon a breach thereof, and no acceptance by Landlord of full or partial rent during the continuance of any breach, shall constitute a waiver of any such breach or such covenant, agreement, term or condition. No acceptance of rent by Landlord at any time shall be deemed to constitute a waiver by Landlord of any breach of this Lease by Tenant whether or not Landlord shall be aware of such breach at the time of such acceptance. No covenant, agreement, term or condition of this Lease to be performed or complied with by either party, and no breach thereof, shall be waived, altered or modified except by a written instrument executed by the other party. No waiver of any breach shall affect or alter this Lease, but each and every covenant, agreement, term and condition of this Lease shall continue in full force and effect with respect to any other then existing or subsequent breach thereof.

21.5 <u>Remedies Cumulative</u>. Each right and remedy of Landlord or Tenant provided for in this Lease shall be distinct, separate and cumulative and shall be in addition to every other right or remedy provided for in this Lease, or available at law or in equity, and the exercise or beginning of the exercise by Landlord or Tenant of any one or more of the rights or remedies provided for in this Lease shall not preclude the simultaneous or later exercise by Landlord or Tenant of any or all other rights or remedies provided for in this Lease or available at law or in equity.

#### 22. Invalidity of Particular Provisions.

If any term or provision of this Lease or the application thereof to any person or circumstance shall, to any extent, be invalid or unenforceable, the remainder of this Lease, or the application of such term or provision to persons or circumstances other than those as to which it is held invalid or unenforceable, shall not be effected thereby, and each term and provision of this Lease shall be valid and be enforced to the fullest extent permitted by law.

#### 23. Notices.

All notices, requests, demands, consents, approvals, and other communications which may or are required to be served or given hereunder (for the purposes of this Section collectively called "Notices") shall be in writing and shall be sent by registered or certified mail, return receipt requested, postage prepaid, or by overnight courier requiring a signed receipt, addressed to the party to receive such Notice at the address set forth below:

If to Landlord, to: Yachtsman Hospitality LLC 2 Livewell Drive, Suite 201, Kennebunk, Maine 04043

If to Tenant, to: KPT Marine, LLC
69 Ocean Avenue
Kennebunkport, Maine 04046

All Notices given by either party shall also be given to the holder of a Leasehold Mortgage. Either party may, by Notice given as aforesaid, change its address or add a second address for all subsequent Notices, except that neither party may require Notices to it to be sent to more than two (2) addresses. Tenant shall be entitled to two (2) addressees in addition to the Notices given to the holder of any Leasehold Mortgage, and the holder of any such Leasehold Mortgage shall be entitled to two (2) addressees. Notices shall be deemed given when received or as of the date the addressee refuses receipt or acceptance. All Notices by or on behalf of Landlord shall be deemed sufficient if signed by one (1) or more of Landlord's officers, partners, members or other owners or by its counsel and if otherwise given or made in compliance with this Section.

All Notices by or on behalf of Tenant shall be deemed sufficient if signed by Tenant or by its counsel and if otherwise given or made in compliance with this Section.

#### 24. <u>Use</u>.

The Premises shall be use for Commercial and retail purposes only.

#### 25. Quiet Enjoyment.

Landlord covenants that Tenant shall quietly have and enjoy the Premises during the term of this Lease, without hindrance or molestation by anyone claiming by, through or under Landlord.

#### 26. Captions.

The captions and table of contents, if any, in this Lease are inserted only as a matter of convenience and for reference and in no way define, limit, enlarge or describe the scope or intent of this Lease nor in any way shall affect this Lease or the construction of any provision hereof.

#### 27. Oral Change or Termination.

This Lease and the documents referred to herein contain the entire agreement between the parties pertaining to the subject matter hereof, and any executory agreement hereafter made shall be ineffective to change, modify or discharge it in whole or in part unless such executory agreement is in writing and signed by the party against whom enforcement of the change, modification or discharge is sought. This Lease cannot be changed or terminated orally.

#### 28. <u>Limitation on Liability</u>.

The term "Landlord" as used in this Lease so far as covenants or obligations on the part of Landlord are concerned shall be limited to mean and include only the owner or owners at the time in question of the fee of the Property. In the event of any transfer or transfers of the title to such fee, Landlord herein named (and in case of any subsequent transfers or conveyances the then Landlord) shall be automatically freed and relieved from and after the date of such transfer or conveyance of all personal liability as respects the performance of any covenants or obligations on the part of Landlord contained in this Lease thereafter to be performed, provided that any funds in the hands of such Landlord or the then Landlord at the time of such transfer, in which Tenant has an interest, shall be turned over to the Tenant and any amount then due and payable to Tenant by Landlord shall, subject as aforesaid, be binding on Landlord, its successors and assigns, only during and in respect of their respective periods of ownership.

Anything in this Lease to the contrary notwithstanding, Tenant shall look solely to the estate and interest of Landlord in and to the fee interest in the Property for the satisfaction of Tenant's remedies or the collection of a judgment against Landlord in the event of any default or breach by Landlord with respect to any of the terms, covenants and conditions of this Lease to be

performed by Landlord and no other property or assets of Landlord or any officer, director, shareholder, member, manager, partner, parent, subsidiary or affiliate of Landlord shall be liable for any obligation of Landlord hereunder. The provisions of this Section shall survive the termination of this Lease.

#### 29. Successors and Assigns.

The covenants, conditions and agreements in this Lease shall bind and inure to the benefit of Landlord and Tenant and, except as otherwise provided in this Lease, their respective legal representatives, successors and assigns.

#### 30. No Merger.

It is the intent and purpose of the parties hereto that this Lease shall remain in full force and effect until duly terminated and shall not be deemed to have merged with the interest of Landlord created by virtue of any lien upon the Property or any other interest therein or any portion thereof held by Landlord or by the purchase by Tenant of Landlord's interest in the Premises.

#### 31. Governing Law.

This Lease shall be construed in accordance with and shall be governed by the laws of the State of Maine.

#### 32. Waivers.

Failure of either party to complain of any act or omission on the part of the other party, no matter how long the same may continue, shall not be deemed to be a waiver by said party of any of its rights hereunder. No waiver by either party at any time, express or implied, of any breach of any provision of this Lease shall be deemed a waiver of a breach of any other provision of this Lease or a consent to any subsequent breach of the same or any other provision. If any action by either party shall require the consent or approval of the other party, the other party's consent to or approval of such action on any one occasion shall not be deemed a consent to or approval of said action on any subsequent occasion or a consent to or approval of any other action on the same or any subsequent occasion.

#### 33. Environmental Provisions.

- 33.1 <u>Definitions</u>. The following definitions shall apply for purposes of this Section:
- (i) "Environmental Laws" shall mean and include each and every federal, state or local statute, regulation or ordinance or any judicial or administrative decree or decision, whether now existing or hereafter enacted, promulgated or issued, with respect to any Hazardous Materials (as hereinafter defined), drinking water, groundwater, wetlands, landfills, open dumps, storage tanks, underground storage tanks, solid waste, waste water, storm water run-off, waste emissions or wells. Without limiting the generality of the foregoing, the term

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shall encompass each of the following statutes and regulations promulgated thereunder as well as any amendments and successors to such statutes and regulations, as may be enacted and promulgated from time to time: (i) the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (codified in scattered sections of 26 U.S.C., 33 U.S.C., 42 U.S.C. and 42 U.S.C. §9601 et seq.); (ii) the Resource Conservation and Recovery Act of 1976 (42 U.S.C. §6901 et seq.); (iii) Hazardous Materials Transportation Act (49 U.S.C. §1801 et seq.); (iv) the Toxic Substances Control Act (15 U.S.C. §2061 et seq.); (v) the Clean Water Act (33 U.S.C. §1251 et seq.); (vi) the Clean Air Act (42 U.S.C. §7401 et seq.); (vii) the Safe Drinking Water Act (21 U.S.C. §349; 42 U.S.C. §201 and §300f et seq.); (viii) the Maine Environmental Policy Act of 1969 (42 U.S.C. §4321); (ix) the Superfund Amendment and Reauthorization Act of 1986 (codified in scattered sections of 10 U.S.C., 29 U.S.C., 33 U.S.C. and 42 U.S.C.); (x) Title III of the Superfund Amendment and Reauthorization Act (40 U.S.C. §1101 et seq.); (xi) the Uncontrolled Hazardous Substance Sites Law, 38 M.R.S.A. §1361 et seq.; (xii) the Hazardous Matter Control Law, 38 M.R.S.A. §1317, et seq.; (xiii) the Maine Hazardous Waste, Septage and Solid Waste Management Act, 38 M.R.S.A. §1301 et seq.; (xiv) the Reduction of Toxics Use, Waste and Release Law, 38 M.R.S.A. §2301 et seq.; and (xv) the Site Location of Development Law, 38 M.R.S.A. §481 et seq.

- (ii) "Hazardous Materials" shall mean each and every element, compound, chemical mixture, contaminant, pollutant, material, waste or other substance which is defined, determined or identified as hazardous or toxic under any Environmental Law. Without limiting the generality of the foregoing, the term shall mean and include:
- (A) "hazardous substances" as defined in the Comprehensive Environmental Response, Compensation and Liability Act of 1980, the Superfund Amendment and Reauthorization Act of 1986, or Title III of the Superfund Amendment and Reauthorization Act, each as amended, and regulations promulgated thereunder;
- (B) "hazardous waste" as defined in the Resource Conservation and Recovery Act of 1976, as amended, and regulations promulgated thereunder;
- (C) "hazardous materials" as defined in the Hazardous Materials Transportation Act, as amended, and regulations promulgated thereunder;
- (D) "chemical substance or mixture" as defined in the Toxic Substances Control Act, as amended, and regulations promulgated thereunder;
- (E) "hazardous matter" as defined in the Hazardous Matter Control Law as amended, and regulations promulgated thereunder; and
- (F) "hazardous waste" as defined in the Maine Hazardous Waste, Septage and Solid Waste Management Act, as amended, and regulations promulgated thereunder.
- (iii) "Indemnified Parties" shall mean Landlord, Landlord's parent, subsidiaries and affiliates, each of their respective shareholders, members, managers, partners, directors,

officers, employees and agents, and the successors and assigns of any of them; and "Indemnified Party" shall mean any one of the Indemnified Parties.

- (iv) "Release" shall mean any spilling, leaking, pumping, pouring, emitting, emptying, discharging, injecting, storing, escaping, leaching, dumping, or discarding, burying, abandoning, or disposing into the environment.
- (v) "Threat of Release" shall mean a substantial likelihood of a Release which requires action to prevent or mitigate damage to the environment which may result from such Release.
- 33.2 <u>Environmental Covenants of Tenant</u>. Tenant covenants and agrees with Landlord that Tenant shall:
  - (i) comply with all Environmental Laws; and
- (ii) not store (except in compliance with all Environmental Laws pertaining thereto), dispose of, Release or allow the Release of any Hazardous Materials on the Property, except to the extent inherent in the operation of the service station located on the Premises.
- Environmental Indemnity. Tenant covenants and agrees, at Tenant's sole cost and expense, to indemnify, defend (at trial and appellate levels, and with attorneys, consultants and experts reasonably acceptable to Landlord) and hold each Indemnified Party harmless from and against any and all liens, damages, losses, liabilities, obligations, settlement payments, penalties, assessments, citations, directives, claims, litigation, demands, defenses, judgments, suits, proceedings, costs, disbursements or expenses of any kind or of any nature whatsoever (including, without limitation, reasonable attorneys', consultants' and experts' fees and disbursements incurred in investigating, defending, settling or prosecuting any claim, litigation or proceeding) which may at any time be imposed upon, incurred by or asserted or awarded against such Indemnified Party or the Property and arising directly or indirectly from or out of: (A) the Release or Threat of Release of any Hazardous Materials on, in, under or affecting all or any portion of the Property or any surrounding areas, regardless of whether or not caused by or within the control of Tenant; (B) the violation of any Environmental Laws relating to or affecting the Property or the Tenant or any person holding under Tenant, whether or not caused by or within the control of Tenant; (C) the failure of Tenant or any person holding under Tenant to comply fully with the terms and conditions of this Section; (D) the breach of any representation or warranty contained in this Section; or (E) the enforcement of this Section, including. Landlord's rights under this Section shall be in addition to all other rights of Landlord under this Lease and shall survive the termination of this Lease.
- 33.4 Notice to Landlord. If Tenant receives any written notice or obtains knowledge of (i) any potential or known Release or Threat of Release of any Hazardous Materials at or from the Property, notification of which must be given to any governmental agency under any Environmental Law, or notification of which has, in fact, been given to any

governmental agency, or (ii) any complaint, order, citation or notice with regard to air emissions, water discharges, or any other environmental health or safety matter affecting Tenant or the Property (an "Environmental Complaint") from any person or entity (including, without limitation, the Environmental Protection Agency), then Tenant shall promptly notify Landlord orally and in writing of said Release or Threat of Release or Environmental Complaint.

#### 35. Tenant's Right to Purchase.

- 35.1 <u>Purchase Option</u>. Notwithstanding any provision in this Lease to the contrary, Tenant shall have the absolute right, at any time, to purchase the Premises for a purchase price of One Hundred Dollars (\$100) ("Purchase Option"). Tenant may exercise its Purchase Option at any time by written notice to Landlord.
- Closing. The closing on the Purchase Option shall take place at 10 a.m. at the offices of Landlord's attorney or at such other place as shall be mutually agreed to by both Landlord and Tenant on the date that is twenty (20) days following receipt of the notice of exercise of the Purchase Option, or at such earlier date as is mutually agreeable to Landlord and Tenant. TIME IS OF THE ESSENCE. At Closing, Landlord shall convey the Premises to Tenant by good and sufficient Maine statutory short form Quitclaim Deed with Covenant (the "Deed"). Title to the Marina Property shall be good and marketable and shall be free and clear of all liens and encumbrances except the following (collectively, the "Permitted Encumbrances"): (i) zoning restrictions and land use matters, including without limitation, all terms and conditions of local, state and federal ordinances or regulations and permits relating to the Premises; (ii) current taxes and assessments; (iii) all easements, restrictions and conditions of record, including all such matters identified in that Old Republic Title Insurance Policy obtained by Landlord with an effective date of October 19, 2017, except that Landlord shall obtain a partial release from any Landlord Mortgage; and (iv) all matters that an accurate survey or physical inspection of the Property would disclose. The following shall occur at the Closing, each being a condition precedent to the others and all being considered as occurring simultaneously:
  - (i) Landlord shall execute, have acknowledged and deliver to Tenant, the Deed and Bill of Sale subject only to Permitted Encumbrances;
  - (ii) Landlord shall deliver an Affidavit indicating that Landlord is not a foreign person and that the transaction is exempt from the requirements of 26 U.S.C. § 1445, or in lieu thereof, Tenant shall be entitled to withhold and account for a portion of the Purchase Price as required by such statute and corresponding regulations;
  - (iii) Landlord shall deliver an Affidavit indicating that Landlord is a Maine resident, or in lieu thereof or of another applicable exemption, Tenant shall be entitled to withhold and account for a portion of the Purchase Price as required by 33 M.R.S.A. §5250-A;
  - (iv) Tenant shall cure any then outstanding Event of Default that is susceptible of being cured by the payment of money.

- (v) Each party shall deliver to the other such other documents, certificates and the like as may be required herein or as may be necessary or helpful to carry out its obligations under this Agreement.
- (vi) Landlord and Tenant shall execute a settlement statement satisfactory to all parties itemizing the various payments and prorations contemplated hereby.
- 35.3 <u>Sale "As-Is, Where-Is."</u> The acceptance of the Deed by Tenant at the Closing shall be deemed to be the full performance and discharge of every agreement, obligation and representation made on the part of Landlord, except as expressly set forth in the Deed. No provisions, agreements or representations herein shall survive the Closing except as specifically stated herein. The Premises will be sold and will be conveyed "as is" without any representation or warranties as to habitability, merchantability, fitness, condition or otherwise. Neither party is relying upon any statements or representations not embodied in this Agreement. Landlord makes no representations or warranties regarding the adequacy of permits or approvals for the installation, maintenance or operation of the docks and marina facilities at the marina property, and Tenant assumes all risk associated with obtaining and maintaining all required governmental permits and approvals associated with the same.
- 35.4 Amendment to Declaration of Easements. At Closing, Landlord and Tenant shall execute and deliver an amendment to the Declaration of Easement granting the Marina Easements that establishes the Marina Easements as appurtenant to the Marina Land and provides for the Marina Easements to run with the Marina Land.

#### 36. Recording.

Landlord agrees to execute a Memorandum of this Lease, which Tenant may record at the York County Registry of Deeds and which shall be substantially in the form of the Memorandum of Lease attached hereto as Exhibit B unless otherwise mutually agreed by the parties hereto.

[signature page to follow]

IN WITNESS WHEREOF, the parties hereto have duly executed this instrument as a sealed instrument on the day and year first above written.

YACHTSMAN HOSPITALITY, LLC

Withess

TENANT:

KPT MARINE, LLC

# EXHIBIT A Lease Area

A certain lot or parcel of situated on the westerly side of Ocean Avenue in the Town of Kennebunkport, County of York, and State of Maine, depicted as "Proposed Lease Parcel" on plan entitled "Boundary Survey at Yachtsman Lodge & Marina, made for Yachtsman Hospitality, LLC" prepared by Owen Haskell, Inc., dated April 26, 2018. OHI Job# 2017-261 KP-Y, bounded and described as follows:

Commencing on the westerly sideline of Ocean Avenue at a one and a quarter inch iron pipe marking the common corner of the grantee and grantor;

Thence, S77°14'00"W along the common line of the grantee and grantor 170.00 feet to the point of beginning;

Thence, from said point of beginning the following courses and distances through land of the grantor:

N14°35'22"W a distance of 270.00 feet;

N30°24'38"E a distance of 30.00 feet;

N14°35'22"W a distance of 40.00 feet:

N59°35'22"W a distance of 30.00 feet;

N14°35'22"W a distance of 239.08 feet to a point 30 feet southerly from the southerly line of land now or formerly of the Town of Kennebunkport (deed book 2115 page 237);

Thence, S78°03'29"W running parallel with and holding 30 feet from said land of the Town of Kennebunkport to the channel of the Kennebunk River;

Thence, southeast along the channel of the Kennebunk River to the common line of the grantee and grantor;

Thence, N77°14'00"E along the common line of the grantee and grantor to the point of beginning.

Bearings are magnetic 1961.

### Exhibit B

### MEMORANDUM OF LEASE

PARTIES TO LEASE:	LESSOR: Yachtsman, LLC
	LESSEE: KPT Marine, LLC
PREMISES:	The premises shown in Exhibit A hereto located at 57 Ocean Avenue, Kennebunkport, Maine, and being a portion of the parcel conveyed by that certain deed from US Hotels New England, LLC to Seller, dated October 11, 2017 and recorded in the York County Registry of Deeds in Book 17585, Page 540.
TERM OF LEASE:	30 Years.
EXTENSION TERM:	Six 10-Year Extensions
TENANT OPTION TO PURCHAS	E: Tenant has an option to purchase the Premises at any time
DATED this day of April,	2018.
WITNESS:	LESSOR(S):
Jul Muy	By: Name Timothy Harringin

STATE OF MAINE COUNTY OF YORK

On this day of April, 2018, before me, the undersigned, a Notary Public in and for said State, personally appeared Timethy Harring to personally known to me or proved to me on the basis of satisfactory evidence to be the individual(s) whose name(s) is subscribed to the within instrument and acknowledged to me that s/he executed the same in her/his capacity, and that by her/his, signature on the instrument, the individual(s) or the person(s) upon behalf of which the individual acted, executed the instrument.

Notary Public

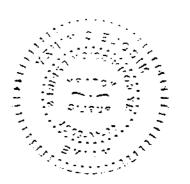




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Attachment 1:

**Activities Description** 

## 1.0 Activities Description

The Yachtsman Marina is located at 57 Ocean Avenue in Kennebunkport, Maine, with 600 feet of frontage along the Kennebunk River. The Town of Kennebunkport's Assessor's Office identifies the parcel as Map 10, Block 1, Lot 3. The facility is an active marina with 58 boat slips.

#### **Existing Conditions**

The Yachtsman Marina is located approximately 0.75-mile from the mouth of the Kennebunk River. The Kennebunk River flows generally southeast, past the towns of Lyman, Arundel, Kennebunk, and Kennebunkport. It enters the Atlantic Ocean in Kennebunkport, approximately 0.5-mile downstream from the town center. The surrounding area, with its high density of marinas and other waterfront uses, has an extensive history of dredging. The Yachtsman Marina dredging activities date back to the 1970s, with the most recent permits issued for maintenance dredging in 2016. Silt, sand, and other natural deposits have impacted the marina of the Yachtsman Marina and have limited boat navigation and berthing depths, especially during periods of low tide.

#### **Proposed Project**

The applicant is proposing to mechanically dredge approximately 6,400± cubic yards of sediment from the area in front of the Yachtsman Marina, including in and around the boat slips, to provide adequate depth for navigation and berthing.

The area of the dredge will be approximately 61,000 square feet (1.4-acres). The proposed dredge depth will be to elevation -6.0 feet mean low water, with about one foot of over-dig. It is anticipated that dredging will coincide with neighboring marinas performing dredging at the same approximate time (see "Adjacent Dredging Projects" section below). The material will be transported by barge to the Isle of Shoals North Disposal Site (IOSN). The IOSN is located approximately 15 nautical miles east of Portsmouth, New Hampshire, in the Gulf of Maine.

The proposed dredge area is coincidental with the area that was previously permitted under Maine DEP Permit #L-18612-4E-A-N in 1994. Since that time, the Yachtsman Marina was dredged in 2005 under Permit ##L-18612-4E-B-N, and in Winter 2015-2016 under Maine DEP's Permit by Rule (PBR) process and U.S. Army Corps of Engineers (USACE) Permit #NAE-2004-319.

Given the timing for receiving permit approvals from Maine DEP and USACE, WEA anticipates that the work will occur during the winter 2025-2026 dredge window.

#### **Adjacent Dredging Projects**

The dredging of the Yachtsman Marina will coincide with similar dredging work at three adjacent marinas on the Kennebunk River, including the Arundel Yacht Club, the Kennebunkport Marina, and the Kennebunk River Club.

**Attachment 2:** 

**Alternatives Analysis** 

## 2.0 Alternatives Analysis

#### **Dredging Alternatives Analysis**

WEA studied several alternatives for the Yachtsman Marina dredging project, all evaluated against its purpose and need. The project's purpose is to dredge and dispose of dredged material from the site in an efficient, environmentally cautious, and effective manner; the project's need is to provide the Yachtsman Marina with safe navigation and anchoring conditions for watercraft.

The existing conditions and dredging alternatives analysis are described in the following narrative:

#### **Existing Conditions**

The Yachtsman Marina (site) encompasses approximately 1.70 acres of land. Ocean Avenue and Silas Perkins Park border the property to the north; Ocean Avenue borders the site to the east; the Kennebunkport Marina is located south of the property; and the Kennebunk River borders the property to the west.

#### Alternative 1 – No Action

WEA investigated the possibility of not dredging, however, the project's purpose is to provide effective navigation for watercraft and boat slips at the Yachtsman Marina. If Alternative 1 is utilized, the club members and guest mariners will not be able to safely navigate to the boat slips. The area would continue to fill in with sediment and eventually the mooring and docking space would become unusable. Alternative 1 is not practicable as it would eventually force the Yachtsman Marina to close due to unsafe navigation and does not satisfy the project need.

#### Alternative 2 – Reduced Dredge

WEA investigated the option of dredging 50% less than the proposed amount of 6,400 cubic yards. Though there may be a slight environmental benefit to dredging less (a smaller area would be disturbed and the length of dredging activities would be reduced), the dredged area would quickly fill in again within a few years, requiring the area to be dredged again sooner than if the area was dredged to elevation -6.0 feet. Again, this would not allow the club members and others to navigate or use the docks in a safe manner. Alternative 2 would not advance the project's need.

#### Alternative 3 – Full Dredge

WEA investigated the option of fully dredging the marina to the proposed elevation of -6.0 feet mean low water, totaling 6,400 cubic yards of dredge material. The dredging will provide adequate sediment removal for boat owners to navigate safely for 6-8 years at the current rate of sedimentation, and therefore has been selected as the most appropriate alternative for this project to meet the project's purpose and need.

#### **Selection**

Given the information above, Alternative 3 was selected as the most appropriate alternative for the project. This alternative will provide the maximum efficiency of dredging and will optimize the time between necessary dredging events.

#### **Dredge Material Disposal Alternatives Analysis**

The USACE approved a Sampling and Analysis Plan (SAP) for the project on January 21, 2022, which provided proposed sediment sampling locations, methods, and testing criteria to determine disposal suitability. The sampling results were submitted to the USACE for the Yachtsman Marina and the nearby Arundel Yacht Club, Kennebunkport Marina, and Kennebunk River Club. The USACE issued a Suitability Determination for all 4 sites on June 10, 2024, which documents the suitability of the dredged material for disposal at the Isle of Shoals North (IOSN) open water disposal site.

It is WEA's understanding that the USACE requires Individual Standard Permit applicants to conduct an alternatives analysis to evaluate options for disposal of dredged material. In order of disposal method preference, the USACE favors onshore disposal, followed by beneficial use, and then open water placement.

The dredge material disposal alternatives analysis is described in the following narrative:

#### Alternative A – Onshore Disposal

#### Onshore Disposal - Storage of Material at the Yachtsman Marina

WEA investigated the option of onshore disposal of the 6,400 cubic yards of dredged materials from the Yachtsman Marina. The Yachtsman Marina encompasses approximately 1.70 acres of land, as shown in the aerial site map attached to this Alternatives Analysis as Figure 1. Due to the layout of the Yachtsman Marina lot, there is minimal space available to conduct onshore disposal operations at the site.

Logistically, to conduct onshore disposal of the dredged material, the following steps would need to be taken:

- Use barge-mounted dredging equipment to dredge sediment.
- Place the dredged material onshore into a stockpile or a large container from the dredge barge.
  - As shown in the attached aerial site map, the largest area available for a stockpile of dredged materials is located within a 26-foot by 26-foot grassed area between the Yachtsman Marina/Hotel buildings. If a 4-foot walkway is kept clear around the stockpile, the allowable diameter of the stockpile would be 18 feet (therefore the allowable radius would be 9 feet). Using the following standard soil stockpile volume equation, the required height of a 6,400 cubic yard (172,800 cubic feet) stockpile would need to be 2,037 feet tall, which is infeasible.

    - Volume =  $\frac{1}{3} \times \pi \times Radius^2 \times Height \rightarrow$  Height = Volume × 3 ×  $\frac{1}{\pi} \times \frac{1}{Radius^2} \rightarrow$  Height = 172,800ft<sup>3</sup> × 3 ×  $\frac{1}{\pi} \times \frac{1}{(9ft)^2} = 2,037$  ft
  - In addition, this step is infeasible due to the layout of the Yachtsman Marina's dock/boat slips; the closest a dredge barge could get to the "open space" located to the between the Yachtsman Marina buildings is at least 70 feet away, requiring the dredging equipment to have a very large reach.

- Give the dredged sediment appropriate time to dewater.
- Load dried dredged sediment into dump trucks or roll-off containers and haul offsite to a final disposal location.
  - O Dump trucks have an approximately 20 cubic yard capacity and roll-off containers have a maximum capacity of 40 cubic yards. With these capacities, the hauling and disposal of the dried dredged sediment would require approximately 320 or 160 truckloads, respectively. The hauling of sediment would be infeasible due to major increases in project duration and costs.
  - In addition, because the proposed and allowable dredging window occurs during winter, local roadways will be posted for heavy truck traffic, which would likely require hauling vehicles to reduce the quantity of sediment they can transport at once.

As documented above, onshore disposal of dredged sediment using the Yachtsman Marina site is infeasible due to site constraints and sediment hauling duration/costs. As mentioned, an aerial map of the site is included as Figure 1 in this Alternatives Analysis for reference.

#### Onshore Disposal - Storage of Material at Alternative Locations on the Kennebunk River

The proposed dredge volume for the Yachtsman Marina is 6,400 cubic yards, or 172,800 cubic feet. Area estimates for storing the dredged material in a stockpile or in roll-off dumpsters for dewatering are described below. Dewatering the dredged sediment could take anywhere from a couple days to a couple weeks.

#### Storage via Stockpile

It is assumed that acceptable side slopes for a stockpile of wet, silty sediment would be between 4:1 and 5:1 (horizontal to vertical), and an acceptable stockpile height would be between 20 and 25 feet. Using these criteria and the estimated dredge volume of 172,800 cubic feet, the diameter of the stockpile needed to store the dredged material would be approximately 180 feet. It is assumed that around 20 feet of additional space would be required around the perimeter of the stockpile for erosion and sedimentation controls, dewatering materials, and equipment access, increasing the diameter of the storage area to 220 feet. Figure 2, included with this Alternatives Analysis, shows what a 220-foot diameter stockpile would look like on nearby facilities with open space along the Kennebunk River; there are no facilities with adequate space to accommodate the stockpile storage area. In addition, the Yachtsman Marina does not have control or interest in any of the nearby facilities along the Kennebunk River shown in Figure 2, with the exception of the Kennebunkport Marina at 67 Ocean Avenue, which also does not have adequate space to accommodate the stockpile storage area.

#### Storage via Roll-Off Dumpster

The largest readily available roll-off dumpster size is 40 cubic yards. It is assumed that wet sediment dumped into a roll-off dumpster to dewater would contain about 20-percent water, which would reduce the soil capacity in the dumpster to 32 cubic yards. With this assumption, it would require 200 dumpsters to store 6,400 cubic yards of sediment. Each roll-off dumpster is 22 feet long by 7.5 feet wide; adding a 5-foot walking area around the roll-off would increase the footprint of each roll-off to 27 feet by 12.5 feet, or 337.5 square feet. The total space required for 200 roll-off dumpsters would be approximately 67,500 square feet. Figure 3, included with this Alternatives

Analysis, shows what an 67,500 square foot roll-off dumpster storage area would look like on nearby facilities with open space along the Kennebunk River; there are no facilities with adequate space to accommodate the roll-off storage area. In addition, the Yachtsman Marina does not have control or interest in any of the nearby facilities along the Kennebunk River shown in Figure 3, with the exception of the Kennebunkport Marina at 67 Ocean Avenue, which also does not have adequate space to accommodate the roll-off storage area.

#### Onshore Disposal – Disposal Location Alternatives

As stated above, it is infeasible to get the dredged material onshore for dewatering and subsequent hauling to a disposal location at the Yachtsman Marina and other nearby facilities along the Kennebunk River. As a result, the following onshore disposal location alternatives are also considered infeasible:

#### Landfill

- o This alternative is also infeasible due to the estimated cost to dispose of the material at a landfill. Tipping and hauling fees for material disposal would likely be between \$75 and \$100 per cubic yard, totaling around \$480,000 to \$640,000 for disposal of 6,400 cubic yards of material.
- The Juniper Ridge Landfill in Alton/Old Town, Maine and the Waste Management Crossroads Landfill in Norridgewock, Maine currently do not have sufficient capacity to accommodate the dredge materials and the increase in daily traffic to dispose of the dredge materials. The Waste Management Turnkey Landfill in Rochester, NH could accommodate the materials, however, as documented above, this option is both infeasible due to inability to get the dredge material upland, and cost prohibitive.

#### • Well injection

- O The Environmental Protection Agency's "General Information About Injection Wells" webpage states that injected fluids may include "water, wastewater, brine (salt water), or water mixed with chemicals." The dredged materials will consist of silty sediment and therefore well injection is not a feasible disposal alternative.
- o In addition, the Maine Department of Environmental Protection's Underground Injection Control (UIC) Program webpage states that Class I, II, III, and IV injections wells are prohibited in Maine.

#### • Incineration

O This alternative is also infeasible due to the estimated cost to incinerate soils. Hauling and incineration fees would likely be around \$700 per cubic yard, totaling around \$4.5M for the incineration of 6,400 cubic yards of material. (Source: Federal Remediation Technologies Roundtable Screening Matrix and Reference Guide, Version 4.0, Section 4.22 Incineration.) In addition, it appears that the closest soil incineration facilities to the Yachtsman Marina are in Illinois or Arkansas.

#### • Spread of material over open ground

This alternative is also infeasible because the Yachtsman Marina does not have access to a land area appropriate for spreading the material over open ground. Spreading 172,800 cubic feet of soil across a land area would consist of: 1 foot of sediment spread across a 172,800 square foot (~4 acre) land area; or 6 inches of sediment spread across a 345,600 square foot (~7.9 acre) land area.

- Additional biological, chemical, or physical treatment of intermediate or final waste streams
  - Additional treatment of the dredged sediment would not increase the feasibility of onshore disposal.

#### Alternative B – Beneficial Use

WEA used the USACE's New England District Beneficial Use Planning Tool (Tool) to identify potential beneficial use dredge material disposal sites within a 30-mile radius of the project site, which is the distance from the Yachtsman Marina to the IOSN open water disposal site. The Tool identified 17 potential beneficial use sites; an analysis of the suitability of each of these sites is as follows:

- Beach Nourishment (4 sites Wells Beach, Drakes Island Beach, Camp Ellis, Western Beach)
  - A representative from the USACE confirmed that all beach nourishment projects require sand, whereas the dredged material from the Kennebunk River will be primarily silt. Therefore, beneficial use of dredged material at the beach nourishment sites is infeasible.
- Construction and Industrial or Commercial Uses (2 sites Cobble Berm in Ogunquit, ME and Dune Erosion/Stormwater Improvements in Wells, ME)
  - The two construction projects require cobble and sand materials, respectively, whereas the material dredged from the Kennebunk River will be primarily silt.
     Therefore, beneficial use of dredged material at the construction sites is infeasible.
- Nearshore Berm (6 sites Wallis Sands, Wells, Goochs Beach, Kennebunk River, Saco, and Little River Rock Disposal Sites)
  - A representative from the USACE confirmed that all nearshore berm projects require sand, whereas the dredged material from the Kennebunk River will be primarily silt. Therefore, beneficial use of dredged material at nearshore berm sites is infeasible.
- Salt Marshes (5 sites Piscataqua, Ogunquit/Rachel Carson National Wildlife Refuge, Webhannet, and Little River Salt Marsh Priority Areas Accepting Sediment; and Goosefare Salt Marsh)
  - Piscataqua Salt Marsh Priority Area: A representative from the New Hampshire Division of Environmental Services (NHDES) stated that the Piscataqua Salt Marsh is not a potential dredge disposal site.
  - Ogunquit/Rachel Carson National Wildlife Refuge, Webhannet, and Little River Salt Marsh Priority Areas Accepting Sediment and Goosefare Salt Marsh: A representative from the U.S. Fish and Wildlife Service (USFWS) stated that the State of Maine's current regulations and permitting processes do not allow the use of dredged materials on salt marshes.
  - o Beneficial use of dredged material at salt marsh sites is infeasible.

A summary of the 17 potential beneficial use sites is included as Table 1, attached to this Alternatives Analysis along with a list of references and copies of relevant email communications.

#### Alternative C – Open Water Placement

#### Open Water Placement - Saco Bay Open Water Disposal Site

In order to get Maine DEP's approval for disposal at the Saco Bay Open Water Disposal Site, additional benthic environment testing of the river sediment is required. The time it will take to conduct the additional sediment testing and analysis, to receive an updated Suitability Determination for Saco Bay from the USACE, and to receive permit approvals for dredging from the USACE and Maine DEP would push the dredging activities to the Winter 2026-2027 dredge window. The Yachtsman Marina has a critical need to conduct their maintenance dredging in the Winter 2025-2026 dredge window, as boats at their marina are already experiencing navigation challenges due to river sediment accumulation at the marina. As a result, consideration of the Saco Bay Disposal Site is not a feasible alternative for this round of maintenance dredging.

#### Open Water Placement - Isle of Shoals North Open Water Disposal Site

As stated above, the USACE issued a Suitability Determination for the Yachtsman Marina and the nearby Arundel Yacht Club, Kennebunkport Marina, and Kennebunk River Club on June 10, 2024, which documents the suitability of the dredged material for disposal at the IOSN open water disposal site.

#### Selection

Due to the infeasibility of disposing of dredged material onshore and there being no beneficial use sites suitable for disposal, Alternative C, open water placement at IOSN, was selected as the most appropriate alternative for the project.

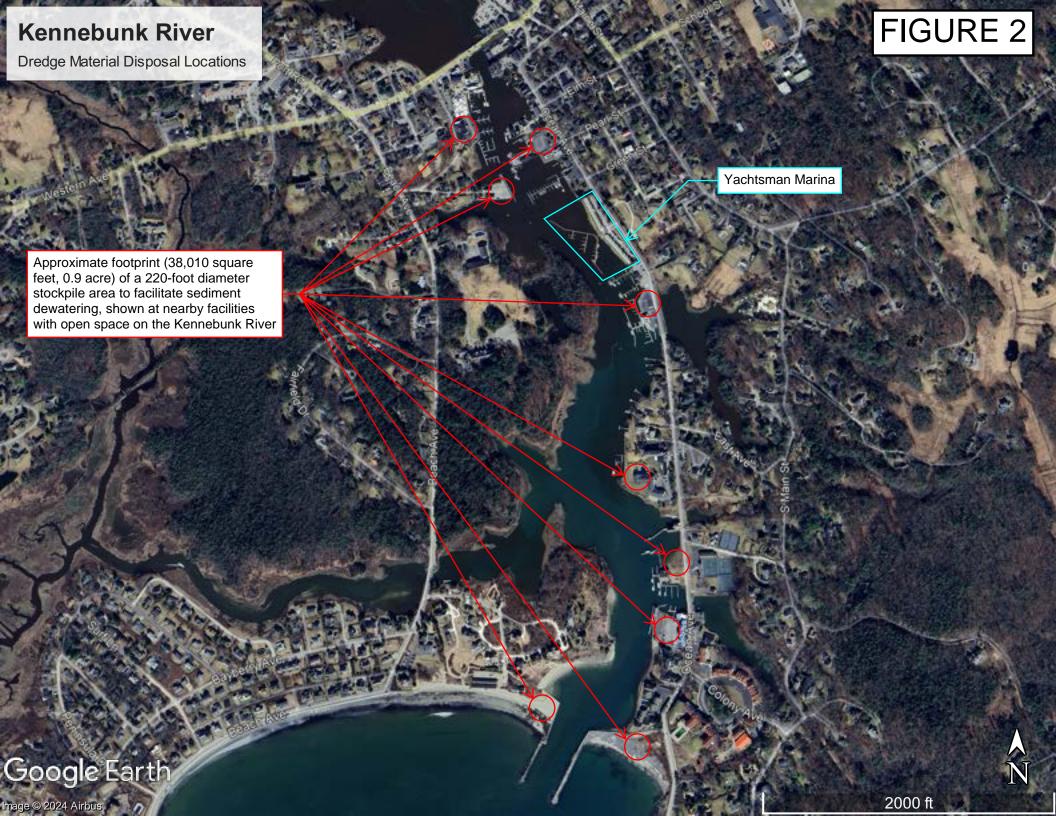
# **Figures**

Figure 1: Yachtsman Marina Site Aerial Map

Figure 2: Kennebunk River – Stockpile Locations

Figure 3: Kennebunk River – Roll-Off Dumpster Locations





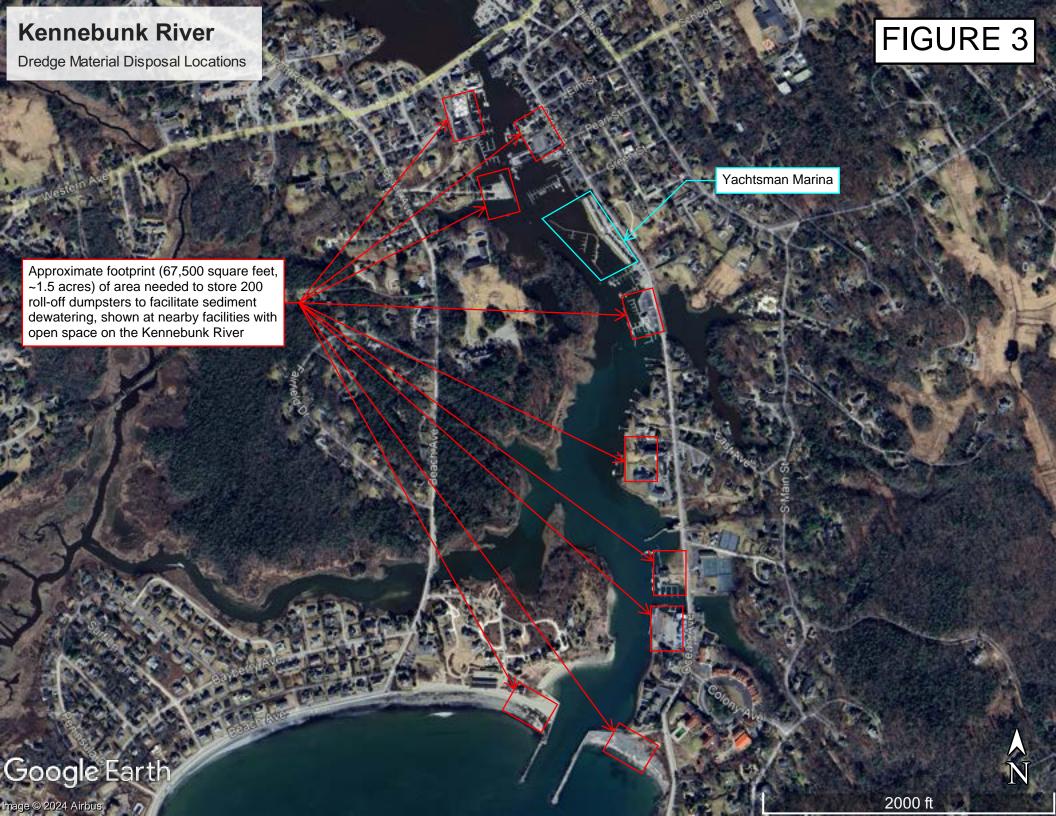




Table 1: Dredge Material Disposal Beneficial Use Alternatives – Yachtsman Marina

# <u>Table 1</u> <u>Dredge Material Disposal Beneficial Use Alternatives - Yachtsman Marina</u> Summary Table & References

Project Name <sup>1</sup>	Project Category	<u>Location</u>	Coordinates	Contact	Feasible Disposal Location?	Reasoning
Wells Beach	Beach Nourishment	Wells, ME	43.311208N -70.561063W	USACE	No	Beach nourishment projects require sand; dredged material from the Kennebunk River will be primarily silt. 4,5
Drakes Island Beach	Beach Nourishment	Wells, ME	43.321900N -70.552082W	USACE	No	Beach nourishment projects require sand; dredged material from the Kennebunk River will be primarily silt. 4,5
Camp Ellis	Beach Nourishment	Saco, ME	43.466204N -70.381264W	USACE	No	This beach nourishment project requires "sandy shoal material," and dredged material from the Kennebunk River will be primarily silt. 4,5,6
Western Beach	Beach Nourishment	Scarborough, ME	43.539528N -70.321888W	USACE	No	Beach nourishment projects require sand; dredged material from the Kennebunk River will be primarily silt. 4,5
Cobble Berm	Construction and Industrial or Commercial Uses	Ogunquit, ME	43.236523N -70.589087W	USACE	No	Project requires cobble, and dredged material from the Kennebunk River will be primarily silt.
Dune Erosion and Stormwater Improvements	Construction and Industrial or Commercial Uses	Wells, ME	43.248998N -70.595158W	USACE	No	Dune requires sand, and dredged material from the Kennebunk River will be primarily silt.
Wallis Sands Disposal Site	Nearshore Berm	Rye, NH	43.020324N -70.726276W	USACE	No	Nearshore berm projects require sand, and dredged material from the Kennebunk River will be primarily silt. <sup>4,5</sup>
Wells Nearshore Disposal Site	Nearshore Berm	Wells, ME	43.307605N -70.560229W	USACE	No	20,000 CY of dredged "sandy" material from the 2020 Wells Harbor federal navigation project was placed here; however, nearshore berm projects require sand, and dredged material from the Kennebunk  River will be primarily silt. 4,5,6
Goochs Beach Nearshore Site	Nearshore Berm	Kennebunkport, ME	43.345503N -70.481053W	USACE	No	20,000 CY of dredged material from the 2020 Kennebunk/Kennebunkport federal navigation project was placed here; however, nearshore berm projects require sand, and dredged material from the Kennebunk River will be primarily silt. <sup>4,5,6</sup>
Kennebunk River Disposal Site	Nearshore Berm	Kennebunkport, ME	43.345134N -70.479100W	USACE	No	Nearshore berm projects require sand, and dredged material from the Kennebunk River will be primarily silt. <sup>4,5</sup>
Saco Nearshore Disposal Site	Nearshore Berm	Saco, ME	43.467543N -70.366173W	USACE	No	Nearshore berm projects require sand, and dredged material from the Kennebunk River will be primarily silt. <sup>4,5</sup>
Little River Rock Nearshore	Nearshore Berm	Saco, ME	43.518925N -70.364468W	USACE	No	Nearshore berm projects require sand, and dredged material from the Kennebunk River will be primarily silt. <sup>4,5</sup>
Piscataqua Salt Marsh Priority Area <sup>2</sup>	Salt Marsh Priority Area	Rye, NH		USFWS	No	Piscataqua Salt Marsh is not a potential dredge disposal site. <sup>7</sup>
Ogunquit Salt Marsh Priority Area/Rachel Carson National Wildlife Refuge <sup>3</sup>	Salt Marsh Priority Area	Ogunquit/Wells, ME		USFWS	No	Maine state permitting does not allow the use of dredged materials on salt marshes. <sup>8</sup>

# <u>Table 1</u> <u>Dredge Material Disposal Beneficial Use Alternatives - Yachtsman Marina</u> Summary Table & References

Project Name <sup>1</sup>	Project Category	<u>Location</u>	<u>Coordinates</u>	Contact	Feasible Disposal Location?	Reasoning
Webhannet Salt Marsh Priority Area <sup>3</sup>	Salt Marsh Priority Area	Wells, ME		USFWS	No	Maine state permitting does not allow the use of dredged materials on salt marshes. <sup>8</sup>
Little River Salt Marsh Priority Area <sup>3</sup>	Salt Marsh Priority Area	Wells, ME		USFWS	No	Maine state permitting does not allow the use of dredged materials on salt marshes. <sup>8</sup>
Goosefare Salt Marsh	Wetland Habitats/Salt Marsh	Saco, ME	43.493752N -70.392875W	USFWS	No	Maine state permitting does not allow the use of dredged materials on salt marshes. <sup>8</sup>

#### References:

- 1. USACE New England District Beneficial Use Planning Tool: https://www.arcgis.com/apps/dashboards/4f1c828081684605af2972cb6297dacf
- 2. New Hampshire Saltmarsh Restoration Priorities for the Saltmarsh Sparrow: https://acjv.org/documents/NH\_SALS\_comp\_guidance\_doc.pdf
- 3. Maine Saltmarsh Restoration Priorities for the Saltmarsh Sparrow: https://acjv.org/documents/ME\_SALS\_comp\_guidance\_doc.pdf
- 4. Email Correspondence Between WEA and USACE, dated August 13, 2024 (attached).
- 5. Email Correspondence Between WEA and USEPA, dated August 14, 2024 (attached).
- 6. USACE Update Report Maine, dated January 31, 2024: https://www.nae.usace.army.mil/Portals/74/ME-UpdateReport\_31Jan2024.pdf
- 7. Email Correspondence Between WEA and NHDES, dated August 19, 2024 (attached).
- 8. Email Correspondence Between WEA and USFWS, dated August 14, 2024 (attached).

# References

- 1. Email Correspondence Between WEA and USACE, dated August 13, 2024.
- 2. Email Correspondence Between WEA and USEPA, dated August 14, 2024.
- 3. Email Correspondence Between WEA and NHDES, dated August 19, 2024.
- 4. Email Correspondence Between WEA and USFWS, dated August 14, 2024.

#### **Leyna Tobey**

From: Hopkins, Aaron D CIV USARMY CENAE (USA) <Aaron.D.Hopkins@usace.army.mil>

**Sent:** Tuesday, August 13, 2024 12:44 PM

**To:** Leyna Tobey; Saloio, Gabriella J CIV USARMY CEHQ (USA)

**Subject:** RE: Beneficial Use Sites for Dredging

Hi Leyna,

I got your voicemail the other day and I apologize for not returning your call yet.

Great to see that you used the Beneficial Use of Dredged Material Planning Tool as a screening step for your project. You are correct about the beach nourishment sites needing sandy material – and the same can be said for the nearshore berm sites you identified in the Planning Map as those are intended to be feeder berms for the adjacent beaches. The openwater sites in your list are included in the Planning Map to compare openwater disposal alternatives and are not considered beneficial use themselves. That leaves the five salt marsh sites on your list which are all potential restoration sites from the USFWS. I would suggest you reach out to the contacts in the Atlantic Coast Joint Venture reference at USFWS or Maine Dept of Inland Fisheries and Wildlife to see if there are any potential beneficial uses for your project at those sites. We were able to provide some dredged material recently to the Rachel Carson National Wildlife Refuge in Wells, ME for a small beneficial use project.

Aaron

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

From: Leyna Tobey <leyna@Walsh-eng.com> Sent: Tuesday, August 13, 2024 10:54 AM

To: Saloio, Gabriella J CIV USARMY CEHQ (USA) <Gabriella.J.Saloio@usace.army.mil>; Hopkins, Aaron D CIV USARMY

CENAE (USA) < Aaron.D. Hopkins@usace.army.mil>

Subject: [Non-DoD Source] Beneficial Use Sites for Dredging

Good morning Gabriella and Aaron,

I am working on permitting a dredging project for several marinas on the lower Kennebunk River in Kennebunk, ME, and am currently conducting an alternatives analysis on where to dispose of the 25,000 CY of silty dredge material. I used the Army Corp's Beneficial Use of Dredged Material Planning Tool and found the potential disposal locations in the attached spreadsheet within a 30-mile radius of the project site.

As Gabriella is listed as the ACOE contact for several of the disposal locations and Aaron is listed at the contact for the DAMOS Beneficial Use Planning Map, I was hoping either of you would be able to provide me with some details for the disposal sites listed in the attached spreadsheet (e.g. if they are accepting materials, what types of materials they are accepting, timeline for acceptance, etc.) or could point me in the right direction to another

contact to reach out to. (Note that the attached spreadsheet does not include any beach nourishment projects, as those projects are assumed to need sand and the material we will be dredging is primarily silt.)

Please give me a call to discuss if that would be easier. Thanks in advance!

Leyna

Leyna Tobey, PE\*
Project Manager | Civil Engineer
\*Licensed in MA



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#### Leyna Tobey

From: Wolf, Steven <Wolf.Steven@epa.gov>
Sent: Wednesday, August 14, 2024 10:18 AM

To: Leyna Tobey
Cc: Sterling, Alexa

**Subject:** FW: Dredged Material Disposal Inquiry

**Attachments:** 2024-08-12 Dredge Disposal Alternatives Analysis\_to EPA.xlsx

Hi Leyna, EPA co-manages the ocean dredged material disposal sites with the Army Corps – the goal of the alternatives analysis is to evaluate other uses of the dredged material rather than just straight disposal. The nearshore sites are considered "beneficial" in that material placed at those sites is integrated into coastal sediment transport and can actually nourish beaches with material under the right hydrodynamic conditions. Unfortunately, as I recall, the material from the projects you referenced contains too high a percentage of fine-grained material to be placed at the nearshore sites. For evaluating the feasibility of using the material as part of salt marsh restoration, I'd direct you back to the Corps and to ME and NH state agencies. I'd suggest starting with Todd Randall at the New England District Corps (todd.a.randall@usace.army.mil) who could provide information on any federal marsh restoration projects as well as the contact information for the states folks involved in marsh restoration. Feel free to reach back it you need additional information - Steve

Steven Wolf | US Environmental Protection Agency, Region 1 (New England) 5 Post Office Square, Suite 100, Mail Code OEP06-1 Boston, MA 02109-3912 Office: 617-918-1617 Mobile: 978-201-1928 wolf.steven@epa.gov

From: Leyna Tobey <leyna@Walsh-eng.com> Sent: Tuesday, August 13, 2024 12:12 PM

To: Sterling, Alexa <Sterling.Alexa@epa.gov>; Wolf, Steven <Wolf.Steven@epa.gov>

Subject: Dredged Material Disposal Inquiry

**Caution:** This email originated from outside EPA, please exercise additional caution when deciding whether to open attachments or click on provided links.

Good afternoon Alexa and Steven,

I am working on permitting a dredging project for several marinas on the lower Kennebunk River in Kennebunk, ME, and am currently conducting an alternatives analysis on where to dispose of the 25,000 CY of silty dredge material. I used the Army Corp's Beneficial Use of Dredged Material Planning Tool and found the potential disposal locations in the attached spreadsheet within a 30-mile radius of the project site.

As you are both listed on the EPA's website for dredged material disposal, I was hoping either of you would be able to provide me with some details for the disposal sites listed in the attached spreadsheet (e.g. if they are accepting materials, what types of materials they are accepting, timeline for acceptance, etc.) or could point me in the right direction to another contact to reach out to. (Note that the attached spreadsheet does not include any beach nourishment projects, as those projects are assumed to need sand and the material we will be dredging is primarily silt.)

Please give me a call to discuss if that would be easier. Thanks in advance!

Leyna

#### Leyna Tobey, PE\* Project Manager | Civil Engineer \*Licensed in MA



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#### **Leyna Tobey**

From: Lucey, Kevin <kevin.p.lucey@des.nh.gov>
Sent: Monday, August 19, 2024 11:59 AM
To: Leyna Tobey; tracy@rockinghamccd.org
Subject: RE: Piscataqua Saltmarsh Restoration Inquiry

Follow Up Flag: Follow up Flag Status: Flagged

#### Hi Leyna,

There are only 3 NH sites listed as Beneficial Use Sites (Seabrook Beach, Hampton Beach, and Wallis Sands Offshore Berm). The "Piscataqua Salt Marsh" is not a potential dredge disposal site. Its included on the USACE mapper because it is a USFWS Priority for Salt Marsh. NH has not yet undertaken any sediment placement projects on tidal wetlands.

I don't know much about it, but I understand that there is a dredge sediment reuse project at the Webhannet Salt Marsh in Wells.

Good luck, Kevin Lucey, Habitat Coordinator Coastal Program | Watershed Mar

Coastal Program | Watershed Management Bureau | Water Division New Hampshire Department of Environmental Services 222 International Drive, Suite 175 Portsmouth, NH 03801 603-559-0026

kevin.p.lucey@des.nh.gov

From: Leyna Tobey <leyna@Walsh-eng.com> Sent: Tuesday, August 13, 2024 1:53 PM

**To:** Lucey, Kevin < kevin.p.lucey@des.nh.gov>; tracy@rockinghamccd.org

Subject: Piscataqua Saltmarsh Restoration Inquiry

**EXTERNAL:** Do not open attachments or click on links unless you recognize and trust the sender.

Good afternoon Tracy and Kevin,

I am working on permitting a dredging project for several marinas on the lower Kennebunk River in Kennebunk, ME, and am currently conducting an alternatives analysis on where to dispose of the 25,000 CY of silty dredge material. I used the Army Corp's Beneficial Use of Dredged Material Planning Tool (here) and found that the Piscataqua Saltmarsh is listed as a potential dredge material disposal location.

I saw that you were both listed as contacts for the project on the New Hampshire Saltmarsh Restoration Priorities for the Saltmarsh Sparrow <u>document</u>, and I was hoping either of you would be able to provide me with some details regarding whether you are accepting materials for the Saltmarsh, what types of materials are being accepted, timeline for material acceptance, etc. Or, if you are not the right contacts to be reaching out to, could you please point me in the right direction of who I should be contacting?

Please give me a call to discuss if that would be easier. Thanks in advance!

Leyna

Leyna Tobey, PE\*
Project Manager | Civil Engineer
\*Licensed in MA



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#### **Leyna Tobey**

From: Sanders, Nicole A <nicole\_sanders@fws.gov>
Sent: Wednesday, August 14, 2024 9:50 AM
To: Leyna Tobey; danielle.dauria@maine.gov

**Cc:** Adamowicz, Susan; Stromayer, Karl

Subject: RE: [EXTERNAL] Webhannet Saltmarsh Restoration Inquiry

Hi Leyna,

Thank you for reaching out! Right now, in Maine, state permitting does now allow the use of dredged materials on salt marshes. We are going to pilot the first thin-layer placement on Refuge land in Maine but the reason we are able to do this is because ours is a true pilot study permitted under an innovate pilot program with the Maine DEP. This permitting pathway operates under a pilot solid waste permit. We initiated conversations with the Army Corps and regulators years prior to getting our small (~1,000 cy) amount of clean, sandy sediment. Though it's certainly not out of the question to apply for another thin-layer placement project, it will not be a fast process, and DEP may not permit it at all based on the current regulatory processes. Usually for a pilot, there is only a small amount of sediment used 1-2,000 cubic yards over a ~2 acre area. Still, they may consider scaling up, which is an important part of learning and attempting new restoration techniques in Maine. And, there are salt marsh areas that we have conceptually considered for future thin-layer projects. All comes down to the permitting process! Once our refuge manager, Karl, has returned from annual leave myself, Sue, and Karl can discuss viable options and get back to you. Thanks again for reaching out and thinking of us.

Best, Nicole

From: Leyna Tobey <leyna@Walsh-eng.com> Sent: Tuesday, August 13, 2024 2:00 PM

To: Sanders, Nicole A <nicole\_sanders@fws.gov>; danielle.dauria@maine.gov

Subject: [EXTERNAL] Webhannet Saltmarsh Restoration Inquiry

This email has been received from outside of DOI - Use caution before clicking on links, opening attachments, or responding.

Good afternoon Nicole and Danielle,

I am working on permitting a dredging project for several marinas on the lower Kennebunk River in Kennebunk, ME, and am currently conducting an alternatives analysis on where to dispose of the 25,000 CY of silty dredge

material. I used the Army Corp's Beneficial Use of Dredged Material Planning Tool (<u>here</u>) and found that the Webhannet River Complex Saltmarsh is listed as a potential dredge material disposal location.

I saw that you were both listed as contacts for the project on the Maine Saltmarsh Restoration Priorities for the Saltmarsh Sparrow <u>document</u>, and I was hoping either of you would be able to provide me with some details regarding whether you are accepting materials for the project(s), what types of materials are being accepted, timeline for material acceptance, etc. Or, if you are not the right contacts to be reaching out to, could you please point me in the right direction of who I should be contacting?

Please give me a call to discuss if that would be easier. Thanks in advance!

Leyna

Leyna Tobey, PE\*
Project Manager | Civil Engineer
\*Licensed in MA



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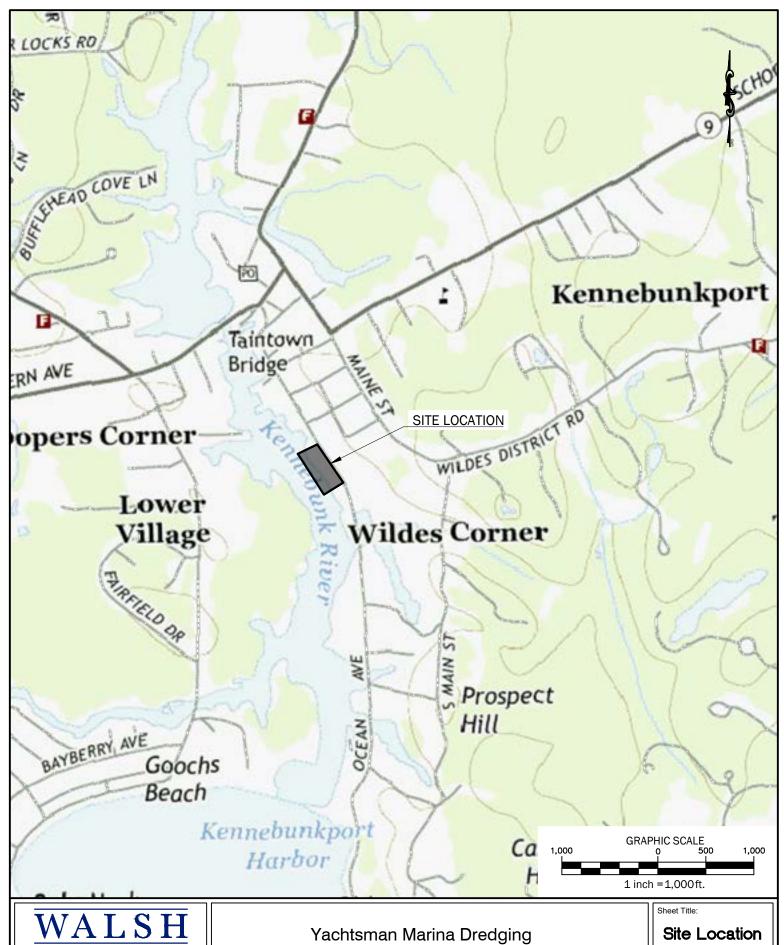




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**Attachment 3:** 

**Site Location Map** 



# engineering associates, inc.

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Yachtsman Marina 57 Ocean Avenue Kennebunkport, Maine 04046 Job No.: Date: OCTOBER 2024 1" = 1,000' Scale: Drawn: LLT Checked: WRW **Attachment 4:** 

Photo Log



# Attachment 4.0 PHOTO LOG

### Yachtsman Marina Dredge

Kennebunkport, ME

Photo No. 1

**Date:** 10/20/2020

Site Location:

Yachtsman Marina

**Description:** 

View from the southeast side of the marina.



Photo No. 2

**Date:** 10/20/2020

Site Location:

Yachtsman Marina

Description:

View from north-west side of the marina.



# Photo No. 3

**Date:** 10/20/2020

# Site Location:

Yachtsman Marina

# Description:

Aerial view of marina.



# Photo No. 4

#### Date:

2021

# Site Location:

Yachtsman Marina

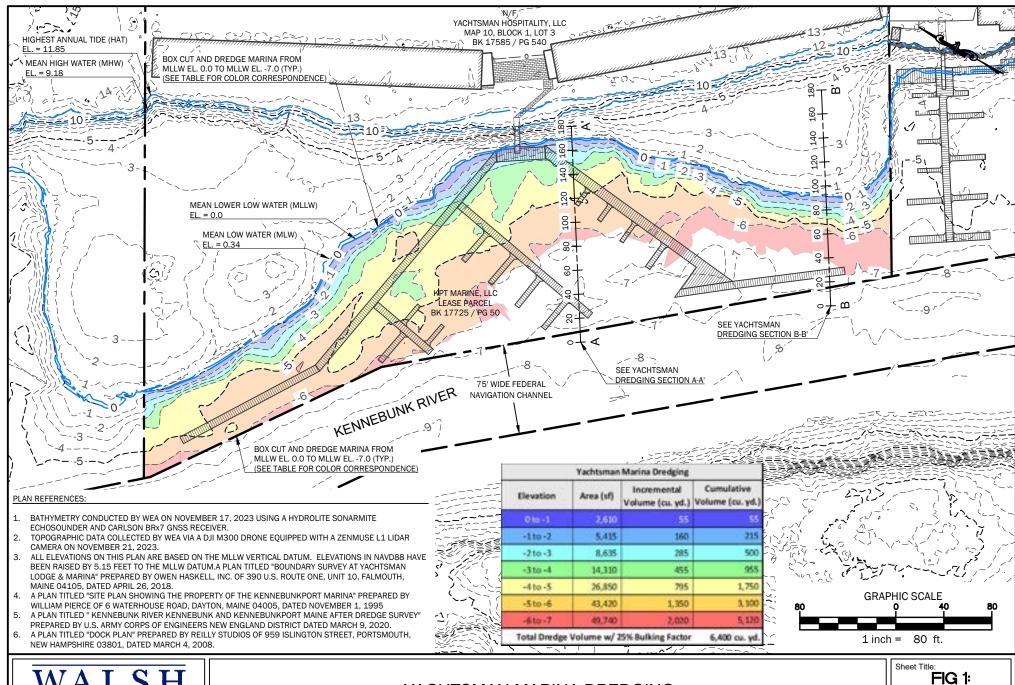
# Description:

Boat slips in the marina.



**Attachment 5:** 

**Site Plan** 





One Karen Dr., Suite 2A | Westbrook, Maine 04092

ph: 207.553.9898

#### YACHTSMAN MARINA DREDGING

57 OCEAN AVE.
KENNEBUNKPORT, ME 04046

 PLAN VIEW

 Job No.:
 643.1

 Date:
 OCT. 29, 2024

 Scale:
 1"= 80"

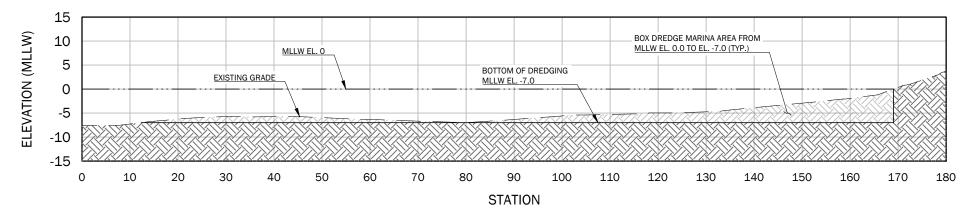
 Drawn:
 CAR/MNW

 Checked:
 WRW

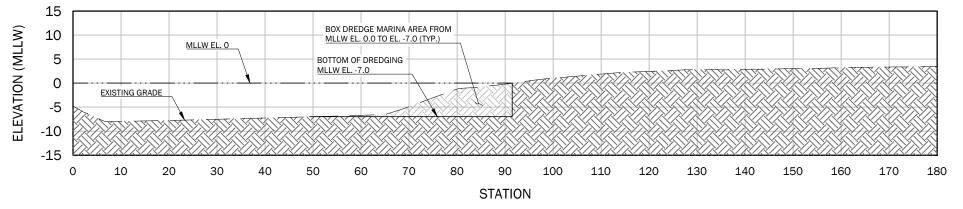
P:\643.1 - Yachtsman Marina Dredge\3, CAD\643.1 - BASE.dwg plot date: 11/5/2024 1:15 PN

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# Attachment 6: Additional Plan (Section Views)



# Yachtsman Dredging Section A-A'



Yachtsman Dredging Section B-B'



Sheet Title



### YACHTSMAN MARINA DREDGING

57 OCEAN AVE. KENNEBUNKPORT, ME 04046

FIG 2:		
SECT	TON VIEW	
Job No.:	643.1	
Date:	OCT. 29, 2024	
Scale:	1" = 20'	
Drawn:	CAR/MNW	
Checked:	WRW	

P:\643.1 - Yachtsman Marina Dredge\3, CAD\643.1 - BASE.dwg plot date: 10/29/2024 8:52 Al

**Attachment 7:** 

**Construction Plan** 

# 7.0 Construction Plan

The dredging will be conducted utilizing a floating barge and dredging crane with a clamshell bucket. The barge will access the project area from traveling upriver from the Kennebunk River Breakwater. The area of the dredge will be approximately 61,000 square feet (1.4 acres). The proposed dredge depth will be to elevation -6.0 feet mean low water, with about one foot of overdig. It is anticipated that dredging will coincide with neighboring marinas performing dredging at the same approximate time, including the Arundel Yacht Club, the Kennebunkport Marina, and the Kennebunk River Club. The material will be transported by barge to the Isle of Shoals North Disposal Site (IOSN). The IOSN is located approximately 15 nautical miles east of Portsmouth, New Hampshire, in the Gulf of Maine.

# Attachment 8:

**Erosion and Sedimentation Control Plan** 

# 8.0 Erosion and Sedimentation Control Plan

The dredging will be conducted from a floating barge using a dredging crane with a clamshell bucket. The dredged material will be placed on the barge and brought to the Isle of Shoals North (IOSN) open water placement site for disposal. There will be no storage of the dredged material on land which negates the need for erosion and sedimentation control measures in this regard. No formal erosion control measures are proposed for the project. However, turbidity curtains will be implemented, if deemed necessary, around the proposed dredging area to mitigate the travel of sediment during the in-water disturbance.

**Attachment 9:** 

**Site Conditions Report** 

# 9.0 Site Conditions Report

The dredging activity will occur at the Yachtsman Marina within the Kennebunk River, which is located approximately 0.75 miles from the mouth of the Kennebunk River.

The shoreline area southeast of the Yachtsman Marina consists of medium riprap placed to prevent bank erosion. The sandy area in front of those walls is completely covered at high tide and is partially exposed at low tide. Minimal rockweed was observed in this area, but no other plant or marine species were noted.

According to the Maine Department of Inland Fisheries & Wildlife (IF&W) Beginning with Habitat website (https://www.maine.gov/ifw/fish-wildlife/wildlife/beginning-with-habitat/maps/index.html), the dredging location is bordered to the northwest and southeast by wetlands identified by the National Wetland Inventory (NWI). The area of the dredging is located in a relatively small area of the Kennebunk River's shellfish growing area.

According to the U.S. Department of Fish & Wildlife Service (USFWS) Information for Planning and Consultation (IPaC) website (https://ipac.ecosphere.fws.gov/), the following are listed species that may occur in the area of the property: the Northern Long-eared Bat, Tricolored Bat, and the Monarch Butterfly.

According to the National Oceanic and Atmospheric Administration (NOAA) Fisheries Essential Fish Habitat (EFH) Mapper, the project location is mapped within a New England/Mid-Atlantic EFH for the following species: Acadian redfish (larvae); haddock (juvenile); little skate (adult); monkfish (eggs, larvae, juvenile, adult); silver hake (eggs, larvae, adult); and winter flounder (eggs). The project is likely to have short-term and localized impacts to EFH, with no significant impacts to these habitats anticipated.

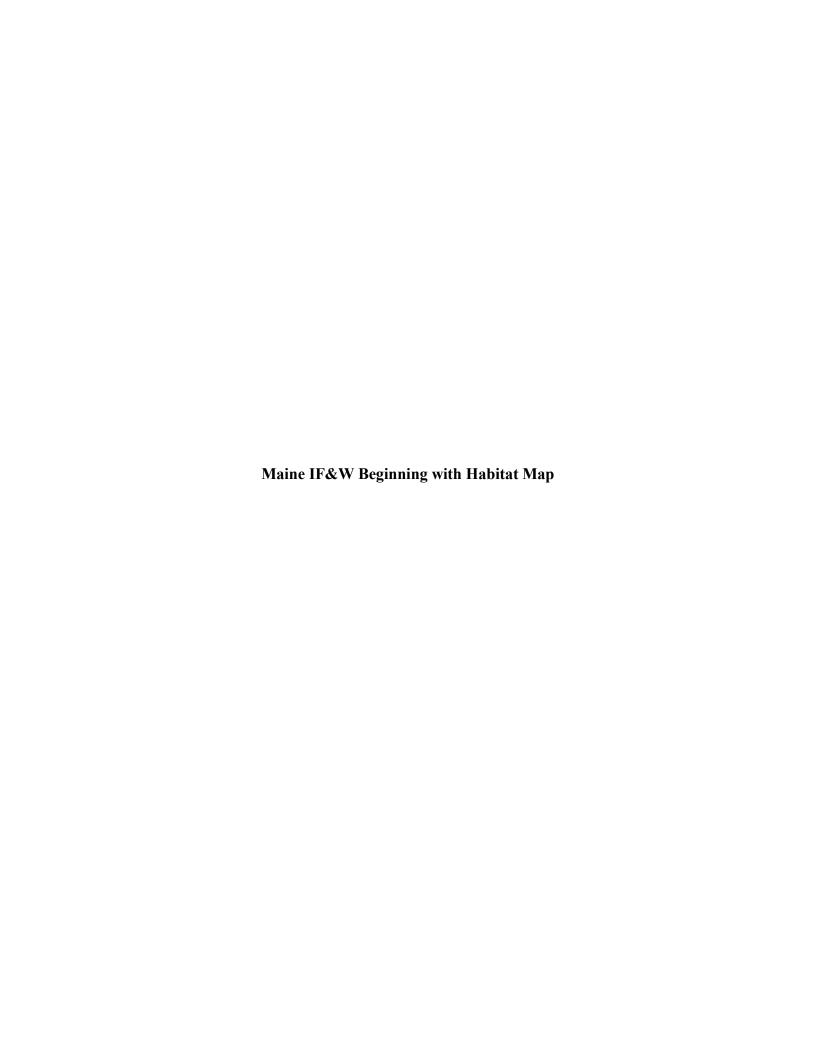
According to the NOAA Fisheries Greater Atlantic Region Endangered Species Act (ESA) Section 7 Mapper (Section 7 Mapper), adult and subadult Atlantic sturgeon (threatened/endangered) and adult shortnose sturgeon (endangered) migrate and forage in the Kennebunk River within the limits of the project boundary. The migrating and foraging time of year for the Atlantic sturgeon is identified as all year, however, the Section 7 Mapper notes that the Atlantic sturgeon exhibit seasonal coastal movements in the spring and fall; the migrating and foraging time of year for the shortnose sturgeon is identified as April 1 to November 30.

The Yachtsman Marina dredging work is proposed to take place in winter 2025-2026 and to avoid disturbances to EFH and sturgeon populations to the maximum extent possible.

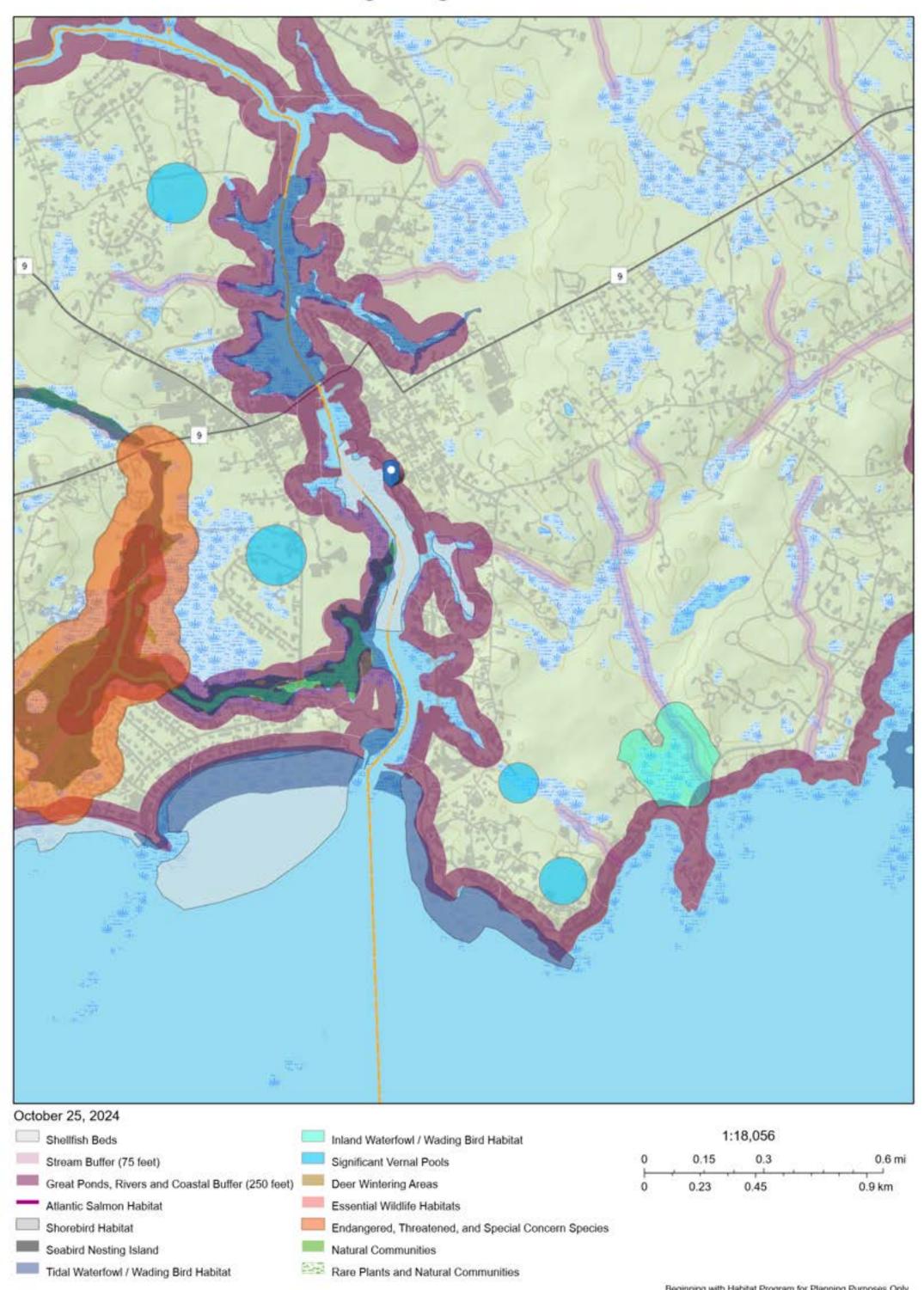
Refer to photos in Section 4.0 and the Maine DEP Coastal Wetland Characterization form provided in Appendix B. Based on the resource mapping shown, the project will have minimal impact on existing natural resources.

The Kennebunk River (Assessment Unit ID ME0106000301\_622 R01) is listed on the Maine Department of Environmental Protection's (DEP's) Final 2018/2020/2022 Integrated Water Quality Report as a Delisted Category 5 Waterbody, as a Total Maximum Daily Load (TMDL) for

E. coli was approved for the river in 2009. The proposed dredging activities will not discharge any bacteria into the river.



# Beginning With Habitat







# United States Department of the Interior



# FISH AND WILDLIFE SERVICE

Maine Ecological Services Field Office P. O. Box A East Orland, ME 04431

Phone: (207) 469-7300 Fax: (207) 902-1588

In Reply Refer To: 10/25/2024 18:30:18 UTC

Project Code: 2025-0011334

Project Name: Yachtsman Marina Dredging

Subject: List of threatened and endangered species that may occur in your proposed project

location or may be affected by your proposed project

#### To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the IPaC system by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 *et seq.*), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2) (c)). For projects other than major construction activities, the Service suggests that a biological

evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

Project code: 2025-0011334

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:

https://www.fws.gov/sites/default/files/documents/endangered-species-consultation-handbook.pdf

**Migratory Birds**: In addition to responsibilities to protect threatened and endangered species under the Endangered Species Act (ESA), there are additional responsibilities under the Migratory Bird Treaty Act (MBTA) and the Bald and Golden Eagle Protection Act (BGEPA) to protect native birds from project-related impacts. Any activity, intentional or unintentional, resulting in take of migratory birds, including eagles, is prohibited unless otherwise permitted by the U.S. Fish and Wildlife Service (50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)). For more information regarding these Acts, see https://www.fws.gov/program/migratory-bird-permit/what-we-do.

The MBTA has no provision for allowing take of migratory birds that may be unintentionally killed or injured by otherwise lawful activities. It is the responsibility of the project proponent to comply with these Acts by identifying potential impacts to migratory birds and eagles within applicable NEPA documents (when there is a federal nexus) or a Bird/Eagle Conservation Plan (when there is no federal nexus). Proponents should implement conservation measures to avoid or minimize the production of project-related stressors or minimize the exposure of birds and their resources to the project-related stressors. For more information on avian stressors and recommended conservation measures, see https://www.fws.gov/library/collections/threats-birds.

In addition to MBTA and BGEPA, Executive Order 13186: *Responsibilities of Federal Agencies to Protect Migratory Birds*, obligates all Federal agencies that engage in or authorize activities that might affect migratory birds, to minimize those effects and encourage conservation measures that will improve bird populations. Executive Order 13186 provides for the protection of both migratory birds and migratory bird habitat. For information regarding the implementation of Executive For information regarding the implementation of Executive Order 13186, please visit https://www.fws.gov/partner/council-conservation-migratory-birds.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Code in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

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### Attachment(s):

- Official Species List
- USFWS National Wildlife Refuges and Fish Hatcheries
- Bald & Golden Eagles
- Migratory Birds
- Wetlands

# **OFFICIAL SPECIES LIST**

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

Maine Ecological Services Field Office P. O. Box A East Orland, ME 04431 (207) 469-7300

# **PROJECT SUMMARY**

Project Code: 2025-0011334

Project Name: Yachtsman Marina Dredging
Project Type: Navigation Channel Improvement

Project Description: Maintenance dredge of Kennebunk River

**Project Location:** 

The approximate location of the project can be viewed in Google Maps: <a href="https://www.google.com/maps/@43.3569549">https://www.google.com/maps/@43.3569549</a>,-70.47482428275957,14z



Counties: York County, Maine

# **ENDANGERED SPECIES ACT SPECIES**

Project code: 2025-0011334

There is a total of 3 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries<sup>1</sup>, as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

1. <u>NOAA Fisheries</u>, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

#### **MAMMALS**

NAME	STATUS
Northern Long-eared Bat Myotis septentrionalis	Endangered
No critical habitat has been designated for this species.	
Species profile: <a href="https://ecos.fws.gov/ecp/species/9045">https://ecos.fws.gov/ecp/species/9045</a>	
Tricolored Bat <i>Perimyotis subflavus</i>	Proposed
No critical habitat has been designated for this species.	Endangered
Species profile: <a href="https://ecos.fws.gov/ecp/species/10515">https://ecos.fws.gov/ecp/species/10515</a>	Ü
INSECTS	
NAME	STATUS
Managah Duttaufly Dangua planing	Candidata

Monarch Butterfly *Danaus plexippus* 

Candidate

No critical habitat has been designated for this species. Species profile: <a href="https://ecos.fws.gov/ecp/species/9743">https://ecos.fws.gov/ecp/species/9743</a>

#### **CRITICAL HABITATS**

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

YOU ARE STILL REQUIRED TO DETERMINE IF YOUR PROJECT(S) MAY HAVE EFFECTS ON ALL ABOVE LISTED SPECIES.

# USFWS NATIONAL WILDLIFE REFUGE LANDS AND FISH HATCHERIES

Any activity proposed on lands managed by the <u>National Wildlife Refuge</u> system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

THERE ARE NO REFUGE LANDS OR FISH HATCHERIES WITHIN YOUR PROJECT AREA.

# **BALD & GOLDEN EAGLES**

Bald and golden eagles are protected under the Bald and Golden Eagle Protection Act<sup>1</sup> and the Migratory Bird Treaty Act<sup>2</sup>.

Any person or organization who plans or conducts activities that may result in impacts to bald or golden eagles, or their habitats<sup>3</sup>, should follow appropriate regulations and consider implementing appropriate conservation measures, as described in the links below. Specifically, please review the "Supplemental Information on Migratory Birds and Eagles".

- 1. The Bald and Golden Eagle Protection Act of 1940.
- 2. The Migratory Birds Treaty Act of 1918.

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#### 3. 50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)

There are likely bald eagles present in your project area. For additional information on bald eagles, refer to <u>Bald Eagle Nesting and Sensitivity to Human Activity</u>

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, see the PROBABILITY OF PRESENCE SUMMARY below to see when these birds are most likely to be present and breeding in your project area.

NAME BREEDING SEASON

#### Bald Eagle Haliaeetus leucocephalus

Breeds Oct 15 to Aug 31

This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.

https://ecos.fws.gov/ecp/species/1626

#### PROBABILITY OF PRESENCE SUMMARY

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read "Supplemental Information on Migratory Birds and Eagles", specifically the FAQ section titled "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

#### **Probability of Presence (■)**

Green bars; the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during that week of the year.

# **Breeding Season** (

Yellow bars; liberal estimate of the timeframe inside which the bird breeds across its entire range.

# Survey Effort (|)

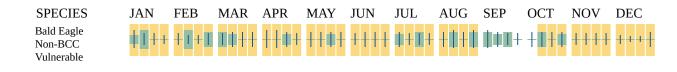
Vertical black lines; the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps.

### No Data (-)

A week is marked as having no data if there were no survey events for that week.

■ probability of presence ■ breeding season | survey effort − no data

Project code: 2025-0011334 10/25/2024 18:30:18 UTC



Additional information can be found using the following links:

- Eagle Management <a href="https://www.fws.gov/program/eagle-management">https://www.fws.gov/program/eagle-management</a>
- Measures for avoiding and minimizing impacts to birds <a href="https://www.fws.gov/library/collections/avoiding-and-minimizing-incidental-take-migratory-birds">https://www.fws.gov/library/collections/avoiding-and-minimizing-incidental-take-migratory-birds</a>
- Nationwide conservation measures for birds <a href="https://www.fws.gov/sites/default/files/documents/nationwide-standard-conservation-measures.pdf">https://www.fws.gov/sites/default/files/documents/nationwide-standard-conservation-measures.pdf</a>
- Supplemental Information for Migratory Birds and Eagles in IPaC <a href="https://www.fws.gov/media/supplemental-information-migratory-birds-and-bald-and-golden-eagles-may-occur-project-action">https://www.fws.gov/media/supplemental-information-migratory-birds-and-bald-and-golden-eagles-may-occur-project-action</a>

# **MIGRATORY BIRDS**

Certain birds are protected under the Migratory Bird Treaty Act<sup>1</sup> and the Bald and Golden Eagle Protection Act<sup>2</sup>.

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats<sup>3</sup> should follow appropriate regulations and consider implementing appropriate conservation measures, as described in the links below. Specifically, please review the "Supplemental Information on Migratory Birds and Eagles".

- 1. The Migratory Birds Treaty Act of 1918.
- 2. The Bald and Golden Eagle Protection Act of 1940.
- 3. 50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, see the PROBABILITY OF PRESENCE SUMMARY below to see when these birds are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON
American Oystercatcher <i>Haematopus palliatus</i>	Breeds Apr 15
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA	to Aug 31
and Alaska.	J
https://ecos.fws.gov/ecp/species/8935	

NAME	BREEDING SEASON
Bald Eagle <i>Haliaeetus leucocephalus</i> This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. <a href="https://ecos.fws.gov/ecp/species/1626">https://ecos.fws.gov/ecp/species/1626</a>	Breeds Oct 15 to Aug 31
Black-billed Cuckoo <i>Coccyzus erythropthalmus</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. <a href="https://ecos.fws.gov/ecp/species/9399">https://ecos.fws.gov/ecp/species/9399</a>	Breeds May 15 to Oct 10
Blue-winged Warbler <i>Vermivora cyanoptera</i> This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA <a href="https://ecos.fws.gov/ecp/species/9509">https://ecos.fws.gov/ecp/species/9509</a>	Breeds May 1 to Jun 30
Bobolink <i>Dolichonyx oryzivorus</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. <a href="https://ecos.fws.gov/ecp/species/9454">https://ecos.fws.gov/ecp/species/9454</a>	Breeds May 20 to Jul 31
Canada Warbler <i>Cardellina canadensis</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. <a href="https://ecos.fws.gov/ecp/species/9643">https://ecos.fws.gov/ecp/species/9643</a>	Breeds May 20 to Aug 10
Chimney Swift <i>Chaetura pelagica</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. <a href="https://ecos.fws.gov/ecp/species/9406">https://ecos.fws.gov/ecp/species/9406</a>	Breeds Mar 15 to Aug 25
Eastern Whip-poor-will <i>Antrostomus vociferus</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. <a href="https://ecos.fws.gov/ecp/species/10678">https://ecos.fws.gov/ecp/species/10678</a>	Breeds May 1 to Aug 20
Grasshopper Sparrow <i>Ammodramus savannarum perpallidus</i> This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA <a href="https://ecos.fws.gov/ecp/species/8329">https://ecos.fws.gov/ecp/species/8329</a>	Breeds Jun 1 to Aug 20
Hudsonian Godwit <i>Limosa haemastica</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. <a href="https://ecos.fws.gov/ecp/species/9482">https://ecos.fws.gov/ecp/species/9482</a>	Breeds elsewhere
Least Tern <i>Sternula antillarum antillarum</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. <a href="https://ecos.fws.gov/ecp/species/11919">https://ecos.fws.gov/ecp/species/11919</a>	Breeds Apr 25 to Sep 5

**BREEDING** NAME **SEASON** Lesser Yellowlegs *Tringa flavipes* Breeds This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA elsewhere and Alaska. https://ecos.fws.gov/ecp/species/9679 Pectoral Sandpiper *Calidris melanotos* Breeds This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA elsewhere and Alaska. https://ecos.fws.gov/ecp/species/9561 Prairie Warbler *Setophaga discolor* Breeds May 1 This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA to Jul 31 and Alaska. https://ecos.fws.gov/ecp/species/9513 Prothonotary Warbler Protonotaria citrea Breeds Apr 1 to This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA Jul 31 and Alaska. https://ecos.fws.gov/ecp/species/9439 Purple Sandpiper Calidris maritima **Breeds** This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA elsewhere and Alaska. https://ecos.fws.gov/ecp/species/9574 Red-headed Woodpecker Melanerpes erythrocephalus Breeds May 10 This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA to Sep 10 and Alaska. https://ecos.fws.gov/ecp/species/9398 **Breeds** Ruddy Turnstone *Arenaria interpres morinella* This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions elsewhere (BCRs) in the continental USA https://ecos.fws.gov/ecp/species/10633 **Breeds** Rusty Blackbird *Euphagus carolinus* This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions elsewhere (BCRs) in the continental USA https://ecos.fws.gov/ecp/species/9478 Saltmarsh Sparrow *Ammospiza caudacuta* Breeds May 15 This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA to Sep 5 and Alaska. https://ecos.fws.gov/ecp/species/9719 Scarlet Tanager Piranga olivacea Breeds May 10 This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions to Aug 10 (BCRs) in the continental USA https://ecos.fws.gov/ecp/species/11967

NAME	BREEDING SEASON
Semipalmated Sandpiper <i>Calidris pusilla</i> This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA <a href="https://ecos.fws.gov/ecp/species/9603">https://ecos.fws.gov/ecp/species/9603</a>	Breeds elsewhere
Short-billed Dowitcher <i>Limnodromus griseus</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. <a href="https://ecos.fws.gov/ecp/species/9480">https://ecos.fws.gov/ecp/species/9480</a>	Breeds elsewhere
Whimbrel <i>Numenius phaeopus hudsonicus</i> This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA <a href="https://ecos.fws.gov/ecp/species/11991">https://ecos.fws.gov/ecp/species/11991</a>	Breeds elsewhere
Willet <i>Tringa semipalmata</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. <a href="https://ecos.fws.gov/ecp/species/10669">https://ecos.fws.gov/ecp/species/10669</a>	Breeds Apr 20 to Aug 5
Wood Thrush <i>Hylocichla mustelina</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. <a href="https://ecos.fws.gov/ecp/species/9431">https://ecos.fws.gov/ecp/species/9431</a>	Breeds May 10 to Aug 31

# PROBABILITY OF PRESENCE SUMMARY

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read "Supplemental Information on Migratory Birds and Eagles", specifically the FAQ section titled "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

#### **Probability of Presence (■)**

Green bars; the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during that week of the year.

#### **Breeding Season** (**•**)

Yellow bars; liberal estimate of the timeframe inside which the bird breeds across its entire range.

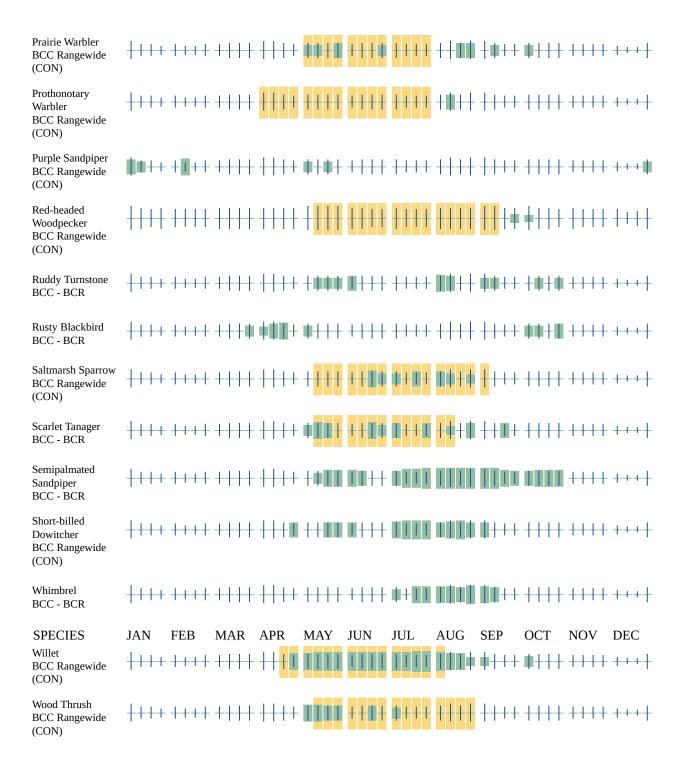
#### Survey Effort (|)

Vertical black lines; the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps.

#### No Data (-)

A week is marked as having no data if there were no survey events for that week.

■ probability of presence ■ breeding season | survey effort — no data **SPECIES** JAN FEB MAR APR MAY JUN JUL AUG **SEP** OCT NOV DEC American ++++ ++++ ++++ + ++|| || || || || || Oystercatcher BCC Rangewide (CON) **Bald Eagle** Non-BCC Vulnerable Black-billed ┼┼┼┼╶┼┼┼┼╶┼┼┼┼╶┼┼┼ Cuckoo BCC Rangewide (CON) Blue-winged ┼┼┼┼╶┼┼┼┼╶┼┼┼┼╶<mark>╏╏╏╏</mark> Warbler BCC - BCR Bobolink ++++ ++++ ++++ ++++ || || || || || || BCC Rangewide (CON) Canada Warbler ┼┼┼┼ ┼┼┼┼ ┼┼┼┼ **┆╏╏╏** BCC Rangewide (CON) Chimney Swift BCC Rangewide (CON) Eastern Whip-poorwill BCC Rangewide (CON) Grasshopper Sparrow BCC - BCR Hudsonian Godwit BCC Rangewide (CON) Least Tern BCC Rangewide (CON) Lesser Yellowlegs ++++ ++++ ++++ •+++ ••••• BCC Rangewide (CON) **SPECIES FEB** MAR APR MAY JUN JUL AUG SEP NOV **JAN** OCT DEC Pectoral Sandpiper BCC Rangewide (CON)



#### Additional information can be found using the following links:

- Eagle Management https://www.fws.gov/program/eagle-management
- Measures for avoiding and minimizing impacts to birds <a href="https://www.fws.gov/library/collections/avoiding-and-minimizing-incidental-take-migratory-birds">https://www.fws.gov/library/collections/avoiding-and-minimizing-incidental-take-migratory-birds</a>

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Nationwide conservation measures for birds <a href="https://www.fws.gov/sites/default/files/documents/nationwide-standard-conservation-measures.pdf">https://www.fws.gov/sites/default/files/documents/nationwide-standard-conservation-measures.pdf</a>

Supplemental Information for Migratory Birds and Eagles in IPaC <a href="https://www.fws.gov/media/supplemental-information-migratory-birds-and-bald-and-golden-eagles-may-occur-project-action">https://www.fws.gov/media/supplemental-information-migratory-birds-and-bald-and-golden-eagles-may-occur-project-action</a>

# **WETLANDS**

Impacts to <u>NWI wetlands</u> and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local <u>U.S. Army Corps of Engineers District</u>.

Please note that the NWI data being shown may be out of date. We are currently working to update our NWI data set. We recommend you verify these results with a site visit to determine the actual extent of wetlands on site.

ESTUARINE AND MARINE DEEPWATER

• E1UBL

ESTUARINE AND MARINE WETLAND

■ E2US3N

Project code: 2025-0011334 10/25/2024 18:30:18 UTC

# **IPAC USER CONTACT INFORMATION**

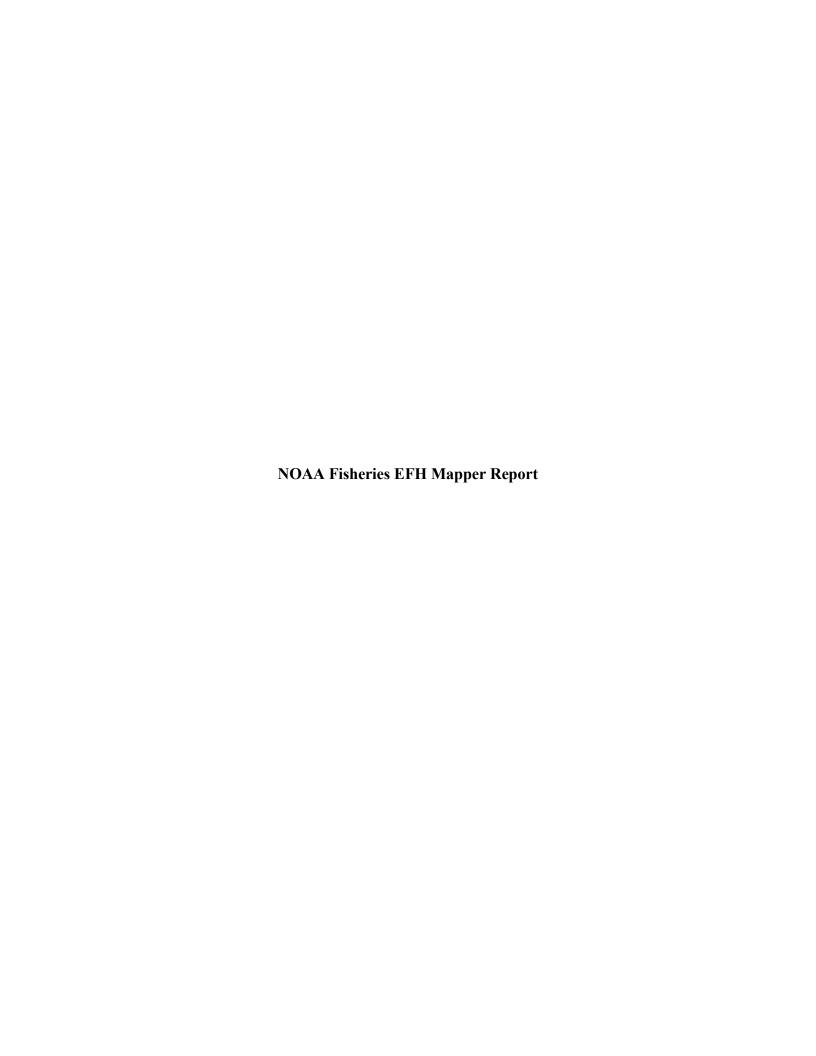
Agency: Private Entity
Name: Leyna Tobey
Address: One Karen Drive

Address Line 2: Suite 2A City: Westbrook

State: ME Zip: 04092

Email leyna@walsh-eng.com

Phone: 2075539898



### **EFH Mapper Report**

### **EFH Data Notice**

Essential Fish Habitat (EFH) is defined by textual descriptions contained in the fishery management plans developed by the regional fishery management councils. In most cases mapping data can not fully represent the complexity of the habitats that make up EFH. This report should be used for general interest queries only and should not be interpreted as a definitive evaluation of EFH at this location. A location-specific evaluation of EFH for any official purposes must be performed by a regional expert. Please refer to the following links for the appropriate regional resources.

Greater Atlantic Regional Office Atlantic Highly Migratory Species Management Division

### **Query Results**

Degrees, Minutes, Seconds: Latitude = 43° 21' 26" N, Longitude = 71° 31' 30" W

Decimal Degrees: Latitude = 43.357, Longitude = -70.475

The query location intersects with spatial data representing EFH and/or HAPCs for the following species/management units.

### \*\*\* W A R N I N G \*\*\*

Please note under "Life Stage(s) Found at Location" the category "ALL" indicates that all life stages of that species share the same map and are designated at the queried location.

### **EFH**

Link	Data Caveats	Species/ Management Unit	Lifestage(s) Found at Location	Management Council	FMP
<u>"</u>	0	Acadian Redfish	Larvae	New England	Amendment 14 to the Northeast Multispecies FMP
<u>"</u>	0	Haddock	Juvenile	New England	Amendment 14 to the Northeast Multispecies FMP
P	•	Little Skate	Adult	New England	Amendment 2 to the Northeast Skate Complex FMP
P	0	Monkfish	Adult, Eggs/Larvae, Juvenile	New England	Amendment 4 to the Monkfish FMP
<u>"</u>	0	Silver Hake	Adult, Eggs/Larvae	New England	Amendment 14 to the Northeast Multispecies FMP
P	0	Winter Flounder	Eggs	New England	Amendment 14 to the Northeast Multispecies FMP

### **Pacific Salmon EFH**

No Pacific Salmon Essential Fish Habitat (EFH) were identified at the report location.

1 of 2 10/25/2024, 10:29 AM

### **Atlantic Salmon**

No Atlantic Salmon were identified at the report location.

### **HAPCs**

No Habitat Areas of Particular Concern (HAPC) were identified at the report location.

### **EFH Areas Protected from Fishing**

No EFH Areas Protected from Fishing (EFHA) were identified at the report location.

Spatial data does not currently exist for all the managed species in this area. The following is a list of species or management units for which there is no spatial data.

\*\*For links to all EFH text descriptions see the complete data inventory: open data inventory -->

All EFH species have been mapped for the Greater Atlantic region, Atlantic Highly Migratory Species EFH,

Bigeye Sand Tiger Shark,

Bigeye Sixgill Shark,

Caribbean Sharpnose Shark,

Galapagos Shark,

Narrowtooth Shark,

Sevengill Shark,

Sixgill Shark,

Smooth Hammerhead Shark,

Smalltail Shark

2 of 2 10/25/2024, 10:29 AM





## Drawn Action Area & Overlapping S7 Consultation Areas

### Area of Interest (AOI) Information

Area: 5.69 acres

Oct 25 2024 10:31:05 Eastern Daylight Time



1 of 2 10/25/2024, 10:32 AM

### Summary

Name	Count	Area(acres)	Length(mi)	
Atlantic Sturgeon	2	9.37	N/A	
Shortnose Sturgeon	1	4.69	N/A	
Atlantic Salmon	0	0	N/A	
Sea Turtles	0	0	N/A	
Atlantic Large Whales	0	0	N/A	
In or Near Critical Habitat	0	0	N/A	

## Atlantic Sturgeon

#	Feature ID	Species	Lifestage	Behavior	Zone	From	Until	From (2)	Until (2)	Area(acres
1	ANS_C50_ ADU_MAF	Atlantic sturgeon	Adult	Migrating & Foraging	N/A	01/01	12/31	N/A	N/A	4.68
2	ANS_C50_ SUB_MAF	Atlantic sturgeon	Subadult	Migrating & Foraging	N/A	01/01	12/31	N/A	N/A	4.68

## Shortnose Sturgeon

#	Feature ID	Species	Life Stage	Behavior	Zone	From	Until	From (2)	Until (2)	Area(acres	
1	SNS_C50_ ADU_MAF	Shortnose sturgeon	Adult	Migrating & Foraging	N/A	04/01	11/30	N/A	N/A	4.69	

2 of 2

**Attachment 10:** 

**Notice of Intent to File** 

### 10.0 Notice of Intent to File

The applicant must provide public notice for all Individual NRPA permit applications.

- 1. **Newspaper**: The NOI was published in the *Portland Press Herald* on November 21, 2024. Proof of the notification is attached.
- 2. **Abutting Property Owners**: Abutters were sent the NOI via mail on November 20, 2024. A list of abutters and proof of mailing is attached.
- 3. **Municipal Office**: A copy of the NOI and a duplicate of the entire application has been sent to the applicable municipal office.

**Newspaper Public Notice** One Karen Drive, Suite 2A | Westbrook, ME 04092 | 207.553.9898 | Walsh-Eng.com

# PUBLIC NOTICE: NOTICE OF INTENT TO FILE

Please take notice that KPT Marine, LLC, of 57 Ocean Ave, Kennebunkport, ME 04046, is intending to file a Natural Resources Protection Act (NRPA) Permit application with the Maine Department of Environmental Protection (DEP) pursuant to the provisions of 38 M.R.S. §§ 480-A through 480-BB on or about November 20, 2024. This application is for dredging activities to take place in the Kennebunk River to improve the boating operations (navigation) of the Yachtsman Marina.

A request for a public hearing or a request that the Board of Environmental Protection assume jurisdiction over this application must be received by the Department in writing no later than 20 days after the application is found by the Department to be complete and is accepted for processing. A public hearing may or may not be held at the discretion of the Commissioner or Board of Environmental Protection. Public comment on the application will be accepted throughout the processing of the application. The application will be filed for public inspection at the Maine DEP's office in Portland during normal working hours. A copy of the application may also be seen at the municipal offices in Kennebunkport, Maine. Written public comments may be sent to the regional office in Portland where the application is filed for public inspection: Maine DEP, Southern Maine Regional Offices, 312 Canco Road, Portland, Maine 04103.

**Proof of Newspaper Public Notice** 



**Classified Advertising Proof** 

Bill Walsh Walsh Engineering Associates 1 Karen Dr #2A Westbrook ME 04092 -192 +1 (207) 553-9898 jenileigh@Walsh-eng.com

Thank you for placing your advertisement with us.

Your order information and a preview of your advertisement are attached below for your review. If there are changes or questions, please contact the classified department at (207) 791-6100

#### Thank you

(207) 791-6100 jjensen@mainetoday.com Monday – Friday 8:00 am – 5pm

Order Number	0529918	Order Price	\$409.95
Sales Rep.	Joan Jensen	PO No.	Yachtsman Marina Notice of Intent to File / Sherry Pinard
Account	10155	Payment Type	Invoice
Publication	Portland Press Herald	Number of dates	1
First Run Date	11/21/2024	Last Run Date	11/21/2024
Publication	Online Upsell PPH	Number of dates	1
First Run Date	11/21/2024	Last Run Date	11/21/2024

### Public Notice

# NOTICE OF INTENT TO FILE

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pursuant to the provisions of 38 M.R.S. §§ 480-A through 480-BB on or about November 20, 2024. This application is for dredging activities to take place in the Kennebunk River to improve the boating operations (navigation) of the Yachtsman Marina. A request for a public hearing or a request that the Board of Environmental Protection assume jurisdiction over this application must be received by the Department in writing no later than 20 days after the application is found by the Department to be complete and is accepted for processing. A public hearing may or may not be held at the discretion of the Commissioner or Board of Environmental Protection. Public comment on the application will be accepted throughout the processing of the application. The application will be filed for public inspection at the Maine DEP's office in Portland during normal working hours.A copy of the application may also be seen at the municipal offices in Kennebunkport, Maine. Written public comments may be sent to the regional office in Portland where the application is filed

for public inspection: Maine DEP, Southern Maine Regional Offices, 312 Canco Road, Portland, Maine 04103. **Abutters Letter** 



November 19, 2024

Dear Abutter/Neighbor of 57 Ocean Ave:

On behalf of KPT Marine, LLC, at 57 Ocean Avenue in Kennebunkport, ME 04046, I am writing to inform you of their intent to submit a Natural Resources Protection Act (NRPA) permit application to the Maine Department of Environmental Protection (DEP). The NRPA permit will provide for dredging activities in the Kennebunk River to improve the boating operations of the Yachtsman Marina.

You are receiving this letter as the Maine DEP requires that all abutters of the subject property receive notification of the NRPA application. I have attached a copy of the Public Notice that will be published in the *Portland Press Herald* on or around November 21, 2024.

Should you have any questions or concerns, please do not hesitate to contact me at (207) 553-9898 or leyna@walsh-eng.com.

Respectfully,

Leyna Tobey, PE – Project Manager Walsh Engineering Associates, Inc.

Leyna L. Tobery

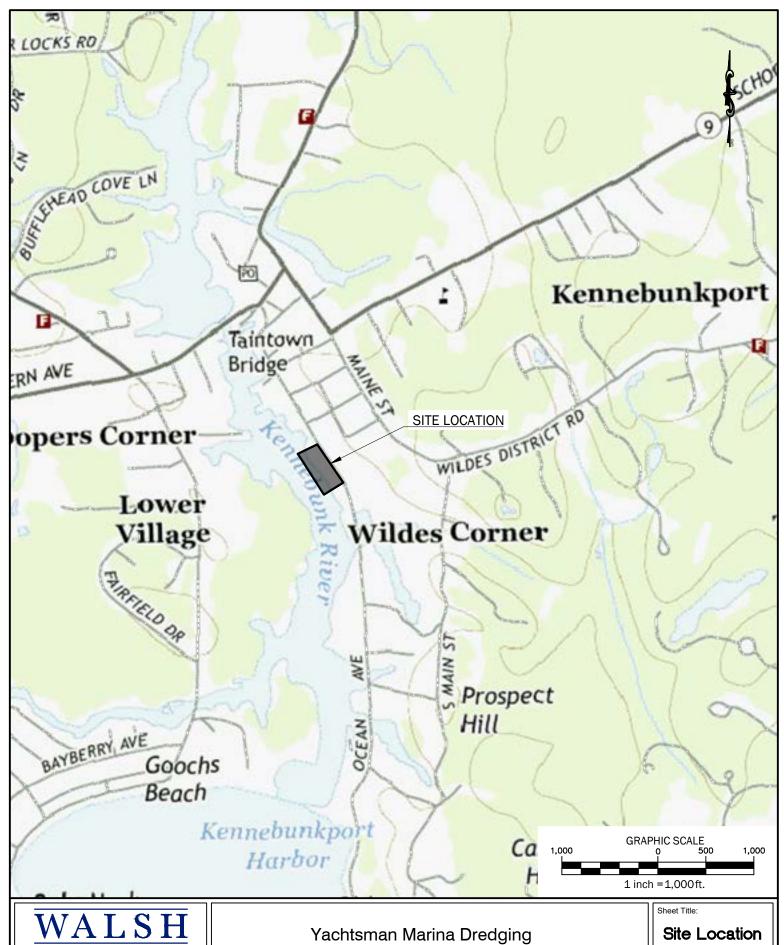
Enc. Public Notice

Site Location Plan

# PUBLIC NOTICE: NOTICE OF INTENT TO FILE

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# engineering associates, inc.

One Karen Dr., Suite 2A | Westbrook, Maine 04092 ph: 207.553.9898 www.walsh-eng.com

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Yachtsman Marina 57 Ocean Avenue Kennebunkport, Maine 04046 Job No.: Date: OCTOBER 2024 1" = 1,000' Scale: Drawn: LLT Checked: WRW **Abutters List (1,000-foot)** 



Kennebunkport, ME November 08, 2024

### **Subject Property:**

Parcel Number: 10-1-3

CAMA Number: 10-1-3 Vision ID: 3427

Property Address: 57 OCEAN AVENUE

Mailing Address: YACHTSMAN HOSPITALITY, LLC

2 LIVEWELL DRIVE, #203

KENNEBUNK. ME 04043

Abutters:

Parcel Number: 10-1-10

CAMA Number: 10-1-10 Vision ID: 3438

Property Address: 41 OCEAN AVENUE

Parcel Number: 10-1-11 CAMA Number: 10-1-11

Vision ID: 539

Property Address: 4 WHARF LANE

Parcel Number: 10-1-12

CAMA Number: 10-1-12 Vision ID: 3439

Property Address: 7 WHARF LANE

Parcel Number: 10-1-13 CAMA Number: 10-1-13

Vision ID: 105940

Property Address: 5 WHARF LANE

Parcel Number: 10-1-14

CAMA Number: 10-1-14 Vision ID: 543

Property Address: 3 WHARF LANE

Parcel Number: 10-1-15

10-1-15 CAMA Number:

Vision ID: 3441

Property Address: 53 OCEAN AVENUE

Parcel Number: 10-1-2

CAMA Number: 10-1-2

Vision ID: 3426

Property Address: 67 OCEAN AVENUE

Parcel Number: 10-1-4

CAMA Number: 10-1-4

11/8/2024

Vision ID: 525 Property Address: OCEAN AVENUE Mailing Address: ENOCH, MATTHEW S & DONNA C

642 ALLEGIANCE DRIVE

**LITITZ, PA 17543** 

Mailing Address: HALL, JONATHAN S

PO BOX 811

WINDHAM, NH 03087

ROMINE, DONALD J & RHODA M Mailing Address:

325 DUNES BLVD., APT 803

**NAPLES, FL 34110** 

Mailing Address: SWEENEY, JOHN & ANN-MARIE

**16 MARTIN STREET ACTON, MA 01720** 

Mailing Address: 2538970 ONTARIO, INC

765 WESTNEY ROAD SOUTH

AJAX, ON L1S 6W1

KENNEBUNKPORT, TOWN OF Mailing Address:

**PO BOX 566** 

KENNEBUNKPORT, ME 04046

Mailing Address: KPT MARINE, LLC

PO BOX 2734

KENNEBUNKPORT, ME 04046

Mailing Address: KENNEBUNKPORT, TOWN OF

**PO BOX 566** 





Kennebunkport, ME November 08, 2024

Parcel Number: CAMA Number:

10-1-5

10-1-5 3428 Vision ID:

Property Address: 51 OCEAN AVENUE

Parcel Number: CAMA Number:

10-1-6 10-1-6 527

Vision ID: Property Address: 49 OCEAN AVENUE

10-1-7

Parcel Number: CAMA Number:

10-1-7 Vision ID: 105722

Property Address: 47 OCEAN AVENUE #5

Parcel Number: 10-1-7

CAMA Number:

10-1-7A Vision ID: 105722

Property Address: 47 OCEAN AVENUE #7

10-1-7

Parcel Number: CAMA Number:

10-1-7B Vision ID: 105722

10-1-7

10-1-7D

105722

Property Address: 47 OCEAN AVENUE #8

Parcel Number: CAMA Number:

10-1-7C Vision ID: 105722

Property Address: 47 OCEAN AVENUE #6

Parcel Number: 10-1-7

CAMA Number: Vision ID:

Property Address: 47 OCEAN AVENUE #4

Parcel Number:

10-1-7 CAMA Number: 10-1-7E

Vision ID: 105722

Property Address: 47 OCEAN AVENUE #2

11/8/2024

Parcel Number: 10-1-7

CAMA Number:

10-1-7F Vision ID: 105722

Property Address: 47 OCEAN AVENUE #3

Parcel Number: 10-1-7 CAMA Number: 10-1-7G

Vision ID: 105722

Property Address: 47 OCEAN AVENUE #1

Mailing Address: ARUNDEL YACHT CLUB

**PO BOX 328** 

KENNEBUNKPORT, ME 04046-0328

Mailing Address: EDITH HG MCCONNELL REVOCABLE

TRUST

PO BOX 1813

KENNEBUNKPORT, ME 04046

Mailing Address: BARTLETT, HUGH J & JUDITH

PO BOX 293

KENNEBUNKPORT, ME 04046

Mailing Address: FANTON, ROMA F

39 MEETINGHOUSE LANE FAIRFIELD, CT 06430

Mailing Address: NOWAK, LORI

4940 N HACIENDA DEL SOL ROAD

**TUCSON, AZ 85718** 

Mailing Address: NOWAK, LORI

4940 N HACIENDA DEL SOL ROAD

**TUCSON, AZ 85718** 

Mailing Address: MCFB, LLC

PO BOX 2675

KENNEBUNKPORT, ME 04046

Mailing Address: MULBERGER, VIRGINIA A

804 HALL PLACE

ALEXANDRIA, VA 22302

Mailing Address: REDDEN, MICHAELA A & OLSHAN,

ARTHUR

8 FRAESCO LANE NORWOOD, NJ 07648

Mailing Address: PELLETIER, THOMAS J & CYNTHIA L

**182 LOWELL STREET** PEABODY, MA 01960



Kennebunkport, ME November 08, 2024

Parcel Number:

10-1-7

Mailing Address: RIVERBANK CONDO

CAMA Number:

10-1-7Z

Vision ID:

105722

Property Address: 47 OCEAN AVENUE #MAIN

Parcel Number: CAMA Number:

10-1-8 10-1-8

Vision ID:

3437

Property Address: 45 OCEAN AVENUE

Parcel Number: CAMA Number: 10-1-9 10-1-9

Vision ID:

537

Property Address: 43 OCEAN AVENUE

Parcel Number:

10-2-1

CAMA Number: Vision ID:

10-2-1 3442

Property Address: 46 OCEAN AVENUE

Parcel Number:

CAMA Number:

10-2-2 10-2-2

10-2-3

Vision ID:

546

Property Address: OCEAN AVENUE

Parcel Number:

CAMA Number: 10-2-3 Vision ID: 547

Property Address: 5 PEARL STREET

Parcel Number: 10-3-1 CAMA Number: 10-3-1

Vision ID:

548

Property Address: 7 PEARL STREET

Parcel Number: CAMA Number:

10-3-2 10-3-2

Vision ID:

549

Property Address: 6 PLEASANT STREET

Parcel Number: CAMA Number:

10-3-3 10-3-3

Vision ID:

550 Property Address: 35 MAINE STREET

Parcel Number:

10-3-4

CAMA Number: Vision ID:

11/8/2024

Property Address: 33 MAINE STREET

10-3-4

551

Mailing Address: WOMEN & WINE, LLC

PO BOX 1148

KENNEBUNKPORT, ME 04046

Mailing Address: WILLIAMSON, ROBERT S

PO BOX 1950

KENNEBUNKPORT, ME 04046

Mailing Address: BYERLY, WILLIAM F & MARY C

PO BOX 2675

KENNEBUNKPORT, ME 04046

Mailing Address: KENNEBUNKPORT CONSERVATION

TRUST

PO BOX 7004

CAPE PORPOISE, ME 04014-07004

Mailing Address: KENNEBUNKPORT CAPTAINS

COLLECTION, LLC

PO BOX 3089

KENNEBUNKPORT, ME 04046

Mailing Address: BALCOM, WILLIAM BRIAN

3002 WINDSOR RIDGE DRIVE WESTBOROUGH, MA 01581

Mailing Address: KENNEBUNKPORT CAPTAINS

COLLECTION, LLC

PO BOX 3089

KENNEBUNKPORT, ME 04046

Mailing Address: KCC-CGH HOLDINGS, LLC

PO BOX 3089

KENNEBUNKPORT, ME 04046

Mailing Address: MICHELLE L DRAGHETTI REVOCABLE

TRUST

PO BOX 2797





Kennebunkport, ME November 08, 2024

Parcel Number: 10-3-5 CAMA Number:

10-3-5

552

Mailing Address: WIDMER, MATTHEW A & AMY M

18 LOUDEN HEIGHTS NORTH

ALBANY, NY 12211

COLLECTION, LLC

Mailing Address: KENNEBUNKPORT CAPTAINS

PO BOX 3089

Parcel Number:

Vision ID:

10-4-1

Property Address: 31 MAINE STREET

CAMA Number: Vision ID:

10-4-1 3443

Property Address: 8 PLEASANT STREET

Mailing Address: MIDDLETON, MARJORIE D & JOHN L JR

PO BOX 1046

KENNEBUNKPORT, ME 04046

KENNEBUNKPORT, ME 04046

Parcel Number: CAMA Number: Vision ID:

10-4-2 3444

10-4-2

10-4-3

Property Address: 10 PLEASANT STREET

Parcel Number:

Mailing Address: DAVID L KELLY FAMILY TRUST

25 OAK STREET

CHARLESTOWN, MA 02129

CAMA Number:

10-4-3 Vision ID: 555

Property Address: 12 PLEASANT STREET

10-4-4

CAMA Number: Vision ID:

Parcel Number:

10-4-4 556

Property Address: 5 SOUTH STREET

Mailing Address: MALTE LUKAS REVOCABLE TRUST

PO BOX 2798

KENNEBUNKPORT, ME 04046

Parcel Number: CAMA Number:

10-4-5 10-4-5 3445

Vision ID: Property Address: 3 SOUTH STREET

Mailing Address: MATTUCHIO FAMILY IRREVOCABLE

TRUST **PO BOX 169** 

KENNEBUNKPORT, ME 04046

Parcel Number: CAMA Number:

Vision ID:

10-4-6 10-4-6A 105723

Property Address: 41 MAINE STREET #1

Mailing Address: MORELLI, MICHAEL J & KERRY H

**42 BOULDER TRAIL BRONXVILLE, NY 10708** 

Parcel Number:

10-4-6

CAMA Number:

10-4-6B

Vision ID: 105723 Property Address: 41 MAINE STREET #2

Mailing Address: LEA RAE LEVINES REVOCABLE TRUST

610 SOUTH ROME AVE, UNIT 303

**TAMPA, FL 33606** 

Parcel Number:

10-4-6

CAMA Number:

10-4-6C

Vision ID: Property Address: 41 MAINE STREET #3

105723

Mailing Address: CAPPS, NOBLE F & NANCY H

PO BOX 1023

KENNEBUNKPORT, ME 04046

Parcel Number: CAMA Number:

11/8/2024

10-4-6

10-4-6Z

Vision ID:

105723

Mailing Address: PORT COMMONS CONDO

Property Address: 41 MAINE STREET #MAIN



Kennebunkport, ME November 08, 2024

Parcel Number: CAMA Number:

10-4-7 10-4-7 Mailing Address: MARINO, ELAINE

PO BOX 1537

Vision ID: 561 Property Address: 11 GREENE STREET

Parcel Number:

Mailing Address: MARINO, ELAINE

KENNEBUNKPORT, ME 04046

CAMA Number:

10-4-8 10-4-8

PO BOX 1537

Vision ID: 562

Property Address: CORNER MAINE & GREENE ST

KENNEBUNKPORT, ME 04046

Parcel Number:

10-4-9

Mailing Address: HUNTER, JAMES & JOAN F

CAMA Number: 10-4-9 Vision ID: 563

39 MAINE STREET KENNEBUNKPORT, ME 04046

Property Address: Parcel Number:

39 MAINE STREET

10-5-1

CAMA Number: 10-5-1 Vision ID: 3449

Mailing Address: RYBCZYK, STEPHEN M & CAROLE A

**BURLINGTON, CT 06013** 

Property Address: 3 SOUTH MAIN STREET

**52 OCEAN AVENUE** 

Vision ID: 587 Property Address: 52 OCEAN AVENUE

10-5-10

10-5-10

Parcel Number: CAMA Number:

Parcel Number:

CAMA Number:

10-5-11 10-5-11

Vision ID:

588

Property Address: 5 GREENE STREET

Parcel Number: 10-5-12

CAMA Number: Vision ID:

10-5-12 3465

Property Address: 60 OCEAN AVENUE

Parcel Number:

10-5-13

CAMA Number: Vision ID:

10-5-13

Property Address: 66 OCEAN AVENUE

Parcel Number:

10-5-14

CAMA Number: Vision ID:

10-5-14 3466

Property Address: 68 OCEAN AVENUE

Parcel Number:

CAMA Number:

11/8/2024

10-5-17 10-5-17

Vision ID: 593

Property Address: 10 SOUTH STREET

64 MILLER ROAD

Mailing Address: MAHONEY FAMILY REVOCABLE TRUST

KENNEBUNKPORT, ME 04046

Mailing Address: STOHLMAN, SUZANNE

**PO BOX 127** 

KENNEBUNKPORT, ME 04046

Mailing Address: MARQUIS, ALFRED C JR & JULIE A

PO BOX 1835

KENNEBUNKPORT, ME 04046

Mailing Address: DORAN, WILLIAM M & SUSAN L

4807 MARBLE HILL DRIVE LAFAYETTE HILL, PA 19444

Mailing Address: WINSTANLEY, ADAM D

150 BAKER AVENUE SUITE 303

CONCORD, MA 01742

Mailing Address: SPENCER, MARY A

PO BOX 1422



Kennebunkport, ME November 08, 2024

Parcel Number: 10-5-2

CAMA Number: 10-5-2 Vision ID: 565

Property Address: 59 MAINE STREET

Mailing Address: KASYAN, ANN M & ALPEYRIE, JEAN-

LOUIS

Mailing Address: JANE E FIRTH TRUST

**59 MAINE STREET** 

**57 MAINE STREET** 

KENNEBUNKPORT, ME 04046

KENNEBUNKPORT, ME 04046

Parcel Number: 10-5-3 CAMA Number: 10-5-3

Vision ID: 566

Parcel Number:

CAMA Number:

Vision ID:

Property Address: 57 MAINE STREET

Mailing Address: HWTM INVESTMENTS LIMITED

**PARTNERSHIP** 

6125 ROUTE DE L'AEROPORT SAINT HUBERT, QC J3Y 0V9

KENNEBUNKPORT, ME 04046

Property Address: 55 MAINE STREET

10-5-4

10-5-4

567

Parcel Number: 10-5-4A CAMA Number: 10-5-4A Vision ID: 568

Property Address: MAINE STREET

**PARTNERSHIP** 

6125 ROUTE DE L'AEROPORT

Mailing Address: HWTM INVESTMENTS LIMITED

SAINT HUBERT, QC J3Y 0V9

Parcel Number: 10-5-5 Mailing Address: ANDONIAN, DAVID & KRIS A PO BOX 800

CAMA Number: 10-5-5 Vision ID: 569

Property Address: 53 MAINE STREET

Mailing Address: CROW, KAREN W Parcel Number: 10-5-6

10-5-6 **PO BOX 342** 

CAMA Number: 105752 Vision ID: KENNEBUNK, ME 04043

Property Address: 47 MAINE STREET #7

Parcel Number: 10-5-6 Mailing Address: DIETZ, KATHLEEN

107 OLD PORT ROAD CAMA Number: 10-5-6A Vision ID: 105752 KENNEBUNK, ME 04043

Property Address: 47 MAINE STREET #8

Parcel Number: 10-5-6 Mailing Address: CALDERA, RICHARD & MARGARET

CAMA Number: 10-5-6B 47 MAINE STREET, UNIT 10 Vision ID: 105752 KENNEBUNKPORT, ME 04046

Property Address: 47 MAINE STREET #10

Parcel Number: 10-5-6 Mailing Address: GRAHAM, MARY ANN

CAMA Number: 10-5-6C PO BOX 183

Vision ID: 105752 KENNEBUNKPORT, ME 04046

Property Address: 47 MAINE STREET #14

Parcel Number: Mailing Address: GROMAN, ELIZABETH L 10-5-6

CAMA Number: 47 MAINE STREET UNIT #9 10-5-6D KENNEBUNKPORT, ME 04046 Vision ID: 105752

Property Address: 47 MAINE STREET #9

11/8/2024



Kennebunkport, ME November 08, 2024

Parcel Number: CAMA Number: 10-5-6 10-5-6E Mailing Address: RANDALL, KAREN

PO BOX 40

Vision ID:

105752

Parcel Number:

CAMA Number:

Property Address: 47 MAINE STREET #11

Mailing Address: DROMGOOLE, JOHN & CAROL ANN

150 HUBBARD STREET #A

CONCORD, MA 01742

**LUDLOW, MA 01056** 

Vision ID:

10-5-6F 105752

10-5-6

Property Address: 47 MAINE STREET #6

Mailing Address: DENOIA, MARC

**590 TREMONT STREET** 

BOSTON, MA 02118

CAMA Number: Vision ID:

Parcel Number:

CAMA Number:

Parcel Number:

10-5-6 10-5-6G

105752

10-5-6

10-5-6H

Property Address: 47 MAINE STREET #2

Mailing Address: MARGUERITE J WATERS REVOCABLE

TRUST

47 MAINE STREET #3

KENNEBUNKPORT, ME 04046

Property Address: 47 MAINE STREET #3

105752

Parcel Number: 10-5-6

Mailing Address: KENNEDY, ILONA & LESLIE 47 MAINE STREET, UNIT 1

CAMA Number: Vision ID:

Vision ID:

10-5-61

105752

Property Address: 47 MAINE STREET #1

KENNEBUNKPORT, ME 04046

Parcel Number:

10-5-6

CAMA Number:

10-5-6J

Vision ID:

105752

Property Address: 47 MAINE STREET #13

Mailing Address: HAGER, CHRISTIE L & STARK, ROYAL J

26 BREWER DRIVE

WESTBOROUGH, MA 01581

Parcel Number:

10-5-6 10-5-6K

CAMA Number: Vision ID:

Vision ID:

Vision ID:

11/8/2024

105752

Property Address: 47 MAINE STREET #12

Mailing Address: AUSTIN, JACK N & HOYT, KATHERINE L

47 MAINE STREET, UNIT 12

KENNEBUNKPORT, ME 04046

Parcel Number:

10-5-6

CAMA Number:

10-5-6L

105752

Property Address: 47 MAINE STREET #5

Mailing Address: MARTHA NIKITAS STONE REV TRUST

**42 PINE STREET** 

CONCORD, MA 01742

Parcel Number: CAMA Number:

10-5-6

10-5-6M

Property Address: 47 MAINE STREET #4

105752

Mailing Address: MCGINN, HOWARD D & JAYNE A

9 SHANANDOAH DRIVE

**PAXTON, MA 01612** 

Parcel Number: CAMA Number:

10-5-6 10-5-6Z

Mailing Address: TAMARACKS CONDO

Vision ID:

105752

Property Address: 47 MAINE STREET #MAIN



Kennebunkport, ME November 08, 2024

Parcel Number: CAMA Number:

10-5-7 10-5-7 Mailing Address: KUDAS, JACEK & SHARRY

KENNEBUNKPORT, ME 04046

Vision ID:

584

Property Address: 43 MAINE STREET

Parcel Number: 10-5-8 CAMA Number:

10-5-8

Vision ID: 3464

Property Address: 6 SOUTH STREET

Parcel Number: 10-5-9 CAMA Number:

10-5-9 Vision ID: 586

Property Address: 8 SOUTH STREET

Parcel Number:

10-6-1

CAMA Number: 10-6-1 Vision ID: 3467

Property Address: 34 MAINE STREET

Parcel Number: 10-6-10 CAMA Number: 10-6-10

Vision ID: 603

Property Address: 56 MAINE STREET

Parcel Number: 10-6-11A CAMA Number: 10-6-11A

Vision ID: 3472

Property Address: 15 TOWNE STREET

Parcel Number: 10-6-2 CAMA Number: 10-6-2

Vision ID: 595

Property Address: 38 MAINE STREET

Parcel Number: 10-6-3

CAMA Number: 10-6-3

Vision ID: 3468

Property Address: 40 MAINE STREET

Parcel Number: 10-6-4

CAMA Number: 10-6-4 Vision ID: 597

Property Address: 42 MAINE STREET

Parcel Number: 10-6-5 CAMA Number: 10-6-5

Vision ID: 598

11/8/2024

Property Address: 44 MAINE STREET

**43 MAINE STREET** 

Mailing Address: YANKOWSKI, GEORGE E JR & JANICE G

PO BOX 1333

KENNEBUNKPORT, ME 04046

Mailing Address: CARNEY, DONALD A

PO BOX 675

KENNEBUNKPORT, ME 04046

Mailing Address: KENNEBUNKPORT CAPTAINS

COLLECTION, LLC

PO BOX 3089

KENNEBUNKPORT, ME 04046

Mailing Address: GREEN, FRANK T

**56 MAINE STREET** 

KENNEBUNKPORT, ME 04046

Mailing Address: TYLER, TROY

**15 TOWNE STREET** 

KENNEBUNKPORT, ME 04046

Mailing Address: CUP AND SAUCER, LLC

133 SEASPRAY AVENUE PALM BEACH, FL 33480

Mailing Address: 40 MAINE STREET, LLC

ATTN: KRISTIN BEAN 7019 S 45TH

**PLACE** 

PHOENIX, AZ 85042

Mailing Address: KIVLEHAN REVOCABLE TRUST

PO BOX 1727

KENNEBUNKPORT, ME 04046

Mailing Address: LINDA BROOKS REVOCABLE TRUST

PO BOX 3085





Kennebunkport, ME November 08, 2024

Parcel Number:

10-6-6

Mailing Address: PAPPAGEORGE, PATRICIA

CAMA Number: Vision ID:

10-6-6 3469

1267 REALTA DRIVE CHARLOTTE, NC 28211

Parcel Number:

10-6-7

10-6-7

Property Address: 48 MAINE STREET

Mailing Address: PRICE, EUGENE THOMAS & KRISTEN E

15 FERNWOOD ROAD

WEST HARTFORD, CT 06119

CAMA Number: Vision ID:

3470

Property Address: 50 MAINE STREET

Mailing Address: FLYNN, SEAN M & AMY S

CAMA Number: 10-6-8 Vision ID:

601

10-6-8

Property Address: 52 MAINE STREET

123 WASHINGTON STREET #2

WINCHESTER, MA 01890

Parcel Number:

Parcel Number:

10-6-9

Mailing Address: MIKLOS MARK A & JENNIFER L

**54 MAINE STREET** 

KENNEBUNKPORT, ME 04046

CAMA Number:

10-6-9

Vision ID:

3471

11-1-1

Property Address: 54 MAINE STREET

Mailing Address: ADAMS, DAVID R & ELLEN L

PO BOX 1016

KENNEBUNKPORT, ME 04046

Parcel Number:

CAMA Number: 11-1-1

Vision ID: Property Address: 37 OCEAN AVENUE #4

105724

11-1-1A

Parcel Number: 11-1-1

Mailing Address: SIMONETTI, ALEXIS A

37 OCEAN AVENUE, #6

Vision ID: 105724

Property Address: 37 OCEAN AVENUE #6

KENNEBUNKPORT, ME 04046

Parcel Number: CAMA Number:

CAMA Number:

11-1-1 11-1-1B

Vision ID: 105724

Mailing Address: STRAUB, CHARLES W JR & CAROL J

100 STONEHAVEN DRIVE COLUMBIANA, OH 44408

Property Address: 37 OCEAN AVENUE #2

Parcel Number:

Vision ID:

11-1-1

CAMA Number:

11-1-1C

105724

Mailing Address: DESCOTEAUX, DAVID & JULIA

89 HAIGHT HILL ROAD

STANFORDVILLE, NY 12581

Parcel Number: CAMA Number:

Property Address: 37 OCEAN AVENUE #5

Mailing Address: REVOCABLE TRUST OF ALICE L ROSE

51 PETTEE STREET #34

NEWTON, MA 02464

Vision ID:

11-1-1D 105724

11-1-1

Property Address: 37 OCEAN AVENUE #1

Mailing Address: DRANOW, STEVEN & JAMIE

**5 ROOKERY CIRCLE** 

CAMA Number: Vision ID:

11/8/2024

Parcel Number:

11-1-1 11-1-1E 105724

Property Address: 37 OCEAN AVENUE #3

NEW CITY, NY 10956



Kennebunkport, ME November 08, 2024

Parcel Number:

11-1-1

Mailing Address: LEESIDE CONDO

CAMA Number:

11-1-1Z

Vision ID:

105724

Property Address: 37 OCEAN AVENUE #MAIN

Parcel Number: CAMA Number:

11-1-2 11-1-2

11-1-4

11-1-4

11-1-5

11-1-6

11-1-6

11-6-1

11-6-1

11-6-10

11-6-10

11-6-11

11-6-11

11-6-2

11-6-2

714

722

713

3477

Vision ID:

614 Property Address: 35 OCEAN AVENUE

Parcel Number: 11-1-3

Vision ID:

CAMA Number: 11-1-3 3475

Property Address: 33 OCEAN AVENUE

Parcel Number:

CAMA Number: Vision ID:

3476 Property Address: 31 OCEAN AVENUE

Parcel Number: CAMA Number:

11-1-5 Vision ID: 617

Property Address: 29 OCEAN AVENUE

Parcel Number:

CAMA Number: Vision ID:

Property Address: 27 OCEAN AVENUE

Parcel Number:

CAMA Number: Vision ID:

Property Address: 11 TOWNE STREET

Parcel Number: CAMA Number:

Vision ID: Property Address: 28 MAINE STREET

Parcel Number:

CAMA Number:

Vision ID: Property Address: 30 MAINE STREET

Parcel Number: CAMA Number:

Vision ID:

11/8/2024

Property Address: 9 TOWNE STREET

Mailing Address: HANDLEN, FRANK W & CUMMINS,

SHARON L

**PO BOX 210** KENNEBUNKPORT, ME 04046

Mailing Address: THOMPSON, HARRY A III & JILL M

PO BOX 20

KENNEBUNKPORT, ME 04046

Mailing Address: RINALDI, JOHN F & POWELL, BRIAN

PO BOX 1079

KENNEBUNKPORT, ME 04046

Mailing Address: SHAHIAN, DOUGLAS & LISA

37 HICKORY LANE

BOXFORD, MA 01921

Mailing Address: DAVID C KRIEG LIVING TRUST **PO BOX 664** 

KENNEBUNKPORT, ME 04046

Mailing Address: MILES, DANIEL F & ANDREA

11 TOWNE STREET

KENNEBUNKPORT, ME 04046

Mailing Address: SPICEWOOD MAINE, LLC 8 SPICEWOOD LANE

**WILTON, CT 06897** 

Mailing Address: EISING, PETER A & SUSANNE PO BOX 2761

KENNEBUNKPORT, ME 04046

Mailing Address: LILLIAN M BARTLETT REVOCABLE TRUST

PO BOX 2549



Kennebunkport, ME November 08, 2024

Parcel Number: 11-7-1 CAMA Number: 11-7-1

724

Vision ID:

Property Address: 29 MAINE STREET

Parcel Number: 11-7-10

CAMA Number: 11-7-10

Vision ID: 3505

Property Address: 4 PEARL STREET

Parcel Number: 11-7-11

CAMA Number: 11-7-11 Vision ID: 3506

Property Address: 8 PEARL STREET

Parcel Number: 11-7-12

CAMA Number: 11-7-12

Vision ID: 735

Property Address: 10 PEARL STREET

Parcel Number: 11-7-13 11-7-13 CAMA Number:

Vision ID: 736

Property Address: 12 PEARL STREET

Parcel Number: 11-7-2 CAMA Number: 11-7-2

Vision ID: 3503

Property Address: 27 MAINE STREET

11-7-3 Parcel Number:

CAMA Number: 11-7-3 Vision ID: 726

Property Address: 9 ELM STREET

Parcel Number: 11-7-4 11-7-4 CAMA Number:

Vision ID: 727

Property Address: 7 ELM STREET

Parcel Number: 11-7-5

CAMA Number: 11-7-5

Vision ID: 728

Property Address: 5 ELM STREET

Parcel Number: 11-7-6

CAMA Number: 11-7-6 Vision ID: 729

11/8/2024

Property Address: 3 ELM STREET

Mailing Address: MAINE PEARL LLC

1370 FAN PALM ROAD

BOCA RATON, FL 33432

Mailing Address: MATTHEW C ALLARD REVOCABLE

TRUST

54 WESSCUM WOOD ROAD RIVERSIDE, CT 06878

STEPHEN C PAGE REVOCABLE TRUST Mailing Address:

6539 SOUTH MARINA WAY

STUART, FL 34996

Mailing Address: PAUL L MAHONEY REVOCABLE TRUST

6825 SAN MARINO DRIVE

**NAPLES, FL 34108** 

Mailing Address: DOWNS, EVA M

PO BOX 1778

KENNEBUNKPORT, ME 04046

Mailing Address: KARAKHANIAN, ALEXANDER & RENA

661 MELALEUCA LANE

MIAMI, FL 33137

Mailing Address: DELANCEY-KAY REVOCABLE TRUST

600 MAIN STREET, APT 2303

WORCESTER, MA 01608

Mailing Address: CONDON, ROBERT & ELLICE

80 S RIVER ROAD STUART, FL 34996

Mailing Address: KUBIAK, FAITH & KATHERINE

PO BOX 6

KENNEBUNKPORT, ME 04046

Mailing Address: M&T BANK

C/O CONCENTRIX PO BOX 2410

**OMAHA, NE 68103** 



Kennebunkport, ME November 08, 2024

Parcel Number: 11-7-7 CAMA Number:

11-7-7

Vision ID: 730

Property Address: 40 OCEAN AVENUE

Parcel Number: 11-7-8 CAMA Number: 11-7-8

Vision ID: 3504

Property Address: 42 OCEAN AVENUE

Parcel Number: 11-7-9

CAMA Number: 11-7-9

Vision ID: 732

Property Address: 2 PEARL STREET

Parcel Number: 11-8-1

CAMA Number: 11-8-1 Vision ID: 3507

Property Address: 6 ELM STREET

Parcel Number: 11-8-2

CAMA Number: 11-8-2 Vision ID: 738

Property Address: 3 CHESTNUT STREET

Parcel Number: 11-8-3 CAMA Number: 11-8-3

Vision ID: 3508

Property Address: 32 OCEAN AVENUE

Parcel Number: 11-8-4 CAMA Number: 11-8-4

Vision ID: 740

Property Address: 2 ELM STREET

Parcel Number: 11-8-5

CAMA Number: 11-8-5 Vision ID: 741

Property Address: 4 ELM STREET

Parcel Number: 11-9-1

CAMA Number: 11-9-1

Vision ID: 742

Property Address: 14 CHESTNUT STREET

Parcel Number:

11-9-11 CAMA Number: 11-9-11

11/8/2024

Vision ID: 3511

Property Address: 30 OCEAN AVENUE

Mailing Address: 1 ELM STREET, LLC

135 GRAFTON STREET

CHEVY CHASE, MD 20815

Mailing Address: PAINE, W ROBERT & EVELYN

PO BOX 1364

KENNEBUNKPORT, ME 04046

Mailing Address: BLACK FAMILY REVOCABLE TRUST

**PO BOX 837** 

KENNEBUNKPORT, ME 04046

Mailing Address: KENNEBUNKPORT, TOWN OF

PO BOX 566

KENNEBUNKPORT, ME 04046

Mailing Address: DULEY, BRIGITTE I

**PO BOX 567** 

KENNEBUNKPORT, ME 04046

Mailing Address: OCEAN AVENUE REALTY TRUST

PO BOX 949

KENWOOD, CA 95452

Mailing Address: CABE, MARIO & JOANN

1008 E KENNEDY RD NORTH WALES, PA 19454

Mailing Address: WHETSELL, M HEYWARD JR &

SHERRILL A

2820 COUNTRY CLUB RD WINSTON-SALEM, NC 27104

Mailing Address: BELYEA, JOHN A

**PO BOX 401** 

KENNEBUNKPORT, ME 04046

Mailing Address: PERKINS, CARLA L

PO BOX 796

KENNEBUNKPORT, ME 04046-0796





Kennebunkport, ME November 08, 2024

Parcel Number: 11-9-12

CAMA Number: 11-9-12 Vision ID: 753

Property Address: 4 CHESTNUT STREET

Parcel Number: 11-9-13 CAMA Number: 11-9-13 3512 Vision ID:

Property Address: 6 CHESTNUT STREET

Parcel Number: 11-9-14

CAMA Number: 11-9-14 755 Vision ID:

Property Address: 8 CHESTNUT STREET

Parcel Number: 11-9-16 CAMA Number: 11-9-16

Vision ID: 757

Property Address: 12 CHESTNUT STREET

Parcel Number: 11-9-2

CAMA Number: 11-9-2 Vision ID: 743

Property Address: 10 ELM STREET

Parcel Number: 11-9-3 CAMA Number: 11-9-3

Vision ID: 3509

Property Address: 12 ELM STREET

Parcel Number: 11-9-4

CAMA Number: 11-9-4

Vision ID: 745

Property Address: 25 MAINE STREET

Parcel Number: 8-1-15

CAMA Number: 8-1-15 Vision ID:

Property Address: 91 OCEAN AVENUE

Parcel Number: 8-1-16 CAMA Number: 8-1-16

Vision ID: 191

Property Address: 89 OCEAN AVENUE

Parcel Number: 8-1-17

CAMA Number: 8-1-17 Vision ID: 192

11/8/2024

Property Address: 87 OCEAN AVENUE

Mailing Address: KNOWLES, ROBERT W

PO BOX 130

KENNEBUNKPORT, ME 04046

Mailing Address: KILBURN HOUSE, LLC

1601 EAST BLOUNT ST. PENSACOLA, FL 32503

Mailing Address: GOODWIN, KAREN A

**PO BOX 545** 

KENNEBUNKPORT, ME 04046

Mailing Address: VASQUEZ, NICHOLAS & KERCADO,

**MELISSA** PO BOX 2742

KENNEBUNKPORT, ME 04046

Mailing Address: MCWILLIAMS FAMILY TRUST

28 COLTON LANE

SHREWSBURY, MA 01545

Mailing Address: HECKLER, JOHN H & CAROL A

PO BOX 831

KENNEBUNKPORT, ME 04046

Mailing Address: NATOLI, JOAN E & RICHARD

PO BOX 763

KENNEBUNKPORT, ME 04046

Mailing Address: 91 OCEAN AVENUE COTTAGE, LLC

C/O MARCIA KELLAMS 2000 S OCEAN

BLVD, Y10

DELRAY BEACH, FL 33483

Mailing Address: CHESTER E & SHIRLEY B HOMER

REVOCABLE TRUSTS

1 HARBOUR PLACE, SUITE 4G PORTSMOUTH, NH 03801

Mailing Address: BARNES, ANNE F

PO BOX 84





Kennebunkport, ME November 08, 2024

8-1-19

8-1-19

8-1-20

195

Property Address: OCEAN AVENUE

194

Property Address: 83 OCEAN AVENUE

Parcel Number: 8-1-18 8-1-18

CAMA Number: Vision ID: 193

Parcel Number:

CAMA Number:

CAMA Number:

Vision ID:

Vision ID:

Property Address: 85 OCEAN AVENUE

Mailing Address: WINSTANLEY, MELISSA F

847 LOWELL ROAD CONCORD, MA 01742

Mailing Address: CHESTER E HOMER III REVOCABLE

TRUST

1 HARBOUR PLACE, SUITE 4G PORTSMOUTH, NH 03801

Parcel Number: Mailing Address: EDMANDS, PETER L & CLARK-8-1-20

EDMANDS, SHEILA

8 IVY COURT

KENNEBUNK, ME 04043

Parcel Number: 8-1-22 Mailing Address: TIDEMARK CORPORATION

CAMA Number: 8-1-22 273 CORPORATE DRIVE, SUITE 150

Vision ID: PORTSMOUTH, NH 03801 197

Property Address: 75 OCEAN AVENUE

Parcel Number: 8-2-1 Mailing Address: 82 OCEAN AVENUE, LLC

CAMA Number: 8-2-1 4461 PRESERVE PARKWAY SOUTH

GREENWOOD VILLAGE, CO 80121 Vision ID: 3357 Property Address: 82 OCEAN AVENUE

Mailing Address: TILNEY, PETER VR & KATHERINE R Parcel Number: 8-2-19

CAMA Number: 8-2-19 15 SOUTH MAIN STREET Vision ID: KENNEBUNKPORT, ME 04046 217

Property Address: CHICKS CREEK

Parcel Number: 8-2-2 Mailing Address: HAMILTON-VOMBAUR, ZOE

CAMA Number: 8-2-2 24 CEDARLAWN ROAD Vision ID: 200 **IRVINGTON, NY 10533** 

Property Address: 84 OCEAN AVENUE

Parcel Number: Mailing Address: WILLIAMS, EMILY B & SILLS, DIANE M 8-2-20

CAMA Number: 8-2-20 28 CONCORD ST Vision ID: CARLISLE, MA 01740

Property Address: 11 SOUTH MAIN STREET

Parcel Number: 8-2-21 Mailing Address: COTTAGE AT CABOT COVE CONDOS

CAMA Number: 8-2-21 Vision ID: 105846

11/8/2024

Property Address: 7 SOUTH MAIN STREET #MAIN

Parcel Number: 8-2-21 Mailing Address: SOUTH MAINE, LLC

CAMA Number: 8-2-21A C/O COTTAGES AT CABOT COVE 2

LIVEWELL DR, STE 203 105846

Vision ID: KENNEBUNK, ME 04043 Property Address: 7 SOUTH MAIN STREET #1



Kennebunkport, ME November 08, 2024

Parcel Number: CAMA Number:

8-2-21

Mailing Address: ATLANTIC RESORT HOLDINGS, LLC

Vision ID:

8-2-21B 105846

Property Address: 7 SOUTH MAIN STREET #2

Parcel Number:

8-2-21 CAMA Number: 8-2-21C

8-2-21E

105846

8-2-21

8-2-21F

105846

8-2-21

8-2-21G

105846

8-2-21

8-2-21H

Vision ID: 105846 Property Address: 7 SOUTH MAIN STREET #3

Parcel Number:

8-2-21 CAMA Number: 8-2-21D

Vision ID:

105846 Property Address: 7 SOUTH MAIN STREET #4

Parcel Number: 8-2-21

CAMA Number: Vision ID:

Property Address: 7 SOUTH MAIN STREET #5

Parcel Number:

CAMA Number:

Vision ID: Property Address: 7 SOUTH MAIN STREET #6

Parcel Number:

CAMA Number: Vision ID:

Property Address: 7 SOUTH MAIN STREET #7

Parcel Number: CAMA Number:

Vision ID: 105846 Property Address: 7 SOUTH MAIN STREET #8

Parcel Number:

8-2-21 CAMA Number: 8-2-21J 105846

Vision ID: Property Address: 7 SOUTH MAIN STREET #9

Parcel Number: 8-2-21

CAMA Number: 8-2-21K Vision ID: 105846

Property Address: 7 SOUTH MAIN STREET #10

Parcel Number: 8-2-21 CAMA Number: 8-2-21L 105846

Vision ID:

11/8/2024

Property Address: 7 SOUTH MAIN STREET #11

2 LIVEWELL DR., SUITE 203

KENNEBUNK, ME 04043

Mailing Address: ATLANTIC RESORT HOLDINGS, LLC

2 LIVEWELL DR., SUITE 203 KENNEBUNK, ME 04043

Mailing Address: ATLANTIC RESORT HOLDINGS, LLC

2 LIVEWELL DR., SUITE 203 KENNEBUNK, ME 04043

Mailing Address: ATLANTIC RESORT HOLDINGS, LLC

2 LIVEWELL DR., SUITE 203 KENNEBUNK, ME 04043

Mailing Address: KNOX, ELIZABETH H & FRANCIS V JR

9 PARKER RIDGE WAY

NEWBURYPORT, MA 01950

Mailing Address: KPT COTTAGE 7, LLC

4224 244TH AVE NE REDMOND, WA 98053

Mailing Address: CHEESMAN, CLAIRE

**403 MONMOUTH AVENUE** NEW MILFORD, NJ 07646

Mailing Address: KLEINMAN, LINDA T & JEFFREY H

2 LOS ANGELES STREET, #1511

NEWTON, MA 02458

Mailing Address: KENNETH J GIMBEL REVOCABLE

TRUST

PO BOX 798

KENNEBUNKPORT, ME 04046

Mailing Address: JUDGE, STEPHEN D

127 PERKINS ROW TOPSFIELD, MA 01983



Kennebunkport, ME November 08, 2024

Parcel Number:

8-2-21

Mailing Address: ATLANTIC RESORT HOLDINGS, LLC

CAMA Number: Vision ID:

8-2-21M 105846

Property Address: 7 SOUTH MAIN STREET #12

Parcel Number: CAMA Number:

8-2-21 8-2-21N

Vision ID: Property Address: 7 SOUTH MAIN STREET #13

105846

Parcel Number: CAMA Number: Vision ID:

8-2-21 8-2-210 105846

Property Address: 7 SOUTH MAIN STREET #14

Parcel Number:

8-2-21 8-2-21P

CAMA Number: Vision ID:

105846

Property Address: 7 SOUTH MAIN STREET #15

Parcel Number:

8-2-21 CAMA Number: 8-2-21Q Vision ID: 105846

Property Address: 7 SOUTH MAIN STREET #16

Parcel Number: CAMA Number:

8-2-23 8-2-23

Vision ID:

3366

Property Address: 80 OCEAN AVENUE

Parcel Number:

8-2-3 CAMA Number: 8-2-3

Vision ID:

201

Property Address: 86 OCEAN AVENUE

Parcel Number:

8-2-4

CAMA Number: Vision ID:

8-2-4

Property Address: 90 OCEAN AVENUE

Parcel Number: CAMA Number:

9-4-1E 9-4-1E

Vision ID:

11/8/2024

103703

Property Address: 12 ARBOR LEDGE DRIVE

Mailing Address: ATLANTIC RESORT HOLDINGS, LLC

2 LIVEWELL DR., SUITE 203

2 LIVEWELL DR., SUITE 203

KENNEBUNK, ME 04043

KENNEBUNK, ME 04043

Mailing Address: KPT COTTAGE 14, LLC

**4224 244TH AVENUE NE** REDMOND, CA 98053

Mailing Address: ATLANTIC RESORT HOLDINGS, LLC

2 LIVEWELL DR., SUITE 203

KENNEBUNK, ME 04043

Mailing Address: ATLANTIC RESORT HOLDINGS, LLC

2 LIVEWELL DR., SUITE 203

KENNEBUNK, ME 04043

Mailing Address: KENNEBUNKPORT, TOWN OF

**PO BOX 566** 

KENNEBUNKPORT, ME 04046

Mailing Address: MARY BANKS STROHM REVOCABLE

TRUST

4211 CASWELL AVE, UNIT A

AUSTIN, TX 78751

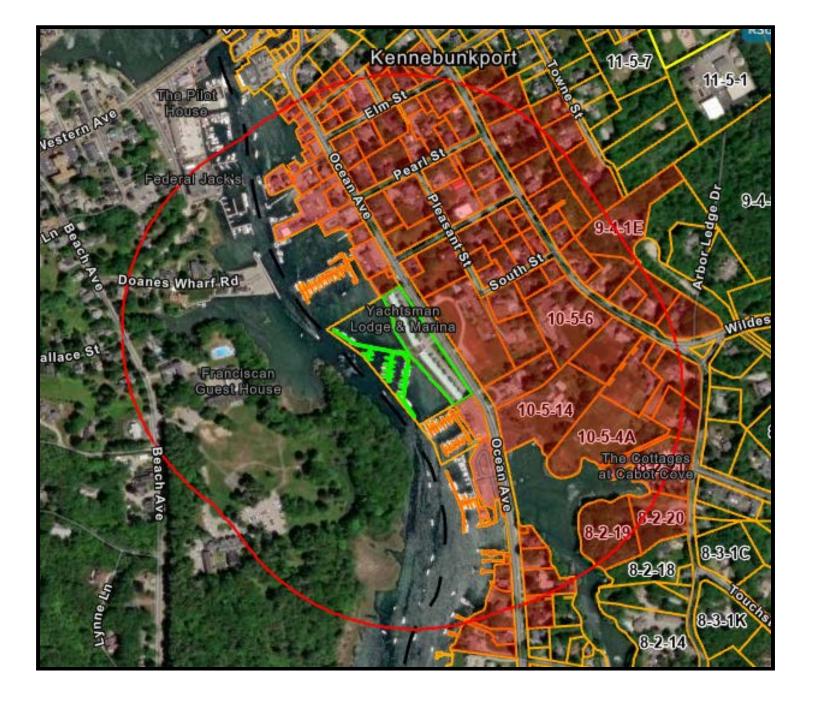
Mailing Address: OCEAN AVE B&B, LLC

60 SEAGATE DRIVE, APT 1701

NAPLES, FL 34103

Mailing Address: FAESSLER, WILLY A & JANICE M

12 ARBOR LEDGE DRIVE



Abutting Properties for 11 DOĂNES WHARF ROAD 088/ / 068/ / (500 Feet)

Location:

088/ / 014/ 022/

8 WESTERN AVENUE #22

Owner:

D'ITALIA, JEFFREY & HOWES, MARY

12 COMMODORES WAY KENNEBUNK, ME 04043

Location:

088/ / 014/ 009/

8 WESTERN AVENUE #9

Owner:

HART, ROBERT &

HART, MARY

42 RIVERSIDE DRIVE READING, MA 01867

Location:

088/ / 014/ 018/

8 WESTERN AVENUE #18

Owner:

UNCLE GF BABA FAMILY IRREVOC

TRST&

CAOUETTE, MICHAEL A TRUSTEE & ET AL

C/O M&JC PROPERTY MNGMNT

480 ROUTE 101 BEDFORD, NH 03110

Location:

088/ / 014/ 012/

8 WESTERN AVENUE #12

Owner:

CAMPBELL, BRIAN J 5706 ROCKMERE DRIVE

BETHESDA, MD 20816

Location:

088/ / 071/ /

8 DOANES WHARF ROAD

Owner:

HARMAN, GERALD K &

HARMAN, ALICE M

P.O. BOX 1554 ARLINGTON, MA 02474

Location:

088/ / 014/ 008/

8 WESTERN AVENUE #8

Owner:

PRM-RGM, LLC F/K/A PRM-CMM LLC

40 STARK STREET

MANCHESTER, NH 03101

088/ / 014/ 005/

8 WESTERN AVENUE #5

Owner:

SINCLAIR, THOMAS J REVOC TRUST& SINCLAIR, THOMAS J & SARA E

TRUSTEES **PO BOX 377** 

KENNEBUNKPORT, ME 04046

Location:

088/ / 014/ 002/

8 WESTERN AVENUE #2

Owner:

ODONNELL, JOHN M & FERREIRO, ROXANA

368 HIGHLAND STREET

WESTON, MA 02493

Location:

088/ / 014/ 004/ 8 WESTERN AVENUE #4

Owner:

UNCLE GF BABA FAMILY IRREVOC

TRST&

CAOUETTE, MICHAEL A. TRSTEE & ET

AL

C/O M&JC PROPERTY MNGMNT

480 ROUTE 101 BEDFORD, NH 03110

Location:

088/ / 014/ 020/

8 WESTERN AVENUE #20

Owner:

109 PORT ROAD LLC

5 HEARTHSTONE DRIVE KENNEBUNK, ME 04043

Location:

088/ / 052/ /

21 BEACH AVENUE

Owner:

CHRISTIANSEN, JOHN

144 COMMONWEALTH AVE BOSTON, MA 02116

Location:

088/ / 014/ 023/ 8 WESTERN AVENUE #23

Owner:

TALMAGE SOLAR ENGINEERING, INC

25 ROCKMARSH ROAD

KENNEBUNKPORT, ME 04046

Location:

088/ / 014/ 014/

8 WESTERN AVENUE #14

Owner:

PRM-RGM, LLC

F/K/A PRM-CMM LLC

**40 STARK STREET** 

MANCHESTER, NH 03101

Location:

088/ / 014/ 010/

8 WESTERN AVENUE #10

Owner:

MULLEN, EUGENE M & MULLEN, LAUREL A

**103 LORING ROAD** 

WESTON, MA 02493

Location:

088/ / 014/ 024/

8 WESTERN AVENUE #24

Owner:

**UMANZIO, ROY D &** 

ZANDER, CHRISTINE

PO BOX 4277

ANDOVER, MA 01810

Location:

088/ / 014/ 015/

8 WESTERN AVENUE #15

Owner:

UNCLE GF BABA FAMILY IRREVOC

TRST&

CAOUETTE, MICHAEL A TRSTEE& ET

AL

C/O M&JC PROPERTY MNGMNT

480 ROUTE 101

BEDFORD, NH 03110

Location:

088/ / 014/ 017/ 8 WESTERN AVENUE #17

Owner:

MURRAY, BENJAMIN & MURRAY, SARAH D 235 BROWN STREET

KENNEBUNK, ME 04043

Location:

088/ / 014/ 006/

8 WESTERN AVENUE #6

Owner:

MULLEN, EUGENE M

103 LORING ROAD WESTON, MA 02493

Location:

088/ / 014/ 021/ 8 WESTERN AVENUE #21

Owner:

ESIELONIS, STEVEN M

ESIELONIS, SUSAN H

15 CHRISTENSEN LANE KENNEBUNK, ME 04043

Location:

088/ / 014/ 019/

8 WESTERN AVENUE #19

Owner: EAST RIDGE REALTY OF SC LLC

1602 BEAUFORD PLACE VALDOSTA, GA 31602

Location:

088/ / 014/ 011/

8 WESTERN AVENUE #11

Owner:

COSTELLO, MICHAEL & COSTELLO, DONNA

KENNEBUNK, ME 04043

37 FAIRFIELD DRIVE

088/ / 014/ 013/ 8 WESTERN AVENUE #13 Owner:

NOBLE, RENN E 15 HOLLAND ROAD KENNEBUNK, ME 04043

Location: 088/ / 075/ /

5 DOANES WHARF ROAD

Owner:

PIMENTEL, ALLYSON B REVOC TRST& PIMENTEL, ALLYSON B & ARMANDO, JR

19730 GRANDVIEW TERRACE

JUPITER, FL 33458

Location: 088/ / 051/ / 19 BEACH AVENUE Owner:

RODRIGUES, JOSEPH S & RODRIGUES, NANCY C 19 BEACH AVENUE KENNEBUNK, ME 04043

Location: 088/ / 069/ /

12 DOANES WHARF ROAD

Owner:

KENNEBUNK SEWER DISTRICT

P.O. BOX 648

KENNEBUNK, ME 04043

Location:

088/ / 014/ 016/

8 WESTERN AVENUE #16

Owner:

MURRAY, JAMES SR, TRUST & MURRAY, JAMES M SR PO BOX 1174

KENNEBUNKPORT, ME 04046

Location: 088/ / 035/ /

20 CHASE HILL ROAD

BEACH DOGS KPT LLC 5220 CASABLANCA DRIVE PARADISE VALLEY, AZ 85253

088/ / 072/ /

6 DOANES WHARF ROAD

Owner: LAMBERTS, RICHARD J REVOC TRUST& LAMBERTS, EDITH L REVOC TRUST & PO BOX 2599

KENNEBUNKPORT, ME 04046

088/ / 074/ /

7 DOANES WHARF ROAD

Owner: TCLL LLC PO BOX 2688

KENNEBUNKPORT, ME 04046

Location: 088/ / 063/ / 25 BEACH AVENUE Owner: MERZ, MARTHA A 316 HÁLSEY ROAD ANNAPOLIS, MD 21401

Location: 088/ / 017/ / CHASE HILL ROAD

Owner:

PORT SCAPE CONDOMINIUMS CHASE HILL ROAD KENNEBUNK, ME 04043

Location: 088/ / 076/ /

1 DOANES WHARF ROAD

Owner:

TRELINA LLC **62 PORTLAND ROAD** 

SUITE 25

KENNEBUNK, ME 04043

Location: 088/ / 068/ /

11 DOANES WHARF ROAD

Owner:

HIOS HOSPITALITY LLC WHITE BARN INN OWNER LLC 11 DOANES WHAR ROAD KENNEBUNK, ME 04043

Location: 088/ / 028/ / 9 CHASE HILL ROAD Owner:

FOLEY, PATRICIA A & DANT, SHANNON HAYES & ET AL

9 CHASE HILL ROAD KENNEBUNK, ME 04043

Location:

088/ / 022/ / 10 CHASE HILL ROAD

Owner:

GLOBEVEST CAPITAL REAL ESTATE US

LP

1005 RUE LIONEL DAUMAIS BUREAU

BOUCHERVILLE, QC J4B 0B1

Location: 088/ / 037/ / 12 BEACH AVENUE Owner:

**GGPP DEAN LLC** 

c/o WILK, NINA 1901 OLDE MILL FOREST DRIVE

RALEIGH, NC 27606

Location:

088/ / 067/ / 4 DOANES WHARF ROAD

Owner: **BR2 LLC** 

**86 NEWBURY STREET** PORTLAND, ME 04101

Location: 088/ / 077/ / 22 BEACH AVENUE Owner: PERKINS, CARLA L

P.O. BOX 796

KENNEBUNKPORT, ME 04046

Location: 088/ / 014/ 007/

8 WESTERN AVENUE #7

Owner:

HANNON, SHEILA W & HANNON, THOMAS A, SR 161 BIANCA ROAD DUXBURY, MA 02332

Location: 088/ / 023/ /

12 CHASE HILL ROAD Owner: J&S HOSPITALITY LLC PO BOX 620C

KENNEBUNKPORT, ME 04046

Location: 088/ / 062/ / 23 BEACH AVENUE

Owner:

23 BEACH AVE LAND TRUST 8502 MARBLEHEAD ROAD LUTHERVILLE, MD 20193

Location: 088/ / 070/ /

10 DOANES WHARF ROAD

Owner:

MCAVOY, KEITH FRANCIS & MCAVOY, MARY-ANN 10 DOANES WHARF ROAD KENNEBUNK, ME 04043

Location:

088/ / 014/ 003/ 8 WESTERN AVENUE #3

Owner:

SINCLAIR, THOMAS J REVOC TRUST & SINCLAIR, SARA E REVOC TRUST&

**PO BOX 377** 

KENNEBUNKPORT, ME 04046

Location: 088/ / 024/ /

16 CHASE HILL ROAD

Owner:

NARVAEZ, DAMIAN M & NARVAEZ, RACHEL G 2500 REGATTA AVENUE MIAMI BEACH, FL 33140

Location: 088/ / 066/ /

2 DOANES WHARF ROAD

Owner: **BR2 LLC** 

**86 NEWBURY STREET** PORTLAND, ME 04101

Location: 088/ / 073/ /

9 DOANES WHARF ROAD

Owner:

WEADOCK, FLORENCE T 256 SIMON WILLARD ROAD CONCORD, MA 01742

Location: 088/ / 079/ / 26 BEACH AVENUE

Owner:

SOCIETY OF FRANCISCAN FATHERS

P.O. BOX 980

KENNEBUNKPORT, ME 04046

Location: 088/ / 014/ /

8 WESTERN AVENUE

Owner:

**RIVERVIEW BOATSLIPS** 

**CONDOMINIUMS CONTROL CARD** 

KENNEBUNK, ME 04043

Location: 088/ / 080/ / 8 WESTERN AVENUE Owner: SHIPYARD, INC 8 WESTERN AVENUE KENNEBUNK, ME 04043 Location: 088/ / 050/ / 17 BEACH AVENUE Owner: MUTINO, PETER A & MUTINO, SUSAN L 8 APPLE TREE LANE DARIEN, CT 06820

Location: 088/ / 018/ / 14 CHASE HILL ROAD Owner: BULL, STEPHEN B & TURNER, SHERRY M 12720 HUNTSMAN WAY POTOMAC, MD 20854-2307 **Proof of Mailing to Abutters (Mailing Labels)** 

06350011485632

USPS CERTIFIED MAIL



9407 1118 9876 5486 6944 65

KENNEBUNKPORT, TOWN OF PO BOX 566
KENNEBUNKPORT ME 04046-0566

USPS CERTIFIED MAIL



9407 1118 9876 5486 6944 03

KPT MARINE, LLC PO BOX 2734 KENNEBUNKPORT ME 04046-2734 վակվիլուդիկուդիկումիկիվութիկի

11923275

USPS CERTIFIED MAIL

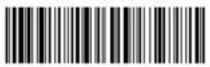


9407 1118 9876 5486 6944 96

KENNEBUNKPORT, TOWN OF PO BOX 566
KENNEBUNKPORT ME 04046-0566

11923275 063S0010937441

#### USPS CERTIFIED MAIL



9407 1118 9876 5486 6944 41

ARUNDEL YACHT CLUB
PO BOX 328
KENNEBUNKPORT ME 04046-0328

#### USPS CERTIFIED MAIL

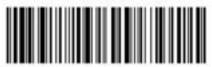


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MAHONEY FAMILY REVOCABLE TRUST 52 OCEAN AVE KENNEBUNKPORT ME 04046

հետիբիվեկիիլիդելիկիիլիվորեկոսանիլիկիսիի

### USPS CERTIFIED MAIL



9407 1118 9876 5486 6944 34

STOHLMAN, SUZANNE PO BOX 127 KENNEBUNKPORT ME 04046-0127

USPS CERTIFIED MAIL



9407 1118 9876 5486 6945 19

9407 1118 9876 5486 6945 26

DORAN, WILLIAM M & SUSAN L 4807 MARBLE HL LAFAYETTE HL PA 19444-1043

\$5.54 US POSTAGE FIRST-CLASS IMI

Oct 30 2024 Mailed from ZIP 04092 1 0Z FRST-CLASS MAIL LETTER RATE

11923275



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1 ELM STREET, LLC 135 GRAFTON STREET CHEVY CHASE MD 20815 2538970 ONTARIO, INC 765 WESTNEY ROAD SOUTH AJAX ON L1S 6W1 40 MAINE STREET, LLC ATTN: KRISTIN BEAN 7019 S 45TH PLACE PHOENIX AZ 85042

82 OCEAN AVENUE, LLC 4461 PRESERVE PARKWAY SOUTH GREENWOOD VILLAGE CO 80121 91 OCEAN AVENUE COTTAGE, LLC C/O MARCIA KELLAMS 2000 S OCEAN BLVD, Y10 DELRAY BEACH FL 33483 ADAMS, DAVID R & ELLEN L PO BOX 1016 KENNEBUNKPORT ME 04046

ANDONIAN, DAVID & KRIS A PO BOX 800 KENNEBUNKPORT ME 04046 ARUNDEL YACHT CLUB PO BOX 328 KENNEBUNKPORT ME 04046-0328 ATLANTIC RESORT HOLDINGS, LLC 2 LIVEWELL DR., SUITE 203 KENNEBUNK ME 04043

AUSTIN, JACK N & HOYT, KATHERINE L 47 MAINE STREET, UNIT 12 KENNEBUNKPORT ME 04046 BALCOM, WILLIAM BRIAN 3002 WINDSOR RIDGE DRIVE WESTBOROUGH MA 01581 BARNES, ANNE F PO BOX 84 KENNEBUNKPORT ME 04046

BARTLETT, HUGH J & JUDITH PO BOX 293 KENNEBUNKPORT ME 04046 BELYEA, JOHN A PO BOX 401 KENNEBUNKPORT ME 04046 BLACK FAMILY REVOCABLE TRUST PO BOX 837 KENNEBUNKPORT ME 04046

BYERLY, WILLIAM F & MARY C PO BOX 2675 KENNEBUNKPORT ME 04046 CABE, MARIO & JOANN 1008 E KENNEDY RD NORTH WALES PA 19454

CARNEY, DONALD A

CALDERA, RICHARD & MARGARET 47 MAINE STREET, UNIT 10 KENNEBUNKPORT ME 04046

CAPPS, NOBLE F & NANCY H PO BOX 1023 KENNEBUNKPORT ME 04046

PO BOX 675 KENNEBUNKPORT ME 04046 CHEESMAN, CLAIRE 403 MONMOUTH AVENUE NEW MILFORD NJ 07646

CHESTER E & SHIRLEY B HOMER REVOCABLE TRUSTS 1 HARBOUR PLACE, SUITE 4G PORTSMOUTH NH 03801 CHESTER E HOMER III REVOCABLE TRUST 1 HARBOUR PLACE, SUITE 4G PORTSMOUTH NH 03801 CONDON, ROBERT & ELLICE 80 S RIVER ROAD STUART FL 34996

COTTAGE AT CABOT COVE CONDOS

CROW, KAREN W PO BOX 342 KENNEBUNK ME 04043 CUP AND SAUCER, LLC 133 SEASPRAY AVENUE PALM BEACH FL 33480

DAVID C KRIEG LIVING TRUST PO BOX 664 KENNEBUNKPORT ME 04046 DAVID L KELLY FAMILY TRUST 25 OAK STREET CHARLESTOWN MA 02129 DELANCEY-KAY REVOCABLE TRUST 600 MAIN STREET, APT 2303 WORCESTER MA 01608 DENOIA, MARC 590 TREMONT STREET BOSTON MA 02118 DESCOTEAUX, DAVID & JULIA 89 HAIGHT HILL ROAD STANFORDVILLE NY 12581 DIETZ, KATHLEEN 107 OLD PORT ROAD KENNEBUNK ME 04043

DORAN, WILLIAM M & SUSAN L 4807 MARBLE HILL DRIVE LAFAYETTE HILL PA 19444 DOWNS, EVA M PO BOX 1778 KENNEBUNKPORT ME 04046 DRANOW, STEVEN & JAMIE 5 ROOKERY CIRCLE NEW CITY NY 10956

DROMGOOLE, JOHN & CAROL ANN 150 HUBBARD STREET #A CONCORD MA 01742 DULEY, BRIGITTE I PO BOX 567 KENNEBUNKPORT ME 04046 EDITH HG MCCONNELL REVOCABLE TRUST PO BOX 1813 KENNEBUNKPORT ME 04046

EDMANDS, PETER L & CLARK-EDMANDS, SHEILA 8 IVY COURT KENNEBUNK ME 04043 EISING, PETER A & SUSANNE PO BOX 2761 KENNEBUNKPORT ME 04046 ENOCH, MATTHEW S & DONNA C 642 ALLEGIANCE DRIVE LITITZ PA 17543

FAESSLER, WILLY A & JANICE M 12 ARBOR LEDGE DRIVE KENNEBUNKPORT ME 04046

FANTON, ROMA F 39 MEETINGHOUSE LANE FAIRFIELD CT 06430 FLYNN, SEAN M & AMY S 123 WASHINGTON STREET #2 WINCHESTER MA 01890

GOODWIN, KAREN A PO BOX 545 KENNEBUNKPORT ME 04046 GRAHAM, MARY ANN PO BOX 183 KENNEBUNKPORT ME 04046 GREEN, FRANK T 56 MAINE STREET KENNEBUNKPORT ME 04046

GROMAN, ELIZABETH L 47 MAINE STREET UNIT #9 KENNEBUNKPORT ME 04046

HAGER, CHRISTIE L & STARK, ROYAL J 26 BREWER DRIVE WESTBOROUGH MA 01581 HALL, JONATHAN S PO BOX 811 WINDHAM NH 03087

HAMILTON-VOMBAUR, ZOE 24 CEDARLAWN ROAD IRVINGTON NY 10533 HANDLEN, FRANK W & CUMMINS, SHARON L PO BOX 210 KENNEBUNKPORT ME 04046 HECKLER, JOHN H & CAROL A PO BOX 831 KENNEBUNKPORT ME 04046

HUNTER, JAMES & JOAN F 39 MAINE STREET KENNEBUNKPORT ME 04046 HWTM INVESTMENTS LIMITED PARTNERSHIP 6125 ROUTE DE L'AEROPORT SAINT HUBERT QC J3Y 0V9 JANE E FIRTH TRUST 57 MAINE STREET KENNEBUNKPORT ME 04046

JUDGE, STEPHEN D 127 PERKINS ROW TOPSFIELD MA 01983 KARAKHANIAN, ALEXANDER & RENA 661 MELALEUCA LANE MIAMI FL 33137 KASYAN, ANN M & ALPEYRIE, JEAN-LOUIS 59 MAINE STREET KENNEBUNKPORT ME 04046 KCC-CGH HOLDINGS, LLC PO BOX 3089 KENNEBUNKPORT ME 04046 KENNEBUNKPORT CAPTAINS COLLECTION, LLC PO BOX 3089 KENNEBUNKPORT ME 04046 KENNEBUNKPORT CONSERVATION TRUST PO BOX 7004 CAPE PORPOISE ME 04014-07004

KENNEBUNKPORT, TOWN OF PO BOX 566 KENNEBUNKPORT ME 04046 KENNEDY, ILONA & LESLIE 47 MAINE STREET, UNIT 1 KENNEBUNKPORT ME 04046 KENNETH J GIMBEL REVOCABLE TRUST PO BOX 798 KENNEBUNKPORT ME 04046

KILBURN HOUSE, LLC 1601 EAST BLOUNT ST. PENSACOLA FL 32503 KIVLEHAN REVOCABLE TRUST PO BOX 1727 KENNEBUNKPORT ME 04046 KLEINMAN, LINDA T & JEFFREY H 2 LOS ANGELES STREET, #1511 NEWTON MA 02458

KNOWLES, ROBERT W PO BOX 130 KENNEBUNKPORT ME 04046 KNOX, ELIZABETH H & FRANCIS V JR 9 PARKER RIDGE WAY NEWBURYPORT MA 01950 KPT COTTAGE 14, LLC 4224 244TH AVENUE NE REDMOND CA 98053

KPT COTTAGE 7, LLC 4224 244TH AVE NE REDMOND WA 98053 KPT MARINE, LLC PO BOX 2734 KENNEBUNKPORT ME 04046

KUBIAK, FAITH & KATHERINE PO BOX 6 KENNEBUNKPORT ME 04046

KUDAS, JACEK & SHARRY 43 MAINE STREET KENNEBUNKPORT ME 04046 LEA RAE LEVINES REVOCABLE TRUST 610 SOUTH ROME AVE, UNIT 303 TAMPA FL 33606 LEESIDE CONDO

LILLIAN M BARTLETT REVOCABLE TRUST PO BOX 2549

KENNEBUNKPORT ME 04046

LINDA BROOKS REVOCABLE TRUST PO BOX 3085 KENNEBUNKPORT ME 04046 M&T BANK C/O CONCENTRIX PO BOX 2410 OMAHA NE 68103

MAHONEY FAMILY REVOCABLE TRUST 52 OCEAN AVENUE

KENNEBUNKPORT ME 04046

MAINE PEARL LLC 1370 FAN PALM ROAD BOCA RATON FL 33432 MALTE LUKAS REVOCABLE TRUST PO BOX 2798 KENNEBUNKPORT ME 04046

MARGUERITE J WATERS REVOCABLE TRUST 47 MAINE STREET #3

1/ MAINE STREET #3

KENNEBUNKPORT ME 04046

MARINO, ELAINE PO BOX 1537 KENNEBUNKPORT ME 04046 MARQUIS, ALFRED C JR & JULIE A PO BOX 1835 KENNEBUNKPORT ME 04046

MARTHA NIKITAS STONE REV TRUST 42 PINE STREET CONCORD MA 01742 MARY BANKS STROHM REVOCABLE TRUST 4211 CASWELL AVE, UNIT A AUSTIN TX 78751 MATTHEW C ALLARD REVOCABLE TRUST 54 WESSCUM WOOD ROAD RIVERSIDE CT 06878 MATTUCHIO FAMILY IRREVOCABLE TRUST PO BOX 169 KENNEBUNKPORT ME 04046 MCFB, LLC PO BOX 2675 KENNEBUNKPORT ME 04046 MCGINN, HOWARD D & JAYNE A 9 SHANANDOAH DRIVE PAXTON MA 01612

MCWILLIAMS FAMILY TRUST 28 COLTON LANE SHREWSBURY MA 01545 MICHELLE L DRAGHETTI REVOCABLE TRUST PO BOX 2797 MIDDLETON, MARJORIE D & JOHN L JR PO BOX 1046 KENNEBUNKPORT ME 04046

KENNEBUNKPORT ME 04046

MIKLOS MARK A & JENNIFER L 54 MAINE STREET KENNEBUNKPORT ME 04046 MILES, DANIEL F & ANDREA 11 TOWNE STREET KENNEBUNKPORT ME 04046 MORELLI, MICHAEL J & KERRY H 42 BOULDER TRAIL BRONXVILLE NY 10708

MULBERGER, VIRGINIA A 804 HALL PLACE ALEXANDRIA VA 22302 NATOLI, JOAN E & RICHARD PO BOX 763 KENNEBUNKPORT ME 04046 NOWAK, LORI 4940 N HACIENDA DEL SOL ROAD TUCSON AZ 85718

OCEAN AVE B&B, LLC 60 SEAGATE DRIVE, APT 1701 NAPLES FL 34103 OCEAN AVENUE REALTY TRUST PO BOX 949 KENWOOD CA 95452 PAINE, W ROBERT & EVELYN PO BOX 1364 KENNEBUNKPORT ME 04046

PAPPAGEORGE, PATRICIA 1267 REALTA DRIVE CHARLOTTE NC 28211 PAUL L MAHONEY REVOCABLE TRUST 6825 SAN MARINO DRIVE NAPLES FL 34108 PELLETIER, THOMAS J & CYNTHIA L 182 LOWELL STREET PEABODY MA 01960

PERKINS, CARLA L PO BOX 796 KENNEBUNKPORT ME 04046-0796 PORT COMMONS CONDO

PRICE, EUGENE THOMAS & KRISTEN E 15 FERNWOOD ROAD WEST HARTFORD CT 06119

RANDALL, KAREN PO BOX 40 LUDLOW MA 01056 REDDEN, MICHAELA A & OLSHAN, ARTHUR 8 FRAESCO LANE NORWOOD NJ 07648

REVOCABLE TRUST OF ALICE L ROSE 51 PETTEE STREET #34 NEWTON MA 02464

RINALDI, JOHN F & POWELL, BRIAN PO BOX 1079 KENNEBUNKPORT ME 04046 RIVERBANK CONDO

ROMINE, DONALD J & RHODA M 325 DUNES BLVD., APT 803 NAPLES FL 34110

RYBCZYK, STEPHEN M & CAROLE A 64 MILLER ROAD BURLINGTON CT 06013 SHAHIAN, DOUGLAS & LISA 37 HICKORY LANE BOXFORD MA 01921 SIMONETTI, ALEXIS A 37 OCEAN AVENUE, #6 KENNEBUNKPORT ME 04046 SOUTH MAINE, LLC C/O COTTAGES AT CABOT COVE 2 LIVEWELL DR, STE 203 KENNEBUNK ME 04043

SPENCER, MARY A PO BOX 1422 KENNEBUNKPORT ME 04046 SPICEWOOD MAINE, LLC 8 SPICEWOOD LANE WILTON CT 06897

STEPHEN C PAGE REVOCABLE TRUST 6539 SOUTH MARINA WAY

STOHLMAN, SUZANNE PO BOX 127

100 STONEHAVEN DRIVE COLUMBIANA OH 44408

STUART FL 34996 KENNEBUNKPORT ME 04046

SWEENEY, JOHN & ANN-MARIE 16 MARTIN STREET ACTON MA 01720

TAMARACKS CONDO

THOMPSON, HARRY A III & JILL M

STRAUB, CHARLES W JR & CAROL J

PO BOX 20

KENNEBUNKPORT ME 04046

TIDEMARK CORPORATION 273 CORPORATE DRIVE, SUITE 150

PORTSMOUTH NH 03801

TILNEY. PETER VR & KATHERINE R 15 SOUTH MAIN STREET KENNEBUNKPORT ME 04046

TYLER, TROY 15 TOWNE STREET

KENNEBUNKPORT ME 04046

VASQUEZ, NICHOLAS & KERCADO, MELISSA

PO BOX 2742

KENNEBUNKPORT ME 04046

WHETSELL. M HEYWARD JR & SHERRILL A

2820 COUNTRY CLUB RD WINSTON-SALEM NC 27104 WIDMER. MATTHEW A & AMY M 18 LOUDEN HEIGHTS NORTH

ALBANY NY 12211

WILLIAMS, EMILY B & SILLS, DIANE M 28 CONCORD ST

CARLISLE MA 01740

WILLIAMSON, ROBERT S

PO BOX 1950

KENNEBUNKPORT ME 04046

WINSTANLEY, ADAM D

150 BAKER AVENUE SUITE 303

CONCORD MA 01742

WINSTANLEY, MELISSA F 847 LOWELL ROAD CONCORD MA 01742

WOMEN & WINE, LLC PO BOX 1148

KENNEBUNKPORT ME 04046

YANKOWSKI, GEORGE E JR & JANICE G

PO BOX 1333

KENNEBUNKPORT ME 04046

D'ITALIA, JEFFREY &
12 COMMODORES WAY
KENNEBUNK, ME 04043

ODONNELL, JOHN M & 368 HIGHLAND STREET WESTON, MA 02493 UMANZIO, ROY D & PO BOX 4277

ANDOVER, MA 01810

HART, ROBERT & 42 RIVERSIDE DRIVE READING, MA 01867 UNCLE GF BABA FAMILY IRREVOC TRST&
C/O M&JC PROPERTY MNGMNT
480 ROUTE 101

C/O M&JC PROPERTY MNGMNT 480 ROUTE 101 BEDFORD. NH 03110

**UNCLE GF BABA FAMILY IRREVOC TRST&** 

UNCLE GF BABA FAMILY IRREVOC TRST&
C/O M&JC PROPERTY MNGMNT
480 ROUTE 101
BEDFORD. NH 03110

109 PORT ROAD LLC 5 HEARTHSTONE DRIVE KENNEBUNK, ME 04043

BEDFORD. NH 03110

MURRAY, BENJAMIN & 235 BROWN STREET KENNEBUNK, ME 04043

CAMPBELL, BRIAN J 5706 ROCKMERE DRIVE BETHESDA, MD 20816 CHRISTIANSEN, JOHN 144 COMMONWEALTH AVE BOSTON, MA 02116 MULLEN, EUGENE M 103 LORING ROAD WESTON, MA 02493

HARMAN, GERALD K & P.O. BOX 1554 ARLINGTON, MA 02474 TALMAGE SOLAR ENGINEERING, INC 25 ROCKMARSH ROAD KENNEBUNKPORT, ME 04046 ESIELONIS, STEVEN M 15 CHRISTENSEN LANE KENNEBUNK, ME 04043

PRM-RGM, LLC 40 STARK STREET MANCHESTER, NH 03101 PRM-RGM, LLC 40 STARK STREET MANCHESTER, NH 03101 EAST RIDGE REALTY OF SC LLC 1602 BEAUFORD PLACE VALDOSTA, GA 31602

SINCLAIR, THOMAS J REVOC TRUST& PO BOX 377 KENNEBUNKPORT, ME 04046 MULLEN, EUGENE M & 103 LORING ROAD WESTON, MA 02493 COSTELLO, MICHAEL &
37 FAIRFIELD DRIVE
KENNEBUNK, ME 04043

J&S HOSPITALITY LLC

NOBLE, RENN E 15 HOLLAND ROAD KENNEBUNK, ME 04043 PORT SCAPE CONDOMINIUMS
CHASE HILL ROAD
KENNEBUNK, ME 04043

PO BOX 620C KENNEBUNKPORT, ME 04046

PIMENTEL, ALLYSON B REVOC TRST& 19730 GRANDVIEW TERRACE JUPITER, FL 33458 TRELINA LLC
62 PORTLAND ROAD
SUITE 25
KENNEBUNK. ME 04043

23 BEACH AVE LAND TRUST 8502 MARBLEHEAD ROAD LUTHERVILLE, MD 20193

RODRIGUES, JOSEPH S & 19 BEACH AVENUE KENNEBUNK, ME 04043 HIOS HOSPITALITY LLC 11 DOANES WHAR ROAD KENNEBUNK, ME 04043 MCAVOY, KEITH FRANCIS & 10 DOANES WHARF ROAD KENNEBUNK, ME 04043 KENNEBUNK SEWER DISTRICT FOLEY, PATRICIA A & P.O. BOX 648 9 CHASE HILL ROAD SINCLAIR, THOMAS J REVOC TRUST & KENNEBUNK, ME 04043 KENNEBUNK, ME 04043 PO BOX 377 KENNEBUNKPORT, ME 04046 NARVAEZ, DAMIAN M & MURRAY, JAMES SR, TRUST & GLOBEVEST CAPITAL REAL ESTATE US LP PO BOX 1174 1005 RUE LIONEL DAUMAIS BUREAU 2500 REGATTA AVENUE KENNEBUNKPORT, ME 04046 BOUCHERVILLE, QC J4B 0B1 MIAMI BEACH, FL 33140 BEACH DOGS KPT LLC **GGPP DEAN LLC** BR2 LLC 5220 CASABLANCA DRIVE c/o WILK, NINA **86 NEWBURY STREET** PARADISE VALLEY, AZ 85253 1901 OLDE MILL FOREST DRIVE PORTLAND, ME 04101 RALEIGH. NC 27606 LAMBERTS, RICHARD J REVOC TRUST& BR2 LLC WEADOCK, FLORENCE T PO BOX 2599 **86 NEWBURY STREET** 256 SIMON WILLARD ROAD KENNEBUNKPORT, ME 04046 PORTLAND, ME 04101 CONCORD, MA 01742 TCLL LLC PERKINS, CARLA L SOCIETY OF FRANCISCAN FATHERS PO BOX 2688 P.O. BOX 796 P.O. BOX 980 KENNEBUNKPORT, ME 04046 KENNEBUNKPORT, ME 04046 KENNEBUNKPORT, ME 04046

MERZ, MARTHA A

HANNON, SHEILA W & RIVERVIEW BOATSLIPS CONDOMINIUMS

316 HALSEY ROAD

ANNAPOLIS, MD 21401

DUXBURY, MA 02332

KENNEBUNK, ME 04043

SHIPYARD, INC MUTINO, PETER A & BULL, STEPHEN B & 8 WESTERN AVENUE 8 APPLE TREE LANE 12720 HUNTSMAN WAY KENNEBUNK, ME 04043 DARIEN, CT 06820 POTOMAC, MD 20854-2307

**Public Notice Certification** 

### PUBLIC NOTICE FILING AND CERTIFICATION

Department Rules, Chapter 2, require an applicant to provide public notice for all Tier 2, Tier 3 and individual Natural Resources Protect Act projects. In the notice, the applicant must describe the proposed activity and where it is located. "Abutter" for the purposes of the notice provision means any person who owns property that is BOTH (1) adjoining and (2) within one mile of the delineated project boundary, including owners of property directly across a public or private right of way.

- 1. **Newspaper:** You must publish the Notice of Intent to File in a newspaper circulated in the area where the activity is located. The notice must appear in the newspaper within 30 days prior to the filing of the application with the Department. You may use the attached Notice of Intent to File form, or one containing identical information, for newspaper publication and certified mailing.
- 2. **Abutting Property Owners:** You must send a copy of the Notice of Intent to File by certified mail to the owners of the property abutting the activity. Their names and addresses can be obtained from the town tax maps or local officials. They must receive notice within 30 days prior to the filing of the application with the Department.
- 3. **Municipal Office:** You must send a copy of the Notice of Intent to File <u>and</u> a **duplicate of the entire** application to the Municipal Office.

ATTACH a list of the names and addresses of the owners of abutting property.

### **CERTIFICATION**

By signing below, the applicant or authorized agent certifies that:

- 5. A Notice of Intent to File was published in a newspaper circulated in the area where the project site is located within 30 days prior to filing the application;
- 6. A certified mailing of the Notice of Intent to File was sent to all abutters within 30 days of the filing of the application;
- 7. A certified mailing of the Notice of Intent to File, and a duplicate copy of the application was sent to the town office of the municipality in which the project is located; and
- 8. Provided notice of and held a public informational meeting, if required, in accordance with Chapter 2, Rules Concerning the Processing of Applications, Section 13, prior to filing the application. Notice of the meeting was sent by certified mail to abutters and to the town office of the municipality in which the project is located at least ten days prior to the meeting. Notice of the meeting was also published once in a newspaper circulated in the area where the project site is located at least seven days prior to the meeting.

The Public Informational Meeting was held on	N/A .
_	Date
Approximately <u>N/A</u> members of the public	c attended the Public Informational Meeting.
Leyna L. Tobery	11/22/2024
Signature of Applicant or authorized agent	Date

**Attachment 11:** 

**Historic Sites** 

## 11.0 Historic Sites

As required by the U.S. Army Corps of Engineers (USACE), the Maine Historic Preservation Commission (MHPC) and the Tribal Historic Preservation Officers (THPO) of Maine have been notified regarding this project. Copies of these notifications are included with this section. Any responses received from the MHPC and THPO will be forwarded to the project manager assigned to this project.





October 25, 2024

Maine Historic Preservation Commission Mr. Kirk F. Mohney, Director 65 State House Station Augusta, Maine 04333-0065 MHPCprojectreview@maine.gov

VIA: Transmitted via email as noted above

RE: Yachtsman Marina Dredging – Project Review Request 57 Ocean Ave, Kennebunkport, ME 04046

Map 10, Block 1, Lot 3

On behalf of the Yachtsman Marina (Applicant), Walsh Engineering Associates, Inc. (WEA) intends to file permit applications with the Maine Department of Environmental Protection (DEP) and the U.S. Army Corps of Engineers (USACE) for maintenance dredging activities in the Kennebunk River at 57 Ocean Avenue in Kennebunkport, Maine. WEA is requesting that the Maine Historic Preservation Commission (MHPC) review the area for any known historic and/or archaeological resources. A site location map is attached for your review.

If you have any questions or concerns with this project, please feel free to contact me at (207) 553-9898 or by e-mail at leyna@walsh-eng.com. Thank you in advance for your time.

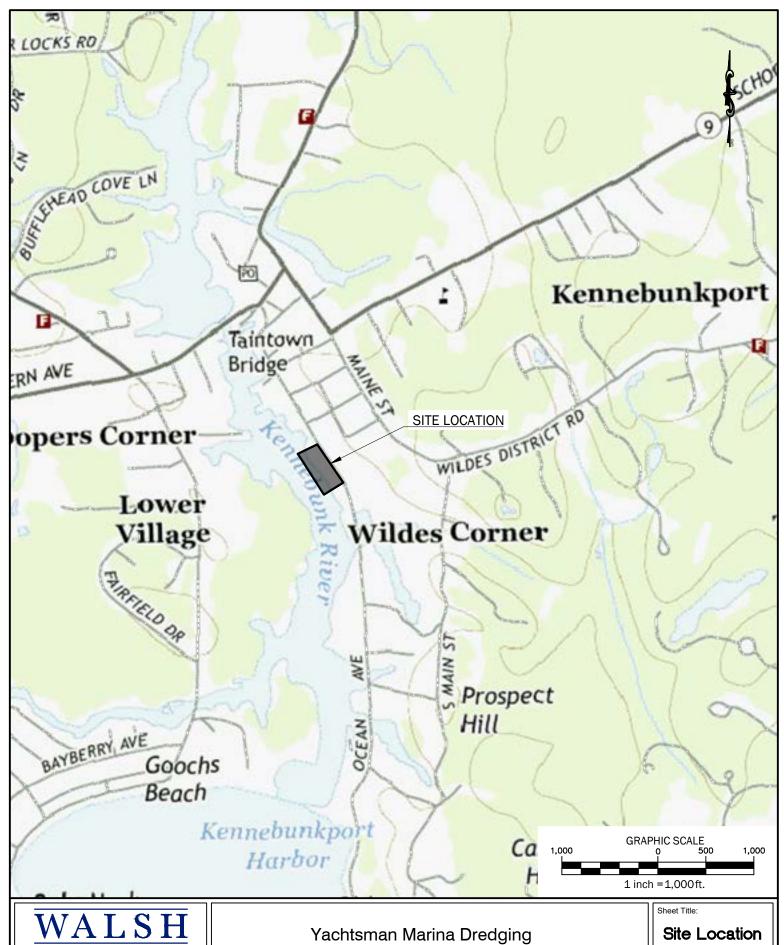
Respectfully,

Leyna Tobey, Project Manager

Leyna L. Tobery

Walsh Engineering Associates, Inc.

Enc: Site Location Map



# engineering associates, inc.

One Karen Dr., Suite 2A | Westbrook, Maine 04092 ph: 207.553.9898 www.walsh-eng.com

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Yachtsman Marina 57 Ocean Avenue Kennebunkport, Maine 04046 Job No.: Date: OCTOBER 2024 1" = 1,000' Scale: Drawn: LLT Checked: WRW





October 25, 2024

Maine Historic Preservation Commission Mr. Kirk F. Mohney, Director 65 State House Station Augusta, Maine 04333-0065 MHPCprojectreview@maine.gov



VIA: Transmitted via email as noted above

RE: Yachtsman Marina Dredging - Project Review Request

57 Ocean Ave, Kennebunkport, ME 04046

Map 10, Block 1, Lot 3

On behalf of the Yachtsman Marina (Applicant), Walsh Engineering Associates, Inc. (WEA) intends to file permit applications with the Maine Department of Environmental Protection (DEP) and the U.S. Army Corps of Engineers (USACE) for maintenance dredging activities in the Kennebunk River at 57 Ocean Avenue in Kennebunkport, Maine. WEA is requesting that the Maine Historic Preservation Commission (MHPC) review the area for any known historic and/or archaeological resources. A site location map is attached for your review.

If you have any questions or concerns with this project, please feel free to contact me at (207) 553-9898 or by e-mail at leyna@walsh-eng.com. Thank you in advance for your time.

Respectfully,

Leyna Tobey, Project Manager

Leyna L. Tobers

Walsh Engineering Associates, Inc.

Enc: Site Location Map

Based on the information submitted, I have concluded that there will be no historic properties affected by the proposed undertaking, as defined by Section 106 of the National Historic Preservation Act.

Consequently, pursuant to 36 CFR 800.4(d)(1), no further Section 106

Consequently, pursuant to 36 CFR 800.4(d)(1), no influence section for consultation is required unless additional resources are discovered during project implementation pursuant to 36 CFR 800.13.

Kirk F. Mohney,

State Historic Preservation Officer

Maine Aistoric Preservation Commission





October 25, 2024

Houlton Band of Maliseet Indians Isaac St. John, THPO 88 Bell Road, Littleton, Maine 04730 istjohn@maliseets.com

Passamaquoddy Tribe of Indians Donald Soctomah, THPO Pleasant Point Reservation P.O. Box 343, Perry, Maine 04667 soctomah@gmail.com

Passamaquoddy Tribe of Indians Donald Soctomah, THPO Indian Township Reservation P.O. Box 301, Princeton, Maine 04668 soctomah@gmail.com

VIA: Transmitted via email as noted above

RE: Yachtsman Marina Dredging – Project Review Request 57 Ocean Ave, Kennebunkport, ME 04046 Map 10, Block 1, Lot 3

On behalf of the Yachtsman Marina (Applicant), Walsh Engineering Associates, Inc. (WEA) intends to file permit applications with the Maine Department of Environmental Protection (DEP) and the U.S. Army Corps of Engineers (USACE) for maintenance dredging activities in the Kennebunk River at 57 Ocean Avenue in Kennebunkport, Maine. WEA is requesting that the Maine Tribal Historic Preservation Offices (THPO) review the area for any known historic and/or archaeological resources. A site location map is attached for your review.

If you have any questions or concerns with this project, please feel free to contact me at (207) 553-9898 or by e-mail at leyna@walsh-eng.com. Thank you in advance for your time.

Respectfully,

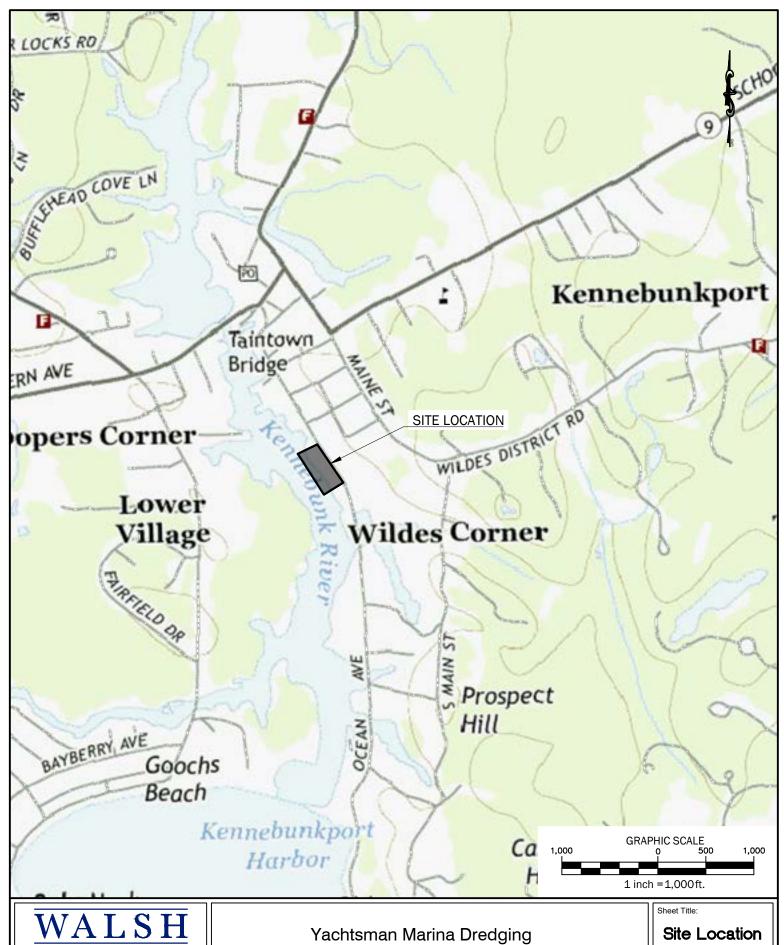
Leyna Tobey, Project Manager Walsh Engineering Associates, Inc.

Leyna L. Tobery

Enc: Site Location Map

Mi'kmaq Nation Jenny Gaenzle, THPO 7 Northern Road, Presque Isle, Maine 04769 jgaenzle@micmac-nsn.gov

Penobscot Nation Chris Sockalexis, THPO Cultural and Historic Preservation Dept. 12 Wabanaki Way, Indian Island, Maine 04468 chris.sockalexis@penobscotnation.org

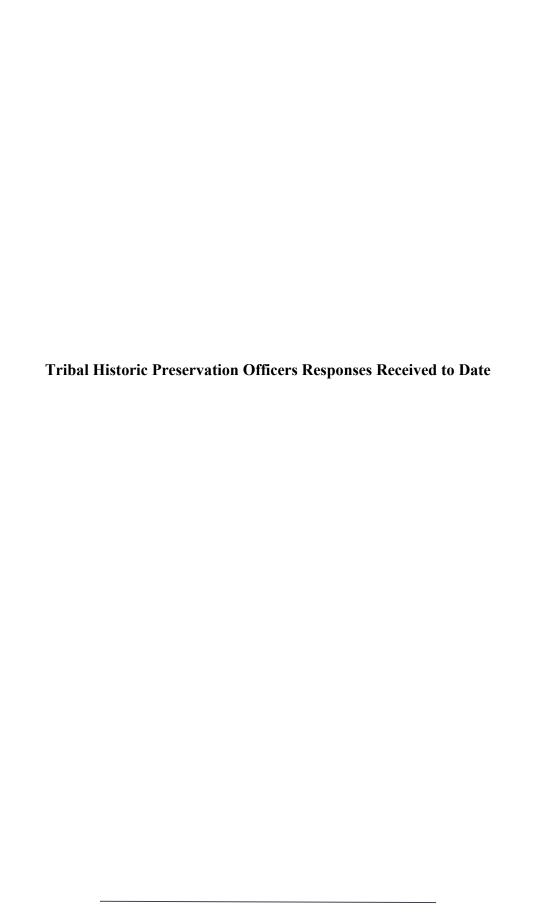


# engineering associates, inc.

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Yachtsman Marina 57 Ocean Avenue Kennebunkport, Maine 04046 Job No.: Date: OCTOBER 2024 1" = 1,000' Scale: Drawn: LLT Checked: WRW



# Tribal Historic Preservation Office Passamaquoddy Tribe

PO Box 159 Princeton, Me. 04668 207-214-4051

November 5, 2024

Leyna Tobey, PE\*

**Project Manager | Civil Engineer** 

Walsh

One Karen Drive, Suite 2A

Westbrook, ME 04092

• Re: Kennebunk River at 57 Ocean Avenue in Kennebunkport

### Dear **Leyna**;

The Passamaquoddy THPO has reviewed the following application regarding the historic properties and significant religious and cultural properties in accordance with NHPA, NEPA, AIRFA, NAGPRA, ARPA, Executive Order 13007 Indian Sacred Sites, Executive Order 13175 Consultation and Coordination with Indian Tribal Governments, and Executive Order 12898 Environmental Justice.

The Project listed above will not have an impact on cultural concerns. If any artifacts or human remains are uncovered please stop and notify this office and the State Historic Preservation Office.

Sincerely;

Donald Soctomah THPO Soctomah@gmail.com

**Attachment 12:** 

**Functional Assessment** 

### 12.0 Functional Assessment

In accordance with the Wetlands and Waterbodies Protection Rules, Section 5.C(6)(b) Coastal Wetlands: a coastal wetland alteration that does not cover, remove or destroy marsh vegetation, does not fill more than 500 square feet of intertidal or subtidal are, and has no adverse effect on marine resource or on wildlife habitat as determined by the DMR or IF&W as applicable requires neither a functional assessment nor compensation.

Because this area has been frequently dredged, the project will have minimal impact on the existing natural resources, and the impact to wetland functions and values from this activity will be insignificant, this project does not require a functional assessment.

Attachment 13: Wetland Compensation Plan

# 13.0 Wetland Compensation Plan

In accordance with the Wetlands and Waterbodies Protection Rules, Section 5.C(6)(b) Coastal Wetlands: a coastal wetland alteration that does not cover, remove or destroy marsh vegetation, does not fill more than 500 square feet of intertidal or subtidal are, and has no adverse effect on marine resource or on wildlife habitat as determined by the DMR or IF&W as applicable requires neither a functional assessment nor compensation.

The proposed activities result in minimal impact to the coastal wetland. No loss or degradation of wetland function is anticipated because of this activity. No compensation is proposed.

Attachment 14: Sampling and Analysis Plan

# 14.0 Sampling and Analysis Plan

The U.S. Army Corps of Engineers (USACE) approved a Sampling and Analysis Plan (SAP) for the project on January 21, 2022, which provided proposed sediment sampling locations, methods, and testing criteria to determine disposal suitability. The sampling results were submitted to the USACE for the Yachtsman Marina and the nearby Arundel Yacht Club, Kennebunkport Marina, and Kennebunk River Club. The USACE issued a Suitability Determination for all 4 sites on June 10, 2024, which documents the suitability of the dredged material for disposal at the Isle of Shoals North (IOSN) open water disposal site.

The SAP and USACE's Suitability Determination are included as an attachment to this permit section for reference.



1. **Project Description:** The applicant is proposing to mechanically dredge approximately 6,300 cubic yards (CY) of material from shoaled areas totaling 1.4 acres within the property's marina basin located in the town of Kennebunkport, ME (Figures 1 and 2). This area will be dredged to the proposed depth of -6 feet at mean lower low water (MLLW) plus one foot of allowable overdepth. The applicant proposes to dispose of this material at the Isles of Shoals North Disposal Site (IOSN).

This sampling and analysis plan (SAP) has been developed by the New England District (NAE) U.S. Army Corps of Engineers (USACE) to gather information to support a dredged material suitability determination for the open water disposal alternative associated with this project. This sampling and analysis effort will be divided into two phases. The first phase will include sampling and testing of dredge site sediment for grain size and bulk chemistry in order to identify contaminants of concern. The second phase will include sampling of dredge site sediment and water for elutriate and biological testing in order to evaluate the material for placement at IOSN. The results of biological testing will be evaluated against the most recent NAE dataset for the IOSN reference area. All sampling and analysis activities described in this plan shall follow the requirements set forth in the "Regional Implementation Manual for the Evaluation of Dredged Material Proposed for Disposal in New England Waters" (RIM) dated May 6, 2004. copy of the RIM may be downloaded from the NAE website: http://www.nae.usace.army.mil/Missions/Regulatory/ DredgedMaterialProgram/RegionalImplementationManual.aspx

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

Project Setting: The property is associated with the Yachtsman Hotel & Marina Club located on the eastern bank of the Kennebunk River approximately 0.3 miles north of the river's mouth in Kennebunkport, ME (Figure 1). The marina offers boat dockage to the Yachtsman Hotel's guests. The Marina is now leased to and managed by the adjacent Kennebunkport Marina located to the south. The Applicant is proposing to dredge the leased area to connect the two Marinas. Land use in the surrounding area includes a mix of residential properties and marina facilities. The adjacent Kennebunkport Marina offers boat slips and full mechanical services and repairs and has a boat ramp. The Arundel Yacht Club

is approximately 500 feet north of the property. Chicks Marina, which has a fuel dock, is adjacent to the southern property boundary of the Kennebunkport Marina, approximately 800 feet south of the Yachtsman property. Downtown Kennebunkport, an area with several restaurants, retail shops, and marine services, is approximately 1,500 feet north of the property. The Kennebunkport River Federal Navigation Project (FNP) -6 foot MLLW channel is located directly adjacent to the western boundary of the project area.

Water Quality: Water Quality in the project area is dictated by tidal exchange with the Gulf of Maine with freshwater input from the Kennebunk River to the north and a series of overboard discharge pipes within the Yachtsman Marina property (Figure 3). The 2014 Environmental Assessment for dredging of the Kennebunk River FNP noted that there have been reported increases of bacterial counts in the water, attributed to faulty septic systems, agriculture, and overboard discharges. Tidal waters of the Kennebunk River are classified as SB by the Maine Department of Environmental Protection (MEDEP). Class SB waters must be of such quality that they are suitable for the designated uses of recreation in and on the water, fishing, aquaculture, propagation and harvesting of shellfish, industrial process and cooling water supply, hydroelectric power generation, navigation and as habitat for fish and other estuarine and marine life M.R.S. (38)https://www.mainelegislature.org/legis/statutes/38/title38sec465-B.html).

Dredge History and Existing Testing Data: The project area was last dredged in 2015 when approximately 3,914 CY of material were removed to a depth of -5 feet Mean Low Water (MLW) and placed at the Cape Arundel Disposal Site (CADS). Sampling and testing of this material in 2014 documented sediments from two samples along the shoreline in the middle of the basin to be predominately fine grained (passing the No. 200 sieve) while the remaining four samples, located away from the shoreline, were predominately sand with some silt. A review of the associated chemistry data found elevated levels of pesticides (total DDX [4,4'-DDD + 4,4'-DDE + 4,4'-DDT]) and total high molecular weight polyaromatic hydrocarbons (HPAHs). A review of the associated biological testing data found sediment from the project area not likely to be acutely toxic to benthic organisms. A suitability determination from 2014 for the project area found sediments suitable for open water disposal at CADS. A residual dredging event of 100 CY was authorized by USACE in 2020 and the material was placed upland.

<u>Spill Data</u>: Based on information provided by the applicant and a review of the Maine Department of Environmental Protection (MEDEP) Oil and Hazardous Waste Spill Database (<a href="https://www.maine.gov/dep/spills/index.html">https://www.maine.gov/dep/spills/index.html</a>), NAE determined that there have been several small diesel, gasoline, and oil spills within the surrounding area of the project site since the area was last dredged. <a href="https://xii.org/Risk Ranking">Risk Ranking</a>: Following the tier one review of the site characteristics, location,

and the available historical data, the proposed project was given a **low-moderate** risk ranking according to the following matrix.

Table 1: Project Risk Ranking

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

**Sample Collection:** In the first phase of testing the applicant shall collect 3. sediment cores from five locations within the proposed dredge areas as specified in Table 2 (also see Figure 3). These locations were selected based on information from the CSM described above, the low to moderate risk ranking for the project, and shoaled areas identified in the project conditions survey submitted by the applicant. All core samples shall be collected to the proposed dredge depth plus overdredge amount using inert core liners. Estimated core lengths based on the bathymetry provided by the applicant are provided in Table 2, but the actual required core lengths shall be determined at the time of the sampling effort using measured water depths at each location corrected to MLLW. In order to ensure that the core samples adequately represent the dredge interval at each location, all cores to be used for this project shall have a recovered length that is within 75% of the core penetration depth. In addition, any cores that display significant disturbance such as compaction or wash out shall be disregarded. If the cores from any location do not meet the acceptability criteria after six attempts, then the applicant should retain the best core from that location and contact NAE for further guidance. The penetration and recovery for the core used for the chemistry and grain size samples should be recorded on the sample log.

Upon collection, all cores shall be measured and maintained in an upright position for a minimum of 15 minutes to allow any fine-grained material to settle. After a core has settled, it shall be re-measured before any overlying water is drained, taking care to not include overlying water with sediment flocculant in the measurement. All cores shall be split lengthwise, photographed with a stadia rod for scale, and described in accordance with ASTM D 2488 (Standard Practice for Description and Identification of Soils). Samples shall be collected from the dredge interval (dredge depth + overdepth) within each core for grain size and bulk chemical analysis as described in the sections below. If the dredge interval within a core is homogenous then the entire length may be composited as a single sample with the chemistry/grain size sample interval noted on the

sampling log. If any core shows significant stratification or obvious signs of contamination, then subsamples shall be collected from each layer and noted on the sampling log and the applicant shall consult NAE for guidance prior to the start of analysis. The term "significant stratification" includes any distinct change in sediment composition that could represent a change in depositional history or waterway usage such as a change in color or lithology. Compositing of dissimilar sediment layers without prior approval from NAE will result in the rejection of any resulting data products.

All sediments held for testing shall be stored in accordance with the requirements in Table 3 (from Table 8-9 in *Evaluation of Dredged Material Proposed for Ocean Disposal, Testing Manual, 1991).* Sample chain of custody forms shall be maintained by the applicant and submitted to NAE with the data package described in section 5 of this SAP.

Based on the results of the grain size and bulk chemistry sediment testing, NAE will provide the applicant with a biological testing compositing plan. In the second phase of testing, dredge area sediment shall be collected from the same sample locations described in Table 2 and composited according to NAE's biological testing compositing plan. Sufficient amounts of sediment and water shall be collected for elutriate preparation and analysis, water column toxicity testing, 10-day whole sediment toxicity testing, and 28-day bioaccumulation testing according to the sections below. Sediment cores from each station shall be collected using inert core liners and may be transferred directly into food grade polyethylene pails after core recovery has been measured. In addition, the applicant shall collect dredge site water from a central location within the proposed project area. All water samples shall be collected from the middle of the water column using either a non-contaminating pump or a discrete water sampler.

Please note that the applicant is not required to collect sediment or water samples from the IOSN reference site as the results of the biological testing will be compared to recent reference site data collected by NAE.

Again, all sediment and water samples held for testing shall be stored in accordance with the requirements in Table 3 (from Table 8-2 in Evaluation of Dredged Material Proposed for Ocean Disposal, Testing Manual, 1991). Sample chain of custody forms shall be maintained by the applicant and submitted to NAE with the data package described in section 5 of this SAP.

Vessel positioning shall be achieved using a Global Positioning System (GPS) that has been calibrated on site using a known reference point. The required horizontal accuracy at each sample location shall be 10 feet or less. All coordinate data shall be reported in geographic NAD 83 decimal degree format. All depth data shall be reported in tenths of feet. Water depths at each location

are to be determined with an accuracy of  $\pm 0.1$  feet (relative to MLLW). All depth data shall be reported in tenths of feet.

For phase one sampling, sample data including date, time, latitude, longitude, GPS accuracy at each sample station, measured water depth, tidal correction, core penetration, recovery, and chemistry sample intervals(s) shall be recorded in a sampling log (Figure 4 or equivalent) and provided to NAE with the applicant's core descriptions and photographs.

For phase two sampling, all sample data including date, time, latitude, longitude, GPS accuracy at each sample station, measured water depth, tidal correction, number of cores collected at each station, core lengths, and a general description of the sediment shall be recorded in a sampling log and provided to NAE. Note that if any of the phase two cores are significantly different from the material that was sampled during phase one, a representative core should be photographed and described and NAE should be consulted for guidance.

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

Grain Size and Bulk Sediment Chemistry: All samples from the proposed dredge footprint shall be individually analyzed for grain size and bulk sediment chemistry. Testing parameters, analytical methods, and reporting limits to be used are outlined in Table 4. The listed analytical methods are recommended but can be replaced by other methods that will provide the required reporting limits. Additional guidance on the physical and chemical analysis of sediments can be found in chapter 5 of the RIM. NAE will provide the applicant with a compositing plan for biological testing based on sample proximity, physical characteristics recorded during the core description process, and the results of grain size and bulk chemistry analysis.

<u>Elutriate Chemistry:</u> Elutriate samples shall be prepared from the dredge area water and sediments according to the project compositing plan. The elutriate samples and clean seawater (provided by the applicant's testing facility) used for dilutions in the suspended phase particulate bioassays shall undergo chemical analysis according to the testing parameters, analytical methods, and reporting limits outlined in Table 5. The listed analytical methods are recommended but can be replaced by other methods that will give the required reporting limits.

Additional guidance can be found in Section 6.1 of the RIM and Section 9.4 of the Green Book.

<u>Water Column Toxicity Testing:</u> Suspended phase particulate bioassays shall be performed on each composite sample in accordance with the requirements specified in Section 6.2 of the RIM, and Section 11.1 of the Green Book. Refer to the RIM for guidance in selecting the test species. Clean seawater provided by the applicant's testing facility shall be used as both control and dilution water.

Please note that excessive ammonia concentrations in the elutriate samples may cause a toxic response that is not of interest to the SPP bioassay, which focuses on persistent contaminants. To account for this scenario, the US Environmental Protection Agency (EPA) and NAE have devised a protocol to determine if ammonia is the driver of toxicity in situations where unionized ammonia is present at concentrations above the applicable water quality criteria (WQC). In order to facilitate this protocol, the applicant may choose to have their laboratory measure total ammonia in the undiluted elutriate samples prior to SPP bioassay initiation and calculate the unionized ammonia concentrations based on measurements of pH, temperature, and salinity. If the calculated unionized ammonia concentrations are greater than the applicable WQC, the testing facility should immediately notify the applicant and seek guidance from NAE on projectspecific procedures for preparation of additional elutriate samples requiring treatment for ammonia reduction and the need for additional SPP testing. This protocol is not a requirement, but NAE recommends it to prevent a 'false positive' toxicity result that would limit the applicant's disposal alternatives.

10-Day Whole Sediment Toxicity Testing: 10-day whole sediment toxicity testing shall be performed on each composite sample in accordance with the requirements specified in Chapter 7.1 of the RIM, Section 11.2 of the Green Book, and Methods for Assessing the Toxicity of Sediment-Associated Contaminants with Estuarine and Marine Amphipods, 1994. The bioassay test shall use two species of test animals, the amphipod *Leptocheirus plumulosus* and the mysid shrimp *Americamysis bahia*. If alternate species are selected from the RIM then contact NAE prior to sampling to coordinate necessary reference data collection.

<u>28-Day Bioaccumulation Testing:</u> 28-day bioaccumulation testing shall be performed on each composite sample in accordance with the requirements specified in Chapter 7.2 of the RIM and Section 12.1 of the Green Book. The bioaccumulation test shall use a bivalve, Macoma nasuta, and the polychaete Nereis virens as test animals. If alternate species are selected from the RIM then contact NAE prior to sampling to coordinate necessary reference data collection. At the end of the 28-day test, the tissues of the survivors shall be tested for the project contaminants of concern according to Tables 8 and 9 of the RIM. The contaminants of concern will be determined from the bulk sediment chemistry

testing described above.

- 5. **Reporting requirements:** All sediment testing data is required to be submitted electronically in the electronic data deliverable (EDD) format available on the NAE website (<a href="http://www.nae.usace.army.mil/Missions/Disposal-Area-Monitoring-System-DAMOS/Electronic-Data-Deliverables.aspx">http://www.nae.usace.army.mil/Missions/Disposal-Area-Monitoring-System-DAMOS/Electronic-Data-Deliverables.aspx</a>). Hard copydata submission is also required but may be substituted with a printer friendly, easy-to-read format (e.g., PDF, MS Word). Any analytes not detected shall be reported as half the method detection limit (MDL) and qualified with a "U". RIM quality control summary tables are required to be submitted with each project dataset. These tables are found in Appendix II of the RIM.
- 6. **Contact Information:** Questions about this plan should be directed to Gabriella Saloio (phone: 978-318-8138 e-mail: <a href="mailto:Gabriella.J.Saloio@usace.army.mil">Gabriella.J.Saloio@usace.army.mil</a>)

Gabriella Saloio

Biologist

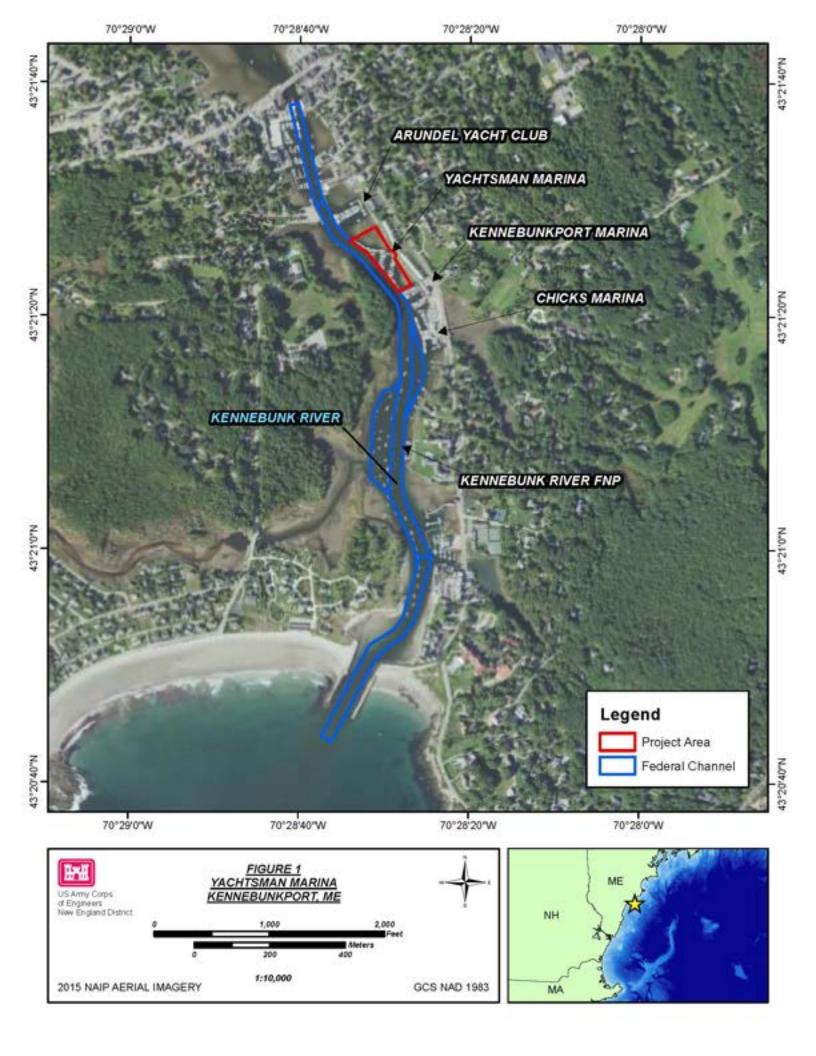
New England District

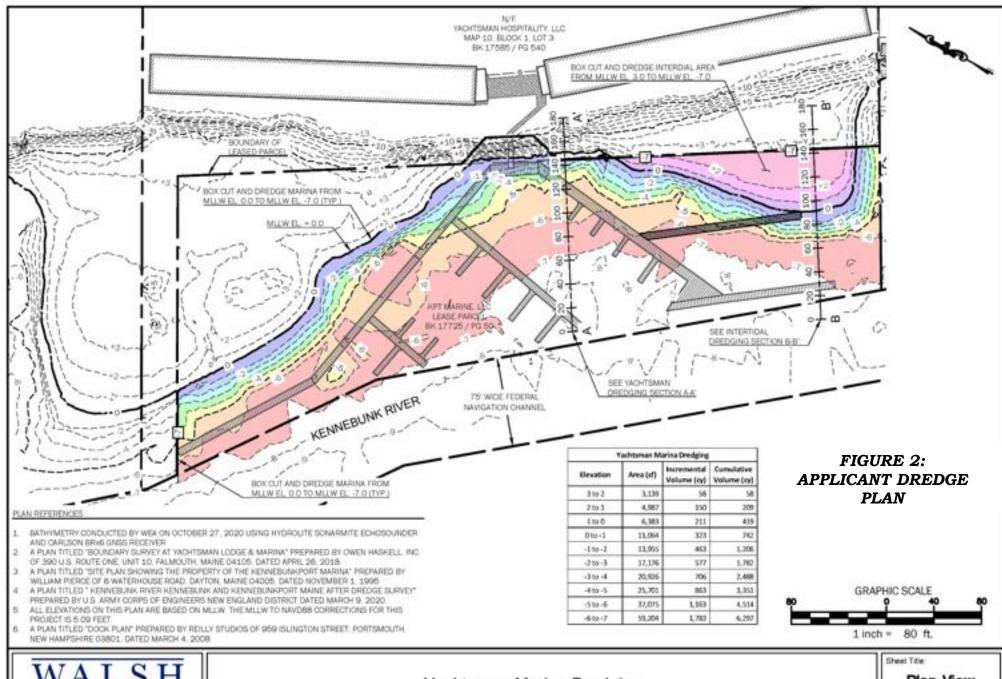
U.S. Army Corps of Engineers

Gabriella Saloio

Table 2: Yachtsman Marina Sample Locations

Station	Latitude (NAD 83)	Longitude (NAD 83)	Survey Depth (Feet MLLW)	Project Depth (Feet MLLW)	Overdepth (Feet)	Estimated Core length (Feet)
Y-1	-70.475778	43.357352	-1.2	-6.0	1.0	5.8
Y-2	-70.475316	43.357253	-0.8	-6.0	1.0	6.2
Y-3	-70.474885	43.357021	-4.1	-6.0	1.0	2.9
Y-4	-70.474671	43.356732	-4.3	-6.0	1.0	2.7
Y-5	-70.474369	43.356289	-1.0	-6.0	1.0	6.0







One Karen Dr., Suite 2A | Westbrook, Maine 04082. ph: 207.553.9888 | www.waish-eng.com Copyright 0.3021

# Yachtsman Marina Dredging

Kennebunkport Marina 59 Ocean Ave Kennebunkport, Maine 04046

# Plan View Job No. 643.1 Date: May 2021 Scale: 1" = 20' Drawn: CAR Checked: WRW

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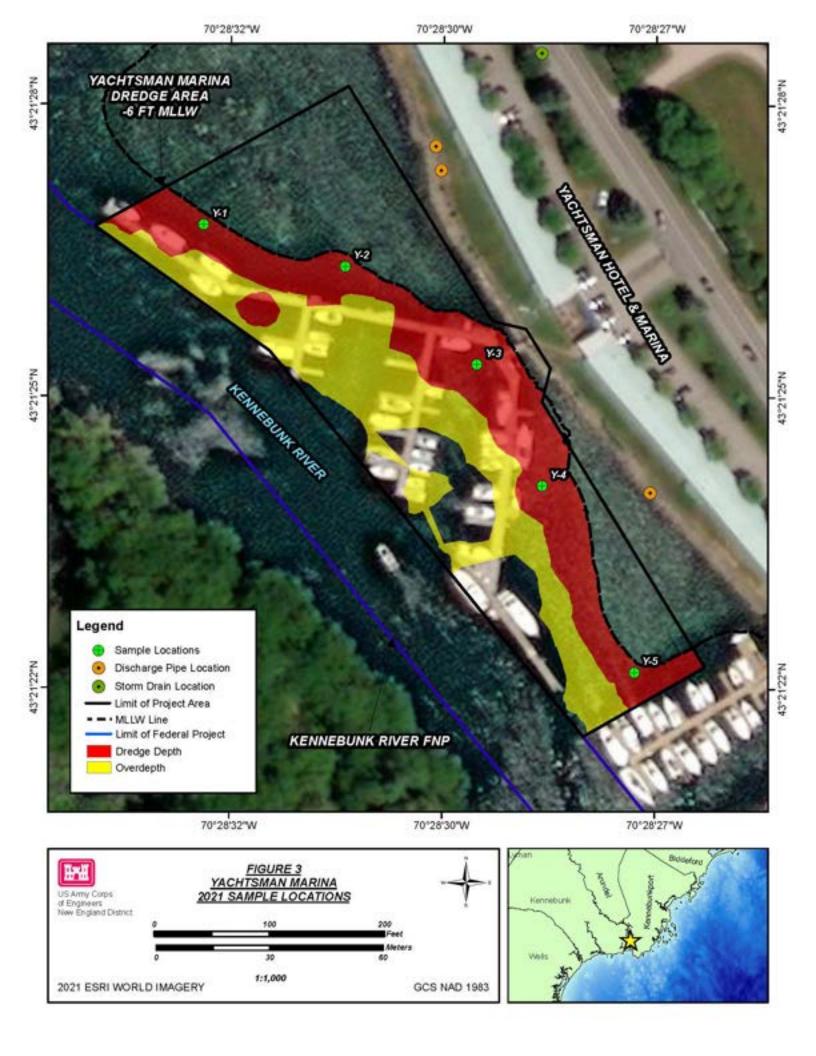


TABLE 3: RECOMMENDED PROCEDURES FOR SAMPLE COLLECTION, PRESERVATION, AND STORAGE

Collection Analyses Method		Sample <u>Volume</u>	<u>Container</u>	Preservation Technique	Storage Conditions	Holding Timeb
Sediment						
Chemical/Physica	l Analyses					
Metals	Grab/corer	200 mL	Precleaned polyethylene jar <sup>c</sup>	Refrigerate. Dry ice <sup>b</sup> or freezer storage is recommended for extended holding times.	≤ 4° Cc	Hg - 28 days Others - 6 Months <sup>d</sup>
Organic Compounds	Grab/corer	475 mL	Solvent-rinsed glass jar with Teflon lid <sup>c</sup>	Refrigerate. Dry ice <sup>b</sup> or freezer storage is recommended for extended holding times.	≤ 4° C/dark <sup>d</sup>	14 days <sup>e</sup>
Particle Size	Grab/corer	75 mL	Whirl-pac bag <sup>b</sup>	Refrigerate	≤ 4° C	Undetermined
Total Organic Carbon	Grab/corer	3 L	Heat treated glass vial with Teflon lined lid <sup>c</sup>	Refrigerate. Dry ice <sup>c</sup> or freezer storage is recommended for extended holding times.	≤ 4° C°	14 days
Sediment from Which Elutriate is Prepared	Grab/corer	Dependent on tests performed	Glass with Teflon lined lid	Completely fill and Refrigerate	≤ 4° C/dark/airtight	Undetermined
<b>Biological Tests</b>						
Dredged Material	Grab/corer	12-15 L per sample	Plastic bag or container <sup>e</sup>	Completely fill and Refrigerate; sieve	≤ 4° C/dark/airtight	14 days <sup>i f</sup>
Reference Sediment	Grab/corer	45-50 L per test	Plastic bag or container <sup>e</sup>	Completely fill and Refrigerate; sieve	≤ 4° C/dark/airtight	14 days <sup>i f</sup>
Control Sediment	Grab/corer	21-25 L per test	Plastic bag or container <sup>e</sup>	Completely fill and Refrigerate; sieve	≤ 4° C/dark/airtight	14 days <sup>i f</sup>
Water and Elutria	te					
Chemical/Physica	1 Analyses					
Metals		Discrete sampler or pump	1 L	Acid-rinsed polyethylene or glass jar	pH <2 with HNO <sub>3</sub> d	4° C ± 2° Cd

TABLE 3: RECOMMENDED PROCEDURES FOR SAMPLE COLLECTION, PRESERVATION, AND STORAGE (CONTINUED)

Discrete sampler or pump	4 L	Amber glass bottled	Airtight seal; refrigerate	4° C ± 2° Cd	5 days <sup>d</sup>
Trawl/ Teflon coated grab	30 g	Double Ziploc <sup>c</sup>	Handle with non-metallic forceps; plastic gloves; dry icec	≤ -20° C°	Hg - 14 days Others - 6 months <sup>i</sup>
Trawl/ Teflon coated grab	100 g	Hexane-rinsed double aluminum foil and double Ziploc <sup>c</sup>	Handle with hexane-rinsed stainless steel forceps; dry icec	≤ -20° C°	10 days <sup>i e</sup>
Trawl/ Teflon coated grab	50 g	Heat cleaned aluminum foil and watertight plastic bag <sup>i</sup>	Covered ice chest <sup>d</sup>	≤ -20° Ci	10 days <sup>i e</sup>
Trawl/ Teflon coated grab	50 g	Hexane-rinsed double aluminum foil and double Ziploc <sup>c</sup>	Handle with hexane-rinsed stainless steel forceps; dry icec	≤ -20° Ci	10 days <sup>i e</sup>
Trawl/ Teflon coated grab	50 g	Hexane-rinsed aluminum foil	Handle with hexane-rinsed stainless steel forceps; quick freeze	20° C	Undetermined
	or pump  Trawl/ Teflon coated grab  Trawl/ Teflon coated grab	or pump  Trawl/ Teflon coated grab  Trawl/ Teflon 50 g	Trawl/ Teflon coated grab  Trawl/ Teflon coated grab	Trawl/ Teflon coated grab  To g  Hexane-rinsed double aluminum foil and watertight plastic bagi  Hexane-rinsed double aluminum foil and double Ziplocc  Handle with hexane-rinsed stainless steel forceps; dry icec  Handle with hexane-rinsed stainless steel forceps; dry icec  Handle with hexane-rinsed stainless steel forceps; dry icec  Handle with hexane-rinsed stainless steel forceps; quick	Trawl/ Teflon coated grab  Trawl / Teflon coated grab  Tr

<sup>&</sup>lt;sup>a</sup> This table contains only a summary of collection, preservation, and storage procedures for samples. The cited references should be consulted for a more detailed description of these procedures.

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

c NOAA (1989).

d Tetra Tech (1986a)

e Sample may be held for up to one year if maintained ≤ -20° C

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

g NOAA (1989).

<sup>&</sup>lt;sup>h</sup> Plumb (1981).

i Tetra Tech (1986b)

# TABLE 4: BULK SEDIMENT TESTING PARAMETERS

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

#### TABLE 4: BULK SEDIMENT TESTING PARAMETERS (CONTINUED)

#### PCB CONGENERS

Analytical Method: NOAA (1993), 8082A

Reporting Limit: 1 ppb

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

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

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

**FINAL** Sampling and Analysis Plan for Yachtsman Marina, Kennebunkport, ME, File Number NAE-2004-00319

# TABLE 5: ELUTRIATE TESTING PARAMETERS

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

#### Reference:

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

# FIGURE 4: EXAMPLE CORE LOG DATA SHEET

PROJECT NAME:		DATE:
PROJECT LOCATION:	SEA STATE:	
	OSITIONING EQUIPMENT:	
SAMPLING EQUIPMENT:		
SAMPLING PERSONNEL:	LOGGI	ED BY:
CORE ID:		TIME:
	LONGITUDE:	
MEASURED WATER DEPTH:	CORRECTED WA	TER DEPTH:
	ACTUAL PENETRATION:	
SAMPLE INTERVAL(S):		
CORE PHOTO:	CORE DES	CRIPTION:
Insert core photograph with scale	Invest field notes and 4	STM description of core
inseri core protograpii wiin scale	inseri fieta notes ana A	S1s1 description of core



CENAE-PDE 10 June 2024

**FINAL** Suitability Determination for Maintenance Dredging of the Kennebunk River Projects, Kennebunkport, Maine

#### **Summary:**

This determination addresses the suitability of shoaled sediments within four project areas along the Kennebunk River, in Kennebunkport, Maine (ME): Arundel Yacht Club (AYC), Yachtsman Marina, Kennebunkport Marina, and Kennebunk River Club (KBRC) for unconfined open water disposal at the Isle of Shoals North Disposal Site (IOSN) (Figure 1). The New England District (NAE) of the US Army Corps of Engineers (USACE) finds that sufficient data have been provided to satisfy the evaluation and testing requirements of Section 103 of the Marine Protection Research and Sanctuaries Act (MPRSA). Based on an evaluation of the project sites and the material proposed to be dredged, NAE finds these sediments suitable for unconfined open water disposal at IOSN as proposed.

#### 1. Project Description:

The applicants are proposing to mechanically dredge shoaled areas from four project areas along the Kennebunk River in Kennebunkport, ME.

- The Arundel Yacht Club is proposing to dredge approximately 8,031 cubic yards (cy) from shoaled areas totaling just over 1 acre within the property's marina basin (Figures 1, 2, and 6).
- The Yachtsman Marina is proposing to dredge approximately 6,400 cy of shoaled material from areas totaling 1.4 acres within the property's marina basin (Figures 1, 3, and 7).
- The Kennebunkport Marina is proposing to dredge approximately 3,675 cy of shoaled material from 0.8 acres within the property's marina basin (Figures 1, 4, and 8).
- The Kennebunk River Club is proposing to dredge a total of approximately 8,935 cy of shoaled material: 3,026 cy of material will be removed from the 0.4 acre north marina basin, and 5,909 cy will be removed from the 0.8 acre south marina basin (Figures 1, 5, and 9).

All areas will be dredged to the authorized project depth of -6 feet at mean lower low water (MLLW) plus 1 foot of allowable overdepth. The applicant requested that disposal of the proposed dredge material be evaluated for IOSN as a potential alternative for this project.

**Table 1: Project Area Summary** 

Project Area	File Number	Project Depth (ft MLLW) plus 1 ft OD	Dredge Volume (cy)	Acreage
Arundel Yacht Club	NAE-2022-00288	-6.0	8,031	1.0
Yachtsman Marina	NAE-2004-00319	-6.0	6,400	1.4
Kennebunkport Marina	NAE-2005-00280	-6.0	3,675	0.8
Kennebunk River Club – North Marina Basin	NAD 0007 0704	-6.0	3,026	0.4
Kennebunk River Club – South Marina Basin	NAE-2007-2704	-6.0	5,909	0.8

# 2. Conceptual Site Model:

USACE reviewed historic testing data, previous environmental assessments, water quality data, and adjacent land use information to develop a conceptual site model (CSM) for the Kennebunk River projects (Figure 10). NAE used this CSM to characterize the system and to identify potential sources of contamination, site-specific contaminants of concern, exposure pathways, and biological receptors to inform this suitability determination.

<u>Project Setting:</u> All four projects are located along the eastern shoreline of the Kennebunk River in Kennebunkport, ME. The Arundel Yacht Club is located farthest upriver (approximately 0.8 miles from the river's mouth), the Yachtsman Marina and Kennebunkport Marina are adjacent to each other just to the south of Arundel Yacht Club, and the Kennebunk River Club is located farther down river, about 0.25 miles from the mouth of the river (Figure 1).

The Arundel Yacht Club building was constructed in 1806 and served as a rope making facility until 1816. Sanborn maps from 1911 show that the property was used as a boat house, carriage house, and wagon shed prior to the establishment of the yacht club in 1957. The yacht club provides dockage for up to fifty recreational boats and has a launch for small sailboats. There are no repair or fuel facilities on the property. The Yachtsman Marina offers boat dockage to the Yachtsman Hotel guests. The Marina is now leased to and managed by the adjacent Kennebunkport Marina, located directly to the south. The applicant is proposing to dredge the leased area to connect the two marinas. The Kennebunkport Marina is a year-round facility offering slips, full mechanical services, a ship store, engine sales, power boat and canoe rentals, as well as a boat ramp. The Kennebunk River Club provides seasonal dockage for recreational vessels, as well as shoreside facilities for social and recreational functions.

Land use in the surrounding area is largely a mix of residential property, many with private docks, and other marina facilities. Chicks Marina, which has a fuel dock, is adjacent to Kennebunkport Marina. Downtown Kennebunkport, which has several restaurants, retail shops, and marine services, is approximately 1,000 feet north of Arundel Yacht Club. The Kennebunkport River Federal Navigation Project (FNP) -6 foot MLLW channel is located directly adjacent to the western boundary of the project areas.

Water Quality: Water Quality in the project area is dictated by tidal exchange with the Gulf of Maine with freshwater input from the Kennebunk River to the north and a series of stormwater discharge pipes within the marina properties along the river (Figures 6-9). Tidal waters of the Kennebunk River are classified as SB by the Maine Department of Environmental Protection (MEDEP). Class SB waters must be of such quality that they are suitable for the designated uses of recreation in and on the water, fishing, aquaculture, propagation and harvesting of shellfish, industrial process and cooling water supply, hydroelectric power generation, navigation and as habitat for fish and other estuarine and marine life (38 M.R.S. § 465(B)(2) https://www.mainelegislature.org/legis/statutes/38/title38sec465-B.html).

<u>Dredge History and Existing Testing Data:</u> The Arundel Yacht Club was last dredged in 2017 when approximately 1,800 cy of material were removed to a depth of -6 feet at Mean Low Water (MLW) and placed at the Cape Arundel Disposal Site (CADS). Sampling and testing of this material in 2003 documented sediments to be predominately fine grained. A review of the associated chemistry data found cadmium, copper, and mercury detected at concentrations with the potential to cause toxicity based on current sediment screening guidelines. Based on the results of elutriate, toxicity, and bioaccumulation studies, NAE found the material from the Arundel Yacht Club suitable for placement at CADS in a 2015 suitability determination.

The Yachtsman Marina was last dredged in 2015 when approximately 3,914 cy of material were removed to a depth of -5 feet MLW and placed at CADS. Sampling and testing of this material in 2014 documented sediments from two samples along the shoreline in the middle of the basin to be predominately fine grained while the remaining four samples, located away from the shoreline, were predominately sand with some silt. A review of the associated chemistry data found levels of total DDX (sum of 4,4'-DDD + 4,4'-DDE +4,4'-DDT) and total high hydrocarbons molecular weight polyaromatic (HPAHs) detected concentrations with the potential to cause toxicity based on current sediment screening guidelines. Based on the results of elutriate, toxicity, bioaccumulation studies, NAE found the material from the Yachtsman Marina suitable for placement at CADS in a 2014 suitability determination. In addition,

a residual dredging event of 100 cy was authorized by USACE in 2020 and this material was placed upland.

The Kennebunkport Marina was last dredged in 2015 when approximately 1,500 cy of material were removed to a depth of -5 feet MLW and placed at CADS. Sampling and testing of this material in 2014 documented predominately fine grained sediments with little sand. A review of the associated chemistry data found total DDX and total HPAHs detected at concentrations with the potential to cause toxicity based on current sediment screening guidelines. Based on the results of elutriate, toxicity, and bioaccumulation studies, NAE found the material from the Kennebunkport Marina suitable for placement at CADS in a 2014 suitability determination.

The Kennebunk River Club was last dredged in 2009 when 7,609 cy of fine grained material were mechanically removed and placed at CADS. A review of the associated chemistry data found cadmium, total HPAHs, total DDX, and total chlordane detected at concentrations with the potential to cause toxicity based on current sediment screening guidelines. Based on the results of elutriate, toxicity, and bioaccumulation studies, NAE found the material from the Kennebunk River Club suitable for placement at CADS in a 2009 suitability determination.

<u>Spill Data:</u> Based on information provided by the applicant and a review of the MEDEP Oil and Hazardous Waste Spill Database (<a href="https://www.maine.gov/dep/spills/index.html">https://www.maine.gov/dep/spills/index.html</a>) and the U.S. Coast Guard's National Response Center website, NAE determined that there have been several small sheens, diesel, gasoline, and oil spills within the vicinity of the project sites since 2009.

<u>Disposal Site:</u> IOSN is located approximately 23 miles south of the project locations. IOSN is regularly monitored by the NAE Disposal Area Monitoring System (DAMOS) Program. The most recent DAMOS report on IOSN was based on a 2022 survey of the site (USACE, 2023).

<u>Risk Ranking:</u> Based on the site characteristics and the available testing data outlined above, all four projects were given a **low-moderate** risk ranking according to the following matrix in Table 2.

Table 2: Project Risk Ranking

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

# 3. Sampling, Testing, and Analysis:

NAE prepared sampling and analysis plans (SAPs) in January of 2022 for the Kennebunkport (three samples) and Yachtsman Marinas (five samples) and in May 2022 for the Arundel Yacht Club (four samples) that called for the collection of samples for bulk sediment chemistry and grain size, as well as full biological testing, including elutriate preparation and analysis, water column toxicity testing, 10-day whole sediment toxicity testing, and 28-day bioaccumulation testing. The applicants collected sediment cores from these three marina basins in July of 2022 (Table 3, Figures 6 through 8) for chemistry and grain size analysis. In addition, NAE prepared a biological testing SAP in June of 2020 for the Kennebunk River Club using bulk sediment chemistry and grain size data collected in December of 2018 which was also used in this evaluation (Table 3, Figure 9).

**Table 3: Core Locations** 

Sample Location	Latitude	Longitude	Project Depth with Overdepth (ft MLLW)	Water Depth (ft MLLW)	Required Core Length (ft)	Recovery/ Penetration (ft)	Sample Interval (ft)
			Arundel Yach	ıt Club			
AYC-1	43.35831	-70.47582	-7.0	-3.9	3.1	3.2/3.2	0-3.2
AYC-2	43.35800	-70.47561	-7.0	-2.1	4.9	2.4/2.4	0-2.4
AYC-3	43.35793	-70.47634	-7.0	-3.2	3.8	0.75/1.0	0-0.75
AYC-4	43.35811	-70.47638	-7.0	-3.0	4.0	4.0/4.1	0-4.0
			Yachtsman N	Iarina			
Y-1	43.35735	-70.47578	-7.0	-1.5	5.5	3.5/3.5	0-3.5
Y-2	43.35724	-70.47533	-7.0	-1.2	5.8	2.5/2.5	0-2.5
Y-3	43.35701	-70.47488	-7.0	-4.2	2.8	2.7/2.7	0-2.7
Y-4	43.35673	-70.47467	-7.0	-4.4	2.6	3.4/3.4	0-2.6
Y-5	43.35629	-70.47437	-7.0	-1.0	6.0	6.1/6.1	0-6.0
			Kennebunkpor	t Marina			
K-1	43.35587	-70.47367	-7.0	-1.8	5.2	4.2/4.2	0-4.2
K-2	43.35607	-70.47394	-7.0	-4.8	2.2	3.1/3.1	0-2.2
K-3	43.35634	-70.47400	-7.0	-1.7	5.3	4.2/4.3	0-4.2
			Kennebunk Rit	er Club			
KBRC-A	43.34975	-70.47269	-7.0	-2.5	5.0	4.5/4.5	0-4.5
KBRC-B	43.34982	-70.47327	-7.0	-4.0	3.0	3.0/3.0	0-3.0
KBRC-C	43.35007	-70.47322	-7.0	-2.0	4.0	5.0/5.0	0-5.0
KBRC-D	43.35008	-70.47340	-7.0	-5.0	1.0	2.0/2.0	0-2.0
KBRC-E	43.35046	-70.47323	-7.0	-2.5	6.0	4.5/4.5	0-4.5
KBRC-F	43.35039	-70.47352	-7.0	-2.0	4.0	5.0/5.0	0-5.0
KBRC-G	43.35063	-70.47326	-7.0	-1.0	2.0	6.0/6.0	0-6.0
KBRC-H	43.35055	-70.47354	-7.0	-4.0	3.0	3.0/3.0	0-3.0
KBRC-I	43.35082	-70.47331	-7.0	-1.5	6.0	5.5/5.5	0-5.5

# Physical and Chemical Analysis of Sediments

Samples were largely composed of fines with little to some fine sand though several stations from the Yachtsman Marina and Kennebunk River Club were composed of fine sand with little to some fines. Grain size data are presented in Table 4 and core logs are provided in Appendix A.

**Table 4: Grain Size Results** 

Somalo ID	%Gravel		%Sand		%Fines		
Sample ID	76Gravei	Coarse	Medium	Fine	%Filles		
Arundel Yacht Club							
AYC-1	0.1	1.7	6.4	13.1	78.7		
AYC-2	3.1	2.2	12.5	31.4	50.8		
AYC-3	0.4	0.9	5.2	14.4	79.1		
AYC-4	3.6	0.8	4.5	10.7	80.4		
	Yach	ıtsman Mar	ina				
Y-1	4.9	0.8	6.0	64.7	23.6		
Y-2	0.3	1.5	9.8	60.6	27.8		
Y-3	2.3	1.7	5.7	20.6	69.7		
Y-4	0.0	0.8	5.4	26.5	67.3		
Y-5	1.0	1.2	4.4	80.6	12.8		
	Kenne	bunkport M	arina				
K-1	0.1	0.6	4.4	43.9	51.0		
K-2	0.0	1.2	7.9	28.9	62.0		
K-3	2.4	1.5	8.0	19.7	68.4		
	Kenne	bunk River	Club				
KBRC-A	0.0	1.0	4.0	32.0	62.7		
KBRC-B	0.1	1.0	7.0	40.0	51.6		
KBRC-C	0.0	1.0	2.0	61.0	35.6		
KBRC-D	0.0	1.0	4.0	56.0	38.6		
KBRC-E	0.0	0.0	3.0	71.0	25.9		
KBRC-F	0.2	1.0	1.0	81.0	16.6		
KBRC-G	0.2	1.0	4.0	61.0	33.8		
KBRC-H	0.6	2.0	4.0	64.0	29.7		
KBRC-I	0.7	2.0	10.0	45.0	43.4		

As no project specific contaminants of concern were identified in the CSM, samples were analyzed for the standard suite of contaminants specified in the Regional Implementation Manual for the Evaluation of Dredged Material Proposed for Disposal in New England Waters (RIM) (EPA/USACE, 2004).

To examine the sediment concentrations in an ecologically meaningful context, NAE used Sediment Quality Guidelines (SQGs) to screen the chemical concentrations found in the sediment samples from the Kennebunk River project areas samples. Applicable SQG screening values for marine and estuarine sediments are the National Oceanic and Atmospheric Administration (NOAA) effects-range low (ERL) and effects-range median (ERM). It is important to understand that these values were not derived as toxicity pass-fail thresholds. Rather, ERL and ERM values are empirically derived guidelines based on a large number of studies nationwide that identify contaminant levels that indicate probability of toxic effects to inform decision making (Long et al., 1998). Effects are considered unlikely at concentrations below the ERL with an increased

probability of toxic effects as concentrations increase. At concentrations above the ERM toxic effects are considered likely. For samples with sediment concentrations that fall between the ERL and ERM levels, consideration is given to both the number of contaminants that exceed ERL values and where the concentrations fall in the range between ERL and ERM values in assessing the probability of toxic effects and the potential need for additional testing.

Metals concentrations were largely below the ERL with many concentrations also less than the IOSN reference concentrations in all four project areas. Arsenic was detected at concentrations just above the ERL and reference value at stations AYC-1 and AYC-4, though both stations were below the established natural background level, 16 mg/kg, in Maine sediments (MEDEP, 2018). Nickel concentrations at Arundel Yacht Club stations AYC-1 and AYC-4 and Yachtsman Marina station Y-3 were also slightly greater than the ERL and IOSN reference value. The lead concentration in the Kennebunkport Marina station K-1 was greater than both the ERL and reference value. All metal concentrations in the Kennebunk River Club samples were below the ERL.

A few individual low molecular weight polyaromatic hydrocarbons (LPAHs) were found at concentrations above their respective ERLs, including acenaphthene and fluorene at station K-2 in the Kennebunkport Marina, acenaphthene, anthracene, and fluorene at stations KBRC-A and B in the Kennebunk River Club, and all individual LPAHs except for naphthalene at the Arundel Yacht Club station AYC-2. Additionally, the total LPAH concentration at AYC-2 was greater than the ERL and IOSN reference value. Individual HPAHs benzo(a)anthracene and fluoranthene were found at concentrations greater than their respective ERLs at stations AYC-2, KBRC-A, and KBRC-B. Pyrene and chrysene were also found above the ERL at KBRC-B and pyrene was found above the ERL in station KBRC-C. Total HPAH concentrations were found above the ERL at stations AYC-2 at the Arundel Yacht Club and stations KBRC-A, B, and C in the Kennebunk River Club. All PAH concentrations were below ERL values in all samples from the Yachtsman Marina.

The pesticides 4,4'-DDD, 4,4'-DDE, and 4,4'-DDT as well as total DDX concentrations were found at concentrations greater than the ERL at stations K-1 and 2 at the Kennebunkport Marina and stations AYC-1 and 2 at the Arundel Yacht Club, where station AYC-4 also had 4,4'-DDE, 4,4'-DDT, and total DDX at concentrations over the ERL. Stations Y-1 and 2 at the Yachtsman Marina contained concentrations of 4,4'-DDE and total DDX that were greater than the ERL and the concentration of 4,4'-DDD was also above the ERL at station Y-2. Total DDX was found in concentrations above the ERL in all the Kennebunk River Club stations except for KBRC-F. 4,4'-DDT concentrations were also greater than the ERL in stations KBRC-B, KBRC-C, and KBRC-I and 4,4'-DDD exceeded the ERL in station KBRC-C. Dieldrin was found at concentrations

greater than the ERL at Kennebunk River Club stations KBRC-A, B, D, E, and I and total chlordane was found at concentrations greater than the ERL at all stations in the Kennebunk River Club project area except for KBRC-E and KBRC-G.

Individual polychlorinated biphenyls (PCBs) were generally not detected. Where detected, total PCBs were found at concentrations well below the ERL at all stations sampled.

A summary of the bulk sediment chemistry data is presented in Table 5 with comparison to the ERL/ERM values and reference concentrations for IOSN. The full bulk chemistry results are presented in Appendix B.

 $\textbf{FINAL} \ \ \text{Suitability Determination for Maintenance Dredging of the Kennebunk River Projects, Kennebunkport, Maine and Maintenance Dredging of the Kennebunk River Projects, Kennebunkport, Maine Dredging Order Projects, Kennebunkport, Maine Dredging Order Projects, Kennebunkport, Maine Dredging Order Projects, Maine Dredging$ 

Table 5. Summary of Bulk Sediment Chemistry Results

							Kennebunkport Marina						Yachtsman Marina											
					IOSI	V	K-1		K-2		K-3		Y-1		Y-2		Y-3		Y-4		Y-5			
Parameter	CAS Number	Units	ERL	ERM	Value	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q		
Physical																								
Total organic carbon	14762744	%			1.28		0.37		3.04		2.32		0.93		0.72		1.90		1.19		0.20			
Metals																								
Arsenic	7440382	mg/kg	8.2	70	9.66		2.85		6.68		6.34		6.65		3.20		7.96		4.54		0.984			
Cadmium	7440439	mg/kg	1.2	9.6	0.072		0.295		0.410		0.344		0.225		0.235		0.388		0.430		0.093			
Chromium	7440473	mg/kg	81	370	31.5		21.9		27.1		26.4		17.7		14.7		33.6		23.1		6.71			
Copper	7440508	mg/kg	34	270	10.9		14.2		16.7		15.4		12.5		8.64		18.3		9.82		1.59			
Lead	7439921	mg/kg	46.7	218	18.1		134		21.9		17.1		12.4		12.9		20.2		7.79		1.81			
Mercury	7439976	mg/kg	0.150	0.710	0.032		0.051		0.063		0.047		0.045		0.051		0.052		0.011	J	0.005	J		
Nickel	7440020	mg/kg	20.9	51.6	20.8		9.17		15.6		15.4		11.3		8.37		21.4		15.1		3.81			
Zinc	7440666	mg/kg	150	410	60.6		56.6		67.4		57.2		42.2		37.6		71.2		45.2		10.2			
PAHs																								
Total LPAH	SUMLPAH	ug/kg	552	3,160	48.2		185		225		225		188		191		118		7.87		8.67			
Total HPAH	SUMHPAH	ug/kg	1,700	9,600	260		1238		1697		1664		1336		1338		863		33.3		48.3			
Pesticides																								
4,4`-DDD	72548	ug/kg	2	20	0.020	U	4.98	J	4.66	J	0.112	UJ	1.16	J	2.86	J	0.093	UJ	0.016	UJ	0.013	UJ		
4,4`-DDE	72559	ug/kg	2.2	27	0.066		2.23		4.53	J	0.068	U	2.50	J	2.78		0.057	U	0.010	U	0.008	U		
4,4`-DDT	50293	ug/kg	1	7	0.026	U	1.44		1.44		0.148	U	0.960		0.808		0.123	U	0.020	U	0.017	U		
Total DDX	SUMDDX	ug/kg	1.58	46.1	0.112		8.65		10.6		0.328	U	4.62		6.45		0.272	U	0.045	U	0.038	U		
Dieldrin	60571	ug/kg	0.02	8	0.040	U	0.031	U	0.038	U	0.226	U	0.038	U	0.031	U	0.187	U	0.031	U	0.026	U		
Total Chlordane	SUMCHLOR	ug/kg	0.5	6	0.300	U	0.233	U	0.289	U	1.710	U	0.285	U	0.234	U	1.42	U	0.233	U	0.198	U		
PCBs																								
Total PCBs	SumNOAA18	ug/kg	22.7	180	4.02	U	8.34		3.98		2.77		1.92		2.33		3.56		1.56	U	1.33	U		

 $\textbf{FINAL} \ \ \text{Suitability Determination for Maintenance Dredging of the Kennebunk River Projects, Kennebunkport, Maine and Maintenance Dredging of the Kennebunk River Projects, Kennebunkport, Maine Dredging Order Projects, Kennebunkport, Maine Dredging Order Projects, Kennebunkport, Maine Dredging Order Projects, Maine Dredging$ 

Table 5. Summary of Bulk Sediment Chemistry Results, cont.

						Arundel Yacht Club							
				IOSI	V	AYC-1		AYC-2	?	AYC-	3	AYC-4	-
CAS Number	Units	ERL	ERM	Value	Q	Result	Q	Result	Q	Result	Q	Result	Q
14762744	%			1.28		1.14		1.15		8.46		2.64	
7440382	mg/kg	8.2	70	9.66		9.75		6.72		7.78		10.3	
7440439	mg/kg	1.2	9.6	0.072		0.335		0.330		0.453		0.613	
7440473	mg/kg	81	370	31.5		41.6		26.2		25.6		38.1	
7440508	mg/kg	34	270	10.9		29.4		15.7		25.6		24.3	
7439921	mg/kg	46.7	218	18.1		30.9		26.1		21.4		33.7	
7439976	mg/kg	0.150	0.710	0.032		0.064		0.086		0.059	J	0.108	
7440020	mg/kg	20.9	51.6	20.8		25.4		13.0		15.0		22.7	
7440666	mg/kg	150	410	60.6		101		58.1		68.6		98.0	
SUMLPAH	ug/kg	552	3,160	48.2		189		654		90.9		104	
SUMHPAH	ug/kg	1,700	9,600	260		1482		3341		411		986	
72548	ug/kg	2	20	0.020	U	3.87	J	4.34	J	0.274	UJ	1.99	J
72559	ug/kg	2.2	27	0.066		7.51	J	5.74		0.167	U	4.37	J
50293	ug/kg	1	7	0.026	U	1.62	J	2.60		0.360	U	1.51	J
SUMDDX	ug/kg	1.58	46.1	0.112		13.0		12.7		0.801	U	7.87	
60571	ug/kg	0.02	8	0.040	U	0.23	U	0.15	U	0.550	U	0.225	U
SUMCHLOR	ug/kg	0.5	6	0.300	U	1.72	U	1.11	U	4.2	U	1.7	U
SumNOAA18	ug/kg	22.7	180	4.02	U	3.95		8.87		5.59	U	2.29	U
	Number  14762744  7440382  7440473  7440473  7440473  7440508  7439976  7440020  7440666  SUMLPAH  SUMHPAH  72548  72559  50293  SUMDDX  60571  SUMCHLOR	Number Units  14762744 %  7440382 mg/kg 7440439 mg/kg 7440508 mg/kg 7439921 mg/kg 7440020 mg/kg 7440666 mg/kg 7440666 mg/kg  SUMLPAH ug/kg SUMLPAH ug/kg 50293 ug/kg SUMCHLOR ug/kg	Number Units ERL  14762744 %  7440382 mg/kg 8.2  7440439 mg/kg 1.2  7440473 mg/kg 81  7440508 mg/kg 46.7  7439921 mg/kg 40.5  7440020 mg/kg 20.9  7440666 mg/kg 150  SUMLPAH ug/kg 552  SUMHPAH ug/kg 552  SUMHPAH ug/kg 1,700  72548 ug/kg 2  72559 ug/kg 2.2  50293 ug/kg 1  SUMDDX ug/kg 1.58  60571 ug/kg 0.5	Number         Units         ERL         ERM           14762744         %	CAS Number Units ERL ERM Value  14762744 % 1.28  7440382 mg/kg 8.2 70 9.66 7440439 mg/kg 1.2 9.6 0.072 7440473 mg/kg 81 370 31.5 7440508 mg/kg 34 270 10.9 7439921 mg/kg 46.7 218 18.1 7439976 mg/kg 0.150 0.710 0.032 7440020 mg/kg 150 410 60.6  SUMLPAH ug/kg 552 3.160 48.2 SUMLPAH ug/kg 552 3.160 48.2 SUMLPAH ug/kg 1,700 9,600 260  72548 ug/kg 2 20 0.020 72559 ug/kg 2.2 27 0.066 50293 ug/kg 1 7 0.026 SUMDDX ug/kg 1.58 46.1 0.112 60571 ug/kg 0.02 8 0.040 SUMCHLOR ug/kg 0.5 6 0.300	Number Units ERL ERM Value Q  14762744 %	CAS Number Units ERL ERM Value Q Result  14762744 % 1.28 1.14  7440382 mg/kg 8.2 70 9.66 9.75  7440439 mg/kg 1.2 9.6 0.072 0.335  7440473 mg/kg 81 370 31.5 41.6  7440508 mg/kg 34 270 10.9 29.4  7439921 mg/kg 46.7 218 18.1 30.9  7439976 mg/kg 0.150 0.710 0.032 0.064  7440020 mg/kg 20.9 51.6 20.8 25.4  7440666 mg/kg 150 410 60.6 101  SUMLPAH ug/kg 552 3.160 48.2 189  SUMLPAH ug/kg 552 3.160 48.2 189  SUMLPAH ug/kg 2 20 0.020 U 3.87  72559 ug/kg 2.2 27 0.066 7.51  50293 ug/kg 1 7 0.026 U 1.62  SUMDDX ug/kg 1.58 46.1 0.112 13.0  60571 ug/kg 0.02 8 0.040 U 0.23  SUMCHLOR ug/kg 0.5 6 0.300 U 1.72	CAS Number Units ERL ERM Value Q Result Q 14762744 % 1.28 1.14 1.4 1.4 1.4 1.4 1.4 1.4 1.4 1.4 1.	CAS Number Units ERL ERM Value Q Result Q Result 14762744 % 1.28 1.14 1.15  7440382 mg/kg 8.2 70 9.66 9.75 6.72  7440439 mg/kg 1.2 9.6 0.072 0.335 0.330  7440473 mg/kg 81 370 31.5 41.6 26.2  7440508 mg/kg 34 270 10.9 29.4 15.7  7439921 mg/kg 46.7 218 18.1 30.9 26.1  7439976 mg/kg 0.150 0.710 0.032 0.064 0.086  7440020 mg/kg 20.9 51.6 20.8 25.4 13.0  7440666 mg/kg 150 410 60.6 101 58.1  SUMLPAH ug/kg 552 3.160 48.2 189 654  SUMLPAH ug/kg 552 3.160 48.2 189 654  SUMHPAH ug/kg 2 20 0.020 U 3.87 J 4.34  72548 ug/kg 2 20 0.020 U 3.87 J 4.34  72559 ug/kg 2.2 27 0.066 7.51 J 5.74  50293 ug/kg 1 7 0.026 U 1.62 J 2.60  SUMDDX ug/kg 1.58 46.1 0.112 13.0 12.7  60571 ug/kg 0.02 8 0.040 U 0.23 U 0.15  SUMCHLOR ug/kg 0.5 6 0.300 U 1.72 U 1.11	CAS Number Units ERL ERM Value Q Result	CAS Number Units ERL ERM Value Q Result	CAS Number Units ERL ERM Value Q Result	CAS Number Units ERL ERM Value Q Result

Table 5. Summary of Bulk Sediment Chemistry Results, cont.

Total LPAH SUMLPAF Total HPAH SUMHPAF Pesticides	mg/kg mg/kg mg/kg mg/kg mg/kg mg/kg mg/kg	1.2 81 34 46.7 0.150 20.9 150	70 9.6 370 270 218 0.710 51.6 410	9.66 0.072 31.5 10.9 18.1 0.032 20.8 60.6		5.34 0.463 27.5 13.7 18.8 0.062 15.9 68.9	Q Q	4.98 0.433 26.0 13.8 17.8 0.054	Q Q	Result  3.52 0.300 20.0 9.34 12.2 0.052 11.4	0	Result  3.30 0.350 20.5 9.52 13.3 0.053	Q	Result	S 0	3.34 0.277 18.0 8.28 11.5	Q Q	Result	Q Q	Fig. 13.6 17.7	Q Q	1.58 0.119 11.0 5.32 4.81
Parameter         Number           Physical         1476274           Total organic carbon         1476274           Metals         7440382           Arsenic         7440382           Cadmium         7440473           Chromium         7440473           Copper         7440508           Lead         7439921           Mercury         743997           Nickel         7440020           Zinc         744066           PAHS         Total LPAH           Total HPAH         SUMLPAH           Total HPAH         SUMLPAH           Pesticides         SUMHPAH	mg/kg mg/kg mg/kg mg/kg mg/kg mg/kg mg/kg mg/kg	8.2 1.2 81 34 46.7 0.150 20.9 150	70 9.6 370 270 218 0.710 51.6 410	1.28 9.66 0.072 31.5 10.9 18.1 0.032 20.8 60.6	Q	5.34 0.463 27.5 13.7 18.8 0.062 15.9	Q	4.98 0.433 26.0 13.8 17.8 0.054 14.5	Q	3.52 0.300 20.0 9.34 12.2 0.052	Q	3.30 0.350 20.5 9.52 13.3	Q	2.47 0.229 15.6 18.6 8.67	Q	3.34 0.277 18.0 8.28	Q	2.82 0.237 16.5 7.16	Q	5.12 0.451 24.8 13.6	Q	1.58 0.119 11.0 5.32
Physical   1476274   Metals   Arsenic   7440382   Cadmium   7440435   Chromium   7440473   Chromium   7440473   Chromium   7440473   Chromium   7440506   Chromium   7439976   Chromium   7439977   Chromium   7439977   Chromium   7439977   Chromium   7439977   Chromium   7439977   Chromium   7439977   Chromium   7440666   Chromium   7440666	mg/kg mg/kg mg/kg mg/kg mg/kg mg/kg mg/kg mg/kg mg/kg	1.2 81 34 46.7 0.150 20.9 150	9.6 370 270 218 0.710 51.6 410	9.66 0.072 31.5 10.9 18.1 0.032 20.8 60.6		5.34 0.463 27.5 13.7 18.8 0.062 15.9		4.98 0.433 26.0 13.8 17.8 0.054 14.5		3.52 0.300 20.0 9.34 12.2 0.052		3.30 0.350 20.5 9.52 13.3		2.47 0.229 15.6 18.6 8.67		3.34 0.277 18.0 8.28		0.237 16.5 7.16		5.12 0.451 24.8 13.6		0.119 11.0 5.32
Total organic carbon         1476274           Metals         744038:           Arsenic         744038:           Cadmium         744043           Chromium         744047           Copper         744050           Lead         743992           Mercury         743997           Nickel         744002           Zinc         744066           PAHs         SUMLPAH           Total LPAH         SUMLPAH           Total HPAH         SUMLPAH           Pesticides         SUMLPAH	mg/kg mg/kg mg/kg mg/kg mg/kg mg/kg mg/kg mg/kg mg/kg	1.2 81 34 46.7 0.150 20.9 150	9.6 370 270 218 0.710 51.6 410	9.66 0.072 31.5 10.9 18.1 0.032 20.8 60.6		5.34 0.463 27.5 13.7 18.8 0.062 15.9		4.98 0.433 26.0 13.8 17.8 0.054 14.5		3.52 0.300 20.0 9.34 12.2 0.052		3.30 0.350 20.5 9.52 13.3		2.47 0.229 15.6 18.6 8.67		3.34 0.277 18.0 8.28		0.237 16.5 7.16		5.12 0.451 24.8 13.6		0.119 11.0 5.32
Metals           Arsenic         744038;           Cadmium         744043;           Chromium         744047;           Copper         744050;           Lead         743992;           Mercury         743997;           Nickel         744066;           PAHs         Total LPAH           Total HPAH         SUMLPAE           Total HPAH         SUMLPAE           Pesticides         SUMLPAE	mg/kg mg/kg mg/kg mg/kg mg/kg mg/kg mg/kg mg/kg mg/kg	1.2 81 34 46.7 0.150 20.9 150	9.6 370 270 218 0.710 51.6 410	9.66 0.072 31.5 10.9 18.1 0.032 20.8 60.6		0.463 27.5 13.7 18.8 0.062 15.9		0.433 26.0 13.8 17.8 0.054 14.5		0.300 20.0 9.34 12.2 0.052		0.350 20.5 9.52 13.3		0.229 15.6 18.6 8.67		0.277 18.0 8.28		0.237 16.5 7.16		0.451 24.8 13.6		0.119 11.0 5.32
Cadmium         7440438           Chromium         7440473           Copper         7440508           Lead         743992           Mercury         743997           Nickel         744002           Zinc         744066           PAHs         Total LPAH           Total HPAH         SUMLPAF           Total HPAH         SUMLPAF           Pesticides         SUMHPAF	mg/kg mg/kg mg/kg mg/kg mg/kg mg/kg mg/kg	1.2 81 34 46.7 0.150 20.9 150	9.6 370 270 218 0.710 51.6 410	0.072 31.5 10.9 18.1 0.032 20.8 60.6		0.463 27.5 13.7 18.8 0.062 15.9		0.433 26.0 13.8 17.8 0.054 14.5		0.300 20.0 9.34 12.2 0.052		0.350 20.5 9.52 13.3		0.229 15.6 18.6 8.67		0.277 18.0 8.28		0.237 16.5 7.16		0.451 24.8 13.6		0.119 11.0 5.32
Chromium         7440473           Copper         7440950           Lead         7449991           Mercury         7439976           Nickel         7440020           Zinc         7440666           PAHs         SUMLPAH           Total LPAH         SUMLPAH           Total HPAH         SUMLPAH           Pesticides	mg/kg mg/kg mg/kg mg/kg mg/kg mg/kg mg/kg	81 34 46.7 0.150 20.9 150	370 270 218 0.710 51.6 410	31.5 10.9 18.1 0.032 20.8 60.6		27.5 13.7 18.8 0.062 15.9		26.0 13.8 17.8 0.054 14.5		20.0 9.34 12.2 0.052		20.5 9.52 13.3		15.6 18.6 8.67		18.0 8.28		16.5 7.16		24.8 13.6		11.0 5.32
Copper         7440508           Lead         7439921           Mercury         7439927           Nickel         7440020           Zinc         7440666           PAHs         SUMLPAH           Total LPAH         SUMLPAH           Total HPAH         SUMLPAH           Pesticides         SUMLPAH	mg/kg mg/kg mg/kg mg/kg mg/kg	34 46.7 0.150 20.9 150 552	270 218 0.710 51.6 410	10.9 18.1 0.032 20.8 60.6		13.7 18.8 0.062 15.9		13.8 17.8 0.054 14.5		9.34 12.2 0.052		9.52 13.3		18.6 8.67		8.28		7.16		13.6		5.32
Lead         743992           Mercury         7439976           Nickel         7440020           Zinc         7440666           PAHS         SUMLPAH           Total LPAH         SUMLPAH           Total HPAH         SUMHPAH           Pesticides         SUMHPAH	mg/kg mg/kg mg/kg mg/kg	46.7 0.150 20.9 150 552	218 0.710 51.6 410	18.1 0.032 20.8 60.6		18.8 0.062 15.9		17.8 0.054 14.5		12.2 0.052		13.3		8.67								
Lead         743992           Mercury         7439976           Nickel         7440020           Zinc         7440666           PAHS         Total LPAH         SUMLPAH           Total HPAH         SUMHPAH           Pesticides         SUMHPAH	mg/kg mg/kg mg/kg mg/kg	46.7 0.150 20.9 150 552	0.710 51.6 410	0.032 20.8 60.6		0.062 15.9		0.054 14.5		0.052						11.5		9.29		17.7		4.81
Nickel         7440020           Zinc         7440666           PAHs         Total LPAH           SUMLPAE         SUMLPAE           Total HPAH         SUMLPAE           Pesticides	mg/kg mg/kg ug/kg	20.9 150 552	51.6 410	20.8 60.6		15.9		14.5				0.053		0.022								
Zinc         7440666           PAHs	mg/kg ug/kg	150 552	410	60.6						11.4				0.032		0.067		0.046		0.056		0.023
PAHS  Total LPAH SUMLPAH  Total HPAH SUMHPAH  Pesticides	ug/kg	552				68.9				11.4		11.3		8.57		9.92		8.67		13.4		6.12
Total HPAH SUMHPAH Pesticides			3,160					67.7		48.3		50.9		37.2		50.5		39.9		78.2		28.9
Total HPAH SUMHPAH Pesticides			3,160																			
Pesticides	ug/kg			48.2		316		321		208		106		114		101		127		217		104
		1,700	9,600	260		2644		4212		2028		866		838		756		653		1301		567
4,4`-DDD 72548	ug/kg	2	20	0.020	U	1.30		1.90		2.10		1.30		1.00		1.20		0.880		1.70		0.680
4,4`-DDE 72559	ug/kg	2.2	27	0.066		1.90		1.30		1.40		1.30		0.790		1.40		1.30		2.00		0.400
4,4`-DDT 50293	ug/kg	1	7	0.026	U	0.850		1.50		4.00		0.750		0.620		0.900		0.530		2.20		0.028
Total DDX SUMDDX	ug/kg	1.58	46.1	0.112		4.05		4.70		7.50		3.35		2.41		3.50		2.71		5.90		1.11
Dieldrin 60571	ug/kg	0.02	8	0.040	U	0.460		0.850		0.026	U	1.00		1.20		0.026	U	0.026	U	0.610		0.026
Total Chlordane SUMCHLO	ug/kg	0.5	6	0.300	U	1.4		0.95		1.8		1.8		0.044	U	0.265		1.54		1.04		1.25
PCBs																						
Total PCBs SumNOAA	s ug/kg	22.7	180	4.02	U	1.4		2.1		1.2		0.751		0.326	U	0.326	U	0.831		1.3		0.706
Notes: Yellow indicates an exceedance of the ERI																						
Red indicates an exceedance of the ERM																						
U= Compound was analyzed for but was r	ot detected	(non-det	ect)																			
J= Indicates an estimated value																						
Non-detects reported as half the MDL																						
Reference site data from DAMOS monitori			SN)																			
Total PCBs were calculated using the NO																						
Total Chlordane is a sum of alpha and ga	nma chlord	ane, cis a	and trans	nonachle	or, an	d oxychlor	lane	; IOSN valu	ıe is	a sum of or	ıly a	lpha and ga	mm	a chlordan	2							

# Elutriate Chemistry and Biological Analysis of Sediments

Based on the lithology, chemistry results, and location of sample stations, NAE provided the applicant with a compositing plan for biological testing following the tiered testing protocol outlined in the Evaluation of Dredged Material Proposed for Ocean Disposal – Testing Manual (Green Book, EPA/USACE, 1991). Sediment and water for biological testing were collected by the applicant in February of 2023 to characterize the potential risk associated with open water placement of the dredged material from the four Kennebunk River projects. Sediment was collected from ten representative sample locations across all four project areas to create one composite sample (Table 2 and Figures 6 through 9). The composite sample for biological testing was comprised of sediment from stations AYC-1, 2, and 4 from the Arundel Yacht Club, Y-2 and 3 from the Yachtsman Marina, K-1 and 2 from the Kennebunkport Marina, and KBRC-B, C, and E from the Kennebunk River Club. Site water was also collected from a central location within each proposed project area and composited. The biological testing samples were collected according to the compositing plan to determine the potential for the dredged sediment to cause adverse effects to the biological receptors identified in the CSM. Compliance with water quality criteria was determined through elutriate testing, sediment toxicity was measured through a 10-day whole sediment acute toxicity test, human health risk was determined through a 28-day bioaccumulation test, and water column toxicity was determined through a suspended particulate phase test as described in the Green Book (USEPA/USACE, 1991).

# **Evaluating Potential Effects to Benthic Organisms**

The CSM identified the uptake of contaminants from placed dredged material at IOSN as a primary exposure pathway for project sediments and the potential for acute toxicity was determined through a 10-day whole sediment acute toxicity test as described in the Green Book (EPA/USACE, 1991).

Mean mortality in the control samples of the 10-day whole sediment acute toxicity tests was less than 10% for the amphipod (*Leptocheirus plumulosus*) and the mysid (*Americamysis bahia*); therefore, the tests were valid based on criteria established in the testing protocol.

Mean survivability for *A. bahia* and *L. plumulosus* was 97% and 95%, respectively. Results were not statistically different when compared to survivability in the IOSN reference sediment. The material proposed to be dredged is not considered acutely toxic to the mysids or amphipods used in this assessment.

Results from the 10-day whole sediment toxicity test are summarized in Table 6.

Table 6: Mean Survivability in the 10-day Whole Sediment Toxicity Test

Organism	Lab Control	IOSN Reference	Comp 1
A. bahia	98%	98%	97%
L. plumulosus	98%	93%	95%

# Evaluating Potential Effects to Human Health

In order to assess the potential risk to human health through the exposure pathways identified in the CSM, a 28-day bioaccumulation test was performed with the clam, *Macoma nasuta*, and marine polychaete worm, *Nereis virens*, using sediments from the composite sample.

Results showed statistically significant increases of certain contaminants of concern (COCs) in tissue samples from clams exposed to project sediments when compared to tissue samples from clams exposed to reference area sediments including three metals (copper, lead, and nickel), several individual PAHs, three PCB congeners, and two pesticides (4,4'-DDD and 4,4'-DDE). Generally, COC concentrations were only slightly higher in the composite tissue sample than in the pre-test or IOSN reference tissue. Anthracene, benzo(a)anthracene, benzo(b)fluoranthene, and chrysene concentrations were 5 times higher in the composite tissue sample than in the IOSN reference site tissue concentrations. Fluoranthene, pyrene and 4,4'-DDD concentrations were more than 10 times higher in the composite tissue sample than in the IOSN reference site tissue concentrations. Copper, nickel, fluorene, naphthalene, and PCB 52 were detected at concentrations less than were detected in the pre-test tissue, which reflects the initial contaminant load in the wild caught specimens prior to the test initiation, suggesting that these contaminants may not be attributable to site conditions. However, these analytes were conservatively included in subsequent risk modeling.

Significant increases in worm tissue samples as compared to reference area tissue samples included five metals (cadmium, chromium, lead, nickel, and zinc), several individual PAHs, two PCB congeners, and one pesticide (4,4'-DDD). Generally, COC concentrations were only slightly higher in the composite tissue sample than in the pre-test or IOSN reference tissue. Pyrene was 5 times higher in the composite tissue sample than the IOSN reference site tissue concentrations. Benzo(k)fluoranthene, fluoranthene, and PCB 105 were more than 10 times higher in the composite tissue sample than the IOSN reference site tissue concentrations. Chromium, lead, nickel, anthracene, naphthalene, and 4,4'-DDD were detected at concentrations less than were detected in the pre-test tissue, which reflects the initial contaminant load in the wild caught

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specimens prior to the test initiation, suggesting that these contaminants may not be attributable to site conditions, however these analytes were conservatively included in the subsequent risk modeling.

Based on these results, the tissue burden data were analyzed with the EPA Bioaccumulation Evaluation Screening Tool (BEST) model to determine the toxicological significance of bioaccumulation from exposure to the dredged sediment. The BEST model includes an evaluation of the non-carcinogenic risk, carcinogenic risk, and any observed exceedances of Food and Drug Administration (FDA) thresholds to determine potential adverse impacts to human health from the consumption of lobster, fish, or shellfish exposed to project sediments. Consideration was also given to the number of contaminants that were statistically elevated in comparison to the reference tissue concentrations and to the magnitude of those concentrations in comparison to the reference tissue concentrations and comparable organisms living in the vicinity of the disposal site according to the factors outlined in the Ocean Testing Manual (USEPA/USACE, 1991).

For both *Macoma nasuta* and *Alitta virens*, modeling based on the tissue contaminant loads measured in the composite sample found that all contaminants were below the EPA Hazard Quotient for non-carcinogenic risk of 1.0, below the EPA carcinogenic risk threshold (1 x 10<sup>-4</sup>), and were also less than established FDA action levels. Statistically elevated concentrations of contaminants in the tissue samples that could not be evaluated using the BEST model were compared to background invertebrate concentrations in the NOAA Mussel Watch dataset (NCCOS, 2023) and all concentrations were found to be less than the dataset concentrations.

Based on this analysis, there is no unacceptable risk to the receptors identified in the CSM from the bioaccumulation of contaminants through exposure to the dredged material from the projects. BEST model outputs and tissue data are provided in Appendix C.

#### **Evaluating Potential Effects to Fish and Marine Invertebrates**

The CSM identified the uptake of contaminants from the water column during the placement of dredged material at IOSN as a primary exposure pathway for project sediments. Elutriate samples were prepared from the site composite sediment sample and site water and the potential for water column toxicity was determined through a suspended particulate phase (SPP) toxicity test as described in the Green Book (USEPA/USACE, 1991).

The results from the SPP toxicity test were used to determine the median lethal concentration ( $LC_{50}$ ) for the three target species exposed to the sediment elutriates. All three species, the mysid, *A. bahia*, the minnow, *Menidia beryllina*,

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and the mussel, *Mytilus edulis*, showed no adverse effects on survival after exposure to the elutriate from the composite sample (Table 7).

Table 7: LC<sub>50</sub> Values in Suspended Phase Toxicity Test

Composite	A. bahia	M. beryllina	M. edulis
	LC <sub>50</sub> (%)	LC <sub>50</sub> (%)	LC <sub>50</sub> (%)
Composite 1	>100%	>100%	>100%

To determine if the discharge of dredged material would meet the limiting permissible concentration (LPC), NAE utilized the Short-Term Fate (STFATE) numerical model to analyze the disposal cloud as it descends through the water column after release from a scow. Results of the STFATE evaluation using the lowest LPC (LC $_{50}$  of 100% and an application factor of 0.01) predicted that the water column would attain the LPC within four hours of disposal at IOSN. Additionally, all contaminants of concern in the elutriate samples were below the federal and Maine water quality criteria. Elutriate chemistry concentrations are presented in Appendix D.

#### 4. Suitability Determination:

Based on the weight of evidence, including the CSM, sediment chemistry results, biological testing results, and the subsequent risk modeling, no significant adverse impacts through the exposure pathways identified in the conceptual site model were found for the Arundel Yacht Club, Kennebunkport Marina, Yachtsman Marina, and Kennebunk River Club. Based on the testing and evaluation requirements set forth in Section 103 of the MPRSA, the sediments to be dredged are considered suitable for unconfined open water disposal at IOSN.

This suitability determination was coordinated with EPA Region 1 and MEDEP. MEDEP concurred with the determination and EPA Region 1 conducted an individual evaluation of the project and documented their findings in a separate memo.

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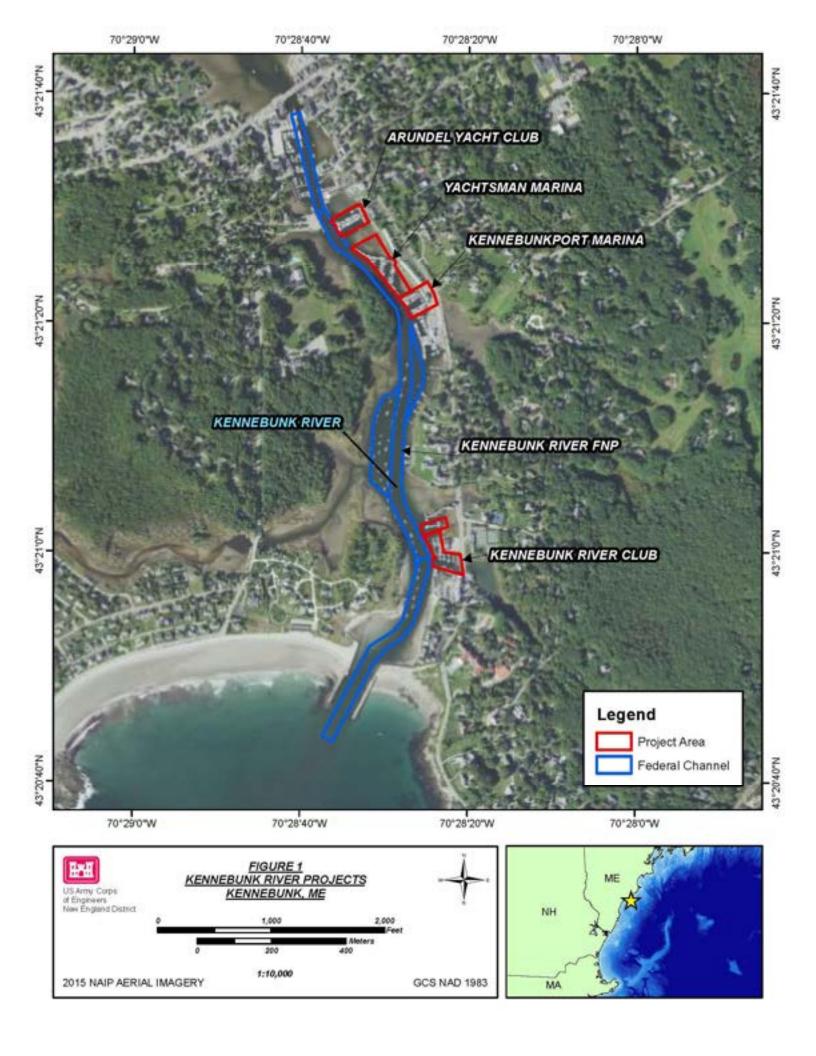
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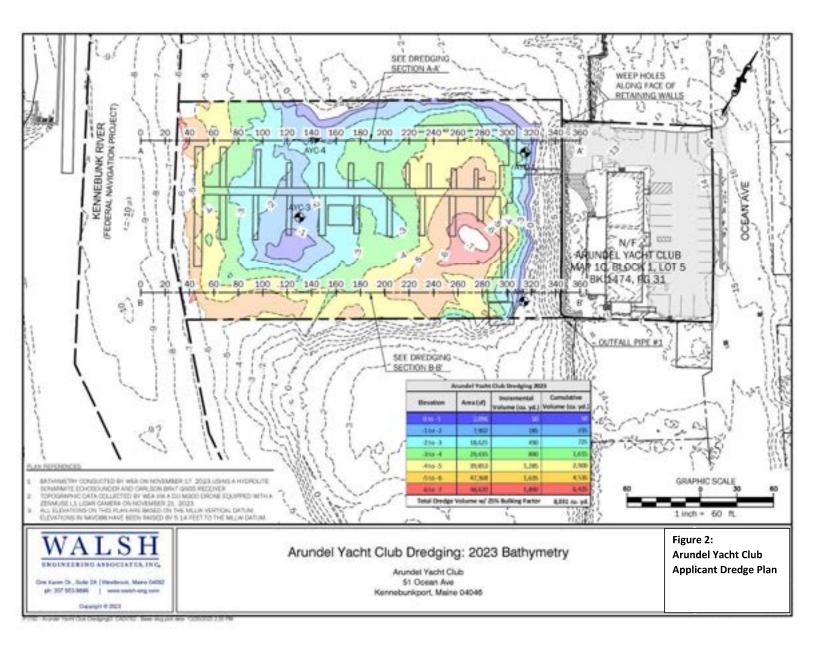
Richard B. Loyd Chief Environmental Resources and Marine Programs Section USACE-New England District **FINAL** Suitability Determination for Maintenance Dredging of the Kennebunk River Projects, Kennebunkport, Maine

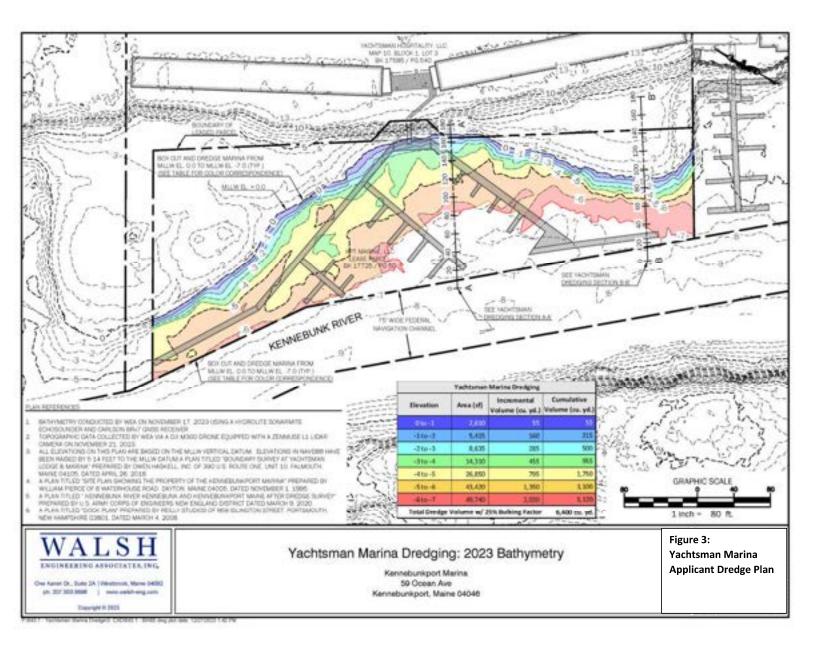
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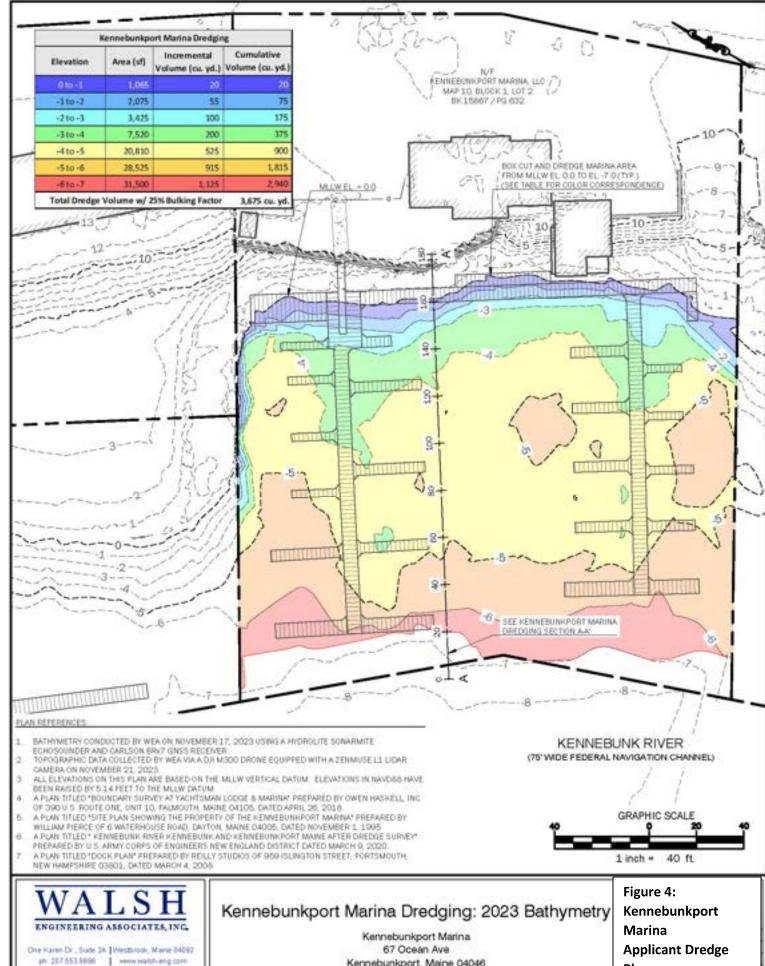
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- USEPA/USACE 1991. Evaluation of Dredged Material Proposed for Ocean Disposal Testing Manual. Environmental Protection Agency, Office of Water and Department of the Army, United States Army Corps of Engineers. Washington, D.C.





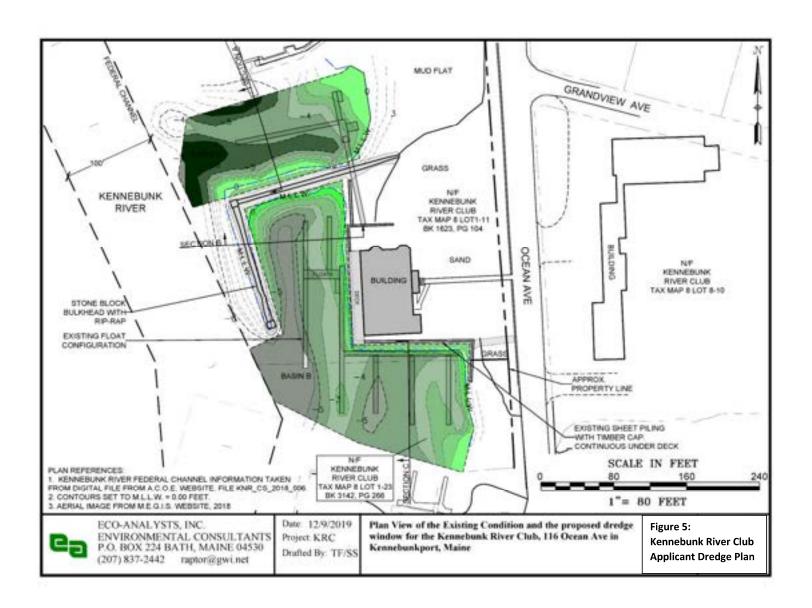


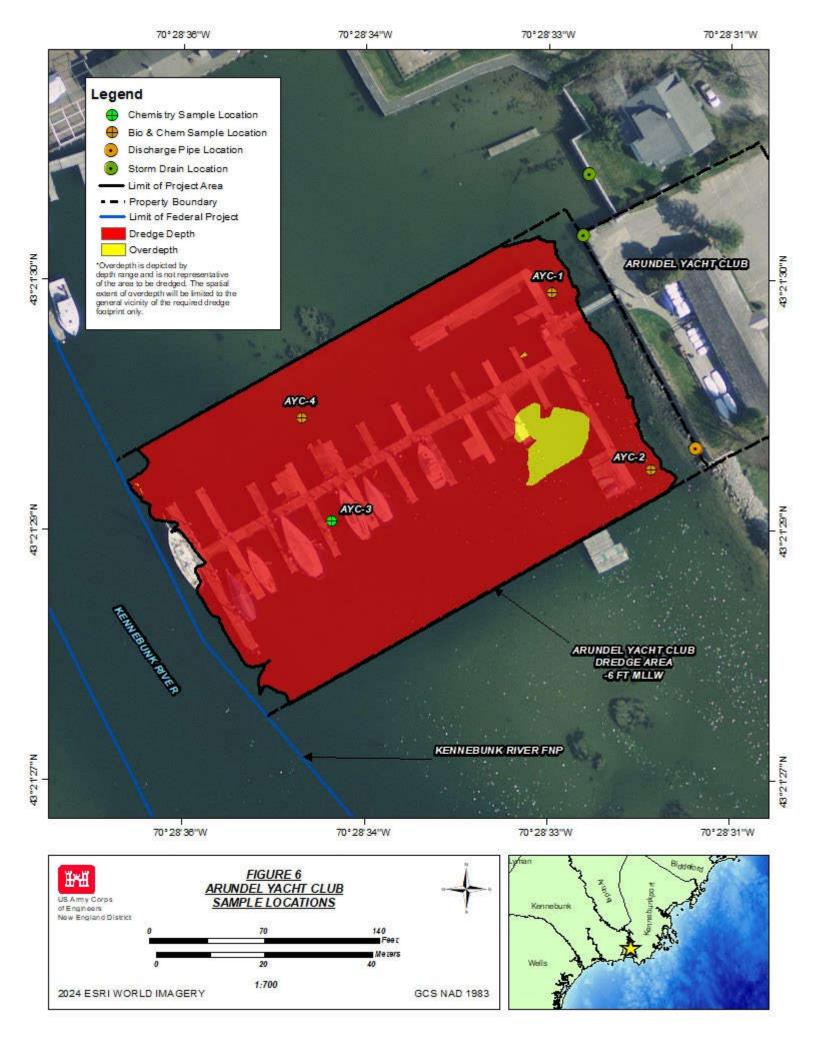


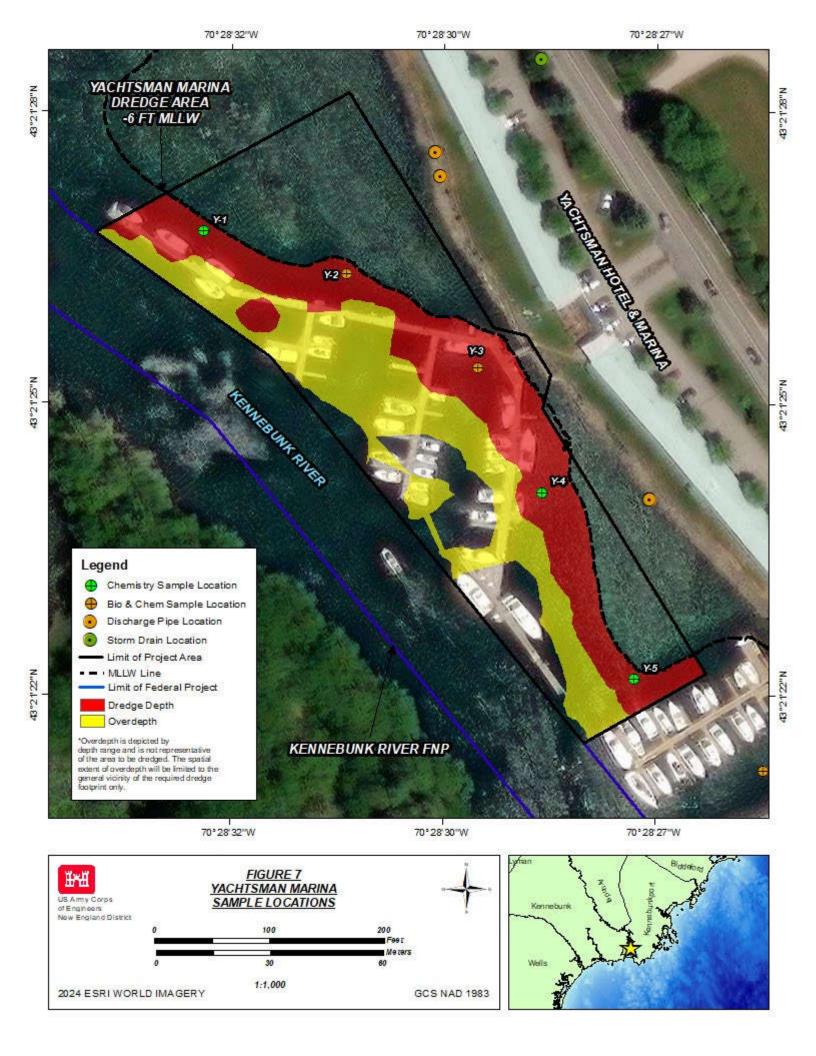
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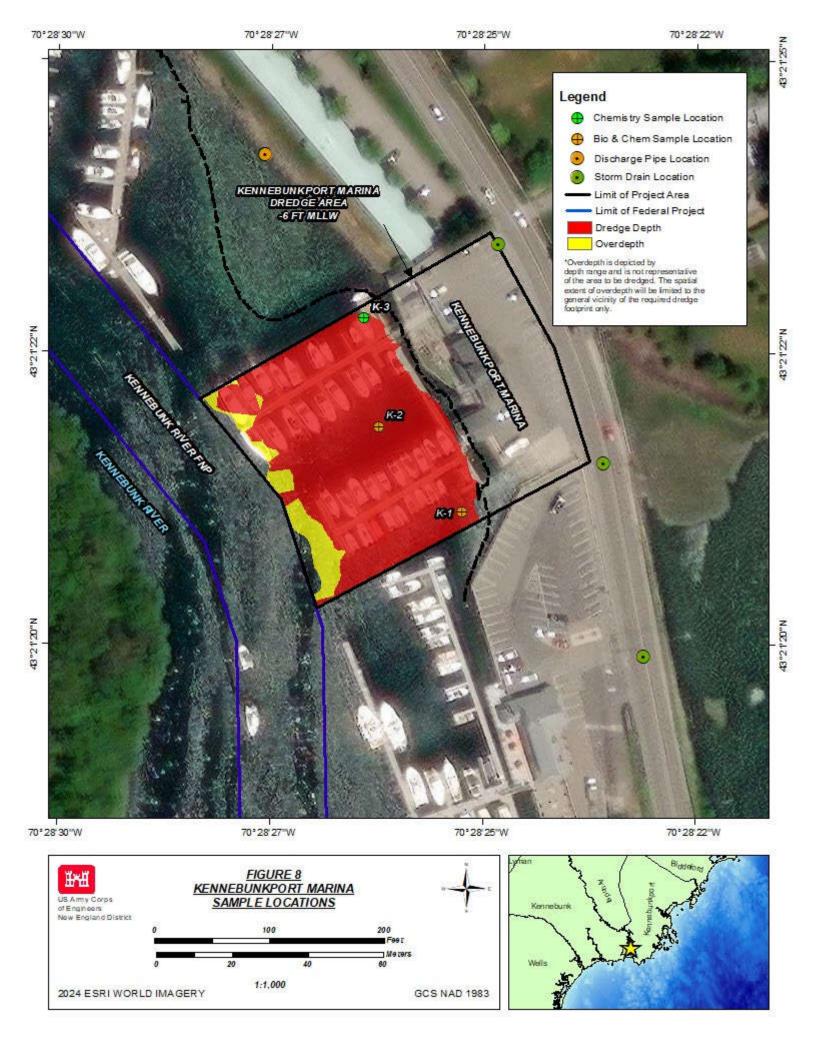
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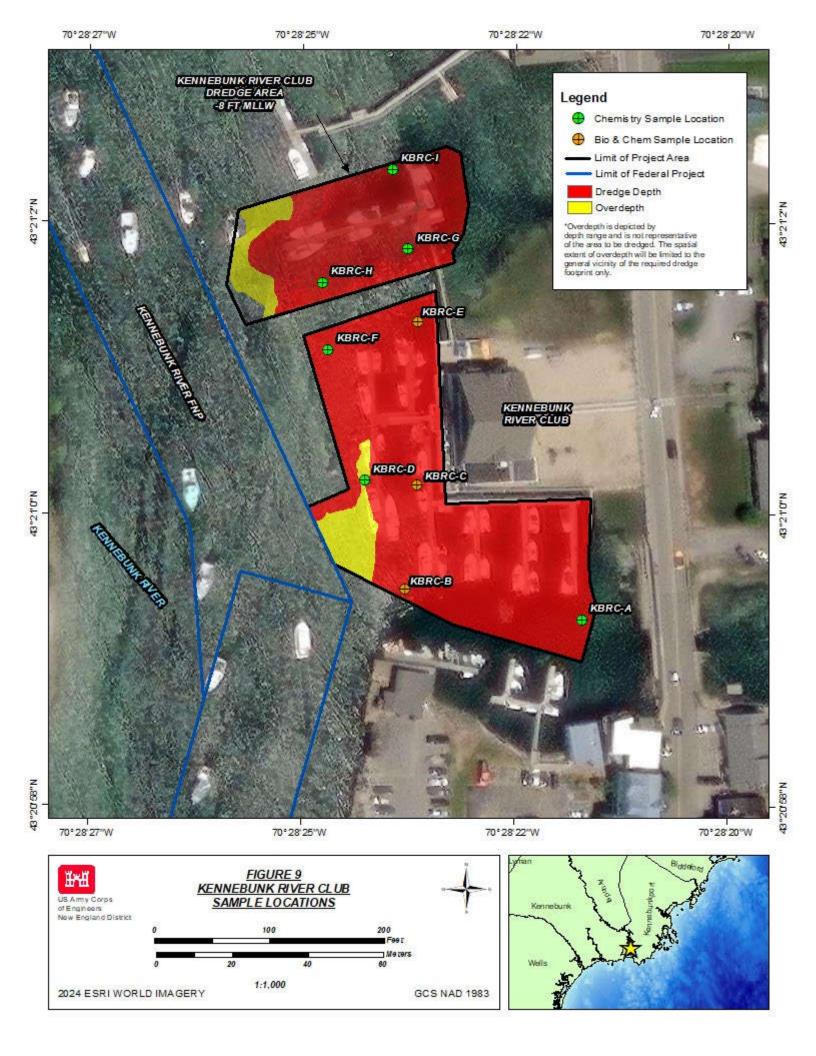
Plan

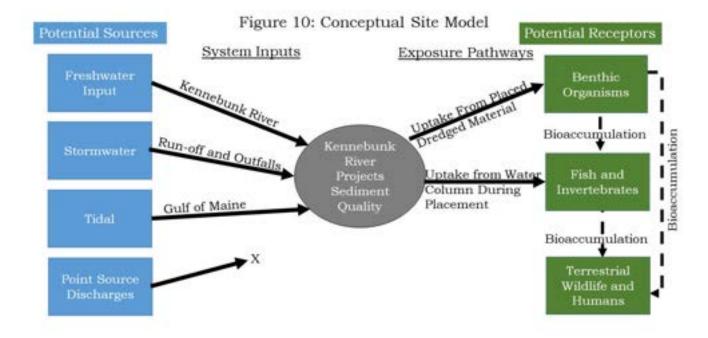












## Appendix A Core Logs and Photographs

Project: Arundel Yacht Club		Date:	022
Sampling Personnel: Dustin J Kach			
Weather: <u>Light Winds, Clear Skies</u>			
Location Method: DGPS: 1 meter ac	ccuracy		
	•		
Sample ID: AYC-1		Time:1	:06 pm
Sampler Type: VibraCore Sample	er		
Depth:			
Coordinates: <u>Latitude: 43.35831</u>		<b>Longitude: -</b> 7	0.47582
Penetration: 3.2' R	Recovery: 3.2'		No. Attempts: 3
Material Description: 0-3.1, composited	d. Dark silt/mud with	shell debris.	

## **Core Photo**



Project: Arunder Yacht Club	Date:
Sampling Personnel: Dustin J Kach	
Weather: Light Winds, Clear Skies	
Location Method: DGPS: 1 meter accuracy	
<u> </u>	
Sample ID: <u>AYC-2</u>	Time: 12:20 pm
Sampler Type: VibraCore Sampler	
Depth:	
Coordinates: Latitude: 43.35800	<b>Longitude:</b> -70.47561
Penetration: 2.4' Recovery:	2.4' No. Attempts: 9
Material Description: <u>0-2.4' composited. Hard p</u>	acked sand with shell debris. Multiple attempts were

## **Core Photo**

made refusal was reached after 2.4' penetration.



Project: <u>Arundel Yacht Clul</u>	<u>b</u>	Date: <u>7/26/2022</u>
Sampling Personnel:Dustin J Ka	ach	
Weather: Light Winds, Clear	Skies	
Location Method:DGPS: 1 m	neter accuracy	
Sample ID: <u>AYC-3</u>		Time: 12:55 pm
Sampler Type: VibraCore	Sampler	
Depth:3.2' MLLW		
Coordinates: <u>Latitude: 43.3579</u>	3	<b>Longitude: -</b> 70.47634
Penetration: 1'	Recovery: 9"	No. Attempts: 16

Material Description: 0-9" composited. Hard substrate encountered a lot of wood debris and shell material. We attempted to call ACOE contacts during sampling, messages were left but no one returned the calls that day. We kept the largest core and did not cut it because we did not want to lose any material. Sample was extruded directly into bucket for compositing. We attempted multiple cores within a 10' radius of the location and saved the best one. Multiple attempts were made refusal was reached after 1' penetration.

#### **Core Photo**



Project: Arundel Yacht Club		Date: _	7/26/2022
Sampling Personnel:	h		
Weather: <u>Light Winds, Clear S</u>	kies		
Location Method: DGPS: 1 met	ter accuracy		
Sample ID: <u>AYC-4</u>		Time: _	12:35 pm
Sampler Type: VibraCore Sa	ampler		
Depth:			
Coordinates: <u>Latitude: 43.35811</u>		Longiti	ıde: -70.47638
Penetration: 4.1'	Recovery:	4.0'	No. Attempts: 5
Material Description: 0-4.0 compo	sited. Dark silt w	vith hard packed sa	and at bottom of core.

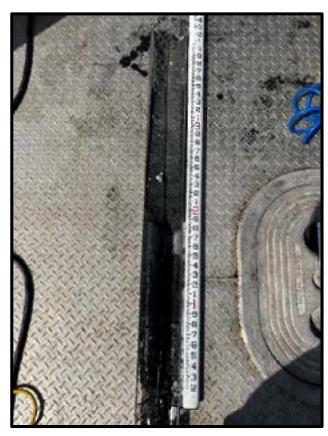
## **Core Photo**



Project: Kennebunkport	Marina	Date: <u>1/26/2022</u>	
Sampling Personnel: <u>Dustin</u>	J Kach		
Weather: Light Winds, C	lear Skies		
	•		
Sample ID: <u>K-1</u>		Time: 9:38 am	
Sampler Type: VibraC	Core Sampler		
Depth:		_	
Coordinates: <u>Latitude: 43.3</u>	35587	<b>Longitude:</b> -70.47367	
Penetration: 4.2'	Recovery:4	1.2' No. Attempts: <u>6</u>	
Material Description: <u>0-4.2'</u>	composited. Dark silt with	h hard packed sand at bottom of core. Multip	<u>ple</u>

## **Core Photo**

attempts were made refusal was reached after 4.2' penetration.



Project: Kennebunkport Marina	Date: <u>7/26/2022</u>
Sampling Personnel: <u>Dustin J Kach</u>	
Weather: Light Winds, Clear Skies	
Location Method: DGPS: 1 meter accuracy	
Sample ID: <u>K-2</u>	Time: _9:47 am
Sampler Type: VibraCore Sampler	
Depth:4.8' MLLW	
Coordinates: <u>Latitude: 43.35607</u>	<b>Longitude:</b> -70.47394
Penetration: 3.1' Recovery: 3.1'	No. Attempts: 3

## **Core Photo**

Material Description: <u>0-2.2</u>' composited. Dark silt with hard packed sand towards bottom of core.



Project:	Kennebunkport Marina	<u>1                                    </u>		Date:	
Sampling Per	sonnel: <u>Dustin J Kach</u>				
Weather:	Light Winds, Clear Ski	ies			
<b>Location Met</b>	hod: DGPS: 1 meter	r accuracy			
Sample ID: _	K-3			Time: 10:05 am	
Sampler Type	e: <u>VibraCore San</u>	npler			
Depth:	-1.7' MLLW				
Coordinates:	<b>Latitude:</b> 43.35634			Longitude: -70.474	
Penetration: _	4.3'	Recovery:	4.2'	No. Attempts: <u>7</u>	
	cription: <u>0-4,2' compose</u>			packed sand at bottom of core. Mul	tiple

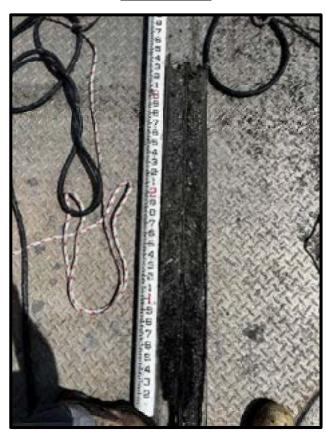
## **Core Photo**



Project: Yachtsman Marina	<b>Date</b> : <u>7/26/2022</u>
Sampling Personnel: <u>Dustin J Kach</u>	
Weather: <u>Light Winds, Clear Skies</u>	
Location Method: DGPS: 1 meter accuracy	_
Sample ID: Y-1	Time: 11:29 am
Sampler Type: VibraCore Sampler	
Depth:1.5' MLLW	
Coordinates: <u>Latitude</u> : 43.35735	<b>Longitude:</b> -70.47578
Penetration: 3.5' Recovery:	3.5' No. Attempts: <u>8</u>
Material Description: <u>0-3.5</u> ° composited. Compa	act sand with shell debris. Multiple attempts were

## **Core Photo**

made refusal was reached after 3.5' penetration.



Project:	Yachtsman Marina			Date: <u>7/26/2022</u>	
Sampling Pers	sonnel: <u>Dustin J Kach</u>				
Weather:	Light Winds, Clear Sk	ies			
Location Metl	hod: DGPS: 1 mete	er accuracy			
Sample ID:	Y-2			Time: _11:15 am	
Sampler Type	e:VibraCore Sar	npler			
Depth:	-1.2' MLLW				
Coordinates:	<b>Latitude:</b> 43.35724			<b>Longitude: -</b> 70.47533	
Penetration: _	2.5'	Recovery:	2.5'	No. Attempts: 8	
	ription: 0-2.5' compos	_		Multiple attempts were made refusa	l was

## **Core Photo**



Project: Yachtsman Marina	<b>Date</b> : <u>7/26/2022</u>
Sampling Personnel: Dustin J Kach	
Weather: Light Winds, Clear Skies	
Location Method: DGPS: 1 meter accur	racv
Sample ID: Y-3	Time: 11:02 am
Sampler Type: VibraCore Sampler	
Depth:4.2' MLLW	
Coordinates: <u>Latitude</u> : 43.35701	<b>Longitude: -</b> 70.47488
Penetration: 2.7' Reco	overy: 2.7' No. Attempts: 5

## **Core Photo**

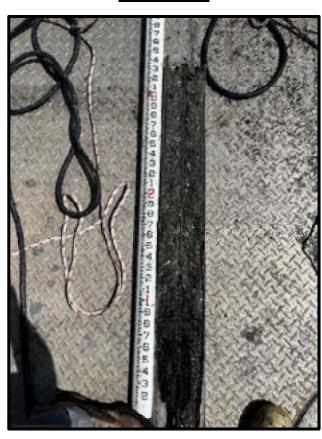
Material Description: <u>0-2.7</u>' composited. Dark silt with hard packed sand at bottom of core.



Project: Yachtsman Marina	Date: <u>7/26/2022</u>
Sampling Personnel: <u>Dustin J Kach</u>	
Weather: Light Winds, Clear Skies	
Location Method: DGPS: 1 meter accuracy	
Sample ID: Y-4	Time: 10:54 am
Sampler Type: VibraCore Sampler	
Depth:4.4' MLLW	
Coordinates: Latitude: 43.35673	<b>Longitude: -</b> 70.47467
Penetration: 3.4' Recovery: 3.4'	No. Attempts: <u>4</u>

## **Core Photo**

Material Description: <u>0-2.6</u>' composited. Dark silt with hard packed sand at bottom of core.



Project: Yachtsman Marina	Date: <u>///26/2022</u>
Sampling Personnel:	
Weather: Light Winds, Clear Skies	
Location Method: DGPS: 1 meter accuracy	
Sample ID: Y-5	Time: 10:40 am
Sampler Type: VibraCore Sampler	
Depth:1.0' MLLW	
Coordinates: <u>Latitude: 43.35629</u>	<b>Longitude: -</b> 70.47437
Penetration: 6.1' Recovery:	6.1' No. Attempts: <u>3</u>

## **Core Photo**

Material Description: <u>0-6.0</u>' composited. Dark silt with hard packed sand at bottom of core.



## Appendix B Bulk Sediment Chemistry Results

Column   C																																					
Column   C																																					
State   Stat		1	1	1	1	IO:	SN	K-	1	K-2	K-3	_	Y-1	Y-2	protect 2	Y-3	Y-4	Y-5	_	AYC-1	AYC-2	2	AYC-3	AYC	-4 KI	BRC-A	KBRC-I	KBR	C-C	KBRC-D				KBRO	>H KBR	C-I	KBRC-F
State	Parameter	CAS Number	Units	ERL	ERM	Value	e 0	Result	O Ro	esult (	Result	O R	esult (	Result	O Res	ult Q	Result	Result	Q R	esult (	Result	Q R	esult C	Result	Q Res	ult O	Result	Q Resul	0 5	Result 1	Result	0	Result	Q Result	Q Result	0 1	Result Q
Second Property   Second Pro																																					
Second   S		14762744	%			1.28	_	0.37	3	.04	2.32	]	0.93	0.72	1.5	90	1.19	0.20		1.14	1.15	Ĭ	8.46	2.64				_	$\perp$	-			-	_	-	$\perp$	_
Column																																_					
The column			mg/kg		70	9.66	_													9.75		_ :	7.78	10.3					-								
Teach   Teac			mg/kg				2																														
The column   The					370	10.0	_																						+								
Column					218	18.1	_	134																					+								
The column   The	Mercury	7439976					2	0.051									0.011		JC	0.064				0.108	0.0	62			_		0.032			0.046		Н.	0.023
Transfer   Property	Nickel	7440020			51.6	20.8		9.17	1	5.6	15.4			8.37	21	.4	15.1	3.81			13.0		15.0	22.7				11.4		11.3	8.57			8.67			
Company   Comp	Zinc	7440666						56.6	- 6	7.4	57.2		12.2	37.6	71	.2	45.2	10.2		101	58.1	-	68.6	98.0	68	.9	67.7	48.3	$\top$	50.9	37.2	-	50.5	39.9	78.2		28.9 J
Company																																					
Column									J 2	0.4											23.4						18.2										
Column																					71.1					.0	1.25										
Column							_		3	4.5											119				90	.3	143.0		-								
Proceedings							_		2	5.5											37.4				J 37	8	30.6										
The part				240	1500	26.0	+														381								10								
Property							+														654								+								
Company																					326					1	522		+								
Company   Comp		50328				23.4		129	- 1	160	130		132 J	130	85	.3	3.12	J 4.60		140			35.7	90.0	17			J 146		80 -	J 76.8			J 58	J 129	J	51.8 J
Property of the Property of			ug/kg																																J 201		
Princip   Prin																																					
Second Column   1970   1985																											251		J								
Part					2,800		_																				455		4								
Control   Cont							-														56.6				11	o J	15.5	J 10.0	UJ								
Column					5,100		+-														702				71	0 1	97 F	Z04	-								
Part					0.600		_																				87.5	J 60.5	J								
Act   Color					9.600		_														3341				26	i.	4212	2028	_								
The column   The		GOMIN AND	OR) AR	1,100	3,000	200	_	1200	1 1	927	1001		.000	1000	- 00	~	00.0	10.0		1102	0011		111	500	20		1212	2020		000	000	-	700	030	1001		501
Column   C		72548	ug/kg	2	20	0.020	U	4.98	J 4	.66	0.112	UJ	1.16	2.86	J 0.0	93 UJ	0.016	J 0.013	UJ :	3.87	4.34	J 0	1.274 U	J 1.99	J 13	10	1.90	2.10		1.30	1.00	-	1.20	0.880	1.70		3,680
Teal Plant   Section   S	4,4°-DDE	72559	ug/kg	2.2	27	0.066	5	2.23	4	.53	0.068	U :	2.50	2.78	0.0	57 U	0.010	0.008	U .	7.51	5,74	- 0	1.167 U	4.37	J 1.9	10	1.30	1.40		1.30	0.790	-	1.40	1.30	2.00		3.400
Column   C	4,4"-DDT				7	0.026	5 U	1.44		.44		UO	.960	0.808			0.020	J 0.017	U	1.62	2.60			1.51	J 0.8	50	1.50	4.00		0.750	0.620		0.900	0.530	2.20		
Company   Comp					46.1			8.65	1	0.6		Ü	1.62	6.45						13.0	12.7			7.87	4.0	15	4.70	7.50		3.35	2.41		3.50	2.71	5.90		
Commendation					_																																
Control   Cont					-																																
Expension   Section   Se																									11 0.4	00	0.007			1.00	1.30				U 0.007		
Expending   Control   Co				V.V.		0.036	5 0	0.021	11 0	035 I	1 0.206	11 0	035 1				0.028	0.024	11 0	1208 1				0.206	11 0.0	09 11	0.009	11 0.009	TI.	0.009	0.009				U 0.009		
England   Common Comm	Endosulfan II	33213659				0.019	9 U	0.015	U 0.	018 U	0.106	UG	.018 U	0.015	U 0.0	88 U	0.015	J 0.013	UC	0.107 U	0.069	UO	.260 U	0.106	U 0.0	19 U	0.019	U 0.019	U	1.20	0.019	Ü	0.019	U 0.019	U 0.740		0.019 U
Expensive market   1987   1988   19	Endrin	72208				0.022	2 U	0.017	U 0.	.021 U	0.123	UG	.021 U	0.017	U 0.1	02 U	0.017	0.014	UC	0.124 U	0.080	U 0	1.300 U	0.123	U 0.0	27 U	0.027	U 0.430		0.760	0.027	U	0.027	U 0.770	1.90		3.027 U
Experiment   1974   1												UO	.038 U							0.23 U		U 0	1.555 U	0.228													
Exemplement   1974   Wight   Co.53   Co.57																																					
Indiana   Control   Cont							, ,			002				0,000																							
Company   Comp				_	_	0.354	1 U			341 U	2.015	U 0	.337 U				0.274							2.02	U 0.0	09 U			U		U 0.010			U 0.010	U 0.010		
Companies				-	-	0.059	9 0			057 (	0.338	0 0	.057 U				0.046							0.338	U 0.0	13 U			1		0.013			U 0.013	U 0.013		
Figure   Control   Contr				+	+																																
Teach Section   Processing				1	1																																
Chapter   Chap	trans-Nonachier	39765805			_	0.018	3 U	0.014	U 0.	017 U	0.100	U C	.017 U	0.014	U 0.0	83 U	0,014	0.012	U C	0.101	0.065	U O	.244 U	0.100	U 0.0	09 U	0.010	U 0.010	Ü	0.010	0.010	Ü	0.010	U 0.010	U 0.010	U I	0.200 UJ
Change   C	Total Chlordane	SUMCHLOR	ug/kg	0.5	- 6	0.300	U	0.233	U 0.	289 U	1.710	U C	.285 t	0.234	U 1.4	12 U	0.233	0.198	U	1.72 t	1.11	U	4.2 U	1.7	U 1.	4	0.95	1.8		1.8	0.044	U	0.265	1.54	1.04		1.25
Property																																					
Characteristics   Characteri				_	_						0.059																				U 0.015						
Column   C				-	-	0.076			U 0.	.037 L	0.043	UO	.036 L	0.030	U 0.0	36 U	0.030	0.025	UIC	J.044 I	0.028	0 0	1.105 U	0.043	U 0.0	17 U	0.017	U 0.017	U	0.017	0.017	U	0.017	U 0.017	U 0.017		
				-	-	0.129	9 0	0,030	U 0.	060	0.074	U 0	060	0.050	U 0.0	01 0	0.050	0.043	U (	J.074   L	0.048	0 0	1.179 U	0.073	U 0.0	13 [	0.015	U 0.015	10	0.015	0.015	U	0.015	U 0.015	U 0.015		
1.00   1.00					_			0.036	U 0.	068	1 0.082	11 0	067		U 0.0	67 U	0.036		11 0	1.081	0.052			0.082							0.008	11	0.008		U 0.008		
Column   C					_			0.033	J 0	248	1 0.046	U n	038		U 0.0	38 11	0.033		U C	1.046	0.506			0.046							0.009	U	0.010		U 0.009		
PG 1971   PG 1987   PG 1					_																																
Part   115   235984   116									J 0.	.030 t	0.035	U C	.029 t							0.035 1					U 0.0	07 U					U 0.007						
Part   18			ug/kg			0.123	3 U			.059 t	0.070	U C	.059 t						UC	0.357		0	1.170 U								0.006			U 0.006	U 0.006		
Heat   125																																					
Fig. 138   35665282   Jug/lag   0.088   U 0.992   0.055   0.056   0.088   U 0.992   0.057   0.016   U 0.090   U 0.		31508006					5 U	0.571	0.	056 t	0.066	U C	.056 t	0.046	U 0.0	55 U	0.045	0.039		0.067 L	0.590			0.066	U 0.0	11 U		0.011			0.011	U	0.011	U 0.011			
CE   15   3006327		38380073					7 U	0.053	U 0.	.066 L	0.078	U 0	.066 L	0.054	U 0.0	65 U	0.053	0.046		0.079 L	0.051			0.078	U 0.0	05 U		U 0.005			0.005	U	0.005	U 0.005			
REF   170   SSOCKSSS   Mark   Cont				-	-							JO	.042 U												U 0.2	80		0.230	4								
Fig. 189   38665269   19g/kg   0.609   U   0.256   J   0.003   U   0.007   U   0.003   U   0.007   U   0.003   U   0.007   U				-	-							U C	.087 L												U 0.2	0U I'		0.220	4								
Fig. 1848   Sp6-5969   ug/lg   0.075   U 0.015   U 0.02   U 0.027   U 0.015   U 0.02   U 0.027   U 0.006   U 0.006					+		1 0											0.022																			
					_		7 11																														
CE   187   S266/3699   ug/kg   0.099   V   0.213   J   0.048   U   0.059   V   0.077   U   0.089   V   0.077   U   0.089   V   0.077   U   0.089   V   0.078   U   0.078   U				_	_																																
F23 195				_	_															0.057 1																	
PCB 209 2051243 ug/kg 0.151 U 0.059 U 0.073 U 0.073 U 0.073 U 0.073 U 0.075 U		52663782				0.129	Ú	0.050	U 0.	.062 t	0.074	U 0	.062 t	0.051	U 0.0	61 Ü	0.050	J 0.043	UC	0.075 I	0.048	U 0	.180 U	0.074	U 0.0	09 U	0.009	U 0.009			U 0.009	Ü	0.009	U 0.009	U 0.009	U	3.009 U
PCB 209 2051243 ug/kg 0.151 U 0.059 U 0.073 U 0.086 U 0.072 U 0.086 U 0.072 U 0.059 U 0.072 U 0.059 U 0.072 U 0.059 U 0.050 U 0.085 U 0.085 U 0.085 U 0.085 U 0.005 U						0.132	2 U	0.051	U 0.	.064 t	0.075	U 0	.063 t	0.052			0.051		UC	0.076 I	0.049							U 0.011	U			U	0.011	U 0.011	U 0.011		
Total PCBs SumModel 8 Ug/kg 22.7 180 4.02 U 8.34 3.98 2.77 1.92 2.33 3.56 1.56 U 1.33 U 3.95 8.87 5.59 U 2.29 U 1.4 2.1 1.2 0.751 0.326 U 0.326 U 0.326 U 0.331 1.3 0.706			ug/kg													72 U																			U 0.005		
	Total PCBs	SumNOA418	ug/kg	22.7	180	4.02	U	8.34	3	.98	2.77		1.92	2.33	3.5	56	1.56	1.33	U .	3.95	8.87		5.59 U	2.29	U 1.	4	2.1	1.2		0.751	0.326	U	0.326	U 0.831	1.3		3.706

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# Appendix C Tissue Concentrations and BEST Model Output

## TABLE C-1 STATISTICAL COMPARISONS OF N. virens BODY BURDENS VS. IOSN 2019 REFERENCE DATA

Compound	Units	Pre-Test <sup>d</sup> Mean Qual	IOSN 2019 Mean Qual	Composite Mean Qual
Trace Metals		`	ì	`
Arsenic, total	mg/Kg	2.00	2.25	2.02 NS
Cadmium, total	mg/Kg	0.0300 b	0.0252 b	0.0338 bS
Chromium, total	mg/Kg	0.620 в	0.0686 Ь	0.551 bS
Copper, total	mg/Kg	1.49	1.20	1.12 NS
Lead, total	mg/Kg mg/Kg	0.195 0.0110 b	0.0744 0.0156 b	0.191 S 0.00662 abNS
Mercury, total Nickel, total	mg/Kg	0.476	0.168	0.0002 abNS 0.232 S
Zinc, total	mg/Kg	13.1	18.6	14.1 NS/S e
PAH Compounds				
Acenaphthene	μg/Kg	0.620 a	0.563 ab	0.883 abNS
Acenaphthylene	μg/Kg	0.381 a	0.286 a	4.22 aNS
Anthracene Benzo(a)anthracene	μg/Kg μg/Kg	0.903 ab 0.775 a	0.310 a 0.581 a	0.610 abS 0.766 ac
Benzo(a)pyrene	μg/Kg μg/Kg	0.813 a	0.610 a	0.805 ac
Benzo(b)fluoranthene	μg/Kg	1.08 a	0.807 a	2.43 aS
Benzo(k)fluoranthene	μg/Kg	0.493 a	0.371 a	6.45 aS
Benzo(g,h,i)perylene	μg/Kg	0.345 a	0.259 a	0.427 abS
Chrysene	μg/Kg	0.752 a	0.564 a	1.14 abS
Dibenz(a,h)anthracene	μg/Kg	0.400 a	0.300 a	0.396 ac
Fluoranthene	μg/Kg	0.610 a	0.569 ab	6.71 bS
Fluorene Indeno(1,2,3-ed)pyrene	μg/Kg	1.07 b 0.810 a	0.431 ab 0.608 a	2.05 bS 0.802 ac
Naphthalene	μg/Kg μg/Kg	1.64 b	0.651 ab	1.60 abS
Phenanthrene	μg/Kg	0.677 a	2.04 b	0.861 abNS
Pyrene	μg/Kg	0.898 a	0.674 a	6.23 bS
Total PAHs	μg/Kg	12.3	9.63	36.4
PCB Congeners				
PCB 008 PCB 018	μg/Kg	0.0638 a 0.0465 a	0.0480 a 0.0349 a	0.0632 ac 0.0460 ac
PCB 018 PCB 028	μg/Kg μg/Kg	0.0463 a 0.0790 a	0.0549 a 0.0593 a	0.0460 ac 0.0784 ac
PCB 044	μg/Kg μg/Kg	0.0880 a	0.0661 a	0.0873 ac
PCB 052	μg/Kg	0.0491 a	0.0369 a	0.136 abS
PCB 066	μg/Kg	0.0462 a	0.0347 a	0.0457 ac
PCB 101	μg/Kg	0.0752 a	0.0564 a	0.0745 ac
PCB 105	μg/Kg	0.0675 a	0.0506 a	0.810 aS
PCB 118	μg/Kg	0.0713 a	0.0534 a	0.0706 ac
PCB 128 PCB 138	μg/Kg	0.0842 a 0.305 ab	0.0632 a 0.331 ab	0.0834 ac 0.462 aNS
PCB 153	μg/Kg μg/Kg	0.628 b	0.763	0.462 aNS 0.857 aNS
PCB 170	μg/Kg μg/Kg	0.0413 a	0.0310 a	0.0409 ac
PCB 180	μg/Kg	0.0423 a	0.0318 a	0.0419 ac
PCB 187	μg/Kg	0.256 a	0.0456 a	0.0601 ac
PCB 195	μg/Kg	0.0795 a	0.0596 a	0.0786 ac
PCB 206	μg/Kg	0.0810 a	0.0608 a	0.0802 ac
PCB 209 Total PCBs	μg/Kg	0.0928 a 4.39	0.0697 a 3.79	0.0920 ac 6.42
	μg/Kg	4.39	3.19	0.42
Pesticides Aldrin	μα/V α	0.0404 a	0.0605 a	0.0400 ac
cis-Chlordane	μg/Kg μg/Kg	0.0404 a 0.0870 a	0.0003 a 0.131 a	0.0400 ac 0.0863 ac
trans-Chlordane	μg/Kg	0.0245 a	0.0369 a	0.0243 ac
cis-Nonachlor	μg/Kg	0.0117 a	0.0176 a	0.0116 ac
trans-Nonachlor	μg/Kg	0.0108 a	0.0161 a	0.0106 ac
Oxychlordane	μg/Kg	0.0501 a	0.0752 a	0.0495 ac
Total Chlordanes	μg/Kg	0.184	0.277	0.182
4,4'-DDT	μg/Kg	0.0159 a	0.0238 a	0.0158 ac
4,4'-DDD 4,4'-DDE	μg/Kg μg/Kg	3.29 ab 0.00737 a	0.0182 a 0.0111 a	0.665 S 0.00728 ac
Total DDT	μg/Kg μg/Kg	3.32	0.0531	0.688
Dieldrin	μg/Kg μg/Kg	0.0243 a	0.0365 a	0.0241 ac
alpha-Endosulfan	μg/Kg	0.0222 a	0.0334 a	0.0220 ac
beta-Endosulfan	μg/Kg	0.0115 a	0.0173 a	0.0113 ac
Total Endosulfans	μg/Kg	0.0337	0.0507	0.0333
Endrin	μg/Kg	0.0132 a	0.0199 a	0.0131 ac
Heptachlor	μg/Kg	0.0253 a	0.0379 a	0.0250 ac
Heptachlor epoxide Hexachlorobenzene	μg/Kg μg/Kg	0.0520 a 0.217 a	0.0780 a 0.326 a	0.0515 ac 0.215 ac
Lindane (gamma-BHC)	μg/Kg μg/Kg	0.0365 a	0.326 a 0.0548 a	0.215 ac 0.0361 ac
Methoxychlor	μg/Kg μg/Kg	0.0575 a	0.843 a	0.0568 ac
Toxaphene	μg/Kg	1.05 a	1.58 a	1.04 ac
		-	-	-

#### Notes

Mean concentrations are reported to 3 significant figures.

a = COC not detected (below MDL) in at least one replicate; mean value was calculated using one-half of the project specific MDL for non-detected values.

b = COC concentration estimated (detected below RL but above MDL) in at least one replicate; mean value calculated using estimated value.

c = COC was not detected in either the dredge tissue replicates or in the historic reference tissue, therefore was eliminated from further evaluation.

<sup>&</sup>lt;sup>d</sup> Pre-test tissue represents the mean of three replicates, whereas the reference and site composites represent a mean of 5 replicates.

<sup>&</sup>lt;sup>e</sup> Analysis conducted after removal of a statistical outlier.

## TABLE C-2 STATISTICAL COMPARISONS OF *M. nasuta* BODY BURDENS VS. IOSN 2019 REFERENCE DATA

Compound	Units	Pre-Test <sup>d</sup> Mean Qual	IOSN 2019 Mean Qual	Composite Mean Qual
Trace Metals			,	,
Arsenic, total	mg/Kg	2.59	3.49	2.54 NS
Cadmium, total	mg/Kg	0.0297 b	0.0290 Ь	0.0266 bNS
Chromium, total	mg/Kg	0.465	0.334 b	0.434 bNS
Copper, total	mg/Kg mg/Kg	3.10 0.129	1.77 0.349	2.71 S 0.452 S
Lead, total Mercury, total	mg/Kg mg/Kg	0.00185 a	0.00170 a	0.432 S 0.00208 ac
Nickel, total	mg/Kg	0.713	0.521	0.570 NS/S <sup>c</sup>
Zinc, total	mg/Kg	11.6	11.8	12.8 NS
PAH Compounds				
Acenaphthene	μg/Kg	1.07 ab	0.453 a	1.56 abNS
Acenaphthylene	μg/Kg	0.378 a	0.279 a	0.381 ac
Anthracene Benzo(a)anthracene	μg/Kg μg/Kg	0.853 ab 1.32 ab	0.302 a 0.565 a	2.69 bS 5.40 bS
Benzo(a)pyrene	μg/Kg	0.805 a	0.594 a	1.74 abS
Benzo(b)fluoranthene	μg/Kg	1.07 a	0.786 a	4.41 bS
Benzo(k)fluoranthene	μg/Kg	0.490 a	0.455 ab	1.25 abS
Benzo(g,h,i)perylene	μg/Kg	0.342 a	0.518 ab	0.820 abNS
Chrysene	μg/Kg	2.01 b	0.550 a	2.92 bS
Dibenz(a,h)anthracene Fluoranthene	μg/Kg α/V.α	0.559 ab 2.57 b	2.97 b 2.12 b	0.400 aNS 26.6 S
Fluorene	μg/Kg μg/Kg	2.11 b	0.253 a	1.74 bS
Indeno(1,2,3-cd)pyrene	μg/Kg	0.803 a	3.54 b	0.985 abNS
Naphthalene	μg/Kg	3.78 b	0.390 a	1.77 bS
Phenanthrene	μg/Kg	4.09 b	1.97 b	6.92 bS
Pyrene	μg/Kg	2.86 b	1.63 b	20.8 S
Total PAHs	μg/Kg	25.1	17.4	80.4
PCB Congeners				
PCB 008	μg/Kg	0.0633 a	0.0467 a	0.0639 ac
PCB 018	μg/Kg	0.0461 a	0.0340 a	0.0465 ac
PCB 028	μg/Kg	0.0783 a	0.0578 a	0.0791 ac 0.0883 ac
PCB 044 PCB 052	μg/Kg μg/Kg	0.0873 a 2.09	0.0644 a 0.0359 a	0.0883 ac 0.172 aS
PCB 066	μg/Kg μg/Kg	0.0457 a	0.0339 a 0.0338 a	0.172 as 0.0462 ac
PCB 101	μg/Kg μg/Kg	0.0745 a	0.0550 a	0.0754 ac
PCB 105	μg/Kg	0.0668 a	0.0493 a	0.0675 ac
PCB 118	μg/Kg	0.0708 a	0.0522 a	0.142 abS
PCB 128	μg/Kg	0.0835 a	0.0616 a	0.0843 ac
PCB 138	μg/Kg	0.392 a	0.0394 a	0.0539 ac
PCB 153 PCB 170	μg/Kg α/V.α	0.111 a 0.0410 a	0.0820 a 0.0303 a	0.142 abS 0.0414 ac
PCB 170	μg/Kg μg/Kg	0.0410 a 0.0419 a	0.0309 a	0.0414 ac 0.0423 ac
PCB 187	μg/Kg	0.0603 a	0.0445 a	0.0607 ac
PCB 195	μg/Kg	0.0787 a	0.0580 a	0.0794 ac
PCB 206	μg/Kg	0.0803 a	0.0594 a	0.0810 ac
PCB 209	μg/Kg	0.0920 a	0.0680 a	0.0929 ac
Total PCBs	μg/Kg	7.22	1.81	2.92
Pesticides				
Aldrin	μg/Kg	0.0200 a	0.0296 a	0.0202 ac
cis-Chlordane	μg/Kg	0.0432 a	0.0638 a	0.0436 ac
trans-Chlordane cis-Nonachlor	μg/Kg	0.0122 a 0.00582 a	0.0180 a 0.00870 a	0.0123 ac 0.00587 ac
trans-Nonachlor	μg/Kg μg/Kg	0.00582 a 0.00533 a	0.00870 a 0.00780 a	0.00538 ac
Oxychlordane	μg/Kg μg/Kg	0.0248 a	0.0366 a	0.0250 ac
Total Chlordanes	μg/Kg	0.0913	0.135	0.0922
4,4'-DDT	μg/Kg	0.00788 a	0.0117 a	0.00796 ac
4,4'-DDD	μg/Kg	0.00598 a	0.00880 a	0.391 S
4,4'-DDE	μg/Kg	0.00365 a	0.219 Ь	0.499 S
Total DDT	μg/Kg	0.0175	0.240	0.898
Dieldrin alpha-Endosulfan	μg/Kg μg/Kg	0.0121 a 0.0110 a	0.0178 a 0.0163 a	0.0122 ac 0.0111 ac
beta-Endosulfan	μg/Kg μg/Kg	0.00568 a	0.00840 a	0.00573 ac
Total Endosulfans	μg/Kg μg/Kg	0.0167	0.0247	0.0168
Endrin	μg/Kg	0.00653 a	0.00970 a	0.00662 ac
Heptachlor	$\mu g/Kg$	0.0125 a	0.0186 a	0.0127 ac
Heptachlor epoxide	μg/Kg	0.0257 a	0.0381 a	0.0260 ac
Hexachlorobenzene	μg/Kg	0.108 a	0.159 a	0.109 ac
Lindane (gamma-BHC) Methoxychlor	μg/Kg ug/Kg	0.0181 a 0.0285 a	0.0267 a 0.411 a	0.0183 ac 0.0287 ac
Toxaphene	μg/Kg μg/Kg	0.0283 a 0.518 a	0.411 a 0.767 a	0.0287 ac 0.524 ac
2piteite	MP/17E	1 0.5.5 %		1 0.52. 40

#### Notes:

Mean concentrations are reported to 3 significant figures.

NS = Not Significant - mean tissue body burden was not statistically different from the associated reference site mean body burden. Statistical significance accepted at  $\alpha$ =0.05. S = Significant - mean tissue body burden was statistically different, greater than the associated reference site mean body burden. Statistical significance accepted at  $\alpha$ =0.05.

a = COC not detected (below MDL) in at least one replicate; mean value was calculated using one-half of the project specific MDL for non-detected values.

b = COC concentration estimated (detected below RL but above MDL) in at least one replicate; mean value calculated using estimated value.

c = COC was not detected in either the dredge tissue replicates or in the historic reference tissue, therefore was eliminated from further evaluation.

 $<sup>^{\</sup>rm d}$  Pre-test tissue represents the mean of three replicates, whereas the reference and site composites represent a mean of 5 replicates.

<sup>&</sup>lt;sup>e</sup> Analysis conducted after removal of a statistical outlier.

## **BRAMS**

Project name: Yachtsman Marina, Kennebunkport, ME

**Project number:** 

Model filename: EPA Reg 1 Template wChemical List.best

Chemical filename: Chemical\_List\_for\_EPA\_Reg1\_template (in progress).xlsx

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#### **Human Subreport**

Human: Adult Angler

Total Estimated Risks From Organics(see EPA Table Xa)

Receptor: Adult Angler
Organism: Macoma nasuta

		Cancer Risk	Non-Cancer Risk
Composite (10 Stations at		Fish	n Fillet
	Test	6.01E-6	3.72E-2
	Reference	1.66E-6	1.74E-2
		Nerei	s virens
	Test	0	0
	Reference	0	0
		Macon	na nasuta
	Test	6.23E-6	3.84E-2
	Reference	1.72E-6	1.8E-2
		Total	Lobster
	Test	3.1E-5	1.92E-1
	Reference	8.57E-6	9E-2

	Cancer Risk	Non-Cancer Risk
	Lobster He	patopancreas
Test	2.14E-5	1.33E-1
Reference	5.91E-6	6.21E-2
	Lobste	er Muscle
Test	9.62E-6	5.96E-2
Reference	2.66E-6	2.79E-2

## Total Estimated Risks From Organics(see EPA Table Xa)

Receptor: Adult Angler
Organism: Nereis virens

		Cancer Risk	Non-Cancer Risk						
Composite (10 Stations at		Fish Fillet							
	Test	5.09E-6	8.9E-2						
	Reference	1.63E-6	3.72E-2						
		Nerei	s virens						
	Test	6.12E-6	1.08E-1						
	Reference	1.97E-6	4.51E-2						
		Macon	na nasuta						
	Test	0	0						
	Reference	0	0						
		Total	Lobster						
	Test	2.63E-5	4.59E-1						
	Reference	8.39E-6	1.92E-1						
		Lobster He	patopancreas						
	Test	1.81E-5	3.17E-1						
	Reference	5.79E-6	1.32E-1						
		Lobste	er Muscle						
	Test	8.14E-6	1.42E-1						
	Reference	2.6E-6	5.95E-2						

## Seafood Non-Cancer Risks (see EPA Table 6a, Columns F & G)

Receptor: Adult Angler
Organism: Macoma nasuta

			Non-Cancer Risk
Composite (10 Stations at	Connor	Test	0
4 Marinas Mud)	Copper	Reference	0
	Lood	Test	0
	Lead	Reference	0
	Niekol	Test	0
	Nickel	Reference	0

## Seafood Non-Cancer Risks (see EPA Table 6a, Columns F & G)

Receptor: Adult Angler
Organism: Nereis virens

			Non-Cancer Risk
Composite (10 Stations at	Cadmium	Test	2.9E-3
4 Marinas Mud)	Cadmium	Reference	2.16E-3
	Chromium	Test	1.57E-2
	Chromium	Reference	1.96E-3
	Load	Test	0
	Lead	Reference	0
	Niekol	Test	0
	Nickel	Reference	0
	7in o	Test	4.02E-3
	Zinc	Reference	5.31E-3

### FDA Action Limit/Tolerance (see EPA Table 3, Columns D & E)

Receptor: Adult AnglerOrganism: Macoma nasuta

	Contaminant	FDA Action Level (mg/kg)	Steady State Corrected Mean Tissue Concentration (mg/kg)
Composite (10 Stations	Total PCBs	2E3	6.47E0
Composite (10 Stations	Mercury	1E0	2.08E-3
Composite (10 Stations	Total DDT	5E3	1.56E0
Composite (10 Stations	Total Chlordanes	3E2	1.53E-1

### FDA Action Limit/Tolerance (see EPA Table 3, Columns D & E)

Receptor: Adult Angler
Organism: Nereis virens

	Contaminant	FDA Action Level (mg/kg)	Steady State Corrected Mean Tissue Concentration (mg/kg)
Composite (10 Stations	Total PCBs	2E3	1.42E1
Composite (10 Stations	Mercury	1E0	6.62E-3
Composite (10 Stations	Total DDT	5E3	1.36E0
Composite (10 Stations	Total Chlordanes	3E2	3.04E-1

Ecological Effects Level (see EPA Table 8a.1, Columns D & E)

Receptor: Adult Angler
Organism: Macoma nasuta

	Contaminant	Ecological Effect Level (mg/kg)	Steady State Corrected Mean Tissue Concentration (mg/kg)
Composite (10 Stations	Anthracene	3.75E3	2.69E0
Composite (10 Stations	Benzo(a)pyrene	8E3	3.47E0
Composite (10 Stations	PAH Total	1E4	8.04E1
Composite (10 Stations	Total PCBs	4E3	6.47E0
Composite (10 Stations	Aldrin	2.99E2	2.02E-2
Composite (10 Stations	Dieldrin	4.37E0	1.64E-2
Composite (10 Stations	Endosulfans	2.86E0	1.69E-2
Composite (10 Stations	Arsenic	1.26E1	2.54E0
Composite (10 Stations	Cadmium	3.03E0	2.66E-2
Composite (10 Stations	Chromium	1.18E1	4.34E-1
Composite (10 Stations	Copper	9.6E0	2.71E0
Composite (10 Stations	Lead	1.19E1	4.52E-1
Composite (10 Stations	Mercury	2E-1	2.08E-3
Composite (10 Stations	Nickel	3.8E0	5.7E-1
Composite (10 Stations	Zinc	1.52E3	1.28E1
Composite (10 Stations	Total DDT	3E3	1.56E0

### Ecological Effects Level (see EPA Table 8a.1, Columns D & E)

Receptor: Adult Angler
Organism: Nereis virens

	Contaminant	Ecological Effect Level (mg/kg)	Steady State Corrected Mean Tissue Concentration (mg/kg)
Composite (10 Stations	Anthracene	3.75E3	6.1E-1
Composite (10 Stations	Benzo(a)pyrene	8E3	1.61E0
Composite (10 Stations	PAH Total	1E4	3.64E1
Composite (10 Stations	Total PCBs	4E3	1.42E1
Composite (10 Stations	Aldrin	2.99E2	4E-2
Composite (10 Stations	Dieldrin	4.37E0	3.25E-2
Composite (10 Stations	Endosulfans	2.86E0	3.33E-2
Composite (10 Stations	Arsenic	1.26E1	2.02E0
Composite (10 Stations	Cadmium	3.03E0	3.38E-2
Composite (10 Stations	Chromium	1.18E1	5.51E-1
Composite (10 Stations	Copper	9.6E0	1.12E0
Composite (10 Stations	Lead	1.19E1	1.91E-1
Composite (10 Stations	Mercury	2E-1	6.62E-3
Composite (10 Stations	Nickel	3.8E0	2.32E-1
Composite (10 Stations	Zinc	1.52E3	1.41E1
Composite (10 Stations	Total DDT	3E3	1.36E0

### FDA Level of Concern (see EPA Table 7a, Columns B & D)

Receptor: Adult Angler
Organism: Macoma nasuta

	Contaminant	FDA Level of Concern(mg/kg)	Steady State Corrected Mean Tissue Concentration (mg/kg)
Composite (10 Stations	Arsenic	8.6E1	2.54E0
Composite (10 Stations	Cadmium	3.7E0	2.66E-2
Composite (10 Stations	Chromium	1.3E1	4.34E-1
Composite (10 Stations	Lead	1.7E0	4.52E-1
Composite (10 Stations	Nickel	8E1	5.7E-1

### FDA Level of Concern (see EPA Table 7a, Columns B & D)

Receptor: Adult Angler
Organism: Nereis virens

	Contaminant	FDA Level of Concern(mg/kg)	Steady State Corrected Mean Tissue Concentration (mg/kg)
Composite (10 Stations	Arsenic	8.6E1	2.02E0
Composite (10 Stations	Cadmium	3.7E0	3.38E-2
Composite (10 Stations	Chromium	1.3E1	5.51E-1
Composite (10 Stations	Lead	1.7E0	1.91E-1
Composite (10 Stations	Nickel	8E1	2.32E-1

### **Selected Chemicals**

### **Invertebrate Name**

Macoma nasuta

	Composite (10
118	X
153	X
4,4'-DDD	Х
4,4'-DDE	Х
Anthracene	X
Benzo(a)anthracene	Х
Benzo(a)pyrene	X
Benzo(b)fluoranthene	X
Benzo(k)fluoranthene	X
Chrysene	X
Fluoranthene	Х
Fluorene	X
Naphthalene	X
PAH Total	X
Phenanthrene	X
Pyrene	X
Total DDT	Х
Total PCBs	Х
Copper	Х
Lead	Х
Nickel	Х

	Composite (10
105	Х
4,4'-DDD	Х
52	Х
Anthracene	X
Benzo(b)fluoranthene	Χ
Benzo(g,h,i)perylene	Χ
Benzo(k)fluoranthene	X
Chrysene	X
Fluoranthene	X
Fluorene	X
Naphthalene	X
PAH Total	X
Pyrene	X
Total DDT	X
Total PCBs	X
Cadmium	X
Chromium	X
Lead	X
Nickel	Х
Zinc	X

Software version: BRAMS 4.0 Last date: 11/28/2023

User name: \*

# Appendix D Elutriate Chemistry Results

Kennebunkport River Projects			ME WQC	Elutriate Average	Q	Site Water Average	Q	Lab Water Average	Q
Parameter	CAS Number	Units							
Metals									
Arsenic	7440382	ug/L	69	3.67		1.22		0.140	U
Cadmium	7440439	ug/L	33	0.295	U	0.30	U	0.295	U
Hexavalent Chromium	18540299	ug/L	1108	1.50	U	1.50	U	1.50	U
Copper	7440508	ug/L	5.78	1.92	U	1.92	U	1.92	U
Lead	7439921	ug/L	221	1.72	U	1.72	U	1.72	U
Mercury	7439976	ug/L	2.1	0.010	U	0.010	U	0.010	U
Nickel	7440020	ug/L	75	2.78	U	2.78	U	2.78	U
Selenium	7782492	ug/L	291	0.115	*	0.065	Ū	0.560	U
Silver	7440224	ug/L	2.24	0.815	U	0.82	U	0.815	U
Zinc	7440666	ug/L	95	17.1	U	17.1	U	17.1	U
Industrial Chemicals	1110000	<u> </u>	, ,	2112		2772		2772	
Pentachlorophenol	87865	ug/L	13	0.290	U	0.224	U	0.222	U
Pesticides	0.000	~6/ 12	10	5.250	Ť	0.221	Ť	0.222	Ť
4,4`-DDT	50293	ug/L	0.13	0.00012	U	0.00008	U	0.00008	U
Aldrin	309002	ug/L ug/L	1.3	0.00012	U	0.00016	U	0.00016	U
Alpha-Chlordane (cis)	5103719	ug/L	1.0	0.00023	U	0.00008	U	0.00008	U
Dieldrin	60571	ug/L	0.71	0.000011	U	0.00004	U	0.00004	U
Chlorpyrifos	2921882	ug/L ug/L	0.011*	0.00001	U	0.00004	U	0.00004	U
Endosulfan I	959988	ug/L ug/L	0.034	0.00011	U	0.00008	U	0.00008	U
Endosulfan II	33213659		0.034	0.00011	U	0.00003	U	0.00003	U
Endosulari ii Endrin	72208	ug/L	0.034	0.00010	U	0.00007	U	0.00007	U
	5103742	ug/L	0.037	0.00012	U	0.00008	U	0.00008	U
Gamma-Chlordane (trans)		ug/L	0.052		U		U		U
Heptachlor	76448	ug/L	0.053	0.00008		0.00006		0.00006	_
Heptachlor epoxide	1024573	ug/L	0.053	0.00010	U	0.00007	U	0.00007	U
Lindane	58899	ug/L	0.16	0.00007	U	0.00005	U	0.00005	U
Toxaphene	8001352	ug/L	0.21	0.00365	U	0.00257	U	0.00257	U
Chlordane (alpha + gamma)	SUMCHLOR	ug/L	0.09	0.00016	U	0.00011	U	0.00011	U
PCBs	24002407			0.00010		0.00007		0.00007	
PCB 008	34883437	ug/L		0.00010	U	0.00007	U	0.00007	U
PCB 018	37680652	ug/L		0.00013	U	0.00009	U	0.00009	U
PCB 028	7012375	ug/L		0.00013	U	0.00009	U	0.00009	U
PCB 044	41464395	ug/L		0.00008	U	0.00006	U	0.00006	U
(PCB 049)	41464408	ug/L		0.00028	J	0.00005	U	0.00005	U
PCB 052	35693993	ug/L		0.00037	J	0.00005	U	0.00005	U
PCB 066	32598100	ug/L		0.00010	U	0.00007	U	0.00007	U
(PCB 087)	38380028	ug/L		0.00013	U	0.00009	U	0.00009	U
PCB 101	37680732	ug/L		0.00016	U	0.00011	U	0.00011	U
PCB 105	32598144	ug/L		0.00011	U	0.00008	U	0.00008	U
PCB 118	31508006	ug/L		0.00009	U	0.00006	U	0.00006	U
PCB 128	38380073	ug/L		0.00011	U	0.00008	U	0.00008	U
PCB 138	35065282	ug/L		0.00008	U	0.00005	U	0.00005	U
PCB 153	35065271	ug/L		0.00009	*	0.00004	U	0.00004	U
PCB 170	35065306	ug/L		0.00012	U	0.00008	U	0.00008	U
PCB 180	35065293	ug/L		0.00010	U	0.00007	U	0.00007	U
(PCB 183)	52663691	ug/L		0.00011	U	0.00007	U	0.00007	U
(PCB 184)	74472483	ug/L		0.00010	U	0.00007	U	0.00007	U
PCB 187	52663680	ug/L		0.00007	U	0.00005	U	0.00005	U
PCB 195	52663782	ug/L		0.00006	U	0.00004	U	0.00004	U
PCB 206	40186729	ug/L		0.00013	U	0.00009	U	0.00009	U
PCB 209	2051243	ug/L		0.00006	U	0.00004	U	0.00004	U
Total PCBs	SumNOAA18	ug/L	0.03	0.00416		0.00243	U	0.00243	U
Notes	i '				•		•		•

Notes

Non-detects are reported as 1/2 the MDL

Half the MDL was used for U-qualified values to calculate summary and average values

Yellow=exceedance of water quality criteria

Total PCBs were calculated using the NOAA 18 method

Total PCB WQC is for chronic exposure as no acute exposure value available

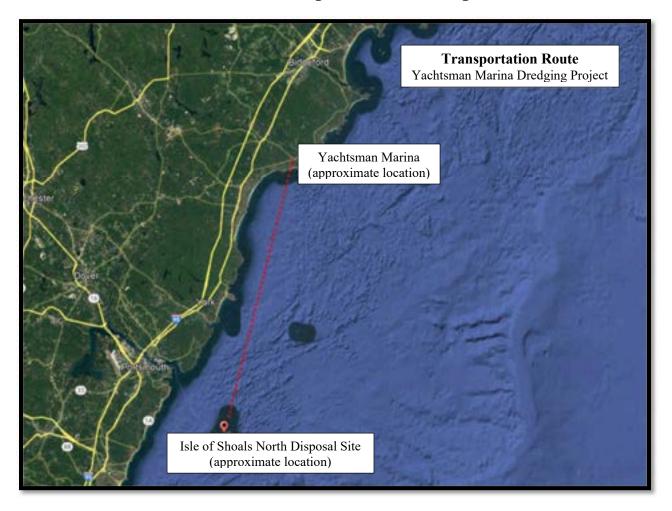
U: Compound was analyzed for but was not detected (non-detect)

J: Indicates an estimated value

<sup>\*</sup> indicates average includes detects and non-detects

# Attachment 15: Disposal Site Transportation Route

### 15.0 Isle of Shoals North Disposal Site Transportation Route



<u>Location</u>: The Isle of Shoals North (IOSN) Disposal Site is located in the Gulf of Maine, approximately 20 km (10.8 nmi) east of Portsmouth, New Hampshire, 17.7 km (9.55 nmi) southeast of Kittery, Maine, and 11.2 km (6.04 nmi) north of Eastern Island, the closest within the Isle of Shoals. The site is defined as a 2,600 m (8,530 ft) diameter circle on the seafloor with its center located at 70° 26.995' W and 43° 1.142' N.

<u>Route:</u> From the Yachtsman Marina, navigate in a southerly direction towards the mouth of the Kennebunk River, then in a southwestern direction through the Gulf of Maine to the IOSN Disposal Site. The total transportation route distance from the Kennebunkport Marina to the IOSN Disposal Site is 23 nautical miles.

<u>Estimated Number of Trips to IOSN:</u> The estimated quantity of dredge material expected to be removed from the Yachtsman Marina is 6,400 cubic yards. It is estimated that the dredge scow that will be used to transport sediment to the IOSN Disposal Site will have between 500 and 600 cubic yards of capacity, which would result in 11 to 13 trips to the IOSN Disposal Site.

**Attachment 16:** 

**Notice to Fisherman** 

### 16.0 Notice to Fisherman

A notice to inform fishermen of the proposed route for transportation the dredged material will be published and appear in a newspaper of general circulation in the area of the route:

#### NOTICE TO FISHERMAN

The Yachtsman Marina proposes to dredge approximately 61,000 square feet (1.4 acres) of the Kennebunk River located offshore and west of the club. The proposed dredge depth will be -6.0, with about one foot of over-dig, with the total volume of proposed dredging to be 6,400 cubic yards of sediment. The dredge will take place in and around the boat slips and is for maintenance and navigational safety.

Dredging of sediment will be completed by mechanical methods using a barge mounted excavator or crane with a clamshell bucket. Sediment will be loaded onto a scow barge and transported to the Isle of Shoals North Disposal Site (IOSN). The IOSN is located approximately 15 nautical miles east of Portsmouth, New Hampshire, in the Gulf of Maine. The suitability determination of the dredge spoils has been approved by the Army Corp of Engineers for open water disposal to the IOSN.

This operation would coincide with neighboring marinas performing dredging at the same approximate time. Dredging activity will occur between November and April in any given year.

## Appendix A:

**MDEP Visual Evaluation Field Survey Checklist** 

# APPENDIX A: MDEP VISUAL EVALUATION FIELD SURVEY CHECKLIST

(Natural Resources Protection Act, 38 M.R.S. §§ 480 A - Z)

Name of applicant: KPT Marine, LLC (c/o Shawn Dumas) Phon	<sub>ie:</sub> 207-59	0-1658	
Application Type: NRPA Individual Permit			
Activity Type: (brief activity description) Dredging approximately	6,400 cy of m	aterial	
Activity Location: Town: Kennebunkport County:	⁄ork		
GIS Coordinates, if known: UTM: 4801524.69 m N, 19 T	380503.11	1 m E	
Date of Survey: 10/17/2024 Observer: Michael N. Walsh	Pł	none: 207 553-98	98
		Between the Propo and Resource (in M	
1. Would the activity be visible from:	0-1/4	1/4-1	1+
A. A National Natural Landmark or other outstanding natural feature?			X
B. A State or National Wildlife Refuge, Sanctuary, or Preserve or a State Game Refuge?			X
C. A state or federal trail?			X
D. A public site or structure listed on the National Register of Historic Places?			×
E. A National or State Park?			X
F. 1) A municipal park or public open space?	×		
2) A publicly owned land visited, in part, for the use, observation, enjoyment and appreciation of natural or man-made visual qualities?	×		
3) A public resource, such as the Atlantic Ocean, a great pond or a navigable river?	×		
2. What is the closest estimated distance to a similar activity?	<b>X</b>		
3. What is the closest distance to a public facility intended for a similar use?		X	
<ul><li>4. Is the visibility of the activity seasonal?</li><li>(i.e., screened by summer foliage, but visible during other</li></ul>	· seasons)	□Yes	X∣No
5. Are any of the resources checked in question 1 used by the during the time of year during which the activity will be v		X Yes	$\Box$ No

## Appendix B:

**MDEP Coastal Wetland Field Survey Checklist** 

#### **APPENDIX B**

### MAINE'S COASTAL WETLANDS: COASTAL WETLAND CHARACTERIZATION GUIDELINES

(Partly derived from Maine's Coastal Wetlands: Volume II)

Guidelines for the sampling and assessment of coastal wetlands have been developed by the Department of Environmental Protection to standardize habitat characterizations and functional assessments of coastal wetlands as required by the Natural Resources Protection Act (NRPA). The NRPA requires all applicants to characterize coastal wetland areas occurring in the location or vicinity of a proposed activity. Intertidal and/or subtidal characterizations are required for the following activities: fill, crib-supported or subtidal piers, lobster pounds, shoreline stabilization, or dredging. Activities impacting over 500 square feet of coastal wetland require a functional assessment performed by a professional wetland scientist unless the Department determines that the activity will have minimal adverse impact on the functions and values of the wetland.

This checklist satisfies the requirement for Attachment 12, Wetland Delineation Report, described in Part II of the NRPA application for coastal wetlands located only in intertidal areas and subtidal areas less than one foot in depth. The checklist is required for all activities impacting coastal wetlands to provide information describing coastal habitats and assess their most critical functions and values with the least amount of sampling effort possible, providing DEP licensing staff and biologists with information. The information provided will be used to determine whether the Department will require further sampling and assessment. This checklist does not substitute for any other NRPA application requirements.

#### **SURVEY METHODS:**

Following the methods below, survey and photograph the activity area on an ebb tide.

- 1. Walk throughout the activity area and note the location and measurements of all dominant habitat types. If not part of an application, complete an overhead drawing of the activity area. The overhead drawing should include the location and types of vegetation, boundaries of habitat types, sample locations, the location of spring high tide, mean high water and mean low water, and contours, if possible.
- 2. Take photographs of activity area and habitat types. (Include date, time, tide cycle and location of each photograph).
- 3. Search throughout the entire activity site, turning over rocks, wood, and algal mats, and look for any identifiable organisms present on the surface of the habitat, list the organisms found if known, and estimate their relative abundance. Complete the Checklist.
- 4. Using a clam rake or shovel, turn over sediments at random locations throughout the intertidal zone (at least one per zone, high, mid and low). Look for any identifiable organisms present in the sediments and estimate their relative abundance. Mark location on overhead drawing. Complete the Checklist.

<u>PLEASE NOTE</u>: Some activities may require quantitative benthic analysis of the sediments. Examples of such activities include dredges, lobster pounds, and fill activities consisting of over 500 square feet. Determination of sampling requirements may be made through consultation with DEP licensing staff and biologists. Guidelines for quantitative benthic sampling can be provided on request.

#### **DEFINITIONS:**

### **Area of Impact:**

<u>Direct Impact</u>: The footprint of a proposed activity; e.g. area of dredge, area covered by cribs, base of riprap.

<u>Indirect Impact</u>: The area surrounding a proposed activity that will potentially be affected by the activity; e.g. shoreline adjacent to riprap, salt marsh areas, shaded areas. NOTE: The area of indirect impact will vary from site to site and should be determined on a case by case basis by the consultant, the applicant, and DEP staff.

(pink)

**Timing of Survey Work:** The date, time of day, and tidal height of sampling. Ideally, surveys should be conducted between May 1 and November 30 on an ebb or flood tide. Surveys may be conducted at other times of year, if necessary. Include the timing of low tide on the survey date. If the activity will extend into the low intertidal and/or shallow subtidal, the survey should be conducted on a negative or zero tide.

### **Energy Levels:**

<u>Exposed/High energy</u>: Area exposed to oceanic swell and wind waves. Wind fetch (i.e. direction of origin) unlimited. Water velocity exceeds 2 meters/second.

<u>Partially exposed/Moderate energy</u>: Oceanic swell attenuated by offshore reefs, islands, or headlands, but shoreline is substantially exposed to wind waves. Typical of cobble or gravel fields. Water velocity between 1 and 2 meters/second.

<u>Semi-protected/Low energy</u>: Shoreline protected from sea swell, but it may receive waves generated by moderate fetch. Typical of gravel or unconsolidated muddy sediments. Water velocity less than 1 meter/second.

<u>Protected/Low energy</u>: No sea swell, little or no current, and restricted wind. Typical of unconsolidated muddy sediments. Water velocity less than 1 meter/second.

**Drainage on Intertidal Flats:** The amount of water left on intertidal area after ebb tide.

**Habitats:** description of activity site and adjacent areas

Sand Beach: exposed environments containing at least 75% sand.

Boulder/cobble Beach: exposed environments dominated by boulders and/or loose rounded rocks.

Sand Flat: protected and semi-protected environment dominated by sandy sediment.

<u>Mixed Coarse & Fines</u>: semi-protected environment consisting of a mixture of rocks, boulders, gravel, sand, cobbles, and mud.

Rocky Shore: semi-protected to moderate consisting of rocks, boulders, or ledge.

Salt Marsh: persistent near shore emergent grass habitats.

Ledge: stable bedrock

Mud Flat: protected environments containing at least 75% mud

Eelgrass: intertidal and subtidal grass habitat.

**Relative Abundance:** the frequency of an organism at or adjacent to the activity site

Absent: Organism is physically absent from the specific area.

<u>Scattered or occasional</u>: A limited number of a specific organism found only after a thorough investigation of the habitat *or* organisms occurring in small (<1/2 square foot) patches or small clumps throughout the zone.

<u>Common</u>: Specific organism found readily with little investigation, but not visually obvious; found repeatedly and/or occurring in numerous patches throughout habitat.

Abundant: Specific organism is visually obvious throughout area with limited or no habitat disturbance.

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# APPENDIX B: MDEP COASTAL WETLAND CHARACTERIZATION: INTERTIDAL & SHALLOW SUBTIDAL FIELD SURVEY CHECKLIST

NAME OF APPLICANT: KPT Marine, APPLICATION TYPE: NRPA IndiaCTIVITY LOCATION: TOWN:	LC (c/o Shawn	Dumas) mit	_ PHONE: <u>207</u>	'-590-1658		
ACTIVITY LOCATION: TOWN:	Kennebun	kport	COUNTY:	York		
ACTIVITY DESCRIPTION: □ fill   ☑ dredg				e stabilization		
DATE OF SURVEY: 10/17/2024		OBSERVE	R: Michael N.	Walsh		
TIME OF SURVEY: 2:30 pm		TIDE AT S	URVEY: Low			
SIZE OF DIRECT IMPACT OR FOO Intertidal area:	OTPRINT (so	quare feet): _Subtidal are	<sub>ea:_</sub> 61,000 SF_	(1.4 acres)		
SIZE OF INDIRECT IMPACT, if known intertidal area:	own (square	feet):_ Subtida	al area:			
HABITAT TYPES PRESENT (check sand beach □ boulder/cobble be □ ledge □ rocky shore smud	ach □ san	d flat ⊠m		nes □salt marsl	1	
ENERGY: □ protected	protected	□ par	tially exposed	□ exposed	l	
DRAINAGE: □ drains completely		water [	□ pools □	stream or channel		
SLOPE: □ >20% □ 10-20%	□ 5-1	10%	<b>⊠</b> 0-5%	□ variable		
SHORELINE CHARACTER:  □ bluff/bank (height from sprin	g high tide:_	) 🗆 be:	ach ⊠rocky	□ vegetated		
FRESHWATER SOURCES: □ stream	n 🛭 riv	ver	□ wetland	□ stormwater		
MARINE ORGANISMS PRESENT:						
_	absent	occasional	common	abundant		
mussels		X				
clams	X					
marine worms		X				
rockweed	X					
eelgrass	X					
lobsters		X				
other						
SIGNS OF SHORELINE OR INTERTIDAL EROSION? □ yes ☑ no						
PREVIOUS ALTERATIONS?			🛛 yes	□ no		
CURRENT USE OF SITE AND ADD undeveloped  ☐ residential	ACENT UP		□ degraded	▼ recreational		
PLEASE SUBMIT THE FOLLOW  ☑ Photographs ☑ Overhea					(pink)	

# Appendix C:

**Supplemental Information for Dredging Activities** 

# APPENDIX C: APPLICATION FOR A NATURAL RESOURCES PROTECTION ACT PERMIT

# SUPPLEMENTAL INFORMATION FOR DREDGING ACTIVITIES IN A COASTAL WETLAND, GREAT POND, RIVER, STREAM OR BROOK

(Discard this part if dredging is not proposed as part of your activity.)

# The DEP and the Corps strongly recommend that applicants schedule a pre-application meeting prior to submitting an application for dredging.

Volume to be dredge	d:	6,40	0 cu. yds.						
Sq. ft. to be dredged:	6	61,00	00 sq. ft.						
Max. depth of dreexisting grade:	edging bel	ow	-6.0						
Type of material (ex silt, clay, gravel. Dredged:			Silt and san	d					
Describe what established sediment control measured during the operation. (attach so if necessary):	asures will e dredgi	ing	will allow it to be de-watered.						
Describe how and where the dredge spoils will be dewatered (attach separate sheet if necessary):  Show dewatering location and erosion control measures on activity drawings.				e loaded directly onto the watered prior to transpor					
What equipment will be used for the dredge?			The dredge will be conducted from a floating barge using a crane with a clam shell bucket and/or backhoe.						
Disposal Location:	Upland d		ıl:	Ocean disposal:					
(Check one)	☐ On site			Federal Disposal Si	ite				
	☐ Landfil	П		☐ Arundel					
	☐ Other_			<ul><li>□ Portland</li><li>□ Rockland</li></ul>					
				☐ Rockland ☐ Other Isle of	Shoole				
				Ma Other isle of	<u>3110a</u> 15				

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### FOR UPLAND DISPOSAL:

Co	ntact the Division of Solid Waste Management at (207) 822-6300:
	Contacted:
FO	OR OCEAN DISPOSAL:
X	Submit as <b>Attachment 15</b> , a copy of the test results performed in accordance with the U.S. Environmental Protection Agency and the Army Corps of Engineers' document entitled "Regional Implementation Manual for the Evaluation of Dredged Material Proposed for Disposal in New England Waters" (May 2002). This is available from the Army Corps of Engineers. (207) 623-8367 *Submitted as Attachment 14
	<b>NOTE:</b> Applicants are STRONGLY recommended to contact the DEP prior to performing any sediment sampling. Improperly sampled or analyzed sediments may have to be retested.
X	Submit as <b>Attachment 16</b> , a copy of a map showing the proposed transportation route to the disposal site.
	t all municipalities adjacent to the proposed transportation site: *Submitted as Attachment 15 lew Hampshire: Rye, New Castle
	Maine: Kittery, Eliot, York, Ogunquit
— А (	Submit as <b>Attachment 17</b> , a copy of the notice of the proposed transportation route. A copy of the proposed transportation route must be published in a newspaper of general circulation in the area of the proposed route. (The notice of the proposed route must include compass bearings or Loran coordinates). The notice must be published under the heading "NOTICE TO FISHERMEN". *Submitted as Attachment 16
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Appendix D: Sediment Sampling Results



# ECOTOXICOLOGICAL TESTING WHOLE SEDIMENT BIOASSAYS

### KENNEBUNKPORT, MAINE

Prepared for:

Eco-Analysts, Inc. P.O. Box 224 Bath, Maine 04530

*Prepared by:* 

EA Engineering, Science, and Technology, Inc., PBC
231 Schilling Circle
Hunt Valley, Maryland 21031
For questions concerning this report, please contact Michael Chanov
ph: 410-584-7000

Results relate only to the items tested or to the samples as received by the laboratory.

This report shall not be reproduced, except in full, without written approval of EA Engineering, Science, and Technology, Inc., PBC

This report contains 18 pages plus 6 attachments.

Michael K. Chanov II Laboratory Director 27 April 2023 Date

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#### 1. INTRODUCTION

In accordance with the US Army Corps of Engineers, New England District (CENAE), EA Engineering, Science, and Technology, Inc., PBC (EA) performed whole sediment toxicity testing on sediment samples collected from the area of dredging proposed for the marinas located on the Kennebunk River in Kennebunkport, Maine. Placement of dredge materials is proposed at the Isles of Shoals North (IOSN) Disposal Site. Samples were provided by Eco-Analysts, Inc., Bath, Maine The purpose of this study was to evaluate the toxicity of the sediment samples to benthic organisms.

The toxicity testing program consisted of 10-day whole sediment toxicity tests with *Americamysis bahia* (opossum shrimp) and *Leptocheirus plumulosus* (estuarine amphipod). The whole sediment toxicity tests evaluated the effects of exposure to the sediment samples on survival of the test organisms compared to a historical reference. All biological testing was completed at EA in Hunt Valley, Maryland.

### 2. MATERIALS AND METHODS

### 2.1 SAMPLE RECEIPT AND PREPARATION

Ten sediment samples were collected by Eco-Analysts personnel from locations in the dredge footprint identified in the Sampling and Analysis Plan. One sediment composite was created for the project and placed into five 5-gallon buckets. The samples were held at  $\leq$ 4°C and were hand delivered by courier to EA's Ecotoxicology Laboratory in Hunt Valley, Maryland. The composited sediment sample was logged in and assigned an EA laboratory accession number and was stored in the dark in a secured walk-in cooler at  $\leq$ 4°C until used for testing. Table 1 summarizes the sample identification, accession numbers, and collection and receipt information for the sediment sample. Chain-of-custody records are included in Attachment I.

### 2.2 TOXICITY TEST METHODS

All toxicity testing was conducted following EA's standard operating procedures (EA 2022) which are in accordance with the *Regional Implementation Manual for Evaluation of Dredged Material Proposed for Disposal in New England Waters* (USEPA, CENAE 2004), USEPA/USACE guidance (1991, 1998) and USEPA guidance (2002).

### 2.2.1 Whole Sediment Toxicity Testing

Whole sediment toxicity testing was conducted with two estuarine species, *Leptocherius plumulosus* (amphipod) and *Americamysis bahia* (opossum shrimp), both acquired from Aquatic Research Organisms (Hampton, New Hampshire) on 9 March 2023. The amphipods in Lot LP-181 were 2-4 mm and the mysids from Lot AB-1232 were 5 days old when used to initiate the toxicity test. Both assays were initiated on 10 March 2023. During the 24-hour holding period, the organisms were gradually acclimated to laboratory water at 20°C and to the appropriate test salinity.

Reference sediment was not collected from the IOSN. Rather, historic survival data from 2019 were provided by the CENAE for comparison purposes.

For solid phase testing, USEPA guidance (Davies, et. al. 1993) specifies the reduction of pore water total ammonia concentrations to  $\leq 20$  mg/L NH<sub>3</sub>-N prior to testing. Pore water was extracted from each of the sediment samples by centrifugation. Initial interstitial total ammonia concentration in the sediment sample was 63.5 mg/L NH<sub>3</sub>-N (Tables 2 and 3). The "thin layer" ammonia reduction procedure described by Ferretti (Ferretti, et.al., 2000) was utilized prior to initiating solid phase testing of the sediment sample. For this procedure, 2 L of sediment was spread evenly over the bottom of a high-density polyethylene tub (88 x 42 x 15 cm) to a depth of approximately 8 mm. A high density polyethylene plastic cover was placed over each sediment, and 12 L of artificial seawater was carefully added to the tub to minimize disturbance of the sediments. The overlying water was replaced twice daily until the pore water ammonia concentration was  $\leq 20$  mg/L NH<sub>3</sub>-N. The interstitial ammonia value for the ammonia purged sediment are presented in Tables 2 and 3.

The whole sediment toxicity tests were conducted as static, non-renewal tests with ten days of exposure to the sediments and overlying water. Artificial seawater (Crystal Sea artificial sea salts) at 20 ppt salinity (*L. plumulosus*) and 30 ppt salinity (*A. bahia*) was used as the overlying water.

The *A. bahia* and *L. plumulosus* tests utilized 1-L beakers as the exposure chambers, with each beaker containing 175 ml of sediment and 800 ml of overlying water. There were five replicate chambers for both the composite sediment sample and laboratory control. Test organisms were randomly assigned to the test chambers, 20 per replicate, for a total of 100 organisms exposed per sample.

The tests were maintained at a target of 20±1°C, with a 16-hour light/8-hour dark (*A. bahia*) or 24-hour light (*L. plumulosus*) photoperiod. The test chambers were visually inspected daily for abnormal organism behavior or lack of burrowing.

The overlying water in each test chamber was gently aerated (100 bubbles per minute) for the duration of the tests. Water quality measurements of temperature, pH, dissolved oxygen, and salinity were recorded daily on one replicate of each sample and control. The water quality parameters measured during the *A. bahia* and *L. plumulosus* toxicity tests are summarized in Tables 4 and 5, respectively.

After ten days of exposure, the test organisms were retrieved from the samples and the number of live organisms per replicate was recorded. Copies of the original data sheets for the *A. bahia* and *L. plumulosus* toxicity testing are included as Attachments II and III, respectively.

### 2.2.2 Data Analysis

Statistical analyses were performed on the whole sediment test data according to USEPA/USACE (1998) guidance, using the CETIS® statistical software package (Comprehensive Environmental Toxicity Information System, Version 2.1.1.5). If survival in the sediment was greater than the allowable percent difference (20 percent) from the corresponding reference, then a t-test or Wilcoxon's Two-Sample Test (depending on normal or non-normal data distribution) was performed on the sediment sample. The statistical analyses were performed to determine if exposure to the sediment sample resulted in significantly lower survival (p=0.05) as compared to the organisms exposed to the corresponding control or historical reference sediment. The results of the *A. bahia* and *L. plumulosus* whole sediment bioassays are summarized in Tables 6 and 7, respectively. The statistical analyses for *A. bahia* and *L. plumulosus* are summarized in Tables 8 and 9, respectively.

### 2.2.3 Reference Toxicant Testing

In conformance with EA's quality assurance/quality control program requirements, reference toxicant testing was performed by EA on acquired lots of *A. bahia* and *L. plumulosus*. The reference toxicant tests consisted of a graded concentration series of a specific toxicant in water only tests, with no sediment present in the test chambers. The results of the reference toxicant

tests were compared to established control chart limits. Table 10 presents the results of the reference toxicant testing.

### 2.3 ARCHIVES

Original data sheets, records, memoranda, notes, and computer printouts are archived at EA's Office in Hunt Valley, Maryland. These data will be retained for a period of 5 years unless a longer period of time is requested.

#### 3. RESULTS AND DISCUSSION

This bioassay study using sediment collected from the Yachtsman Marina project area was designed and conducted to meet the requirements of the USEPA/USACE dredged material testing program. The results of these toxicity tests met the current NELAC standards, where applicable. Protocol requires 90 percent survival in the laboratory control, indicating that test organisms were healthy and that endpoints met or exceed requirements specified in the current version of the RIM.

### 3.1 WHOLE SEDIMENT TOXICITY TESTING

Tables 6 and 8 summarize the results and statistical analyses of the 10-day whole sediment toxicity testing with *A. bahia*. Survival in the composite sediment sample was 97 percent, while the laboratory control and historical IOSN reference data both had 98 percent survival. Statistical analyses demonstrated that there were no significant effects on *A. bahia* survival following exposure to the composite sediment sample as compared with the IOSN 2019 reference data, and results for the composite sample were within 20% of the reference data.

Tables 7 and 9 summarize the results and statistical analyses of the 10-day whole sediment toxicity testing with *L. plumulosus*. Survival in the composite sediment sample was 95 percent. The laboratory control had 98 percent survival, while the historical IOSN reference data had 93 percent survival. As such, the statistical analyses demonstrated that there were no significant effects on *L. plumulosus* survival following exposure to the composite sediment sample as compared with the IOSN 2019 reference data, and results for the composite sample were within 20% of the reference data.

### 3.2 REFERENCE TOXICANT TESTS

The results of the reference toxicant tests are summarized in Table 10. All of the reference toxicant test results fell within the established laboratory control chart limits.

#### 4. REFERENCES CITED

- Davies T., D. Davis, J. Elmore. 1993. Technical panel recommendations concerning use of acute amphipod tests in evaluation of dredged material. Technical Report. U.S. Environmental Protection Agency, Office of Water, Washington, D.C.
- EA. 2022. EA Ecotoxicology Laboratory Quality Assurance and Standard Operating Procedures Manual. EA Manual ATS-102. Internal document prepared by EA's Ecotoxicology Laboratory, EA Engineering, Science, and Technology, Inc., PBC, Hunt Valley, Maryland.
- Ferretti, J. A., D. F. Calesso and T. R. Hermon. 2000. Evaluation of Methods to Remove Ammonia Interference in Marine Sediment Toxicity Tests. Environ. Toxicol. Chem. 19:1935-1941.
- USEPA. 2002. Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms. Fifth Edition. EPA-821-R-02-012. U.S. Environmental Protection Agency, Office of Water, Washington, D.C.
- USEPA and USACE. 1991. Evaluation of Dredged Material Proposal for Ocean Disposal, Testing Manual (commonly called "The Green Book").
- USEPA and USACE. 1998. Evaluation of Dredged Material Proposed for Discharge in Waters of the U.S.-Inland Testing Manual. EPA/823/B-94/004. U.S. Environmental Protection Agency, Office of Water, Washington, D.C. and Department of the Army, U.S. Army Corps of Engineers, Washington, D.C.
- USEPA Region 1, CENAE. 2004. Regional Implementation Manual for Evaluation of Dredged Material Proposed for Disposal in New England Waters. September 2004.

# TABLE 1 SUMMARY OF COLLECTION AND RECEIPT INFORMATION FOR SEDIMENT SAMPLES

Sample	EA	(	Collection	Receipt		
Identification	Identification Accession Number		Date	Time	Date	
10 Stations at 4 Marinas Mud	AT3-098	1300	8 February 2023	1630	9 February 2023	

TABLE 2 AMMONIA CONCENTRATIONS MEASURED ON SEDIMENT PORE WATER AND OVERLYING WATER DURING SOLID PHASE TOXICITY TESTING WITH Americamysis bahia

Pore Water Ammonia (mg/L NH3-N)								
Sediment Identification	EA Accession Number	Initial	Day 0	Day 2	Day 4	Day 6	Day 8	Day 10
10 Stations at 4 Marinas Mud	AT3-098	63.5	15.9	15.3	15.2	6.6	3.7	7.4
SOLID PHASE CONTROL	AT3-152	N/A	3.8	3.6	1.7	1.0	< 0.4	< 0.4

	Overlying Water Ammonia (mg/L NH3-N)							
Sediment Identification	EA Accession Number	Day 0	Day 2	Day 4	Day 6	Day 8	Day 10	
10 Stations at 4 Marinas Mud	AT3-098	2.2	2.0	2.1	2.1	2.0	2.3	
SOLID PHASE CONTROL	AT3-152	1.2	1.0	0.9	<0.1	< 0.1	<0.1	

TABLE 3 AMMONIA CONCENTRATIONS MEASURED ON SEDIMENT PORE WATER AND OVERLYING WATER DURING SOLID PHASE TOXICITY TESTING WITH Leptocherius plumulosus

Pore Water Ammonia (mg/L NH3-N)								
Sediment Identification	EA Accession Number	Initial	Day 0	Day 2	Day 4	Day 6	Day 8	Day 10
10 Stations at 4 Marinas Mud	AT3-098	63.5	19.0	18.3	19.1	10.6	3.9	
SOLID PHASE CONTROL	AT3-152	N/A	2.8	2.4	2.8	1.5	1.3	<0.4

	Overlying Water Ammonia (mg/L NH3-N)							
Sediment Identification	EA Accession Number	Day 0	Day 2	Day 4	Day 6	Day 8	Day 10	
10 Stations at 4 Marinas Mud	AT3-098	2.6	2.6	2.4	4.0	3.1	3.0	
SOLID PHASE CONTROL	AT3-152	0.6	0.9	0.8	<0.1	< 0.1	<0.1	

TABLE 4 SUMMARY OF WATER QUALITY PARAMETERS MEASURED DURING WHOLE SEDIMENT BIOASSAY TESTING WITH Americamysis bahia

	EA	Range					
Sediment Sample Identification	EA Accession Number	Temperature (°C)	рН	Dissolved Oxygen (mg/L)	Salinity (ppt)		
10 Stations at 4 Marinas Mud	AT3-098	19.2 – 21.6 a	7.9 - 8.3	6.9 - 7.7	27.0 - 30.1		
SOLID PHASE CONTROL	AT3-152	19.0 – 21.9 a	8.0 - 8.2	5.4 – 7.6	27.0 – 28.5		

<sup>&</sup>lt;sup>a</sup> Measurement is outside the target range but within limits allowed by the RIM.

TABLE 5 SUMMARY OF WATER QUALITY PARAMETERS MEASURED DURING WHOLE SEDIMENT BIOASSAY TESTING WITH Leptocheirus plumulosus

	EA	Range						
Sediment Sample Identification	Accession Number	Temperature (°C)	рН	Dissolved Oxygen (mg/L)	Salinity (ppt)			
10 Stations at 4 Marinas Mud	AT3-098	19.0 – 21.7 a	7.7 - 8.5	7.4 - 8.1	19.5 – 22.0			
SOLID PHASE CONTROL	AT3-152	19.0 – 22.0 a	7.7 - 8.4	7.2 - 8.1	19.6 – 22.0			

<sup>&</sup>lt;sup>a</sup> Measurement is outside the target range but within limits allowed by the RIM.

# TABLE 6 RESULTS OF 10-DAY WHOLE SEDIMENT TOXICITY TESTING WITH $\it Americamysis\ bahia$

Test Number: TN-23-326

Sample Identification	EA Accession Number	No. Alive/No. Exposed	10-Day Mean Percent Survival
10 Stations at 4 Marinas Mud	AT3-098	97 / 100	97
IOSN REFERENCE	N/A	N/A	98
SOLID PHASE CONTROL	AT3-152	98 / 100	98

# TABLE 7 RESULTS OF 10-DAY WHOLE SEDIMENT TOXICITY TESTING WITH $Leptocheirus\ plumulosus$

Test Number: TN-23-327

Sample Identification	EA Accession Number	No. Alive/No. Exposed	10-Day Mean Percent Survival
10 Stations at 4 Marinas Mud	AT3-098	95 / 100	95
IOSN REFERENCE	N/A	N/A	93
SOLID PHASE CONTROL	AT3-152	98 / 100	98

# TABLE 8 STATISTICAL ANALYSIS OF 10-DAY WHOLE SEDIMENT TOXICITY TESTING WITH Americamysis bahia

Test Number: TN-23-326

	EA		Significantly Different	Difference	in Survival
	Accession	Mean	as Compared to:	>20% as Co	ompared to:
Sample Identification	Number	Survival	IOSN 2019	IOSN	2019
IOSN Reference	IOSN 2019	98%	-	-	-
10 Stations at 4 Marinas Mud	AT3-098	97%	No	No	1%

# TABLE 9 STATISTICAL ANALYSIS OF 10-DAY WHOLE SEDIMENT TOXICITY TESTING WITH Leptocheirus plumulosus

Test Number: TN-23-327

	EA		Significantly Different	Difference	in Survival
	Accession	Mean	as Compared to:	>20% as Co	ompared to:
Sample Identification	Number	Survival	IOSN 2019	IOSN	2019
IOSN Reference	IOSN 2019	93%	-	-	-
10 Stations at 4 Marinas Mud	AT3-098	95%	No	No	-2%

# TABLE 10 RESULTS OF REFERENCE TOXICANT TESTING ON ACQUIRED LOTS OF TEST ORGANISMS

Test Species	Reference Toxicant	Test Endpoint	Acceptable Control Chart Limits
Americamysis bahia	Potassium chloride (KCl)	48-Hour EC50: 493 mg/L KCl	413 – 604 mg/L KCl
Leptocheirus plumulosus	Cadmium chloride (CdCl <sub>2</sub> )	48-Hour LC50: 9.3 mg/L Cd	2.6 – 25.1 mg/L Cd

# ATTACHMENT I

Chain-of-Custody Records (2 pages)

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# ® EA Engineering, Science, and Technology

EA Ecotoxicology Laboratory 231 Schilling Circle Hunt Valley, Maryland 21031 Telephone: 410-584-7000 Fax: 410-584-1057



Sample Ship	ped By: (	
Fed. Ex.	UPS	Other: Courier
Tracking #:		
		· · · · · · · · · · · · · · · · · · ·
		•

Client: ECO-ANALYSTS, INC. Project No.:

NPDES Number: \_\_\_\_\_ Client Purchase Order Number: \_\_\_\_\_

City/State Collected: KENNEBUNK RIVER, MAINE

# PLEASE READ SAMPLING INSTRUCTIONS ON BACK OF FORM

Accession				ection	Sample Descriptio	n i	2
Number (office use only)	Grab	Composite	Start Date/Time	End Date/Time	(including Site, Stati Number, and Outfall Nu	on imber)	Number/Volume of Container
AT3-019		X	2/8/23 0900	02/8/23 1300	10 Stations at 4 Marinas	Mud	5 Ten Gal Buckets
At3-09.9	<b>X</b> .		11	11	II	Sitewater	ır
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Sampled By:	Date/Time	Received By:	Date/Time
Dustin Kach & Bud Brown	2/8/23 0900 - 1300	Dustin Kach	2/8/23 1300
Sampler's Printed Name:	Title:	Relinquished By	Date/Time
Dustin Kach & Bud Brown	President		41/23 @ 11:37 am
Relipquished By:	Date/Time Z)8/23 1/3-2	Received By Laboratory Away	Date/Time 2/9/23 /630

Was Sample Chilled During Collection? No

Comments:

Sample Collection Parameters

Visual Description:

Temperature (°C):

pH; .

TRC (mg/L):

Other:

White-Report Production EA 0534 F&B Rev.9/12 Yellow-Laboratory

Pink-Client/Sampler

# **ATTACHMENT II**

Americamysis bahia 10-Day Whole Sediment Test Data Sheets and Statistical Analyses (20 pages)



# SEDIMENT TOXICITY TEST SET-UP BENCH SHEET

Project Number: <u>EA.TOX</u>	
Client: Eco Analyst	· · · · · · · · · · · · · · · · · · ·
QC Test Number: TN-23-326	
TEST ORGAN	ISM INFORMATION
Common Name: Opossum shrimp	Adults Isolated (Time, Date):
Scientific Name: <u>A. bahia</u>	Neonates Pulled (Time, Date):
Lot Number:	Acclimation: 24hr Age: 5days
Source: ARO	Acclimation: 24hr Age: 5days  Culture Water (T/S): 20.1 °C 27.9 ppt
TEST	INITIATION
Date Time Initials	Activity
1730 36	Sediment Added to Chambers
	Overlying Water Added to Chambers
3110123 1530 P	Organisms Transferred
TES	T SET-UP
Sample Number(s): AT3-152(Control), AT3-098	
Overlying Water: 30 ppt Crystal Sea (	LD3-385)
Treatment Volume Test AT3- \ 5 \( \) (Lab Control) \ \ 175	
AT3-098	



# TOXICOLOGY LABORATORY BENCH SHEET -ORGANISM RECOVERY RECORD

rioject Number:		TEST ORGANISM	
Client: <u>Eco Analy</u>		Common Name:	Opossum shrimp
QC Test Number:		Scientific Name:	———
Organisms Recovered (d	late, time, initials):	3/20/2> 1500 m	
Treatment	Replicate	Number of Organisms Loaded	Number of Organisms Recovered
AT3- (5)	A	20	20
(Lab Control)	В	20	19
	С	20	19
	D	20	20
	Е	20	20
AT3-098	A	20	20
	В	20	
	C	20	20
	D	20	19
	E	20	19
	-		19
	+		
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# TOXICITY TEST WATER QUALITY DATA SHEET - NEW SOLUTIONS

Project Number: EA.TOX	TEST ORGANISM	Beginning Date:	3110123	Time	1530
Client: Eco Analyst	Common Name: Opossum shrimp	Ending Date:	3/2/12	Time	1000
QC Test Number: TN-23-326	Scientific Name: A. bahia			i I	2

TARGET VALUES Temp: 20 °C pH: 6.0 - 9.0 DO; >4.0 mg/L Salinity: 30 ppt Photoperiod: 161,8 d Light Intensity; 50 - 100 fc

				Temp	Temperature (*C)	(,C)					-	Hd				-	viossio	Dissolved Oxygen (mg/L)	) m8/	ng/L)				Se	Salinity (ppt)	()0	
Sample #		0	-	2	6	4	40	9	0	-	2	-	4	100	9	-	2	-	-11		4	0	-	,			-
AT3-152 C	Control	6.9							90		+	+	+	+	1	_	+	-	+	+		2			2	-	,
AT3-098		0.0							0		++	+	+	H	2	3	+	+	-			32					
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# TOXICITY TEST WATER QUALITY DATA SHEET - OLD SOLUTIONS

Project Number: EA.TOX	A.TOX	TEST ORGANISM		Beginning Date:	3/10/33	Time:	230
Client: Eco Analyst	yst	Common Name:	Opossum shrimp	Ending Date:	3/2/2	Time: 15	200
QC Test Number: TN-23-326	IN-23-326	Scientific Name:	A. bahia				
TARGET VALUES Te	TARGET VALUES Temp: 20 °C pH: 6.0-9.0 DO:		>4.0 mg/L Salinity: 30 ppt Photoperiod: 161,8 d Light Intensity: 50 - 100	8 d Light Inter	nsity: 50 - 100 fc		

	Tem	Temperature (°C)	100000		-	2	Hd 4	4	2	-	Disso	Dissolved Oxygen (mg/L)	xygen (n	mg/L)	-	_	64	Salinit	Salinity (ppt)	9	-
. 5	5	31.0	300	1 3	FIX	2 30	O.C.		U	1		1	200	375	1517	0.00	1316)	100		100	3
23	71.0 21.0 0.19	310		2/0 49 20.8	8.7.9	-2	1.8 2.4	8	63			18	5	150	17.0	37.0	20.07	F.0 28	12	279 380 ze, r	30
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50 FG	387 198	789/1	1890	(82Just 142	189	189 785		682 1882 LESS LES	53 65	- 681	1759	891189	X 65	682 (82 145)		189 737	52L 6	651 651 662	23	285 1683 144	3
35 7	Time (025) 1440 (210)	0380	1372m	100	080 1372 Mc 1 wo 105 144 1210 080 1310 UN 1100 1035	140 121	1000	13/10	07/10	56014	生	1210 08	8 5	0800 1312 HOVILLE 1025 1449 1210 0830 131446 1 120	1100	1035	1.66	210 08	39 13	9772	100
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Salvine Salvine



# TOXICITY TEST WATER QUALITY DATA SHEET - OLD SOLUTIONS

Project Number: EA.TOX	TEST ORGANISM		Beginning Date:	3116123	Time:	1530
Client: Eco Analyst	Common Name:	Opossum shrimp	Ending Date:	3/10/15	Time: 1	1500
QC Test Number: TN-23-326	Scientific Name:	A. bahia				
TARGET VALUES Temp: 20 °C pH: 6.0 - 9.0 DO;	>4.0 mg/L	Salinity: 30 ppt Photoperiod: 161,8 d Light Intensity: 50 - 100 ft	61.8 d Light Intens	ity: 50 - 100 fc		

	Temperature (°C)	(D.,		Hd	8			Dissolved Oxygen (mg/L)	d Oxyg	m (mg/	3	-		Sali	Salinity (ppt)	Od		
Sample #	8 9 10	12 13 14	6 8	11 01	12 13	14	00	01 6	н	12	13	4	6 8	10	=	12	5	4
AT3-152 Control	19 19 120.5 19 19 19 19 19 19 19 19 19 19 19 19 19 1		8.0 8.119	0	L		1.6	7.574				52	18.2 70.17	1222				
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Initi	Initials [V] N 72		M M M	N.			KA	1/2				- 2	10 Mg	Z	T	T	T	Г

12/14/2

ATS-T14 06/21/06

Client: Eco Analyst

FA Comple		Day 0 Over	Day 0 Overlying Water			Day 0 Po	Day 0 Pore Water	
Number	Ammonia (mg/L)	Salinity	Hd	Temperature	Ammonia	Salinity	Hď	Temperature
	(mg/gmr)	(ppt)	(ns)	(2)	(11/8m)	(ppt)	(ns)	(2)
Control	1.22	31.9	7.5	19. L	3,84	3), 2	7.6	0.3/
AT3-098	2.19	ル.し	9.4	7.61	15.85	3/.0	2.6	19.0
				-				
;								
		-						
Meter	VERSASTAR	769	799	ر43	VERSASTAR	203	682	6.27
Initials/Date/ Time	3/15/13 MVL	3/10/12 1220	3/10/12/22	afferting to	sh5lvs MM	3/10/12,120	3/10/12	3/10/12

Client: Eco Analyst

QC Test Number: TN-23-326

FA Comple		Day 2 Ove	Day 2 Overlying Water			Day 2 F	Day 2 Pore Water		
Number	Ammonia (mg/L)	Salinity (ppt)	Hd (ns)	Temperature (°C)	Ammonia (mg/L)	Salinity	Hd	Temperature	
Control	96.9	31.9	2.4	19.6	3,56	(PPP)	(ne)	(2)	
AT3-098	202	Jo. 6	∂-9	14/	15.30	79.4	7.7	6	
							<u></u>	5	
									_
Meter	VERSASTAR	203	20)	687	VERSASTAR	269	( 6)	, a	
Initials/Date/	2/15/12	श्वीवण्य ११६०	3/14/5	stight will	3/15/18/20	3/14/11/101	3/14/13 1100	1100 L	
Time	MKL	4	Ž	}		}			

Client: Eco Analyst

0		Day 4 Over	Day 4 Overlying Water			Day 4 P	Day 4 Pore Water	:
EA Sample Number	Ammonia (mg/L)	Salinity (ppt)	Hd (ns)	Temperature (°C)	Ammonia (mg/L)	Salinity (ppt)	Hq (su)	Temperature (°C)
Control	6.84	33.0	7.8	18.7	371	330	7.9	189
AT3-098	2,09	33.0	79	18.0	15.20	33.0	7.6	18.9
٠								
-								
Meter	VERSASTAR	289	289	289	VERSASTAR	685	2.89	680
te/	Slistes	31M123	3114123	3114123	3/15/23 MC/	31141123	2714118	31MEC
THILE		\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	-//	, 1A	)	300	***	

Client: Eco Analyst

		ıture		7									2,
		Temperature (°C)	7.7	\$6.4 4.08								(%)	Con ONLY
	Day 6 Pore Water	(ns)	7.3	1 3								(%)	48 23 47 47 47 47 47 47 47 47 47 47 47 47 47
	Day 6 Po	Salinity (ppt)	Med	31,3			:					(182	UN 01/2
		Ammonia (mg/L)	1.01	6,64								VERSASTAR	3/28/12
		Temperature (°C)	1761	0,91								CRN	2637
	ying Water	Hd (sa)	1.00	80				· 'ছ.				(483	56-21/2
1	Day 6 Overlying Water	Salinity (ppt)	38.5	30 ho						-		< 30	12m 5 6.21/2
		Ammonia (mg/L)	7.07	2.11						i		VERSASTAR	3128123
	. L	Number Number	Control	AT3-098								Meter	Initials/Date/ Time

Eco Analyst

Client:

QC Test Number: TN-23-326

CD TO 3118123

		ure									-			T			T -
		Temperature	(C)	とだ	2.0	2										(08)	3118123 New 26
	Day 8 Pore Water	Hď	(ns)	79	7.7											63	3118123 1100-7
	Day 8 P	Salinity	(ppt)	280	27.3							-				loss	311812 [21812]
Canal Canal Canal		Ammonia	(rr.gm)	7.07	3,70				-			_			S. Mo. Odin	VEKSASIAK	411123
		Temperature	(S)	01.0 st. 1	21.7											_	218118
	lying Water	Hq (iis)	40		62										000	1 80	311913
	Day 8 Overlying W	Salinity (ppt)	197 27.00	100 July 100	41.4										101	100	31/8/25 NW-75
		Ammonia (mg/L)	70.1		5.0								_		VERSASTAR	4.00	3/26/2
	EA Sample	Number	Control	A T2 000	060-614										Meter	_ _	Initials/Date/ Time

Eco Analyst Client:

Ammonia (mg/L)  20.1  2.3.1  2.3.1  VERSASTAR  3)78[43  WIC 3.3)	FA Comple		Day 10 Ove	Day 10 Overlying Water			Day 10 P	ore Water	
(mg/L) (ppt) (su) (su) (mg/L) (ppt) (su) (su) (su) (su) (su) (su) (su) (su	s Sample	Ammonia	Salinity	Hu	Tomporofus	A second	101 fm.	ore realest	
231 23.5 7.8 20.4 43.1 7.6 231 23.7 7.8 20.5 7.35 34.5 (e.g. quantitation of the states of the state	umber	(mg/L)	(ppt)	(ns)		Ammonia (mg/L)	Salinity (ppt)	Hq (ms)	Temperature (°C)
231 23.7 7.5 20.5 7.35 36.3 (e.g. 10.9)  VERSASTAR (e.g. 10.8) (4.	Control	(0)	33.5	816	p, 0C	h:07	- CA	77	, , ,
VERSASTAR 1693 689 1694 312823 (AP) 1683 WEL 330-33 1683 (AB) 30-33 MAL 330-33 (AB) 30-33 MAL 330-33 (AB) 30-33 (AB) 30-3	AT3-098	182	53.7	\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	V 30	7.35	6 0	9 5	5.00
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VERSASTAR (elg.) (Lg.) VERSASTAR (elg.)  3/24/2 UND UND UND 1044 3/26/2 (Lg.)  MUL 3-20-33 3-30-33 mul 3-30-33 (Lg.)									
VERSASTAR (elg) (Lg) VERSASTAR (elg) 3/28/22 UND (UND)									
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3-30-33 3-30-33 mile 3-30-33 (4-30-33)	ls/Date/	,	MAD! CHA	<u>a</u>	350 QM		S. 1. C.	Sal Ca	
	ime		5-20-23	3-2013	3-30-33		33033 (4	38.50 38.50 30.50	100 mg



# TOXICOLOGY LABORATORY BENCH SHEET - FEEDING RECORD

Project Number: _	EA.TOX		
Client: <u>Eco</u>	Analyst	 _	
QC Test Number:	TN-23-326		

Food: (Day 0-10): 5 drops of Artemia 1x/day.

Day	Date	Time	Initials
0	3110123	1545	70
1	3/11/23	0830	. 44
2	3/12/23	0830	れ こ
3	3/13/23	0813	X6
4	3/14/23	0830	KY
5	3/15/23	0830	a
6	31Ve123	0810	to
7	3117123	6755	70
8	3/18/23	0825	KY
9	3/19/23	0815	The state of the s
10	3/20/23	0830	Xb



# TOXICOLOGY LABORATORY BENCH SHEET - TESTING LOCATION

Project Number:	EA.TOX_
Client: Eco Analys	t
QC Test Number:TN-	23-326

Dave	Transfer T			
Day	Testing Location	Date	Time	Initials
0	29 29	3/10/23	1239	70
1	29	3/11/23	0839	KY
2	29	3/12/23	1450	兀
_3	29 21	3/13/23	j210	76
4	29	3/14/23	0830	6
5	29	3115,123	1308	25
6	29 29	3/16/13	1402	in
7	29	3/17/21	1607	Ris
8	1 29	3118123	1105 0815	P
9	29	3/19/23		The
10	29	3/20/23	0830	86
11	<u> </u>			
12_	<u> </u>			
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17	<u> </u>			
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29				
30				



# TOXICOLOGY LABORATORY BENCH SHEET

Project Number: <u>EA.TOX</u>	
Client: <u>Eco Analyst</u>	
QC Test Number: TN-23-326	
Date/Time/Initials	Comments/Activity



# TOXICOLOGY LABORATORY CORRECTION BENCH SHEET

Project Number: <u>EA.TOX</u> Client: <u>Eco Analyst</u>
QC Test Number:TN-23-326  Correction Explanations
(a) Technician Error-Mathematical
(b) Technician Error-Manual Data Recording
(c) Technician Error-Head Count Observation
(d) Technician Error-Overwrite
(e) Technician Error-Missing Data
(f) Technician Error-Lost Organism
(g) Technician Error-Transcription Error
(h) Technician Error-Other:
(i) Meter Malfunction

# **CETIS Test Data Worksheet**

Report Date:

Test Code/ID:

07 Apr-23 16:32 (p 1 of 1) TN-23-326Ab / 13-1892-8740

						1636 GOGGID: 114-20-020AD / 10-1032-0740
Americamysis	s bahia	10-E	ay Sı	ırvival Sedir	nent Test	EA-EST, Inc. PBC
Start Date: End Date: Sample Date:	20 Ma	ar-23	15:30 15:00		I: US ACE	mysis bahia  Sample Code: AT3-152  NED RIM (2004)  Sample Source: Yachtsman Marina NAE-2004-00319  ory Control Sediment  Sample Station: Laboratory Control
Sample		Rep	Pos	# Exposed	# Survived	Notes
AT3-152		1	1	20	20	
AT3-152		2	4	20	19	
AT3-152		3	8	20	19	
AT3-152		4	11	20	20	
AT3-152		5	15	20	20	
IOSN 2019		1	3	20	19	
IOSN 2019		2	5	20	20	
IOSN 2019		3	9	20	20	
IOSN 2019	•	4	12	20	19	
IOSN 2019		5	13	20	20	
AT3-098		1	2	20	20.	
AT3-098		2	6	20	20	
AT3-098		3	7	20	19	
AT3-098		4	10	20	19	
AT3-098		5	14	20	19	

Analyst: N

Report Date:

07 Apr-23 16:37 (p 1 of 1)

camveis babia 10-Day Survival Sediment Tee

Test Code/ID:

TN-23-326Ab / 13-1892-8740

Americamysi	s bahia 10-Day	Survival S	ediment	Test	_						EA-ES	T, Inc. PBC
Batch ID: Start Date: Ending Date: Test Length:	12-9216-3705 10 Mar-23 15:3 : 20 Mar-23 15:0 9d 23h	0 Pr 0 Sp	st Type: otocol: ecies: xon:	Survival US ACE NED Americamysis	, ,			Analy Diluer Brine: Source	nt: No	ncy Roka t Applicable /stal Sea tO - Aquatic	Research O	r Age: 5 d
Sample ID: Sample Date: Receipt Date Sample Age:	: 09 Mar-23 15:3	Ma 0 CA	de: iterial: iS (PC): ent:	AT3-152 Laboratory Co Eco-Analysts,		ent		Projec Sourc Statio	e: Ya	edged Sedin chtsman Ma coratory Cor	rina NAE-20	
Sample Code	Sample I	D Sa	mple Dat	te Receip	t Date	Sample	Age	Client	Name	P	——— roject	"
AT3-152 IOSN 2019 AT3-098	14-3904- 00-2071-8 07-1559-4	8579 10	Mar-23 Mar-23 Feb-23 1	10 Mar	-23 15:30 -23 -23 16:30	40h 16h 30d 3h		Eco-A	nalysts, Ir		redged Sedi	ment Evalu
Sample Code	Material	Туре		Sample Source	e		Station I	ocatio	n	Lat/Long		
AT3-152 IOSN 2019 AT3-098		e sediment	ediment	Yachtsman Ma Yachtsman Ma Yachtsman Ma	rina NAE-2	004-00	Laborato IOSN Re 10 Statio	ference		⁄lu		
Single Compa	arison Summar	у			<del></del>	,					, <u> </u>	
Analysis ID	Endpoint	_	Comp	arison Method	I		P-V	alue	Compari	son Result		s
	Survival Rate Survival Rate			on Rank Sum Variance t Two			0.73 0.28	881	IOSN 20	19 passed si passed surv	urvival rate	1
Survival Rate	Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	. Min	Max	(	Std Err	Std Dev	CV%	%Effect
AT3-152 IOSN 2019 AT3-098	LC RS	5 5 5	0.980 0.980 0.970	0.946 0.946 0.936	1.010 1.010 1.000	0.950 0.950 0.950	1.00 1.00 1.00	0	0.012 0.012 0.012	0.027 0.027 0.027	2.79% 2.79% 2.82%	0.00% 0.00% 1.02%
	Detail				··	·	<del>-</del>	MD5:	6DB39A	6AF9FD0DE	)6C333D750	C16513A7C
Survival Rate										VI DUDE		,,0010A/C
Survival Rate Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5						
		Rep 1	Rep 2 0.950	Rep 3 0.950	Rep 4 1.000	Rep 5						
Sample	Code							<del></del>	_			

Report Date: Test Code/ID: 07 Apr-23 16:32 (p 1 of 2) TN-23-326Ab / 13-1892-8740

Americamysis bal	nia 10-Day S	urvival Se	diment T	est						EA-ES	ST, Inc. PB
Analysis ID: 18-	1122-5059	En <sub>f</sub>	dpoint: 3	Survival Rate			CET	IS Version:	CETISV	211	
-	Apr-23 16:32		-	Vonparametric	-Two Samol	e		us Level:	1	<b>4.1.1</b>	
•	\pr-23 16:30			CF0DC2D65B					005-341	-210-6	
	<del></del>				02 100 12102	.D. 000DZL	DZOO EUIC	U1 1D.	000-041	-210-5	<del></del> _
	216-3705		t Type: 3				Anal	yst: Nar	ncy Roka		
Start Date: 10 l	//ar-23 15:30	Pro	tocol: l	JS ACE NED	RIM (2004)		Dilu	ent: Not	Applicable		
Ending Date: 20 f	/lar-23 15:00	Spe	ecies: /	Americamysis	bahia		Brin	e: Cry	stal Sea		
Test Length: 9d	23h	Тах	on:				Sou		O - Aquatic	Research (	Or Age: 5
Sample Code	Sample ID	) Sar	nple Date	Receip	t Date	Sample Ag	je Cliei	nt Name	P	roject	
AT3-152	14-3904-12	293 09	Mar-23	09 Mar	-23 15:30	40h	Eco-	Analysts, In	ic. D	redged Sec	diment Eva
IOSN 2019	00-2071-8	579 10	Mar-23	10 Mar	-23	16h				•	
Sample Code	Material T	ype	Ş	Sample Source	e	Sta	ation Locati	on	Lat/Long	<del></del>	
AT3-152	Laboratory	Control So	ediment \	/achtsman Ma	ırina NAE-20	04-00 Lal	boratory Cor	ntrol			
IOSN 2019	Reference	sediment	`	/achtsman Ma	rina NAE-20	004-00 IOS	SN Reference	e			
Data Transform		Alt Hyp	-"			Comparis	on Result				PMSD
Angular (Corrected	<u></u>	C>T				IOSN 201	9 passed sι	ırvival rate e	endpoint		3.29%
Wilcoxon Rank St	ım Two-San	nple Test					·				
Sample I vs	Sample II	df	Test St	at Critical	Ties	P-Type	P-Value	Decision	(a:5%)		
Lab Control Sedim		Sed 8	27.5		2	Exact	0.7381		ificant Effec		
Auxiliary Tests					<u> </u>						
Attribute	Test				Test Stat	Critical	P-Value	Dooision	(a.E9/)		
Outlier		xtreme Val	ue Test		1.16	2.29	1.0000	Decision			
	Oldbos E	Alleme val	ue rest	<del></del>	1.10	2.29	1.0000	No Outile	rs Detected		
ANOVA Table											
Source	Sum Squa	ires	Mean S	quare	DF	F Stat	P-Value	Decision	(α:5%)		
Between	0		0		1	0	1.0000	Non-Signi	ficant Effec	t	
Error	0.0309042		0.00386	30	8						
Total	0.0309042			, <u></u>	9	_					
ANOVA Assumption	ns Tests										
Attribute	Test				Test Stat	Critical	P-Value	Decision	(α:1%)		
Variance	Variance R	atio F Tes	į		1	23.2	1.0000	Equal Var			
Distribution	Shapiro-Wi	ilk W Norm	ality Test		0.64	0.741		•	nal Distribut	ion	
Commissed Data Com	·						0.0002	TAOLI-TAOLI			
Survival Rate Sur	mary				······································	<del></del>	0.0002	1001-10011			
	mary Code	Count	Mean	95% LCL	95% UCL	Median	0.0002 Min	Max	Std Err	cv%	%Effect
Sample	Code	~	<b>Mean</b> 0.980				Min	Max	Std Err	CV%	%Effect
Sample AT3-152		Gount 5 5		<b>95% LCL</b> 0.946 0.946	95% UCL 1.000 1.000	Median 1.000 1.000		<u> </u>	Std Err 0.012 0.012	<b>CV%</b> 2.79% 2.79%	%Effect 0.00% 0.00%
<b>Sample</b> AT3-152 IOSN 2019	Code LC RS	5 5	0.980 0.980	0.946	1.000	1.000	Min 0.950	Max 1.000	0.012	2.79%	0.00%
Sample AT3-152 IOSN 2019 Angular (Corrected	Code LC RS	5 5	0.980 0.980	0.946	1.000	1.000	Min 0.950	Max 1.000 1.000	0.012 0.012	2.79% 2.79%	0.00% 0.00%
Sample AT3-152 IOSN 2019 Angular (Corrected Sample	Code LC RS d) Transforn Code	5 5 ned Summ	0.980 0.980 nary Mean	0.946 0.946 <b>95%</b> LCL	1.000 1.000 95% UCL	1.000 1.000 Median	Min 0.950 0.950	Max 1.000 1.000	0.012 0.012 Std Err	2.79% 2.79% CV%	0.00% 0.00% %Effect
Sample AT3-152 IOSN 2019 Angular (Corrected Sample AT3-152	Code LC RS d) Transform	5 5 ned Summ Count	0.980 0.980 nary	0.946 0.946	1.000 1.000	1.000 1.000	Min 0.950 0.950	Max 1.000 1.000	0.012 0.012	2.79% 2.79%	0.00% 0.00%
Sample AT3-152 IOSN 2019 Angular (Corrected Sample AT3-152 IOSN 2019	Code LC RS d) Transform Code LC RS	5 5 ned Summ Count 5	0.980 0.980 nary Mean 1.410	0.946 0.946 <b>95% LCL</b> 1.340	1.000 1.000 95% UCL 1.490	1.000 1.000 Median 1.460	Min 0.950 0.950 Min 1.350	Max 1.000 1.000 Max 1.460	0.012 0.012 Std Err 0.028	2.79% 2.79% CV% 4.40%	0.00% 0.00% %Effect 0.00%
Sample AT3-152 IOSN 2019 Angular (Corrected Sample AT3-152 IOSN 2019 Survival Rate Deta	Code LC RS d) Transform Code LC RS	5 5 ned Summ Count 5	0.980 0.980 nary Mean 1.410	0.946 0.946 <b>95% LCL</b> 1.340	1.000 1.000 95% UCL 1.490	1.000 1.000 Median 1.460	Min 0.950 0.950 Min 1.350	Max 1.000 1.000 Max 1.460	0.012 0.012 Std Err 0.028	2.79% 2.79% CV% 4.40%	0.00% 0.00% %Effect 0.00%
Sample AT3-152 OSN 2019 Angular (Corrected Sample AT3-152 OSN 2019 Survival Rate Deta Sample	Code LC RS  I) Transform Code LC RS	5 5 ned Summ Count 5	0.980 0.980 hary Mean 1.410 1.410	0.946 0.946 <b>95% LCL</b> 1.340 1.340	1.000 1.000 95% UCL 1.490 1.490	1.000 1.000 Median 1.460 1.460	Min 0.950 0.950 Min 1.350	Max 1.000 1.000 Max 1.460	0.012 0.012 Std Err 0.028	2.79% 2.79% CV% 4.40%	0.00% 0.00% %Effect 0.00%
Sample AT3-152 IOSN 2019 Angular (Corrected Sample AT3-152 IOSN 2019 Survival Rate Deta Sample AT3-152	Code LC RS  I) Transform Code LC RS  il Code	5 5 ned Summ Count 5 5	0.980 0.980 hary Mean 1.410 1.410	0.946 0.946 95% LCL 1.340 1.340 Rep 3	1.000 1.000 95% UCL 1.490 1.490	1.000 1.000 Median 1.460 1.460	Min 0.950 0.950 Min 1.350	Max 1.000 1.000 Max 1.460	0.012 0.012 Std Err 0.028	2.79% 2.79% CV% 4.40%	0.00% 0.00% %Effect 0.00%
Sample AT3-152 OSN 2019 Angular (Corrected Sample AT3-152 OSN 2019 Survival Rate Deta Sample AT3-152 OSN 2019 OSN 2019	Code LC RS  I) Transform Code LC RS  II Code LC RS	5 5 ned Summ Count 5 5 5 Rep 1 1.000 0.950	0.980 0.980 <b>Mean</b> 1.410 1.410 <b>Rep 2</b>	0.946 0.946 95% LCL 1.340 1.340 Rep 3 0.950	1.000 1.000 95% UCL 1.490 1.490 Rep 4 1.000	1.000 1.000 Median 1.460 1.460 Rep 5 1.000	Min 0.950 0.950 Min 1.350	Max 1.000 1.000 Max 1.460	0.012 0.012 Std Err 0.028	2.79% 2.79% CV% 4.40%	0.00% 0.00% %Effect 0.00%
Sample AT3-152 IOSN 2019 Angular (Corrected Sample AT3-152 IOSN 2019 Survival Rate Deta Sample AT3-152 IOSN 2019 Angular (Corrected	Code LC RS  I) Transform Code LC RS  II Code LC RS	5 5 ned Summ Count 5 5 5 Rep 1 1.000 0.950	0.980 0.980 <b>Mean</b> 1.410 1.410 <b>Rep 2</b>	0.946 0.946 95% LCL 1.340 1.340 Rep 3 0.950	1.000 1.000 95% UCL 1.490 1.490 Rep 4 1.000	1.000 1.000 Median 1.460 1.460 Rep 5 1.000	Min 0.950 0.950 Min 1.350	Max 1.000 1.000 Max 1.460	0.012 0.012 Std Err 0.028	2.79% 2.79% CV% 4.40%	0.00% 0.00% %Effect 0.00%
Survival Rate Surr Sample AT3-152 IOSN 2019  Angular (Corrected Sample AT3-152 IOSN 2019  Survival Rate Deta Sample AT3-152 IOSN 2019  Angular (Corrected Sample AT3-152	Code LC RS  I) Transform Code LC RS  II Code LC RS	5 5 5 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6	0.980 0.980 <b>Mean</b> 1.410 1.410 <b>Rep 2</b> 0.950 1.000	0.946 0.946 95% LCL 1.340 1.340 Rep 3 0.950 1.000	1.000 1.000 95% UCL 1.490 1.490 Rep 4 1.000 0.950	1.000 1.000 Median 1.460 1.460 Rep 5 1.000	Min 0.950 0.950 Min 1.350	Max 1.000 1.000 Max 1.460	0.012 0.012 Std Err 0.028	2.79% 2.79% CV% 4.40%	0.00% 0.00% %Effect 0.00%

# **CETIS Analytical Report**

Report Date: Test Code/ID: 07 Apr-23 16:32 (p 2 of 2) TN-23-326Ab / 13-1892-8740

Americamysis	bahia 10-Da	y Survival	Sedime	nt Tes					Code/ib.	1110-		13-1892-87
	18-2338-967								_ <del></del> _		EA-E	ST, Inc. PB
	07 Apr-23 16	•	Endpoin Analysis		rvival Rate rametric-Tu	ua Campla			TIS Version	·	v2.1.1	
1 -	07 Apr-23 16		•			жо Затріе 86F57113D/	\54 <u>03079</u> 0		atus Level litor ID:	-	4.040.5	
Batch ID:	12-9216-370						10 1000100		itor ib.	005-34	1-210-5	
	12-92 10-370: 10 Mar-23 15	'	Test Typ Protocol			DIM (DOD A)				Vancy Roka		
Ending Date: 2			Species:		nericamysis	RIM (2004)				Vot Applicable	е	
Test Length: 9			гроског. Гахоп:	ΔII	iciicaiiiysis	Dariia				Crystal Sea	_	
Sample Code								- 30	urce: /	ARO - Aquati	c Research	Or Age: 5 d
IOSN 2019	Sample 00-2071		Sample I 10 Mar-23			pt Date	Sample A		ent Name		Project	
AT3-098	07-1559		0 Mar-23 08 Feb-23	_	10 Ma	r-23 o-23 16:30	16h	Ec	o-Analysts,	Inc.	Dredged Se	ediment Eval
0			70 T GD-20	3 10.00	J USTER	7-23 10.30	30d 3h				<u></u>	
Sample Code IOSN 2019	Materia				mple Sour			tation Loca	tion	Lat/Lon	g	
AT3-098		ice sedimer Sediment	nt			arina NAE-2		OSN Refere				_
		Sediment		Yac	chtsman Ma	arina NAE-2	004-00 1	0 Stations a	t 4 Marinas	Mu 		
Data Transform		Alt Hy	<u>р</u>				Compar	ison Resul	t			PMSD
Angular (Correct	ted)	C > T					AT3-098	passed sur	vival rate e	ndpoint	<del>-</del>	3.29%
Equal Variance	t Two-Samp	ole Test					<u> </u>					· · · · · ·
  Sample   vs	s Sample	II	df Tes	t Stat	Critical	MSD	D Time	D Value	<b>.</b>			
Reference Sed	AT3-098		8 0.57		1.86	0.0731	P-Type CDF	P-Value 0.2898		on(α:5%) anificant Effe		
Auxiliary Tests								0.2000	14011-31	Jillicani Ene	CI	
_												
Attribute Outlier	Test	Fadrons - 17	/-live T			Test Stat		P-Value		on(α:5%)		
- Cantel	Grubbs	Extreme V	alue les	iI		1.16	2.29	1.0000	No Outi	iers Detected	<u> </u>	
ANOVA Table												
Source	Sum Sq	uares	Mea	n Squ	are	DF	F Stat	P-Value	Decisio	n(α:5%)		
Between -	0.00128		0.00	12877		1	0.333	0.5796		nificant Effec	t	-
Total Total	0.03090		0.00	38630	<u></u> _	8	_		_	•		
	0.03219	19 			<del>_</del>	9						
ANOVA Assump	ptions Tests							<u></u>				
Attribute	Test					Test Stat	Critical	P-Value	Decisio	n(α:1%)		
Variance		Ratio F Te			<u> </u>	1	23.2	1.0000	_	ariances		
Distribution	Shapiro-	Wilk W Nor	rmality Te	est ———		0.799	0.741	0.0142	Normal	Distribution		
Survival Rate Su	ummary	·							<u> </u>	<u></u>		
Sample	Code	Count	Mea	n	95% LCL	95% UCL	Median	Min	Мах	Std Err	CV9/	0/ F#s
IOSN 2019	RS	5	0.980	)	0.946	1.000	1.000	0.950	1.000	0.012		%Effect
AT3-098		5	0.970	ס	0.936	1.000	0.950	0.950	1.000	0.012	2.79%	0.00% 1.02%
Angular (Correc	ted) Transfo	rmed Sum	marv				<del></del>					
Sample	Code	Count	Mear		95% LCL	059/ 1101	3.012 - ·					
IOSN 2019	RS	5	1.41(		1.340	95% UCL 1.490	Median 1.460	Min	Max	Std Err	CV%	%Effect
AT3-098		5	1.390		1.310	1.470	1.350	1.350 1.350	1.460 1.460	0.028	4.40%	0.00%
Survival Rate De								1.000	1.400	0.028	4.47% 	1.61% ————
		_	_	_								
Sample IOSN 2019	Code	Rep 1	Rep		Rep 3	Rep 4	Rep 5				<u></u> _	
AT3-098	RS	0.950 1.000	1.000		1.000	0.950	1.000					
		1.000	1.000	,	0.950 	0.950	0.950					
	ted) Transfo	rmed Detai	il									
Angular (Correct Sample	Code	rmed Detai Rep 1	il Rep :	2	Rep 3	Rep 4	Rep 5					
Angular (Correct Sample OSN 2019 AT3-098				)	Rep 3 1.460	Rep 4	Rep 5 1.460			<u> </u>		

Analyst: NR QA: JR

# **ATTACHMENT III**

Leptocheirus plumulosus 10-Day Whole Sediment Test Data Sheets and Statistical Analyses (20 pages)



# SEDIMENT TOXICITY TEST SET-UP BENCH SHEET

	and the second of the second o
Project Number: <u>EA.TOX</u>	
Client: <u>Eco Analyst</u>	
QC Test Number: TN-23-327	
TEST ORGA	NISM INFORMATION
Common Name: <u>Amphipod</u>	Adults Isolated (Time, Date):
Scientific Name: <u>Leptocheirus plumulosus</u>	Neonates Pulled (Time, Date):
Lot Number: <u>CP-181</u>	Acclimation: 24hB Age: 2-4 mm
Source:ARO	
	ppt
TEST	INITIATION
Date Time Initials	
3/9/23 1530 SC	Sediment Added to Chambers
f T t	Overlying Water Added to Chambers
3110123 1430 6	Organisms Transferred
	ST SET-UP
Sample Number(s): AT3-152(Control), AT3-098	
	-
Overlying Water: 20 ppt Crystal Sea	(LD3-259 )
<u>Treatment</u> <u>Volume Tes</u>	t Sediment Volume Overlying Water
AT3- 159 (Lab Control) 175	5 ml 800 ml
	·
<b>▼</b> AT3-098	
A13-090	+
9 (4)	



# TOXICOLOGY LABORATORY BENCH SHEET - ORGANISM RECOVERY RECORD

Project Number: <u>EA.TOX</u>	TEST ORGANISM
Client: <u>Eco Analyst</u>	Common Name: Amphipod
QC Test Number: TN-23-327	Scientific Name: <u>Leptocheirus plumulosus</u>
Organisms Recovered (date, time, initials): 3 /20	125 1330

Organisms Recovered (dat	te, time, initials):	3/20/25 1330	
Treatment	Replicate	Number of Organisms Loaded	Number of Organisms Recovered
AT3- 157	A	20	11
(Lab Control)	В	20	20
	C	20	ئ
	D	20	w
	Е	20	19
AT3-098	A	20	19
	В	20	19
	C	20	19
	D	20	K
	Е	20	19
			1
	_		

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Time (93)

Meter Number (R)

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# TOXICITY TEST WATER QUALITY DATA SHEET - NEW SOLUTIONS

Project Number: EA.TOX	TEST ORGANISM		Beginning Date:	5210115	Time:	3
Client: Eco Analyst	Common Name:	Amphipod	Ending Date:	3 6. 15	Time:	1330
QC Test Number: TN-23-327	Scientific Name:	Leptocheirus plumulosus				
TARGET VALUES: Temp: 20 °C pH: 6.0 - 9.0 DO: ≥4.0	mg	L Salinity: 20 ppt Photoperiod: 24 hr light Light Intensity: 50 - 100 fe	hr light Light Intensi	ty: 50 - 100 fc		

	5 6											
(bbt)	4	_		-	H	H	-	⊬	L	L		ŀ
Salinity (ppt)	60					L				L		L
S	64											L
	-											
	0	F	51.3									
	9											
(T)	S											
em (mg	4											
Dissolved Oxygen (mg/L)	m											
olved	24											
Diss	-											
	0	17	1.				T		$\vdash$			
	9					Т						
	2						T					
	47			$\exists$								
Hd	ю											
	2		П	$\exists$		Т	T					
	-			$\exists$								
	0	Si	100	$\exists$								
	9			$\dashv$					Т			
	S		$\forall$	$\dashv$		$\vdash$	$\vdash$					
( <sub>0</sub> C)	4		H	$\dashv$			$\vdash$					-
atruc	ю		H				$\vdash$					
Temperature (°C)	2		H	$\dashv$			$\vdash$					-
Н	-		H	$\dashv$								-
	0	08	0,0	$\dashv$		-						-
			5,	$\dashv$								-
		Control										
	Sample #	AT3-(9)-	AT3-098									



# TOXICITY TEST WATER QUALITY DATA SHEET - OLD SOLUTIONS

							_	_		_								
2	2				4	848.262 858,184 79 7.477 76 808,1 1,500 62,500,1 219 21,3 19522,0	22.0											
Time: 1430	Time: 1330				9	19.5	9.6											
ime:	ime:			(pdd)	5	21.3	22.t											
1	-			Salinity (ppt)	4	21.9	22.0											
_	7		9	S	2 3	20.1	900											
2/0	3 12 13	06	100			20.5	210											
3110115	^		55		-	9	=							L				
			tensit		7	7.7	7.3											
Beginning Date:	hate:		ght In	g/L)	9	00	5											
immin	Ending Date:		3	m) uas	N	000	7.9											
Beg	End		Light	d Oxy	4	78	75					,						
	1	1	24 h	Dissolved Oxygen (mg/L)	m	土土	43											
		SHS	riod:	Dis	2	7.4	7.7											
		omno	otope		1	R	5											
		Leptocheirus plumulosus	P		7	7	.0											
	Amphipod	cheir	PP PP		9	ãó	3		1									
	Amp	Lepte	28		S	8	2											
			inity:	Hd	4	23	28			Ä.								
ISM	Name	Name	Sal	- 1	9	8.2	8.2											
GAN	Common Name:	Scientific Name:	l/gm.		7	48												
TEST ORGANISM	Com	Scien	0.4		-	20	80											
TES	1	-1	9		7	201499 21,083	210 NO BLO BLO 8.2											
ĺ			0.0	100	9	199	340							_ 0				
			-0.9	Temperature (°C)	5								15				1	
			H.	peratra	47	Ag 21.0 21.7 21.0	20,0 21.0 22.0 21.0									4		2
		12	ပ္	Tem	m	17	20											
XO.		TN-23-327	20		7	0.12	21.0											
EA.TOX	alys		Cemp		-	P.9	35											
	Eco Analyst		ES:	(7)		lon			-		1							
nper:	Ec	mber	/ALU			Control								0	100			
Project Number:	Client:	QC Test Number:	TARGET VALUES: Temp: 20 °C pH: 6.0-9.0 DO: >4.0 mg/L Salinity: 20 ppt Photoperiod: 24 hr light Light Intensity: 50-100 fc		Sample #	AT3-193	AT3-098			Ī								
F	O	0	T		Sam	AT	AT					3						

[3] (82 (82 (42 ) 642 64) 682 [83] (83

681/1/82 1682/187 Jun 1581 1562

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# TOXICITY TEST WATER QUALITY DATA SHEET - OLD SOLUTIONS

Project Number: EA.TOX	TEST ORGANISM		Beginning Date:	3/10/123	Time: 1430
Client: Eco Analyst	Common Name:	Amphipod	Ending Date:	3/11/12	Time: 1330
QC Test Number: TN-23-327	Scientific Name:	Leptocheirus plumulosus			
TARGET VALUES: Temp: 20 °C pH: 6.0-9.0 DO: >4.0	mg	L Salinity: 20 ppt Photoperiod: 24 hr light Light Intensity: 50	light Light Intensi	ty: 50 - 100 fc	

		Temperature (°C)	Darre (°C					hd					Diss	Dissolved Oxygen (mg/L)	xygen	(mg/L	_			Sal	Salinity (ppt)	()dx		
Sample #	6 8	11 01	1 12	13	14	90	9 10	=	12	13	14	90	6	01	=	12	13 14	50	6	10	11	12	13	7
ATS- (S) Control	0,12 1,02 1,04	0.12		_		198.	7 3	14-			720	1.8	4.4	7.9				7.	21.02202	121.4				
A13-098	0.12 4.12 1.00	0.73				-	7	<del>-</del>				1.6	2	>.				<u> </u>	277	Š.				
Meter Number GY	1318	080		-		631	GB1 682 681 OSS9 1318 OSS0	- 8				1500	13/8	681			+	SS 53.4		13/8/250				
Initia	Initials Ky W	12				14	19					Z	M	18				×	KY N	2				

Client: Eco Analyst

,		Day 0 Over	Day 0 Overlying Water			Day 0 Pore Water	re Water	
EA Sample Number	Ammonia (mg/L)	Salinity (ppt)	Hd (ns)	Temperature (°C)	Ammonia (mg/L)	Salinity (ppt)	Hd (ns)	Temperature (°C)
Control	0.54	2.12	ي بھ	1.51	2.40	20.3	0.8	19,1
AT3-098	2.57	21.6	0.8	0.61	18.95	70.9	4.6	19.3
								,
								:
Meter	VERSASTAR	7,7	ر ډر د د د	239	VERSASTAR	239	769	622
Initials/Date/ Time	3/15/23 MKL	3/1. lm	of when	Mul white	3/15/23	31:0/2	3/11/23	1/10/13

Client: Eco Analyst

	Day 2 Over	Day 2 Overlying Water			Day 2 Pore Water	re Water	
Ammonia (mg/L)	Salinity (ppt)	pH (su)	Temperature (°C)	Ammonia (mg/L)	Salinity (ppt)	(ns)	Temperature (°C)
0.91	5.0.2	Ø.0	19.0	2.36	23.1	7.(	15.3
2.60	402	8-(	19.0	18,30	7.72	7.6	19.6
VERSASTAR	769	739	229	VERSASTAR	769	682	739
3/15/13	July > 1/11/t	1/11/23 HE	THE WAYS	3/15/23 #	The tolk	2/143	3/11/13
MKE	4	, , , , , , , , , , , , , , , , , , ,	4	MKL	¥	S.	· -{

Eco Analyst Client:

		Day 4 Over	Day 4 Overlying Water			Day 4 Po	Day 4 Pore Water	
EA Sample Number	Ammonia (mg/L)	Salinity (ppt)	(ns)	Temperature (°C)	Ammonia (mg/L)	Salinity (ppt)	Hd (ns)	Temperature (°C)
Control	0.82	23.0	8.0	281	1.84	23.0	9.8	19.7
AT3-098	2,43	21.5	7.8	19.0	19.05	245	28	263
Meter	VERSASTAR	780)	280)	289	VERSASTAR	280)	280)	280)
Initials/Date/ Time	3/15/23 MVL	3/14/123 1/40/7	3114123 MY074	311412 N4070	3/15/13 MKL	अस्पाद हामाह	314173	314123



# TOXICOLOGY LABORATORY BENCH SHEET - AMMONIA RECORD - SEDIMENT

Client: Eco Analyst

QC Test Number: TN-23-327

4		Day 6 Over	Day 6 Overlying Water			Day 6 Pc	Day 6 Pore Water	
Number	Ammonia (mg/L)	Salinity (ppt)	(ns) Hd	Temperature (°C)	Ammonia (mg/L)	Salinity (ppt)	Hd (sa)	Temperature (°C)
Control	1.0>	195	ن. گر	26.0	\ <u>`</u> \`	1.7.6	7.5	19.0
AT3-098	0.2	62.0	2.8	5.1.2	ا0, د	2.51	& E	17.9
			-					
Meter	VERSASTAR	C 8 3	683	(69)	VERSASTAR	681	663	(8)
Initials/Date/ 1/2/17	3/20/13	2/11/13	1/19/12	3/1415	3/20/13	2/10/12	3/16/13	51/n//c
Time	M	1000	j 606 🗸	freeze	7	1606,00	1600	1600

# TOXICOLOGY LABORATORY BENCH SHEET -**AMMONIA RECORD - SEDIMENT**

Eco Analyst

QC Test Number: TN-23-327 Client: \_

						1		 	 					
	Temperature (°C)	22.0	21.9								189	3/18/23	man	
Day 8 Pore Water	Hd (ns)	82	7.8								189	C218118	1 m 1	
Day 8 Po	Salinity (ppt)	20.6	21.5								189	2718118	1/00/1	
	Ammonia (mg/L)	Sc. ,	5,85								VERSASTAR	348183	CHA SING	4. (9)
	Temperature (°C)	21.0	21.5								189	3118123	2.001	
ying Water	Hd (su)	7.8	7.9								189	3118123	2 m	
Day 8 Overlying Water	Salinity (ppt)	30.4	21.2								189)	3118113	J_0011	
	Ammonia (mg/L)	3,10	3.11 201								VERSASTAR	3/26/23	MEC	Balnalis
, a	EA Sample Number	Control	AT3-098								Meter	Initials/Date/		

5211/1E



# TOXICOLOGY LABORATORY BENCH SHEET - AMMONIA RECORD - SEDIMENT

Client: Eco Analyst

QC Test Number: TN-23-327

5		Day 10 Ove	Day 10 Overlying Water			Day 10 Pe	Day 10 Pore Water	
LA Sample Number	Ammonia (mg/L)	Salinity (ppt)	(ns)	Temperature (°C)	Ammonia (mg/L)	Salinity (ppt)	(ns)	Temperature (°C)
Control	1'07	SIC	مارا	22.5C	h'07	22.7	1.4	439
AT3-098	76.2	1.86	8.c	31.0				
	,							
				·				
Meter	VERSASTAR	83,7)	(AB)	EGN)	VERSASTAR	(H)	-ABM	Ch <sup>n</sup>
Initials/Date/ Time	3/28/23 NVL	SEARY CEAR PAIN	26.26% ST	Static own	3/18/12 mer.	believes.	ret sex	CESSES )

(3) 3/20/25 ok furmo



### TOXICOLOGY LABORATORY CORRECTION BENCH SHEET

Project Number: <u>EA.TOX</u>
Client: Eco Analyst
QC Test Number: TN-23-327
Correction Explanations
(a) Technician Error-Mathematical
(b) Technician Error-Manual Data Recording
(c) Technician Error-Head Count Observation
(d) Technician Error-Overwrite
(e) Technician Error-Missing Data
(f) Technician Error-Lost Organism
(g) Technician Error-Transcription Error
(h) Technician Error-Other:
(i) Meter Malfunction



### TOXICOLOGY LABORATORY BENCH SHEET

Project Number: <u>EA.7</u>	COX
Client: Eco Analyst	
QC Test Number: TN-23	3-327
Date/Time/Initials	Comments/Activity



# TOXICOLOGY LABORATORY BENCH SHEET - TESTING LOCATION

Project Number:	EA.TOX
Client: <u>Eco Analyst</u>	
QC Test Number:TN-23-	-327

	· · · · · · · · · · · · · · · · · · ·	<u> </u>	<u> </u>	· .
Day	Testing Location	Date	Time	Initials
0	25	3/10/20	ISW	7
1	25	3/11/23	1022	BC
2	25	3/12/23	1456	JL
3	25	3/13/23	1219	XI
4	25	3714123	1219	RP
5	25	3115/23	1312	SC
6	<del>25</del>	3/16/23	1607)	UMO
7	25 25 25 25	3117/23	1600)	L
88	25	3118123	1105	760
9	25	3/19/23	1315	80
10	2.5	3/20/23	0850	Th.
11				
12				
13				
14				
15				
16				
17	·			
18				
19				
20				
21				
22				
_23				
24				
25				
26				
27				
28				
29				
30				

### **CETIS Test Data Worksheet**

Report Date:

07 Apr-23 16:34 (p 1 of 1)

Test Code/ID:

TN-23-327Lp / 08-3039-3260

Leptocheirus 10-d Survival and Reburial Sediment Test

EA-EST, Inc. PBC

Start Date:

Sample Date: 09 Mar-23

10 Mar-23 14:30

Species: Leptocheirus plumulosus

Sample Code: AT3-152

End Date:

20 Mar-23 13:30

Protocol: EPA/600/R-94/025 (1994) Material: Laboratory Control Sediment

Sample Source: Yachtsman Marina NAE-2004-00319

Sample Station: Laboratory Control

				ii Eaborato		Cample Station: Laboratory Control
Sample	Rep	Pos	# Exposed	# Survived	# Reburied	Notes
AT3-152	1	1	20	19		
AT3-152	2	4	20	20		
AT3-152	3	8	20	20		
AT3-152	4	12	20	20		
AT3-152	5	13	20	19		
OSN 2019	1	3	20	18		
OSN 2019	2	6	20	18		
OSN 2019	3	9	20	19		
OSN 2019	4	11	20	19		
OSN 2019	5	15	20	19		
AT3-098	1	2	20	19		
AT3-098	2	5	20	19		
AT3-098	3	7	20	19		
AT3-098	4	10	20	19	""	
AT3-098	5	14	20	19		

Report Date:

07 Apr-23 16:35 (p 1 of 1)

Test Code/ID:

TN-23-327Lp / 08-3039-3260

Leptocheirus 10-d Survival and Re	eburial Sediment	Test
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EA-EST, Inc. PBC

Leptocheirus	10-d Survival a	nu Keburiai	seaimer	it rest						EA-ES	T, Inc. PBC
Batch ID; Start Date: Ending Date: Test Length:	18-4074-9173 10 Mar-23 14:30 20 Mar-23 13:30 9d 23h	0 Prote	ocol: E cies: L	iurvival-Rebur PA/600/R-94/ eptocheirus p falacostraca	'025 (1994 <u>)</u>		D B	iluent: No rine: Ci	ancy Roka of Applicable ystal Sea RO - Aquatic	Research (	Or <b>Age:</b>
Sample ID: Sample Date: Receipt Date: Sample Age:	: 09 Mar-23 15:30	Code Mate CAS Clier	rial: L (PC):	T3-152 aboratory Cor co-Analysts, I		ent	S	ource: Ya	edged Sedim achtsman Ma aboratory Con	rina NAE-2	
Sample Code	Sample II	D Sam	ple Date	Receip	t Date	Sample	Age C	lient Name	P	roject	
AT3-152 IOSN 2019 AT3-098	14-3904-1 00-2071-8 07-1559-4	3579 10 M		09 Mar- 10 Mar-	-23 15:30	38h 14h 30d 2h		co-Analysts, l			fiment Eval
Sample Code	Material	Туре	s	ample Sourc	е		Station Loc	ation	Lat/Long		
AT3-152 IOSN 2019 AT3-098		e sediment	Y	achtsman Ma achtsman Ma achtsman Ma	rina NAE-2	004-00	Laboratory ( IOSN Reference 10 Stations		Mu		
Single Compa	arison Summary	/									
Analysis ID	Endpoint		Compar	ison Method			P-Valu	e Compai	ison Result		
09-6242-9666 07-0341-4086	Survival Rate Survival Rate			ղ Rank Sum T Variance t Tv			0.0397 0.9111		119 failed sur passed surv		-
Test Acceptal	oility				-	ТА	.C Limits		·		
Analysis ID	Endpoint		Attribute	9	Test Stat			Overlap	Decision		
09-6242-9666	Survival Rate		Control I	Resp	0.98	0.9	<<	Yes	Passes C	riteria	
Survival Rate	Summary			***							
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
AT3-152	LC	5	0.980	0.946	1.010	0.950	1.000	0.012	0.027	2.79%	0.00%
IOSN 2019 AT3-098	RS	5 5	0.930 0.950	0.896	0.964	0.900	0.950	0.012	0.027	2.94%	5.10%
			0.850	0.950	0.950	0.950	0.950	0.000	0.000	0.00%	3.06%
Survival Rate	Detail						N	ID5: A9FBF	58A28141E82	27CEAD3E	25AD5132A
	Cada	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
Sample	Code					- 12   -					
AT3-152	LC	0.950	1.000	1.000	1.000	0.950			<u>-</u>		
				-		_			_		<u> </u>

### **CETIS Analytical Report**

Report Date: Test Code/ID: 07 Apr-23 16:35 (p 1 of 3) TN-23-327Lp / 08-3039-3260

Leptocheirus 10	)-d Survival a	nd Reburia	l Sedime	nt Test						EA-ES	ST, Inc. PBC
Analysis ID: 0	9-6242-9666	End	point:	Survival Rate			CET	IS Version	: CETISV	2.1.1	
Analyzed: 0	7 Apr-23 16:34			Nonparametric				us Level:	1		
Edit Date: 0	7 Apr-23 16:33	3 MD:	5 Hash: I	BEE15B2ADF(	C4B9839C1/	471D8F53E	EC313 Edit	or ID:	005-341	-210-5	
Batch ID: 1	8-4074-9173	Tes	t Type: 3	Survival-Rebur	ial		Ana	yst: Na	ency Roka	•	
Start Date: 1	0 Mar-23 14:30	O Pro	tocol: i	EPA/600/R-94/	025 (1994)		Dilu	ent: No	t Applicable		
Ending Date: 26		O Spe	cies: l	_eptocheirus pl	lumulosus		Brin	e: Cr	ystal Sea		
Test Length: 9	1 23h	Tax	on: !	Vialacostraca			Sou	rce: AF	RO - Aquatic	Research (	Or <b>Age:</b>
Sample Code	Sample II		ple Date	Receip	t Date	Sample Ag	je Clie	nt Name	Р	roject	
AT3-152	14-3904-1		/lar-23			38h	Eco-	Analysts, I	nc. D	redged Se	diment Evalu
IOSN 2019	00-2071-8	3579 10 N	//аг-23	10 Mar-	-23	14h					
Sample Code	Material 1	Гуре		Sample Sourc	е	Sta	ation Locati	on	Lat/Long	9	
AT3-152	Laborator	y Control Se	diment	Yachtsman Ma	rina NAE-20	04-00 Lal	boratory Cor	ntrol			
IOSN 2019	Reference	e sediment	`	Yachtsman Ma	rina NAE-20	04-00 10	SN Referenc	e			
Data Transform		Alt Hyp				Comparis	son Result				PMSD
Angular (Correct	ed)	C > T		, , , , , , , , , , , , , , , , , , ,		IOSN 201	9 failed sun	/ival rate e	ndpoint		3.05%
Wilcoxon Rank	Sum Two-Sai	mple Test								- · · · · · ·	
Sample I vs	Sample II	df	Test St	at Critical	Ties	P-Type	P-Value	Decision	n(α:5%)		
Lab Control Sedi	m Reference	Sed* 8	18	. —	1	Exact	0.0397	Significa	nt Effect		
Test Acceptabili	ity Criteria	TAC L	imits	<del></del>		<del></del>	<del></del>				
Attribute	Test Stat		Upper	Overlap	Decision						
Control Resp	0.98	0.9	<<	Yes	Passes Ci	riteria					
Auxiliary Tests											
Attribute	Test				Test Stat	Critical	P-Value	Decision	n(a-5%)		
Outlier		xtreme Valu	ue Test		1.25	2.29	1.0000		ers Detected		
ANOVA Table					<del></del> -						
Source	Sum Squ	ares	Mean S	Square	DF	F Stat	P-Value	Decision	n(a:5%)		
Between	0.0283984		0.02839	<del></del>	1			Significa			
Error		4				8 55	111111111111111111111111111111111111111		111 1211001		
	0.026566	-	0.00332		8	8.55	0.0192	o.goa			
Total	0.026566				9	8.55 	0.0192	o ig. ii. i va			
	0.0549644					8.55 - -	0.0192		· · · · · · · · · · · · · · · · · · ·		
Total	0.0549644					<del>-</del>	0.0192		η(α:1%)		
Total  ANOVA Assump	0.0549644 otions Tests Test		0.00332		9	<del>-</del>		<b>Decisior</b>			
Total  ANOVA Assump  Attribute	0.0549644 otions Tests Test Variance F	4	0.00332	208	9 Test Stat	Critical	P-Value	<b>Decision</b> Equal Va		ion	
Total  ANOVA Assump  Attribute  Variance	0.0549644  otions Tests  Test  Variance F  Shapiro-W	4 Ratio F Test	0.00332	208	9 <b>Test Stat</b> 1.39	Critical 23.2	<b>P-Value</b> 0.7572	<b>Decision</b> Equal Va	ariances	ion	
ANOVA Assump Attribute Variance Distribution	0.0549644  otions Tests  Test  Variance F  Shapiro-W	4 Ratio F Test	0.00332	208	9 <b>Test Stat</b> 1.39	Critical 23.2	<b>P-Value</b> 0.7572	<b>Decision</b> Equal Va	ariances	ion	%Effect
ANOVA Assump Attribute Variance Distribution Survival Rate St	0.0549644  tions Tests  Test  Variance F Shapiro-W  ummary	4 Ratio F Test Vilk W Norm	0.00332	208	9 Test Stat 1.39 0.7	Critical 23.2 0.741	<b>P-Value</b> 0.7572 0.0009	<b>Decisior</b> Equal Va Non-Norr	ariances mal Distribut		%Effect 0.00%
ANOVA Assump Attribute Variance Distribution Survival Rate St Sample	0.0549644  tions Tests  Test  Variance F Shapiro-W  ummary  Code	Ratio F Test Vilk W Norm Count	0.00332 ality Test Mean	95% LCL	9 Test Stat 1.39 0.7 95% UCL	Critical 23.2 0.741	P-Value 0.7572 0.0009	Decision Equal Va Non-Non	ariances mal Distribut Std Err	cv%	
ANOVA Assump Attribute Variance Distribution Survival Rate St Sample AT3-152	0.0549644  tions Tests  Test  Variance F Shapiro-W  ummary  Code  LC  RS	Ratio F Test Vilk W Norm Count 5	0.00332 ality Test Mean 0.980 0.930	95% LCL 0.946	9 Test Stat 1.39 0.7 95% UCL 1.000	Critical 23.2 0.741 Median 1.000	P-Value 0.7572 0.0009 Min 0.950	Decision Equal Va Non-Non Max 1.000	eriances mal Distribut  Std Err  0.012	CV% 2.79%	0.00%
ANOVA Assump Attribute Variance Distribution Survival Rate St Sample AT3-152 IOSN 2019	0.0549644  tions Tests  Test  Variance F Shapiro-W  ummary  Code  LC  RS	Ratio F Test Vilk W Norm Count 5	0.00332 ality Test Mean 0.980 0.930	95% LCL 0.946	9 Test Stat 1.39 0.7 95% UCL 1.000	Critical 23.2 0.741 Median 1.000	P-Value 0.7572 0.0009 Min 0.950	Decision Equal Va Non-Non Max 1.000	eriances mal Distribut  Std Err  0.012	CV% 2.79%	0.00%
ANOVA Assump Attribute Variance Distribution Survival Rate St Sample AT3-152 IOSN 2019 Angular (Correct	0.0549644  variance F Shapiro-W  ummary  Code  LC  RS  ted) Transford	Ratio F Test Vilk W Norm  Count 5 5 med Summ	0.00332  ality Test  Mean 0.980 0.930  ary	95% LCL 0.946 0.896	9 Test Stat 1.39 0.7  95% UCL 1.000 0.964	Critical 23.2 0.741  Median 1.000 0.950	P-Value 0.7572 0.0009  Min 0.950 0.900	Decision Equal Va Non-Nom Max 1.000 0.950	Std Err 0.012 0.012	<b>CV%</b> 2.79% 2.94%	0.00% 5.10% %Effect
ANOVA Assump Attribute Variance Distribution Survival Rate St Sample AT3-152 IOSN 2019 Angular (Correct Sample	0.0549644  variance E Shapiro-W  ummary  Code  LC  RS  ted) Transfort	Ratio F Test Vilk W Norm  Count 5 5 med Summ Count	ality Test  Mean 0.980 0.930  ary  Mean	95% LCL 0.946 0.896	9 Test Stat 1.39 0.7  95% UCL 1.000 0.964  95% UCL	Critical 23.2 0.741  Median 1.000 0.950  Median	P-Value 0.7572 0.0009 Min 0.950 0.900	Decision Equal Va Non-Non Max 1.000 0.950	Std Err 0.012 0.012 Std Err	CV% 2.79% 2.94%	0.00% 5.10%
ANOVA Assump Attribute Variance Distribution Survival Rate St Sample AT3-152 IOSN 2019 Angular (Correct Sample AT3-152	0.0549644  Intions Tests  Test  Variance R Shapiro-W  Ummary  Code  LC  RS  ted) Transford  Code  LC  RS	Ratio F Test Vilk W Norm  Count 5 5 med Summ Count 5	0.00332  ality Test  Mean 0.980 0.930  ary  Mean 1.410	95% LCL 0.946 0.896 95% LCL 1.340	9 Test Stat 1.39 0.7  95% UCL 1.000 0.964  95% UCL 1.490	Critical 23.2 0.741  Median 1.000 0.950  Median 1.460	P-Value 0.7572 0.0009  Min 0.950 0.900  Min 1.350	Decision Equal Va Non-Non Max 1.000 0.950 Max 1.460	Std Err 0.012 0.012 Std Err 0.028	CV% 2.79% 2.94% CV% 4.40%	0.00% 5.10% %Effect 0.00%
ANOVA Assump Attribute Variance Distribution Survival Rate St Sample AT3-152 IOSN 2019 Angular (Correct Sample AT3-152 IOSN 2019	0.0549644  Intions Tests  Test  Variance R Shapiro-W  Ummary  Code  LC  RS  ted) Transford  Code  LC  RS	Ratio F Test Vilk W Norm  Count 5 5 med Summ Count 5	0.00332  ality Test  Mean 0.980 0.930  ary  Mean 1.410	95% LCL 0.946 0.896 95% LCL 1.340	9 Test Stat 1.39 0.7  95% UCL 1.000 0.964  95% UCL 1.490	Critical 23.2 0.741  Median 1.000 0.950  Median 1.460	P-Value 0.7572 0.0009  Min 0.950 0.900  Min 1.350	Decision Equal Va Non-Non Max 1.000 0.950 Max 1.460	Std Err 0.012 0.012 Std Err 0.028	CV% 2.79% 2.94% CV% 4.40%	0.00% 5.10% %Effect 0.00%
ANOVA Assump Attribute Variance Distribution Survival Rate St Sample AT3-152 IOSN 2019 Angular (Correct Sample AT3-152 IOSN 2019 Survival Rate De	0.0549644  variance F Shapiro-W  ummary Code LC RS  ted) Transford Code LC RS	Ratio F Test Vilk W Norm  Count 5 5 med Summ Count 5 5 5	0.00332  ality Test  Mean 0.980 0.930  ary  Mean 1.410 1.310	95% LCL 0.946 0.896 95% LCL 1.340 1.240	9 Test Stat 1.39 0.7  95% UCL 1.000 0.964  95% UCL 1.490 1.370	Critical 23.2 0.741  Median 1.000 0.950  Median 1.460 1.350	P-Value 0.7572 0.0009  Min 0.950 0.900  Min 1.350	Decision Equal Va Non-Non Max 1.000 0.950 Max 1.460	Std Err 0.012 0.012 Std Err 0.028	CV% 2.79% 2.94% CV% 4.40%	0.00% 5.10% %Effect 0.00%

Analyst: NR QA: JR

### **CETIS Analytical Report**

Report Date: Test Code/ID:

07 Apr-23 16:35 (p 2 of 3) TN-23-327Lp / 08-3039-3260

Leptocheirus 10-d Survival and Reburial Sediment Test EA-EST, Inc. PBC

Analysis ID: 09-6242-9666 Endpoint: Survival Rate CETISv2.1.1 CETIS Version: Analyzed: 07 Apr-23 16:34 Analysis: Nonparametric-Two Sample

Status Level: Edit Date: MD5 Hash: BEE15B2ADFC4B9839C1A71D8F53EC313 Editor ID: 07 Apr-23 16:33 005-341-210-5

Angular (Corrected) Transformed Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
AT3-152	LC	1.350	1.460	1. <del>4</del> 60	1.460	1.350
IOSN 2019	RS	1.250	1.250	1.350	1.350	1.350

### **CETIS Analytical Report**

Report Date: Test Code/ID:

07 Apr-23 16:35 (p 3 of 3) TN-23-327Lp / 08-3039-3260

1											
Leptocheirus 10-c	1 Survival a	nd Reburi	ial Sedim	ent Test		- '			<del>-</del>	EA-E	ST, Inc. PBC
1	0341-4086 Apr-23 16:34		-	Survival Rate Parametric-Tv	vo Sample			ΓIS Versio tus Level:		2.1.1	
Edit Date: 07 A	Apr-23 16:33	; MI		2A42733776C		36E264C4		tor ID:	005-34°	<b>1-</b> 210-5	
Batch ID: 18-4	4074-9173	Te	st Type:	Survival-Rebu	rial		Ana	lyst: N	lancy Roka		
Start Date: 10 l	Mar-23 14:30	) Pr	otocol:	EPA/600/R-94	/025 (1994)			•	lot Applicable	<u> </u>	
Ending Date: 20 f		) Sp	ecies:	Leptocheirus p	olumulosus		Brin		rystal Sea		
Test Length: 9d	23h	Ta	xon:	Malacostraca			Sou	rce: A	RO - Aquatic	Research	Or Age:
Sample Code	Sample ID	) Sa	mple Dat	e Receir	ot Date	Sample A	ge Clie	nt Name	F	roject	
IOSN 2019	00-2071-8	579 10	Mar-23	10 Mar	-23	14h	Eco	-Analysts,			diment Evalu
AT3-098	07-1559-4	974 08	Feb-23 1	3:00 09 Feb	-23 16:30	30d 2h				<u> </u>	
Sample Code	Material T	уре		Sample Source	се	St	ation Locat	ion	Lat/Long	9	
IOSN 2019	Reference			Yachtsman Ma			SN Referen	ce			<u> </u>
AT3-098	Marine Se	diment		Yachtsman Ma	arina NAE-20	004-00 10	Stations at	4 Marinas	Mu		
Data Transform		Alt Hyp				Compari	son Result				PMSD
Angular (Corrected)	)	C>T				AT3-098	passed surv	rival rate e	ndpoint		2.75%
Unequal Variance	t Two-Sam	ple Test		·				<del></del>	<del></del>	-	<del></del>
Sample I vs	Sample II	d	If Test S	tat Critical	MSD	P-Type	P-Value	Docisio	n(α:5%)		
Reference Sed	AT3-098	4		2.13	0.0503	CDF	0.9111		nificant Effec	±	
Auxiliary Tests	<del></del>	<del></del>									
Attribute	Test				Test Stat	Critical	P-Value	Dooloin	-(~-E9/)		
Outlier	Grubbs Ex	xtreme Va	lue Test		1.64	2.29	0.8052		n(α:5%) iers Detected	<del></del> _	<del>"</del>
ANOVA Table							0.0002	110 Culi	- Detected		<del></del>
Source	Sum Squa	ires	Mean 5	Sanara	DF	F Stat	P-Value	Dani-i-	(ED/)		
Between	0.0037046		0.0037	<del>_</del>	1	2.67	0.1411		n(α:5%) nificant Effec		
Error	0.0111139		0.0013		8	2.01	0.1-11	Non-Sig	minicant Enec	-L	
Total	0.0148185				9	<u></u>					
ANOVA Assumption											
	ons Tests										
Attribute	ons Tests Test				Test Stat	Critical	P-Value	Decisio	π(α:1%)		
Attribute Variance	Test Variance R		•	<del>_</del>	Test Stat	Critical	P-Value	Decisio:	<u> </u>		·
Attribute	Test		•		Test Stat	Critical 0.741	<b>P-Value</b> 0.0215	Indeterm	<u> </u>		<u> </u>
Attribute Variance	Test Variance R Shapiro-Wi		•		· -		<del> </del>	Indeterm	ninate		·
Attribute Variance Distribution	Test Variance R Shapiro-Wi		•	95% LCL	0.814		<del> </del>	Indeterm	ninate		%Effect
Attribute Variance Distribution Survival Rate Sum Sample IOSN 2019	Test Variance R Shapiro-Wi	ilk W Nom	nality Test		0.814	0.741	0.0215	Indeterm Normal I	ninate Distribution	CV%	%Effect 0.00%
Attribute Variance Distribution Survival Rate Sum Sample	Test Variance R Shapiro-Wi mary Code	ilk W Nom	nality Test Mean	95% LCL	0.814 95% UCL	0.741 Median	0.0215 Min	Indeterm Normal I	ninate Distribution Std Err		%Effect 0.00% -2.15%
Attribute Variance Distribution  Survival Rate Sum Sample IOSN 2019 AT3-098	Test Variance R Shapiro-Wi mary Code RS	Count 5	Mean 0.930 0.950	<b>95% LCL</b> 0.896	0.814 95% UCL 0.964	0.741 <b>Median</b> 0.950	0.0215 Min 0.900	Indeterm Normal I Max 0.950	Std Err 0.012	2.94%	0.00%
Attribute Variance Distribution  Survival Rate Sum Sample IOSN 2019 AT3-098  Angular (Corrected	Test Variance R Shapiro-Wi mary Code RS	Count 5	Mean 0.930 0.950	<b>95% LCL</b> 0.896	0.814 95% UCL 0.964	0.741 <b>Median</b> 0.950	0.0215 Min 0.900	Max 0.950 0.950	Std Err 0.012 0.000	2.94% 0.00%	0.00% -2.15%
Attribute Variance Distribution  Survival Rate Sum Sample IOSN 2019 AT3-098  Angular (Corrected Sample	Test Variance R Shapiro-Wi mary Code RS	Count 5 5 ned Sumn	Mean 0.930 0.950	<b>95% LCL</b> 0.896 0.950	95% UCL 0.964 0.950	0.741 Median 0.950 0.950	0.0215 Min 0.900 0.950	Max 0.950 0.950	Std Err 0.012 0.000	2.94% 0.00% CV%	0.00% -2.15% %Effect
Attribute Variance Distribution  Survival Rate Sum Sample IOSN 2019 AT3-098  Angular (Corrected Sample	Test Variance R Shapiro-Wi mary Code RS d) Transform	Count 5 5 ned Sumn	Mean 0.930 0.950 mary Mean	95% LCL 0.896 0.950 95% LCL	0.814 95% UCL 0.964 0.950 95% UCL	0.741  Median 0.950 0.950  Median	0.0215  Min 0.900 0.950  Min	Max 0.950 0.950	Std Err 0.012 0.000	2.94% 0.00%	0.00% -2.15%
Attribute Variance Distribution  Survival Rate Sum Sample IOSN 2019 AT3-098  Angular (Corrected Sample IOSN 2019 AT3-098	Variance R Shapiro-Wi mary Code RS d) Transform Code	Count 5 5 ned Sumn Count 5	Mean 0.930 0.950 mary Mean 1.310	95% LCL 0.896 0.950 95% LCL 1.240	0.814 95% UCL 0.964 0.950 95% UCL 1.370	0.741  Median 0.950 0.950  Median 1.350	0.0215  Min 0.900 0.950  Min 1.250	Max 0.950 0.950 Max 1.350	Std Err 0.012 0.000 Std Err 0.024	2.94% 0.00% CV% 4.03%	0.00% -2.15% %Effect 0.00%
Attribute Variance Distribution  Survival Rate Sum Sample IOSN 2019 AT3-098  Angular (Corrected Sample IOSN 2019 AT3-098  Survival Rate Detail Sample	Test Variance R Shapiro-Wi mary Code RS d) Transform Code RS	Count 5 5 ned Sumn Count 5	Mean 0.930 0.950 mary Mean 1.310	95% LCL 0.896 0.950 95% LCL 1.240	0.814 95% UCL 0.964 0.950 95% UCL 1.370	0.741  Median 0.950 0.950  Median 1.350	0.0215  Min 0.900 0.950  Min 1.250	Max 0.950 0.950 Max 1.350	Std Err 0.012 0.000 Std Err 0.024	2.94% 0.00% CV% 4.03%	0.00% -2.15% %Effect 0.00%
Attribute Variance Distribution  Survival Rate Sum Sample IOSN 2019 AT3-098  Angular (Corrected Sample IOSN 2019 AT3-098  Survival Rate Detail Sample IOSN 2019	Test Variance R Shapiro-Wi mary Code RS d) Transform Code RS	Count 5 5 ned Sumn Count 5 5 Rep 1 0.900	Mean 0.930 0.950 mary Mean 1.310 1.350	95% LCL 0.896 0.950 95% LCL 1.240 1.350	95% UCL 0.964 0.950 95% UCL 1.370 1.350	0.741  Median 0.950 0.950  Median 1.350 1.350	0.0215  Min 0.900 0.950  Min 1.250	Max 0.950 0.950 Max 1.350	Std Err 0.012 0.000 Std Err 0.024	2.94% 0.00% CV% 4.03%	0.00% -2.15% %Effect 0.00%
Attribute Variance Distribution  Survival Rate Sum Sample IOSN 2019 AT3-098  Angular (Corrected Sample IOSN 2019	Test Variance R Shapiro-Wi mary Code RS d) Transform Code RS	Count 5 5 ned Sumn Count 5 5 Rep 1	Mean 0.930 0.950 mary Mean 1.310 1.350	95% LCL 0.896 0.950 95% LCL 1.240 1.350	95% UCL 0.964 0.950 95% UCL 1.370 1.350	0.741  Median 0.950 0.950  Median 1.350 1.350  Rep 5	0.0215  Min 0.900 0.950  Min 1.250	Max 0.950 0.950 Max 1.350	Std Err 0.012 0.000 Std Err 0.024	2.94% 0.00% CV% 4.03%	0.00% -2.15% %Effect 0.00%
Attribute Variance Distribution  Survival Rate Sum Sample IOSN 2019 AT3-098  Angular (Corrected Sample IOSN 2019 AT3-098  Survival Rate Detail Sample IOSN 2019 AT3-098	Test Variance R Shapiro-Wi mary Code RS  I) Transform Code RS	Count 5 5 5 Rep 1 0.900 0.950	Mean 0.930 0.950 mary Mean 1.310 1.350  Rep 2 0.900 0.950	95% LCL 0.896 0.950 95% LCL 1.240 1.350 Rep 3 0.950	95% UCL 0.964 0.950 95% UCL 1.370 1.350 Rep 4 0.950	0.741  Median 0.950 0.950  Median 1.350 1.350  Rep 5 0.950	0.0215  Min 0.900 0.950  Min 1.250	Max 0.950 0.950 Max 1.350	Std Err 0.012 0.000 Std Err 0.024	2.94% 0.00% CV% 4.03%	0.00% -2.15% %Effect 0.00%
Attribute Variance Distribution  Survival Rate Sum Sample IOSN 2019 AT3-098  Angular (Corrected Sample IOSN 2019 AT3-098  Survival Rate Detail Sample IOSN 2019	Test Variance R Shapiro-Wi mary Code RS  I) Transform Code RS	Count 5 5 5 Rep 1 0.900 0.950	Mean 0.930 0.950 mary Mean 1.310 1.350  Rep 2 0.900 0.950	95% LCL 0.896 0.950 95% LCL 1.240 1.350 Rep 3 0.950	95% UCL 0.964 0.950 95% UCL 1.370 1.350 Rep 4 0.950	0.741  Median 0.950 0.950  Median 1.350 1.350  Rep 5 0.950	0.0215  Min 0.900 0.950  Min 1.250	Max 0.950 0.950 Max 1.350	Std Err 0.012 0.000 Std Err 0.024	2.94% 0.00% CV% 4.03%	0.00% -2.15% %Effect 0.00%
Attribute Variance Distribution  Survival Rate Sum Sample IOSN 2019 AT3-098  Angular (Corrected Sample IOSN 2019 AT3-098  Survival Rate Detail Sample IOSN 2019 AT3-098  Angular (Corrected	Test Variance R Shapiro-Wi mary Code RS d) Transform Code RS il Code RS	Count 5 5 The Summ Count 5 5 Rep 1 0.900 0.950 The Detail	Mean 0.930 0.950 mary Mean 1.310 1.350  Rep 2 0.900 0.950	95% LCL 0.896 0.950 95% LCL 1.240 1.350 Rep 3 0.950 0.950	95% UCL 0.964 0.950 95% UCL 1.370 1.350 Rep 4 0.950 0.950	0.741  Median 0.950 0.950  Median 1.350 1.350  Rep 5 0.950 0.950	0.0215  Min 0.900 0.950  Min 1.250	Max 0.950 0.950 Max 1.350	Std Err 0.012 0.000 Std Err 0.024	2.94% 0.00% CV% 4.03%	0.00% -2.15% %Effect 0.00%

CETIS™ v2.1.1.5 x64 Analyst:\_ NR QA: DR

# ATTACHMENT IV

Report Quality Assurance Record (2 pages)



## REPORT QUALITY ASSURANCE RECORD

	nt: Eco-Analysks hor: M. Chaner	Project Number: 70022 EA Report Number: 9/79	. TOX
	REPOR	RT CHECKLIST	
	QA/QC ITEM	REVIEWER	DATE
1.	Samples collected, transported, and received according to study plan requirements.	Mark	4/25/23
2.	Samples prepared and processed according to study plan requirements.	Luf /CIK	4/25/23
3.	Data collected using calibrated instruments and equipment.	hy/le	4/25/23
4.	Calculations checked: - Hand calculations checked	Jul KIR	4/25/23
	<ul> <li>Documented and verified statistical procedure used.</li> </ul>	MIKK	4/25/25
5.	Data input/statistical analyses complete and correct.	Less medy =	4/27/2023
6.	Reported results and facts checked against original sources.	SSS Medil,S	4/27/2023
7.	Data presented in figures and tables correct and in agreement with text.	Gess mRedy =	4/27/2023
8.	Results reviewed for compliance with study plan requirements.	MICH	4/25/23
		AUTHOR	DATE
9.	Commentary reviewed and resolved.	delle	4/22/23
10.	All study plan and quality assurance/control requi approved:	irements have been met and the repor	t is
		PROJECT MANAGER	1/27/23 DATE
		QUALIFICEONTROL OFFICER	4/27/0023 DATE
		Jan Tan	<u>467123</u>
		SENIOR TECHNICAL REVIEWER	DATE

## ATTACHMENT V

US Army Corps of Engineers Quality Assurance Checklist (3 pages)

Table II-1: Completeness Checklist

Quality Assurance/Quality Control Questions	Yes/No? Comments?
Was the report signed by the responsible applicant approved	100/101 00//////
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
If not, were deviations documented?	NA
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
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?	NA
14. Was the MDL study performed on each matrix (with this data submission) or within the last 12 months?	NA
15. Were the SRM/CRM analyses within acceptance criteria?	NA
16. Were the matrix spike/matrix spike duplicates run at the required frequency and was the percent recovery/RPD within the acceptance criteria?	NA
17. Were the duplicate samples analyzed and were the RPDs within the required acceptance criteria?	NA
18. For each analytical fraction of organic compounds, were recoveries for the internal standard within the acceptance criteria?	NA
19. Were surrogate recoveries within the required acceptance criteria?	NA
20. Were corrective action forms provided for all non-conforming data?	NA
21. Were all the species-specific test conditions in Appendix V met?	Yes, except as noted for temperature
22. Were the test-specific age requirements met for each test species?	Yes
23. Was the bulk physical/chemical testing performed on the sediments/composites that were biologically tested?	No, bulk physical/chemical testing completed prior to biological testing
24. Were the mortality acceptance criteria met for the water column and sediment toxicity tests?	Yes
25. Were the test performance requirements in Table 11.3 of EPA (1994a) met?	Yes

Table II-8: Quality Control Summary for Biological Toxicity Testing only

### Method Reference Numbers:

Quality Control (QC) Element	Acceptance Criteria*	Criteria Met?	List results outside criteria	Location of Results
		Yes/No	(Cross-reference results table in	(Retained at Lab or in
			data report)	Data Package)
Test condition requirements for each species: Temperature, Salinity, pH, D.O., Ammonia (Total, Unionized)	Test conditions within the requirements specified for each species	Yes	Temperature in both assays higher than target range, but within RIM limits (Tables 4 and 5)	Data Package
Test species age	Age/health within guidelines for each species (Appendix V)	Yes		Data Package
Bulk physical/chemical analyses (If required by the Sampling plan)	Required? If so, performed? Yes or No	Yes		Data Package (separate cover)
Water column toxicity test: Control mortality Control abnormality	≤ 10% mean ≤ 30% mussel/oyster; < 40% clam larvae, < 30% sea urchin larvae	NA		
Sediment toxicity test:  Control mortality  Compliance with applicable test acceptability requirements in Table 11.3 (EPA 1994a)	≤ 10% mean (no chamber > 20%) See EPA (1994a) Section 9; Table 11.3	Yes		Data Package

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

# ATTACHMENT VI

Email Communications (2 pages)

----Original Message-----

From: Hopkins, Aaron D CIV USARMY CENAE (US) < Aaron.D. Hopkins@usace.army.mil>

Sent: Wednesday, March 11, 2020 16:41

Cc: Wolf, Steven H CIV USARMY CENAE (USA) < Steven. Wolf@usace.army.mil>

Subject: RE: 10-Day Solid Phase Assay (UNCLASSIFIED)

We are sticking with the 20% threshold for the 10 day toxicity tests. This is something we are reviewing though and may revise as part of the RIM update.

Thanks, Aaron

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

----Original Message-----

From: Wolf, Steven H CIV USARMY CENAE (USA)

Sent: Wednesday, March 11, 2020 1:45 PM

To: Hopkins, Aaron D CIV USARMY CENAE (US) <Aaron.D.Hopkins@usace.army.mil>

Subject FW: 10-Day Solid Phase Assay (UNCLASSIFIED)

Sent: Wednesday, March 11, 2020 12:23 PM
To: Wolf, Steven H CIV USARMY CENAE (USA) <Steven Wolf@usace.army.mil>
Columnia
Subject [Non-DoD Source] 10-Day Solid Phase Assay

Hi Steve.

The lab is working through the bioassays for the project, and is beginning to draft the interim reports and provide data. In the reporting process a question regarding the comparson of the dredge site data to the reference site has come up. Historically including as recently as the last spring, all 10-day survival numbers were compared to the reference site to determine if they were significantly different and if so was the difference >20%, the lab has asked if they should continue to use 20% or should they use 10% as is stated in the ITM.



### ECOTOXICOLOGICAL TESTING BIOACCUMULATION ASSAYS

### KENNEBUNKPORT, MAINE

Prepared for:

Eco-Analysts, Inc. P.O. Box 224 Bath, Maine 04530

*Prepared by:* 

EA Engineering, Science, and Technology, Inc., PBC
231 Schilling Circle
Hunt Valley, Maryland 21031
For questions concerning this report, please contact Michael Chanov
ph: 410-584-7000

Results relate only to the items tested or to the samples as received by the laboratory.

This report shall not be reproduced, except in full, without written approval of EA Engineering, Science, and Technology, Inc., PBC

This report contains 23 pages plus 14 attachments.

Michael K. Chanov II

Laboratory Director

6 September 2023

Date



### 1. INTRODUCTION

In accordance with the US Army Corps of Engineers, New England District (CENAE), EA Engineering, Science, and Technology, Inc., PBC (EA) performed solid phase bioaccumulation testing on sediment samples collected from the area of dredging proposed the marinas located on the Kennebunk River in Kennebunkport, Maine. Placement of dredge materials is proposed at the Isles of Shoals North (IOSN) Disposal Site. Samples were provided by Eco-Analysts, Inc., Bath, Maine. The purpose of this study was to evaluate the toxicity and bioaccumulation potential of the sediment samples to benthic organisms.

The toxicity testing program consisted of 28-day bioaccumulation tests with *Nereis virens* (sand worm) and *Macoma nasuta* (blunt-nose clam). The bioaccumulation tests evaluated survival of the test organisms and bioaccumulative effects following exposure to the sediment samples. All biological testing was completed at EA, Hunt Valley, Maryland. At the completion of the 28-day exposure period, tissues from surviving organisms were couriered to Alpha Analytical, Mansfield, Massachusetts for chemical analysis.

### 2. MATERIALS AND METHODS

### 2.1 SAMPLE RECEIPT AND PREPARATION

Ten sediment cores were collected by Eco-Analysts personnel and/or their representatives from locations in the dredge footprint and composited in accordance with the Sampling and Analysis Plan. One sediment composite was created for the project and placed into five 5-gallon buckets. The samples were held at ≤4°C and were hand delivered to EA's Ecotoxicology Laboratory in Hunt Valley, Maryland. The composited sediment sample was logged in and assigned an EA laboratory accession number and was stored in the dark in a secured walk-in cooler at ≤4°C until used for testing. Table 1 summarizes the sample identification, accession number, and collection and receipt information for the sediment samples. A summary of the pore water ammonia measurements is included in Table 2. Chain-of-custody records are included in Attachment I.

Reference sediment was not collected from the IOSN. Rather, historic survival and body burden data from 2019 were provided by the CENAE for statistical comparison purposes.

### 2.2 TOXICITY TEST METHODS

All toxicity testing was conducted following EA's standard operating procedures (EA 2022) which are in accordance with the *Regional Implementation Manual for Evaluation of Dredged Material Proposed for Disposal in New England Waters* (USEPA, CENAE 2004), and USEPA/USACE guidance (1991, 1998).

### 2.2.1 Bioaccumulation Testing and Tissue Chemistry

Bioaccumulation testing was conducted using the sand worm (*Nereis virens*) and the blunt-nose clam (*Macoma nasuta*). The adult clams (lot number MA-080) and the adult worms (NV-088) were received from Aquatic Research Organisms (Hampton, New Hampshire) on 29 March 2023 and 7 March 2023, respectively. The organisms were placed in clean seawater and allowed to depurate accumulated waste products, prior to use in testing.

The sediment samples and overlying water were added to the test chambers a minimum of one day prior to test initiation to allow time for the suspended sediments to settle. The overlying water was 30 ppt artificial seawater (Crystal Sea artificial sea salts). Natural sediments from the organism collection sites were used as laboratory controls in the bioaccumulation testing. Control sediment used in the *N. virens* test was collected from the Damariscotta River, Booth Bay Harbor, Maine. Control sediment used in the clam bioaccumulation test was collected from Tomales Bay, California. The bioaccumulation tests were 28 days in duration and were conducted as static renewal assays. The overlying water was replaced three times a week by siphoning approximately 80 percent of the overlying water from the aquaria and replacing with new overlying water taking care not to disturb the sediment surface.

The bioaccumulation tests were conducted in 10-gallon aquaria with 5 L of sediment and 22 L of overlying water per aquarium. There were five replicates per test sediment, and three replicates per control sediment. Based on the analytical tissue biomass requirements, 30 organisms were randomly introduced into each replicate chamber for both species.

The bioaccumulation test for the sandworm was initiated on 8 March 2023 and completed on 5 April 2023. The clam assay was initiated on 29 March 2023 and completed on 26 April 2023. During the 28-day exposure periods, the test chambers were maintained at a target temperature of 20±1°C for *N. virens* and 12±1°C for *M. nasuta* with a 16-hour light/8-hour dark photoperiod. Gentle aeration was provided to each aquarium throughout the test period. Observations of mortality and abnormal organism behavior were recorded daily, and dead organisms were removed, as observed, from the test chambers. Measurements of temperature, pH, dissolved oxygen, and salinity of the overlying water were recorded on one replicate of each sample and control at test initiation, termination, and three times a week prior to replacement of the overlying water. The water quality measurements are summarized in Table 3 (*N. virens*) and Table 4 (*M. nasuta*). The organisms were not fed during the exposure period.

After 28 days of exposure, the organisms were recovered from the samples and placed into clean artificial sea water for 24 hours to purge their digestive tracts. After the depuration period, the organism tissues were collected and submitted to Alpha Analytical for chemical analyses. Copies of the original data sheets and tissue chains-of-custody from the *N. virens* and *M. nasuta* testing are included in Attachments II and III, respectively. Copies of tissue chemistry results

used for the statistical analysis of body burden data for *N. virens* and *M. nasuta* are provided in Attachments IV through XI. The complete tissue chemistry and quality assurance analytical report is provided under separate cover by Alpha Analytical.

All tissue data qualified as "JB" or "P" were treated as J-qualified for purposes of assigning footnotes for the CENAE EDD.

The RLs for zinc and PCBs were higher than their respective RIM RLs, however all MDLs met RIM criteria.

### 2.2.2 Data Analysis

The statistical analyses of survival and body burden data were completed using CETIS® ver. 2.1.1.5 (Comprehensive Environmental Toxicity Information System) software to determine significant differences between the IOSN 2019 reference data and the site composite tissues. Data were evaluated to determine homogeneity of sample variances and normality of distribution using appropriate statistical analyses. Data sets were subsequently evaluated using the appropriate parametric or non-parametric Analysis of Variance (ANOVA) statistical tests. Statistical difference was evaluated at α = 0.05. Per RIM guidelines and direction provided by the CENAE in an email dated March 30, 2018, one-half the MDL is used in instances when a compound of concern (COC) is not detected for purposes of calculating a mean tissue concentration and total concentrations for PAHs, PCBs, and pesticides. MDLs used in statistical computations may differ due to differences in tissue mass and final extract volumes used in the analysis for each sample. Statistical analyses of survival data are included in Attachments II and III for *N. virens* and *M. nasuta*, respectively. Statistical analyses of body burden data are included in Attachments IV through XI.

All mean body burden concentrations presented in the narrative report tables, CETIS® reports and the CENAE EDD spreadsheet are calculated from the same source of tissue chemistry data generated by Alpha. Concentrations are presented to a precision of 3 significant figures for all COCs. Slight differences in the concentrations may be attributable to the ability and limitations of each software package to capture and report significant figures. The values agree within

reason by rounding and represent the magnitude of the average concentration of the COC detected in tissue.

The statistical analyses were completed for all COCs identified in the SAP, however following guidance from the CENAE in emails dated July 28, 2020 and October 9, 2020, COCs were excluded from the evaluation if they were not detected in both the reference site and composite tissue replicates. These COCs are "c" qualified accordingly. All email communications are included in Attachment XIV.

As mentioned in Section 2.1, IOSN reference data from 2019 were used for statistical comparisons against data generated from this study. The IOSN 2019 data were generated using a different lot of test organisms than the assays completed for this study. As such, a comparison between the pre-test tissue and site composite results provides added insight to the levels of COCs observed in site tissue samples because the test organisms are from the same lot. In addition, there may be slight differences in the MDLs between the IOSN 2019 reference data and the samples analyzed as part of this study.

### 2.2.3 Reference Toxicant Testing

In conformance with EA's quality assurance/quality control program requirements, reference toxicant testing was performed by EA on the acquired lots of *N. virens* and *M. nasuta* utilized in the testing program. The reference toxicant tests consisted of a graded concentration series of a specific toxicant in water only tests, with no sediment present in the test chambers. Table 5 presents the results of the reference toxicant testing.

### 2.3 ARCHIVES

Original data sheets, records, memoranda, notes, and computer printouts are archived at EA's Office in Hunt Valley, Maryland. These data will be retained for a period of 5 years unless a longer period of time is requested.

### 3. RESULTS AND DISCUSSION

This bioassay study using a sediment composite sample collected from the Yachtsman Marina project area was designed and conducted to meet the requirements of the USEPA/USACE dredged material testing program. The results of these toxicity tests met the current NELAC standards, where applicable. Protocol requires 90 percent survival in the laboratory control, indicating that test organisms were healthy and that endpoints met or exceed requirements specified in the current version of the RIM.

Tables 6 through 9 provide results of *N. virens* and *M. nasuta* survival summaries and statistical analyses. Tables 10 and 11 provide summaries of body burden data with findings of significance for *N. virens* and *M. nasuta*, respectively. Table 12 summarizes significant uptake and the magnitude of COC concentrations in worm and clam tissue versus IOSN 2019 and pre-test tissue. Table 13 summarizes project specific Reporting Limits (RLs) and Method Detection Limits (MDLs) used in this study. Summaries of the tissue chemistry results and the statistical analysis of body burden data for *N. virens* and *M. nasuta* are provided in Attachments IV through XI.

### 3.1 Nereis virens BIOACCUMULATION EVALUATION RESULTS

### 3.1.1 Survival

Mean *N. virens* survival in the laboratory control sediment was 93 percent. Surviving organisms from the site composite sample provided sufficient tissue for preparation and analysis of body burdens. Mean survival of worms was 93 percent in the composite sample, and 90 percent in the IOSN 2019 reference data. Statistical analyses demonstrated that there were no significant effects on *N. virens* survival following exposure to the composite sediment sample as compared with the IOSN 2019 reference data, and results were within 10 percent of the reference data.

### 3.1.2 Body Burden Analysis

There were significant increases in body burdens for worms maintained in site composite sediments for 5 metals, 9 PAHs, 2 PCB congeners and 4,4'-DDD as compared to IOSN 2019

reference data. Of these COCs, lead, nickel, anthracene, and naphthalene were detected in composite tissue at concentrations less than in pre-test tissue, suggesting that the presence of these COCs may not be attributable to site conditions or factor heavily in the suitability determination for sediment disposal. Likewise, although concentrations of chromium and 4,4'-DDD were 8 to 37 times higher in composite tissue than in IOSN 2019 reference tissue, they were detected at concentrations below pre-test tissue levels. Of the remaining COCs, concentrations of pyrene were more than 5 times higher and concentrations of 2 PAHs and PCB 105 were more than 1 order of magnitude higher in composite tissue than in IOSN 2019 tissue. The remaining COCs were only slightly higher in composite tissue than in pre-test or IOSN 2019 tissue.

### 3.2 Macoma nasuta BIOACCUMULATION EVALUATION RESULTS

### 3.2.1 Survival

Mean *M. nasuta* survival in the laboratory control sediment was 90 percent. Surviving organisms from the site composite sample provided sufficient tissue for preparation and analysis of body burdens. Mean survival of clams was 96 percent in the site composite sample and 94 percent in the IOSN 2019 reference data. Statistical analyses demonstrated that there were no significant effects on *M. nasuta* survival following exposure to the composite sediment sample as compared with the IOSN 2019 reference data, and results were within 10 percent of the reference data.

### 3.2.2 Body Burden Analysis

There were significant increases in body burdens for clams maintained in site composite sediments for 3 metals, 11 PAHs, 3 PCB congeners and 2 pesticides as compared to IOSN 2019 reference data. Of these COCs, copper, nickel, PCB 52 and naphthalene were detected in composite tissue at concentrations less than in pre-test tissue, suggesting that the presence of these COCs may not be attributable to site conditions or factor heavily in the suitability determination for sediment disposal. Likewise, fluorene was over 6 times higher in composite tissue than in IOSN 2019 reference tissue, they were detected at concentrations below pre-test tissue levels. Of the remaining COCs, concentrations of 4 PAHs were more than 5 times higher and concentrations of 2 PAHs and 4,4'-DDD were more than 1 order of magnitude higher in

composite tissue than in IOSN 2019 tissue. The remaining COCs were only slightly higher in composite tissue than in pre-test or IOSN 2019 tissue.

### 3.3 REFERENCE TOXICANT TESTS

The results of the reference toxicant tests are summarized in Table 5. All of the reference toxicant test results fell within the established laboratory control chart limits.

### 4. REFERENCES CITED

- EA. 2022. EA Ecotoxicology Laboratory Quality Assurance and Standard Operating Procedures Manual. EA Manual ATS-102. Internal document prepared by EA's Ecotoxicology Laboratory, EA Engineering, Science, and Technology, Inc., PBC, Hunt Valley, Maryland.
- USEPA and USACE. 1991. Evaluation of Dredged Material Proposal for Ocean Disposal, Testing Manual (commonly called "The Green Book").
- USEPA and USACE. 1998. Evaluation of Dredged Material Proposed for Discharge in Waters of the U.S.-Inland Testing Manual. EPA/823/B-94/004. U.S. Environmental Protection Agency, Office of Water, Washington, D.C. and Department of the Army, U.S. Army Corps of Engineers, Washington, D.C.
- USEPA Region 1, CENAE. 2004. Regional Implementation Manual for Evaluation of Dredged Material Proposed for Disposal in New England Waters. September 2004

# TABLE 1 SUMMARY OF COLLECTION AND RECEIPT INFORMATION FOR SEDIMENT SAMPLES

Sample	EA A apaggian	Collection		Receipt	
Identification	Accession Number	Time	Date	Time	Date
10 Stations at 4 Marinas Mud	AT3-098	0900-1300	8 February 2023	1630	9 February 2023

# TABLE 2 AMMONIA CONCENTRATIONS MEASURED ON SEDIMENT PORE WATER PRIOR TO BIOACCUMULATION TOXICITY TESTING

Sediment Identification	EA Accession Number	Initial Ammonia (mg/L NH <sub>3</sub> -N)	Purged Ammonia (mg/L NH <sub>3</sub> -N)
10 Stations at 4 Marinas Mud	AT3-098	63.5	49.6

# TABLE 3 SUMMARY OF WATER QUALITY PARAMETERS MEASURED DURING BIOACCUMULATION TESTING WITH Nereis virens

Test Number: TN-23-302 Testing Dates: 3/8/23 - 4/5/23

Codiment	EA Aggagian	Range				
Sediment Sample Identification	EA Accession Number	Temperature (°C)	pH (SU)	Dissolved Oxygen (mg/L)	Salinity (ppt)	
10 Stations at 4 Marinas Mud	AT3-098	19.3 - 20.3	7.8 - 8.2	6.8 - 8.4	27.0 – 31.4	
LABORATORY CONTROL	AT3-152	19.0 - 20.2	7.8 - 8.1	7.0 - 8.7	27.0 – 31.7	

# TABLE 4 SUMMARY OF WATER QUALITY PARAMETERS MEASURED DURING BIOACCUMULATION TESTING WITH Macoma nasuta

Test Number: TN-23-303

Testing Dates: 3/29/23 - 4/26/23

Codiment	EA Aggagian	Range				
Sediment Sample Identification	EA Accession Number	Temperature (°C)	рН	Dissolved Oxygen (mg/L)	Salinity (ppt)	
10 Stations at 4 Marinas Mud	AT3-098	11.5 - 13.0	7.6 - 8.2	7.9 - 8.8	27.0 - 32.2	
LABORATORY CONTROL	AT3-191	11.6 - 13.0	7.7 - 8.2	7.7 - 8.7	27.0 - 32.0	

### TABLE 5 RESULTS OF REFERENCE TOXICANT TESTING ON ACQUIRED LOTS OF TEST ORGANISMS

<b>Test Species</b>	Organism Lot Number	Reference Toxicant	Test Endpoint	Acceptable Control Chart Limits	
Nereis virens	NV-088	Potassium chloride (KCl)	48-Hour LC50: 1,208 mg/L KCl	587-1,973 mg/L KCl	
Macoma nasuta	MA-080	Potassium chloride (KCl)	48-Hour LC50: 1,439 mg/L KCl	929-1,762 mg/L KCl	

### TABLE 6 RESULTS OF 28-DAY BIOACCUMULATION TESTING WITH Nereis virens

Test Number: TN-23-302 *Testing Dates:* 3/8/23 - 4/5/23

Sample Identification	EA Accession Number	No. Alive/No. Exposed <sup>(a)</sup>	28-Day Mean Percent Survival
LABORATORY CONTROL	AT3-152	72 / 75 <sup>b</sup>	93
IOSN REFERENCE	N/A	N/A	90
10 Stations at 4 Marinas Mud	AT3-098	140 / 150	93

<sup>(</sup>a) Total for five replicates of thirty organisms for all test sediments except for control, which had three replicates.(b) Only 15 organisms were added to replicate B of the laboratory control due to technician error.

# TABLE 7 STATISTICAL ANALYSIS OF 28-DAY BIOACCUMULATION TESTING WITH Nereis virens

Test Number: TN-23-302

**Testing Dates:** 3/8/23 - 4/5/23

Sample Identification	EA Accession Number	Mean Survival	Significantly Different as Compared to: IOSN 2019		in Survival ompared to: 2019
IOSN REFERENCE	N/A	90%	-	-	-
10 Stations at 4 Marinas Mud	AT3-098	93%	No	No	-3%

### TABLE 8 RESULTS OF 28-DAY BIOACCUMULATION TESTING WITH Macoma nasuta

Test Number: TN-23-303

**Testing Dates:** 3/29/23 - 4/26/23

Sample Identification	EA Accession Number	No. Alive/No. Exposed <sup>(a)</sup>	28-Day Mean Percent Survival
LABORATORY CONTROL	AT3-191	81 / 90	90
IOSN REFERENCE	N/A	N/A	94
10 Stations at 4 Marinas Mud	AT3-098	144 / 150	96

<sup>(</sup>a) Total for five replicates of thirty organisms for all test sediments except for control, which had three replicates.

# TABLE 9 STATISTICAL ANALYSIS OF 28-DAY BIOACCUMULATION TESTING WITH Macoma nasuta

Test Number: TN-23-303

**Testing Dates:** 3/29/23 - 4/26/23

	EA Accession	Mean	Significantly Different as Compared to:	Difference in Survival >10% as Compared to			
Sample Identification	Number	Survival	IOSN 2019	IOSN 2019			
IOSN REFERENCE	N/A	94%	-	-	-		
10 Stations at 4 Marinas Mud	AT3-098	96%	No	No	-2%		

TABLE 10 STATISTICAL COMPARISONS OF *N. virens* BODY BURDENS VS. IOSN 2019 REFERENCE DATA

Compound Units		Pre-Test <sup>d</sup> Mean Qual	IOSN 2019 Mean Qual	Composite Mean Qual			
Trace Metals		Mean Quai	Mean Quar	Mean Quar			
Arsenic, total	mg/Kg	2.00	2.25	2.02 NS			
Cadmium, total	mg/Kg	0.0300 b	0.0252 b	0.0338 bS			
Chromium, total	mg/Kg	0.620 b	0.0686 Ь	0.551 bS			
Copper, total	mg/Kg	1.49	1.20	1.12 NS			
Lead, total	mg/Kg	0.195	0.0744	0.191 S			
Mercury, total	mg/Kg	0.0110 Ь	0.0156 Ь	0.00662 abNS			
Nickel, total	mg/Kg	0.476	0.168	0.232 S			
Zinc, total	mg/Kg	13.1	18.6	14.1 NS/S e			
PAH Compounds							
Acenaphthene	μg/Kg	0.620 a	0.563 ab	0.883 abNS			
Acenaphthylene Anthracene	μg/Kg μg/Kg	0.381 a 0.903 ab	0.286 a 0.310 a	4.22 aNS 0.610 abS			
Benzo(a)anthracene	μg/Kg μg/Kg	0.775 a	0.510 a 0.581 a	0.766 ac			
Benzo(a)pyrene	μg/Kg μg/Kg	0.773 a 0.813 a	0.610 a	0.805 ac			
Benzo(b)fluoranthene	μg/Kg	1.08 a	0.807 a	2.43 aS			
Benzo(k)fluoranthene	μg/Kg	0.493 a	0.371 a	6.45 aS			
Benzo(g,h,i)perylene	μg/Kg	0.345 a	0.259 a	0.427 abS			
Chrysene	μg/Kg	0.752 a	0.564 a	1.14 abS			
Dibenz(a,h)anthracene	μg/Kg	0.400 a	0.300 a	0.396 ac			
Fluoranthene	μg/Kg	0.610 a	0.569 ab	6.71 bS			
Fluorene	μg/Kg	1.07 b	0.431 ab	2.05 bS			
Indeno(1,2,3-cd)pyrene	μg/Kg	0.810 a	0.608 a	0.802 ac			
Naphthalene	μg/Kg	1.64 b	0.651 ab	1.60 abS			
Phenanthrene	μg/Kg	0.677 a	2.04 b	0.861 abNS			
Pyrene	μg/Kg	0.898 a	0.674 a	6.23 bS			
Total PAHs	μg/Kg	12.3	9.63	36.4			
PCB Congeners PCB 008	///	0.0638 a	0.0480 a	0.0632 ac			
PCB 008 PCB 018	μg/Kg μg/Kg	0.0638 a 0.0465 a	0.0480 a 0.0349 a	0.0632 ac 0.0460 ac			
PCB 028	μg/Kg μg/Kg	0.0790 a	0.0593 a	0.0784 ac			
PCB 044	μg/Kg μg/Kg	0.0880 a	0.0661 a	0.0873 ac			
PCB 052	μg/Kg	0.0491 a	0.0369 a	0.136 abS			
PCB 066	μg/Kg	0.0462 a	0.0347 a	0.0457 ac			
PCB 101	μg/Kg	0.0752 a	0.0564 a	0.0745 ac			
PCB 105	μg/Kg	0.0675 a	0.0506 a	0.810 aS			
PCB 118	μg/Kg	0.0713 a	0.0534 a	0.0706 ac			
PCB 128	μg/Kg	0.0842 a	0.0632 a	0.0834 ac			
PCB 138	μg/Kg	0.305 ab	0.331 ab	0.462 aNS			
PCB 153	μg/Kg	0.628 b	0.763	0.857 aNS			
PCB 170	μg/Kg	0.0413 a	0.0310 a	0.0409 ac			
PCB 180	μg/Kg	0.0423 a	0.0318 a	0.0419 ac			
PCB 187 PCB 195	μg/Kg	0.256 a 0.0795 a	0.0456 a 0.0596 a	0.0601 ac 0.0786 ac			
PCB 195 PCB 206	μg/Kg μg/Kg	0.0793 a 0.0810 a	0.0608 a	0.0780 ac			
PCB 209	μg/Kg μg/Kg	0.0928 a	0.0697 a	0.0920 ac			
Total PCBs	μg/Kg	4.39	3.79	6.42			
Pesticides							
Aldrin	μg/Kg	0.0404 a	0.0605 a	0.0400 ac			
cis-Chlordane	μg/Kg	0.0870 a	0.131 a	0.0863 ac			
trans-Chlordane	μg/Kg	0.0245 a	0.0369 a	0.0243 ac			
cis-Nonachlor	μg/Kg	0.0117 a	0.0176 a	0.0116 ac			
trans-Nonachlor	μg/Kg	0.0108 a	0.0161 a	0.0106 ac			
Oxychlordane	μg/Kg	0.0501 a	0.0752 a	0.0495 ac			
Total Chlordanes	μg/Kg	0.184	0.277	0.182			
4,4'-DDT	μg/Kg	0.0159 a	0.0238 a	0.0158 ac			
4,4'-DDD	μg/Kg	3.29 ab	0.0182 a	0.665 S			
4,4'-DDE	μg/Kg	0.00737 a	0.0111 a	0.00728 ac			
Total DDT	μg/Kg	3.32	0.0531 0.0365 a	0.688			
Dieldrin alpha-Endosulfan	μg/Kg μg/Kσ	0.0243 a 0.0222 a	0.0365 a 0.0334 a	0.0241 ac 0.0220 ac			
beta-Endosulfan	μg/Kg μg/Kg	0.0222 a 0.0115 a	0.0334 a 0.0173 a	0.0220 ac 0.0113 ac			
Total Endosulfans	μg/Kg μg/Kg	0.0337	0.0507	0.0333			
Endrin	μg/Kg μg/Kg	0.0132 a	0.0199 a	0.0131 ac			
Heptachlor	μg/Kg	0.0253 a	0.0379 a	0.0250 ac			
Heptachlor epoxide	μg/Kg	0.0520 a	0.0780 a	0.0515 ac			
Hexachlorobenzene	μg/Kg	0.217 a	0.326 a	0.215 ac			
Lindane (gamma-BHC)	μg/Kg	0.0365 a	0.0548 a	0.0361 ac			
Methoxychlor	μg/Kg	0.0575 a	0.843 a	0.0568 ac			
Toxaphene	μg/Kg	1.05 a	1.58 a	1.04 ac			

### Notes:

Mean concentrations are reported to 3 significant figures.

a = COC not detected (below MDL) in at least one replicate; mean value was calculated using one-half of the project specific MDL for non-detected values.

b = COC concentration estimated (detected below RL but above MDL) in at least one replicate; mean value calculated using estimated value.

c = COC was not detected in either the dredge tissue replicates or in the historic reference tissue, therefore was eliminated from further evaluation.

<sup>&</sup>lt;sup>d</sup> Pre-test tissue represents the mean of three replicates, whereas the reference and site composites represent a mean of 5 replicates.

<sup>&</sup>lt;sup>e</sup> Analysis conducted after removal of a statistical outlier.

NS = Not Significant - mean tissue body burden was not statistically different from the associated reference site mean body burden. Statistical significance accepted at  $\alpha$ =0.05. S = Significant - mean tissue body burden was statistically different, greater than the associated reference site mean body burden. Statistical significance accepted at  $\alpha$ =0.05.

TABLE 11 STATISTICAL COMPARISONS OF M. nasuta BODY BURDENS VS. IOSN 2019 REFERENCE DATA

Compound Units		Pre-Test <sup>d</sup> Mean Qual	IOSN 2019 Mean Qual	Composite Mean Qual			
Trace Metals							
Arsenic, total	mg/Kg	2.59	3.49	2.54 NS			
Cadmium, total	mg/Kg	0.0297 Ь	0.0290 Ь	0.0266 bNS			
Chromium, total	mg/Kg	0.465	0.334 b	0.434 bNS			
Copper, total	mg/Kg	3.10	1.77	2.71 S			
Lead, total	mg/Kg	0.129	0.349	0.452 S			
Mercury, total	mg/Kg	0.00185 a	0.00170 a	0.00208 ac			
Nickel, total	mg/Kg	0.713	0.521	0.570 NS/S e			
Zinc, total	mg/Kg	11.6	11.8	12.8 NS			
PAH Compounds		107.1	0.452	156 1210			
Acenaphthene	μg/Kg	1.07 ab 0.378 a	0.453 a	1.56 abNS			
Acenaphthylene Anthracene	μg/Kg μg/Kg	0.853 ab	0.279 a 0.302 a	0.381 ac 2.69 bS			
Benzo(a)anthracene	μg/Kg μg/Kg	1.32 ab	0.565 a	5.40 bS			
Benzo(a)pyrene	μg/Kg μg/Kg	0.805 a	0.594 a	1.74 abS			
Benzo(b)fluoranthene	μg/Kg	1.07 a	0.786 a	4.41 bS			
Benzo(k)fluoranthene	μg/Kg	0.490 a	0.455 ab	1.25 abS			
Benzo(g,h,i)perylene	μg/Kg	0.342 a	0.518 ab	0.820 abNS			
Chrysene	μg/Kg	2.01 b	0.550 a	2.92 bS			
Dibenz(a,h)anthracene	μg/Kg	0.559 ab	2.97 b	0.400 aNS			
Fluoranthene	μg/Kg	2.57 b	2.12 Ь	26.6 S			
Fluorene	μg/Kg	2.11 b	0.253 a	1.74 bS			
Indeno(1,2,3-cd)pyrene	μg/Kg	0.803 a	3.54 b	0.985 abNS			
Naphthalene	μg/Kg	3.78 b	0.390 a	1.77 bS			
Phenanthrene	μg/Kg	4.09 b	1.97 Ь	6.92 bS			
Pyrene	μg/Kg	2.86 b	1.63 b	20.8 S			
Total PAHs	μg/Kg	25.1	17.4	80.4			
PCB Congeners							
PCB 008	μg/Kg	0.0633 a	0.0467 a	0.0639 ac			
PCB 018	μg/Kg	0.0461 a 0.0783 a	0.0340 a	0.0465 ac			
PCB 028 PCB 044	μg/Kg		0.0578 a	0.0791 ac 0.0883 ac			
PCB 052	μg/Kg μg/Kg	0.0873 a	0.0644 a				
PCB 066		2.09 0.0457 a	0.0359 a 0.0338 a	0.172 aS 0.0462 ac			
PCB 101	μg/Kg μg/Kg	0.0745 a	0.0550 a	0.0462 ac 0.0754 ac			
PCB 105	μg/Kg μg/Kg	0.0668 a	0.0493 a	0.0675 ac			
PCB 118	μg/Kg	0.0708 a	0.0522 a	0.142 abS			
PCB 128	μg/Kg	0.0835 a	0.0616 a	0.0843 ac			
PCB 138	μg/Kg	0.392 a	0.0394 a	0.0539 ac			
PCB 153	μg/Kg	0.111 a	0.0820 a	0.142 abS			
PCB 170	μg/Kg	0.0410 a	0.0303 a	0.0414 ac			
PCB 180	μg/Kg	0.0419 a	0.0309 a	0.0423 ac			
PCB 187	μg/Kg	0.0603 a	0.0445 a	0.0607 ac			
PCB 195	μg/Kg	0.0787 a	0.0580 a	0.0794 ac			
PCB 206	μg/Kg	0.0803 a	0.0594 a	0.0810 ac			
PCB 209	μg/Kg	0.0920 a	0.0680 a	0.0929 ac			
Total PCBs	μg/Kg	7.22	1.81	2.92			
Pesticides			0.000				
Aldrin	μg/Kg	0.0200 a	0.0296 a	0.0202 ac			
cis-Chlordane trans-Chlordane	μg/Kg	0.0432 a 0.0122 a	0.0638 a 0.0180 a	0.0436 ac 0.0123 ac			
cis-Nonachlor	μg/Kg μg/Kg	0.0122 a 0.00582 a	0.0180 a 0.00870 a	0.0123 ac 0.00587 ac			
trans-Nonachlor	μg/Kg μg/Kg	0.00533 a	0.00780 a	0.00537 ac			
Oxychlordane	μg/Kg	0.0248 a	0.0366 a	0.0250 ac			
Total Chlordanes	μg/Kg	0.0913	0.135	0.0922			
4,4'-DDT	μg/Kg	0.00788 a	0.0117 a	0.00796 ac			
4,4'-DDD	μg/Kg	0.00598 a	0.00880 a	0.391 S			
4,4'-DDE	μg/Kg	0.00365 a	0.219 b	0.499 S			
Total DDT	μg/Kg	0.0175	0.240	0.898			
Dieldrin	μg/Kg	0.0121 a	0.0178 a	0.0122 ac			
alpha-Endosulfan	μg/Kg	0.0110 a	0.0163 a	0.0111 ac			
beta-Endosulfan	μg/Kg	0.00568 a	0.00840 a	0.00573 ac			
Total Endosulfans	μg/Kg	0.0167	0.0247	0.0168			
Endrin	μg/Kg	0.00653 a	0.00970 a	0.00662 ac			
Heptachlor	μg/Kg	0.0125 a	0.0186 a	0.0127 ac			
Heptachlor epoxide	μg/Kg	0.0257 a	0.0381 a	0.0260 ac			
Hexachlorobenzene	μg/Kg	0.108 a	0.159 a	0.109 ac			
Lindane (gamma-BHC)	μg/Kg	0.0181 a	0.0267 a 0.411 a	0.0183 ac			
Methoxychlor Toxonbene	μg/Kg μg/Kα	0.0285 a		0.0287 ac 0.524 ac			
Toxaphene	μg/Kg	0.518 a	0.767 a	0.324 ac			

### Notes:

Mean concentrations are reported to 3 significant figures.

a = COC not detected (below MDL) in at least one replicate; mean value was calculated using one-half of the project specific MDL for non-detected values.

b = COC concentration estimated (detected below RL but above MDL) in at least one replicate; mean value calculated using estimated value.

c = COC was not detected in either the dredge tissue replicates or in the historic reference tissue, therefore was eliminated from further evaluation.

<sup>&</sup>lt;sup>d</sup> Pre-test tissue represents the mean of three replicates, whereas the reference and site composites represent a mean of 5 replicates.

<sup>&</sup>lt;sup>c</sup> Analysis conducted after removal of a statistical outlier.

NS = Not Significant - mean tissue body burden was not statistically different from the associated reference site mean body burden. Statistical significance accepted at  $\alpha$ =0.05. S = Significant - mean tissue body burden was statistically different, greater than the associated reference site mean body burden. Statistical significance accepted at  $\alpha$ =0.05.

TABLE 12 SUMMARY OF SIGNIFICANT UPTAKE AND MAGNITUDE OF CONCENTRATION IN TISSUE

	Nereis virens	Macoma nasuta
	Composite	Composite
Metals (ug/g wet weight)		
Cadmium	S	
Chromium	S	
Copper		S
Lead	S	S
Nickel	S	S a
Zinc	S a	
PAHs (ng/g wet weight)		
Anthracene	S	S
Benzo(a)anthracene		S
Benzo(a)pyrene		S
Benzo(b)fluoranthene	S	S
Benzo(k)fluoranthene	S	S
Benzo(g,h,i)perylene	S	
Chrysene	S	S
Fluoranthene	S	S
Fluorene	S	S
Naphthalene	S	S
Phenanthrene		S
Pyrene	S	S
PCB Congeners (ng/g wet wt.)		
PCB 52	S	S
PCB 105	S	
PCB 118		S
PCB 153		S
Pesticides (ng/g wet weight)		
4,4'-DDD	S	S
4,4'-DDE		S

### **Summary of Significant Uptake:**

"S" = Finding of significance.

"" = Finding of no significance.

### **Summary of Magnitude of Concentration:**

Green shading = concentration in site tissue is equal to or lower than in pre-test tissue.

No shading = concentration in site tissue is <5 times higher than in historic reference tissue.

Orange shading/"S" = concentration in composite tissue is 5-10 times higher than in historic reference tissue.

Red shading/"S" = concentration in composite tissue is  $\ge 10$  times higher than in historic reference tissue.

### **Notes:**

<sup>&</sup>lt;sup>a</sup> Analysis conducted both with and without a statistical outlier, and the findings of significance were split.

TABLE 13 PROJECT SPECIFIC ANALYTICAL RLs AND MDLs

COC	Units	RLs MD		MDLs	COC	Units	R	MDLs		
		RIM	Alpha				RIM	Alpha		
Trace Metals (6020B and 7					PAH Compounds (8270D	-SIM/680(N	1))			
Arsenic	mg/Kg	0.5	0.123	0.0423	Acenaphthene	$\mu g/Kg$	20	6.6	1.27	
Cadmium	mg/Kg	0.1	0.0490		Acenaphthylene	μg/Kg	20	6.6	0.778	
Chromium	mg/Kg	1	0.491	0.0442	Anthracene	μg/Kg	20	6.6	0.844	
Copper	mg/Kg	1	0.123	0.041	Benzo(a)anthracene	μg/Kg	20	6.6	1.6	
Lead	mg/Kg	1		0.0072	Benzo(a)pyrene	μg/Kg	20	6.6	1.7	
Mercury	mg/Kg	0.02			Benzo(b)fluoranthene	μg/Kg	20	6.6	2.2	
Nickel	mg/Kg	1	0.123		Benzo(k)fluoranthene	μg/Kg	20	6.6	1.01	
Zinc	mg/Kg	1	1.23 <sup>a</sup>	0.184	Benzo(g,h,i)perylene	μg/Kg	20	6.6	0.706	
PCB Congeners (8270D-SI	M/680(M))				Chrysene Dibenz(a,h)anthracene	μg/Kg μg/Kg	20 20	6.6 6.6	1.54 0.818	
PCB 008	μg/Kg	0.5	0.66 a	0.13	Fluoranthene	μg/Kg μg/Kg	20	6.6	1.25	
PCB 018	μg/Kg	0.5	0.66 a	0.095	Fluorene	μg/Kg	20	6.6	0.706	
PCB 028	μg/Kg μg/Kg	0.5	0.66 a	0.162	Indeno(1,2,3-c,d)pyrene	μg/Kg μg/Kg	20	6.6	1.66	
PCB 044				0.102				6.6	1.09	
	μg/Kg	0.5	0.66 a		Naphthalene	μg/Kg	20			
PCB 049	μg/Kg	-	0.66 a	0.176	Phenanthrene	μg/Kg	20	6.6	1.38	
PCB 052	$\mu g/Kg$	0.5	0.66 a	0.1	Pyrene	μg/Kg	20	6.6	1.83	
PCB 066	$\mu g/Kg$	0.5	$0.66^{a}$	0.0943						
PCB 077	$\mu g/Kg$	-	-	-	Pesticides (8081B)					
PCB 087	$\mu g/Kg$	-	0.66 a	0.0765	4,4'-DDD	$\mu g/Kg$	1	0.33	0.0247	
PCB 101	$\mu g/Kg$	0.5	$0.66^{a}$	0.154	4,4'-DDE	$\mu g/Kg$	1	0.33	0.015	
PCB 105	$\mu g/Kg$	0.5	0.66 a	0.138	4,4'-DDT	$\mu g/Kg$	1	0.33	0.0325	
PCB 118	$\mu g/Kg$	0.5	0.66 a	0.146	Aldrin	$\mu g/Kg$	1	0.33	0.0824	
PCB 126	$\mu g/Kg$	0.5	-	-	Alpha-BHC	μg/Kg	-	0.33	0.0501	
PCB 128	$\mu g/Kg$	-	0.66 a	0.172	Alpha-Chlordane	μg/Kg	1	0.33	0.178	
PCB 138	$\mu g/Kg$	0.5	0.66 a	0.11	Beta-BHC	$\mu g/Kg$	-	0.33	0.0343	
PCB 153	μg/Kg	0.5	0.66 a	0.23	Chlorpyrifos	μg/Kg	-	-	-	
PCB 170	μg/Kg	0.5	0.66 a	0.0844	cis-Nonachlor	μg/Kg	1	0.33	0.0239	
PCB 180	μg/Kg	0.5	0.66 a	0.086	Delta-BHC	μg/Kg	-	0.33	0.0392	
PCB 183	μg/Kg	-	0.66 a	0.0465	Dieldrin	μg/Kg	1	0.33	0.0497	
PCB 184	μg/Kg	_	0.66 a	0.095	Endosulfan I	μg/Kg	1	0.33	0.0454	
PCB 187	μg/Kg	0.5	0.66 a	0.124	Endosulfan II	μg/Kg	1	0.33	0.0234	
PCB 195	μg/Kg	0.5	0.66 a	0.162	Endosulfan sulfate	μg/Kg	_	0.33	0.0135	
PCB 206	μg/Kg	0.5	0.66 a	0.166	Endrin	μg/Kg	1	0.33	0.027	
PCB 209	μg/Kg	0.5	0.66 a	0.19	Endrin Aldehyde	μg/Kg	_	-	_	
10220)	MB/116	0.0	0.00	0.17	Endrin ketone	μg/Kg	_	_	_	
Notes: Reporting and Metho	d Datastian	limita	n this tak	10 000	Gamma-BHC (Lindane)	μg/Kg	1	0.33	0.0745	
representative for this specif				ne are	Gamma-Chlordane	μg/Kg	1	0.33	0.0501	
reporting/Method Detection					Heptachlor	μg/Kg	1	0.33	0.0516	
computations may be slightly different from these values as they		Heptachlor epoxide	μg/Kg	1	0.66	0.106				
are based on actual tissue mass, and final extract volumes for a		Hexachlorobenzene	μg/Kg	1	0.66	0.444				
specific analysis. The number					Methoxychlor	$\mu g/Kg$	1	0.33	0.117	
presented in tables and those used in the statistical analysis may		Oxychlordane	$\mu g/Kg$	-	0.66	0.102				
also vary.					Toxaphene	μg/Kg	50	16.6	2.14	
<sup>a</sup> RL is high but MDL meets	Trans-Nonachlor	$\mu g/Kg$	1	0.33	0.022					

## ATTACHMENT I

Chain-of-Custody Records (2 pages)



City/State Collected:

### EA Engineering, Science, and Technology

EA Ecotoxicology Laboratory 231 Schilling Circle Hunt Valley, Maryland 21031 Telephone: 410-584-7000 Fax: 410-584-1057



Sample Ship	ped By:	· _
Fed. Ex.	UPS	Other; Courier
Tracking #: ,	<del></del>	
•		_
Ī		•

Client: ECO-ANALYSTS, INC. Project No.: NPDES Number: Client Purchase Order Number: KENNEBUNK RIVER, MAINE

PLEASE READ SAMPLING INSTRUCTIONS ON BACK OF FORM

					A THOUSE ON PHONEOUS SOL		•7
Accession Number (office use only)	, ,	Composite	Start Date/Time	ection End Date/Time	Sample Description (including Site, Static Number, and Outfall Nur	חמ	Number/Volume of Container
AT3-018	A	X	2/8/23 0900	02/8/23 1300	10 Stations at 4 Marinas	Mind	5 Ten Gal Buckets
Ar3-09.9	<b>x</b> :		11	11	II .	Sitewater	ıı
Wite Property							·
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A CANAGA	•						,
24 - 2000 2000				<u> </u>			
NAT PARK	•					•	
A CONTRACTOR OF THE PROPERTY O					,		

Sampled By: Dustin Kach & Bud Brown	Date/Time 2/8/23 0900 - 1300	Received By: Dustin Kach	Date/Time 2/8/23 1300
Sampler's Printed Name: Dustin Kach & Bud Brown	Title: President	Relinquished By Mrhhhh	Date/Time
Relipquished By:	Date/Time 2/8/23 (13.2)	Received By Laboratory May	Date/Time 2/9/23 /630

Was Sample Chilled During Collection? No

Comments:

Sample Collection Parameters

Visual Description:

Temperature (°C):

pH:

TRC (mg/L):

Other:

White-Report Production EA 0534 F&B Rev.9/12

Yellow-Laboratory

Pink-Cilent/Sampler

## **ATTACHMENT II**

Nereis virens 28-Day Solid Phase Bioaccumulation Testing Data Sheets and Survival Statistical Analyses (19 pages)



## SEDIMENT TOXICITY TEST SET-UP BENCH SHEET

roject Number:1	EA.TOX									
Client: <u>Eco Analys</u>										
QC Test Number:										
	TE	ST ORGANI	ISM INFORMATION							
Common Name: S	and worm		Adults Isolated (Time, Date):							
Scientific Name: <i>N</i>			Neonates Pulled (Time, Date):							
Lot Number: NV-	<u>රව්වි</u>	<u>_</u>	Acclimation: 1 day Age: Adult							
Source: ARO			Culture Water (T/S):ppt							
		TEST I	NITIATION							
<u>Date</u> 3 /3/みろ	<u>Time</u> (みるの	Initials CS	Activity							
	,		Sediment Added to Chambers							
<u> </u>		•	Overlying Water Added to Chambers							
3/8/23	[130]	UPOLICA	Organisms Transferred							
		TEST	SET-UP							
Sample Number(s): AT3	3-152 (Lab Control)	, AT3-098								
			(LD3-みしし)							
Treatment		me Test Sed								
AT3- 153- (Lab Con	trol)	5L	22L							
AT3-098		1								
		$\downarrow$	↓							
			·							



### TOXICOLOGY LABORATORY BENCH SHEET -ORGANISM LOADING RECORD

Project Number: E	A.TOX	TEST ORGANISM									
Client: <u>EcoAnalysts</u>		Common Name: Sand worm									
QC Test Number:T	N-23-302										
		Lot Number: NV- 080 Source: ARO									
		Acclimation: ~24 hour Age: Adult									
Organisms Transferred (da	ite, time, initials	s): 3-8-33 1130 Uto 179									
Treatment	Replicate	Number of Organisms Loaded									
AT3-152											
(Control)	В	<b>→</b> 15*									
	С	£30									
AT3-098	A	30									
	В										
	С										
	D										
	Е	<u> </u>	_								

\* 15 organisms looded due to technician evan

03/01/00



## TOXICOLOGY LABORATORY BENCH SHEET - ORGANISM RECOVERY RECORD

roject Number: <u>E</u>			
Client: Eco Analysts		Common Name:	Sand worm
QC Test Number:		Scientific Name:	Nereis virens
Organisms Recovered (date,	time, initials):	415123 1030 To	
Treatment	Replicate	Number of Organisms Loaded	Number of Organisms Recovered
AT3-152	A	30	30
(Lab Control)	В	36 15 *	12
	С	30	30
AT3-098	A	30	$\mathcal{J}$ 8
	В	30	28
	С	30	29
	D	30	29
	E	30	26
<u> </u>			
Ĺ			

\* 15 organisms loaded due to technicion error.

(5) 3/8/2003 dR ATS-T30

03/01/00

Time: 1/50	Time: 1030		ļ		5 6							-							
Time:	Time:			Salinity (ppt)	3 4									_					
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3/8/23	33		oo tc		1														
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	J		nsity:		9	8	m										ري.	52	ب
Date:	.; eş		Photoperiod: 161,8 d Light Intensity: 50 - 100 fc	L)	S														
Beginning Date:	Ending Date:		Ligh	Dissolved Oxygen (mg/L)	4														
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		I	161.	olved	2			-			_					 Ì			
			riod: _	Diss	_														
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		ns			9														
	Sand worm	Nereis virens	DO: >2.5 mg/L Salinity: 30 ppt		ν														
	Sand	Nere	30		4												_		
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TEST ORGANISM	Common Name:	Scientific Name:	L Sa		2														
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			Hd (	Temperature (°C)	2				 						<u>-</u>				
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umber:	EcoA	Vumber:	TARGET VALUES: Temp: 20 °C pH: 6.0 - 9.0			Lab Control									:		Meter Number 1083	L	Ini
Project Number:	Client:	QC Test Number:	TARGET		Sample #	AT3-153	AT3-098												

3/8/33. Time: 1/30	23 Time: 1030		<u>00</u> fc
Beginning Date: 3	Ending Date: 415123	ı	16 l, 8 d Light Intensity: 50 - 10
SM	Sand worm	Nereis virens	Salinity: _30_ppt Photoperiod: _
TEST ORGANISM	_ Common Name:	Scientific Name:	DO: >2.5 mg/L
Project Number: EA.TOX	Client: Eco Analysts	QC Test Number: TN-23-302	TARGET VALUES Temp: 20 °C pH: 6.0 - 9.0 DO: >2.5 mg/L Salinity: 30 ppt Photoperiod: 16 l, 8 d Light Intensity: 50 - 100 fc

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		Lab Control										Meter Number	Time	Initials
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Project Number:	Jlient: _	QC Test Number: TN-23-302	TARGET VALUES Temp: 20 °C pH: 6.0 - 9.0 DO: >2.5 mg/L Salinity: 30 ppt Photoperiod: 161,8 d Light Intensity: 50 - 100 fc		# alc	AT3- EZ Lab Control
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	Sample#	AT3-152	AT3-098											l	

ATS-T14 06/21/06

Project Number: EA.TOX	TEST ORGANISM	Beginning Date: 3/8/33	Time:
Client: Eco Analysts	Common Name: Sand worm	Ending Date: 415723	Time:
QC Test Number: TN-23-302	Scientific Name: Nereis virens		
TARGET VALUES Temp: 20 °C pH: 6.0 - 9.0 D	DO: >2.5 mg/L Salinity: 30 ppt Photoperiod: 161.8 d Light Intensity: 50 - 100 fc	51, 8 d Light Intensity: 50 - 100 fc	

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Time: [130]	Time: 1030		
Time:	Time:		:
318/33	22/S/h		ity: 50 - 100 fc
Beginning Date: _	Ending Date:	1	161,8 d Light Intens
	Sand worm	Nereis virens	FARGET VALUES Temp: 20 °C pH: 6.0-9.0 DO: >2.5 mg/L Salinity: 30 ppt Photoperiod: 161,8 d Light Intensity: 50-100 fc
TEST ORGANISM	Common Name:	Scientific Name: _	>2.5 mg/L Sa
			pH: <u>6.0 - 9.0</u> DO <u>:</u>
EA.TOX	ıalysts	TN-23-302	Temp:20_°C
Project Number:	Client: Eco Analysts	QC Test Number: TN-23-302	TARGET VALUES

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ļ	Sample #	AT3-152	AT3-098												
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# SEDIMENT TOXICITY TEST OBSERVATION DATA SHEET

Time: 1130 Time: 1030 5 L sed / 22 L water Test Container: 10 gal aquarium 3/8/33 Test Volume: Beginning Date: Ending Date: Photoperiod: 161,8 d Light Intensity: 50 - 100 fc Renewal / Non-renewal Static / Flowthrough Nereis virens Sand Worm Scientific Name: Common Name: TEST ORGANISM TEST TYPE: 1D3-2746 30 PPT Crystal Sea Accession Number(s): See set up QC Test Number: TN-23-302 SEDIMENT EA.TOX Client: Eco Analysts Accession Number: Test Material(s): Project Number: Overlying Water:

28 days	
Test Duration:	

												_			
Total Recovered	Day Date														
Total Removed	Day Date														
	Day Date		-												
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	Rep	A	В	C		A	В	C	D	Ħ					
	Treatment	CONTROL	AT3-152			AT3-098									Time / Initials



# TOXICOLOGY LABORATORY BENCH SHEET - OVERLYING WATER PREPARATION / USAGE LOG

rojed	ct Number:]	EA.TOX	TES	T ORGANISM	
Client	t: <u>Eco Analysts</u>	s	Com	mon Name: Sar	nd worm
QC T	est Number:	TN-23-302		ntific Name: <u>Nereis s</u>	_
Overl	ying Water:	30 ppt Crystal Sea Art			
·	Sample Number	Preparation Time, Date	Initials	Date of First Use	Date of Final Use
61 . 	UD3-266	1600 314/13	TP	3/8/23	3/8/23
	LD3 384	1300 3/8/23	JL	3/0/23	3/10/23
	(D3- 407)	1154 3/11/3	10	3/13/23	3/3/25
	LD3-408	1100 3114)23	Tr	3/15/23	3)15)13
	LD3-423	12353/15/13	<u>61</u>	3117123	3/20/13
	UD3 -438	17003/17/23		3/2/2/23	3/22/23
	L113-453	1430 3/12/13	兀	3/24/13	3/24/23
]	W3-454	1730 3/14/3	JL_	3/17/23	3/27/23
	<u>CD3-470</u>	1340 3/26/23	GL	3/29/27	3/29/23
]	173-476	1630 3/28/23	GL	3/31/23	4/3/23
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## TOXICOLOGY LABORATORY BENCH SHEET - RENEWAL RECORD

Project 1	Number:	EA.TOX	
Client:	Eco	Analysts	
QC Test	Number:	TN-23-302	

Day	Overlying Water	Date	Time	Initials
0				
1				
2	AT3-384	3/10/23	1194	(CE)
3		<u> </u>		
4				-
5	403-403	3/13/22	0915	(Aro
6	1001-0	2 6 7 7		
7	103-404	3/15/13	0928	J2_
<u>8</u> 9	102 112	2/17/23	11.78	100
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12	LD3-123	3/10/13	1401_	TL
13	15 5 15 5	3,1000	7	
14	LD3-438	3/22/23	1400	No.
15				
16	LD3-453	3/24/23	1114	<b>「</b>
17		,		
18	4 1 1 1	- 4		
19	LD3-454	3/27/23	1129	ス
20 21	LD3-470	7100107	1430	B
22	LUJY	3/29/23	17130	<u> </u>
23	LD3-476	3 31/23	1500	(CP)
24		12705		
25		, ,		
26	(03-476	4/3/23	0930	CAD
27				
28				



# TOXICOLOGY LABORATORY BENCH SHEET - TESTING LOCATION

Project Number: _	EA.TOX	
Client: <u>Eco</u>	Analysts	
QC Test Number:	TN-23-302	

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Day	Testing Location	Date	Time	Initials
0	7A.13B	3/8/23	1942	(AD)
1				
2	7A,BB	3/10/23	0950	OR
3			-	
4				
5	7A,130	3113/23	<u> </u>	CAD
6	,			
7	7 A 13 B	3115)23	0841	TL
8		•		
9	7A.BB	3/17/33	(699)	<u>UAO</u>
10				
11				
12	7A,13D	3/20/83	0842	un
13				
14	7A 13B	3/22/23	1400	16
15	7.70	2 12 11 2	~ (F)	
16	74,1 <b>3</b> 8	3/24/23	<i>0</i> 85i	d
17				
18	71.10	010m h2		
19	7 A BB	3/27/23	(4,45	ス
20	21100	7 in a in a	11200	CA
$\frac{21}{22}$	7A,13B	3/29/23	1429	ge
22 23	7A, 13B	3/31/23	A910	<u> </u>
24	I (Tr ( ) D	2/10/8	0919	GC
25				
26	7A 12B	4/3/23	0857	(A)
27	7A, 13B	コーフィケン	(10) a	4,0
28	7A .13B	4/5/23	DR 08	Th
29	111,130	121-2	<u> </u>	# # # # # # # # # # # # # # # # # # #
30				
	<u> </u>	<u> </u>	·	<u> </u>



## TOXICOLOGY LABORATORY BENCH SHEET

Project Number: <u>EA.TOX</u>	
Client: <u>Eco Analysts</u>	
QC Test Number: TN-23-302	
Date/Time/Initials	Comments/Activity



## TOXICOLOGY LABORATORY CORRECTION BENCH SHEET

Project Number: <u>EA.TOX</u>
Client: Eco Analysts
QC Test Number: TN-23-302
Correction Explanations
(a) Technician Error-Mathematical
(b) Technician Error-Manual Data Recording
(c) Technician Error-Head Count Observation
(d) Technician Error-Overwrite
(e) Technician Error-Missing Data
(f) Technician Error-Lost Organism
(g) Technician Error-Transcription Error
(h) Technician Error-Other:
(i) Meter Malfunction

### **CETIS Test Data Worksheet**

End Date:

Report Date:

05 Sep-23 14:08 (p 1 of 1)

EA-EST, Inc. PBC

Test Code/ID:

TN-23-302NvSurv / 08-9048-9728

Bioaccumulation Evaluation - Survival Endpoint

Start Date: 08 Mar-23 11:30 05 Apr-23 10:30

Species: Nereis virens

Protocol: US ACE NED RIM (2004)

Sample Code: AT3-152

Sample Source: Yachtsman Marina NAE-2004-00319

Sample Date: 03	3 Mar-23			I: Laborator	. , administration (4000)
Sample	Rep	Pos	# Exposed	# Survived	Notes
AT3-152	1	3	30	30	11003
AT3-152	2	4	15	12	
AT3-152	3	7	30	30	
IOSN 2019	1	2	20	18	
IOSN 2019	2	5	20	16	
IOSN 2019	3	9	20	20	
IOSN 2019	4	11	20	19	
IOSN 2019	5	13	20	17	
AT3-098	1	1	30	28	
AT3-098	2	6	30	28	
AT3-098	3	8	30	29	
AT3-098	4	10	30	29	
AT3-098	5	12	30	26	

Analyst: NR QA: OL

Report Date:

05 Sep-23 14:09 (p 1 of 1)

Test Code/ID:

TN-23-302NvSurv / 08-9048-9728

### Bioaccumulation Evaluation - Survival Endpoint

EA-EST, Inc. PBC

		- Oui vii ui i	Liidpoiii	•							EA-ES	i, inc. PBC	
Batch ID: Start Date: Ending Date: Test Length:	06-1174-0758 08 Mar-23 11:30 05 Apr-23 10:30 27d 23h	0 Pro	st Type: otocol: ecies: con:	Nereis vire	Survival US ACE NED RIM (2004) Nereis virens Polychaeta					alyst: Nancy Roka uent: Not Applicable ne: Crystal Sea urce: ARO - Aquatic Research Or Age:			
Sample ID: Sample Date: Receipt Date: Sample Age:	03 Mar-23 12:3		terial: S (PC):	AT3-152 Laboratory Eco-Analys	Control Sedim		Project: Source: Station:	e: Yachtsman Marina NAE-2004-00319					
Sample Code AT3-152 IOSN 2019 AT3-098	Sample II 11-9755-1 13-4648-8 07-1559-4	1044 03 i 3170 08 i	nple Dat Mar-23 Mar-23 Feb-23 1	03 l 08 l	Mar-23 12:30 Mar-23 Mar-23 Feb-23 16:30	Sample 5d 11h 11h 27d 22h	<u> </u>	Client N Eco-Ana			roject redged Sed	iment Evalu	
Analysis ID	Laborator Reference Marine Se arison Summary Endpoint	y Control Se e sediment ediment		Yachtsman	Marina NAE-2 Marina NAE-2 Marina NAE-2	2004-00 2004-00	Station L Laborator IOSN Ret 10 Station	y Control erence is at 4 Ma	arinas I	Lat/Long  Mu  ison Result			
02-5654-4767 12-2728-1176	Survival Rate		•		Two-Sample Te		0.24 0.75			19 passed surv			
Survival Rate Sample AT3-152	Code LC	Count 3	<b>Mean</b> 0.933	<b>95% L</b> 0.646	.CL 95% UCI	_ Min 0.800	<b>Max</b>		d Err	Std Dev 0.115	CV% 12.37%	%Effect	
IOSN 2019 AT3-098	RS	5 5	0.900 0.933	0.802 0.883	0.998 0.984	0.800 0.867	1.00 0.96	0.	035 018	0.079 0.041	8.78% 4.37%	3.57% 0.00%	
Survival Rate Sample	Detail Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5		MD5: 5	2371F	4AC9B6ED2	EB2804070	:07EF73DD	
AT3-152 IOSN 2019 AT3-098	LC RS	1.000 0.900 0.933	0.800 0.800 0.933	1.000 1.000 0.967	0.950 0.967	0.850 0.867							

Analyst: NR QA: X

Report Date: Test Code/ID: 05 Sep-23 14:09 (p 1 of 2) TN-23-302NvSurv / 08-9048-9728

									Te	est Co	de/ID:	TN-23-30	2NvSurv / 0	8-9048-9728
Bioaccumulat	tion Eval	uation - Sui	vival E	ndpoin	t								EA-ES	T, Inc. PBC
Analysis ID:	02-5654-	-4767	End	point	Surviva	al Rate				CETI	S Version	ı: CETIŞv2	2.1.1	
Analyzed:	05 Sep-2	23 14:09	Ana	lysis:	Parame	etric-Two	Sample			Statu	ıs Level:	1		
Edit Date:	05 Sep-2	23 13:37	MD	5 Hash:	2BE92	66D39B4	4D289B001	77DB674B	BC8F	Edito	or ID:	005-341	-210-5	
Batch ID:	06-1174	0758	Tes	t Tyne:	Surviva	al				Anal	ret N	ancy Roka		
Start Date:	08 Mar-2			tocol:			RIM (2004)			Dilue		ot Applicable		
Ending Date:				cies:	Nereis		(200 1)			Brine		ystal Sea		
Test Length:	=		Tax		Polycha					Sour		RO - Aquatic I	Research (	)r Ane
Sample Code	Sample Code Sample ID Sample Date Receipt						t Date	Sample Ag	10		t Name			
AT3-152	_	9755-1044		/lar-23				5d 11h	,,,,,		Analysts, I		roject	iment Evalu
IOSN 2019		-4648-8170		/lar-23		08 Mar-		11h		1.00-7	nialysis, i		reugeu seu	imeni Evalu
Sample Code	Ma	iterial Type			Sample	e Source	e	Sta	ation L	ocati	on	Lat/Long	<u>.                                    </u>	
AT3-152	Lal	оогаtory Cor	ntrol Se	diment	Yachtsı	man Mai	rina NAE-20	04-00 La	borato	ry Con	trol			· · · · ·
IOSN 2019	Re	ference sedi	iment		Yachtsı	man Mai	rina NAE-20		SN Re	•				
Data Transfor			Нур					Comparis				<del></del>		PMSD
Angular (Corre	cted)	C>	· T					IOSN 201	9 pass	sed su	rvival rate	endpoint		13.49%
Equal Variance	e t Two-	Sample Tes	t											
		nple II	df	Test S	Stat Cr	itical	MSD	P-Type	P-Va	alue	Decisio	n(α:5%)		
Lab Control Se	dim Ref	erence Sed	6	0.721	1.9	94	0.239	CDF	0.24		~	nificant Effect	t	
Auxiliary Test	s		-		•									
Attribute	Te	est					Test Stat	Critical	P-Va	alue	Decision	n(α:5%)		
Outlier	Gı	ubbs Extren	ne Valu	e Test			1.59	2.13	0.68	12		ers Detected		<del></del>
ANOVA Table				-										
Source	Su	m Squares		Mean	Square		DF	F Stat	P-Va	alue	Decisio	n(a:5%)		
Between		147312		0.0147	<del></del>		1	0.52	0.49		Non-Significant Effect			
Error	0.1	69963		0.0283	3272		6							
Total	0.1	84695					7	_						
ANOVA Assur	nptions 1	Tests												
Attribute	Tes	st					Test Stat	Critical	P-Va	alue	Decision	n(α:1%)		
Variance	Var	iance Ratio	F Test				2.38	26.3	0.41	68	Equal Va	<del></del>		
Distribution	Sha	apiro-Wilk W	/ Norma	ality Tes	t		0.94	0.645	0.60	74	•	Distribution		
Survival Rate	Summar	<del></del>					<u></u>			=				
Sample	Co	de Cou	unt	Mean	95	% LCL	95% UCL	Median	Min		Max	Std Err	CV%	%Effect
AT3-152	LC	3		0.933	0.6	546	1.000	1.000	0.80	0	1.000	0.067	12.37%	0.00%
IOSN 2019	RS	5		0.900	0.8	302	0.998	0.900	0.80	0	1.000	0.035	8.78%	3.57%
Angular (Corre	ected) Tra	ansformed	Summ	ary								· ·		
Sample	Co	de Cou	ınt	Mean	95	% LCL	95% UCL	Median	Min		Max	Std Err	CV%	%Effect
AT3-152	LC	3		1.360	0.8	321	1.890	1.480	1.11	0	1.480	0.124	15.86%	0.00%
IOSN 2019	RS	5		1.270	1.0	90	1.440	1.250	1.11		1.460	0.062	11.00%	6.54%
Survival Rate	Detail													
Sample	Co	de Rep	1	Rep 2	Re	p 3	Rep 4	Rep 5						
AT3-152	LC	1.00	00	0.800	1.0	000								
IOSN 2019	RS	0.90	00	0.800	1.0	000	0.950	0.850						
Angular (Corre	ected) Tra	ansformed i	Detail											
Sample	Co	de Rep	1	Rep 2	Re	р 3	Rep 4	Rep 5						
AT3-152	LC	1.48		1.110		180		· · ·				<u> </u>		
IOSN 2019	RS	1.25	50	1.110	1.4	160	1.350	1.170						
												_		

Analyst: NE QA: OK

### **CETIS Analytical Report**

Report Date: Test Code/ID:

05 Sep-23 14:09 (p 2 of 2) TN-23-302NvSurv / 08-9048-9728

Bioaccumulation Evaluation - Survival Endpoint EA-EST, Inc. PBC 12-2728-1176 Analysis ID: Endpoint: Survival Rate

**CETIS Version:** CETISv2.1.1 Analyzed: 05 Sep-23 14:09 Analysis: Parametric-Two Sample Status Level:

**Edit Date:** 05 Sep-23 13:37 MD5 Hash: 97E2AE4963EA6A03812B029A11B133ED Editor ID: 005-341-210-5

Batch ID: 06-1174-0758 Test Type: Survival Analyst: Nancy Roka Start Date: 08 Mar-23 11:30 Protocol: US ACE NED RIM (2004) Diluent: Not Applicable Ending Date: 05 Apr-23 10:30 Species: Nereis virens Brine: Crystal Sea

Test Length: 27d 23h Taxon: Polychaeta Source: ARO - Aquatic Research Or Age:

Sample Code Sample ID Sample Date Receipt Date Sample Age **Client Name** Project **IOSN 2019** 13-4648-8170 08 Mar-23 08 Mar-23 11h Eco-Analysts, Inc. Dredged Sediment Evalu AT3-098 07-1559-4974 08 Feb-23 13:00 09 Feb-23 16:30 27d 22h

Sample Code Material Type Sample Source Station Location Lat/Long IOSN 2019 Reference sediment Yachtsman Marina NAE-2004-00 IOSN Reference AT3-098 Marine Sediment Yachtsman Marina NAE-2004-00 10 Stations at 4 Marinas Mu

**Data Transform** Alt Hyp Comparison Result **PMSD** Angular (Corrected) C > TAT3-098 passed survival rate endpoint 8.78%

**Equal Variance t Two-Sample Test** Sample I Sample II df Test Stat Critical MŞD P-Type P-Value Decision(a:5%)

Reference Sed AT3-098 R -0.721 1.86 0.133 CDF 0.7542 Non-Significant Effect **Auxiliary Tests** 

Attribute Test Test Stat Critical P-Value Decision(a:5%) Outlier Grubbs Extreme Value Test 1.8 2.29 0.4893 No Outliers Detected

ANOVA Table Source Sum Squares Mean Square DF F Stat P-Value Decision(a:5%) Between 0.0066221 0.0066221 1 0.52 0.4915 Non-Significant Effect Error 0.101947 0.0127433 8

9

ANOVA Assumptions Tests Attribute Test Test Stat Critical P-Value Decision(a:1%) Variance Variance Ratio F Test 3.19 23.2 0.2879 Equal Variances Distribution Shapiro-Wilk W Normality Test

Survival Rate Summary Sample Code Count 95% LCL Mean 95% UCL Median Min Max Std Err CV% %Effect RS IOSN 2019 5 0.900 0.802 0.998 0.900 0.800 1.000 0.035 8.78% 0.00% AT3-098 5 0.933 0.883 0.984 0.9330.867 0.967 0.018 4.37% -3.70%

0.741

0.7927

Normal Distribution

0.961

Angular (Corrected) Transformed Summary Sample Code Count Mean 95% LCL 95% UCL Median Min Max Std Err CV% %Effect IOSN 2019 RS 5 1.270 1.090 1.440 1.250 1.110 1.460 0.062 11.00% 0.00% AT3-098 5 1.320 1.220 1.420 1.310 1.200 1.390 0.035 5.92% -4.06%

Survival Rate Detail Sample Code Rep 1 Rep 2 Rep 3 Rep 4 Rep 5 IOSN 2019 RS 0.900 0.800 1.000 0.950 0.850 AT3-098 0.933 0.933 0.967 0.967 0.867

Angular (Corrected) Transformed Detail Sample Code Rep 1 Rep 2 Rep 3 Rep 4 Rep 5 IOSN 2019 RS 1.250 1.110 1.460 1.350 1.170 AT3-098 1.310 1.310 1.390 1.390 1.200

Total

0.108569

## **ATTACHMENT III**

Macoma nasuta 28-Day Solid Phase Bioaccumulation Testing
Data Sheets and Survival Statistical Analyses
(18 pages)



## SEDIMENT TOXICITY TEST SET-UP BENCH SHEET

Client: <u>EcoAnalysts</u>		<del></del>								
QC Test Number: TN-23-3	03									
		ISM INFORMATION								
Common Name: Blunt nose Scientific Name: Macoma n	asuta	Adults Isolated (Time, Date):								
Lot Number: <u>MA-080</u>		Acclimation: Age: Adult								
Source: ARO		Culture Water (T/S):ppt								
	TEST I	NITIATION								
<u>Date</u> <u>Time</u> 3 12 12 12 3 16 0 0	Initials	Activity								
3/20/23 1600	\$6	Sediment Added to Chambers								
4 +	4	Overlying Water Added to Chambers								
3/29/23 /345	uho uho	Organisms Transferred								
<u> </u>	TEST	Γ SET-UP								
G 1 37 1										
Sample Number(s): AT3- 9  (La Overlying Water:30										
Treatment	Volume Test Sed	diment Volume Overlying Water								
AT3- 191 (Lab Control)	5L	22L								
AT3-098										



## TOXICOLOGY LABORATORY BENCH SHEET - ORGANISM LOADING RECORD

roject Number:	EA.TOX	TEST ORGANISM								
Client: Eco Analy	<u>rs</u> ts	Common Name: Blunt nose Clam								
QC Test Number:	TN-23-303	Scientific Name: <u>Macoma nasuta</u>								
		Lot Number: MA- OSO Source: ARO								
		Acclimation: <24-hour Age: Adult								
Organisms Transferred (	date, time, initials):									
Treatment	Replicate	Number of Organisms Loaded								
AT3-191	A	30								
(Control)	В									
	С									
AT3-098	A	30								
	В									
	С									
	D									
	Е									
	-									
	4.									



# TOXICOLOGY LABORATORY BENCH SHEET - ORGANISM RECOVERY RECORD

roject Number:	EA.TOX	TEST ORGANISM						
Client: Eco Analys	sts	Common Name:	Blunt nose clam					
QC Test Number:	TN-23-303	Scientific Name:	Macoma nasuta					
Organisms Recovered (date,	time, initials):	4126123 1245 To						
Treatment	Replicate	Number of Organisms Loaded	Number of Organisms Recovered					
AT3- 191	A	30	28					
(Lab Control)	В	30	26					
	C	30	27					
ATTO 000								
AT3-098	A	30	30					
	В	30_	30					
	С	30	26					
	D	30	29					
	E	30	29					
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ATS-T13 06/21/06



# TOXICITY TEST WATER QUALITY DATA SHEET - NEW SOLUTIONS

3/29/23 Time: 1345	4126/23 Time: 1245		Salinity (ppt)	0 1 2 3 4 5 6	33.1	293						C&9	Q2A)	GL
Beginning Date:	Ending Date:	<i>Ita</i> Photoperiod: 16 l, 8 d Light Intensity: 50 - 100 fc	Dissolved Oxygen (mg/L)	0 1 2 3 4 5 6	9	9							8	
TEST ORGANISM	Common Name: Blunt nose clam	Scientific Name: Macoma nasuta DO: >2.5 mg/L Salinity: 30 ppt Photo	Hď	1 2 3 4 5 6		9.8						(89)		(S)
Project Number: EA.TOX	Client: Eco Analysts	QC Test Number: TN-23-303  TARGET VALUES: Temp: 12 °C pH: 6.0-9.0	Temperature (°C)		Lab Control	A13-038						Meter Number (%)_	Time MGO	Initials (L

# **S**

# TOXICITY TEST WATER QUALITY DATA SHEET - OLD SOLUTIONS

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	Jump	VAL			Lab (														Meter		
Client:	QC Test 🗅	TARGET		Sample #	AT3-19-1	AT3-098															
	Eco Analysts Common Name: Blunt nose clam Ending Date: 4/24/23	Eco Analysts       Common Name:       Blunt nose clam       Ending Date:       4/24/23         : Number:       TN-23-303       Scientific Name:       Macoma nasuta	Analysts         Common Name:         Blunt nose clam         Ending Date:         4/24/23           TN-23-303         Scientific Name:         Macoma nasuta           S: Temp: 12 °C pH: 6.0 - 9.0 DO: >2.5 mg/L Salinity: 30 ppt Photoperiod: 16 l, 8 d         Light Intensity: 50 - 100 fc	Common Name: Blunt nose clam   Ending Date: 4 24/23     Scientific Name: Macoma nasuta   Scientific Name: National Name: National Name: National Nat	Eco Analysts  Holmon Name: Blunt nose clam  Scientific Name: Macoma nasuta  TN-23-303  Scientific Name: Macoma nasuta  TN-23-303  Scientific Name: Macoma nasuta  Tremperature (°C)  Tremperature (°C)  Tremperature (°C)  Temperature Eco Analysts  TN-23-303  Scientific Name: Blunt nose clam	Eco Analysts   Eco Analysts   Scientific Name:   Blunt nose clam   Ending Date:   4 26/12 3   Time:   124   Scientific Name:   Macoma nasuta   Acoma nasut	Eco Analysts   TN-23-303   Scientific Name:   Macoma nasuta   Macoma nasuta   Anumber:   TN-23-303   Scientific Name:   Macoma nasuta   Anumber:   TN-23-303   Scientific Name:   Macoma nasuta   Anumber:   TN-23-303   Scientific Name:   Macoma nasuta   Anumber:   TN-23-303   Scientific Name:   Macoma nasuta   Anumber:   TN-23-303   Scientific Name:   Macoma nasuta   Scientific Name:   Macoma nasuta   Scientific Name:   Macoma nasuta   Scientific Name:   Macoma nasuta   Scientific Name:   Macoma nasuta   Scientific Name:   Macoma nasuta   Scientific Name:   Macoma nasuta   Scientific Name:   Macoma nasuta   Scientific Name:   Macoma nasuta   Scientific Name:   Macoma nasuta   Scientific Name:   Scientific Name:   Macoma nasuta   Scientific Name:   Scientific Name:   Macoma nasuta   Scientific Name:	FCO Analysts   TN-23-303   Scientific Name:   Blunt nose clam   Ending Date:   4 26/123   Time:   12/4     TNumber:   TN-23-303   Scientific Name:   Maccoma nasvita   Maccoma nasvita   Maccoma nasvita   Inc.	Eco Analysts   Eco Analysts   Common Name: Blunt nose clam   Ending Date:   4 26/123   Time:   124	Eco Analysts  Thurber: TN-23-303 Scientific Name: Blunt nose clam  Tomperature (°C)  Lab Control [\$\frac{3}{3}\text{ f } \frac{5}{3}\text{ f } \frac{5}{3}	Eco Analysts	Eco Analysts   Eco Analysts   Scientific Name: Blunt nose clam   Blunt nose clam   Blunt nose clam   Scientific Name: Macoma nasuta   Scientific Name: Macoma nasuta   Scientific Name: Macoma nasuta   Scientific Name: Macoma nasuta   Scientific Name: Macoma nasuta   Scientific Name: Macoma nasuta   Scientific Name: Macoma nasuta   Scientific Name: Macoma nasuta   Scientific Name: Macoma nasuta   Scientific Name: Macoma nasuta   Scientific Name: Macoma nasuta   Scientific Name: Macoma nasuta   Scientific Name: Macoma nasuta   Scientific Name: Macoma nasuta   Scientific Name: Macoma nasuta   Scientific Name: Macoma nasuta   Scientific Name:	Ending Date:   Finding Date:	Eco Analysts Common Name: Blunt nose clam Ending Date: 4/26/123 Time: 124/24/28: Temp: 12 °C pH: 60-90 DO: 225 mg/L Salinity: 30 ppt Photoperiod: 16 / 8 d Light Intensity: 50-100 & Time: 124/24/28: Temp: 12 °C pH: 60-90 DO: 225 mg/L Salinity: 30 ppt Photoperiod: 16 / 8 d Light Intensity: 50-100 & Time: 124/24/28: 12 °C pH: 60-90 DO: 225 mg/L Salinity: 30 ppt Photoperiod: 16 / 8 d Light Intensity: 50-100 & Time: 124/24/28: 12 °C pH: 60-90 DO: 225 mg/L Salinity: 30 ppt Photoperiod: 16 / 8 d C 7 1 2 °C pH: 60-90 DO: 225 mg/L Salinity: 12 °C pH: 60-90 DO: 225 mg	Eco Analysts	Evo Analysts Scientific Name: Blant nose clain Ending Date: 4 126/123 Time: 1244  I Number: TN-23-303  Scientific Name: Macema nasula  I Number: TN-23-303  Scientific Name: Macema nasula  I S	Eco Analysis   Common Name: Blunt nose clam   Ending Date:   4 26/12.3   Time:   124/10.4    Thu.23-303   Scientific Name:   Maceman answira    Temperature (°C)   PH   Photoperiod:   16,18.4   Light Intensity: \$50 - 100.5    Temperature (°C)   PH   Photoperiod:   16,18.4   Light Intensity: \$50 - 100.5    Temperature (°C)   PH   Photoperiod:   16,18.4   Light Intensity: \$50 - 100.5    Temperature (°C)   PH   Photoperiod:   16,18.4   Light Intensity: \$50 - 100.5    Temperature (°C)   PH   PH   Photoperiod:   16,18.4   Light Intensity: \$50 - 100.5    Temperature (°C)   PH   PH   Photoperiod:   16,18.4   Light Intensity: \$50 - 100.5    Temperature (°C)   PH   PH   Photoperiod:   16,18.4   Light Intensity: \$50 - 100.5    Temperature (°C)   PH   PH   Photoperiod:   16,18.4   Light Intensity: \$50 - 100.5    Temperature (°C)   PH   PH   Photoperiod:   16,18.4   Light Intensity: \$50 - 100.5    Temperature (°C)   PH   PH   Photoperiod:   16,18.4   Light Intensity: \$50 - 100.5    Temperature (°C)   PH   Photoperiod:   16,18.4   Light Intensity: \$50 - 100.5    Temperature (°C)   PH   Photoperiod:   16,18.4   Light Intensity: \$50 - 100.5    Temperature (°C)   PH   Photoperiod:   16,18.4   Light Intensity: \$50 - 100.5    Temperature (°C)   PH   Photoperiod:   16,18.4   Light Intensity: \$50 - 100.5    Temperature (°C)   PH   Photoperiod:   16,18.4   Light Intensity: \$50 - 100.5    Temperature (°C)   PH   Photoperiod:   16,18.4   Light Intensity: \$50 - 100.5    Temperature (°C)   PH   Photoperiod:   16,18.4   Light Intensity: \$50 - 100.5    Temperature (°C)   PH   Photoperiod:   16,18.4   Light Intensity: \$50 - 100.5    Temperature (°C)   PH   Photoperiod:   16,18.4   Light Intensity: \$50 - 100.5    Temperature (°C)   PH   Photoperiod:   16,18.4   Light Intensity: \$50 - 100.5    Temperature (°C)   PH   Photoperiod:   16,18.4   Light Intensity: \$50 - 100.5    Temperature (°C)   PH   Photoperiod:   16,18.4   Light Intensity: \$50 - 100.5    Temperature (°C)   PH   Photoperiod:   16,18.4   Light Intensity: \$10.5    Temperature (°C	Eco Analysts  Common Name: Blunt nose clan  Finding Date: 4/L6/12.3 Time: 1344  Scientific Name: Macona nasuta  TVALUES: Temp: 12 ° C pH: 60.90 DO: 225 mg/L Salinity: 30 ppt Photoperiod: 16.18 d. Light Intensity: 50-100 &  Temperature CO  Lab Courted (3.0 y3-C225 mg/L Salinity: 30 ppt Photoperiod: 16.18 d. Light Intensity: 50-100 &  Lab Courted (3.0 y3-C225 mg/L Salinity: 30 ppt Photoperiod: 16.18 d. Light Intensity: 50-100 &  Lab Courted (3.0 y3-C225 mg/L Salinity: 30 ppt Photoperiod: 16.18 d. Light Intensity: 50-100 &  Lab Courted (3.0 y3-C225 mg/L Salinity: 30 ppt Photoperiod: 16.18 d. Light Intensity: 50-100 &  Lab Courted (3.0 y3-C225 mg/L Salinity: 30 ppt Photoperiod: 16.18 d. Light Intensity: 50-100 &  Lab Courted (3.0 y3-C225 mg/L Salinity: 30 ppt Photoperiod: 16.18 d. Light Intensity: 50-100 &  Temperature CO  Fig. 8.7 g/L S.	Ego Analysis   Scientific Numer.   Blant nose clam   Ending Date   4 26/163   Time:   124	Eco Analysis   Scientific Name: Blant nose class   Fading Date:   4 26463   Time: 134	

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Project N	Project Number:	EA	EA.TOX						TE	TEST OF	ORGANISM	ISM							Beg	Beginning Date:	g Date	- 1	3	79	7	Tim	ائے۔' ق	Time: 345
Client:	Eco Analysts	<u>naly</u>	rsts						ŭ	mmo	Common Name:	ë	Blu	Blunt nose clam	e clar				Enc	Ending Date: _	ate: _		7115	163	4126123	Tim	Time:	1245
QC Test]	QC Test Number:	I	TN-23-303	303					Sc	ientifi	Scientific Name: Macoma nasuta	<u>i</u>	Ma	coma	nasutc													
TARGET	TARGET VALUES: Temp: 12 °C pH: 6.0 - 9.0 DO: >2.5	Tem	p: 12	<sub>2</sub> گر	) pH	: <u>6.0</u>	0.6-0	_ DC	;   		_mg/L Salinity: _30_ ppt Photoperiod: _161,8 d Light Intensity: _50 - 100 fc	alinit	y:	00 P	pt I	hotor	eriod	: 16	1,8 d	ij	ght Int	ensity	: 50 -	100 fc				
				T <sub>er</sub>	mpera	Temperature (°C)	Ď					Hd					ig .	ssolve	d Oxy	Dissolved Oxygen (mg/L)	g/L)				Salin	Salinity (ppt)	Đ	
Sample #		∞	6	10	-	11	12	13 1	41	8	9 10		12	13	41	∞	6	10	11	12	13	14	∞	6	10	==	12	13 14
4T3-191	Lab Control		05)		2	130 130	S	<u> </u>	30	රා	0.6 0.6		2%		7.7		7			C.%		8.5		3).4		~	872	2.5
AT3-098			5.			- XX	130	<u>~</u>	13.0	₹ T			8.5	~	3,7		0,1			しジ		8,5		30,5		10X	\$ \$\overline{\pi}{\sigma}\$	3%
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# TOXICITY TEST WATER QUALITY DATA SHEET - OLD SOLUTIONS

Project Number:		EA.TOX	×					II	TEST O	ORGANISM	ISM							Beg	nning	Beginning Date:	ر۹	3/39	3/29/13	I	Time: 1345	345	\
Client: E	Eco Analysts	alysts						S	ommo	Common Name:	je:	Blu	nt nos	Blunt nose clam				End	Ending Date:		412	210		ı	Time: 1245	124	4
QC Test Number:	3f:	TN-23-303	3-303					Š	ientif	Scientific Name:	je:	Mae	soma	Macoma nasuta													
TARGET VALUES: Temp:_	UES: T	emp: _	12	°C p	pH: 6	0.6 - 0.9	r	DO: <u>&gt;2.5</u>		mg/L Salinity: 30 ppt	alinit	.≍	0 P		hotop	eriod:	16,	1,8 d	Ligh	Photoperiod: 161,8 d Light Intensity: 50 - 100 fc	sity: 5	0 - 10	ු ව				
				Temperature (°C)	rature	(၁)					Hd					Dis	solved	Oxyg	Dissolved Oxygen (mg/L)	1			S	Salinity (ppt)	) gg		
Sample #		15	91	17	18	19	20	21	15 1	16 17	7 18	19	20	21	15	16	17	18	19	<u> </u>	21 15	5 16		18	19	20	21
AT34Q( Lab C	Lab Control		13.0			3.0	<del> </del>	0.51	PÕ	8,0		8,0	$\perp$	0.8	_	N S			<u>a</u>	8.0	0	25.5			39.3		2 7
AT3-098		-	13.0			3.0		(3.0	~ ≈	-		0,8		- %		\$			10	) Z		3.60	, 0		3	1~	31.0
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Project Number: EA.TOX	TEST ORGANISM	Beginning Date: $39903$	Time: 1345
Client: Eco Analysts	Common Name: Blunt nose clam	2	
QC Test Number: TN-23-303	Scientific Name: Macoma nasuta		
TARGET VALUES: Temp: 12 °C pH: 6.0 - 9.0 DO: 22.5 mg/L Salinity: 30 ppt Photoperiod: 161,8 d Light Intensity: 50 - 100 fc	: 22.5 mg/L Salinity: 30 ppt Photoperiod: 16	1.8 d Light Intensity: 50 - 100 fc	

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			Tem	Temperature (°C)	(°C)				İ		μd		4,5		Q	issolve	Dissolved Oxygen (mg/L)	gen (m	g/L)				Salini	Salinity (ppt)	_		
Sample #	22	23	24	25	26	27	28	22	23	24	25	56	27 2	28 22	2 23	24	25	26	27	28	22	23	24	25   2	26 27	78	~
AT3- [9] Lab Control	1	130			9		<u>₽</u>		33	-		5	2,4	15	8.4		_	87		7		┿	-			1	,   <
AT3-098		13.0			>=		<u>+</u>		6,3	+	***	- G	->t	-   >	, %		1	7 5		36		> \	+	717	- ا	3	, ا ج
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Time		<b>E</b>	_	_ <del></del>	6639	_ ~_0	0814	0	<u>12</u>		ζ≥	33	180	=	2			1	-	0814	<u>'   2</u>	1505	+	\$ <b>\</b>	<u> </u>		.
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# TOXICOLOGY LABORATORY BENCH SHEET - RENEWAL RECORD

Project Number: _	EA.TOX	
Client: Eco	Analysts	
QC Test Number:	TN-23-303	

Day	Overlying Water	Date	Time	Initials
0				
1				
2	LD3-471	3/31/23	1600	Co
3		-/ /		
4		,		
5	LD3-471	EGICIL	1030	an
6	100	4 1 - 1		
7	LD3-485	415/23	1001	BC
8				
9	LD3-508	4/7/23	1360	(Cro
10			<u>-</u>	
11	132-6			
12 13	103-501	4/10/23	[011	1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1
14	100-ENI	4112122		<u> </u>
15	L03-501	4/12/23	1100	KY
16	103-502	म् १५ १३ ३	1094	GC .
17	202 200	(i. I iax	[vo/	
18			-	*
19	LD3-S13	4/17/23	1415	OND
.20			(11)	<u> </u>
21	LD3-532/LD3-539	4/19/23	1105	KY
22		_		
23	LD3-540	4/21/23	0910	KY
24	10	4		•
25				
26	W3- 548	4/24/23	1035	CAD
27				
28	,			



# TOXICOLOGY LABORATORY BENCH SHEET - OVERLYING WATER PREPARATION / USAGE LOG

je	ct Number:	EA.TOX		TEST ORGANISM	•			
Clien	t: <u>Eco Analys</u>	sts	***	Common Name: Blunt nose clam				
-		TN-23-303 30 ppt Crystal Sea Ar		Scientific Name: <u>Macoma nas</u>	ruta			
	Sample Number	Preparation Time, Date	Initials	Date of First Use	Date of Final Use			
	CD3-466	1620,3/26/25	ىڭ	3/28/23	3/28/23			

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Sample Number	Preparation Time, Date	Initials	Date of First Use	Date of Final Use
LD3-466	1620,3/26/23	بط	3/28/23	3/28/23
LD3-471	1530,3/28/23	77	3/31/23	4/3/23
LD3-485	1520, 3/28/23	JG	4/5/23	4/5/23
103-508	1630 415/23	SL	4/7/23	4110123
LD3-501	1630-41513	プトシント	4110123	4110734/12/23
LD3-50+	1100045123	SETKY	4	
LO3-50)L	1635 379/13	G	4/14/23	4/14/23
103-513	1615 4/10/2	SGL	uln123	4117123
LD3-532	1037 4 119/2	3 K4156	4/19/23	4/19/23
<u> 103-539</u>	1430 4/18/23	KM	4/19/23	4/19/23
LD3-540	1000 4/19/23	<u> </u>	4/21/23	4/21/23
W3-548_	1331 4/20 33	GL_	4/24/23	4/4/2
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# TOXICOLOGY LABORATORY BENCH SHEET - TESTING LOCATION

Project Number:	EA.TOX	
Client: <u>Eco</u>	Analysts	
QC Test Number: _	TN-23-303	

Day	Testing Location	Date	Time	Initials
0	198,208	3bala3	1600	óK
1				
2	198, 20R	3/31/23	0936	a
3				
4		2		
5	190, 2012	4333	0937	UAD
6				
7	198,208	4/5/23	0911	Be
8				
9	190,200	4713	0940	ap
10				
11				, <u> </u>
12	19B,20B	4/10/23	1540	SR
13			_	
14	1913, 2013	4/12/23	1020	KY
15				1 -1
16	198,208	414123	1001	- GL
17				
18			'90 	
19	19B, FUB	4/17/33	1430	470
20				
21	19B, 20B	4/19/23	0846	Ci
22	3 -			
23	198,203	4/21/23	9090	KY
24				
25				
26	190, 200	4/24/23	<u> </u>	(A)
27	1			
28	19B, 20B	4126123	1245	7
29				
30		,		



## TOXICOLOGY LABORATORY CORRECTION BENCH SHEET

Project Number: <u>EA.TOX</u>
Client: Eco Analysts
QC Test Number: TN-23-303
Correction Explanations
(a) Technician Error-Mathematical
(b) Technician Error-Manual Data Recording
(c) Technician Error-Head Count Observation
(d) Technician Error-Overwrite
(e) Technician Error-Missing Data
(f) Technician Error-Lost Organism
(g) Technician Error-Transcription Error
(h) Technician Error-Other:
(i) Meter Malfunction



### TOXICOLOGY LABORATORY BENCH SHEET

Project Number:	EA.TOX	
Client: <u>Eco Analy</u>	ysts	<u> </u>
QC Test Number:	TN-23-303	
Date/Time/Initials		Comments/Activity

#### **CETIS Test Data Worksheet**

Report Date:

08 May-23 23:11 (p 1 of 1)

Test Code/ID: TN-23-303MnSurv / 05-1648-0077

Bioaccumulat	ion E	valua	tion -	Survival En	dpoint	EA-EST, Inc. PBC
Start Date: End Date: Sample Date:	29 Mar-23 13:45 26 Apr-23 12:45 20 Mar-23		45 Protocol: US ACI		Sample Code: AT3-191  E NED RIM (2004)  Sample Source: Yachtsman Marina NAE-2004-00319  Dry Control Sediment  Sample Station: Laboratory Control	
Sample AT3-191		Rep	Pos 1	#Exposed	#Survived	Notes
AT3-191		2	6	30	26	
AT3-191		3	8	30	27	
IOSN 2019		1	2	20	19	
IOSN 2019		2	5	20	18	
IOSN 2019	-	3	7	20	20	
IOSN 2019		4	10	20	18	
IOSN 2019		5	12	20	19	
AT3-098		1	3	30	30	
AT3-098		2	4	30	30	
AT3-098		3	9	30	26	
AT3-098	-	4	11	30	29	
AT3-098		5	13	30	29	

Report Date:

08 May-23 23:13 (p 1 of 1) TN-23-303MnSurv / 05-1648-0077

Test Code/ID:

Bioaccumula	tion Evaluation	n - Surviv	al Endpoin	ıt							EA-ES	T, inc. PBC
Batch ID: Start Date: Ending Date: Test Length:	03-8883-4534 29 Mar-23 13: 26 Apr-23 12:4 27d 23h	45 I 45 \$	Test Type: Protocol: Species: Taxon:		ED RIM (2004 asuta	)		Analy Dilue Brine Sour	nt: No : No	ncy Roka of Applicable of Applicable RO - Aquatic	Research (	Or Age:
Sample ID: Sample Date: Receipt Date: Sample Age:	20 Mar-23 16:	i 00 00	Code: Viaterial: CAS (PC); Client:	AT3-191 Laboratory Eco-Analys	Control Sedim	nent		Proje Soure Static	ce: Ya	edged Sedin chtsman Ma boratory Cor	rina NAE-2	
Sample Code			Sample Dat	te Rec	eipt Date	Sample	Age	Clien	Name	 P	roject	
AT3-191 IOSN 2019 AT3-098	10-1907- 13-4648- 07-1559-	-8170 (	20 Mar-23 )8 Mar-23 )8 Feb-23 1	1 80	Mar-23 16:00 Mar-23 Feb-23 16:30	9d 14h 21d 14 49d 1h	h	Eco-A	nalysts, li	nc. D	redged Sec	liment Evalu
Sample Code	Material	Туре		Sample So	urce	············	Station I	ocatio	n	Lat/Long		<u> </u>
AT3-191 IOSN 2019 AT3-098		ce sedime		Yachtsman	Marina NAE-2 Marina NAE-2 Marina NAE-2	2004-00	Laborato IOSN Re 10 Statio	ference		<b>⁄</b> lu		
Single Compa	rison Summa	ry		<del> </del>							<u>.                                    </u>	· · · · ·
Analysis ID	Endpoint		Comp	arison Metl	nod		P-V	alue	Compari	son Result		٤
06-3628-8518			Equal	Variance t Two-Sample Test 0.88				IOSN 2019 passed survival rate 1				
15-9977 <b>-</b> 3478	Survival Rate		Equal	Variance t T	wo-Sample Te	est	0.79	68		passed surv		
Survival Rate	Summary											
Sample	Code	Count	Mean	95% L	CL 95% UC	Min	Max	:	Std Err	Std Dev	CV%	%Effect
AT3-191	LC	3	0.900	0.817	0.983	0.867	0.93	3	0.019	0.033	3.70%	0.00%
IOSN 2019	RS	5	0.940	0.888	0.992	0.900	1.00	0	0.019	0.042	4.45%	-4.44%
AT3-098	······································	5	0.960	0.892	1.030	0.867	1.00	0	0.025	0.055	5.71%	-6.67%
Survival Rate	Detail				·			MD5:	9962839	BD8282B8E	BFF87A88	1CBEBCC1
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5						
AT3-191	LC	0.933	0.867	0.900						_		
IOSN 2019	RS	0.950	0.900	1.000	0.900	0.950						

AT3-098

1.000

1.000

0.867

0.967

0.967

Report Date:

08 May-23 23:12 (p 1 of 2)

	y ticar ixcp	011					Test	Code/ID:			05-1648-0077
Bioaccumulation	on Evaluation	- Surviv	al Endpoir	nt		-				EA-ES	ST, Inc. PBC
Analyzed: 0	06-3628-8518 08 May-23 23:1 08 May-23 23:0	2 .	Analysis:	Survival Rate Parametric-Tw 3AB31F1E28E		B01DCD2B	Sta	TIS Versio itus Level: itor ID:	n: CETISV 1 005-341		
1	•	5 i	Test Type: Protocol: Species: Taxon:	Survival US ACE NED Macoma nasu Bivalvia	, ,	· <u></u>	Di <b>l</b> Bri	uent: N ne: N	ancy Roka ot Applicable ot Applicable RO - Aquatic		Or <b>Age</b> :
Sample Code	Sample I	D :	Sample Da	te Receip	ot Date	Sample A	ge Cli	ent Name	F	roject	
AT3-191 IOSN 2019	10-1907-{ 13- <b>4</b> 648-{		20 Mar-23 08 Mar-23	20 Mar 08 Mar	-23 16:00 -23	9d 14h 21d 14h	Ec	o-Analysts,			diment Evalu
Sample Code	Material	Гуре		Sample Source	e	St	ation Loca	tion	Lat/Long	1	
AT3-191 IOSN 2019	Laborator Reference			Yachtsman Ma Yachtsman Ma			boratory C SN Refere			· · ·	
Data Transform		Alt Hy	ур	-		Compari	son Resul	ŧ			PMSD
Angular (Correct	ed)	C > T				IOSN 20	19 passed	survival rate	endpoint		8.16%
Equal Variance	t Two-Sample	e Test			·	· · ·				-	
Sample I vs			df Test S	Stat Critical	MSD	P-Type	P-Value	Decisio	n(α:5%)		
Lab Control Sedi	im Reference	Sed	6 -1.36	1.94	0.111	CDF	0.8889	Non-Sig	nificant Effec	t	
Auxiliary Tests					**						
Attribute	Test		-		Test Stat	Critical	P-Value	Decisio	n(a:5%)		
Outlier	Grubbs E	xtreme \	Value Test		1.79	2.13	0.3406	No Outl	ers Detected		
ANOVA Table	_										
Source	Sum Squ	ares	Mean	Square	DF	F Stat	P-Value	Decisio	n(α:5%)		
Between	0.011287		0.0112		1	1.86	0.2221	Non-Sig	nificant Effec	t	
Error Total	0.0365073		0.0060	0845	7	<del></del>					
									· · · · · · · · · · · · · · · · · · ·	<del></del>	
ANOVA Assump					=						
Variance	Test Variance l	Patio E T	oet .	<del>,</del>	Test Stat	Critical 199	P-Value 0.6357	Decisio			
Distribution			omality Tes	it	0.928	0.645	0.6357	=	ariances Distribution		
Survival Rate S	ummarv					<del></del>	<del>_</del>	·		-	
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	cv%	%Effect
AT3-191	LC	3	0.900	0.817	0.983	0.900	0.867	0.933	0.019	3.70%	0.00%
IOSN 2019	RS	5	0.940	0.888	0.992	0.950	0.900	1.000	0.019	4.45%	-4.44%
Angular (Correc	ted) Transfor	med Sur	nmary		· · · · · · · · · · · · · · · · · · ·			···			
Sample	Code	Count	=	95% LCL	95% UCL	Median	Min	Max	Std Err	cv%	%Effect
AT3-191	LC	3	1.250	1.110	1.390	1.250	1.200	1.310	0.033	4.50%	0.00%
IOSN 2019	RS	5	1.330	1.220	1.440	1.350	1.250	1.460	0.039	6.53%	-6.20% 
Survival Rate De	etail										
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
AT3-191 IOSN 2019	LC RS	0.933 0.950	0.867 0.900	0.900 1.000	0.900	0.950					
Angular (Correc			·				•		<del></del>		
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
AT3-191	LC	1.310	1.200	1.250	***		÷ -				
IOSN 2019	R\$	1.350	1.250	1.460	1.250	1.350					

Report Date:

08 May-23 23:12 (p 2 of 2)

Test Code/ID:

TN-23-303MnSurv / 05-1648-0077

					<u> </u>		lest (	Code/ID:	114-23-3	O3MnSurv	/ 05-1648 <b>-</b> 007
Bioaccumulati	on Evaluatio	n - Surviva	I Endpoin	t				- "	<u>-</u>	EA-E	ST, Inc. PBC
1	15-9977-3478	_	-	Survival Rate			CE	TIS Versi	on: CETIS	v2.1.1	
1	08 May-23 23. 08 May-23 23:		nalysis:	Parametric-T	wo Sample	_	Sta	itus Level	1		
			IDS HASN:	ED41FF2F03	SC95AC3423	E56D60D1	3F732 Ed	itor ID:	005-34	1-210-5	
1	03 <b>-</b> 8883-4534	•	est Type:				An	alyst: 1	Vancy Roka		
Ending Date: 2	29 Mar-23 13: 26 Apr-23 12:	•		US ACE NED			Dil	uent: 1	Not Applicable	е	
Test Length: 2				Macoma nası Bivalvia	uta		Bri	-	Vot Applicable		
						<del></del>	So	urce: /	NRO - Aquatio	c Research	Or Age:
Sample Code IOSN 2019	Sample 13-4648		ample Date 3 Mar-23		pt Date	Sample A	ge Clie	ent Name		Project	
AT3-098	07-1559		3 Feb-23 13	08 Ma 3-00 00 Eal	hr-23 b-23 16:30	21d 14h	Eco	-Analysts,	Inc.	Dredged Se	ediment Evalu
Samuela Carda						49d 1h					
Sample Code IOSN 2019	Material	Type ce sedimen		Sample Sour			tation Loca	tion	Lat/Lon	g	
AT3-098	Marine S			Yachtsman M			SN Referer				
				Yachtsman M	anna NAE-2	004-00 10	Stations at	4 Marinas	Mu		
Data Transform Angular (Correct		Alt Hyp					ison Result				PMSD
Angular (Correct	.ea)	C>T				AT3-098	passed sur	vival rate e	endpoint		6.91%
Equal Variance	t Two-Sampl	le Test			-			<del></del>			
Sample I vs	Sample II	<u> </u>	df Test St	at Critical	MSD	P-Type	P-Value	Decisio	on(α:5%)		
Reference Sed	AT3-098		3 -0.876	1.86	0.12	CDF	0.7968		gnificant Effe	 ct	
Auxiliary Tests						-		<del></del>		<del></del>	<del></del>
Attribute	Test				Test Stat	Critical	P-Value	D			
Outlier	Grubbs I	Extreme Va	alue Test		1.96	2.29	0.2713		n(α:5%) iers Detected		<u> </u>
ANOVA Table							0.2. 10	- TO Out	leta Defected	! 	
Source	Sum Squ	ıares	Mean S	quare	DF	F Stat	P-Value	Doninia	w/ <b>5</b> 0/3		
Between	0.007994		0.00799	<u> </u>	1	0.768	0.4065		n(α:5%) Inificant Effec	<u>.</u>	
Error	0.083314		0.01041	43	8		0.7000	14011-Olg	huncant Eller	d	
Total 	0.091308	4 ————		·	9						
ANOVA Assump	tions Tests							<u>-</u>			
Attribute	Test				Test Stat	Critical	P-Value	Decisio	n(α:1%)		
Variance		Ratio F Tes			1.76	23.2	0.5962		ariances	·	
Distribution	Shapiro-V	Vilk W Norr	nality Test		0.937						
Survival Rate Su					0.937	0.741	0.5215	Normal	Distribution		
	ımmary		<u> </u>		0.937	0.741	0.5215	Normal	Distribution		<del></del>
Sample	ımmary Cođe	Count	Mean	95% LCL	95% UCL	0.741 Median				CV9/	9/ E#aas
Sample IOSN 2019		Count 5	<u> </u>	95% LCL 0.888			Min	Max	Std Err	CV%	%Effect
Sample	Code		Mean		95% UCL	Median				4.45%	0.00%
Sample IOSN 2019	Code RS	5 5	<b>Mean</b> 0.940 0.960	0.888	<b>95% UCL</b> 0.992	Median 0.950	<b>Min</b> 0.900	Max 1.000	<b>Std Err</b> 0.019		
<b>Sample</b> IOSN 2019 AT3-098	Code RS	5 5	Mean 0.940 0.960 mary	0.888 0.892	<b>95% UCL</b> 0.992 1.000	<b>Median</b> 0.950 0.967	Min 0.900 0.867	Max 1.000 1.000	<b>Std Err</b> 0.019 0.025	4.45% 5.71%	0.00% -2.13%
Sample IOSN 2019 AT3-098 Angular (Correct	Code RS red) Transfor	5 5 <b>med Su</b> mn	<b>Mean</b> 0.940 0.960	0.888	<b>95% UCL</b> 0.992	Median 0.950 0.967  Median	Min 0.900 0.867	Max 1.000 1.000	Std Err 0.019 0.025 Std Err	4.45% 5.71% CV%	0.00% -2.13% %Effect
Sample IOSN 2019 AT3-098 Angular (Correct Sample	Code RS ed) Transfor	5 5 med Sumn Count	Mean 0.940 0.960 nary	0.888 0.892 <b>95%</b> LCL	95% UCL 0.992 1.000	<b>Median</b> 0.950 0.967	Min 0.900 0.867	Max 1.000 1.000	<b>Std Err</b> 0.019 0.025	4.45% 5.71%	0.00% -2.13% %Effect 0.00%
Sample IOSN 2019 AT3-098 Angular (Correct Sample IOSN 2019	Code RS red) Transfor Code RS	5 5 med Sumn Count 5	Mean 0.940 0.960 mary Mean 1.330	0.888 0.892 95% LCL 1.220	95% UCL 0.992 1.000 95% UCL 1.440	Median 0.950 0.967  Median 1.350	Min 0.900 0.867 Min 1.250	Max 1.000 1.000 Max 1.460	Std Err 0.019 0.025 Std Err 0.039	4.45% 5.71% <b>CV%</b> 6.53%	0.00% -2.13% %Effect
Sample IOSN 2019 AT3-098  Angular (Correct Sample IOSN 2019 AT3-098	Code RS red) Transfor Code RS	5 5 med Sumn Count 5	Mean 0.940 0.960 nary Mean 1.330 1.390	0.888 0.892 95% LCL 1.220 1.240	95% UCL 0.992 1.000 95% UCL 1.440 1.530	Median 0.950 0.967  Median 1.350 1.390	Min 0.900 0.867 Min 1.250	Max 1.000 1.000 Max 1.460	Std Err 0.019 0.025 Std Err 0.039	4.45% 5.71% <b>CV%</b> 6.53%	0.00% -2.13% %Effect 0.00%
Sample IOSN 2019 AT3-098  Angular (Correct Sample IOSN 2019 AT3-098  Survival Rate Del	Code RS  red) Transford Code RS	5 5 med Sumn Count 5 5	Mean 0.940 0.960 mary Mean 1.330	0.888 0.892 95% LCL 1.220	95% UCL 0.992 1.000 95% UCL 1.440	Median 0.950 0.967  Median 1.350 1.390	Min 0.900 0.867 Min 1.250	Max 1.000 1.000 Max 1.460	Std Err 0.019 0.025 Std Err 0.039	4.45% 5.71% <b>CV%</b> 6.53%	0.00% -2.13% %Effect 0.00%
Sample IOSN 2019 AT3-098  Angular (Correct Sample IOSN 2019 AT3-098  Survival Rate Del Sample	Code RS red) Transford Code RS	5 5 med Sumn Count 5 5	Mean 0.940 0.960 nary Mean 1.330 1.390	0.888 0.892 95% LCL 1.220 1.240	95% UCL 0.992 1.000 95% UCL 1.440 1.530	Median 0.950 0.967  Median 1.350 1.390	Min 0.900 0.867 Min 1.250	Max 1.000 1.000 Max 1.460	Std Err 0.019 0.025 Std Err 0.039	4.45% 5.71% <b>CV%</b> 6.53%	0.00% -2.13% %Effect 0.00%
Sample IOSN 2019 AT3-098  Angular (Correct Sample IOSN 2019 AT3-098  Survival Rate Del Sample IOSN 2019	Code RS  red) Transford Code RS  fail Code RS	5 5 <b>med Sumn</b> <b>Count</b> 5 5 <b>Rep 1</b> 0.950 1.000	Mean 0.940 0.960 mary Mean 1.330 1.390  Rep 2 0.900 1.000	0.888 0.892 95% LCL 1.220 1.240 Rep 3 1.000	95% UCL 0.992 1.000 95% UCL 1.440 1.530 Rep 4 0.900	Median 0.950 0.967  Median 1.350 1.390  Rep 5 0.950	Min 0.900 0.867 Min 1.250	Max 1.000 1.000 Max 1.460	Std Err 0.019 0.025 Std Err 0.039	4.45% 5.71% <b>CV%</b> 6.53%	0.00% -2.13% %Effect 0.00%
Sample IOSN 2019 AT3-098  Angular (Correct Sample IOSN 2019 AT3-098  Survival Rate Del Sample OSN 2019 AT3-098	Code RS  red) Transford Code RS  fail Code RS	5 5 5 med Summ Count 5 5 5	Mean 0.940 0.960 nary Mean 1.330 1.390  Rep 2 0.900 1.000	0.888 0.892 95% LCL 1.220 1.240 Rep 3 1.000 0.867	95% UCL 0.992 1.000 95% UCL 1.440 1.530 Rep 4 0.900 0.967	Median 0.950 0.967  Median 1.350 1.390  Rep 5 0.950 0.967	Min 0.900 0.867 Min 1.250	Max 1.000 1.000 Max 1.460	Std Err 0.019 0.025 Std Err 0.039	4.45% 5.71% <b>CV%</b> 6.53%	0.00% -2.13% %Effect 0.00%
Sample IOSN 2019 AT3-098  Angular (Correct Sample IOSN 2019 AT3-098  Survival Rate Det Sample OSN 2019 AT3-098	Code RS  ced) Transfor Code RS  tail Code RS	5 5 <b>med Sumn</b> <b>Count</b> 5 5 <b>Rep 1</b> 0.950 1.000	Mean 0.940 0.960 mary Mean 1.330 1.390  Rep 2 0.900 1.000	0.888 0.892 95% LCL 1.220 1.240 Rep 3 1.000	95% UCL 0.992 1.000 95% UCL 1.440 1.530 Rep 4 0.900	Median 0.950 0.967  Median 1.350 1.390  Rep 5 0.950	Min 0.900 0.867 Min 1.250	Max 1.000 1.000 Max 1.460	Std Err 0.019 0.025 Std Err 0.039	4.45% 5.71% <b>CV%</b> 6.53%	0.00% -2.13% %Effect 0.00%

Analyst: NL QA: OK

## **ATTACHMENT IV**

Nereis virens 28-Day Solid Phase Bioaccumulation Testing Tissue Chemistry and Body Burden Statistical Analyses

Metals

(17 pages)

## Yachtsman Marina APPENDIX A. CONCENTRATIONS OF COCs IN THE WORM (*N. virens*) NAE-2004-00319

			Pre-Assay		
CONTAMINANT	REP1	REP2	REP3	REP4 *	REP5 *
Metals (ug/g wet weight)					
Arsenic	1.94	2.40	1.66		
Cadmium	0.0270 J	0.0420 J	0.0210 J		
Chromium	0.389 J	1.10	0.372 J		
Copper	1.13	2.28	1.05		
Lead	0.171	0.247	0.167		
Mercury	0.0100 J	0.0180	0.00500 J		
Nickel	0.344	0.784	0.299		
Zinc	14.9	16.6	7.73		

<sup>\* =</sup> Qualifiers

U Analyte not detected; below Method Detection Limit; value is one-half the Method Detection Limit

J Analyte estimated; detection below Reporting Limit but above Method Detection Limit

NA Not Analyzed

#### APPENDIX A. CONCENTRATIONS OF COCs IN THE WORM (N. virens) Yachtsman Marina NAE-2004-00319

CONTAMINANT	REP1	REP2	REP3	REP4	REP5	
Metals (ug/g wet weight)						
Arsenic	2.26	1.92	1.93	2.63	2.51	
Cadmium	0.0250 J	0.0220 J	0.0180 J	0.0320 J	0.0290 J	
Chromium	0.0730 J	0.0630 J	0.0550 J	0.0880 J	0.0640 J	
Copper	1.16	1.12	0.996	1.40	1.31	
Lead	0.0700	0.0740	0.0580	0.0710	0.0990	
Mercury	0.0180	0.0160	0.0120	0.0180	0.0140 J	
Nickel	0.154	0.130	0.118	0.191	0.246	
Zinc	7.15	11.8	6.63	8.38	58.9	

<sup>\* =</sup> Qualifiers

U Analyte not detected; below J Analyte estimated; detectio NA Not Analyzed

## Yachtsman Marina APPENDIX A. CONCENTRATIONS OF COCs IN THE WORM (*N. virens*) NAE-2004-00319

#### 10 Stations at 4 Marinas Mud CONTAMINANT REP1 REP2 REP3 REP4 REP5 Metals (ug/g wet weight) 1.65 1.96 2.21 2.16 2.12 Arsenic Cadmium 0.0300 J 0.0370 J 0.0330 J 0.0340 J 0.0350 J Chromium 0.507 0.459 J 0.997 0.561 0.232 J Copper 0.901 1.08 1.04 1.41 1.19 Lead 0.180 0.179 0.173 0.196 0.225 Mercury 0.00195 U 0.00400 J 0.00213 U 0.0160 0.00900 J Nickel 0.179 0.203 0.239 0.278 0.262 Zinc 18.6 12.0 16.7 14.5 8.61

U Analyte not detected; belowJ Analyte estimated; detection

NA Not Analyzed

<sup>\* =</sup> Qualifiers

**CETIS Test Data Worksheet** 

Report Date:

19 Aug-23 06:54 (p 1 of 1)

Test Code/ID: TN-23-302NvMet / 07-8839-3412

Bioaccumulation Evaluation - Metals - Nereis virens EA-EST, Inc. PBC

Start Date: 08 Mar-23 11:31 Species: Nereis virens Sample Code: AT3-152

End Date: 05 Apr-23 10:31 Protocol: US ACE NED RIM (2004) Sample Source: Yachtsman Marina NAE-2004-00319

Sample Date: 03 Mar-23 Material: Laboratory Control Sediment Sample Station: Laboratory Control

Campie Bater of	) War 20		materian Easterday of	and Codimont		TO GLULIOTH LAD	oratory control				
Sample	Rep	Pos	Arsenic Body	Cadmium	Chromiu m	Copper	Lead	Mercury	Nickel	Zinc	Silver
IOSN 2019	1	2	2.26	0.025	0.073	1.16	0.07	0.018	0.154	7.15	
IOSN 2019	2	3	1.92	0.022	0.063	1.12	0.074	0.016	0.13	11.8	
IOSN 2019	3	6	1.93	0.018	0.055	0.996	0.058	0.012	0.118	6.63	
IOSN 2019	4	8	2.63	0.032	0.088	1.4	0.071	0.018	0.191	8.38	
IOSN 2019	5	10	2.51	0.029	0.064	1.31	0.099	0.014	0.246	58.9	
AT3-098	1	1	1.65	0.03	0.232	0.901	0.196	0.001945	0.203	18.6	
AT3-098	2	4	1.96	0.037	0.507	1.08	0.225	0.004	0.239	12	
AT3-098	3	5	2.21	0.033	0.459	1.04	0.18	0.00213	0.278	16.7	
AT3-098	4	7	2.16	0.034	0.997	1.41	0.179	0.016	0.262	14.5	
AT3-098	5	9	2.12	0.035	0.561	1.19	0.173	0.009	0.179	8.61	

**Report Date:** 19 Aug-23 06:55 (p 1 of 3) **Test Code/ID:** TN-23-302NvMet / 07-8839-3412

#### **Bioaccumulation Evaluation - Metals - Nereis virens**

Bioaccumulat	tion Evaluation - Meta	is - Nereis vir	ens				EA-E	SI, Inc. PBC
Batch ID:	13-8417-6872	Test Type:	Bioaccumulation - Metals		Analy	yst: Nancy Ro	oka	
Start Date:	08 Mar-23 11:31	Protocol:	US ACE NED RIM (2004	)	Dilue	ent: Not Appli	icable	
Ending Date:	05 Apr-23 10:31	Species:	Nereis virens		Brine	e: Crystal S	Sea	
Test Length:	27d 23h	Taxon:	Polychaeta		Sour	ce: ARO - Ad	quatic Research	Or <b>Age:</b>
Sample ID:	11-9755-1044	Code:	AT3-152		Proje	ect: Dredged	Sediment Evalu	ation
Sample Date:	03 Mar-23	Material:	Laboratory Control Sedim	ent	Sour	ce: Yachtsm	an Marina NAE-	2004-00319 (
Receipt Date:	03 Mar-23 12:30	CAS (PC):			Stati	on: Laborato	ry Control	
Sample Age:	5d 12h	Client:	Eco-Analysts, Inc.					
Sample Code	Sample ID	Sample Date	e Receipt Date	Sample	Age Clien	t Name	Project	
IOSN 2019	13-4648-8170	08 Mar-23	08 Mar-23	12h	Eco-A	Analysts, Inc.	Dredged Se	ediment Evalu
AT3-098	07-1559-4974	08 Feb-23 13	3:00 09 Feb-23 16:30	27d 23l	h			
Sample Code	Material Type		Sample Source		Station Location	on Lat	t/Long	
IOSN 2019	Reference sedin	nent	Yachtsman Marina NAE-	2004-00	IOSN Referenc	е		
AT3-098	Marine Sedimen	ıt	Yachtsman Marina NAE-	2004-00	10 Stations at 4	Marinas Mu		
Single Compa	arison Summary							
Analysis ID	Endpoint	Comp	arison Method		P-Value	Comparison I	Result	s
14-3802-6235	Arsenic	Equal '	Variance t Two-Sample T	est	0.8845	AT3-098 passe	ed arsenic	1
14-9372-2871	Cadmium	Equal '	Variance t Two-Sample T	est	0.0069	AT3-098 failed	cadmium	1
16-2542-8047	Chromium	Unequ	al Variance t Two-Sample	e Test	0.0072	AT3-098 failed	chromium	1
02-4210-0599	Chromium	Wilcox	on Rank Sum Two-Samp	le Test	0.0040	AT3-098 failed	chromium	1
13-8883-2132	Copper	Equal '	Variance t Two-Sample T	est	0.7353	AT3-098 passe	ed copper	1
06-0350-2940	Lead	Equal '	Variance t Two-Sample T	est	<1.0E-05	AT3-098 failed	lead	1
12-6341-4781	Mercury	Equal '	Variance t Two-Sample T	est	0.9925	AT3-098 passe	ed mercury	1
20-0017-5455	Nickel	Equal '	Variance t Two-Sample T	est	0.0305	AT3-098 failed	nickel	1
13-3955-6427	Zinc	Equal '	Variance t Two-Sample T	est	0.0206	AT3-098 failed	zinc	1

#### **CETIS Summary Report**

Report Date: Test Code/ID: 19 Aug-23 06:55 (p 2 of 3) TN-23-302NvMet / 07-8839-3412

#### **Bioaccumulation Evaluation - Metals - Nereis virens**

Arsenic Summa	ary										
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
IOSN 2019	RS	5	2.25	1.85	2.65	1.92	2.63	0.145	0.325	14.46%	0.00%
AT3-098		5	2.02	1.74	2.3	1.65	2.21	0.102	0.227	11.24%	10.22%
Cadmium Sumr	mary										
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
IOSN 2019	RS	5	0.0252	0.0183	0.0321	0.018	0.032	0.00248	0.00554	21.99%	0.00%
AT3-098		5	0.0338	0.0306	0.037	0.03	0.037	0.00116	0.00259	7.66%	-34.13%
Chromium Sum	nmary										
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
IOSN 2019	RS	5	0.0686	0.053	0.0842	0.055	0.088	0.00563	0.0126	18.34%	0.00%
AT3-098		5	0.551	0.205	0.898	0.232	0.997	0.125	0.279	50.60%	-703.50%
Copper Summa	ıry										
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
IOSN 2019	RS	5	1.2	0.999	1.4	0.996	1.4	0.0713	0.159	13.32%	0.00%
AT3-098		5	1.12	0.888	1.36	0.901	1.41	0.0851	0.19	16.93%	6.10%
Lead Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
IOSN 2019	RS	5	0.0744	0.0557	0.0931	0.058	0.099	0.00673	0.015	20.22%	0.00%
AT3-098		5	0.191	0.164	0.217	0.173	0.225	0.00941	0.021	11.03%	-156.18%
Mercury Summa	ary										
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
IOSN 2019	RS	5	0.0156	0.0124	0.0188	0.012	0.018	0.00117	0.00261	16.72%	0.00%
AT3-098		5	0.00662	-0.000797	0.014	0.00195	0.016	0.00267	0.00597	90.24%	57.60%
Nickel Summar	у										
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
IOSN 2019	RS	5	0.168	0.103	0.232	0.118	0.246	0.0232	0.0518	30.90%	0.00%
AT3-098		5	0.232	0.181	0.283	0.179	0.278	0.0183	0.041	17.65%	-38.38%
Zinc Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
IOSN 2019	RS	5	18.6	-9.53	46.7	6.63	58.9	10.1	22.6	121.87%	0.00%
AT3-098		5	14.1	9.2	19	8.61	18.6	1.76	3.93	27.89%	24.18%

#### **CETIS Summary Report**

Report Date: Test Code/ID: 19 Aug-23 06:55 (p 3 of 3) TN-23-302NvMet / 07-8839-3412

#### **Bioaccumulation Evaluation - Metals - Nereis virens**

Arsenic Detail							MD5: 48E122A42250FF85911F835BB2714057
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
IOSN 2019	RS	2.26	1.92	1.93	2.63	2.51	
AT3-098		1.65	1.96	2.21	2.16	2.12	
Cadmium Detail							MD5: 49D3145D3123EE99E93E8679CCD08CA8
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
IOSN 2019	RS	0.025	0.022	0.018	0.032	0.029	
AT3-098		0.03	0.037	0.033	0.034	0.035	
Chromium Detail							MD5: 33A4BA1F273B8C646B085A0939A25926
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
IOSN 2019	RS	0.073	0.063	0.055	0.088	0.064	
AT3-098		0.232	0.507	0.459	0.997	0.561	
Copper Detail							MD5: 53E4A07891BFC6AE9553271C0EAE2C41
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
IOSN 2019	RS	1.16	1.12	0.996	1.4	1.31	
AT3-098		0.901	1.08	1.04	1.41	1.19	
Lead Detail							MD5: 08B1B33DD308F1D4D30CFFD0662A5930
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
IOSN 2019	RS	0.07	0.074	0.058	0.071	0.099	
AT3-098		0.196	0.225	0.18	0.179	0.173	
Mercury Detail							MD5: C833F844DB2CF941F2FCB24EBADA1402
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
IOSN 2019	RS	0.018	0.016	0.012	0.018	0.014	
AT3-098		0.00195	0.004	0.00213	0.016	0.009	
Nickel Detail							MD5: BAF4DBD486C3A66235EB865EB550BEBC
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
IOSN 2019	RS	0.154	0.13	0.118	0.191	0.246	
AT3-098		0.203	0.239	0.278	0.262	0.179	
Zinc Detail							MD5: 7821CD915E3E53C736EE0C85DE1DE09D
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
IOSN 2019	RS	7.15	11.8	6.63	8.38	58.9	
AT3-098		18.6	12	16.7	14.5	8.61	

STUDY: TN-23-302

CLIENT: Eco-Analysts, Inc.

PROJECT: Yachtsman Marina, Kennebunkport, ME NAE-2004-00319

ASSAY: *N. virens* 28-day Bioaccumulation Evaluation TASK: Statistical Analysis of Body Burden Metals

Endpoint	Method	С	<	Т	Statistic	Critical	P Level	Alpha	Reject Null	MSD	DF	Ties	P-Type
Arsenic	Equal Variance t Two-Sample Test	IOSN	<	Comp	-1.296315	1.859548	0.8844953	0.05	FALSE	0.3299323	8		С
Cadmium	Equal Variance t Two-Sample Test	IOSN	<	Comp	3.144471	1.859548	0.006856192	0.05	TRUE	0.005085788	8		С
Chromium	Unequal Variance t Two-Sample Test	IOSN	<	Comp	5.11689	2.353364	0.00722293	0.05	TRUE	0.1706995	3		С
Chromium	Wilcoxon Rank Sum Two-Sample Test	IOSN	<	Comp	15		0.003968254	0.05	TRUE		8	0	E
Copper	Equal Variance t Two-Sample Test	IOSN	<	Comp	-0.6574845	1.859548	0.7353358	0.05	FALSE	0.2064641	8		С
Lead	Equal Variance t Two-Sample Test	IOSN	<	Comp	10.04866	1.859548	4.093E-06	0.05	TRUE	0.02150332	8		С
Mercury	Equal Variance t Two-Sample Test	IOSN	<	Comp	-3.084291	1.859548	0.9924905	0.05	FALSE	0.005417142	8		С
Nickel	Equal Variance t Two-Sample Test	IOSN	<	Comp	2.179135	1.859548	0.03047227	0.05	TRUE	0.05495523	8		С
Zinc	Equal Variance t Two-Sample Test	IOSN	<	Comp	2.498184	1.894579	0.02055064	0.05	TRUE	4.240874	7		С
Zinc	Wilcoxon Rank Sum Two-Sample Test	IOSN	<	Comp	21		0.1111111	0.05	FALSE		8	0	E

Report Date: Test Code/ID: 19 Aug-23 06:54 (p 1 of 8) TN-23-302NvMet / 07-8839-3412

								1691	Code/ID:	114-20-0	02NVMet / 0	
Bioaccumula	tion Evaluation	n - Metal	s - Nere	eis vir	ens						EA-ES	Γ, Inc. PBC
Analysis ID:	14-3802-6235		Endpo						TIS Version		2.1.1	
Analyzed:	19 Aug-23 6:5		Analys		Parametric-Tv DF2BDA9EB0	•	200407054		atus Level	: 1		
Edit Date:	08 May-23 22	:49	МО5 Н	asn: I	JF2BDA9EBU	EU032414F0	598407CF1	223E <b>E</b> 0	itor iD:			
Batch ID:	13-8417-6872			•	Bioaccumulati				•	Nancy Roka		
Start Date:	08 Mar-23 11:		Protoc		JS ACE NED	RIM (2004)				Not Applicable		
	05 Apr-23 10:	31	Specie		Nereis virens					Crystal Sea	D	
Test Length:	27a 23n		Taxon:	. I	Polychaeta				urce: A	ARO - Aquatic	Research C	r Age:
Sample Code	Sample	ID	Sampl	e Date	Recei	ot Date	Sample A	ge Cli	ent Name	P	roject	
IOSN 2019	13-4648	-8170	08 Mar	-23	08 Ma		12h	Ec	o-Analysts	, Inc.	redged Sed	iment Evalu
AT3-098	07-1559	-4974	08 Feb	-23 13	:00 09 Feb	-23 16:30	27d 23h					
Sample Code	Materia	l Type			Sample Sour	се	St	ation Loca	ation	Lat/Long	9	
IOSN 2019	Referen	ce sedim	ent	`	rachtsman M	arina NAE-20	004-00 IO	SN Refere	nce			
AT3-098	Marine S	Sediment		`	∕achtsman M	arina NAE-20	004-00 10	Stations a	it 4 Marina	s Mu		
Data Transfor	m	Alt H	lyp				Compari	son Resu	lt			PMSD
Untransformed	t	C < T					AT3-098	passed ar	senic endp	oint		14.66%
Equal Variand	ce t Two-Samp	ole Test										
	vs Sample		df T	est St	at Critical	MSD	P-Type	P-Value	e Decisi	on(α:5%)		
Reference Sec	•		8 -	1.3	1.86	0.33	CDF	0.8845		ignificant Effe	ct	
Auxiliary Test	ts											
Attribute	Test					Test Stat	Critical	P-Value	Decisi	on(α:5%)		
Outlier	Grubbs	Extreme	Value <sup>-</sup>	Test		1.44	2.29	1.0000	No Ou	tliers Detected	j	
ANOVA Table	)											
Source	Sum So	uares	N	lean S	Square	DF	F Stat	P-Value	Decisi	on(α:5%)		
Between	0.13225		0	.1322	 5	1	1.68	0.2310	Non-Si	ignificant Effec	et .	
Error	0.6296		0	.0787		8	_					
Total	0.76185					9						
ANOVA Assu	mptions Tests											
Attribute	Test					Test Stat	Critical	P-Value	e Decisi	on(α:1%)		
Variance	Variance	e Ratio F	Test			2.05	23.2	0.5031	Equal '	Variances		
Distribution	Shapiro-	-Wilk W N	Normalit	y Test		0.922	0.741	0.3732	Norma	l Distribution		
Arsenic Sumi	mary											
Sample	Code	Coun	nt N	/lean	95% LCL	. 95% UCL	Median	Min	Max	Std Err	CV%	%Effect
	RS	5	2	2.25	1.85	2.65	2.26	1.92	2.63	0.145	14.46%	0.00%
IOSN 2019	Ro				4 74	2.3	2.12	1.65	2.21	0.102	11.24%	10.22%
IOSN 2019 AT3-098		5	2	2.02	1.74							
		5	2	2.02	1.74							
AT3-098		5 <b>Rep</b> ′		2.02 Rep 2	Rep 3	Rep 4	Rep 5					
AT3-098  Arsenic Detai	I		1 F									

Report Date: Test Code/ID: 19 Aug-23 06:54 (p 2 of 8) TN-23-302NvMet / 07-8839-3412

Bioaccumulat	ion Evaluation -	Metals -	Nereis vi	rens						EA-ES	T, Inc. PBC
Analysis ID: Analyzed: Edit Date:	14-9372-2871 19 Aug-23 6:54 08 May-23 22:49	Aı	ndpoint: nalysis: D5 Hash:	Parametric-1	wo Sample 3516D3013B	78FD7B5D1	Sta	ris Version tus Level: tor ID:	n: CETISv2 1	2.1.1	
Batch ID: Start Date: Ending Date: Test Length:	13-8417-6872 08 Mar-23 11:31 05 Apr-23 10:31 27d 23h	Pi Si	est Type: rotocol: pecies: axon:	Bioaccumula US ACE NE Nereis virens Polychaeta	O RIM (2004)		Dilu Brii	ient: N	ancy Roka ot Applicable rystal Sea RO - Aquatic	Research C	or <b>Age:</b>
Sample Code	Sample ID	) Sa	ample Da	te Rece	ipt Date	Sample Ag	je Clie	nt Name	P	roject	
IOSN 2019 AT3-098	13-4648-8 07-1559-4		3 Mar-23 3 Feb-23 1	08 M 3:00 09 Fe	ar-23 eb-23 16:30	12h 27d 23h	Ecc	-Analysts,	Inc. D	redged Sed	iment Evalu
Sample Code	Material T	уре		Sample Sou	rce	Sta	ation Loca	ion	Lat/Long		
IOSN 2019	Reference	sedimen	t	Yachtsman I	Marina NAE-20	004-00 IO	SN Referer	се			
AT3-098	Marine Se	diment		Yachtsman I	Marina NAE-20	004-00 10	Stations at	4 Marinas	Mu		
Data Transfor	m	Alt Hyp	)			Comparis	son Result				PMSD
Untransformed	I	C < T				AT3-098	failed cadm	ium endpo	int		20.18%
	vs Sample II AT3-098*	(	df Test \$	Stat Critical	MSD 0.00509	P-Type CDF	<b>P-Value</b> 0.0069		n(α:5%) ant Effect		
Auxiliary Test	s										
Attribute	Test				Test Stat	Critical	P-Value	Decisio	n(α:5%)		
O : :41!											
Outlier	Grubbs E	xtreme V	alue Test		1.77	2.29	0.5560	No Outl	iers Detected		
ANOVA Table	-	xtreme V	alue Test		1.77	2.29	0.5560	No Outl	iers Detected		
	-			Square	1.77 <b>DF</b>	2.29 <b>F Stat</b>	0.5560 P-Value		en(α:5%)		
ANOVA Table		ares						Decisio			
ANOVA Table Source Between Error	Sum Squa 0.0001849 0.0001496	ares	Mean	1849	<b>DF</b> 1 8	F Stat	P-Value	Decisio	n(α:5%)		
ANOVA Table Source Between Error Total	Sum Squa 0.0001849 0.0001496 0.0003345	ares	<b>Mean</b> 0.000	1849	<b>DF</b> 1	F Stat	P-Value	Decisio	n(α:5%)		
ANOVA Table Source Between Error Total ANOVA Assur	Sum Squa 0.0001849 0.0001496 0.0003345 mptions Tests	ares	<b>Mean</b> 0.000	1849	<b>DF</b> 1 8	<b>F Stat</b> 9.89	<b>P-Value</b> 0.0137	<b>Decisio</b> Significa	n(α:5%) ant Effect		
ANOVA Table Source Between Error Total ANOVA Assur	Sum Squa 0.0001849 0.0001496 0.0003345 mptions Tests Test	ares	<b>Mean</b> 0.000 0.000	1849	DF 1 8 9	F Stat 9.89 — Critical	P-Value 0.0137	Decision Signification	n(α:5%) ant Effect on(α:1%)		
ANOVA Table Source Between Error Total ANOVA Assur Attribute Variance	Sum Squa 0.0001849 0.0001496 0.0003345  mptions Tests  Test  Variance F	ares	Mean 0.000 0.000	1849 0187	DF 1 8 9  Test Stat 4.58	F Stat 9.89  Critical 23.2	P-Value 0.0137  P-Value 0.1696	Decision Signification Signifi	n(α:5%) ant Effect n(α:1%) ariances		
ANOVA Table Source Between Error Total ANOVA Assur	Sum Squa 0.0001849 0.0001496 0.0003345  mptions Tests  Test  Variance F Shapiro-W	ares	Mean 0.000 0.000	1849 0187	DF 1 8 9	F Stat 9.89 — Critical	P-Value 0.0137	Decision Signification Signifi	n(α:5%) ant Effect on(α:1%)		
ANOVA Table Source Between Error Total  ANOVA Assur Attribute Variance Distribution	Sum Squa 0.0001849 0.0001496 0.0003345  mptions Tests  Test  Variance F Shapiro-W	ares	Mean 0.000 0.000	1849 0187	DF 1 8 9  Test Stat 4.58 0.989	F Stat 9.89  Critical 23.2 0.741	P-Value 0.0137  P-Value 0.1696	Decision Signification Signifi	n(α:5%) ant Effect n(α:1%) ariances	CV%	%Effect
ANOVA Table Source Between Error Total  ANOVA Assur Attribute Variance Distribution  Cadmium Sur Sample IOSN 2019	Sum Squa 0.0001849 0.0001496 0.0003345 mptions Tests Test Variance F Shapiro-W	Ratio F Te	Mean 0.000 0.000 est mality Te	1849 0187 st <b>95% LC</b> 2 0.0183	DF 1 8 9  Test Stat 4.58 0.989  EL 95% UCL 0.0321	F Stat 9.89  Critical 23.2 0.741  Median 0.025	P-Value 0.0137  P-Value 0.1696 0.9959  Min 0.018	Decision  Decision  Equal V  Normal  Max  0.032	en(α:5%) ant Effect en(α:1%) ariances Distribution  Std Err 0.00248	21.99%	0.00%
ANOVA Table Source Between Error Total  ANOVA Assur Attribute Variance Distribution  Cadmium Sur Sample	Sum Squa 0.0001849 0.0001496 0.0003345 mptions Tests Test Variance F Shapiro-W nmary Code	Ratio F Te	Mean 0.000 0.000 est mality Te	1849 0187 st <b>95% LC</b> 2 0.0183	DF 1 8 9  Test Stat 4.58 0.989	F Stat 9.89  Critical 23.2 0.741  Median	P-Value 0.0137  P-Value 0.1696 0.9959  Min	Decision  Decision  Equal V  Normal	n(α:5%) ant Effect n(α:1%) ariances Distribution Std Err		
ANOVA Table Source Between Error Total  ANOVA Assur Attribute Variance Distribution  Cadmium Sur Sample IOSN 2019	Sum Squa 0.0001849 0.0001496 0.0003345 mptions Tests	Ratio F Te	Mean 0.000 0.000 est mality Te	1849 0187 st <b>95% LC</b> 2 0.0183	DF 1 8 9  Test Stat 4.58 0.989  EL 95% UCL 0.0321	F Stat 9.89  Critical 23.2 0.741  Median 0.025	P-Value 0.0137  P-Value 0.1696 0.9959  Min 0.018	Decision  Decision  Equal V  Normal  Max  0.032	en(α:5%) ant Effect en(α:1%) ariances Distribution  Std Err 0.00248	21.99%	0.00%
ANOVA Table Source Between Error Total  ANOVA Assur Attribute Variance Distribution  Cadmium Sur Sample IOSN 2019 AT3-098	Sum Squa 0.0001849 0.0001496 0.0003345 mptions Tests	Ratio F Te	Mean 0.000 0.000  est mality Te	95% LC 2 0.0183 8 0.0306	DF 1 8 9  Test Stat 4.58 0.989  EL 95% UCL 0.0321	F Stat 9.89  Critical 23.2 0.741  Median 0.025	P-Value 0.0137  P-Value 0.1696 0.9959  Min 0.018	Decision  Decision  Equal V  Normal  Max  0.032	en(α:5%) ant Effect en(α:1%) ariances Distribution  Std Err 0.00248	21.99%	0.00%
ANOVA Table Source Between Error Total  ANOVA Assur Attribute Variance Distribution  Cadmium Sur Sample IOSN 2019 AT3-098  Cadmium Det	Sum Squa 0.0001849 0.0001496 0.0003345 mptions Tests     Test     Variance F     Shapiro-W nmary     Code     RS	Ratio F Te Filk W Nor Count 5	Mean 0.000 0.000 est mality Tes  Mean 0.025 0.033	95% LC 2 0.0183 8 0.0306	DF 1 8 9 Test Stat 4.58 0.989  L 95% UCL 0.0321 0.037	F Stat 9.89  Critical 23.2 0.741  Median 0.025 0.034	P-Value 0.0137  P-Value 0.1696 0.9959  Min 0.018	Decision  Decision  Equal V  Normal  Max  0.032	en(α:5%) ant Effect en(α:1%) ariances Distribution  Std Err 0.00248	21.99%	0.00%

Report Date: Test Code/ID: 19 Aug-23 06:54 (p 3 of 8) TN-23-302NvMet / 07-8839-3412

							Test Co	oae/ID:	IN-23-30	Zinviviet / U	7-8839-3412
Bioaccumula	tion Evaluatio	n - Metals	- Nereis vi	rens						EA-ES	Γ, Inc. PBC
Analysis ID: Analyzed: Edit Date:	16-2542-8047 19 Aug-23 6:5 08 May-23 22:	4 <b>A</b>	Endpoint: Analysis: MD5 Hash:	Chromium Parametric-Two 53A2BA2A097	•	D20E75BC	Stat	IS Version: us Level: or ID:	CETISv2	2.1.1	
Batch ID: Start Date: Ending Date: Test Length:	13-8417-6872 08 Mar-23 11: 05 Apr-23 10: 27d 23h	31 <b>F</b> 31 <b>S</b>	Test Type: Protocol: Species: Taxon:	Bioaccumulation US ACE NED F Nereis virens Polychaeta			Ana Dilu Brin Sou	ent: Not e: Cry	ncy Roka Applicable stal Sea O - Aquatic l	Research O	r <b>Age</b> :
Sample Code	Sample	ID S	Sample Da	te Receip	t Date	Sample Age	e Clie	nt Name	Pı	roject	
IOSN 2019 AT3-098	13-4648 07-1559		08 Mar-23 08 Feb-23 1	08 Mar- 3:00 09 Feb-	-23 -23 16:30	12h 27d 23h	Eco-	Analysts, In	ic. Di	redged Sed	iment Evalu
Sample Code	Material	Туре		Sample Sourc	е	Sta	tion Locat	ion	Lat/Long		
IOSN 2019 AT3-098		ce sedimei Sediment	nt	Yachtsman Ma Yachtsman Ma			SN Referend Stations at	ce 4 Marinas M	1u		
Data Transfor	m	Alt Hy	'p			Comparis	on Result				PMSD
Untransformed	d	C < T				AT3-098 fa	ailed chrom	ium endpoi	nt		248.83%
Unequal Varia	ance t Two-Sa	mple Test									
Sample I	vs Sample I	I	df Test S	Stat Critical	MSD	P-Type	P-Value	Decision	(α:5%)		
Reference Sec	d AT3-098	•	3 5.12	2.35	0.171	CDF	0.0072	Significar	t Effect		
ANOVA Table	ı										
Source	Sum Sq	uares	Mean	Square	DF	F Stat	P-Value	Decision	(α:5%)		
Between	0.30611		0.306		1	33.8	0.0007	Significar	t Effect		
Error	0.06338		0.009	0554	7	_					
Total	0.36950	4			8						
ANOVA Assu	mptions Tests										
Attribute	Test				Test Stat	Critical	P-Value	Decision	(α:1%)		
Variance		Ratio F T			132	24.3	0.0004	Unequal \			
Distribution	Shapiro-	Wilk W No	ormality Te	st	0.814	0.701	0.0293	Normal D	istribution		
Chromium Sเ	ımmary										
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
IOSN 2019	RS	5	0.068		0.0842	0.064	0.055	0.088	0.00563	18.34%	0.00%
AT3-098		4	0.44	0.21	0.67	0.459	0.232	0.561	0.0723	32.89%	-541.03%
Chromium De	etail										
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
IOSN 2019	RS	0.073	0.063	0.055	0.088	0.064					
AT3-098		0.232	0.507	0.459		0.561					

Report Date: Test Code/ID: 19 Aug-23 06:54 (p 4 of 8) TN-23-302NvMet / 07-8839-3412

Bioaccumulat	ion Evaluatior	ı - Metals	- Nereis	virens	i							EA-ES	T, Inc. PBC
,	13-8883-2132		ndpoint:		•	o Comita			TIS Versi		CETISv2	2.1.1	
•	19 Aug-23 6:54 08 May-23 22:		inalysis:		ametric-Two	o Sample B4ED4B31 <i>A</i>	CE20020B		atus Leve	1:	1		
Edit Date:	00 Way-23 22.						CE29920B	3/DF <b>E</b> (	ILOF ID:				
Batch ID:	13-8417-6872				accumulatio				-	Nancy			
Start Date:	08 Mar-23 11:3		rotocol:		ACE NED F	RIM (2004)					plicable		
Ending Date:	•		pecies:		eis virens					Crystal			
Test Length:	27d 23h	ı	axon:	Poly	/chaeta			S	urce:	ARO -	Aquatic	Research C	or <b>Age:</b>
Sample Code	Sample	ID S	ample D	ate	Receip	t Date	Sample Ag	e CI	ent Name	)	Pı	roject	
IOSN 2019	13-4648-		8 Mar-23		08 Mar-		12h	Ed	o-Analysts	s, Inc.	Di	redged Sed	liment Evalı
AT3-098	07-1559-	-4974 0	8 Feb-23	13:00	09 Feb-	23 16:30	27d 23h						
Sample Code	Material	Туре		San	nple Sourc	е	Sta	ition Loc	ation	L	_at/Long		
IOSN 2019	Reference	e sedimer	nt	Yac	htsman Ma	rina NAE-20	04-00 103	SN Refere	nce				
AT3-098	Marine S	Sediment		Yac	htsman Ma	rina NAE-20	04-00 10	Stations a	it 4 Marina	as Mu			
Data Transfor	m	Alt Hy	р				Comparis	on Resu	t				PMSD
Untransformed		C < T					AT3-098	passed co	pper endp	oint			17.25%
Equal Variance	e t Two-Samp	le Test											
	vs Sample I		df Test	Stat	Critical	MSD	P-Type	P-Value	. Decis	ion(α:	5%)		
Reference Sed	•	!								•			
	I AT3-098		8 -Uh:	57	1 86	0 206	CDF	0.7353	Non-S	Significa	ant ⊢ffeci	ī	
			8 -0.65	57	1.86	0.206	CDF	0.7353	Non-S	Significa	ant Effec	t	
Auxiliary Test	s		8 -0.68	57	1.86							t	
Auxiliary Test	s Test				1.86	Test Stat	Critical	P-Value	e Decis	ion(α:	5%)	t	
Auxiliary Test	s Test	Extreme \			1.86				e Decis	ion(α:		t	
Auxiliary Test	s Test	Extreme \			1.86	Test Stat	Critical	P-Value	e Decis	ion(α:	5%)	t .	
Auxiliary Test: Attribute Outlier	s Test		'alue Tes			Test Stat	Critical	P-Value	Decis No Ou	ion(α:	5%) Detected	t	
Auxiliary Tests Attribute Outlier ANOVA Table	s Test Grubbs	uares	'alue Tes <b>M</b> ea	t	are	Test Stat	Critical 2.29	<b>P-Valu</b> 0.6291	No Ou	ion(α:	5%) Detected		
Auxiliary Tests Attribute Outlier ANOVA Table Source	s Test Grubbs Sum Sq	uares	/alue Tes Mea 0.01	t n Squ	are	Test Stat 1.73  DF 1 8	Critical 2.29	P-Value 0.6291 P-Value	No Ou	ion(α:	5%) Detected 5%)		
Auxiliary Tests Attribute Outlier ANOVA Table Source Between	Sum Sq	uares 25	/alue Tes Mea 0.01	t n <b>Squ</b> 33225	are	Test Stat 1.73  DF 1	Critical 2.29	P-Value 0.6291 P-Value	No Ou	ion(α:	5%) Detected 5%)		
Auxiliary Test: Attribute Outlier ANOVA Table Source Between Error	Sum Sq 0.013322 0.24655 0.259872	uares 25	/alue Tes Mea 0.01	t n <b>Squ</b> 33225	are	Test Stat 1.73  DF 1 8	Critical 2.29	P-Value 0.6291 P-Value	No Ou	ion(α:	5%) Detected 5%)		
Auxiliary Tests Attribute Outlier ANOVA Table Source Between Error Total	Sum Sq 0.013322 0.24655 0.259872	uares 25	/alue Tes Mea 0.01	t n <b>Squ</b> 33225	are	Test Stat 1.73  DF 1 8	Critical 2.29  F Stat 0.432	P-Value 0.6291 P-Value	Decis No Ou  Decis Non-S	ion(α:	5%) Detected 5%) ant Effec		
Auxiliary Test: Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assur	S Test Grubbs Sum Sq 0.013322 0.24655 0.259872 mptions Tests Test	uares 25	<b>Mea</b> 0.01 0.03	t n <b>Squ</b> 33225	are	Test Stat 1.73  DF 1 8 9	Critical 2.29  F Stat 0.432	P-Value 0.6291 P-Value 0.5293	Decis No Ou  Decis Non-S	ion(α: utliers E ion(α: Significa	5%) Detected  5%) ant Effec		
Auxiliary Tests Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assur Attribute	Sum Sq 0.013322 0.24655 0.259872 mptions Tests Test Variance	uares 25	Mea 0.01 0.03	t <b>n Squ</b> 33225 08187	are	Test Stat 1.73  DF 1 8 9	Critical 2.29  F Stat 0.432  Critical	P-Value 0.6291  P-Value 0.5293	Decis No Ou  Decis Non-S  Decis Equal	ion(α:: itiers E ion(α:: ion(α:: ion(α::	5%) Detected  5%) ant Effec  1%)		
Auxiliary Test: Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assur Attribute Variance	S Test Grubbs Sum Sq 0.013322 0.24655 0.259872 mptions Tests Test Variance Shapiro-	uares 25 2	Mea 0.01 0.03	t <b>n Squ</b> 33225 08187	are	Test Stat 1.73  DF 1 8 9  Test Stat 1.42	Critical 2.29  F Stat 0.432  Critical 23.2	P-Value 0.6291 P-Value 0.5293 P-Value 0.7399	Decis No Ou  Decis Non-S  Decis Equal	ion(α:: itiers [ ition(α:: ition(α:: ition(α:: ition(α:: ition(α::	5%) Detected  5%) ant Effec  1%)		
Auxiliary Tests Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assur Attribute Variance Distribution	S Test Grubbs Sum Sq 0.013322 0.24655 0.259872 mptions Tests Test Variance Shapiro-	uares 25 2	Mea 0.01 0.03	t <b>n Squ</b> 33225 08187	are	Test Stat 1.73  DF 1 8 9  Test Stat 1.42 0.954	Critical 2.29  F Stat 0.432  Critical 23.2 0.741	P-Value 0.6291 P-Value 0.5293 P-Value 0.7399	Decis No Ou  Decis Non-S  Decis Equal	sion(α:sion(α:sion(α:sion(α:sion(α:varian	5%) Detected  5%) ant Effec  1%)		%Effect
Auxiliary Tests Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assur Attribute Variance Distribution  Copper Summ	S Test Grubbs Sum Sq 0.013322 0.24655 0.259872 nptions Tests Test Variance Shapiro-	uares 25 2 Ratio F T Wilk W No	Mea 0.01 0.03 est	t <b>n Squ</b> 33225 08187	are	Test Stat 1.73  DF 1 8 9  Test Stat 1.42 0.954	Critical 2.29  F Stat 0.432  Critical 23.2 0.741	P-Value 0.6291 P-Value 0.5293 P-Value 0.7399 0.7163	Decis No Ou  Decis Non-S  Decis Equal Norms	sion(α: sion(α: sion(α: Significa sion(α: Varian al Distr	5%) Detected  5%) ant Effect  1%) aces ibution	t	%Effect 0.00%
Auxiliary Test: Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assur Attribute Variance Distribution  Copper Summ Sample	S Test Grubbs Sum Sq 0.013322 0.24655 0.259872 mptions Tests Test Variance Shapiro- mary Code	uares 25 2 Ratio F T Wilk W No	/alue Tes  Mea  0.01 0.03  est  rmality Te	t n Squ 33225 08187 est	are	Test Stat 1.73  DF 1 8 9  Test Stat 1.42 0.954  95% UCL	Critical 2.29  F Stat 0.432  Critical 23.2 0.741  Median	P-Value 0.6291  P-Value 0.5293  P-Value 0.7399 0.7163  Min	Decis No Ou  Decis Non-S  Decis Non-S  Max	sion(α:sion(a:sion(α:sion(a:s	5%) Detected 5%) ant Effect 1%) aces abution	t CV%	
Auxiliary Test: Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assur Attribute Variance Distribution  Copper Summ Sample IOSN 2019	S Test Grubbs  Sum Sq 0.013322 0.24655 0.259872  mptions Tests Test Variance Shapiro- nary Code RS	uares 25 2 Ratio F T Wilk W No Count 5	Mea  0.01 0.03  est  mality T	t n Squ 33225 08187 est	95% LCL 0.999	Test Stat 1.73  DF 1 8 9  Test Stat 1.42 0.954  95% UCL 1.4	Critical 2.29  F Stat 0.432  Critical 23.2 0.741  Median 1.16	P-Value 0.6291  P-Value 0.5293  P-Value 0.7399 0.7163  Min 0.996	Decis No Ou  Decis Non-S  Decis Non-S  Max 1.4	sion(α:sion(a:sion(α:sion(α:sion(a:s	5%) Detected  5%) ant Effect  1%) acces ibution  Std Err  0.0713	cv% 13.32%	0.00%
Auxiliary Test: Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assur Attribute Variance Distribution  Copper Summ Sample IOSN 2019 AT3-098	S Test Grubbs  Sum Sq 0.013322 0.24655 0.259872  mptions Tests Test Variance Shapiro- nary Code RS	uares 25 2 Ratio F T Wilk W No Count 5	Mea  0.01 0.03  est  mality T	t n Squ 33225 08187	95% LCL 0.999	Test Stat 1.73  DF 1 8 9  Test Stat 1.42 0.954  95% UCL 1.4	Critical 2.29  F Stat 0.432  Critical 23.2 0.741  Median 1.16	P-Value 0.6291  P-Value 0.5293  P-Value 0.7399 0.7163  Min 0.996	Decis No Ou  Decis Non-S  Decis Non-S  Max 1.4	sion(α:sion(a:sion(α:sion(α:sion(a:s	5%) Detected  5%) ant Effect  1%) acces ibution  Std Err  0.0713	cv% 13.32%	0.00%
Auxiliary Tests Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assur Attribute Variance Distribution  Copper Summ Sample IOSN 2019 AT3-098  Copper Detail	S Test Grubbs  Sum Sq 0.013322 0.24655 0.259872  mptions Tests Test Variance Shapiro- mary Code RS	uares 25 2 Ratio F T Wilk W No Count 5	Mea 0.01 0.03  est rmality T  Mea 1.2 1.12	t n Squ 33225 08187 est	95% LCL 0.999 0.888	Test Stat 1.73  DF 1 8 9  Test Stat 1.42 0.954  95% UCL 1.4 1.36	Critical 2.29  F Stat 0.432  Critical 23.2 0.741  Median 1.16 1.08	P-Value 0.6291  P-Value 0.5293  P-Value 0.7399 0.7163  Min 0.996	Decis No Ou  Decis Non-S  Decis Non-S  Max 1.4	sion(α:sion(a:sion(α:sion(α:sion(a:s	5%) Detected  5%) ant Effect  1%) acces ibution  Std Err  0.0713	cv% 13.32%	0.00%

Report Date: Test Code/ID: 19 Aug-23 06:54 (p 5 of 8) TN-23-302NvMet / 07-8839-3412

<b>-</b> .											
Bioaccumula	ion Evaluation	- Metals -	Nereis vi	rens						EA-ES	Γ, Inc. PBC
Analysis ID: Analyzed: Edit Date:	06-0350-2940 19 Aug-23 6:54 08 May-23 22:4	<b>A</b> n	dpoint: alysis: 05 Hash:	Parametric-	Γwo Sample DD112B2B637	D9FCC383 <sup>-</sup>	Stat	IS Versio us Level: or ID:	n: CETISv2 1	2.1.1	
Batch ID: Start Date: Ending Date: Test Length:	13-8417-6872 08 Mar-23 11:3 05 Apr-23 10:3 27d 23h	1 <b>Pr</b> o	st Type: otocol: ecies: xon:		ation - Metals D RIM (2004) s		Ana Dilu Brin Sou	ent: N e: C	ancy Roka ot Applicable rystal Sea RO - Aquatic	Research C	er <b>Age</b> :
Sample Code	Sample I	D Sa	mple Dat	te Rece	eipt Date	Sample Ag	je Clie	nt Name	P	roject	
IOSN 2019 AT3-098	13-4648- 07-1559-		Mar-23 Feb-23 1		lar-23 eb-23 16:30	12h 27d 23h	Eco-	Analysts,	Inc. D	redged Sed	iment Evalu
Sample Code	Material	Туре		Sample Sou	ırce	Sta	ation Locat	ion	Lat/Long		
IOSN 2019	Referenc	e sediment		Yachtsman	Marina NAE-20	004-00 10	SN Referen	ce			
AT3-098	Marine S	ediment		Yachtsman	Marina NAE-20	004-00 10	Stations at	4 Marinas	Mu		
Data Transfor	m	Alt Hyp				Comparis	son Result				PMSD
Untransformed	I	C < T				AT3-098 f	failed lead e	ndpoint			28.90%
Equal Variand	e t Two-Sampl	e Test									
Sample I	vs Sample II	d	f Test S	Stat Critical	MSD	P-Type	P-Value	Decisio	n(α:5%)		
Reference Sec	d AT3-098*	8	10	1.86	0.0215	CDF	<1.0E-05	Significa	ant Effect		
Auxiliary Test	s										
Attribute	Test				Test Stat	Critical	P-Value	Decisio	n(α:5%)		
Outlier	Grubbs	Extreme Va	lue Test		2	2.29	0.2387	No Outl	iers Detected		
ANOVA Table											
Source	Sum Squ	ıares	Mean	Square	DF	F Stat	P-Value	Decisio	n(α:5%)		
Between	0.033756	51									
Error		•	0.033	7561	1	101	<1.0E-05	Significa	ant Effect		
	0.002674	4	0.000		8	101		Significa	ant Effect		
Total	0.002674 0.036430	4			-	101 —		Significa	ant Effect		
Total		4			8	101		Significa	ant Effect		
ANOVA Assul	0.036430 mptions Tests Test	4	0.0003		8 9 Test Stat	Critical	<1.0E-05	Decisio	on(α:1%)		
ANOVA Assuration Attribute Variance	0.036430 mptions Tests Test Variance	4 5 Ratio F Tes	0.0003	3343	8 9 <b>Test Stat</b> 1.95	Critical 23.2	<1.0E-05  P-Value  0.5323	<b>Decisio</b> Equal V	on(α:1%) 'ariances		
ANOVA Assuration  Attribute  Variance  Distribution	0.036430 mptions Tests Test Variance Shapiro-\	4	0.0003	3343	8 9 Test Stat	Critical	<1.0E-05	<b>Decisio</b> Equal V	on(α:1%)		
ANOVA Assurattribute Variance Distribution Lead Summa	0.036430  mptions Tests  Test  Variance Shapiro-\	A Satio F Tes Wilk W Norr	0.0003	3343 st	8 9 <b>Test Stat</b> 1.95 0.871	<b>Critical</b> 23.2 0.741	<1.0E-05  P-Value  0.5323  0.1020	<b>Decisio</b> Equal V Normal	on(α:1%) ariances Distribution	CVV	9/ Effort
ANOVA Assu Attribute Variance Distribution Lead Summa Sample	0.036430  mptions Tests  Test  Variance Shapiro-V	Ratio F Tes Vilk W Norr	0.0003	95% LC	8 9 <b>Test Stat</b> 1.95 0.871 <b>CL 95% UCL</b>	Critical 23.2 0.741	<1.0E-05  P-Value 0.5323 0.1020  Min	Decision Equal V Normal	on(α:1%) /ariances Distribution Std Err	CV%	%Effect
ANOVA Assurattribute Variance Distribution Lead Summa	0.036430  mptions Tests  Test  Variance Shapiro-\	Ratio F Tee Vilk W Norr	0.0003 st mality Tes  Mean 0.0744	95% LC	8 9 9 Test Stat 1.95 0.871 CL 95% UCL 0.0931	23.2 0.741 Median 0.071	P-Value 0.5323 0.1020  Min 0.058	Decision Equal V Normal Max 0.099	on(α:1%) ariances Distribution	CV% 20.22% 11.03%	0.00%
ANOVA Assuration Attribute Variance Distribution  Lead Summa Sample IOSN 2019 AT3-098	0.036430  mptions Tests  Test  Variance Shapiro-V	Ratio F Tes Vilk W Norr	0.0003	95% LC	8 9 <b>Test Stat</b> 1.95 0.871 <b>CL 95% UCL</b>	Critical 23.2 0.741	<1.0E-05  P-Value 0.5323 0.1020  Min	Decision Equal V Normal	on(α:1%) /ariances Distribution  Std Err  0.00673	20.22%	
ANOVA Assuration Attribute Variance Distribution  Lead Summa Sample IOSN 2019 AT3-098  Lead Detail	0.036430 mptions Tests Test Variance Shapiro-V  Code RS	Ratio F Tes Wilk W Norr Count 5	0.0003  st mality Tes  Mean 0.0744 0.191	95% LC 4 0.0557 0.164	8 9  Test Stat 1.95 0.871  CL 95% UCL 0.0931 0.217	Critical 23.2 0.741  Median 0.071 0.18	P-Value 0.5323 0.1020  Min 0.058	Decision Equal V Normal Max 0.099	on(α:1%) /ariances Distribution  Std Err  0.00673	20.22%	0.00%
ANOVA Assuration Attribute Variance Distribution  Lead Summa Sample IOSN 2019 AT3-098	0.036430  mptions Tests  Test  Variance Shapiro-V	Ratio F Tee Vilk W Norr	0.0003 st mality Tes  Mean 0.0744	95% LC 4 0.0557 0.164	8 9 9 Test Stat 1.95 0.871 CL 95% UCL 0.0931	23.2 0.741 Median 0.071	P-Value 0.5323 0.1020  Min 0.058	Decision Equal V Normal Max 0.099	on(α:1%) /ariances Distribution  Std Err  0.00673	20.22%	0.00%

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Bioaccumulat	ion Evaluation	- Metals -	Nereis vir	rens						EA-ES	Γ, Inc. PBC
Analysis ID: Analyzed: Edit Date:	12-6341-4781 19 Aug-23 6:54 08 May-23 22:4	- An	•	Mercury Parametric-Two B14DF90D09FF	•	76DE339A1	Stat	IS Versior us Level: or ID:	n: CETISv2 1	2.1.1	
Batch ID: Start Date: Ending Date: Test Length:	13-8417-6872 08 Mar-23 11:3 05 Apr-23 10:3 27d 23h	1 <b>Pr</b> 1 <b>S</b> p	otocol: ecies:	Bioaccumulatio US ACE NED R Nereis virens Polychaeta				ent: No e: Cr	ancy Roka ot Applicable ystal Sea RO - Aquatic	Research C	er <b>Age</b> :
Sample Code	Sample I	D Sa	mple Dat	e Receipt	Date	Sample Ag	e Clie	nt Name	P	roject	
IOSN 2019 AT3-098	13-4648-8 07-1559-4		Mar-23 Feb-23 1	08 Mar-2 3:00 09 Feb-2		12h 27d 23h	Eco	-Analysts, I	nc. D	redged Sed	iment Evalı
Sample Code	Material	Туре		Sample Source	•	Sta	ition Locat	ion	Lat/Long	1	
IOSN 2019	Reference	e sediment		Yachtsman Mar	ina NAE-20	004-00 108	SN Referen	се			
AT3-098	Marine Se	ediment		Yachtsman Mar	ina NAE-20	004-00 10	Stations at	4 Marinas	Mu		
Data Transfor	m	Alt Hyp				Comparis	on Result				PMSD
Untransformed		C < T				AT3-098 p	oassed mer	cury endpo	oint		34.73%
	e t Two-Sample II AT3-098			tat Critical	MSD 0.00542	<b>P-Type</b> CDF	<b>P-Value</b> 0.9925	<b>Decisio</b> Non-Sig	n(α:5%) nificant Effec	ıt	
<b>Auxiliary Test</b>	s										
Auxiliary Test Attribute	s Test				Test Stat	Critical	P-Value	Decisio	n(α:5%)		
-	Test	Extreme Va	alue Test		Test Stat	Critical 2.29	<b>P-Value</b> 0.1085	<b>Decisio</b> No Outli	n(α:5%) ers Detected		
Attribute	Test	Extreme Va	ılue Test								
Attribute Outlier	Test			Square					ers Detected		
Attribute Outlier ANOVA Table	Test Grubbs E	ıares		-	2.16	2.29	0.1085	No Outli	ers Detected		
Attribute Outlier ANOVA Table Source Between Error	Test Grubbs B Sum Squ 0.000201 0.000169	iares 8 7	Mean	2018	2.16 <b>DF</b> 1	2.29 F Stat	0.1085 P-Value	No Outli	ers Detected n(α:5%)		
Attribute Outlier ANOVA Table Source Between	Test Grubbs B Sum Squ 0.000201	iares 8 7	<b>Mean</b> 0.0002	2018	2.16 <b>DF</b>	2.29 F Stat	0.1085 P-Value	No Outli	ers Detected n(α:5%)		
Attribute Outlier ANOVA Table Source Between Error	Test Grubbs B Sum Squ 0.000201 0.000169 0.000371	iares 8 7	<b>Mean</b> 0.0002	2018	2.16 <b>DF</b> 1	2.29 F Stat	0.1085 P-Value	No Outli	ers Detected n(α:5%)		
Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assur Attribute	Test Grubbs E  Sum Squ 0.000201 0.000169 0.000371  mptions Tests Test	8 7 6	Mean 9 0.0002 2.122E	2018	2.16  DF  1 8 9	F Stat 9.51 Critical	0.1085  P-Value  0.0150  P-Value	Decisio Significa  Decisio	ers Detected n(α:5%) unt Effect n(α:1%)		
Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assur Attribute Variance	Sum Squ 0.000201 0.000371 nptions Tests Test Variance	ares 8 7 6 Ratio F Te	Mean 9 0.0002 2.122E	2018 E-05	2.16  DF  1 8 9  Test Stat 5.24	2.29  F Stat  9.51  Critical  23.2	0.1085  P-Value 0.0150  P-Value 0.1376	Decisio Significa  Decisio Equal Va	n(α:5%) Int Effect n(α:1%) ariances		
Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assur Attribute Variance Distribution	Sum Squ 0.000201 0.000371 mptions Tests Variance Shapiro-V	8 7 6	Mean 9 0.0002 2.122E	2018 E-05	2.16  DF  1 8 9	F Stat 9.51 Critical	0.1085  P-Value  0.0150  P-Value	Decisio Significa  Decisio Equal Va	ers Detected n(α:5%) unt Effect n(α:1%)		
Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assur Attribute Variance Distribution  Mercury Sumi	Sum Squ 0.000201 0.000371  nptions Tests Test Variance Shapiro-V	Ratio F Te	Mean 9 0.0002 2.122E st mality Tes	t	2.16  DF  1 8 9  Test Stat  5.24 0.893	2.29  F Stat  9.51  Critical  23.2  0.741	P-Value 0.0150  P-Value 0.1376 0.1815	Decisio Significa  Decisio Equal Va	n(α:5%) Int Effect n(α:1%) ariances Distribution		%Effect
Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assur Attribute Variance Distribution	Test Grubbs B Sum Squ 0.000201 0.000169 0.000371 mptions Tests Test Variance Shapiro-V mary Code	Ratio F Te Vilk W Non	Mean and 0.0002 2.122E	t 95% LCL	2.16  DF  1 8 9  Test Stat 5.24 0.893	2.29  F Stat  9.51  Critical  23.2  0.741  Median	P-Value 0.0150  P-Value 0.1376 0.1815	Decisio Significa  Decisio Equal Va Normal I	n(α:5%) Int Effect n(α:1%) ariances	CV%	%Effect 0.00%
Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assur Attribute Variance Distribution  Mercury Summanule	Sum Squ 0.000201 0.000371  nptions Tests Test Variance Shapiro-V	Ratio F Te	Mean 9 0.0002 2.122E st mality Tes	2018 E-05 t t 95% LCL 6 0.0124	2.16  DF  1 8 9  Test Stat 5.24 0.893  95% UCL 0.0188	2.29  F Stat  9.51  Critical  23.2  0.741	P-Value 0.0150  P-Value 0.1376 0.1815	Decisio Significa  Decisio Equal Va	n(α:5%) Int Effect  n(α:1%) Pariances Distribution  Std Err		%Effect 0.00% 57.60%
Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assur Attribute Variance Distribution  Mercury Sumi Sample IOSN 2019 AT3-098	Test Grubbs B Sum Squ 0.000201 0.000169 0.000371 mptions Tests Test Variance Shapiro-V mary Code RS	Ratio F Te Vilk W Non	Mean 0.0002 2.122E	2018 E-05 t t 95% LCL 6 0.0124	2.16  DF  1 8 9  Test Stat 5.24 0.893  95% UCL 0.0188	2.29  F Stat  9.51  Critical  23.2  0.741  Median  0.016	P-Value 0.0150  P-Value 0.1376 0.1815  Min 0.012	Decisio Significa  Decisio Equal Va Normal I	n(a:5%) Int Effect  n(a:1%) Intraces Distribution  Std Err  0.00117	<b>CV%</b> 16.72%	0.00%
Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assur Attribute Variance Distribution  Mercury Summanule IOSN 2019	Test Grubbs B Sum Squ 0.000201 0.000169 0.000371 mptions Tests Test Variance Shapiro-V mary Code RS	Ratio F Te Vilk W Non	Mean 3 0.0002 2.122E st mality Tes Mean 0.0156 0.0066	95% LCL 0.0124 62 -0.000797	2.16  DF  1 8 9  Test Stat 5.24 0.893  95% UCL 0.0188 0.014	2.29  F Stat  9.51  Critical  23.2  0.741  Median  0.016  0.004	P-Value 0.0150  P-Value 0.1376 0.1815  Min 0.012	Decisio Significa  Decisio Equal Va Normal I	n(a:5%) Int Effect  n(a:1%) Intraces Distribution  Std Err  0.00117	<b>CV%</b> 16.72%	0.00%
Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assur Attribute Variance Distribution  Mercury Sumi Sample IOSN 2019 AT3-098  Mercury Detail	Test Grubbs B  Sum Squ 0.000201 0.000169 0.000371  mptions Tests Test Variance Shapiro-V  mary Code RS	Ratio F Te Vilk W Nor	Mean 0.0002 2.122E	2018 E-05 t t 95% LCL 6 0.0124	2.16  DF  1 8 9  Test Stat 5.24 0.893  95% UCL 0.0188	2.29  F Stat  9.51  Critical  23.2  0.741  Median  0.016	P-Value 0.0150  P-Value 0.1376 0.1815  Min 0.012	Decisio Significa  Decisio Equal Va Normal I	n(a:5%) Int Effect  n(a:1%) Intraces Distribution  Std Err  0.00117	<b>CV%</b> 16.72%	0.00%

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Test Code/ID: TN-23-302NvMet / 07-8839-3412

										16	est Co	ue/ID.					7-8839-3	712
Bioaccumulat	tion l	Evaluation -	- Metal	s - N	ereis v	irens										EA-ES	Γ, Inc. Pl	вс
Analysis ID: Analyzed: Edit Date:	19 <i>A</i>	0017-5455 Aug-23 6:54 May-23 22:49	9	Anal	point: lysis: i Hash:	Para	ametric-Two	Sample 9BC529979	C5AC2D07	EA33		S Versions S Level or ID:		CETIS	v2.1.1			
Batch ID: Start Date: Ending Date: Test Length:	08 N 05 A	•		Prot	ocol:	US /	iccumulatio ACE NED F eis virens chaeta				Analy Dilue Brine Sour	nt: 1	Not Ap Crysta	/ Roka pplicable al Sea - Aquatio		earch O	r <b>Age:</b>	
Sample Code		Sample IE	)	Sam	ple Da	te	Receipt	Date	Sample Ag	je	Clien	t Name			Proje	ct		
IOSN 2019 AT3-098		13-4648-8 07-1559-4			lar-23 eb-23 ´	13:00	08 Mar- 09 Feb-		12h 27d 23h		Eco-A	Analysts	, Inc.	l	Dredg	jed Sedi	ment Ev	alu
Sample Code		Material T	уре			Sam	ple Source	Э	St	ation L	ocatio	on		Lat/Lon	g			
IOSN 2019		Reference	sedim	ent		Yacl	ntsman Mai	rina NAE-20	04-00 IO	SN Re	ference	е						
AT3-098		Marine Se	diment			Yacl	ntsman Mai	rina NAE-20	04-00 10	Statio	ns at 4	Marina	s Mu					
Data Transfor	m		Alt H	lyp					Compari	son Re	esult						PMSD	)
Untransformed	t		C < T	•					AT3-098	failed r	nickel e	endpoint	t				32.75	%
Equal Variand	ce t T vs	「wo-Sample Sample II	Test	df	Test	Stat	Critical	MSD	P-Type	P-V	alue	Decisi	on(a.	:5%)				
Janipie	٧S	Sample II		uı	1631	Jiai	Critical	IVIOD	r-iype	L-A	aiue		oniju.	. 5 /0)				
Reference Sec	b	AT3-098*		8	2.18		1.86	0.055	CDF	0.03	05	Signific	cant E	Effect				
Auxiliary Test Attribute Outlier		Test Grubbs E	xtreme				1.86	0.055  Test Stat 1.78			alue	Decisi	ion(α:		d			
Auxiliary Test Attribute	ts	Test	xtreme				1.86	Test Stat	Critical	P-V	alue	Decisi	ion(α:	:5%)	d			
Auxiliary Test Attribute Outlier	ts	Test				ı Squ		Test Stat	Critical	P-V	alue 199	Decisi	i <b>on(α:</b> tliers	: <b>5%)</b> Detecte	d			
Auxiliary Test Attribute Outlier ANOVA Table Source Between Error	ts	Test Grubbs E  Sum Squa 0.0103684 0.0174676	ares		e Test	3684		Test Stat 1.78  DF 1 8	Critical 2.29	<b>P-V</b> 3	alue 199 alue	Decisi No Ou	on(α: tliers ion(α:	: <b>5%)</b> Detecte				
Auxiliary Test Attribute Outlier  ANOVA Table Source Between Error Total	ts	Test Grubbs E  Sum Squa 0.0103684 0.0174676 0.027836	ares		Mean	3684		<b>Test Stat</b> 1.78 <b>DF</b> 1	Critical 2.29	P-V:	alue 199 alue	Decisi No Ou	on(α: tliers ion(α:	:5%) Detecte				
Auxiliary Test Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assur	ts	Test Grubbs E  Sum Squa 0.0103684 0.0174676 0.027836  ons Tests	ares		Mean	3684		Test Stat 1.78 DF 1 8 9	Critical 2.29  F Stat 4.75	P-V: 0.53 P-V: 0.06	alue 199 alue	Decisi No Ou Decisi Non-S	ion(a: tliers   ion(a: ignific	:5%) Detecte :5%) cant Effe				
Auxiliary Test Attribute Outlier  ANOVA Table Source Between Error Total	ts	Test Grubbs E  Sum Squa 0.0103684 0.0174676 0.027836	ares	Valu	Mean 0.010 0.002	3684		Test Stat 1.78  DF 1 8 9	Critical 2.29  F Stat 4.75  Critical	P-V:	alue 199 alue 1009	Decisi No Ou  Decisi Non-S	ion(α: tliers ion(α: ignific	Detecte  :5%) cant Effe				
Auxiliary Test Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assur Attribute	ts	Test Grubbs E  Sum Squa 0.0103684 0.0174676 0.027836 ons Tests Test	ares	Valu	Mean 0.010 0.002	3684 1835		Test Stat 1.78 DF 1 8 9	Critical 2.29  F Stat 4.75	P-V: 0.53 P-V: 0.06	alue 199 alue 199 alue	Decisi Non-S  Decisi Equal	ion(α: tliers   ion(α: ignific	Detecte  :5%) cant Effe				
Auxiliary Test Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assur Attribute Variance	mptic	Test Grubbs E  Sum Squa 0.0103684 0.0174676 0.027836 ons Tests Test Variance F	ares	Valu	Mean 0.010 0.002	3684 1835		Test Stat 1.78  DF 1 8 9  Test Stat 1.6	Critical 2.29  F Stat 4.75  Critical 23.2	P-V: 0.53  P-V: 0.06	alue 199 alue 199 alue	Decisi Non-S  Decisi Equal	ion(α: tliers   ion(α: ignific	Detecte  :5%) cant Effe				
Auxiliary Test Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assur Attribute Variance Distribution	mptic	Test Grubbs E  Sum Squa 0.0103684 0.0174676 0.027836 ons Tests Test Variance F	ares	Test Norma	Mean 0.010 0.002	3684 1835 st		Test Stat 1.78  DF 1 8 9  Test Stat 1.6	Critical 2.29  F Stat 4.75  Critical 23.2	P-V: 0.53  P-V: 0.06	alue 999 alue 609 alue 694	Decisi Non-S  Decisi Equal	ion(a:	Detecte  :5%) cant Effe	ect	V%	%Effec	
Auxiliary Test Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assur Attribute Variance Distribution  Nickel Summa	mptic	Test Grubbs E  Sum Squa 0.0103684 0.0174676 0.027836 ons Tests Test Variance F Shapiro-W	ares	Test Norma	Mean 0.010 0.002	3684 1835 st	are	Test Stat 1.78  DF 1 8 9  Test Stat 1.6 0.947	Critical 2.29  F Stat 4.75  Critical 23.2 0.741	P-V: 0.53  P-V: 0.06  P-V: 0.65 0.62	alue 199 alue 199 alue 194 181	Decisi No Ou  Decisi Non-S  Decisi Equal Norma	tion(a: tion(a: tion(a: tion(a: Variar Variar	Detecte  5%) cant Effe  1%) nces ribution	ect	<b>V%</b> 0.90%	%Effec 0.00%	
Auxiliary Test Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assur Attribute Variance Distribution  Nickel Summi	mptic	Test Grubbs E  Sum Squa 0.0103684 0.0174676 0.027836 ons Tests Test Variance F Shapiro-W  Code	ares	Test Norma	Mean 0.010 0.002 ality Te	3684 1835 st	are	Test Stat 1.78  DF 1 8 9  Test Stat 1.6 0.947	Critical 2.29  F Stat 4.75  Critical 23.2 0.741  Median	P-V: 0.53  P-V: 0.06  P-V: 0.65  0.62	alue 199 alue 199 alue 194 181	Decisi No Ou  Decisi Non-S  Decisi Equal Norma	idon(a:	Detecte :5%) :ant Effe :1%) nces ribution	C C 3			
Auxiliary Test Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assur Attribute Variance Distribution  Nickel Summa Sample IOSN 2019	mptic	Test Grubbs E  Sum Squa 0.0103684 0.0174676 0.027836 ons Tests Test Variance F Shapiro-W  Code	ares	Test Norma	Mean 0.010 0.002  ality Te  Mean 0.168	3684 1835 st	95% LCL 0.103	Test Stat 1.78  DF 1 8 9  Test Stat 1.6 0.947  95% UCL 0.232	Critical 2.29  F Stat 4.75  Critical 23.2 0.741  Median 0.154	P-V: 0.53  P-V: 0.06  0.65  Min 0.11	alue 199 alue 199 alue 194 181	Decisi No Ou  Decisi Non-S  Decisi Equal Norma  Max  0.246	idon(a:	2:5%) Detecte 2:5%) Cant Effect 2:1%) Inces Pribution  Std Err 0.0232	C C 3	0.90%	0.00%	
Auxiliary Test Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assur Attribute Variance Distribution  Nickel Summa Sample IOSN 2019 AT3-098	mptic	Test Grubbs E  Sum Squa 0.0103684 0.0174676 0.027836 ons Tests Test Variance F Shapiro-W  Code	ares	Test Norma	Mean 0.010 0.002  ality Te  Mean 0.168	3684 1835 st	95% LCL 0.103	Test Stat 1.78  DF 1 8 9  Test Stat 1.6 0.947  95% UCL 0.232	Critical 2.29  F Stat 4.75  Critical 23.2 0.741  Median 0.154	P-V: 0.53  P-V: 0.06  0.65  Min 0.11	alue 199 alue 199 alue 194 181	Decisi No Ou  Decisi Non-S  Decisi Equal Norma  Max  0.246	idon(a:	2:5%) Detecte 2:5%) Cant Effect 2:1%) Inces Pribution  Std Err 0.0232	C C 3	0.90%	0.00%	
Auxiliary Test Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assur Attribute Variance Distribution  Nickel Summ: Sample IOSN 2019 AT3-098  Nickel Detail	mptic	Test Grubbs E  Sum Squa 0.0103684 0.0174676 0.027836 ons Tests Test Variance F Shapiro-W  Code RS	Ratio F Vilk W N	Test Norma	Mean 0.010 0.002  ality Te  Mean 0.168 0.232	3684 1835 st	95% LCL 0.103 0.181	Test Stat 1.78  DF 1 8 9  Test Stat 1.6 0.947  95% UCL 0.232 0.283	Critical 2.29  F Stat 4.75  Critical 23.2 0.741  Median 0.154 0.239	P-V: 0.53  P-V: 0.06  0.65  Min 0.11	alue 199 alue 199 alue 194 181	Decisi No Ou  Decisi Non-S  Decisi Equal Norma  Max  0.246	idon(a:	2:5%) Detecte 2:5%) Cant Effect 2:1%) Inces Pribution  Std Err 0.0232	C C 3	0.90%	0.00%	

Report Date: Test Code/ID:

19 Aug-23 06:54 (p 8 of 8) TN-23-302NvMet / 07-8839-3412

							Test Co	ode/ID:	TN-23-30	2NvMet / 0	7-8839-3412
Bioaccumulat	tion Evaluation	- Metals -	Nereis vire	ıs						EA-ES	T, Inc. PBC
Analysis ID: Analyzed: Edit Date:	13-3955-6427 19 Aug-23 6:54 08 May-23 22:4	1 An	•	nc arametric-Two 273BB7FF8A	•	)C48774CE	Stati	IS Versionus Level: or ID:	n: CETISv2 1	2.1.1	
Batch ID: Start Date: Ending Date: Test Length:	13-8417-6872 08 Mar-23 11:3 05 Apr-23 10:3 27d 23h	31 <b>Pr</b> 1 <b>S</b> p	otocol: U	oaccumulations ACE NED Foreis virens			Anal Dilud Brin Soul	ent: No e: Cr	ancy Roka ot Applicable rystal Sea RO - Aquatic	Research C	Or <b>Age:</b>
Sample Code	Sample I	ID Sa	mple Date	Receip	t Date	Sample Age	e Clier	nt Name	Pi	roject	
IOSN 2019 AT3-098	13-4648- 07-1559-		Mar-23 Feb-23 13:0	08 Mar-	-23	12h 27d 23h		Analysts,		•	iment Evalu
Sample Code	Material	Туре	Sa	ample Sourc	е	Sta	tion Locati	on	Lat/Long		
IOSN 2019 AT3-098	Referenc Marine S	e sediment ediment		achtsman Ma achtsman Ma			SN Reference Stations at		Mu		
Data Transfor	m	Alt Hyp				Comparis	on Result				PMSD
Untransformed	d	C < T				AT3-098 fa	ailed zinc ei	ndpoint			49.95%
Equal Variand	ce t Two-Sampl	le Test									
Sample I	vs Sample II	c	If Test Sta	t Critical	MSD	P-Type	P-Value	Decisio	n(α:5%)		
Reference Sec	d AT3-098*	7	2.5	1.89	4.24	CDF	0.0206	Significa	ant Effect		
ANOVA Table											
Source	Sum Squ	uares	Mean So	quare	DF	F Stat	P-Value	Decisio	n(α:5%)		
Between	69.4899		69.4899		1	6.24	0.0411	Significa	ant Effect		
Error	77.9419		11.1346		7	_					
Total	147.432				8						
ANOVA Assur	mptions Tests										
Attribute	Test				Test Stat	Critical	P-Value	Decisio	n(α:1%)		
Variance	Variance	Ratio F Te	st		2.85	46.2	0.4155	Equal V	ariances		
Distribution	Shapiro-\	Wilk W Nor	mality Test		0.968	0.701	0.8726	Normal	Distribution		
Zinc Summar	у										
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
IOSN 2019	RS	4	8.49	4.79	12.2	7.15	6.63	11.8	1.16	27.39%	0.00%
AT3-098		5	14.1	9.2	19	14.5	8.61	18.6	1.76	27.89%	-65.87%
Zinc Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
					0.00						
IOSN 2019	RS	7.15	11.8	6.63	8.38						

## ATTACHMENT V

Nereis virens 28-Day Solid Phase Bioaccumulation Testing Tissue Chemistry and Body Burden Statistical Analyses

**PAHs** 

(27 pages)

#### Yachtsman Marina NAE-2004-00319

#### APPENDIX A. CONCENTRATIONS OF COCs IN THE WORM (N. virens)

			Pre-Assay		
CONTAMINANT	REP1	REP2	REP3	REP4 *	REP5 *
PAHs (ng/g wet weight)					
Acenaphthene	0.615 <mark>U</mark>	0.630 U	0.615 <mark>U</mark>		
Acenaphthylene	0.377 <mark>U</mark>	0.388 <mark>U</mark>	0.378 <mark>U</mark>		
Anthracene	0.409 <mark>U</mark>	0.421 <mark>U</mark>	1.88 <mark>J</mark>		
Benzo(a)anthracene	0.765 <mark>U</mark>	0.790 U	0.770 <mark>U</mark>		
Benzo(a)pyrene	0.805 <mark>U</mark>	0.830 U	0.805 <mark>U</mark>		
Benzo(b)fluoranthene	1.07 <mark>U</mark>	1.10 <mark>U</mark>	1.07 <mark>U</mark>		
Benzo(k)fluoranthene	0.489 <mark>U</mark>	0.500 U	0.490 U		
Benzo(g,h,i)perylene	0.342 <mark>U</mark>	0.352 <mark>U</mark>	0.343 <mark>U</mark>		
Chrysene	0.745 <mark>U</mark>	0.765 <mark>U</mark>	0.745 <mark>U</mark>		
Dibenzo(a,h)anthracene	0.396 <mark>U</mark>	0.408 U	0.397 <mark>U</mark>		
Fluoranthene	0.605 <mark>U</mark>	0.620 U	0.605 <mark>U</mark>		
Fluorene	1.34 J	1.18 <mark>J</mark>	0.693 J		
Indeno(1,2,3-c,d)pyrene	0.800 U	0.825 <mark>U</mark>	0.805 <mark>U</mark>		
Naphthalene	1.54 JB	2.19 JB	1.20 JB		
Phenanthrene	0.670 U	0.690 U	0.670 U		
Pyrene	0.890 <mark>U</mark>	0.915 <mark>U</mark>	0.890 <del>U</del>		
PAH Total	11.9	12.6	12.4		

<sup>\* =</sup> Qualifiers

U Analyte not detected; below Method Detection Limit; value is one-half the Method Detection Limit

J Analyte estimated; detection below Reporting Limit but above Method Detection Limit

NA Not Analyzed

#### Yachtsman Marina NAE-2004-00319

#### APPENDIX A. CONCENTRATIONS OF COCs IN THE WORM (N. virens)

<b>IOSN Reference</b>		
REP3	REP4	REP5
J 0.460 U	0.954 J	0.480 <mark>U</mark>
J 0.283 U	0.287 <mark>U</mark>	0.295 <mark>U</mark>
J 0.307 U	0.311 <mark>U</mark>	0.320 <mark>U</mark>
J 0.575 <b>U</b>	0.585 <mark>U</mark>	0.600 <mark>U</mark>
J 0.605 U	0.610 U	0.630 U
J 0.800 U	0.810 U	0.830 <mark>U</mark>
J 0.367 U	0.372 <mark>U</mark>	0.382 <mark>U</mark>
J 0.257 U	0.260 U	0.267 U
J 0.560 U	0.565 <mark>U</mark>	0.580 U
J 0.297 U	0.301 <mark>U</mark>	0.310 U
J 0.453 U	0.459 <mark>U</mark>	0.472 U
	0.832 <mark>J</mark>	0.267 U
J 0.600 U	0.610 <mark>U</mark>	0.625 <mark>U</mark>
J 0.396 U	1.24 <mark>J</mark>	0.412 <mark>U</mark>
	3.10 J	1.23 J
J 0.665 U	0.675 <mark>U</mark>	0.695 <mark>U</mark>
9.18	12.0	8.39
	REP3  J 0.460 U J 0.283 U J 0.307 U J 0.575 U J 0.605 U J 0.800 U J 0.257 U J 0.560 U J 0.453 U J 0.543 J J 0.600 U J 0.396 U J 0.665 U	REP3 REP4  J 0.460 U 0.954 J J 0.283 U 0.287 U J 0.307 U 0.311 U J 0.575 U 0.585 U J 0.605 U 0.610 U J 0.800 U 0.810 U J 0.257 U 0.260 U J 0.560 U 0.565 U J 0.297 U 0.301 U J 0.453 U 0.459 U J 0.543 J 0.832 J J 0.600 U 0.610 U J 0.396 U 1.24 J J 2.01 J 3.10 J J 0.665 U 0.675 U

<sup>\* =</sup> Qualifiers

U Analyte not detected; belogJ Analyte estimated; detection

NA Not Analyzed

#### Yachtsman Marina NAE-2004-00319

#### APPENDIX A. CONCENTRATIONS OF COCs IN THE WORM (N. virens)

#### 10 Stations at 4 Marinas Mud

CONTAMINANT	REP1	REP2	REP3	REP4	REP5
PAHs (ng/g wet weight)					
Acenaphthene	0.620 <mark>U</mark>	1.31 <mark>J</mark>	0.610 <mark>U</mark>	1.24 J	0.635 <mark>U</mark>
Acenaphthylene	0.380 <mark>U</mark>	0.371 U	0.374 U	12.2	7.79
Anthracene	0.412 <mark>U</mark>	0.845 J	0.965 J	0.404 U	0.422 U
Benzo(a)anthracene	0.770 U	0.755 U	0.760 U	0.755 <mark>U</mark>	0.790 U
Benzo(a)pyrene	0.810 <mark>U</mark>	0.790 U	0.800 U	0.795 <mark>U</mark>	0.830 <mark>U</mark>
Benzo(b)fluoranthene	1.07 <mark>U</mark>	1.05 <b>U</b>	7.90	1.05 <mark>U</mark>	1.10 <b>U</b>
Benzo(k)fluoranthene	0.492 <mark>U</mark>	0.481 U	30.3	0.483 <mark>U</mark>	0.505 U
Benzo(g,h,i)perylene	0.344 <mark>U</mark>	0.337 U	0.339 <mark>U</mark>	0.338 <mark>U</mark>	0.776 J
Chrysene	1.82 <mark>J</mark>	1.63 <mark>J</mark>	0.740 U	0.735 <mark>U</mark>	0.770 U
Dibenzo(a,h)anthracene	0.399 <mark>U</mark>	0.390 U	0.393 <mark>U</mark>	0.391 <mark>U</mark>	0.409 U
Fluoranthene	7.81	8.46	10.7	2.77 J	3.83 <mark>J</mark>
Fluorene	1.73 <mark>J</mark>	1.31 <mark>J</mark>	1.13 <mark>J</mark>	3.78 J	2.30 J
Indeno(1,2,3-c,d)pyrene	0.805 <mark>U</mark>	0.790 U	0.795 U	0.790 U	0.830 U
Naphthalene	1.65 JB	2.32 JB	2.29 JB	0.520 U	1.20 JB
Phenanthrene	0.675 <mark>U</mark>	0.660 U	1.62 J	0.660 U	0.690 U
Pyrene	8.04	6.62	7.73	4.83 J	3.92 J
PAH Total	27.8	28.1	67.4	31.7	26.8

<sup>\* =</sup> Qualifiers

U Analyte not detected; belogJ Analyte estimated; detection

NA Not Analyzed

#### **CETIS Test Data Worksheet**

Report Date:

19 Aug-23 06:55 (p 1 of 1)

Test Code/ID:

TN-23-302NvPAH / 17-1765-7444

**Bioaccumulation Evaluation - PAHs - Nereis** 

EA-EST, Inc. PBC

Start Date: End Date:

05 Apr-23 10:32

08 Mar-23 11:32 Species: Nereis virens

Protocol: US ACE NED RIM (2004)

Sample Code: AT3-152 Sample Source: Yachtsman Marina NAE-2004-00319

Sample Date: 03 l	Mar-23		Mate	rial: La	boratory	Control S	ediment		Sam	ple Statio	on: Labo	oratory Co	ontrol							
Sample	Rep	Pos	Acenaphthene	Acenaphthylene	Anthracene	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(g,h,l)perylene	Benzo(k)fluoranthene	Chrysene	Dibenz(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-cd)pyrene	Naphthalene	Phenanthrene	Pyrene	1,4-Dichlorobenze	Total PAHs
IOSN 2019	1	2	0.462	0.284	0.308	0.575	0.605	0.8	0.2575	0.368	0.56	0.2985	1.01	0.2575	0.605	0.812	2.12	0.67		
IOSN 2019	2	4	0.458	0.2815	0.3055	0.57	0.6	0.795	0.255	0.365	0.555	0.296	0.451	0.255	0.6	0.3935	1.76	0.665		
IOSN 2019	3	5	0.46	0.283	0.307	0.575	0.605	8.0	0.2565	0.3665	0.56	0.297	0.453	0.543	0.6	0.3955	2.01	0.665		
IOSN 2019	4	8	0.954	0.2865	0.311	0.585	0.61	0.81	0.26	0.3715	0.565	0.301	0.459	0.832	0.61	1.24	3.1	0.675		
IOSN 2019	5	9	0.4795	0.2945	0.3195	0.6	0.63	0.83	0.267	0.382	0.58	0.3095	0.472	0.267	0.625	0.412	1.23	0.695		
AT3-098	1	1	0.62	0.3795	0.4115	0.77	0.81	1.07	0.344	0.492	1.82	0.399	7.81	1.73	0.805	1.65	0.675	8.04		
AT3-098	2	3	1.31	0.371	0.845	0.755	0.79	1.045	0.3365	0.481	1.63	0.39	8.46	1.31	0.79	2.32	0.66	6.62		
AT3-098	3	6	0.61	0.374	0.965	0.76	0.8	7.9	0.339	30.3	0.74	0.393	10.7	1.13	0.795	2.29	1.62	7.73		
AT3-098	4	7	1.24	12.2	0.404	0.755	0.795	1.05	0.3375	0.483	0.735	0.391	2.77	3.78	0.79	0.52	0.66	4.83		
AT3-098	5	10	0.635	7.79	0.422	0.79	0.83	1.1	0.776	0.505	0.77	0.409	3.83	2.3	0.83	1.2	0.69	3.92		

Analyst:\_

14-6869-2556 Chrysene

02-3007-9915 Fluorene

14-8100-8905 Fluorene

13-2043-1908 Pyrene

16-7604-1580 Fluoranthene

12-1685-5860 Naphthalene

01-9493-0851 Phenanthrene

19-8988-8883 Dibenz(a,h)anthracene

08-3442-7926 Indeno(1,2,3-cd)pyrene

Report Date: 19 Aug-23 06:56 (p 1 of 5) Test Code/ID: TN-23-302NvPAH / 17-1765-7444

#### Bioaccumulation Evaluation - PAHs - Nereis

EA-EST. Inc. PBC

Bioaccumulai	tion Evaluation - PAHS	- Nereis					EA-ESI, Inc.	PBC
Batch ID:	16-7806-7369	•	Bioaccumulation -		Anal	•		
Start Date:	08 Mar-23 11:32	Protocol:	US ACE NED RIM	1 (2004)	Dilue			
1 -	05 Apr-23 10:32	Species:	Nereis virens		Brine	,		
Test Length:	27d 23h	Taxon:	Polychaeta		Sour	ce: ARO - Aq	uatic Research Or <b>Age</b> :	:
Sample ID:	11-9755-1044	Code:	AT3-152		Proje	ect: Dredged	Sediment Evaluation	
Sample Date:	03 Mar-23	Material:	Laboratory Contro	l Sediment	Sour	ce: Yachtsma	an Marina NAE-2004-00	319 (
Receipt Date:	03 Mar-23 12:30	CAS (PC):			Stati	on: Laborator	y Control	
Sample Age:	5d 12h	Client:	Eco-Analysts, Inc.					
Sample Code	Sample ID	Sample Da	te Receipt Da	ate Sample	Age Clier	nt Name	Project	
IOSN 2019	13-4648-8170	08 Mar-23	08 Mar-23	12h	Eco-	Analysts, Inc.	Dredged Sediment	Evalu
AT3-098	07-1559-4974	08 Feb-23 1	13:00 09 Feb-23	16:30 27d 23	h			
Sample Code	Material Type		Sample Source		Station Location	on Lat	Long .	
IOSN 2019	Reference sedim	ent	Yachtsman Marina	a NAE-2004-00	IOSN Reference	e		
AT3-098	Marine Sedimen	t	Yachtsman Marina	a NAE-2004-00	10 Stations at 4	1 Marinas Mu		
Single Compa	arison Summary							
Analysis ID	Endpoint	Comp	oarison Method		P-Value	Comparison R	Result	s
09-6281-0431	Acenaphthene	Equal	Variance t Two-Sa	mple Test	0.0634	AT3-098 passe	d acenaphthene	1
10-1846-2388	Acenaphthylene	Unequ	ual Variance t Two-	Sample Test	0.0922	AT3-098 passe	d acenaphthylene	1
14-8405-4060	Anthracene	Unequ	ual Variance t Two-	Sample Test	0.0352	AT3-098 failed	anthracene	1
02-1204-0422	Benzo(a)anthracene	Equal	Variance t Two-Sa	mple Test	<1.0E-05	AT3-098 failed	benzo(a)anthracene	1
10-8756-9954	Benzo(a)pyrene	Equal	Variance t Two-Sa	mple Test	<1.0E-05	AT3-098 failed	benzo(a)pyrene	1
09-2700-3438	Benzo(b)fluoranthene	Equal	Variance t Two-Sa	mple Test	<1.0E-05	AT3-098 failed	benzo(b)fluoranthene	1
18-4472-6594	Benzo(b)fluoranthene	Wilco	xon Rank Sum Two	-Sample Test	0.0040	AT3-098 failed	benzo(b)fluoranthene	1
13-4397-7733	Benzo(g,h,i)perylene	Equal	Variance t Two-Sa	mple Test	<1.0E-05	AT3-098 failed	benzo(g,h,i)perylene	1
15-5949-4399	Benzo(g,h,i)perylene	Wilco	xon Rank Sum Two	-Sample Test	0.0040	AT3-098 failed	benzo(g,h,i)perylene	1
11-9752-3554	Benzo(k)fluoranthene	Equal	Variance t Two-Sa	mple Test	<1.0E-05	AT3-098 failed	benzo(k)fluoranthene	1
04 4504 6740	Benzo(k)fluoranthene	Wilco	xon Rank Sum Two	Sample Test	0.0040	AT3 009 failed	benzo(k)fluoranthene	1

Unequal Variance t Two-Sample Test

Unequal Variance t Two-Sample Test

Equal l Variance t Two-Sample Test

0.0378

0.0072

0.0014

0.0054

0.0188

0.9945

0.0012

AT3-098 failed chrysene

AT3-098 failed fluorene

AT3-098 failed fluorene <1.0E-05 AT3-098 failed indeno(1,2,3-cd)pyrene

AT3-098 failed pyrene

<1.0E-05 AT3-098 failed dibenz(a,h)anthracene

AT3-098 failed fluoranthene

AT3-098 failed naphthalene

AT3-098 passed phenanthrene

#### **CETIS Summary Report**

Report Date: Test Code/ID: 19 Aug-23 06:56 (p 2 of 5) TN-23-302NvPAH / 17-1765-7444

#### **Bioaccumulation Evaluation - PAHs - Nereis**

ICSN 2019	Code Count Mass	05% 101	05% 1101	Min	Max	Std Err	Std Dev	CV%	%Effect
AT3-098   5 0.883 0.437 1.33 0.61 1.31 0.16 0.369 40.64%   Accenaphthylene Summary   Sample   Code   Count   Mean   95% LCL   2.60 1.1 0.371   12.2 0.40 0.0023 0.00514 1.80%   AT3-098   5 0.286 0.28 0.292 0.292 0.292 0.294 0.0023 0.00514 1.80%   AT3-098   5 0.286 0.28 0.292 0.292 0.294 0.0023 0.00514 1.80%   AT3-098   5 0.286 0.28 0.292 0.292 0.294 0.0023 0.00514 1.80%   AT3-098   Code   Count   Mean   95% LCL   95% UCL   Min   Max   Std Err   Std Dev   CV%   IOSN 2019   RS   5 0.31 0.303 0.317 0.306 0.319 0.0024 0.00557 1.80%   AT3-098   S   0.61 0.27 0.949 0.404 0.365 0.319 0.0024 0.00557 1.80%   AT3-098   S   0.581 0.566 0.566 0.57 0.6 0.319 0.0024 0.00557 1.80%   AT3-098   S   0.581 0.566 0.566 0.57 0.6 0.0534 0.019 0.20%   AT3-098   S   0.581 0.566 0.78 0.56 0.57 0.6 0.0534 0.017 1.93%   AT3-098   S   0.61 0.656 0.78 0.786 0.79 0.0066 0.0147 1.93%   AT3-098   S   0.61 0.650 0.786 0.786 0.79 0.68 0.0054 0.0147 1.93%   AT3-098   S   0.61 0.650 0.785 0.79 0.38 0.00524 0.0117 1.93%   AT3-098   S   0.61 0.650 0.785 0.79 0.83 0.00524 0.0117 1.93%   AT3-098   S   0.61 0.650 0.785 0.825 0.79 0.83 0.00524 0.0117 1.93%   AT3-098   S   0.61 0.505 0.785 0.825 0.79 0.83 0.00524 0.0117 1.93%   AT3-098   S   0.61 0.505 0.785 0.825 0.79 0.83 0.00524 0.0117 1.93%   AT3-098   S   0.61 0.610 0.785 0.785 0.79 0.83 0.00524 0.0117 1.93%   AT3-098   S   0.61 0.610 0.785 0.785 0.79 0.83 0.00524 0.0117 1.92%   AT3-098   S   0.61 0.610 0.785 0.785 0.79 0.83 0.00524 0.0117 1.93%   AT3-098   S   0.61 0.610 0.785 0.785 0.79 0.83 0.00524 0.0117 1.93%   AT3-098   S   0.61 0.610 0.785 0.785 0.79 0.83 0.00524 0.0117 1.93%   AT3-098   S   0.61 0.830 0.785 0.825 0.79 0.83 0.00524 0.0117 1.93%   AT3-098   S   0.61 0.830 0.785 0.830 0.00524 0.0117 1.93%   AT3-098   S   0.625 0.255 0.267 0.267 0.0061 0.0041 1.73%   AT3-098   S   0.625 0.259 0.253 0.265 0.267 0.0211 0.00472 1.82%   AT3-098   S   0.625 0.371 0.302 0.390 0.305 0.0081 1.84%   AT3-098   S   0.640 0.259 0.350 0.385 0.382 0.3052 0.0085 1.84%   AT3-098   S   0.640 0.0041 Mean 95% LCL									
Sample   Code   Count   Mean   95% LCL   95% UCL   Min   Max   Std Err   Std Dev   CV%									0.00% -56.92%
Sample   Code   Count   Mean   95% LCL   95% UCL   Min   Max   Std Err   Std Dev   CV%		0.401	1.00	0.01	1.01	0.10	0.000	40.0470	
IOSN 2019	•	05% I CI	95% HCI	Min	May	Std Err	Std Dov	CV9/.	%Effect
AT3-098									
Sample									0.00% -1377.0
Sample         Code         Count         Mean         95% LCL         95% UCL         Min         Max         Std Err         Std Dev         CV%           ICSN 2019         RS         5         0.31         0.303         0.317         0.306         0.319         0.00249         0.00557         1.80%           AT3-098         5         0.61         0.27         0.494         0.404         0.965         0.122         0.273         44.81%           Bonzo(a)pathracere Summary         Summary         Summary         Summary         Summary         Summary         Summary         Summary         CV%           ICSN 2019         RS         5         0.581         0.586         0.596         0.57         0.6         0.00534         0.0119         2.05%           AT3-098         Code         Count         Mean         95% LCL         95% UCL         Min         Max         Std Err         Std Dev         CV%           ICSN 2019         RS         5         0.61         0.595         0.625         0.6         0.63         0.00524         0.0117         1.92%           AT3-098         RS         5         0.61         0.595         0.785         0.62         0.6 <td></td> <td>2.0</td> <td></td> <td>0.07 1</td> <td>12.2</td> <td>2.40</td> <td></td> <td>100.1270</td> <td></td>		2.0		0.07 1	12.2	2.40		100.1270	
IOSN 2019	•	95% I CI	95% LICI	Min	May	Std Err	Std Dev	CV%	%Effec
Semble   S									0.00%
Semple   Code   Count   Mean   95% LCL   95% UCL   Min   Max   Std Err   Std Dev   CV%									-96.49%
Sample		0.21	0.040	0.404	0.505	0.122	0.270	44.0170	-30.4370
IOSN 2019	•	059/ 1 CI	059/ 1101	Min	May	Ctd Eur	Ctd Day	C\/0/	0/ <b>Eff</b> o.or
Sample   Code   Count   Mean   95% LCL   95% UCL   Min   Max   Std Err   Std Dev   CV%									%Effect
Name									0.00%
Sample         Code         Count         Mean         95% LCL         95% UCL         Min         Max         Std Err         Std Dev         CV%           IOSN 2019         RS         5         0.61         0.595         0.625         0.6         0.63         0.00524         0.0117         1.92%           AT3-098         -         5         0.805         0.785         0.825         0.79         0.83         0.00707         0.0158         1.96%           Benzo(g)fluoranthene Summary           Sample         Code         Count         Mean         95% LCL         95% UCL         Min         Max         Std Err         Std Dev         CV%           IOSN 2019         RS         5         0.807         0.79         0.824         0.795         0.83         0.00624         0.014         1.73%           AT3-098         S         0.243         -1.36         6.23         1.04         7.9         1.37         3.06         125.62%           Benzo(g,h,i)peryler Summary           Sample         Code         Count         Mean         95% LCL         95% UCL         Min         Max         Std Err         Std Dev         CV%           IOS	5 0.766	0.748	0.784	0.755	0.79	0.0066	0.0147	1.93%	-31.84%
Name	ne Summary								
AT3-098         5         0.805         0.785         0.825         0.79         0.83         0.00707         0.0158         1.96%           Benzo(b)fluoranthere Summary:           Sample         Code         Count         Mean         95% LCL         95% UCL         Min         Max         Std Err         Std Dev         CV%           IOSN 2019         RS         5         0.807         0.79         0.824         0.795         0.83         0.00624         0.014         1.73%           AT3-098         -         5         0.43         -1.36         6.23         1.04         7.9         1.37         3.06         125.62%           Benzo(g,h,i)perylene/summary           Sample         Code         Count         Mean         95% LCL         95% UCL         Min         Max         Std Err         Std Dev         CV%           IOSN 2019         RS         5         0.259         0.253         0.265         0.255         0.267         0.00211         0.00472         1.82%           Benzo(k)fluoranthere summary           Sample         Code         Count         Mean         95% LCL         95% UCL         Min		95% LCL	95% UCL		Max	Std Err	Std Dev	CV%	%Effec
Sample   Code   Count   Mean   95% LCL   95% UCL   Min   Max   Std Err   Std Dev   CV%	RS 5 0.61					0.00524	0.0117	1.92%	0.00%
Sample         Code         Count         Mean         95% LCL         95% UCL         Min         Max         Std Err         Std Dev         CV%           IOSN 2019         RS         5         0.807         0.79         0.824         0.795         0.83         0.00624         0.014         1.73%           AT3-098         5         2.43         -1.36         6.23         1.04         7.9         1.37         3.06         125.62%           Benzo(g,h,i)perylene summury           Sample         Code         Count         Mean         95% LCL         95% UCL         Min         Max         Std Err         Std Dev         CV%           IOSN 2019         RS         5         0.259         0.253         0.265         0.267         0.00211         0.00472         1.82%           AT3-098         Tode         Count         Mean         95% LCL         95% UCL         Min         Max         Std Err         Std Dev         CV%           IOSN 2019         RS         5         0.371         0.362         0.379         0.365         0.382         0.0035         0.00681         1.84%           AT3-098         Tode         Count         Mean	5 0.805	0.785	0.825	0.79	0.83	0.00707	0.0158	1.96%	-31.97%
IOSN 2019	anthene Summary								
Sample   S	Code Count Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effec
Sample   Code   Count   Mean   95%   LCL   95%   UCL   Min   Max   Std   Err   Std   Dev   CV%	RS 5 0.807	0.79	0.824	0.795	0.83	0.00624	0.014	1.73%	0.00%
Sample         Code         Count         Mean         95% LCL         95% UCL         Min         Max         Std Err         Std Dev         CV%           IOSN 2019         RS         5         0.259         0.253         0.265         0.255         0.267         0.00211         0.00472         1.82%           AT3-098         5         0.427         0.184         0.669         0.336         0.776         0.0874         0.195         45.79%           Benzo(k)fluoranthene Summary           Sample         Code         Count         Mean         95% LCL         95% UCL         Min         Max         Std Err         Std Dev         CV%           IOSN 2019         RS         5         0.371         0.362         0.379         0.365         0.382         0.00305         0.00681         1.84%           AT3-098         Code         Count         Mean         95% LCL         95% UCL         Min         Max         Std Err         Std Dev         CV%           IOSN 2019         RS         5         0.564         0.552         0.576         0.555         0.58         0.0043         0.00962         1.71%           AT3-098         Code         C	5 2.43	-1.36	6.23	1.04	7.9	1.37	3.06	125.62%	-201.49
Name	erylene Summary								
Name	Code Count Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
Name	RS 5 0.259	0.253	0.265	0.255	0.267				0.00%
Sample         Code         Count         Mean         95% LCL         95% UCL         Min         Max         Std Err         Std Dev         CV%           IOSN 2019         RS         5         0.371         0.362         0.379         0.365         0.382         0.00305         0.00681         1.84%           AT3-098         5         6.45         -10.1         23         0.481         30.3         5.96         13.3         206.62%           Chrysene Summary           Sample         Code         Count         Mean         95% LCL         95% UCL         Min         Max         Std Err         Std Dev         CV%           IOSN 2019         RS         5         0.564         0.552         0.576         0.555         0.58         0.0043         0.00962         1.71%           AT3-098         5         1.14         0.469         1.81         0.735         1.82         0.241         0.539         47.35%           Dibenz(a,h)anthracere Summary           Sample         Code         Count         Mean         95% LCL         95% UCL         Min         Max         Std Err         Std Dev         CV%           IOSN 2019         RS<									-64.58%
Sample         Code         Count         Mean         95% LCL         95% UCL         Min         Max         Std Err         Std Dev         CV%           IOSN 2019         RS         5         0.371         0.362         0.379         0.365         0.382         0.00305         0.00681         1.84%           AT3-098         5         6.45         -10.1         23         0.481         30.3         5.96         13.3         206.62%           Chrysene Summary           Sample         Code         Count         Mean         95% LCL         95% UCL         Min         Max         Std Err         Std Dev         CV%           IOSN 2019         RS         5         0.564         0.552         0.576         0.555         0.58         0.0043         0.00962         1.71%           AT3-098         5         1.14         0.469         1.81         0.735         1.82         0.241         0.539         47.35%           Dibenz(a,h)anthracere Summary           Sample         Code         Count         Mean         95% LCL         95% UCL         Min         Max         Std Err         Std Dev         CV%           IOSN 2019         RS<	anthene Summary								
IOSN 2019	•	05% I CI	95% HCI	Min	May	Std Err	Std Dov	CV9/.	%Effec
AT3-098         5         6.45         -10.1         23         0.481         30.3         5.96         13.3         206.62%           Chrysene Summary:           Sample         Code         Count         Mean         95% LCL         95% UCL         Min         Max         Std Err         Std Dev         CV%           IOSN 2019         RS         5         0.564         0.552         0.576         0.555         0.58         0.0043         0.00962         1.71%           AT3-098         5         1.14         0.469         1.81         0.735         1.82         0.241         0.539         47.35%           Dibenz(a,h)anthracene Summary:           Sample         Code         Count         Mean         95% LCL         95% UCL         Min         Max         Std Err         Std Dev         CV%           IOSN 2019         RS         5         0.396         0.387         0.406         0.39         0.409         0.00352         0.00786         1.98%           Fluoranthene Summary           Sample         Code         Count         Mean         95% LCL         95% UCL         Min         Max         Std Err         Std Dev									
Chrysene Summary   Sample   Code   Count   Mean   95% LCL   95% UCL   Min   Max   Std Err   Std Dev   CV%									0.00%
Sample         Code         Count         Mean         95% LCL         95% UCL         Min         Max         Std Err         Std Dev         CV%           IOSN 2019         RS         5         0.564         0.552         0.576         0.555         0.58         0.0043         0.00962         1.71%           AT3-098         5         1.14         0.469         1.81         0.735         1.82         0.241         0.539         47.35%           Dibenz(a,h)anthracene Summary           Sample         Code         Count         Mean         95% LCL         95% UCL         Min         Max         Std Err         Std Dev         CV%           IOSN 2019         RS         5         0.3         0.294         0.307         0.296         0.31         0.00243         0.00542         1.81%           AT3-098         5         0.396         0.387         0.406         0.39         0.409         0.00352         0.00786         1.98%           Fluoranthene Summary           Sample         Code         Count         Mean         95% LCL         95% UCL         Min         Max         Std Err         Std Dev         CV%           IOSN 2019	5 6.45	-10.1	23	0.481	30.3	5.96	13.3	206.62%	-1641.0
IOSN 2019   RS   5   0.564   0.552   0.576   0.555   0.58   0.0043   0.00962   1.71%	nmary								
AT3-098         5         1.14         0.469         1.81         0.735         1.82         0.241         0.539         47.35%           Dibenz(a,h)anthracene Summary           Sample         Code         Count         Mean         95% LCL         95% UCL         Min         Max         Std Err         Std Dev         CV%           IOSN 2019         RS         5         0.3         0.294         0.307         0.296         0.31         0.00243         0.00542         1.81%           AT3-098         5         0.396         0.387         0.406         0.39         0.409         0.00352         0.00786         1.98%           Fluoranthene Summary           Sample         Code         Count         Mean         95% LCL         95% UCL         Min         Max         Std Err         Std Dev         CV%           IOSN 2019         RS         5         0.569         0.263         0.875         0.451         1.01         0.11         0.247         43.35%	Code Count Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effec
Dibenz(a,h)anthracene Summary      Sample         Code         Count         Mean         95% LCL         95% UCL         Min         Max         Std Err         Std Dev         CV%           IOSN 2019         RS         5         0.3         0.294         0.307         0.296         0.31         0.00243         0.00542         1.81%           AT3-098         5         0.396         0.387         0.406         0.39         0.409         0.00352         0.00786         1.98%           Fluoranthene Summary           Sample         Code         Count         Mean         95% LCL         95% UCL         Min         Max         Std Err         Std Dev         CV%           IOSN 2019         RS         5         0.569         0.263         0.875         0.451         1.01         0.11         0.247         43.35%	RS 5 0.564	0.552	0.576	0.555	0.58	0.0043	0.00962	1.71%	0.00%
Sample         Code         Count         Mean         95% LCL         95% UCL         Min         Max         Std Err         Std Dev         CV%           IOSN 2019         RS         5         0.3         0.294         0.307         0.296         0.31         0.00243         0.00542         1.81%           AT3-098         5         0.396         0.387         0.406         0.39         0.409         0.00352         0.00786         1.98%           Fluoranthene Summary           Sample         Code         Count         Mean         95% LCL         95% UCL         Min         Max         Std Err         Std Dev         CV%           IOSN 2019         RS         5         0.569         0.263         0.875         0.451         1.01         0.11         0.247         43.35%	5 1.14	0.469	1.81	0.735	1.82	0.241	0.539	47.35%	-101.95
IOSN 2019         RS         5         0.3         0.294         0.307         0.296         0.31         0.00243         0.00542         1.81%           AT3-098         5         0.396         0.387         0.406         0.39         0.409         0.00352         0.00786         1.98%           Fluoranthene Summary           Sample         Code         Count         Mean         95% LCL         95% UCL         Min         Max         Std Err         Std Dev         CV%           IOSN 2019         RS         5         0.569         0.263         0.875         0.451         1.01         0.11         0.247         43.35%	thracene Summary								
AT3-098 5 0.396 0.387 0.406 0.39 0.409 0.00352 0.00786 1.98%  Fluoranthene Summary  Sample Code Count Mean 95% LCL 95% UCL Min Max Std Err Std Dev CV%  IOSN 2019 RS 5 0.569 0.263 0.875 0.451 1.01 0.11 0.247 43.35%	Code Count Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effec
Fluoranthene Summary           Sample         Code         Count         Mean         95% LCL         95% UCL         Min         Max         Std Err         Std Dev         CV%           IOSN 2019         RS         5         0.569         0.263         0.875         0.451         1.01         0.11         0.247         43.35%	RS 5 0.3	0.294	0.307	0.296	0.31	0.00243	0.00542	1.81%	0.00%
Sample         Code         Count         Mean         95% LCL         95% UCL         Min         Max         Std Err         Std Dev         CV%           IOSN 2019         RS         5         0.569         0.263         0.875         0.451         1.01         0.11         0.247         43.35%	5 0.396	0.387	0.406	0.39	0.409	0.00352	0.00786	1.98%	-31.96%
IOSN 2019 RS 5 0.569 0.263 0.875 0.451 1.01 0.11 0.247 43.35%	Summary								
	Code Count Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effec
	RS 5 0.569	0.263	0.875	0.451	1.01	0.11	0.247	43.35%	0.00%
AT3-098 5 6.71 2.6 10.8 2.77 10.7 1.48 3.32 49.40%	5 6.71	2.6	10.8	2.77	10.7	1.48	3.32	49.40%	-1079.9

## **CETIS Summary Report**

Report Date: Test Code/ID: 19 Aug-23 06:56 (p 3 of 5) TN-23-302NvPAH / 17-1765-7444

**Bioaccumulation Evaluation - PAHs - Nereis** 

Fluorene Sumr	nary										
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
IOSN 2019	RS	5	0.431	0.114	0.748	0.255	0.832	0.114	0.256	59.32%	0.00%
AT3-098		5	2.05	0.725	3.37	1.13	3.78	0.477	1.07	52.04%	-375.75%
Indeno(1,2,3-co	d)pyrene Sum	nmary									
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
IOSN 2019	RS	5	0.608	0.595	0.621	0.6	0.625	0.00464	0.0104	1.71%	0.00%
AT3-098		5	0.802	0.781	0.823	0.79	0.83	0.00752	0.0168	2.10%	-31.91%
Naphthalene S	ummary										
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
IOSN 2019	RS	5	0.651	0.185	1.12	0.394	1.24	0.168	0.375	57.59%	0.00%
AT3-098		5	1.6	0.65	2.54	0.52	2.32	0.341	0.762	47.75%	-145.31%
Phenanthrene	Summary										
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
IOSN 2019	RS	5	2.04	1.2	2.89	1.23	3.1	0.305	0.683	33.41%	0.00%
AT3-098		5	0.861	0.334	1.39	0.66	1.62	0.19	0.424	49.30%	57.88%
Pyrene Summa	ıry										
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
IOSN 2019	RS	5	0.674	0.659	0.689	0.665	0.695	0.00557	0.0124	1.85%	0.00%
AT3-098		5	6.23	3.99	8.46	3.92	8.04	0.805	1.8	28.92%	-824.04%

005-341-210-5

Report Date: Test Code/ID: 19 Aug-23 06:56 (p 4 of 5) TN-23-302NvPAH / 17-1765-7444

#### Bioaccumulation Evaluation - PAHs - Nereis

Acenaphthene I	Detail						MD5: 28B59F3CDBB3583514093D0F338B80B5
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
IOSN 2019	RS	0.462	0.458	0.46	0.954	0.479	
AT3-098		0.62	1.31	0.61	1.24	0.635	
Acenaphthylene	e Detail						MD5: 299524FB48C3129698F11873019E882B
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
IOSN 2019	RS	0.284	0.282	0.283	0.287	0.294	
AT3-098		0.38	0.371	0.374	12.2	7.79	
Anthracene Det	ail						MD5: A34DB90A0D84147410AFDC111A084513
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
IOSN 2019	RS	0.308	0.306	0.307	0.311	0.319	
AT3-098		0.412	0.845	0.965	0.404	0.422	
Benzo(a)anthra	cene Detail						MD5: F21062880BC25FB0106842311D450EF9
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
IOSN 2019	RS	0.575	0.57	0.575	0.585	0.6	
AT3-098		0.77	0.755	0.76	0.755	0.79	
Benzo(a)pyrene	Detail						MD5: 3E33BFA4FFA8A2EA09CE125D593F1F9E
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
IOSN 2019	RS	0.605	0.6	0.605	0.61	0.63	
AT3-098		0.81	0.79	8.0	0.795	0.83	
Benzo(b)fluora	nthene Detai	 I					MD5: B9DBFEDE27A858016CB5293AEE0B8C7
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
IOSN 2019	RS	0.8	0.795	0.8	0.81	0.83	
AT3-098		1.07	1.04	7.9	1.05	1.1	
Benzo(g,h,i)per	vlene Detail						MD5: 97E05B58C7062EF6512E109593DA9630
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
IOSN 2019	RS	0.257	0.255	0.257	0.26	0.267	
AT3-098		0.344	0.336	0.339	0.338	0.776	
Benzo(k)fluorar	nthene Detail	l					MD5: 5AC16B10241B3E60E75B2811EC01D1A9
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
IOSN 2019	RS	0.368	0.365	0.366	0.371	0.382	
AT3-098		0.492	0.481	30.3	0.483	0.505	
Chrysene Detai	I						MD5: 1E6F3DE2491E3F1E8BB58E2E184DE3BE
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
IOSN 2019	RS	0.56	0.555	0.56	0.565	0.58	
AT3-098		1.82	1.63	0.74	0.735	0.77	
Dibenz(a,h)anth	racene Deta	il					MD5: 98BDEA55C64E5C7EF57253E78848B905
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
IOSN 2019	RS	0.299	0.296	0.297	0.301	0.31	
AT3-098		0.399	0.39	0.393	0.391	0.409	
Fluoranthene D	etail						MD5: B46293A567C77CBA338763CB86CD1614
	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
Sample		1.01	0.451	0.453	0.459	0.472	
Sample IOSN 2019	RS	1.01	0				

#### **CETIS Summary Report**

Report Date: Test Code/ID: 19 Aug-23 06:56 (p 5 of 5) TN-23-302NvPAH / 17-1765-7444

**Bioaccumulation Evaluation - PAHs - Nereis** 

Fluorene Detail							MD5: 3FA5D56A13943E3E44387FC58EED93C8
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
IOSN 2019	RS	0.257	0.255	0.543	0.832	0.267	
AT3-098		1.73	1.31	1.13	3.78	2.3	
Indeno(1,2,3-cd)	pyrene Deta	ail					MD5: 4B1EBBEADD85F99B8C5A7EE9812EE16
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
IOSN 2019	RS	0.605	0.6	0.6	0.61	0.625	
AT3-098		0.805	0.79	0.795	0.79	0.83	
Naphthalene De	tail						MD5: CD3D20716F571D79A1152AFA9AD5B270
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
IOSN 2019	RS	0.812	0.394	0.396	1.24	0.412	
AT3-098		1.65	2.32	2.29	0.52	1.2	
Phenanthrene D	etail						MD5: C87FB68D06FB6E8BD23935F2E5F05A70
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
IOSN 2019	RS	2.12	1.76	2.01	3.1	1.23	
AT3-098		0.675	0.66	1.62	0.66	0.69	
Pyrene Detail							MD5: 1B7ED20057A7949857964C82BD3C8A93
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
IOSN 2019	RS	0.67	0.665	0.665	0.675	0.695	
AT3-098		8.04	6.62	7.73	4.83	3.92	

STUDY: TN-23-302

CLIENT: Eco-Analysts, Inc.

PROJECT: Yachtsman Marina, Kennebunkport, ME NAE-2004-00319

ASSAY: *N. virens* 28-day Bioaccumulation Evaluation TASK: Statistical Analysis of Body Burden PAHs

Endpoint	Method	С	<	Т	Statistic	Critical	P Level	Alpha	Reject Null	MSD	DF	Ties	P-Type
Acenaphthene	Equal Variance t Two-Sample Test	IOSN	<	Comp	1.703979	1.859548	0.06339341	0.05	FALSE	0.3495425	8		С
Acenaphthylene	Unequal Variance t Two-Sample Test	IOSN	<	Comp	1.602066	2.131847	0.09219988	0.05	FALSE	5.238909	4		С
Anthracene	Unequal Variance t Two-Sample Test	IOSN	<	Comp	2.44968	2.131847	0.03523478	0.05	TRUE	0.2604674	4		С
Benzo(a)anthracene	Equal Variance t Two-Sample Test	IOSN	<	Comp	21.80244	1.859548	0	0.05	TRUE	0.0157788	8		С
Benzo(a)pyrene	Equal Variance t Two-Sample Test	IOSN	<	Comp	22.15053	1.859548	0	0.05	TRUE	0.01637034	8		С
Benzo(b)fluoranthene	Wilcoxon Rank Sum Two-Sample Test	IOSN	<	Comp	15		0.003968254	0.05	TRUE		8	0	E
Benzo(b)fluoranthene	Equal Variance t Two-Sample Test	IOSN	<	Comp	19.86739	1.894579	0	0.05	TRUE	0.0247224	7		С
Benzo(g,h,i)perylene	Equal Variance t Two-Sample Test	IOSN	<	Comp	28.51986	1.894579	0	0.05	TRUE	0.005317733	7		С
Benzo(g,h,i)perylene	Wilcoxon Rank Sum Two-Sample Test	IOSN	<	Comp	15		0.003968254	0.05	TRUE		8	0	E
Benzo(k)fluoranthene	Equal Variance t Two-Sample Test	IOSN	<	Comp	20.22445	1.894579	0	0.05	TRUE	0.01120853	7		С
Benzo(k)fluoranthene	Wilcoxon Rank Sum Two-Sample Test	IOSN	<	Comp	15		0.003968254	0.05	TRUE		8	0	E
Chrysene	Unequal Variance t Two-Sample Test	IOSN	<	Comp	2.383667	2.131847	0.03784344	0.05	TRUE	0.5142547	4		С
Dibenz(a,h)anthracene	Equal Variance t Two-Sample Test	IOSN	<	Comp	22.47496	1.859548	0	0.05	TRUE	0.007942909	8		С
Fluoranthene	Unequal Variance t Two-Sample Test	IOSN	<	Comp	4.131057	2.131847	0.007240722	0.05	TRUE	3.171149	4		С
Fluorene	Equal Variance t Two-Sample Test	IOSN	<	Comp	3.300467	1.859548	0.005425649	0.05	TRUE	0.9122329	8		С
Fluorene	Equal Variance t Two-Sample Test	IOSN	<	Comp	4.52013	1.894579	0.001365866	0.05	TRUE	0.4973545	7		С
Indeno(1,2,3-cd)pyrene	Equal Variance t Two-Sample Test	IOSN	<	Comp	21.96619	1.859548	0	0.05	TRUE	0.01642307	8		С
Naphthalene	Equal Variance t Two-Sample Test	IOSN	<	Comp	2.489245	1.859548	0.01878322	0.05	TRUE	0.7062451	8		С
Phenanthrene	Equal Variance t Two-Sample Test	IOSN	<	Comp	-3.289896	1.859548	0.9944881	0.05	FALSE	0.6686671	8		С
Pyrene	Unequal Variance t Two-Sample Test	IOSN	<	Comp	6.895549	2.131847	0.00115953	0.05	TRUE	1.71709	4		С

AT3-098

0.62

1.31

0.61

**Report Date:** 19 Aug-23 06:56 (p 1 of 16) **Test Code/ID:** TN-23-302NvPAH / 17-1765-7444

Bioaccumula	ion	Evaluation - F	PAHs ·	- Nei	reis									EA-ES	T, Inc. PBC
Analysis ID: Analyzed: Edit Date:	19 /	6281-0431 Aug-23 6:55 May-23 22:50	4	Anal	ysis:	Para	naphthene metric-Two 33CF8084E	o Sample 3FBF14A40	43A9C96	3E506		S Versio is Level: or ID:		2.1.1	
Batch ID: Start Date: Ending Date: Test Length:	08 N 05 A		! :	Prot	ocol: cies:	US A Nere	ccumulatio ACE NED F els virens chaeta				Analy Dilue Brine Sour	ent: N e: C	ancy Roka ot Applicable rystal Sea RO - Aquatic	Research C	or <b>Age:</b>
Sample Code		Sample ID	,	Sam	ple Date	9	Receipt	Date	Sample <i>A</i>	Age	Clien	t Name	P	roject	
IOSN 2019 AT3-098		13-4648-81 07-1559-49	70 (	08 M	ar-23 eb-23 13		08 Mar-	23	12h 27d 23h			Analysts,		redged Sed	iment Evalu
Sample Code		Material Ty	ре		;	Sam	ple Source	9	S	tation	Location	on	Lat/Long	]	
IOSN 2019		Reference s	sedime	ent	,	Yach	ntsman Ma	rina NAE-20	04-00 10	OSN Re	eferenc	е			
AT3-098		Marine Sedi	iment		,	Yach	ntsman Ma	rina NAE-20	04-00 1	0 Statio	ons at 4	l Marinas	Mu		
Data Transfor	m		Alt Hy	ур					Compa	rison R	Result				PMSD
Untransformed	i		C < T						AT3-098	3 passe	ed acen	aphthene	endpoint		62.12%
Equal Variand	ce t 1	Γwo-Sample ∃ Sample II	Test	df	Test S	tat	Critical	MSD	P-Type	P-\	/alue	Decisio	on(α:5%)		
Reference Sec		AT3-098		8	1.7		1.86	0.35	CDF		634		gnificant Effec	ot .	
Auxiliary Test Attribute Outlier	s	Test Grubbs Ext	treme '	Valu	e Test			Test Stat	Critical		<b>/alue</b>		on(α:5%) liers Detected	I	
ANOVA Table															
Source Between Error Total		Sum Squar 0.25648 0.706668 0.963148	es		Mean \$	8	are	<b>DF</b> 1 8	<b>F Stat</b> 2.9		<b>/alue</b> 268		on(α:5%) gnificant Effec	ct	
ANOVA Assur	mpti	Test						Test Stat	Critical	P-V	/alue	Decisio	on(α:1%)		
Variance Distribution		Variance Ra Shapiro-Wil			ality Tes	t		2.69 0.794	23.2 0.741		616 124	•	/ariances Distribution		
Acenaphthen	e Su	mmary													
Sample		Code	Count	t	Mean		95% LCL	95% UCL	Median	Mir	1	Max	Std Err	CV%	%Effect
IOSN 2019 AT3-098			5 5		0.563 0.883		0.291 0.437	0.835 1.33	0.462 0.635	0.4 0.6		0.954 1.31	0.0979 0.16	38.90% 40.64%	0.00% -56.92%
Acenaphthen	e De	tail													
Sample			Rep 1		Rep 2		Rep 3	Rep 4	Rep 5						
IOSN 2019			0.462		0.458		0.46	0.954	0.48						
A TO 000			0 00												

1.24

0.635

AT3-098

0.38

0.371

0.374

Report Date: 19 Aug-23 06:56 (p 2 of 16)
Test Code/ID: TN-23-302NvPAH / 17-1765-7444

Bioaccumula	tion	Evaluation - P	AHs -	Nei	reis									EA-EST	, Inc. PBC
Analysis ID: Analyzed: Edit Date:	19	1846-2388 Aug-23 6:55 May-23 22:50	A	۱nal	ysis:	Para	naphthylene ametric-Two 0152BD86 <i>l</i>		F1257F4	FC61E	Statu	S Version s Level: or ID:	n: CETISv2 1	2.1.1	
Batch ID: Start Date: Ending Date: Test Length:	08 05		F	Prot	ocol: cies:	US / Nere	ccumulatio ACE NED Feis virens chaeta				Analy Dilue Brine Sour	ent: No e: Cr	ancy Roka ot Applicable rystal Sea RO - Aquatic I	Research O	r <b>Age:</b>
Sample Code	)	Sample ID		Sam	ple Dat	e	Receipt	Date	Sample /	Age	Clien	t Name	Pı	roject	
IOSN 2019 AT3-098		13-4648-817 07-1559-497			ar-23 eb-23 1	3:00	08 Mar- 09 Feb-	23	12h 27d 23h		Eco-A	Analysts, l	Inc. Di	redged Sedi	ment Evalu
Sample Code	,	Material Typ	ре			Sam	ple Source	e	5	Station	Location	on	Lat/Long		
IOSN 2019		Reference se	edime	nt				rina NAE-20		OSN Re					
AT3-098		Marine Sedir	ment			Yacl	ntsman Ma	rina NAE-20	04-00 1	0 Statio	ons at 4	Marinas	Mu		
Data Transfor	rm	A	Alt Hy	γp					Compa	rison R	esult				PMSD
Untransformed	t	(	C < T						AT3-09	8 passe	d acen	aphthylen	e endpoint		1832.43%
Unequal Varia	ance	t Two-Sample	e Test												
Sample I	vs	Sample II		df	Test S	tat	Critical	MSD	P-Type	P-V	/alue	Decisio	n(α:5%)		
Reference Sec	d	AT3-098		4	1.6		2.13	5.24	CDF	0.0	922	Non-Sig	nificant Effect	t	
Auxiliary Test	ts	Test						Test Stat	Critical	P-V	/alue	Decisio	n(α:5%)		
Outlier		Grubbs Extr	reme \	/alu	e Test			2.18	2.29		992		ers Detected		
ANOVA Table	,														
Source		Sum Square	es		Mean	Sau	are	DF	F Stat	P-V	/alue	Decisio	n(α:5%)		
Between		38.7499			38.749		-	1	2.57	0.1	478		nificant Effect	t	
Error		120.781			15.097	77		8	_						
Total		159.531						9							
ANOVA Assu	mpti	ons Tests													
Attribute		Test						Test Stat	Critical	P-V	/alue	Decisio	n(α:1%)		
Variance Distribution		Variance Ra			ality Tes	st		1140000 0.837	23.2 0.741	<1. 0.0	0E-05 402	•	l Variances Distribution		
Acenaphthyle	ne S	Summary			-					-	-	·			
Sample		Code (	Count		Mean		95% LCL	95% UCL	Median	Mir	1	Max	Std Err	CV%	%Effect
IOSN 2019		RS 5	5		0.286		0.28	0.292	0.284	0.2	82	0.295	0.0023	1.80%	0.00%
AT3-098		5	5		4.22		-2.6	11	0.38	0.3	71	12.2	2.46	130.12%	-1377.05%
Acenaphthyle	ne I	Detail													
Sample		Code F	Rep 1		Rep 2		Rep 3	Rep 4	Rep 5						
IOSN 2019		RS (	).284		0.282		0.283	0.287	0.295				<u> </u>		
A TO 000		_			~ ~- 4			400							

12.2

7.79

Report Date: Test Code/ID:

19 Aug-23 06:56 (p 3 of 16) TN-23-302NvPAH / 17-1765-7444

Bioaccumulation	on Evaluation -	- PAHs - N	Vereis							EA-ES	T, Inc. PBC
Analyzed:	14-8405-4060 19 Aug-23 6:55 08 May-23 22:50	Ar	nalysis:	Anthracene Parametric-Two 0EE18B918309		F3897FAFF	Stat	IS Versior us Level: or ID:	n: CETISv2	2.1.1	
	•	Pr Sp	est Type: rotocol: pecies: exon:	Bioaccumulation US ACE NED F Nereis virens Polychaeta			Dilu Brir	ent: No ne: Cr	ancy Roka ot Applicable ystal Sea RO - Aquatic	Research C	or <b>Age:</b>
Sample Code IOSN 2019 AT3-098	Sample IE 13-4648-8 07-1559-4	170 08	mple Dat Mar-23 Feb-23 1	08 Mar-		<b>Sample A</b> ç 12h 27d 23h		<b>nt Name</b> -Analysts, I		roject redged Sed	iment Evalu
Sample Code IOSN 2019 AT3-098	Material T Reference Marine Se	sediment	t	Sample Sourc Yachtsman Ma Yachtsman Ma	rina NAE-20	004-00 IO	ation Locat SN Referen Stations at	ce	<b>Lat/Long</b> Mu		
Data Transform	1	Alt Hyp	ı			Compari	son Result				PMSD
Untransformed		C < T				AT3-098	failed anthra	acene endp	oint		83.97%
Unequal Variar	s Sample II	(		Stat Critical	MSD	P-Type	P-Value	Decision	• •		
Reference Sed	AT3-098*		1 2.45	2.13	0.26	CDF	0.0352	Significa	nt Effect		
Auxiliary Tests Attribute	Test					Critical	P-Value	Decision			
Outlier	Grubbs E	xtreme Va	alue l'est		1.95	2.29	0.2857	No Outli	ers Detected		
ANOVA Table Source Between Error	Sum Squa 0.223951 0.298555	ares	Mean 0.2239 0.0373		<b>DF</b> 1 8	<b>F Stat</b>	<b>P-Value</b> 0.0400	<b>Decisio</b> Significa	n(α:5%) nt Effect		
Total	0.522507				9	_					
ANOVA Assum											
Variance Distribution	Test Variance F Shapiro-W			st	2400 0.862	23.2 0.741	<b>P-Value</b> <1.0E-05 0.0810	•	n(α:1%) Variances Distribution		
Anthracene Su	mmary										
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
IOSN 2019 AT3-098	RS	5 5	0.31 0.61	0.303 0.27	0.317 0.949	0.308 0.422	0.306 0.404	0.32 0.965	0.00249 0.122	1.80% 44.81%	0.00% -96.49%
Anthracene De	tail										
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
IOSN 2019 AT3-098	RS	0.308 0.412	0.306 0.845	0.307 0.965	0.311 0.404	0.32 0.422					

Report Date: 19 Aug-23 06:56 (p 4 of 16)
Test Code/ID: TN-23-302NvPAH / 17-1765-7444

Bioaccumulat	tion Evaluatio	n - PAHs -	Nereis							EA-ES	T, Inc. PBC
Analysis ID: Analyzed: Edit Date:	02-1204-0422 19 Aug-23 6:5 08 May-23 22	5 <b>A</b>	nalysis:		thracene Two Sample BBDF8F36ED70	09B3AD119	Stat	IS Versionus Level: or ID:	n: CETISv2 1	2.1.1	
Batch ID:	16-7806-7369	T	est Type:	Bioaccumul	ation - PAHs		Ana	lyst: Na	ancy Roka		
Start Date:	08 Mar-23 11:	32 <b>P</b>	rotocol:	US ACE NE	ED RIM (2004)		Dilu	ent: No	ot Applicable		
Ending Date:	05 Apr-23 10:3	32 <b>S</b>	pecies:	Nereis virer	ıs		Brin	e: Cr	ystal Sea		
Test Length:	27d 23h	Ta	axon:	Polychaeta			Sou	rce: Af	RO - Aquatic	Research (	Or <b>Age:</b>
Sample Code	Sample	ID S	ample Da	te Rec	eipt Date	Sample A	ge Clie	nt Name	P	roject	
IOSN 2019	13-4648	-8170 08	8 Mar-23	N 80	//ar-23	12h	Eco-	Analysts,	Inc. D	redged Sed	diment Evalu
AT3-098	07-1559	-4974 08	8 Feb-23 1	3:00 09 F	eb-23 16:30	27d 23h					
Sample Code	Materia	Туре		Sample So	urce	St	ation Locat	ion	Lat/Long		
IOSN 2019	Referen	ce sedimen	t	Yachtsman	Marina NAE-20	004-00 IO	SN Referen	ce			
AT3-098	Marine S	Sediment		Yachtsman	Marina NAE-20	004-00 10	Stations at	4 Marinas	Mu		
Data Transfor	m	Alt Hy	)			Compari	son Result				PMSD
Untransformed	d	C < T				AT3-098	failed benzo	(a)anthrac	ene endpoint		2.72%
Equal Variand	ce t Two-Samp	le Test									
	vs Sample l		df Test S	Stat Critica	al MSD	P-Type	P-Value	Decisio	n(α:5%)		
Reference Sec	•		8 21.8	1.86	0.0158	CDF	<1.0E-05	Significa	ant Effect		
Auxiliary Test	is										
Attribute	Test				Test Stat	Critical	P-Value	Decisio	n(α:5%)		
Outlier	Grubbs	Extreme V	alue Test		1.9	2.29	0.3527	No Outli	ers Detected		
ANOVA Table	ı										
Source	Sum Sq	uares	Mean	Square	DF	F Stat	P-Value	Decisio	n(α:5%)		
Between	0.08556	25	0.085	5625	1	475	<1.0E-05	Significa	ant Effect		
Error	0.00144		0.000	18	8	_					
Total	0.08700	25			9						
ANOVA Assur	mptions Tests										
Attribute	Test				Test Stat	Critical	P-Value	Decisio	n(α:1%)		
Variance	Variance	Ratio F Te	est		1.53	23.2	0.6920	Equal V	ariances		
Distribution	Shapiro-	Wilk W No	rmality Te	st	0.821	0.741	0.0264	Normal	Distribution		
Benzo(a)anth	racene Summ	ary									
Sample	Code	Count	Mean	95% L	CL 95% UCL	Median	Min	Max	Std Err	CV%	%Effect
IOSN 2019	RS	5	0.581	0.566	0.596	0.575	0.57	0.6	0.00534	2.05%	0.00%
AT3-098		5	0.766	0.748	0.784	0.76	0.755	0.79	0.0066	1.93%	-31.84%
Benzo(a)anth	racene Detail										
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
IOSN 2019	RS	0.575	0.57	0.575	0.585	0.6					
AT3-098		0.77	0.755	0.76	0.755	0.79					
			300	J U	••						

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Test Code/ID: TN-23-302NvPAH / 17-1765-7444

								Test Co	ue/ID.	111 20 00		17-1765-7444
Bioaccumulation	on Evaluatio	n - PAHs	- Nere	eis							EA-ES	ST, Inc. PBC
Analyzed:	10-8756-9954 19 Aug-23 6:5 08 May-23 22:	5	Analy	/sis:		rene Two Sample B1562C92F30	CA08067BE	Statu	S Versionus Level: or ID:		/2.1.1	
	•	32 32	Test Test Test Test Test Test Test Test	ocol:   ies:		ation - PAHs ED RIM (2004) s		Anal Dilue Brine Sour	ent: No e: Ci	ancy Roka ot Applicable rystal Sea RO - Aquatic		Or <b>Age:</b>
Sample Code	Sample	ID	Samp	ole Date	Rec	eipt Date	Sample Ag	ge Clier	nt Name	F	Project	
IOSN 2019 AT3-098	13-4648 07-1559		08 Ma 08 Fe	ar-23 eb-23 13		Mar-23 eb-23 16:30	12h 27d 23h	Eco-	Analysts,	Inc. [	Oredged Se	diment Evalu
Sample Code	Material	Type			Sample So	urce	St	ation Locati	on	Lat/Lon	g	
IOSN 2019		ce sedime	ent	,	Yachtsman	Marina NAE-2	004-00 IO	SN Reference	<del></del>			
AT3-098	Marine S	Sediment	_	•	Yachtsman	Marina NAE-2	004-00 10	Stations at 4	1 Marinas	Mu		
Data Transforn	n	Alt H	ур				Compari	son Result				PMSD
Untransformed		C < T	•				AT3-098	failed benzo	(a)pyrene	endpoint		2.68%
Equal Variance	•		df	Test St	at Critica	ıl MSD	P-Type	P-Value	Decisio	on(α:5%)		
Reference Sed	AT3-098*	•	8	22.2	1.86	0.0164	CDF	<1.0E-05	Significa	ant Effect		
	Test	Extreme			1.86		Critical 2.29	<1.0E-05  P-Value  0.3427	Decisio	on(α:5%) iers Detected	d	
Reference Sed  Auxiliary Tests  Attribute	Test				1.86	Test Stat	Critical	P-Value	Decisio	on(α:5%)	d	
Auxiliary Tests Attribute Outlier	Test	Extreme	Value			Test Stat	Critical	P-Value	<b>Decisio</b> No Outli	on(α:5%)	d	
Auxiliary Tests Attribute Outlier ANOVA Table	Test Grubbs	Extreme uares 25	Value	e Test	<b>Square</b> 625	Test Stat	Critical 2.29	<b>P-Value</b> 0.3427	Decisio  No Outli  Decisio	on(α:5%) iers Detected	d	
Auxiliary Tests Attribute Outlier ANOVA Table Source Between Error	Sum Sq 0.09506 0.00155 0.09661	Extreme uares 25	Value	Mean \$	<b>Square</b> 625	Test Stat 1.91  DF 1 8	Critical 2.29	P-Value 0.3427 P-Value	Decisio  No Outli  Decisio	on(α:5%) iers Detected on(α:5%)	d	
Auxiliary Tests Attribute Outlier ANOVA Table Source Between Error Total	Sum Sq 0.09506 0.00155 0.09661	Extreme uares 25	Value	Mean \$	<b>Square</b> 625	Test Stat 1.91  DF 1 8 9	Critical 2.29	P-Value 0.3427 P-Value	Decisio No Outli  Decisio Significa	on(α:5%) iers Detected on(α:5%)	d	
Auxiliary Tests Attribute Outlier ANOVA Table Source Between Error Total ANOVA Assum	Sum Sq 0.09506 0.00155 0.09661	Extreme uares 25	Value	Mean \$	<b>Square</b> 625	Test Stat 1.91  DF 1 8 9	Critical 2.29  F Stat 491	P-Value 0.3427 P-Value <1.0E-05	Decisio No Outli Decisio Significa	on(α:5%) iers Detected on(α:5%) ant Effect	d	
Auxiliary Tests Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assum Attribute	Sum Sq 0.09506 0.00155 0.09661 nptions Tests Test Variance	Extreme uares 25	Value	Mean \$ 0.09500 0.00011	<b>Square</b> 625 938	Test Stat 1.91  DF 1 8 9	F Stat 491 Critical	P-Value 0.3427  P-Value <1.0E-05	Decisio  Decisio  Significa  Decisio  Equal V	on(α:5%) iers Detected on(α:5%) ant Effect on(α:1%)	d	
Auxiliary Tests Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assum Attribute Variance	Sum Sq 0.09506 0.00155 0.09661 nptions Tests Test Variance Shapiro-	Extreme  uares  25  25  Ratio F	Value	Mean \$ 0.09500 0.00011	<b>Square</b> 625 938	Test Stat 1.91  DF 1 8 9  Test Stat 1.82	F Stat 491 Critical 23.2	P-Value 0.3427  P-Value <1.0E-05  P-Value 0.5768	Decisio  Decisio  Significa  Decisio  Equal V	on(α:5%) iers Detected on(α:5%) ant Effect on(α:1%) 'ariances	d	
Auxiliary Tests Attribute Outlier ANOVA Table Source Between Error Total ANOVA Assum Attribute Variance Distribution	Sum Sq 0.09506 0.00155 0.09661 nptions Tests Test Variance Shapiro-	Extreme  uares  25  25  Ratio F	Value Test Jormal	Mean \$ 0.09500 0.00011	<b>Square</b> 625 938	Test Stat 1.91  DF 1 8 9  Test Stat 1.82 0.866	F Stat 491  Critical 23.2 0.741	P-Value 0.3427  P-Value <1.0E-05  P-Value 0.5768	Decisio  Decisio  Significa  Decisio  Equal V	on(α:5%) iers Detected on(α:5%) ant Effect on(α:1%) 'ariances	CV%	%Effect
Auxiliary Tests Attribute Outlier ANOVA Table Source Between Error Total ANOVA Assum Attribute Variance Distribution Benzo(a)pyrene	Sum Sq 0.09506 0.00155 0.09661 nptions Tests Test Variance Shapiro-	Extreme  uares  25  25  e Ratio F  Wilk W N	Value Test Jormal	Mean \$ 0.09500 0.00011	<b>Square</b> 625 938	Test Stat 1.91  DF 1 8 9  Test Stat 1.82 0.866	F Stat 491  Critical 23.2 0.741	P-Value 0.3427  P-Value <1.0E-05  P-Value 0.5768 0.0909	Decisio  No Outli  Decisio  Significa  Decisio  Equal V  Normal	on(α:5%) iers Detected on(α:5%) ant Effect on(α:1%) draiances Distribution	CV%	%Effect 0.00%
Auxiliary Tests Attribute Outlier ANOVA Table Source Between Error Total ANOVA Assum Attribute Variance Distribution Benzo(a)pyrene Sample	Sum Sq 0.09506 0.00155 0.09661 nptions Tests Test Variance Shapiro-	Extreme  uares  25  25  Ratio F  Wilk W N	Value Test	Mean \$ 0.09500 0.00011	Square 625 938	Test Stat 1.91  DF 1 8 9  Test Stat 1.82 0.866  CL 95% UCL	F Stat 491  Critical 23.2 0.741  Median	P-Value 0.3427  P-Value <1.0E-05  P-Value 0.5768 0.0909  Min	Decisio No Outli  Decisio Significa  Decisio Equal V Normal	on(α:5%) iers Detected on(α:5%) ant Effect on(α:1%) draiances Distribution Std Err	<b>CV%</b> 1.92%	
Auxiliary Tests Attribute Outlier ANOVA Table Source Between Error Total ANOVA Assum Attribute Variance Distribution Benzo(a)pyrene Sample IOSN 2019	Sum Sq 0.09506 0.00155 0.09661 nptions Tests Test Variance Shapiro- e Summary Code	Extreme  uares  25  25  Ratio F  Wilk W N  Count	Value Test	Mean \$ 0.09500 0.00011	<b>Square</b> 625 938 <b>95% L</b> 0.595	Test Stat 1.91  DF 1 8 9  Test Stat 1.82 0.866  CL 95% UCL 0.625	F Stat 491  Critical 23.2 0.741  Median 0.605	P-Value 0.3427  P-Value <1.0E-05  P-Value 0.5768 0.0909  Min 0.6	Decision No Outli Decision Significat  Decision Equal V Normal  Max 0.63	on(α:5%) iers Detected on(α:5%) ant Effect on(α:1%) cariances Distribution Std Err 0.00524	<b>CV%</b> 1.92%	0.00%
Auxiliary Tests Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assum Attribute Variance Distribution  Benzo(a)pyrene Sample IOSN 2019 AT3-098  Benzo(a)pyrene	Sum Sq 0.09506 0.00155 0.09661 nptions Tests Test Variance Shapiro- e Summary Code	Extreme  uares 25 25 25 Ratio F Wilk W N  Coun 5	Value Test lormal	Mean \$ 0.09500 0.000115  Mean 0.61 0.805	<b>Square</b> 625 938 <b>95% L</b> 0.595 0.785	Test Stat 1.91  DF 1 8 9  Test Stat 1.82 0.866  CL 95% UCL 0.625 0.825	F Stat 491  Critical 23.2 0.741  Median 0.605 0.8	P-Value 0.3427  P-Value <1.0E-05  P-Value 0.5768 0.0909  Min 0.6	Decision No Outli Decision Significat  Decision Equal V Normal  Max 0.63	on(α:5%) iers Detected on(α:5%) ant Effect on(α:1%) cariances Distribution Std Err 0.00524	<b>CV%</b> 1.92%	0.00%
Auxiliary Tests Attribute Outlier ANOVA Table Source Between Error Total  ANOVA Assum Attribute Variance Distribution  Benzo(a)pyrend Sample IOSN 2019 AT3-098	Sum Sq 0.09506 0.00155 0.09661  nptions Tests Variance Shapiro- e Summary Code RS	Extreme  uares  25  25  Ratio F  Wilk W N  Count	Value Test lormal	Mean \$ 0.09500 0.00011	<b>Square</b> 625 938 <b>95% L</b> 0.595	Test Stat 1.91  DF 1 8 9  Test Stat 1.82 0.866  CL 95% UCL 0.625	F Stat 491  Critical 23.2 0.741  Median 0.605	P-Value 0.3427  P-Value <1.0E-05  P-Value 0.5768 0.0909  Min 0.6	Decision No Outli Decision Significat  Decision Equal V Normal  Max 0.63	on(α:5%) iers Detected on(α:5%) ant Effect on(α:1%) cariances Distribution Std Err 0.00524	<b>CV%</b> 1.92%	0.00%

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									Test Co	de/ID:	11N-23-302	2NvPAH / 17	-1705-7444
Bioaccumula	tion E	Evaluation - F	PAHs - N	Nereis								EA-EST	, Inc. PBC
Analysis ID: Analyzed: Edit Date:	19 A	472-6594 aug-23 6:55 May-23 22:50	Ar	ndpoin nalysis D5 Has	: No	•	nthene -Two Sampl 40E1F9527		Statu	S Versior is Level: or ID:	n: CETISv2 1	2.1.1	
Batch ID: Start Date: Ending Date: Test Length:	08 N 05 A	•	Pr Sp	est Typ rotoco pecies ixon:	I: US : Ne	accumulation ACE NED lineis virens ychaeta			Analy Dilue Brine Sour	ent: No e: Cr	ancy Roka ot Applicable ystal Sea RO - Aquatic	Research Oi	· Age:
Sample Code	•	Sample ID	Sa	ample	Date	Receip	t Date	Sample Ag	e Clien	t Name	P	roject	
IOSN 2019 AT3-098		13-4648-817 07-1559-497		Mar-2 Feb-2	3 3 13:00	08 Mar 0 09 Feb		12h 27d 23h	Eco-/	Analysts, I	nc. D	redged Sedi	ment Evalı
Sample Code	)	Material Typ	pe		Sa	mple Sourc	e	Sta	tion Location	on	Lat/Long		
IOSN 2019		Reference s		t	Ya	chtsman Ma	ırina NAE-20	004-00 108	SN Referenc	е			
AT3-098		Marine Sedi	ment		Ya	chtsman Ma	rina NAE-20	004-00 10	Stations at 4	Marinas	Mu		
Data Transfo	rm	ı	Alt Hyp	)				Comparis	on Result				PMSD
Untransforme	d	(	C < T					AT3-098 f	ailed benzo(	b)fluorantl	hene endpoir	nt	314.95%
Wilcoxon Rai Sample I Reference See	vs	m Two-Samp Sample II AT3-098*	(		st Stat	Critical	Ties	P-Type Exact	<b>P-Value</b> 0.0040	Decision	n(α:5%) Int Effect		
Leicicies Se													
Auxiliary Tes													
Auxiliary Tes Attribute		Test					Test Stat	Critical	P-Value	Decision	n(α:5%)		
Auxiliary Tes					est						n(α:5%)		
Auxiliary Tes Attribute	ts	Test			est		Test Stat	Critical	P-Value	Decision	n(α:5%)		
Auxiliary Tes Attribute Outlier	ts	Test	reme Va	alue Te	est ean Sqi		Test Stat	Critical	P-Value	Decision	n(α:5%) Detected		
Auxiliary Tes Attribute Outlier ANOVA Table	ts	Test Grubbs Ext	reme Va	alue Te			Test Stat	Critical 2.29	<b>P-Value</b> 0.0004	Decision  Outlier D	n(α:5%) Detected	t	
Auxiliary Tes Attribute Outlier ANOVA Table Source Between Error	ts	Test Grubbs Ext Sum Squar 6.60969 37.3628	reme Va	Me 6.6	an Sqı		<b>Test Stat</b> 2.68 <b>DF</b> 1 8	Critical 2.29	P-Value 0.0004 P-Value	Decision  Outlier D	n(α:5%) Detected n(α:5%)	t	
Auxiliary Tes Attribute Outlier ANOVA Table Source Between	ts	Test Grubbs Ext Sum Squar 6.60969	reme Va	Me 6.6	ean Squ		<b>Test Stat</b> 2.68 <b>DF</b> 1	Critical 2.29	P-Value 0.0004 P-Value	Decision  Outlier D	n(α:5%) Detected n(α:5%)	t	
Auxiliary Tes Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assu	ts	Test Grubbs Ext  Sum Squar  6.60969 37.3628 43.9725  Dons Tests	reme Va	Me 6.6	ean Squ		Test Stat 2.68  DF 1 8 9	Critical 2.29  F Stat 1.42	P-Value 0.0004  P-Value 0.2683	Decision Outlier D Decision Non-Sign	n(α:5%) Detected n(α:5%) nificant Effec	t	
Auxiliary Tes Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assu Attribute	ts	Test Grubbs Ext  Sum Squar 6.60969 37.3628 43.9725 ons Tests Test	es	<b>Me</b> 6.6 4.6	ean Squ		Test Stat 2.68  DF 1 8 9  Test Stat	Critical 2.29  F Stat 1.42  Critical	P-Value 0.0004  P-Value 0.2683	Decision  Decision  Non-Sig	n(α:5%) Detected n(α:5%) nificant Effec n(α:1%)	t	
Auxiliary Tes Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assu Attribute Variance	ts	Test Grubbs Ext  Sum Squar 6.60969 37.3628 43.9725 ons Tests Test Variance Ra	es	Me 6.6 4.6	ean Squ 60969 67035		Test Stat 2.68  DF 1 8 9  Test Stat 47900	Critical 2.29  F Stat 1.42  Critical 23.2	P-Value 0.2683  P-Value 0.2683	Decision Non-Sign Decision Unequal	n(α:5%) Detected  n(α:5%) nificant Effec  n(α:1%) Variances		
Auxiliary Tes Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assu Attribute Variance Distribution	mptic	Test Grubbs Ext  Sum Square 6.60969 37.3628 43.9725  Dris Tests  Test  Variance Ra Shapiro-Will	es  atio F Te	Me 6.6 4.6	ean Squ 60969 67035		Test Stat 2.68  DF 1 8 9  Test Stat	Critical 2.29  F Stat 1.42  Critical	P-Value 0.0004  P-Value 0.2683	Decision Non-Sign Decision Unequal	n(α:5%) Detected n(α:5%) nificant Effec n(α:1%)		
Auxiliary Tes Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assu Attribute Variance Distribution  Benzo(b)fluor	mptic	Test Grubbs Ext  Sum Squar 6.60969 37.3628 43.9725 ons Tests Test Variance Ra Shapiro-Will	es atio F Te	Me 6.6 4.6	ean Squ 60969 67035	uare	Test Stat 2.68  DF 1 8 9  Test Stat 47900 0.63	Critical 2.29  F Stat 1.42  Critical 23.2 0.741	P-Value 0.0004  P-Value 0.2683  P-Value <1.0E-05 0.0001	Decision Non-Sign  Decision Unequal Non-Nor	n(α:5%) Detected  n(α:5%) nificant Effec  n(α:1%)  Variances mal Distribut	ion	
Auxiliary Tes Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assu Attribute Variance Distribution  Benzo(b)fluot Sample	mptic	Test Grubbs Ext  Sum Squar 6.60969 37.3628 43.9725 ons Tests Test Variance Ra Shapiro-Will ene Summar	es atio F Tek W Nor	Me Te Me Te	ean Squ 50969 57035 Test	uare	Test Stat 2.68  DF 1 8 9  Test Stat 47900 0.63	Critical 2.29  F Stat 1.42  Critical 23.2 0.741  Median	P-Value 0.0004  P-Value 0.2683  P-Value <1.0E-05 0.0001  Min	Decision Non-Sign Decision Unequal Non-Nor	n(α:5%) Detected  n(α:5%) nificant Effec  n(α:1%) Variances mal Distribut  Std Err	ion CV%	%Effect
Auxiliary Tes Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assu Attribute Variance Distribution  Benzo(b)fluor Sample IOSN 2019	mptic	Test Grubbs Ext  Sum Squar 6.60969 37.3628 43.9725  Dons Tests Test Variance Ra Shapiro-Will ene Summar Code RS	es  atio F Te k W Nor y Count	Me 6.6 4.6  Me 0.8	ean Squ 60969 67035 Test	95% LCL 0.79	Test Stat 2.68  DF 1 8 9  Test Stat 47900 0.63  95% UCL 0.824	Critical 2.29  F Stat 1.42  Critical 23.2 0.741  Median 0.8	P-Value 0.0004  P-Value 0.2683  P-Value <1.0E-05 0.0001  Min 0.795	Decision Non-Sig  Decision Unequal Non-Nor  Max 0.83	n(a:5%) Detected  n(a:5%) nificant Effect  n(a:1%) Variances mal Distribut  Std Err  0.00625	CV% 1.73%	0.00%
Auxiliary Tes Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assu Attribute Variance Distribution  Benzo(b)fluot Sample	mptic	Test Grubbs Ext  Sum Squar 6.60969 37.3628 43.9725  Dons Tests Test Variance Ra Shapiro-Will ene Summar Code RS	es atio F Tek W Nor	Me Te Me Te	ean Squ 60969 67035 Test	uare	Test Stat 2.68  DF 1 8 9  Test Stat 47900 0.63	Critical 2.29  F Stat 1.42  Critical 23.2 0.741  Median	P-Value 0.0004  P-Value 0.2683  P-Value <1.0E-05 0.0001  Min	Decision Non-Sign Decision Unequal Non-Nor	n(α:5%) Detected  n(α:5%) nificant Effec  n(α:1%) Variances mal Distribut  Std Err	ion CV%	0.00%
Auxiliary Tes Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assu Attribute Variance Distribution  Benzo(b)fluor Sample IOSN 2019	mptic	Test Grubbs Ext  Sum Squar 6.60969 37.3628 43.9725  Dons Tests  Test Variance Ra Shapiro-Will ene Summar Code RS	es  atio F Te k W Nor y Count	Me 6.6 4.6  Me 0.8	ean Squ 60969 67035 Test	95% LCL 0.79	Test Stat 2.68  DF 1 8 9  Test Stat 47900 0.63  95% UCL 0.824	Critical 2.29  F Stat 1.42  Critical 23.2 0.741  Median 0.8	P-Value 0.0004  P-Value 0.2683  P-Value <1.0E-05 0.0001  Min 0.795	Decision Non-Sig  Decision Unequal Non-Nor  Max 0.83	n(a:5%) Detected  n(a:5%) nificant Effect  n(a:1%) Variances mal Distribut  Std Err  0.00625	CV% 1.73%	
Auxiliary Tes Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assu Attribute Variance Distribution  Benzo(b)fluor Sample IOSN 2019 AT3-098	mptic	Test Grubbs Ext  Sum Squar 6.60969 37.3628 43.9725 ons Tests Test Variance Ra Shapiro-Will ene Summar Code RS	es  atio F Te k W Nor y Count	Me 6.6 4.6 4.6 Me mality Me 0.8 2.4	ean Squ 60969 67035 Test	95% LCL 0.79	Test Stat 2.68  DF 1 8 9  Test Stat 47900 0.63  95% UCL 0.824	Critical 2.29  F Stat 1.42  Critical 23.2 0.741  Median 0.8	P-Value 0.0004  P-Value 0.2683  P-Value <1.0E-05 0.0001  Min 0.795	Decision Non-Sig  Decision Unequal Non-Nor  Max 0.83	n(a:5%) Detected  n(a:5%) nificant Effect  n(a:1%) Variances mal Distribut  Std Err  0.00625	CV% 1.73%	0.00%
Auxiliary Tes Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assu Attribute Variance Distribution  Benzo(b)fluo Sample IOSN 2019 AT3-098  Benzo(b)fluo	mptic	Test Grubbs Ext  Sum Squar 6.60969 37.3628 43.9725 ons Tests Test Variance Ra Shapiro-Will ene Summar Code RS	es  atio F Te k W Nor  y  Count 5	Me 6.6 4.6 4.6 Me mality Me 0.8 2.4	ran Sqi 10969 17035 Test 1007 13	95% LCL 0.79 -1.36	Test Stat 2.68  DF 1 8 9  Test Stat 47900 0.63  95% UCL 0.824 6.23	Critical 2.29  F Stat 1.42  Critical 23.2 0.741  Median 0.8 1.07	P-Value 0.0004  P-Value 0.2683  P-Value <1.0E-05 0.0001  Min 0.795	Decision Non-Sig  Decision Unequal Non-Nor  Max 0.83	n(a:5%) Detected  n(a:5%) nificant Effect  n(a:1%) Variances mal Distribut  Std Err  0.00625	CV% 1.73%	0.00%

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Test Code/ID: TN-23-302NvPAH / 17-1765-7444

	,						Test C	ode/ID:	TN-23-302	2NvPAH / 1	7-1765-7444
Bioaccumula	tion Evaluation	- PAHs - Ne	ereis							EA-ES	T, Inc. PBC
Analysis ID: Analyzed: Edit Date:	13-4397-7733 19 Aug-23 6:55 08 May-23 22:5	Ana	lysis:	Benzo(g,h,i)pe Parametric-Tv 5FE12096E65	vo Sample	.02296512A	Sta	TIS Version tus Level: tor ID:	n: CETISv2 1	.1.1	
Batch ID: Start Date: Ending Date: Test Length:	16-7806-7369 08 Mar-23 11:3 05 Apr-23 10:3 27d 23h	2 <b>Pro</b> 2 <b>Spe</b>	t Type: tocol: ecies: on:	Bioaccumulati US ACE NED Nereis virens Polychaeta			Dilu Brir	ient: No ne: Cr	ancy Roka ot Applicable ystal Sea RO - Aquatic I	Research (	Or <b>Age:</b>
Sample Code	Sample I	D Sar	nple Dat	te Recei	pt Date	Sample Ag	je Clie	nt Name	Pr	oject	
IOSN 2019 AT3-098	13-4648-8 07-1559-4		Mar-23 Feb-23 1	08 Ma 3:00 09 Feb	r-23 b-23 16:30	12h 27d 23h	Eco	-Analysts, l	nc. Dr	redged Sec	diment Evalu
Sample Code	Material	Туре		Sample Sour	ce	St	ation Loca	ion	Lat/Long		
IOSN 2019 AT3-098	Reference Marine Se	e sediment ediment		Yachtsman M Yachtsman M			SN Referen Stations at		Mu		
Data Transfor	m	Alt Hyp				Compari	son Result				PMSD
Untransformed	t	C < T				AT3-098	failed benzo	o(g,h,i)pery	ene endpoint		2.05%
Equal Variand	ce t Two-Sampl	e Test									
Sample I	vs Sample II	dí	Test S	Stat Critical	MSD	P-Type	P-Value	Decisio	n(α:5%)		
Reference Sec	d AT3-098*	7	28.5	1.89	0.00532	CDF	<1.0E-05	Significa	int Effect		
ANOVA Table	1										
Source	Sum Squ	iares	Mean	Square	DF	F Stat	P-Value	Decisio	n(α:5%)		
Between	0.01424		0.0142	24	1	813	<1.0E-05	Significa	nt Effect		
Error	0.000122	6	1.751	E-05	7	_					
Total	0.014362	6			8						
ANOVA Assu	mptions Tests										
Attribute	Test				Test Stat	Critical	P-Value	Decisio	n(α:1%)		
Variance		Ratio F Tes	-		2.01	46.2	0.5916	Equal V	ariances		
Distribution	Shapiro-V	Vilk W Norm	nality Tes	st	0.871	0.701	0.1264	Normal	Distribution		
Benzo(g,h,i)p	erylene Summa	iry									
Sample	Code	Count	Mean	95% LCL	_ 95% UCL	Median	Min	Max	Std Err	CV%	%Effect
IOSN 2019	RS	5	0.259	0.253	0.265	0.258	0.255	0.267	0.00211	1.82%	0.00%
AT3-098		4	0.339	0.334	0.345	0.338	0.337	0.344	0.00166	0.98%	-30.88%
Benzo(g,h,i)p	erylene Detail										
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
IOSN 2019	RS	0.258	0.255	0.257	0.26	0.267				·	
AT3-098		0.344	0.337	0.339	0.338						

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	<b>,</b>						Test Co	de/ID:	TN-23-302	NvPAH / 1	7-1765-7444
Bioaccumula	tion Evaluatio	n - PAHs - I	Nereis							EA-ES	T, Inc. PBC
Analysis ID: Analyzed: Edit Date:	11-9752-3554 19 Aug-23 6:5 08 May-23 22:	5 <b>A</b>	ndpoint: nalysis: ID5 Hash:	Benzo(k)fluora Parametric-Tw 6855E33D32D	o Sample	8ABC8834I	Statu	S Version us Level: or ID:	: CETISv2	.1.1	
Batch ID: Start Date: Ending Date: Test Length:	16-7806-7369 08 Mar-23 11: 05 Apr-23 10: 27d 23h	32 <b>P</b> 32 <b>S</b>	est Type: rotocol: pecies: axon:	Bioaccumulatio US ACE NED I Nereis virens Polychaeta			Anal Dilue Brine Sour	ent: No e: Cry	ncy Roka t Applicable /stal Sea O - Aquatic I	Research (	Or <b>Age:</b>
Sample Code	Sample	ID S	ample Da	te Receip	t Date	Sample Ag	e Clier	nt Name	Pr	oject	
IOSN 2019 AT3-098	13-4648 07-1559		8 Mar-23 8 Feb-23 1	08 Mar- 3:00 09 Feb-		12h 27d 23h	Eco-	Analysts, Ir	nc. Dr	edged Sed	diment Evalu
Sample Code	Material	Туре		Sample Source	е	Sta	ition Locati	on	Lat/Long		
IOSN 2019 AT3-098		ce sedimen Sediment	t	Yachtsman Ma Yachtsman Ma			SN Reference Stations at 4		Лu		
Data Transfor	rm	Alt Hyp	)			Comparis	on Result				PMSD
Untransformed	d	C < T				AT3-098 f	ailed benzo(	k)fluoranth	ene endpoin	t	3.02%
Equal Variand	ce t Two-Samp	le Test									
Sample I	vs Sample I	I	df Test S	Stat Critical	MSD	P-Type	P-Value	Decision	ι(α:5%)		
Reference Sec	d AT3-098 <sup>*</sup>	Ŧ	7 20.2	1.89	0.0112	CDF	<1.0E-05	Significar	nt Effect		
ANOVA Table	)										
Source	Sum Sq	uares	Mean	Square	DF	F Stat	P-Value	Decision	η(α:5%)		
Between	0.03181	36	0.031	8136	1	409	<1.0E-05	Significa	nt Effect		
Error	0.00054		7.778	E-05	7	_					
Total	0.03235	81			8						
ANOVA Assu	mptions Tests										
Attribute	Test				Test Stat	Critical	P-Value	Decision	• •		
Variance		Ratio F Te			2.58	24.3	0.3830	Equal Va			
Distribution	Snapiro-	Wilk W No	rmailty res	SI .	0.898	0.701	0.2390	Normai L	Distribution		
Benzo(k)fluor	ranthene Sumr	-									
Sample	Code	Count	Mean		95% UCL		Min	Max	Std Err	CV%	%Effect
IOSN 2019	RS	5	0.371	0.362	0.379	0.368	0.365	0.382	0.00305	1.84%	0.00%
AT3-098		4	0.49	0.473	0.508	0.483	0.481	0.505	0.00547	2.23%	-32.29%
Benzo(k)fluoi	ranthene Detai	I									
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
IOSN 2019	RS	0.368	0.365	0.367	0.372	0.382					
AT3-098		0.492	0.481		0.483	0.505					

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Bioaccumulati	ion Evaluation - P	AHs - Ne	reis							EA-ES	T, Inc. PBC
Analyzed:	14-6869-2556 19 Aug-23 6:55 08 May-23 22:50	Anal	•	ametric-Tw		893711A0B	Sta	TIS Versior tus Level: tor ID:	n: CETISv 1	2.1.1	
Batch ID:	16-7806-7369	Test	Type: Bio	accumulatio	n - PAHs		Ana	alyst: Na	ancy Roka		
Start Date:	08 Mar-23 11:32			ACE NED I				-	ot Applicable		
Ending Date:	05 Apr-23 10:32	Spe		reis virens	, ,		Bri		ystal Sea		
Test Length:	27d 23h	Taxo	on: Pol	ychaeta			So	urce: AF	RO - Aquatic	Research C	r Age:
Sample Code	Sample ID	Sam	ple Date	Receip	t Date	Sample Ag	e Cli	ent Name	Р	roject	
IOSN 2019	13-4648-8170	0 08 N	lar-23	08 Mar-	-23	12h	Eco	-Analysts, I	nc. D	redged Sed	iment Evalu
AT3-098	07-1559-497	4 08 F	eb-23 13:00	09 Feb	-23 16:30	27d 23h					
Sample Code	Material Typ	е	Sai	nple Sourc	е	Sta	ition Loca	tion	Lat/Long	9	
IOSN 2019	Reference se	ediment	Ya	chtsman Ma	rina NAE-20	004-00 108	SN Refere	nce			
AT3-098	Marine Sedin	nent	Yad	chtsman Ma	rina NAE-20	004-00 10	Stations a	4 Marinas	Mu		
Data Transform	m A	Alt Hyp				Comparis	on Resul	<b>!</b>			PMSD
Untransformed	С	C < T				AT3-098 f	ailed chrys	ene endpoi	nt		91.18%
Unequal Varia	nce t Two-Sample	Test									
Sample I v	rs Sample II	df	Test Stat	Critical	MSD	P-Type	P-Value	Decisio	n(α:5%)		
Reference Sed	AT3-098*	4	2.38	2.13	0.514	CDF	0.0378	Significa	nt Effect		
Auxiliary Tests	5										
Attribute	Test				Test Stat	Critical	P-Value	Decisio	n(α:5%)		
Outlier	Grubbs Extr	eme Valu	e Test		1.89	2.29	0.3574	No Outli	ers Detected	j	
ANOVA Table											
Source	Sum Square	s	Mean Squ	ıare	DF	F Stat	P-Value	Decisio	n(α:5%)		
Between	0.826563		0.826563		1	5.68	0.0443	Significa	int Effect		
Error	1.16379		0.145474		8			•			
Total	1.99035				9						
ANOVA Assun	nptions Tests										
Attribute	Test				Test Stat	Critical	P-Value	Decisio	n(α:1%)		
		io F Toot			3140	23.2	<1.0E-0	5 Unequal	Variances		
Variance	Variance Rat										
Variance Distribution	Shapiro-Wilk				0.858	0.741	0.0714	Normal I	Distribution		
	Shapiro-Wilk				0.858	0.741	0.0714	Normal I	Distribution		
Distribution	Shapiro-Wilk nmary Code C			95% LCL			0.0714 <b>Min</b>	Normal I	Std Err	CV%	%Effect
Distribution  Chrysene Sum	Shapiro-Wilk	W Norma	ality Test	<b>95% LCL</b> 0.552						<b>CV%</b>	%Effect 0.00%
Distribution  Chrysene Sum Sample	Shapiro-Wilk nmary Code C	W Norma	Mean		95% UCL	Median	Min	Max	Std Err		
Chrysene Sum Sample IOSN 2019	Shapiro-Wilk  Code C  RS 5	W Norma	Mean 0.564	0.552	<b>95% UCL</b> 0.576	Median 0.56	<b>Min</b> 0.555	<b>Max</b> 0.58	<b>Std Err</b> 0.0043	1.71%	0.00%
Chrysene Sum Sample IOSN 2019 AT3-098	Shapiro-Wilk  Code C  RS 5  5	W Norma	Mean 0.564	0.552	<b>95% UCL</b> 0.576	Median 0.56	<b>Min</b> 0.555	<b>Max</b> 0.58	<b>Std Err</b> 0.0043	1.71%	0.00%
Chrysene Sum Sample IOSN 2019 AT3-098	Shapiro-Wilk  Code C  RS 5  5  ail  Code R	W Norma	Mean 0.564 1.14	0.552 0.469	<b>95% UCL</b> 0.576 1.81	<b>Median</b> 0.56 0.77	<b>Min</b> 0.555	<b>Max</b> 0.58	<b>Std Err</b> 0.0043	1.71%	0.00%

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Test Code/ID: TN-23-302NvPAH / 17-1765-7444

	.,	•						Test Co	de/ID:	114-20-002	LIVI / (II/	7-1765-744
Bioaccumulati	ion Evaluati	on - PAHs	- Nei	reis							EA-ES	T, Inc. PBC
Analyzed:	19-8988-888 19 Aug-23 6 08 May-23 2	:55	Anal	ysis: F	Dibenz(a,h)ant Parametric-Tw E03DE0113FD	o Sample	0D47ABC1E	Statu	S Version is Level: or ID:	: CETISv2	2.1.1	
	•	1:32		ocol: L cies: N	Bioaccumulation  JS ACE NED Intereis virens  Polychaeta			Analy Dilue Brine Sour	ent: Not	ncy Roka t Applicable /stal Sea O - Aquatic	Research (	Or <b>Age:</b>
Sample Code	Samp	e ID	Sam	ple Date	Receip	t Date	Sample Age	e Clien	t Name	Р	roject	
IOSN 2019 AT3-098		18-8170 59-4974		lar-23 eb-23 13	08 Mar :00 09 Feb		12h 27d 23h	Eco-A	Analysts, Ir	nc. D	redged Sed	liment Eval
Sample Code	Materi	al Type		5	ample Sourc	е	Sta	tion Location	on	Lat/Long	1	
IOSN 2019		nce sedim	ent		achtsman Ma		004-00 IOS	N Referenc	e			
AT3-098	Marine	Sediment	t	Y	'achtsman Ma	rina NAE-20	004-00 10	Stations at 4	Marinas N	Лu		
Data Transfori	m	Alt I	Нур				Comparis	on Result				PMSD
Untransformed		C < 1	Γ				AT3-098 fa	ailed dibenz	(a,h)anthra	cene endpo	int	2.64%
•	ve Sample	v II	Аf	Toet St			P-Type	P-Value	Decision			
Sample I v Reference Sed			df 8	<b>Test St</b> 22.5	at Critical 1.86	<b>MSD</b> 0.00794	CDF	<1.0E-05	Significar	•		
Sample I v Reference Sed Auxiliary Tests Attribute	AT3-09	8*	8	22.5		0.00794  Test Stat	CDF  Critical	<1.0E-05	Significar Decision	nt Effect n(α:5%)		
Sample I v Reference Sed	AT3-09		8	22.5		0.00794	CDF	<1.0E-05	Significar Decision	nt Effect		
Sample I version Reference Sed  Auxiliary Tests  Attribute  Outlier	AT3-09	8*	8	22.5		0.00794  Test Stat	CDF  Critical	<1.0E-05	Significar Decision	nt Effect n(α:5%)		
Sample I v Reference Sed Auxiliary Tests Attribute	s Test Grubb	8* os Extreme	8	e Test  Mean S	1.86 quare	0.00794  Test Stat 1.98  DF	CDF  Critical 2.29  F Stat	<1.0E-05  P-Value  0.2560  P-Value	Decision No Outlie	nt Effect n(α:5%) ers Detected n(α:5%)		
Sample I v Reference Sed Auxiliary Tests Attribute Outlier ANOVA Table Source Between	Sum S	8* ps Extreme squares	8	22.5 e Test  Mean S 0.02304	1.86	0.00794  Test Stat 1.98  DF	CDF  Critical 2.29	<1.0E-05  P-Value  0.2560	Significar  Decision  No Outlie	nt Effect n(α:5%) ers Detected n(α:5%)		
Sample I v Reference Sed Auxiliary Tests Attribute Outlier ANOVA Table Source Between Error	Sum \$ 0.0230 0.0003	8*  os Extreme  Gquares  04  6649	8	e Test  Mean S	1.86	0.00794  Test Stat 1.98  DF 1 8	CDF  Critical 2.29  F Stat	<1.0E-05  P-Value  0.2560  P-Value	Decision No Outlie	nt Effect n(α:5%) ers Detected n(α:5%)		
Reference Sed  Auxiliary Tests  Attribute  Outlier  ANOVA Table  Source  Between  Error  Total	Sum S 0.0234	8*  Squares  94  1649  1049	8	22.5 e Test  Mean S 0.02304	1.86	0.00794  Test Stat 1.98  DF	CDF  Critical 2.29  F Stat	<1.0E-05  P-Value  0.2560  P-Value	Decision No Outlie	nt Effect n(α:5%) ers Detected n(α:5%)		
Sample I v Reference Sed Auxiliary Tests Attribute Outlier ANOVA Table Source Between Error Total ANOVA Assun	Sum \$ 0.0230 0.0033 mptions Tes	8*  Squares  94  1649  1049	8	22.5 e Test  Mean S 0.02304	1.86	0.00794  Test Stat 1.98  DF 1 8 9	CDF  Critical 2.29  F Stat 505	<1.0E-05  P-Value 0.2560  P-Value <1.0E-05	Decision No Outlie  Decision Significan	n(α:5%) ers Detected n(α:5%) nt Effect		
Reference Sed Auxiliary Tests Attribute Outlier ANOVA Table Source Between Error Total ANOVA Assun Attribute	Sum S 0.0230 0.00234 mptions Test	s Extreme  Squares  04  0649  1049  ts	8 Valu	22.5 e Test  Mean S 0.02304	1.86	0.00794  Test Stat 1.98  DF 1 8 9	CDF  Critical 2.29  F Stat 505  Critical	P-Value 0.2560 P-Value <1.0E-05	Decision No Outlie Decision Significan	n(α:5%) ers Detected n(α:5%) nt Effect n(α:1%)		
Reference Sed  Auxiliary Tests  Attribute  Outlier  ANOVA Table  Source  Between  Error  Total  ANOVA Assun  Attribute  Variance	Sum S 0.0230 0.0003 0.0234 mptions Test Varian	8*  Squares  94  1649  1049	8 Valu	e Test  Mean S 0.02304 4.561E-	1.86 quare 05	0.00794  Test Stat 1.98  DF 1 8 9	CDF  Critical 2.29  F Stat 505	<1.0E-05  P-Value 0.2560  P-Value <1.0E-05	Decision  Decision  Significan  Decision  Equal Va	n(α:5%) ers Detected n(α:5%) nt Effect n(α:1%)		
Reference Sed Auxiliary Tests Attribute Outlier ANOVA Table Source Between Error Total ANOVA Assun Attribute Variance Distribution	Sum S 0.0230 0.0003 0.0234 mptions Test Varian Shapir	os Extreme  Squares  94  9649  1049  ts  ce Ratio F  o-Wilk W	8 Valu	e Test  Mean S 0.02304 4.561E-	1.86 quare 05	0.00794  Test Stat 1.98  DF 1 8 9  Test Stat 2.1	CDF  Critical 2.29  F Stat 505  Critical 23.2	P-Value 0.2560 P-Value <1.0E-05 P-Value 0.4900	Decision  Decision  Significan  Decision  Equal Va	n(α:5%) ers Detected n(α:5%) nt Effect n(α:1%) riances		
Reference Sed Auxiliary Tests Attribute Outlier ANOVA Table Source Between Error Total ANOVA Assun Attribute Variance Distribution	Sum S 0.0230 0.0003 0.0234 mptions Test Varian Shapir	os Extreme  Squares  94  9649  1049  ts  ce Ratio F  o-Wilk W	8 Valu	e Test  Mean S 0.02304 4.561E-	1.86 quare 	0.00794  Test Stat 1.98  DF 1 8 9  Test Stat 2.1	Critical 23.2 0.741	P-Value 0.2560 P-Value <1.0E-05 P-Value 0.4900	Decision  Decision  Significan  Decision  Equal Va	n(α:5%) ers Detected n(α:5%) nt Effect n(α:1%) uriances Distribution	CV%	%Effect
Reference Sed Auxiliary Tests Attribute Outlier ANOVA Table Source Between Error Total ANOVA Assun Attribute Variance Distribution Dibenz(a,h)ant	Sum S 0.0230 0.0003 0.0232 mptions Test Varian Shapir thracene Su	8*  Squares  3649  4049  ts  ce Ratio F  o-Wilk W I  mmary  Coui	8 Valu	e Test  Mean S 0.02304 4.561E-	1.86 quare 05	0.00794  Test Stat 1.98  DF 1 8 9  Test Stat 2.1 0.861	Critical 2.29  F Stat 505  Critical 23.2 0.741  Median	<1.0E-05  P-Value 0.2560  P-Value <1.0E-05  P-Value 0.4900 0.0779  Min	Decision Significan  Decision Significan  Decision Equal Va Normal D	n(α:5%) ers Detected n(α:5%) nt Effect n(α:1%) priances Distribution  Std Err	CV%	%Effect 0.00%
Reference Sed Auxiliary Tests Attribute Outlier ANOVA Table Source Between Error Total ANOVA Assun Attribute Variance Distribution Dibenz(a,h)ant Sample IOSN 2019	Sum S 0.0230 0.0003 0.0232 mptions Test Varian Shapir	8*  Squares 04 6649 1049  ts  ce Ratio F o-Wilk W I	8 Valu	e Test  Mean S 0.02304 4.561E-	1.86 quare 	0.00794  Test Stat 1.98  DF 1 8 9  Test Stat 2.1 0.861	Critical 23.2 0.741	P-Value 0.2560 P-Value <1.0E-05  P-Value 0.4900 0.0779	Decision No Outlie  Decision Significan  Decision Equal Va Normal D	n(α:5%) ers Detected n(α:5%) nt Effect n(α:1%) uriances Distribution		%Effect 0.00% -31.96%
Reference Sed Auxiliary Tests Attribute Outlier ANOVA Table Source Between Error Total ANOVA Assun Attribute Variance Distribution Dibenz(a,h)ant Sample IOSN 2019 AT3-098	Sum S 0.0230 0.0003 0.0232 mptions Test Varian Shapir thracene Su Code RS	8*  Squares  3649  4049  ts  ce Ratio F  o-Wilk W I  mmary  Coui  5  5	8 Valu	22.5  e Test  Mean S 0.02304 4.561E-  ality Test  Mean 0.3	1.86  quare 05  95% LCL 0.294	0.00794  Test Stat 1.98  DF 1 8 9  Test Stat 2.1 0.861  95% UCL 0.307	Critical 2.29  F Stat 505  Critical 23.2 0.741  Median 0.299	P-Value 0.2560 P-Value <1.0E-05  P-Value 0.4900 0.0779  Min 0.296	Decision Significan  Decision Significan  Decision Equal Va Normal D  Max  0.31	n(α:5%) ers Detected n(α:5%) nt Effect n(α:1%) riances Distribution Std Err 0.00243	<b>CV%</b> 1.81%	0.00%
Reference Sed  Auxiliary Tests  Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assun Attribute Variance Distribution  Dibenz(a,h)ant Sample IOSN 2019	Sum S 0.0230 0.0003 0.0232 mptions Test Varian Shapir thracene Su Code RS	8*  Squares  3649  4049  ts  ce Ratio F  o-Wilk W I  mmary  Coui  5  5	8 Valu	22.5  e Test  Mean S 0.02304 4.561E-  ality Test  Mean 0.3	1.86  quare 05  95% LCL 0.294	0.00794  Test Stat 1.98  DF 1 8 9  Test Stat 2.1 0.861  95% UCL 0.307	CDF  Critical 2.29  F Stat 505  Critical 23.2 0.741  Median 0.299 0.393	P-Value 0.2560 P-Value <1.0E-05  P-Value 0.4900 0.0779  Min 0.296	Decision Significan  Decision Significan  Decision Equal Va Normal D  Max  0.31	n(α:5%) ers Detected n(α:5%) nt Effect n(α:1%) riances Distribution Std Err 0.00243	<b>CV%</b> 1.81%	0.00%
Reference Sed  Auxiliary Tests Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assun Attribute Variance Distribution  Dibenz(a,h)ant Sample IOSN 2019 AT3-098  Dibenz(a,h)ant	Sum S 0.0230 0.0003 0.0234 mptions Test Varian Shapir thracene Su RS	8*  Squares  14  3649  1049  ts  ce Ratio F  o-Wilk W I  mmary  Court  5  5	8 Valu Test Norma	22.5  e Test  Mean S 0.02304 4.561E-  ality Test  Mean 0.3 0.396	95% LCL 0.294 0.387	0.00794  Test Stat 1.98  DF 1 8 9  Test Stat 2.1 0.861  95% UCL 0.307 0.406	Critical 2.29  F Stat 505  Critical 23.2 0.741  Median 0.299	P-Value 0.2560 P-Value <1.0E-05  P-Value 0.4900 0.0779  Min 0.296	Decision Significan  Decision Significan  Decision Equal Va Normal D  Max  0.31	n(α:5%) ers Detected n(α:5%) nt Effect n(α:1%) riances Distribution Std Err 0.00243	<b>CV%</b> 1.81%	0.00%

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	,						Test Co	oae/ID:	114 20 00	ZINVI / II/ II	7-1765-7444
Bioaccumulation	on Evaluation	- PAHs - N	ereis							EA-ES	Γ, Inc. PBC
Analyzed:	16-7604-1580 19 Aug-23 6:55 08 May-23 22:5	An	alysis: P	uoranthene arametric-Two 3EFA4925F3	•	BF4A9811EE	Statı	IS Versior us Level: or ID:	n: CETISv 1	2.1.1	
	•	2 <b>Pro</b> 2 <b>Sp</b>	otocol: U ecies: N	ioaccumulatio S ACE NED F ereis virens olychaeta			Anal Dilue Brine Soui	ent: No e: Cr	ancy Roka ot Applicable ystal Sea RO - Aquatic		r <b>Age:</b>
Sample Code	Sample II	D Sa	mple Date	Receip	t Date	Sample Ag	e Clier	nt Name	P	roject	
IOSN 2019 AT3-098	13-4648-8 07-1559-4		Mar-23 Feb-23 13:	08 Mar- 00 09 Feb-		12h 27d 23h	Eco-	Analysts, I	nc. [	redged Sed	ment Evalu
Sample Code	Material <sup>-</sup>	Туре	S	ample Sourc	e	Sta	tion Locati	on	Lat/Long	<del></del>	
IOSN 2019		e sediment		achtsman Ma		004-00 IOS	N Reference	e		•	
AT3-098	Marine Se	ediment	Υ	achtsman Ma	rina NAE-20	004-00 10	Stations at 4	4 Marinas	Mu		
Data Transforn	n	Alt Hyp				Comparis	on Result				PMSD
Untransformed		C < T				•	ailed fluorar	thene end	Ipoint		557.32%
Unequal Variar	s Sample II	h	f Test Sta	t Critical	MSD	P-IVNE					
Sample I v. Reference Sed Auxiliary Tests Attribute Outlier ANOVA Table	AT3-098*  Test	d 4 Extreme Va	4.13	t Critical 2.13	3.17  Test Stat  1.8	Critical 2.29	P-Value 0.0072 P-Value 0.5014	Significa	n(a:5%) Int Effect  n(a:5%) ers Detected	I	
Sample I vi Reference Sed Auxiliary Tests Attribute Outlier	AT3-098*	4 Extreme Va	4.13	2.13	3.17 Test Stat	CDF  Critical	0.0072 P-Value	Significa	n(α:5%) ers Detected	I	
Sample I vince Reference Sed  Auxiliary Tests  Attribute  Outlier  ANOVA Table	AT3-098*  Test  Grubbs E	4 Extreme Va	4.13	2.13	3.17  Test Stat  1.8	CDF  Critical 2.29	0.0072 <b>P-Value</b> 0.5014	Decision No Outlin	n(α:5%) ers Detected	ı	
Sample I vi Reference Sed  Auxiliary Tests Attribute Outlier  ANOVA Table Source Between Error	Test Grubbs E  Sum Squ 94.4026 44.2539 138.656	4 Extreme Va	4.13 lue Test  Mean Se 94.4026	2.13	3.17  Test Stat  1.8  DF  1  8	CDF  Critical 2.29  F Stat	P-Value 0.5014	Decision No Outlin	n(α:5%) ers Detected n(α:5%)	I	
Reference Sed  Auxiliary Tests Attribute Outlier  ANOVA Table Source Between Error Total	Test Grubbs E  Sum Squ 94.4026 44.2539 138.656	4 Extreme Va	4.13 lue Test  Mean Se 94.4026	2.13	3.17  Test Stat  1.8  DF  1  8	CDF  Critical 2.29  F Stat 17.1	P-Value 0.5014	Decision No Outlin	n(α:5%) ers Detected n(α:5%) ant Effect	I	
Reference Sed  Auxiliary Tests  Attribute  Outlier  ANOVA Table  Source  Between  Error  Total  ANOVA Assum	Test Grubbs E Sum Squ 94.4026 44.2539 138.656 aptions Tests Test Variance	4 Extreme Va	4.13    ue Test	2.13	3.17  Test Stat 1.8  DF 1 8 9	CDF  Critical 2.29  F Stat 17.1	P-Value 0.5014  P-Value 0.0033	Decision Signification Decision Signification Decision Unequal	n(α:5%) ers Detected n(α:5%) ant Effect	I	
Reference Sed  Auxiliary Tests  Attribute  Outlier  ANOVA Table  Source  Between  Error  Total  ANOVA Assum  Attribute  Variance	Test Grubbs E Sum Squ 94.4026 44.2539 138.656 aptions Tests Variance Shapiro-V	Extreme Va	4.13    ue Test	2.13	3.17  Test Stat 1.8  DF 1 8 9  Test Stat 181	Critical 2.29  F Stat 17.1  Critical 23.2	P-Value 0.0033  P-Value 0.00033	Decision Signification Decision Signification Decision Unequal	n(α:5%) ers Detected n(α:5%) ant Effect  n(α:1%) Variances	l	
Reference Sed  Auxiliary Tests  Attribute  Outlier  ANOVA Table  Source  Between  Error  Total  ANOVA Assum  Attribute  Variance  Distribution	Test Grubbs E Sum Squ 94.4026 44.2539 138.656 aptions Tests Variance Shapiro-V	Extreme Va	4.13    ue Test	2.13	3.17  Test Stat 1.8  DF 1 8 9  Test Stat 181	Critical 2.29  F Stat 17.1  Critical 23.2 0.741	P-Value 0.0033  P-Value 0.00033	Decision Signification Decision Signification Decision Unequal	n(α:5%) ers Detected n(α:5%) ant Effect  n(α:1%) Variances	CV%	%Effect
Sample I vi Reference Sed  Auxiliary Tests Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assum Attribute Variance Distribution	Test Grubbs E Sum Squ 94.4026 44.2539 138.656 aptions Tests Test Variance Shapiro-V	Extreme Valares  Ratio F Tes Vilk W Norr	4.13    Mean St	2.13	3.17  Test Stat  1.8  DF  1  8  9  Test Stat  181  0.926	Critical 2.29  F Stat 17.1  Critical 23.2 0.741	P-Value 0.0033  P-Value 0.0002 0.4106	Decision  Decision  Signification  Decision  Unequal  Normal I	n(α:5%) ers Detected n(α:5%) ant Effect  n(α:1%) Variances Distribution		%Effect 0.00%
Reference Sed  Auxiliary Tests Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assum Attribute Variance Distribution  Fluoranthene S Sample	Test Grubbs E  Sum Squ 94.4026 44.2539 138.656  Aptions Tests Test Variance Shapiro-V  Summary Code	Extreme Valares  Ratio F Tes Vilk W Norr	4.13  Wean So 94.4026 5.53174  st nality Test  Mean	2.13 quare	3.17  Test Stat  1.8  DF  1  8  9  Test Stat  181  0.926	Critical 2.29  F Stat 17.1  Critical 23.2 0.741  Median	P-Value 0.0033  P-Value 0.0033  P-Value 0.0002 0.4106	Decision No Outlin Decision Significat  Decision Unequal Normal I	n(α:5%) ers Detected n(α:5%) ant Effect  n(α:1%) Variances Distribution  Std Err	CV%	0.00%
Reference Sed  Auxiliary Tests Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assum Attribute Variance Distribution  Fluoranthene S Sample IOSN 2019	Test Grubbs E Sum Squ 94.4026 44.2539 138.656 Iptions Tests Variance Shapiro-V Summary Code RS	Extreme Values  Ratio F Tes Vilk W Norr  Count 5	4.13  Mean Sc 94.4026 5.53174  st nality Test  Mean 0.569	2.13  quare  95% LCL  0.263	3.17  Test Stat  1.8  DF  1  8  9  Test Stat  181  0.926  95% UCL  0.875	Critical 2.29  F Stat 17.1  Critical 23.2 0.741  Median 0.459	P-Value 0.0033  P-Value 0.0033  P-Value 0.0002 0.4106  Min 0.451	Decision Signification Decision Signification Unequal Normal I  Max 1.01	n(α:5%) ers Detected n(α:5%) ent Effect  n(α:1%) Variances Distribution  Std Err 0.11	<b>CV%</b> 43.35%	0.00%
Reference Sed  Auxiliary Tests Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assum Attribute Variance Distribution  Fluoranthene S Sample IOSN 2019 AT3-098	Test Grubbs E Sum Squ 94.4026 44.2539 138.656 Iptions Tests Variance Shapiro-V Summary Code RS	Extreme Values  Ratio F Tes Vilk W Norr  Count 5	4.13  Mean Sc 94.4026 5.53174  st nality Test  Mean 0.569	2.13  quare  95% LCL  0.263	3.17  Test Stat  1.8  DF  1  8  9  Test Stat  181  0.926  95% UCL  0.875	Critical 2.29  F Stat 17.1  Critical 23.2 0.741  Median 0.459	P-Value 0.0033  P-Value 0.0033  P-Value 0.0002 0.4106  Min 0.451	Decision Signification Decision Signification Unequal Normal I  Max 1.01	n(α:5%) ers Detected n(α:5%) ent Effect  n(α:1%) Variances Distribution  Std Err 0.11	<b>CV%</b> 43.35%	0.00%
Reference Sed  Auxiliary Tests Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assum Attribute Variance Distribution  Fluoranthene Sample IOSN 2019 AT3-098  Fluoranthene I	Test Grubbs E  Sum Squ 94.4026 44.2539 138.656  Aptions Tests Test Variance Shapiro-V  Summary Code RS	Extreme Valuares  Ratio F Tes Vilk W Norr  Count 5 5	4.13  Mean So 94.4026 5.53174  st nality Test  Mean 0.569 6.71	2.13  quare  95% LCL 0.263 2.6	3.17  Test Stat 1.8  DF 1 8 9  Test Stat 181 0.926  95% UCL 0.875 10.8	CDF  Critical 2.29  F Stat 17.1  Critical 23.2 0.741  Median 0.459 7.81	P-Value 0.0033  P-Value 0.0033  P-Value 0.0002 0.4106  Min 0.451	Decision Signification Decision Signification Unequal Normal I  Max 1.01	n(α:5%) ers Detected n(α:5%) ent Effect  n(α:1%) Variances Distribution  Std Err 0.11	<b>CV%</b> 43.35%	

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Test Code/ID: TN-23-302NvPAH / 17-1765-7444

										Т	est Co	ae/ID:		114-20-0	, OZ 1 <b>1</b> 1		7-1765-7	444
Bioaccumulat	tion Ev	/aluation -	PAHs -	Nere	eis											EA-ES	Γ, Inc. P	вс
Analysis ID: Analyzed: Edit Date:	19 Au	00-8905 g-23 6:56 ay-23 22:50	A	naly	sis: F	Fluorene Parametri DAEDD73		Sample 10F039F24I	B66E57CI	336BD		S Versions Level or ID:		CETIS 1	Sv2.1.	1		
Batch ID: Start Date: Ending Date: Test Length:	08 Ma 05 Ap		P S	est T Protoc Speci- axon	col: l		NED R	n - PAHs IIM (2004)			Analy Dilue Brine Sour	ent: 1 e: (	Not A Crysta	y Roka pplicab al Sea - Aquati		search C	er <b>Age:</b>	
Sample Code		Sample ID	S	amp	le Date	R	eceipt	Date	Sample A	\ge	Clien	t Name			Proje	ect		
IOSN 2019 AT3-098		13-4648-81 07-1559-49		8 Ma 8 Fel	ar-23 b-23 13		3 Mar-2 9 Feb-2		12h 27d 23h		Eco-A	Analysts	, Inc.		Dred	ged Sed	iment Ev	/alu
Sample Code		Material Ty	уре			Sample S	Source	)	s	tation I	Locatio	on		Lat/Lo	ng			
IOSN 2019		Reference		nt	١	/achtsma	an Mar	ina NAE-20	04-00 10	OSN Re	ferenc	e						
AT3-098		Marine Sec	diment		١	/achtsma	an Mar	ina NAE-20	04-00 1	0 Statio	ns at 4	Marina	s Mu					
Data Transfor	m		Alt Hy	р					Compai	rison R	esult						PMSE	)
Untransformed	t		C < T						AT3-098	3 failed	fluoren	e endpo	int				211.7	0%
Equal Variand		o-Sample Sample II	Test	df ·	Test St	at Criti	cal	MSD	P-Type	P-V	alue	Decisi	on(α	:5%)				
Reference Sec	d <i>F</i>	AT3-098*		8 3	3.3	1.86		0.912	CDF	0.00	)54	Signific	cant E	Effect				
		AT3-098*  Test  Grubbs Ex	ktreme V			1.86		0.912 <b>Test Stat</b> 2.37			alue	Decisi Outlier	ion(α	:5%)				
Reference Sec Auxiliary Test Attribute	ts	Test	κtreme V			1.86		Test Stat	Critical	P-V	alue	Decisi	ion(α	:5%)				
Auxiliary Test Attribute Outlier	s	Test		/alue				Test Stat	Critical	P-V 0.02	alue	Decisi	i <b>on(α</b> Dete	: <b>5%)</b> ected				
Auxiliary Test Attribute Outlier ANOVA Table	d's	Test Grubbs Ex		/alue	Test	Square		Test Stat 2.37	Critical 2.29	P-V 0.02	alue 288 alue	<b>Decisi</b> Outlier	ion(α Dete	:5%) ected				
Auxiliary Test Attribute Outlier ANOVA Table Source Between Error	d's	Test Grubbs Ex  Sum Squa 6.55371 4.81312 11.3668		/alue	Test  Mean S 6.55371	Square		<b>Test Stat</b> 2.37 <b>DF</b> 1 8	Critical 2.29	P-V 0.02 P-V	alue 288 alue	Decisi Outlier Decisi	ion(α Dete	:5%) ected				
Auxiliary Test Attribute Outlier ANOVA Table Source Between Error Total	mption	Test Grubbs Ex  Sum Squa 6.55371 4.81312 11.3668		/alue	Test  Mean S 6.55371	Square		<b>Test Stat</b> 2.37 <b>DF</b> 1 8	Critical 2.29  F Stat 10.9	P-V 0.02 P-V 0.04	alue 288 alue	Decisi Outlier Decisi	ion(α Dete ion(α cant I	:5%) ected :5%)				
Auxiliary Test Attribute Outlier ANOVA Table Source Between Error Total ANOVA Assur	mption	Test Grubbs Ex  Sum Squa 6.55371 4.81312 11.3668 ns Tests	ires	/alue	Test  Mean S 6.55371	Square		<b>Test Stat</b> 2.37 <b>DF</b> 1 8 9	Critical 2.29  F Stat 10.9	P-V 0.02 P-V 0.04	alue 288 alue 109	Decisi Outlier Decisi Signifi	ion(α Dete ion(α cant I	:5%) ected :5%) Effect				
Auxiliary Test Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assur Attribute	mption	Test Grubbs Ex  Sum Squa 6.55371 4.81312 11.3668 ns Tests Test	ares	/alue	Test  Mean S 6.55371 0.60164	Square		Test Stat 2.37  DF 1 8 9  Test Stat	Critical 2.29  F Stat 10.9  Critical	P-V 0.02 P-V 0.07	<b>alue</b> 288 <b>alue</b> 109 <b>alue</b> 170	Decisi Signific  Decisi Equal	ion(α Dete	:5%) ected :5%) Effect				
Auxiliary Test Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assur Attribute Variance	mption	Test Grubbs Ex  Sum Squa 6.55371 4.81312 11.3668 Ins Tests Test Variance R	ares	/alue	Test  Mean S 6.55371 0.60164	Square		Test Stat 2.37  DF 1 8 9  Test Stat 17.4	Critical 2.29  F Stat 10.9  Critical 23.2	P-V 0.02 P-V 0.07	<b>alue</b> 288 <b>alue</b> 109 <b>alue</b> 170	Decisi Signific  Decisi Equal	ion(α Dete	:5%) ected :5%) Effect :1%)				
Auxiliary Test Attribute Outlier ANOVA Table Source Between Error Total ANOVA Assur Attribute Variance Distribution	mption	Test Grubbs Ex  Sum Squa 6.55371 4.81312 11.3668 Ins Tests Test Variance R	ares	/alue	Test  Mean S 6.55371 0.60164	equare	LCL	Test Stat 2.37  DF 1 8 9  Test Stat 17.4 0.876	Critical 2.29  F Stat 10.9  Critical 23.2 0.741	P-V 0.02 P-V 0.07	falue 288 falue 109 falue 170 181	Decisi Signific  Decisi Equal	ion(α Dete	:5%) ected :5%) Effect :1%)		CV%	%Effec	ct
Auxiliary Test Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assur Attribute Variance Distribution  Fluorene Sum	mption	Sum Squa 6.55371 4.81312 11.3668 ns Tests Test Variance R Shapiro-Wi	ares Satio F T	/alue	Mean S 6.55371 0.60164	equare	LCL	Test Stat 2.37  DF 1 8 9  Test Stat 17.4 0.876	Critical 2.29  F Stat 10.9  Critical 23.2 0.741	P-V 0.02 P-V 0.01	(alue) (288) (alue) (109) (alue) (170) (181)	Decisi Decisi Signific Decisi Equal Norma	ion(α Dete	:5%) ected :5%) Effect :1%) nces tribution	· (	CV% 59.32%	<b>%Effec</b> 0.00%	
Auxiliary Test Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assur Attribute Variance Distribution  Fluorene Sum Sample	mption	Test Grubbs Ex  Sum Squa 6.55371 4.81312 11.3668 ns Tests Test Variance R Shapiro-Wi	atio F T ilk W No	est est	Mean S 6.55371 0.60164	Square	LCL 4	Test Stat 2.37  DF 1 8 9  Test Stat 17.4 0.876	Critical 2.29  F Stat 10.9  Critical 23.2 0.741  Median	P-V 0.02 P-V 0.0° P-V 0.0° 0.1°	falue 288 falue 109 falue 170 181 555	Decisi Signifi  Decisi Equal Norma	ion(α Dete	:5%) ected :5%) Effect :1%) nces tribution	r (			
Auxiliary Test Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assur Attribute Variance Distribution  Fluorene Sum Sample IOSN 2019	mption	Test Grubbs Ex  Sum Squa 6.55371 4.81312 11.3668 ns Tests Test Variance R Shapiro-Wi	tatio F T illk W No	est est	Mean S 6.55371 0.60164  ity Test  Mean 0.431	95% 0.11	LCL 4	Test Stat 2.37  DF 1 8 9  Test Stat 17.4 0.876  95% UCL 0.748	Critical 2.29  F Stat 10.9  Critical 23.2 0.741  Median 0.267	P-V 0.02 P-V 0.07 0.11 Min 0.25	falue 288 falue 109 falue 170 181 555	Decisi Signific  Decisi Equal Norma  Max 0.832	ion(α Dete	:5%) ected :5%) Effect :1%) ences tribution Std Err 0.114	r (	59.32%	0.00%	
Auxiliary Test Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assur Attribute Variance Distribution  Fluorene Sum Sample IOSN 2019 AT3-098	mption	Test Grubbs Ex  Sum Squa 6.55371 4.81312 11.3668 ns Tests Test Variance R Shapiro-Wi	tatio F T illk W No	/alue	Mean S 6.55371 0.60164  ity Test  Mean 0.431	95% 0.11	<b>LCL</b> 4 5	Test Stat 2.37  DF 1 8 9  Test Stat 17.4 0.876  95% UCL 0.748	Critical 2.29  F Stat 10.9  Critical 23.2 0.741  Median 0.267	P-V 0.02 P-V 0.07 0.11 Min 0.25	falue 288 falue 109 falue 170 181 555	Decisi Signific  Decisi Equal Norma  Max 0.832	ion(α Dete	:5%) ected :5%) Effect :1%) ences tribution Std Err 0.114	r (	59.32%	0.00%	
Auxiliary Test Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assur Attribute Variance Distribution  Fluorene Sum Sample IOSN 2019 AT3-098  Fluorene Deta	mption	Test Grubbs Ex  Sum Squa 6.55371 4.81312 11.3668 INSTEST  Test Variance R Shapiro-Wi  Code  RS	eatio F T ilk W No Count 5	est	Mean S 6.55371 0.60164 ity Test  Mean 0.431 2.05	95% 0.11- 0.72	LCL 4 5	Test Stat 2.37  DF 1 8 9  Test Stat 17.4 0.876  95% UCL 0.748 3.37	Critical 2.29  F Stat 10.9  Critical 23.2 0.741  Median 0.267 1.73	P-V 0.02 P-V 0.07 0.11 Min 0.25	falue 288 falue 109 falue 170 181 555	Decisi Signific  Decisi Equal Norma  Max 0.832	ion(α Dete	:5%) ected :5%) Effect :1%) ences tribution Std Err 0.114	r (	59.32%	0.00%	

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	<u> </u>						Test Co	ue/ID.	111-20-002		7-1765-744
Bioaccumula	tion Evaluation	- PAHs - I	Nereis							EA-ES	T, Inc. PBC
Analysis ID: Analyzed: Edit Date:	08-3442-7926 19 Aug-23 6:56 08 May-23 22:	6 <b>A</b> ı	nalysis:	Indeno(1,2,3-co Parametric-Two E499F098C84I	Sample	A0B8134DD.	Statu	S Version is Level: or ID:	ı: CETISv2 1	.1.1	
Batch ID: Start Date: Ending Date: Test Length:	16-7806-7369 08 Mar-23 11:3 05 Apr-23 10:3 27d 23h	32 <b>P</b> ı 2 <b>S</b>	est Type: rotocol: pecies: axon:	Bioaccumulation US ACE NED F Nereis virens Polychaeta			Anal Dilue Brine Sour	ent: No e: Cr	incy Roka ot Applicable ystal Sea RO - Aquatic I	Research (	Or <b>Age:</b>
Sample Code	Sample	ID Sa	ample Dat	e Receip	t Date	Sample Ag	e Clier	t Name	Pı	oject	
IOSN 2019 AT3-098	13-4648- 07-1559-		3 Mar-23 3 Feb-23 1	08 Mar- 3:00 09 Feb-		12h 27d 23h	Eco-	Analysts, I	nc. Di	edged Sed	liment Evalu
Sample Code	Material	Туре		Sample Sourc	e	Sta	tion Locati	on	Lat/Long		
IOSN 2019	Reference	e sedimen	t	Yachtsman Ma	rina NAE-20	004-00 109	SN Reference	е	_		
AT3-098	Marine S	ediment		Yachtsman Ma	rina NAE-20	004-00 10	Stations at 4	l Marinas I	Mu		
Data Transfor	rm	Alt Hyp	)			Comparis	on Result				PMSD
Untransformed	d	C < T				AT3-098 f	ailed indeno	(1,2,3-cd)	pyrene endpo	int	2.70%
Equal Variand	ce t Two-Samp	le Test									
Sample I	vs Sample II	1 (	df Test S	Stat Critical	MSD	P-Type	P-Value	Decision	n(α:5%)		
Reference Sec	d AT3-098*		8 22	1.86	0.0164	CDF	<1.0E-05	Significa	nt Effect		
Auxiliary Test	ts										
Attribute	Test				Test Stat	Critical	P-Value	Decision	n(α:5%)		
Outlier	Grubbs	Extreme V	alue Test		2.13	2.29	0.1299	No Outlie	ers Detected		
ANOVA Table	)										
Source	Sum Sq	uares	Mean	Square	DF	F Stat	P-Value	Decision	n(α:5%)		
Between	0.09409		0.0940	09	1	483	<1.0E-05	Significa	nt Effect		
Error	0.00156		0.000	195	8	_					
Total	0.09565				9						
	mptions Tests										
Attribute	Test				Test Stat		P-Value	Decision	· ,		
						23.2	0.3721	Egual Va	ariances		
Variance		Ratio F Te		.4	2.63			•	Diatribution.		
Distribution	Shapiro-¹	Wilk W Noi		st	0.842	0.741	0.0462	•	Distribution		
Distribution Indeno(1,2,3-6	Shapiro-	Wilk W Nor	rmality Tes		0.842	0.741	0.0462	Normal [			
Distribution Indeno(1,2,3-c	Shapiro-l cd)pyrene Sum Code	Wilk W Noi mary Count	rmality Tes	95% LCL	0.842 <b>95% UCL</b>	0.741  Median	0.0462 <b>Min</b>	Normal [	Std Err	CV%	%Effect
Indeno(1,2,3-d Sample IOSN 2019	Shapiro-	wilk W Normary Count	Mean 0.608	<b>95% LCL</b> 0.595	0.842 <b>95% UCL</b> 0.621	0.741 <b>Median</b> 0.605	0.0462 <b>Min</b> 0.6	Max 0.625	<b>Std Err</b> 0.00464	1.71%	0.00%
Distribution Indeno(1,2,3-c	Shapiro-l cd)pyrene Sum Code	Wilk W Noi mary Count	rmality Tes	95% LCL	0.842 <b>95% UCL</b>	0.741  Median	0.0462 <b>Min</b>	Normal [	Std Err		
Indeno(1,2,3-d Sample IOSN 2019 AT3-098	Shapiro-l cd)pyrene Sum Code	mary Count 5 5	Mean 0.608	<b>95% LCL</b> 0.595	0.842 <b>95% UCL</b> 0.621	0.741 <b>Median</b> 0.605	0.0462 <b>Min</b> 0.6	Max 0.625	<b>Std Err</b> 0.00464	1.71%	0.00%
Indeno(1,2,3-d Sample IOSN 2019 AT3-098 Indeno(1,2,3-d Sample	Shapiro-  cd)pyrene Sum  Code  RS  cd)pyrene Deta  Code	Wilk W Nor mary Count 5 5	Mean 0.608 0.802	95% LCL 0.595 0.781 Rep 3	95% UCL 0.621 0.823	0.741  Median  0.605  0.795	0.0462 <b>Min</b> 0.6	Max 0.625	<b>Std Err</b> 0.00464	1.71%	0.00%
Indeno(1,2,3-c Sample IOSN 2019 AT3-098 Indeno(1,2,3-c	Shapiro-¹ cd)pyrene Sum Code RS cd)pyrene Deta	mary Count 5 5	Mean 0.608 0.802	<b>95% LCL</b> 0.595 0.781	95% UCL 0.621 0.823	0.741 Median 0.605 0.795	0.0462 <b>Min</b> 0.6	Max 0.625	<b>Std Err</b> 0.00464	1.71%	0.00%

AT3-098

1.65

2.32

2.29

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Bioaccumula	tion E	valuation -	PAHs	- Ne	reis									EA-ES	T, Inc. PBC
Analysis ID: Analyzed: Edit Date:	19 A	685-5860 ug-23 6:56 ay-23 22:50		Anal	ysis:	Para	hthalene ametric-Two 9FD9E0C1	o Sample 76677B373	05CC020	F17AD	Statu	S Versio is Level: or ID:		2.1.1	
Batch ID: Start Date: Ending Date: Test Length:	08 M 05 A			Prot	ocol: cies:	US A Nere	ocumulatio ACE NED Feis virens chaeta				Analy Dilue Brine Sour	ent: N e: C	ancy Roka ot Applicable rystal Sea RO - Aquatic		or <b>Age</b> :
Sample Code	)	Sample ID		Sam	ple Date	9	Receipt	t Date	Sample A	Age	Clien	t Name	P	roject	
IOSN 2019 AT3-098		13-4648-81 07-1559-49		08 N	lar-23 eb-23 13		08 Mar-	23	12h 27d 23h	<b>J</b>		Analysts,		redged Sed	iment Evalu
Sample Code	)	Material Ty	/pe		;	Sam	ple Sourc	e	S	Station	Locati	on	Lat/Long	]	
IOSN 2019		Reference	sedim	ent	,	Yacl	ntsman Ma	rina NAE-20	04-00	OSN Re	eferenc	е			
AT3-098		Marine Sed	liment		,	Yacl	ntsman Ma	rina NAE-20	04-00 1	0 Statio	ons at 4	Marinas	Mu		
Data Transfor	rm		Alt H	lyp					Compa	rison R	esult				PMSD
Untransformed	d		C < T	•					AT3-098	8 failed	naphth	alene en	dpoint		108.55%
Equal Variand			Test	.16	T4 0		0-1411	1400	D. T		<b>/</b> - 1	D. dalai	( 50/)		
Sample I Reference Sec		Sample II AT3-098*		df 8	2.49	tat	Critical 1.86	<b>MSD</b> 0.706	P-Type CDF		<b>/alue</b> 188		on(α:5%) ant Effect		
		A10-030			2.40		1.00	0.700	<u> </u>	0.0	100	Olgrillo			
Auxiliary Test	ts														
Attribute Outlier		Grubbs Ex		1/-1.	- T4			Test Stat	2.29		<b>/alue</b> 485		on(α:5%) liers Detected	1	
Outilei		Grubbs Ex	ueme	valu	e rest			1.9	2.29	0.3	400	No Out	ners Detected		
ANOVA Table	•														
Source		Sum Squa	res		Mean		are	DF	F Stat		/alue		on(α:5%)		
Between Error		2.23445 2.88487			2.2344 0.3606			1 8	6.2	0.0	376	Signific	ant Effect		
Total		5.11932			0.3000	09		9	_						
ANOVA Assu	mntio	no Tooto													
Attribute	iiiptio	Test						Test Stat	Critical	D.	/alue	Docinio	n/a:19/\		
Variance		Variance R	atio F	Test				4.14	23.2		978		on(α:1%) ⁄ariances		
Distribution		Shapiro-Wi				t		0.927	0.741		218	•	Distribution		
Naphthalene	Sumn				•										
Sample	Sullill	Code	Coun	.+	Mean		95% LCL	95% UCL	Median	Mir		Max	Std Err	CV%	%Effect
IOSN 2019		RS	5		0.651		0.185	1.12	0.412	0.3		1.24	0.168	57.59%	0.00%
AT3-098		110	5		1.6		0.65	2.54	1.65	0.5		2.32	0.341	47.75%	-145.31%
Naphthalene	Detail														
Sample		Code	Rep 1	1	Rep 2		Rep 3	Rep 4	Rep 5						
IOSN 2019		RS	0.812	)	0.394		0.396	1.24	0.412						
A TO 000							0.00								

0.52

1.2

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								10	est Cod	ie/ID:	1 IN-23-30	ZNVPAH / T	7-1765-744
Bioaccumula	tion Evaluat	ion - PAHs	- Nereis									EA-ES	T, Inc. PBC
Analysis ID: Analyzed: Edit Date:	01-9493-08 19 Aug-23 ( 08 May-23 )	6:56	Endpoint: Analysis: MD5 Hash	Param		o Sample ABEB7E2A	B615F64	38C2A1	Status	S Version s Level: r ID:	: CETISv. 1	2.1.1	
Batch ID: Start Date: Ending Date: Test Length:	•	11:32 0:32	Test Type: Protocol: Species: Taxon:	US AC	E NED F	on - PAHs RIM (2004)			Analy Diluer Brines Source	nt: No	ncy Roka It Applicable Iystal Sea RO - Aquatic		or <b>Age:</b>
Sample Code	Samp	ole ID	Sample Da	ate	Receipt	t Date	Sample A	Age	Client	Name	Р	roject	
IOSN 2019 AT3-098			08 Mar-23 08 Feb-23	13:00	08 Mar- 09 Feb-		12h 27d 23h		Eco-A	nalysts, I	nc. D	redged Sed	iment Evalu
Sample Code	Mate	rial Type		Samp	le Sourc	<u></u> е		Station L	ocatio	n	Lat/Long	]	
IOSN 2019	Refer	ence sedime	ent			rina NAE-20		OSN Re	ference	•			
AT3-098	Marin	e Sediment		Yachts	sman Ma	rina NAE-20	004-00 ′	10 Statio	ns at 4	Marinas I	Mu		
Data Transfor	rm	Alt H	ур				Compa	rison Re	esult				PMSD
Untransformed	t	C < T					AT3-09	8 passed	d phena	anthrene (	endpoint		32.71%
Sample I Reference Sec	vs Samp	e II	<b>df Test</b> 8 -3.29		ritical .86	<b>MSD</b> 0.669	P-Type CDF	<b>P-V</b>	alue 945	<b>Decision</b> Non-Sign	n(α:5%) nificant Effec	pt .	
Auxiliary Test	ts												
Attribute	Test					Test Stat	Critical	I P-V	alue	Decision	n(α:5%)		
Outlier	Grub	bs Extreme	Value Test			1.97	2.29	0.26	355	No Outli	ers Detected		
ANOVA Table	)												
Source	Sum	Squares	Mea	n Squar	е	DF	F Stat	P-V	alue	Decision	n(α:5%)		
Between	3.498	72	3.498	372		1	10.8	0.01	10	Significa	nt Effect		
Error	2.586		0.323	3255		8	_						
Total	6.084	76				9							
ANOVA Assu	mptions Tes	sts											
Attribute	Test					Test Stat			alue	Decision	<u> </u>		
Variance Distribution		nce Ratio F <sup>-</sup> ro-Wilk W N		et		2.59 0.866	23.2 0.741	0.37 0.08		Equal Va	ariances Distribution		
	<u> </u>	10-1111111111111	ormanty 10			0.000	0.741	0.00		Nomiai	Distribution		
Phenanthrene	-	Count	. Maa	. 0	E0/ I CI	059/ 1101	Mediar	. Min		May	Std Err	CV%	0/ <b>Eff</b> ort
Sample IOSN 2019	Code RS	Count 5	t Meai 2.04		.2	<b>95% UCL</b> 2.89	2.01	1.23		<b>Max</b> 3.1	0.305	33.41%	%Effect 0.00%
AT3-098	NΘ	5 5	0.86		.2 .334	1.39	0.675	0.66		1.62	0.305	49.30%	57.88%
	- Detail				-						- +		
Phenanthrene Sample	e Detail Code	Rep 1	Rep	2 D	ep 3	Rep 4	Rep 5						
IOSN 2019	RS	2.12	1.76		.01	3.1	1.23						
AT3-098	NΟ	0.675			.62	0.66	0.69						
, . 1 0 0 0 0 0		0.073	0.00		.52	5.55	0.00						

**Report Date:** 19 Aug-23 06:56 (p 16 of 16) **Test Code/ID:** TN-23-302NvPAH / 17-1765-7444

									Т	est Co	de/ID:	TN-23-30	2NvPAH / 1	7-1765-7444
Bioaccumulat	ion Evalua	tion - PAH	s - Ne	reis									EA-ES	Γ, Inc. PBC
Analysis ID: Analyzed: Edit Date:	13-2043-19 19 Aug-23 08 May-23	6:56	Ana	lpoint: lysis: 5 Hash:	Para	ametric-Two	o Sample C61834386	F3A2DF	12E9E0		S Versio is Level: or ID:	n: CETISv	2.1.1	
Batch ID: Start Date: Ending Date: Test Length:	•	11:32	Pro	tocol:	US A	accumulatio ACE NED F eis virens rchaeta				Analy Dilue Brine Sour	ent: N	ancy Roka ot Applicable rystal Sea RO - Aquatic	Research O	r <b>Age</b> :
Sample Code	Sam	ple ID	San	nple Da	te	Receipt	t Date	Sample	Age	Clien	t Name	Р	roject	
IOSN 2019 AT3-098		648-8170 559-4974		//ar-23 - eb-23 1	3:00	08 Mar- 09 Feb-	23 23 16:30	12h 27d 23h	1	Eco-/	Analysts,	Inc. D	redged Sed	ment Evalu
Sample Code	Mate	rial Type			San	ple Source	e		Station	Location	on	Lat/Long	)	
IOSN 2019	Refe	rence sedin	nent		Yac	htsman Ma	rina NAE-20	004-00	IOSN Re	ferenc	е			
AT3-098	Marir	ne Sedimer	nt		Yac	htsman Ma	rina NAE-20	004-00	10 Statio	ns at 4	Marinas	Mu		
Data Transfor	m	Alt	Нур					Comp	arison R	esult				PMSD
Untransformed	l	C <	Т					AT3-09	98 failed	pyrene	endpoint			254.76%
Unequal Varia	nce t Two- vs Samp		est df	Test \$	Stat	Critical	MSD	P-Type	e P-V	'alue	Decisio	on(α:5%)		
Reference Sed			4	6.9		2.13	1.72	CDF	0.0			ant Effect		
Auxiliary Test Attribute Outlier	Tes	t obs Extrem	e Valı	ue Test			Test Stat	Critica 2.29	n <b>I P-V</b>	<b>'alue</b> 209		on(α:5%) iers Detected	l	
ANOVA Table														
Source	Sum	Squares		Mean	Squ	are	DF	F Stat	P-V	alue	Decisio	on(α:5%)		
Between	77.1	173		77.11	73		1	47.5	0.0	001	Signific	ant Effect		
Error	12.97			1.621	86		8	_						
Total	90.09	922					9							
ANOVA Assur		sts												
Attribute	Test						Test Stat			alue		on(α:1%)		
Variance Distribution		nce Ratio f iro-Wilk W			st .		20900 0.895	23.2 0.741	<1.0 0.19	0E-05 925		l Variances Distribution		
Pyrene Summ	•	II O-VVIIK VV	INUIII	anty 16	J.		0.030	0.741	0.13	JZJ	INUITIAL	Distribution		
Sample	Code	e Cou	nt	Mean		95% LCL	95% UCL	Media	n Min		Max	Std Err	CV%	%Effect
IOSN 2019	RS	5 5		0.674		0.659	0.689	0.67	0.6		0.695	0.00557	1.85%	0.00%
AT3-098	110	5		6.23		3.99	8.46	6.62	3.9		8.04	0.805	28.92%	-824.04%
Pyrene Detail														
Sample	Code	e Rep	1	Rep 2	,	Rep 3	Rep 4	Rep 5						
IOSN 2019	RS	0.67		0.665		0.665	0.675	0.695						
AT3-098	,	8.04		6.62		7.73	4.83	3.92						
						-								

# **ATTACHMENT VI**

Nereis virens 28-Day Solid Phase Bioaccumulation Testing Tissue Chemistry and Body Burden Statistical Analyses

**PCBs** 

(29 pages)

#### Yachtsman Marina NAE-2004-00319

#### APPENDIX A. CONCENTRATIONS OF COCs IN THE WORM (N. virens)

			Pre-Assay		
CONTAMINANT	REP1	REP2	REP3	REP4 *	REP5 *
PCB Congeners (ng/g wet wt.)					
PCB 8	0.0630 U	0.0650 U	0.0635 <mark>U</mark>		
PCB 18	0.0460 U	0.0473 U	0.0461 <mark>U</mark>		
PCB 28	0.0780 <mark>U</mark>	0.0805 U	0.0785 <mark>U</mark>		
PCB 44	0.0870 <b>U</b>	0.0895 U	0.0875 <mark>U</mark>		
PCB 52	0.0486 U	0.0500 U	0.0487 <mark>U</mark>		
PCB 66	0.0457 <b>U</b>	0.0470 U	0.0458 <mark>U</mark>		
PCB 101	0.0745 <mark>U</mark>	0.0765 U	0.0745 <mark>U</mark>		
PCB 105	0.0670 U	0.0685 U	0.0670 U		
PCB 118	0.0705 U	0.0725 U	0.0710 U		
PCB 128	0.0835 <mark>U</mark>	0.0855 U	0.0835 <mark>U</mark>		
PCB 138	0.267 J	0.594 J	0.0535 <mark>U</mark>		
PCB 153	0.454 J	0.651 J	0.780		
PCB 170	0.0409 U	0.0421 U	0.0410 U		
PCB 180	0.0419 U	0.0431 U	0.0420 U		
PCB 187	0.646	0.0620 U	0.0600 U		
PCB 195	0.0785 <mark>U</mark>	0.0810 U	0.0790 U		
PCB 206	0.0800 <b>U</b>	0.0825 <mark>U</mark>	0.0805 <mark>U</mark>		
PCB 209	0.0920 <mark>U</mark>	0.0945 U	0.0920 U		
Total PCBs	4.73	4.66	3.79		

<sup>\* =</sup> Qualifiers

U Analyte not detected; below Method Detection Limit; value is one-half the Method Detection Limit

J Analyte estimated; detection below Reporting Limit but above Method Detection Limit

NA Not Analyzed

#### Yachtsman Marina NAE-2004-00319

# APPENDIX A. CONCENTRATIONS OF COCs IN THE WORM (N. virens)

		ı	OSN Reference		
CONTAMINANT	REP1	REP2	REP3	REP4	REP5
PCB Congeners (ng/g wet wt					
PCB 8	0.0475 <mark>U</mark>	0.0475 <mark>U</mark>	0.0475 <mark>U</mark>	0.0480 <mark>U</mark>	0.0495 <mark>U</mark>
PCB 18	0.0345 <mark>U</mark>	0.0345 <mark>U</mark>	0.0345 <mark>U</mark>	0.0350 <mark>U</mark>	0.0360 <mark>U</mark>
PCB 28	0.0590 U	0.0585 <mark>U</mark>	0.0585 <mark>U</mark>	0.0595 <mark>U</mark>	0.0610 <mark>U</mark>
PCB 44	0.0655 <mark>U</mark>	0.0650 <mark>U</mark>	0.0655 <mark>U</mark>	0.0665 <mark>U</mark>	0.0680 <mark>U</mark>
PCB 52	0.0365 <mark>U</mark>	0.0365 <mark>U</mark>	0.0365 <mark>U</mark>	0.0370 U	0.0380 <mark>U</mark>
PCB 66	0.0345 <mark>U</mark>	0.0340 U	0.0345 <mark>U</mark>	0.0350 U	0.0355 <mark>U</mark>
PCB 101	0.0560 <mark>U</mark>	0.0555 <mark>U</mark>	0.0560 <mark>U</mark>	0.0565 <mark>U</mark>	0.0580 <mark>U</mark>
PCB 105	0.0500 U	0.0500 U	0.0500 U	0.0510 U	0.0520 U
PCB 118	0.0530 U	0.0525 <mark>U</mark>	0.0530 <mark>U</mark>	0.0535 <mark>U</mark>	0.0550 U
PCB 128	0.0630 U	0.0620 U	0.0625 U	0.0635 <mark>U</mark>	0.0650 <mark>U</mark>
PCB 138	0.714	0.498	0.0400 U	0.0405 U	0.361 J
PCB 153	0.862	0.621	0.687	1.01	0.636
PCB 170	0.0310 U	0.0305 <mark>U</mark>	0.0305 <mark>U</mark>	0.0310 U	0.0320 U
PCB 180	0.0315 U	0.0315 U	0.0315 U	0.0320 U	0.0325 <mark>U</mark>
PCB 187	0.0455 U	0.0450 U	0.0450 U	0.0455 U	0.0470 U
PCB 195	0.0590 U	0.0585 U	0.0590 U	0.0600 <mark>U</mark>	0.0615 <mark>U</mark>
PCB 206	0.0605 <mark>U</mark>	0.0600 U	0.0600 <del>U</del>	0.0610 <mark>U</mark>	0.0625 <mark>U</mark>
PCB 209	0.0690 <mark>U</mark>	0.0685 <mark>U</mark>	0.0690 <mark>U</mark>	0.0700 U	0.0720 U
Total PCBs	4.74	3.82	3.04	3.71	3.65

<sup>\* =</sup> Qualifiers

U Analyte not detected; belov

J Analyte estimated; detectio

NA Not Analyzed

#### Yachtsman Marina NAE-2004-00319

# APPENDIX A. CONCENTRATIONS OF COCs IN THE WORM (N. virens)

#### 10 Stations at 4 Marinas Mud

CONTAMINANT	REP1	REP2	REP3	REP4	REP5
PCB Congeners (ng/g wet wt					
PCB 8	0.0635 <mark>U</mark>	0.0620 U	0.0630 U	0.0625 U	0.0650 U
PCB 18	0.0463 U	0.0453 U	0.0457 U	0.0455 <b>U</b>	0.0475 U
PCB 28	0.0790 U	0.0770 U	0.0775 <b>U</b>	0.0775 <b>U</b>	0.0810 U
PCB 44	0.0880 U	0.0860 U	0.0865 <mark>U</mark>	0.0860 U	0.0900 U
PCB 52	0.0489 U	0.0478 U	0.0482 U	0.485 J	0.0500 U
PCB 66	0.0460 U	0.0450 U	0.0453 U	0.0451 U	0.0472 U
PCB 101	0.0750 U	0.0730 U	0.0740 U	0.0735 U	0.0770 U
PCB 105	0.0670 U	0.0655 U	3.78	0.0660 U	0.0690 U
PCB 118	0.0710 U	0.0695 U	0.0700 U	0.0695 U	0.0730 U
PCB 128	0.0840 U	0.0820 U	0.0825 U	0.0825 U	0.0860 U
PCB 138	1.00	1.15	0.0530 U	0.0525 U	0.0550 U
PCB 153	1.04	1.48	0.843	0.110 U	0.814
PCB 170	0.0412 U	0.0403 U	0.0406 U	0.0404 <b>U</b>	0.0422 U
PCB 180	0.0422 U	0.0412 U	0.0415 U	0.0414 U	0.0432 U
PCB 187	0.0605 U	0.0590 U	0.0595 U	0.0595 U	0.0620 U
PCB 195	0.0790 U	0.0775 U	0.0780 U	0.0775 U	0.0810 U
PCB 206	0.0805 U	0.0790 U	0.0795 U	0.0790 U	0.0830 U
PCB 209	0.0925 U	0.0905 <mark>U</mark>	0.0910 U	0.0910 U	0.0950 U
Total PCBs	6.21	7.34	11.3	3.29	3.92

<sup>\* =</sup> Qualifiers

U Analyte not detected; belov

J Analyte estimated; detectio

NA Not Analyzed

#### **CETIS Test Data Worksheet**

Report Date:

19 Aug-23 06:57 (p 1 of 1)

Test Code/ID:

TN-23-302NvPCB / 04-0924-3837

**Bioaccumulation Evaluation - PCB Congeners - Nereis** 

EA-EST, Inc. PBC

Start Date: End Date:

Sample Date: 03 Mar-23

08 Mar-23 11:33 05 Apr-23 10:33

Species: Nereis virens

Protocol: US ACE NED RIM (2004)

Material: Laboratory Control Sediment

Sample Code: AT3-152

Sample Source: Yachtsman Marina NAE-2004-00319

Sample Station: Laboratory Control

Sample	Rep	Pos	PCB 008	PCB 018	PCB 028	PCB 044	PCB 052	PCB 066	PCB 101	PCB 105	PCB 118	PCB 128	PCB 138	PCB 153	PCB 170	PCB 180	PCB 187	PCB 195	PCB 206	PCB 209	PCB 087	PCB 049	PCB 183	PCB 184	Total PCBs
IOSN 2019	1	2	0.048	0.035	0.059	0.066	0.037	0.035	0.056	0.05	0.053	0.063	0.714	0.862	0.031	0.032	0.046	0.059	0.061	0.069	0.028	0.064	0.017	0.035	
IOSN 2019	2	3	0.048	0.035	0.059	0.065	0.037	0.034	0.056	0.05	0.053	0.062	0.498	0.621	0.031	0.032	0.045	0.059	0.06	0.069	0.028	0.064	0.017	0.035	
IOSN 2019	3	5	0.048	0.035	0.059	0.066	0.037	0.035	0.056	0.05	0.053	0.063	0.04	0.687	0.031	0.032	0.045	0.059	0.06	0.069	0.028	0.064	0.017	0.035	
IOSN 2019	4	8	0.048	0.035	0.06	0.067	0.037	0.035	0.057	0.051	0.054	0.064	0.041	1.01	0.031	0.032	0.046	0.06	0.061	0.07	0.028	0.065	0.017	0.035	
IOSN 2019	5	10	0.05	0.036	0.061	0.068	0.038	0.036	0.058	0.052	0.055	0.065	0.361	0.636	0.032	0.033	0.047	0.062	0.063	0.072	0.029	0.067	0.018	0.036	
AT3-098	1	1	0.064	0.046	0.079	0.088	0.049	0.046	0.075	0.067	0.071	0.084	1	1.04	0.041	0.042	0.061	0.079	0.081	0.093	0.037	0.086	0.023	0.046	
AT3-098	2	4	0.062	0.045	0.077	0.086	0.048	0.045	0.073	0.066	0.07	0.082	1.15	1.48	0.040	0.041	0.059	0.078	0.079	0.091	0.037	0.084	0.022	0.045	
AT3-098	3	6	0.063	0.046	0.078	0.087	0.048	0.045	0.074	3.78	0.07	0.083	0.053	0.843	0.041	0.042	0.06	0.078	0.08	0.091	0.037	0.085	0.022	0.046	
AT3-098	4	7	0.063	0.045	0.078	0.086	0.485	0.045	0.074	0.066	0.07	0.083	0.053	0.11	0.040	0.041	0.06	0.078	0.079	0.091	0.037	0.084	0.022	0.045	
AT3-098	5	9	0.065	0.048	0.081	0.09	0.05	0.047	0.077	0.069	0.073	0.086	0.055	0.814	0.042	0.043	0.062	0.081	0.083	0.095	0.038	0.088	0.023	0.048	

IOSN 2019

**Report Date:** 19 Aug-23 06:58 (p 1 of 5) **Test Code/ID:** TN-23-302NvPCB / 04-0924-3837

Eco-Analysts, Inc.

#### **Bioaccumulation Evaluation - PCB Congeners - Nereis**

13-4648-8170

08 Mar-23

EA-EST, Inc. PBC

Dredged Sediment Evalu

Sample Code	Sample ID	Sample Da	te Receipt Date	Sample Age	Client Nan	ne Project
Sample Age:	5d 12h	Client:	Eco-Analysts, Inc.			
Receipt Date:	03 Mar-23 12:30	CAS (PC):			Station:	Laboratory Control
Sample Date:	03 Mar-23	Material:	Laboratory Control Sedi	ment	Source:	Yachtsman Marina NAE-2004-00319 (
Sample ID:	11-9755-1044	Code:	AT3-152		Project:	Dredged Sediment Evaluation
Test Length:	27d 23h	Taxon:	Polychaeta		Source:	ARO - Aquatic Research Or <b>Age:</b>
Ending Date:	05 Apr-23 10:33	Species:	Nereis virens		Brine:	Crystal Sea
Start Date:	08 Mar-23 11:33	Protocol:	US ACE NED RIM (200	4)	Diluent:	Not Applicable
Batch ID:	16-3825-9393	Test Type:	Bioaccumlation - PCBs	- Nv	Analyst:	Nancy Roka

AT3-098	07-1559-4974 08 Fe	eb-23 13:00 09 Fe	b-23 16:30 27d 20	3h	
Sample Code	Material Type	Sample Sou	ce	Station Location	Lat/Long
IOSN 2019	Reference sediment	Yachtsman N	arina NAE-2004-00	IOSN Reference	
AT3-098	Marine Sediment	Yachtsman N	arina NAE-2004-00	10 Stations at 4 Marinas M	u

12h

08 Mar-23

Single Compa	arison Summary				
Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	s
02-9121-2104	PCB 008	Equal Variance t Two-Sample Test	<1.0E-05	AT3-098 failed pcb 008	1
13-8217-6257	PCB 018	Equal Variance t Two-Sample Test	<1.0E-05	AT3-098 failed pcb 018	1
11-4561-0244	PCB 028	Equal Variance t Two-Sample Test	<1.0E-05	AT3-098 failed pcb 028	1
16-1112-5112	PCB 044	Equal Variance t Two-Sample Test	<1.0E-05	AT3-098 failed pcb 044	1
09-0192-7086	PCB 052	Equal Variance t Two-Sample Test	<1.0E-05	AT3-098 failed pcb 052	1
13-3296-8099	PCB 052	Wilcoxon Rank Sum Two-Sample Test	0.0040	AT3-098 failed pcb 052	1
11-5197-6838	PCB 066	Equal Variance t Two-Sample Test	<1.0E-05	AT3-098 failed pcb 066	1
18-8869-0510	PCB 101	Equal Variance t Two-Sample Test	<1.0E-05	AT3-098 failed pcb 101	1
16-3802-4478	PCB 105	Equal Variance t Two-Sample Test	<1.0E-05	AT3-098 failed pcb 105	1
07-4136-0669	PCB 105	Wilcoxon Rank Sum Two-Sample Test	0.0040	AT3-098 failed pcb 105	1
00-9484-6417	PCB 118	Equal Variance t Two-Sample Test	<1.0E-05	AT3-098 failed pcb 118	1
13-1827-6879	PCB 128	Equal Variance t Two-Sample Test	<1.0E-05	AT3-098 failed pcb 128	1
11-3728-5619	PCB 138	Equal Variance t Two-Sample Test	0.3277	AT3-098 passed pcb 138	1
20-6837-7661	PCB 153	Equal Variance t Two-Sample Test	0.3489	AT3-098 passed pcb 153	1
12-6194-5314	PCB 170	Equal Variance t Two-Sample Test	<1.0E-05	AT3-098 failed pcb 170	1
05-3230-0024	PCB 180	Equal Variance t Two-Sample Test	<1.0E-05	AT3-098 failed pcb 180	1
05-4569-7612	PCB 187	Equal Variance t Two-Sample Test	<1.0E-05	AT3-098 failed pcb 187	1
02-2598-3391	PCB 195	Equal Variance t Two-Sample Test	<1.0E-05	AT3-098 failed pcb 195	1
03-1612-5429	PCB 206	Equal Variance t Two-Sample Test	<1.0E-05	AT3-098 failed pcb 206	1
15-1840-5518	PCB 209	Equal Variance t Two-Sample Test	<1.0E-05	AT3-098 failed pcb 209	1

Report Date: Test Code/ID: 19 Aug-23 06:58 (p 2 of 5) TN-23-302NvPCB / 04-0924-3837

#### **Bioaccumulation Evaluation - PCB Congeners - Nereis**

Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
•	RS		0.048	0.0469		0.0475	0.0495			1.80%	0.00%
IOSN 2019 AT3-098	KS	5 5	0.048	0.0469	0.0491 0.0646	0.0475	0.0495	0.000387 0.000515	0.000866 0.00115	1.80%	-31.67%
A13-096		J	0.0032	0.0010	0.0040	0.002	0.005	0.000515	0.00113	1.0270	-31.07 70
PCB 018 Summa	ry										
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
IOSN 2019	RS	5	0.0349	0.0341	0.0357	0.0345	0.036	0.000292	0.000652	1.87%	0.00%
AT3-098		5	0.046	0.0449	0.0472	0.0453	0.0475	0.000403	0.000901	1.96%	-31.92%
PCB 028 Summa	ry										
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
IOSN 2019	RS	5	0.0593	0.058	0.0606	0.0585	0.061	0.000464	0.00104	1.75%	0.00%
AT3-098		5	0.0784	0.0764	0.0804	0.077	0.081	0.000731	0.00164	2.09%	-32.21%
PCB 044 Summa	ry										
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
IOSN 2019	RS	5	0.0661	0.0646	0.0676	0.065	0.068	0.000534	0.00119	1.81%	0.00%
AT3-098		5	0.0873	0.0852	0.0894	0.086	0.09	0.000768	0.00172	1.97%	-32.07%
PCB 052 Summa	ry										
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
IOSN 2019	RS	5	0.0369	0.0361	0.0377	0.0365	0.038	0.000292	0.000652	1.77%	0.00%
AT3-098		5	0.136	-0.106	0.378	0.0478	0.485	0.0873	0.195	143.48%	-268.51%
PCB 066 Summa	ry										
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
IOSN 2019	RS	5	0.0347	0.034	0.0354	0.034	0.0355	0.000255	0.00057	1.64%	0.00%
AT3-098		5	0.0457	0.0446	0.0468	0.045	0.0472	0.000405	0.000905	1.98%	-31.70%
PCB 101 Summa	ry										
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
IOSN 2019	RS	5	0.0564	0.0552	0.0576	0.0555	0.058	0.00043	0.000962	1.71%	0.00%
AT3-098		5	0.0745	0.0725	0.0765	0.073	0.077	0.000707	0.00158	2.12%	-32.09%
PCB 105 Summa	ry										
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
IOSN 2019	RS	5	0.0506	0.0495	0.0517	0.05	0.052	0.0004	0.000894	1.77%	0.00%
AT3-098		5	0.809	-1.25	2.87	0.0655	3.78	0.743	1.66	205.13%	-1499.80
PCB 118 Summa	ry										
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
IOSN 2019	RS	5	0.0534	0.0522	0.0546	0.0525	0.055	0.00043	0.000962	1.80%	0.00%
AT3-098		5	0.0706	0.0688	0.0724	0.0695	0.073	0.00066	0.00147	2.09%	-32.21%
PCB 128 Summa	ry										
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
IOSN 2019	RS	5	0.0632	0.0618	0.0646	0.062	0.065	0.000515	0.00115	1.82%	0.00%
AT3-098		5	0.0834	0.0814	0.0854	0.082	0.086	0.000731	0.00164	1.96%	-31.96%
PCB 138 Summa	ry										
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
IOSN 2019	RS	5	0.331	-0.0337	0.695	0.04	0.714	0.131	0.293	88.75%	0.00%
AT3-098		5	0.462	-0.236	1.16	0.0525	1.15	0.251	0.562	121.62%	-39.73%

### **CETIS Summary Report**

Report Date: Test Code/ID: 19 Aug-23 06:58 (p 3 of 5) TN-23-302NvPCB / 04-0924-3837

#### **Bioaccumulation Evaluation - PCB Congeners - Nereis**

PCB 153 Summ	nary										
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
IOSN 2019	RS	5	0.763	0.555	0.972	0.621	1.01	0.0751	0.168	22.01%	0.00%
AT3-098		5	0.857	0.242	1.47	0.11	1.48	0.222	0.495	57.78%	-12.34%
PCB 170 Summ	nary										
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
IOSN 2019	RS	5	0.031	0.0302	0.0318	0.0305	0.032	0.000274	0.000612	1.98%	0.00%
AT3-098		5	0.0409	0.0399	0.0419	0.0402	0.0422	0.000357	0.000798	1.95%	-31.97%
PCB 180 Summ	nary										
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
IOSN 2019	RS	5	0.0318	0.0312	0.0324	0.0315	0.0325	0.0002	0.000447	1.41%	0.00%
AT3-098		5	0.0419	0.0409	0.0429	0.0412	0.0432	0.000368	0.000822	1.96%	-31.70%
PCB 187 Summ	nary										
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
IOSN 2019	RS	5	0.0456	0.0446	0.0466	0.045	0.047	0.000367	0.000822	1.80%	0.00%
AT3-098		5	0.0601	0.0586	0.0616	0.059	0.062	0.000534	0.00119	1.99%	-31.80%
PCB 195 Summ	nary										
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
IOSN 2019	RS	5	0.0596	0.0581	0.0611	0.0585	0.0615	0.000534	0.00119	2.00%	0.00%
AT3-098		5	0.0786	0.0768	0.0804	0.0775	0.081	0.00066	0.00147	1.88%	-31.88%
PCB 206 Summ	nary										
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
IOSN 2019	RS	5	0.0608	0.0595	0.0621	0.06	0.0625	0.000464	0.00104	1.71%	0.00%
AT3-098		5	0.0802	0.0781	0.0823	0.079	0.083	0.000752	0.00168	2.10%	-31.91%
PCB 209 Summ	nary										
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
IOSN 2019	RS	5	0.0697	0.068	0.0714	0.0685	0.072	0.000624	0.0014	2.00%	0.00%
AT3-098		5	0.092	0.0897	0.0943	0.0905	0.095	0.000822	0.00184	2.00%	-31.99%

Report Date: Test Code/ID: 19 Aug-23 06:58 (p 4 of 5) TN-23-302NvPCB / 04-0924-3837

Bioaccumulation	Evaluation	- PCB	Congeners	- Nereis

Bioaccumulation	Evaluation	n - PCB Con	geners - Ne	ereis			EA-EST, Inc. PBC
PCB 008 Detail							MD5: B6CD15DC1443B921495F7DFEACB92387
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
IOSN 2019	RS	0.0475	0.0475	0.0475	0.048	0.0495	
AT3-098		0.0635	0.062	0.063	0.0625	0.065	
PCB 018 Detail							MD5: 0A8FA30BC4B1B12BC4E49675F270B3A8
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
IOSN 2019	RS	0.0345	0.0345	0.0345	0.035	0.036	
AT3-098		0.0463	0.0453	0.0457	0.0454	0.0475	
PCB 028 Detail							MD5: 6FBFC0FADFAA4B848CA74B7F828197E2
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
IOSN 2019	RS	0.059	0.0585	0.0585	0.0595	0.061	
AT3-098		0.079	0.077	0.0775	0.0775	0.081	
PCB 044 Detail							MD5: 1C1D1CB6B4C2ADEFF1E79CE2C642DB23
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	MBS. 101010000402ADE11 1E730E20042BD20
IOSN 2019	RS	0.0655	0.065	0.0655	0.0665	0.068	
AT3-098	110	0.088	0.086	0.0865	0.086	0.09	
							MDE: 2020C427A4DDA200DA0C240CEC0ACCED
PCB 052 Detail							MD5: 3920C127A4BDA389DA0F319C5F8AFCEB
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
IOSN 2019	RS	0.0365	0.0365	0.0365	0.037	0.038	
AT3-098		0.0489	0.0478	0.0482	0.485	0.05	
PCB 066 Detail							MD5: 4EE269D0EA41A6E9E9823C291BDE5535
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
IOSN 2019	RS	0.0345	0.034	0.0345	0.035	0.0355	
AT3-098		0.046	0.045	0.0453	0.0451	0.0472	
PCB 101 Detail							MD5: B20C9DAA8B6E4F50398B841B80DA6C21
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
IOSN 2019	RS	0.056	0.0555	0.056	0.0565	0.058	
AT3-098		0.075	0.073	0.074	0.0735	0.077	
PCB 105 Detail							MD5: 4E29C9426F5B6AA09DB8A3D99E3FD1F6
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
IOSN 2019	RS	0.05	0.05	0.05	0.051	0.052	
AT3-098		0.067	0.0655	3.78	0.066	0.069	
PCB 118 Detail							MD5: 1B5869B575FE2659921098AB6726212A
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
IOSN 2019	RS	0.053	0.0525	0.053	0.0535	0.055	
AT3-098		0.071	0.0695	0.07	0.0695	0.073	
PCB 128 Detail							MD5: 0803864E2A529E2E5537574498EE36A7
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
IOSN 2019	RS	0.063	0.062	0.0625	0.0635	0.065	
AT3-098		0.084	0.082	0.0825	0.0825	0.086	
PCB 138 Detail							MD5: F6533DA9A7F279C17F5EED8E45DF3AB9
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
IOSN 2019	RS	0.714	0.498	0.04	0.0405	0.361	
AT3-098		1	1.15	0.053	0.0525	0.055	

# **CETIS Summary Report**

Report Date: Test Code/ID: 19 Aug-23 06:58 (p 5 of 5) TN-23-302NvPCB / 04-0924-3837

Bioaccumulation Eva	aluation - PCE	Congeners -	Nereis
Dioaccamalation Eve	u.uu 0 =	Congenera	1101010

PCB 153 Detail							MD5: F3D0988551B15E211EEF7D3467C18071
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
IOSN 2019	RS	0.862	0.621	0.687	1.01	0.636	
AT3-098		1.04	1.48	0.843	0.11	0.814	
PCB 170 Detail							MD5: 23C6B5B239CEFCFA428787F92E620FE3
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
IOSN 2019	RS	0.031	0.0305	0.0305	0.031	0.032	
AT3-098		0.0411	0.0402	0.0406	0.0404	0.0422	
PCB 180 Detail							MD5: 470506518B2F2F8E005B0E35E4536EB0
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
IOSN 2019	RS	0.0315	0.0315	0.0315	0.032	0.0325	
AT3-098		0.0421	0.0412	0.0415	0.0413	0.0432	
PCB 187 Detail							MD5: 4EBDDEB24063208E6681206C01A3F2F5
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
IOSN 2019	RS	0.0455	0.045	0.045	0.0455	0.047	
AT3-098		0.0605	0.059	0.0595	0.0595	0.062	
PCB 195 Detail							MD5: CA8DC931CC03C1416788B6DD2F3BD47
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
IOSN 2019	RS	0.059	0.0585	0.059	0.06	0.0615	
AT3-098		0.079	0.0775	0.078	0.0775	0.081	
PCB 206 Detail							MD5: 1F069A22AD4D1FA756C1F37E04C63A59
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
IOSN 2019	RS	0.0605	0.06	0.06	0.061	0.0625	
AT3-098		0.0805	0.079	0.0795	0.079	0.083	
PCB 209 Detail							MD5: FAAA6B62B98D4AE5FBE056DA1E916DA
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
IOSN 2019	RS	0.069	0.0685	0.069	0.07	0.072	
AT3-098		0.0925	0.0905	0.091	0.091	0.095	

STUDY: TN-23-302

CLIENT: Eco-Analysts, Inc.

PROJECT: Yachtsman Marina, Kennebunkport, ME NAE-2004-00319

ASSAY: *N. virens* 28-day Bioaccumulation Evaluation TASK: Statistical Analysis of Body Burden PCBs

Endpoint	Method	С	<	Т	Statistic	Critical	P Level	Alpha	Reject Null	MSD	DF	Ties	P-Type
PCB 008	Equal Variance t Two-Sample Test	IOSN	<	Comp	23.59498	1.859548	0	0.05	TRUE	0.00119793	8		С
PCB 018	Equal Variance t Two-Sample Test	IOSN	<	Comp	22.39903	1.859548	0	0.05	TRUE	0.000924833	8		С
PCB 028	Equal Variance t Two-Sample Test	IOSN	<	Comp	22.05477	1.859548	0	0.05	TRUE	0.001610416	8		С
PCB 044	Equal Variance t Two-Sample Test	IOSN	<	Comp	22.66373	1.859548	0	0.05	TRUE	0.001739449	8		С
PCB 052	Wilcoxon Rank Sum Two-Sample Test	IOSN	<	Comp	15		0.003968254	0.05	TRUE		8	0	E
PCB 052	Equal Variance t Two-Sample Test	IOSN	<	Comp	22.01617	1.894579	0	0.05	TRUE	0.001017588	7		С
PCB 066	Equal Variance t Two-Sample Test	IOSN	<	Comp	22.99916	1.859548	0	0.05	TRUE	0.000889381	8		С
PCB 101	Equal Variance t Two-Sample Test	IOSN	<	Comp	21.86922	1.859548	0	0.05	TRUE	0.001539049	8		С
PCB 105	Equal Variance t Two-Sample Test	IOSN	<	Comp	19.91628	1.894579	0	0.05	TRUE	0.001548194	7		С
PCB 105	Wilcoxon Rank Sum Two-Sample Test	IOSN	<	Comp	15		0.003968254	0.05	TRUE		8	0	E
PCB 118	Equal Variance t Two-Sample Test	IOSN	<	Comp	21.84402	1.859548	0	0.05	TRUE	0.00146421	8		С
PCB 128	Equal Variance t Two-Sample Test	IOSN	<	Comp	22.5843	1.859548	0	0.05	TRUE	0.00166323	8		С
PCB 138	Equal Variance t Two-Sample Test	IOSN	<	Comp	0.4634183	1.859548	0.3277057	0.05	FALSE	0.5272658	8		С
PCB 153	Equal Variance t Two-Sample Test	IOSN	<	Comp	0.402669	1.859548	0.3488687	0.05	FALSE	0.435021	8		С
PCB 170	Equal Variance t Two-Sample Test	IOSN	<	Comp	22.03038	1.859548	0	0.05	TRUE	0.000836487	8		С
PCB 180	Equal Variance t Two-Sample Test	IOSN	<	Comp	24.08549	1.859548	0	0.05	TRUE	0.000778238	8		С
PCB 187	Equal Variance t Two-Sample Test	IOSN	<	Comp	22.37401	1.859548	0	0.05	TRUE	0.001205124	8		С
PCB 195	Equal Variance t Two-Sample Test	IOSN	<	Comp	22.39171	1.859548	0	0.05	TRUE	0.001577879	8		С
PCB 206	Equal Variance t Two-Sample Test	IOSN	<	Comp	21.96619	1.859548	0	0.05	TRUE	0.001642307	8		С
PCB 209	Equal Variance t Two-Sample Test	IOSN	<	Comp	21.60877	1.859548	0	0.05	TRUE	0.001919032	8		С

Report Date: 19 Aug-23 06:58 (p 1 of 18)
Test Code/ID: TN-23-302NvPCB / 04-0924-3837

	<b>,</b>									T	est Co	de/ID:	TN-23-302	NvPCB / 0	4-0924-3837
Bioaccumula	tion	Evaluation	- PCB	Cong	eners -	- Nere	eis							EA-ES	T, Inc. PBC
Analysis ID: Analyzed: Edit Date:	19 /	9121-2104 Aug-23 6:57 May-23 22:5		Ana	point: lysis: i Hash:	Para	metric-Two	Sample 829C5A69	B72184	3C7316		S Version is Level: or ID:	: CETISv2 1	.1.1	
Batch ID: Start Date: Ending Date: Test Length:	08 N 05 A	•		Prot	ocol:	US A	ccumlation ACE NED Feis virens chaeta	- PCBs - N RIM (2004)	V		Analy Dilue Brine Sour	ent: No e: Cry	ncy Roka t Applicable ⁄stal Sea O - Aquatic F	Research (	Or <b>Age:</b>
Sample Code	)	Sample II	D	Sam	ple Da	te	Receipt	Date	Sample	Age	Clien	t Name	Pr	oject	
IOSN 2019 AT3-098		13-4648-8 07-1559-4			1ar-23 eb-23 1	13:00	08 Mar- 09 Feb-		12h 27d 23	h	Eco-/	Analysts, Ir	nc. Dr	edged Sed	liment Evalu
Sample Code	)	Material 1	Гуре			Sam	ple Source	9		Station	Location	on	Lat/Long		
IOSN 2019		Reference		ent		Yach	ntsman Mai	rina NAE-20	004-00	IOSN R	eferenc	e			
AT3-098		Marine Se	ediment	t		Yach	ntsman Mai	rina NAE-20	004-00	10 Statio	ons at 4	Marinas M	Лu		
Data Transfor	rm		Alt I	Нур					Comp	arison R	Result				PMSD
Untransformed	d		C < 7	Γ					AT3-0	98 failed	pcb 00	8 endpoint			2.50%
Equal Variand Sample I Reference Sec	vs	Sample II AT3-098*	e Test	df 8	<b>Test 9</b> 23.6	Stat	Critical	<b>MSD</b> 0.0012	P-Typ		<b>/alue</b> 0E-05	<b>Decision</b> Significan	<u> </u>		
Auxiliary Test Attribute Outlier	ts	<b>Test</b> Grubbs E	Extreme	e Valu	ıe Test			Test Stat	Critic		<b>/alue</b> 839	<b>Decision</b> No Outlie	n(α:5%) ers Detected		
ANOVA Table	)														
Source		Sum Squ	ares		Mean	Squa	are	DF	F Stat	: P-\	/alue	Decision	ι(α:5%)		
Between Error Total		0.0005776 0.0000083 0.0005859	3		0.000 1.038			1 8 9	557 —	<1.	0E-05	Significa	nt Effect		
ANOVA Assu	mpti	ons Tests													
Attribute	-	Test						Test Stat	Critic	al P-\	/alue	Decision	ι(α:1%)		
Variance Distribution		Variance I Shapiro-W				st		1.77 0.872	23.2 0.741	0.5	950 046	Equal Va	. ,		
PCB 008 Sum	ımar	v													
Sample		Code	Cou	nt	Mean		95% LCL	95% UCL	Media	an Mir	า	Max	Std Err	CV%	%Effect
IOSN 2019		RS	5		0.048		0.0469	0.0491	0.047		475	0.0495	0.000387	1.80%	0.00%
AT3-098			5		0.063		0.0618	0.0646	0.063			0.065	0.000515	1.82%	-31.67%
PCB 008 Deta	ail														
Sample		Code	Rep	1	Rep 2	<u> </u>	Rep 3	Rep 4	Rep 5						
IOSN 2019		RS	0.047		0.047		0.0475	0.048	0.049						
AT3-098			0.063		0.062		0.063	0.0625	0.065						

Report Date: Test Code/ID: 19 Aug-23 06:58 (p 2 of 18) TN-23-302NvPCB / 04-0924-3837

Bioaccumulat	ion Evaluat	ion - PCB C	Congen	ers - Ne	reis						EA-ES	T, Inc. PBC
Analysis ID: Analyzed: Edit Date:	13-8217-62 19 Aug-23 6 08 May-23 2	6:57	Analysi		CB 018 rametric-Two DA257F039I	•	'81E2EB20	Sta	TIS Version tus Level: tor ID:	: CETISv2 1	.1.1	
Batch ID: Start Date: Ending Date: Test Length:	•	11:33 0:33	Test Ty Protoco Species Taxon:	ol: US s: Ne	paccumlation ACE NED F reis virens lychaeta		V	Dilu Brir	ne: No	ncy Roka t Applicable /stal Sea O - Aquatic F	Research (	Or <b>Age:</b>
Sample Code IOSN 2019 AT3-098		48-8170	Sample 08 Mar- 08 Feb-		Receipt 08 Mar- 0 09 Feb-	23	<b>Sample A</b> 12h 27d 23h		<b>nt Name</b> -Analysts, Ir		<b>oject</b> edged Sed	diment Evalu
Sample Code IOSN 2019 AT3-098	Refer	rial Type ence sedime e Sediment	ent	Ya	mple Sourc chtsman Ma chtsman Ma	rina NAE-20	004-00 IC	tation Locat OSN Referen OStations at	ce	<b>Lat/Long</b> Mu		
Data Transfor	m	Alt H	ур				Compar	ison Result				PMSD
Untransformed	l	C < T					AT3-098	failed pcb 0	18 endpoint			2.65%
Equal Variance Sample I Reference Sec	vs Sampl	e II		est Stat 2.4	Critical	MSD 0.000925	P-Type CDF	P-Value <1.0E-05	<b>Decision</b> Significal	, ,		
Auxiliary Test Attribute Outlier	Test	bs Extreme	Value T	est		Test Stat	Critical 2.29	<b>P-Value</b> 0.2663	<b>Decisior</b> No Outlie	n(α:5%) ers Detected		
ANOVA Table						DE.	F 04-4	D. Volus	Desistan	(50()		
Between Error Total	0.000 4.947 0.000	E-06	0.	ean Sq .000310 .184E-0	2	<b>DF</b> 1 8	<b>F Stat</b> 502	<b>P-Value</b> <1.0E-05	<b>Decision</b> Significan	, ,		
ANOVA Assur Attribute Variance Distribution	Test Variar	nce Ratio F		/ Test		Test Stat 1.91 0.826	<b>Critical</b> 23.2 0.741	<b>P-Value</b> 0.5462 0.0299	<b>Decisior</b> Equal Va Normal D	<u> </u>		
PCB 018 Sum				<u>'</u>								
Sample IOSN 2019	Code RS	Coun 5		<b>ean</b> .0349	<b>95% LCL</b> 0.0341	<b>95% UCL</b> 0.0357	Median 0.0345	<b>Min</b> 0.0345	<b>Max</b> 0.036	<b>Std Err</b> 0.000292	<b>CV%</b>	%Effect 0.00%
AT3-098		5		.046	0.0449	0.0472	0.0457	0.0453	0.0475	0.000403	1.96%	-31.92%
PCB 018 Deta	il											
Sample	Code			ep 2	Rep 3	Rep 4	Rep 5					
IOSN 2019 AT3-098	RS	0.034 0.046		.0345 .0453	0.0345 0.0457	0.035 0.0455	0.036 0.0475					

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Diagrammulati	ion Francisco	DCD Com	N	!-						EA E0	T Inc. DDC
Bioaccumulat	ion Evaluation									EA-ES	T, Inc. PBC
	11-4561-0244		dpoint: P		0 1			S Version		.1.1	
•	19 Aug-23 6:57 08 May-23 22:5		•	arametric-Two 3664154466A	•	621086E00		ıs Level: or ID:	1		
Euit Date.	00 May-23 22.3						702 Euite	טו ול.			
Batch ID:	16-3825-9393			ioaccumlation		V	Anal	-	incy Roka		
	08 Mar-23 11:3			S ACE NED F	RIM (2004)		Dilue		t Applicable		
•	05 Apr-23 10:33	•		ereis virens			Brine		ystal Sea		
Test Length:	27d 23h	lax	on: P	olychaeta			Sour	ce: AR	RO - Aquatic F	Research (	Or <b>Age:</b>
Sample Code	Sample II		nple Date	Receipt	t Date	Sample Ag	je Clier	nt Name		oject	
IOSN 2019	13-4648-8		Mar-23	08 Mar-		12h	Eco-/	Analysts, I	nc. Dr	edged Sed	diment Evalu
AT3-098	07-1559-4	1974 08	Feb-23 13:	00 09 Feb-	23 16:30	27d 23h					
Sample Code	Material <sup>7</sup>	Гуре	S	ample Sourc	е	Sta	ation Location	on	Lat/Long		
IOSN 2019	Reference	e sediment	Y	achtsman Ma	rina NAE-20	004-00 103	SN Referenc	e			
AT3-098	Marine Se	ediment	Y	achtsman Ma	rina NAE-20	004-00 10	Stations at 4	Marinas I	Mu		
Data Transfori	m	Alt Hyp				Comparis	son Result				PMSD
Untransformed		C < T				AT3-098 f	failed pcb 02	8 endpoint	t		2.72%
Equal Varianc	e t Two-Sample	e Test									
	/s Sample II	d	Test Sta	t Critical	MSD	P-Type	P-Value	Decision	n(a:5%)		
Reference Sed		8	22.1	1.86	0.00161	CDF	<1.0E-05	Significa	• •		
								9			
Auxiliary Tests											
Attribute	Test				Test Stat		P-Value	Decision	` ,		
Outlier	Grubbs E	Extreme Val	ue Test		2.01	2.29	0.2206	No Outlie	ers Detected		
ANOVA Table											
Source	Sum Squ	ares	Mean So	quare	DF	F Stat	P-Value	Decision	n(α:5%)		
Between	0.0009120	)	0.00091	20	1	486	<1.0E-05	Significa	nt Effect		
Error	0.000015		1.875E-0	)6	8	_					
Total	0.000927	0			9						
ANOVA Assun	nptions Tests			<u> </u>					<u> </u>		
Attribute	Test				Test Stat	Critical	P-Value	Decision	n(α:1%)		
Attribute Variance		Ratio F Tes	t		Test Stat 2.49	Critical 23.2	<b>P-Value</b> 0.3988	Decision Equal Va	<u> </u>		
	Variance	Ratio F Tes Vilk W Norn	=					Equal Va	<u> </u>		
Variance	Variance Shapiro-V		=		2.49	23.2	0.3988	Equal Va	ariances		
Variance Distribution	Variance Shapiro-V		=	95% LCL	2.49	23.2 0.741	0.3988	Equal Va	ariances	CV%	%Effect
Variance Distribution PCB 028 Summ	Variance Shapiro-V	Vilk W Norn	nality Test	<b>95% LCL</b> 0.058	2.49 0.871	23.2 0.741	0.3988 0.1027	Equal Va	ariances Distribution	<b>CV%</b> 1.75%	%Effect 0.00%
Variance Distribution PCB 028 Summanulus Sample	Variance Shapiro-V mary Code	Vilk W Norn	Mean		2.49 0.871 <b>95% UCL</b>	23.2 0.741 Median	0.3988 0.1027 <b>Min</b>	Equal Va	ariances Distribution Std Err		
Variance Distribution  PCB 028 Summare Sample IOSN 2019	Variance Shapiro-V mary Code RS	Count	Mean 0.0593	0.058	2.49 0.871 <b>95% UCL</b> 0.0606	23.2 0.741 <b>Median</b> 0.059	0.3988 0.1027 <b>Min</b> 0.0585	Equal Va Normal E Max 0.061	Std Err 0.000464	1.75%	0.00%
Variance Distribution  PCB 028 Sumi Sample IOSN 2019 AT3-098	Variance Shapiro-V mary Code RS	Count	Mean 0.0593 0.0784	0.058 0.0764	2.49 0.871 <b>95% UCL</b> 0.0606 0.0804	23.2 0.741 <b>Median</b> 0.059	0.3988 0.1027 <b>Min</b> 0.0585	Equal Va Normal E Max 0.061	Std Err 0.000464	1.75%	0.00%
Variance Distribution  PCB 028 Sumi Sample IOSN 2019 AT3-098  PCB 028 Detail	Variance Shapiro-W mary Code RS	Count 5 5	Mean 0.0593	0.058	2.49 0.871 <b>95% UCL</b> 0.0606	23.2 0.741 <b>Median</b> 0.059 0.0775	0.3988 0.1027 <b>Min</b> 0.0585	Equal Va Normal E Max 0.061	Std Err 0.000464	1.75%	0.00%

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	,									T	est Co	de/ID:	TN-23-30	2NvPCB	/ 04-0924-3
Bioaccumulat	tion E	valuation -	РСВ (	Cong	eners ·	- Nere	is							EA-E	EST, Inc. PE
Analysis ID: Analyzed: Edit Date:	19 A	112-5112 ug-23 6:57 ay-23 22:52		Anal	point: ysis: Hash:	Parai	metric-Two	Sample DD8669A3 <i>i</i>	AD481C	61CFF0A	Statu	S Version: is Level: or ID:	CETISv 1	2.1.1	
Batch ID:		825-9393			• •			- PCBs - N	V		Analy		ncy Roka		
Start Date:		lar-23 11:33			ocol:		CE NED F	(IM (2004)			Dilue		Applicable		
Ending Date: Test Length:		•		Spec			is virens haeta				Brine Sour	•	stal Sea O - Aquatic	Pagarak	o Or Ago:
		2311		Tax	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	Folyc	паеца				Jour	Ce. AN			Age.
Sample Code		Sample ID			ple Da	te	Receipt		Sample	Age		t Name		Project	
IOSN 2019		13-4648-81			lar-23		08 Mar-		12h		Eco-	Analysts, In	c. E	Oredged S	Sediment Eva
AT3-098		07-1559-49	974	1 80	eb-23 1	13:00	09 Feb-	23 16:30	27d 23	h ———					
Sample Code		Material Ty	/pe			Samı	ple Source	9		Station I	Locatio	on	Lat/Long	g	
IOSN 2019		Reference	sedim	ent		Yach	tsman Mar	ina NAE-20	004-00	IOSN Re	ferenc	е			
AT3-098		Marine Sed	liment			Yach	tsman Mar	ina NAE-20	004-00	10 Statio	ns at 4	Marinas M	1u		
Data Transfor	m		Alt H	ур					Comp	arison R	esult				PMSD
Untransformed	t		C < T						AT3-0	98 failed	pcb 04	4 endpoint			2.63%
Equal Variand	ce t Tv	wo-Sample	Test												
Sample I	vs	Sample II		df	Test S	Stat	Critical	MSD	Р-Тур	e P-V	alue	Decision	(α:5%)		
Reference Sec		AT3-098*		8	22.7		1.86	0.00174	CDF		DE-05	Significan	t Effect		
Auxiliary Test	s														
Attribute		Test						Test Stat	Critic	al P-V	alue	Decision	(a:5%)		
Outlier		Grubbs Ex	treme	Valu	e Test			1.94	2.29	0.30			rs Detected	 :	
ANOVA Table															
Source		Cum Caua	*00		Moon	Sauc	**	DF	F Stat	. D.V	alue	Decision	(a. E0/ )		
Between		Sum Squa 0.0011236	162		0.001	Squa	16	1	514		DE-05	Decision Significar	• •		
Error		0.00011230			2.188			8	314	~1.0	JE-03	Significal	it Ellect		
Total		0.0011411						9	_						
ANOVA Assur	mptio	ns Tests													
Attribute		Test						Test Stat	Critic	al P-V	alue	Decision	(α:1%)		
Variance		Variance R	atio F	Test				2.07	23.2	0.49	983	Equal Va	· ,		
Distribution		Shapiro-Wi	lk W N	lorma	ality Te	st		0.861	0.741	0.07	775	Normal D	istribution		
PCB 044 Sum	marv														
Sample	,	Code	Coun	t	Mean	,	95% LCL	95% UCL	Media	n Min		Max	Std Err	CV%	%Effec
IOSN 2019		RS	5		0.066	1	0.0646	0.0676	0.065	5 0.06	35	0.068	0.000534	1.81%	0.00%
AT3-098			5		0.087	3	0.0852	0.0894	0.086	5 0.08	36	0.09	0.000768	3 1.97%	-32.079
PCB 044 Deta	il														
Sample		Code	Rep 1	l	Rep 2	2	Rep 3	Rep 4	Rep 5						
IOSN 2019		RS	0.065		0.065		0.0655	0.0665	0.068						
AT3-098			0.088		0.086		0.0865	0.086	0.09						
<del>-</del>					0										

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		_							Те	st Co	de/ID:	114-23-302	NVPCB / 04	-0924-3837
Bioaccumulat	tion Eva	luation - PC	B Cong	eners -	Nereis	s							EA-EST	, Inc. PBC
Analysis ID: Analyzed: Edit Date:	13-3296 19 Aug- 08 May-		Anal	point: lysis: i Hash:	Nonpa	arametric-	Two Sampl		DB556	Statu	S Version: s Level: r ID:	CETISv2.	1.1	
Batch ID: Start Date: Ending Date: Test Length:	05 Apr-2	23 11:33 23 10:33	Prot	ocol: cies:	US AC	CE NED F s virens	- PCBs - N RIM (2004)	V		Analy Dilue Brine Sourc	nt: Not : Cry	ncy Roka Applicable stal Sea O - Aquatic F	Research Or	Age:
Sample Code	Sa	ample ID	Sam	ple Dat	e	Receipt	Date	Sample Aç	ge	Client	t Name	Pro	oject	
IOSN 2019 AT3-098		3-4648-8170 7-1559-4974		1ar-23 eb-23 1	3:00	08 Mar-: 09 Feb-:		12h 27d 23h		Eco-A	nalysts, In	ic. Dre	edged Sedii	ment Evalu
Sample Code	М	aterial Type			Samp	le Source	)	St	ation L	ocatio	n	Lat/Long		
IOSN 2019	Re	eference sec	liment		Yachts	sman Mar	ina NAE-20	04-00 IO	SN Ref	erence	)			
AT3-098	М	arine Sedime	ent		Yacht	sman Mar	ina NAE-20	004-00 10	Station	s at 4	Marinas M	<b>1</b> u		
Data Transfor	m	Alt	Нур					Compari	son Re	sult				PMSD
Untransformed	d	C	< T					AT3-098	failed p	cb 052	2 endpoint			439.72%
Wilcoxon Rar Sample I Reference Sec	vs Sa	Two-Sample mple II 3-098*	Test df 8	Test S	Stat C	Critical 	Ties	P-Type Exact	<b>P-Va</b>		<b>Decision</b> Significan	• •		
Auxiliary Test Attribute Outlier	Т	est Grubbs Extre	me Valu	e Test			Test Stat	Critical 2.29	<b>P-Va</b>		<b>Decision</b> Outlier De	· ,		
ANOVA Table														
Source	Si	um Squares		Mean	Squar	e	DF	F Stat	P-Va	lue	Decision	(α:5%)		
Between Error Total	0.	0245421 152273 176815		0.0245 0.0190			1 8 9	1.29 —	0.28	90	Non-Sign	ificant Effect		
ANOVA Assur	mptions	Tests												
Attribute	Te	est					Test Stat	Critical	P-Va	lue	Decision	(α:1%)		
Attribute Variance Distribution	Va				st		<b>Test Stat</b> 89600 0.628	<b>Critical</b> 23.2 0.741	<b>P-Va</b>	E-05	Unequal \	(α:1%) Variances nal Distributio	on	
Variance	Va SI	est ariance Ratio			st		89600	23.2	<1.0	E-05	Unequal \	Variances	on	
Variance Distribution	Va SI <b>mary</b>	est ariance Ratio napiro-Wilk V				95% LCL	89600	23.2	<1.0	E-05	Unequal \	Variances	on CV%	%Effect
Variance Distribution PCB 052 Sum	Va SI <b>mary</b>	est ariance Ratic napiro-Wilk V	V Norma	ality Tes	9	9 <b>5% LCL</b>	89600 0.628	23.2 0.741	<1.0 0.000	E-05 01	Unequal \ Non-Norn	Variances nal Distributio		%Effect 0.00%
Variance Distribution  PCB 052 Sum Sample	Va SI mary Co	est ariance Ratic napiro-Wilk V	V Norma	ality Tes	<b>9</b>		89600 0.628 <b>95% UCL</b>	23.2 0.741 <b>Median</b>	<1.0 0.000	E-05 01	Unequal Non-Norm	Variances nal Distributio	CV%	
Variance Distribution  PCB 052 Sum Sample IOSN 2019	Va SI I <b>mary</b> Ca RS	est ariance Ratio napiro-Wilk V	V Norma	Mean 0.0369	<b>9</b>	0.0361	89600 0.628 <b>95% UCL</b> 0.0377	23.2 0.741 <b>Median</b> 0.0365	<1.0 0.000 <b>Min</b> 0.030	E-05 01	Unequal Non-Norm  Max  0.038	Variances nal Distributio  Std Err  0.000292	<b>CV%</b> 1.77%	0.00%
Variance Distribution  PCB 052 Sum Sample IOSN 2019 AT3-098	Va SI Imary Ca RS	est ariance Ratio napiro-Wilk V  ode Co S 5 5	V Norma	Mean 0.0369	9 0	0.0361	89600 0.628 <b>95% UCL</b> 0.0377	23.2 0.741 <b>Median</b> 0.0365	<1.0 0.000 <b>Min</b> 0.030	E-05 01	Unequal Non-Norm  Max  0.038	Variances nal Distributio  Std Err  0.000292	<b>CV%</b> 1.77%	0.00%
Variance Distribution  PCB 052 Sum Sample IOSN 2019 AT3-098  PCB 052 Deta	Va SI Imary Ca RS	est ariance Ratio napiro-Wilk V  ode Co S 5 5	V Norma	Mean 0.0369 0.136	9 0 -(	0.0361 0.106	89600 0.628 <b>95% UCL</b> 0.0377 0.378	23.2 0.741 <b>Median</b> 0.0365 0.0489	<1.0 0.000 <b>Min</b> 0.030	E-05 01	Unequal Non-Norm  Max  0.038	Variances nal Distributio  Std Err  0.000292	<b>CV%</b> 1.77%	0.00%

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Bioaccumulation   PCB Congeners - Nerels   EA-EST, Inc. PBC											I	est Co	ue/ID.	111 20 01	021441		4-0924-383
Analysic   19 Aug-22 6:57	Bioaccumula	tion	Evaluation -	РСВ С	ong	eners -	- Nere	eis								EA-ES	Γ, Inc. PBC
Start Date: 08 Mar-23 11:33   Protocol: US AGE NED RIM (2004)   Section	Analyzed:	19 <i>A</i>	Aug-23 6:57	-	٩nal	ysis:	Para	metric-Two	•	0268051	CE78A	Statu	s Level:		v2.1.1		
TOSN 2019	Start Date: Ending Date:	08 N 05 A	Mar-23 11:33 Apr-23 10:33	F	Prote Spec	ocol:	US A	ACE NED F		V		Dilue Brine	ent: N e: C	lot Applicable rystal Sea		earch C	r <b>Age:</b>
IOSN 2019	Sample Code	•	Sample ID	, ;	Sam	ple Da	te	Receipt	Date	Sample	Age	Clien	t Name	ı	Proje	ct	
DSN 2019   Reference sediment AT3-098   Reference sediment Marina NAE-2004-00   IOSN Reference   IOSN 2019   IOSN Reference   IOSN 2019   IOSN Reference   IOSN 2019   IOSN Reference   IOSN 2019   IOSN Reference   IOSN 2019   IOSN Reference   IOSN 2019   IOSN 20	IOSN 2019						13:00		23	12h		Eco-A	Analysts,	Inc. [	Dredg	ged Sed	iment Evalı
Ar3-098	Sample Code	•	Material T	ype			Sam	ple Source	е	;	Station I	Location	on	Lat/Lon	g		
Data Transform	IOSN 2019		Reference	sedime	nt		Yach	ntsman Mai	rina NAE-20	004-00	IOSN Re	eferenc	е				
Lintransformed   C < T	AT3-098		Marine Sec	diment			Yach	ntsman Mai	rina NAE-20	004-00	10 Statio	ns at 4	Marinas	Mu			
Equal Variance   Two-Sample   Test   Sample   Vs   Sample   S	Data Transfor	rm		Alt Hy	/p					Compa	arison R	esult					PMSD
Sample   vs   Sample     vs   Sample       off   Test Stat   Critical   MSD   P-Type   P-Value   Decision(a:5%)	Untransformed	d		C < T						AT3-09	8 failed	pcb 06	6 endpoi	nt			2.56%
Attribute         Test         Test Stat         Critical         P-Value         Decision(α:5%)           Outlier         Grubbs Extreme Value Test         2.03         2.29         0.2022         No Outliers Detected           ANOVA Table           Source         Sum Squares         Mean Square         DF         F Stat         P-Value         Decision(α:5%)           Between         0.0003025         0.0003025         1         529         <1.0E-05         Significant Effect           Error         4.575E-06         5.719E-07         8         5         Significant Effect           ANOVA Assumptions Tests           Attribute         Test         Test Stat         Critical         P-Value         Decision(α:1%)           Variance         Variance Ratio F Test         0.905         0.741         0.3927         Equal Variances           Distribution         Shapiro-Wilk W Normality Test         0.905         0.741         0.2468         Normal Distribution           PCB 066 Summary           Sample         Code         Count         Mean         95% LCL         95% UCL         Median         Min         Max         Std Err         CV%         %Effect           IOSN	Sample I	vs	Sample II	Test													
Source   Sum Squ=res   Mean Squ=re   DF   F Stat   P-Value   Decision(α:5%)	_	ts															
Between   0.0003025   0.0003025   1   529   \$1.0E-05   Significant Effect	Outlier			xtreme \	Valu	e Test									d		
Error   4.575E-06   5.719E-07   8     9	Outlier	•	Grubbs Ex		Valu				2.03	2.29					d		
ANOVA Assumptions Tests           Attribute         Test         Test Stat         Critical         P-Value         Decision(α:1%)           Variance         Variance Ratio F Test         2.52         23.2         0.3927         Equal Variances           Distribution         Shapiro-Wilk W Normality Test         0.905         0.741         0.2468         Normal Distribution           PCB 066 Summary           Sample         Code         Count         Mean         95% LCL         95% UCL         Median         Min         Max         Std Err         CV%         %Effect           IOSN 2019         RS         5         0.0347         0.034         0.0354         0.0345         0.034         0.0355         0.000255         1.64%         0.00%           AT3-098         5         0.0457         0.0446         0.0468         0.0453         0.045         0.0472         0.000405         1.98%         -31.70%           PCB 066 Detail           Sample         Code         Rep 1         Rep 2         Rep 3         Rep 4         Rep 5           IOSN 2019         RS         0.0345         0.034         0.0355         0.0355	Outlier  ANOVA Table Source	9	Grubbs Ex	ıres	Valu	Mean		are	2.03 <b>DF</b>	2.29 <b>F Stat</b>	0.20 P-V	022 alue	No Out	liers Detected	d		
Attribute         Test         Test Stat         Critical         P-Value         Decision(α:1%)           Variance Distribution         Variance Ratio F Test Shapiro-Wilk W Normality Test         2.52         23.2         0.3927         Equal Variances Point Normal Distribution           PCB 066 Summary           Sample         Code         Count         Mean         95% LCL         95% UCL         Median         Min         Max         Std Err         CV%         %Effect           IOSN 2019         RS         5         0.0347         0.034         0.0354         0.0345         0.034         0.0355         0.000255         1.64%         0.00%           AT3-098         5         0.0457         0.0446         0.0468         0.0453         0.045         0.0472         0.000405         1.98%         -31.70%           PCB 066 Detail           Sample         Code         Rep 1         Rep 2         Rep 3         Rep 4         Rep 5           IOSN 2019         RS         0.0345         0.034         0.0355         0.0355	Outlier  ANOVA Table Source Between	9	Sum Squa 0.0003025	ıres	Valu	<b>Mean</b> 0.000	3025	are	2.03 <b>DF</b>	2.29 <b>F Stat</b>	0.20 P-V	022 alue	No Out	liers Detected	d		
Variance Distribution         Variance Ratio F Test Shapiro-Wilk W Normality Test         2.52 0.905         23.2 0.3927 0.2468         Equal Variances Normal Distribution           PCB 066 Summary Sample         Code         Count         Mean         95% LCL         95% UCL         Median         Min         Max         Std Err         CV%         %Effect           IOSN 2019         RS         5         0.0347         0.034         0.0354         0.0345         0.034         0.0355         0.000255         1.64%         0.00%           AT3-098         5         0.0457         0.0446         0.0468         0.0453         0.045         0.0472         0.000405         1.98%         -31.70%           PCB 066 Detail           Sample         Code         Rep 1         Rep 2         Rep 3         Rep 4         Rep 5           IOSN 2019         RS         0.0345         0.034         0.0345         0.0355         0.0355	Outlier  ANOVA Table Source Between Error	9	Sum Squa 0.0003025 4.575E-06	ıres	Valu	<b>Mean</b> 0.000	3025	are	2.03 <b>DF</b> 1 8	2.29 <b>F Stat</b>	0.20 P-V	022 alue	No Out	liers Detected	d		
Distribution   Shapiro-Wilk W Normality Test   0.905   0.741   0.2468   Normal Distribution	Outlier  ANOVA Table Source Between Error Total		Sum Squa 0.0003025 4.575E-06 0.0003071	ıres	Valu	<b>Mean</b> 0.000	3025	are	2.03 <b>DF</b> 1 8	2.29 <b>F Stat</b>	0.20 P-V	022 alue	No Out	liers Detected	d		
Sample         Code         Count         Mean         95% LCL         95% UCL         Median         Min         Max         Std Err         CV%         %Effect           IOSN 2019         RS         5         0.0347         0.034         0.0354         0.0345         0.034         0.0355         0.000255         1.64%         0.00%           AT3-098         5         0.0457         0.0446         0.0468         0.0453         0.045         0.0472         0.000405         1.98%         -31.70%           PCB 066 Detail           Sample         Code         Rep 1         Rep 2         Rep 3         Rep 4         Rep 5           IOSN 2019         RS         0.0345         0.034         0.0345         0.035         0.0355	Outlier  ANOVA Table Source Between Error Total  ANOVA Assu		Sum Squa 0.0003025 4.575E-06 0.0003071 ons Tests	ıres	Valu	<b>Mean</b> 0.000	3025	are	2.03 <b>DF</b> 1 8 9	2.29 <b>F Stat</b> 529	0.20 P-V <1.0	/alue 0E-05	Decision Signification	on(α:5%) ant Effect	d		
Sample         Code         Count         Mean         95% LCL         95% UCL         Median         Min         Max         Std Err         CV%         %Effect           IOSN 2019         RS         5         0.0347         0.034         0.0354         0.0345         0.034         0.0355         0.000255         1.64%         0.00%           AT3-098         5         0.0457         0.0446         0.0468         0.0453         0.045         0.0472         0.000405         1.98%         -31.70%           PCB 066 Detail           Sample         Code         Rep 1         Rep 2         Rep 3         Rep 4         Rep 5           IOSN 2019         RS         0.0345         0.034         0.0345         0.035         0.0355	Outlier  ANOVA Table Source Between Error Total  ANOVA Assu Attribute Variance		Sum Squa 0.0003025 4.575E-06 0.0003071 ons Tests Test Variance R	ares	「est	<b>Mean</b> 0.000 5.719	3025 E-07	are	2.03  DF  1 8 9  Test Stat 2.52	2.29  F Stat 529  Critica 23.2	0.20 P-V <1.0	/alue 0E-05 /alue 927	Decision  Decision  Decision  Decision  Equal \	on(α:5%) ant Effect on(α:1%) /ariances	d		
IOSN 2019         RS         5         0.0347         0.034         0.0354         0.0345         0.034         0.0355         0.000255         1.64%         0.00%           AT3-098         5         0.0457         0.0466         0.0468         0.0453         0.045         0.0472         0.000405         1.98%         -31.70%           PCB 066 Detail           Sample         Code         Rep 1         Rep 2         Rep 3         Rep 4         Rep 5           IOSN 2019         RS         0.0345         0.034         0.0345         0.035         0.0355	Outlier  ANOVA Table Source Between Error Total  ANOVA Assu Attribute Variance Distribution	mpti	Sum Squa 0.0003025 4.575E-06 0.0003071 ons Tests Test Variance R Shapiro-W	ares	「est	<b>Mean</b> 0.000 5.719	3025 E-07	are	2.03  DF  1 8 9  Test Stat 2.52	2.29  F Stat 529  Critica 23.2	0.20 P-V <1.0	/alue 0E-05 /alue 927	Decision  Decision  Decision  Decision  Equal \	on(α:5%) ant Effect on(α:1%) /ariances	d		
AT3-098 5 0.0457 0.0446 0.0468 0.0453 0.045 0.0472 0.000405 1.98% -31.70%    PCB 066 Detail   Sample   Code   Rep 1   Rep 2   Rep 3   Rep 4   Rep 5     IOSN 2019   RS 0.0345 0.034 0.0345 0.035 0.0355	Outlier  ANOVA Table Source Between Error Total  ANOVA Assu Attribute Variance Distribution  PCB 066 Sum	mpti	Sum Squa 0.0003025 4.575E-06 0.0003071 ons Tests Test Variance R Shapiro-W	ares Ratio F T	「est orma	Mean 0.000 5.719	3025 E-07 st		2.03  DF  1 8 9  Test Stat 2.52 0.905	2.29  F Stat 529  Critica 23.2 0.741	0.20 P-V <1.0 I P-V 0.39 0.24	/alue 0E-05 /alue 927 468	Decision Signification Decision Equal \ Normal	on(α:5%) ant Effect on(α:1%) /ariances Distribution		V%	%Effect
Sample         Code         Rep 1         Rep 2         Rep 3         Rep 4         Rep 5           IOSN 2019         RS         0.0345         0.034         0.0345         0.035         0.0355	Outlier  ANOVA Table Source Between Error Total  ANOVA Assu Attribute Variance Distribution  PCB 066 Sum Sample	mpti	Sum Squa 0.0003025 4.575E-06 0.0003071 ons Tests Test Variance R Shapiro-W	ares Ratio F T ilk W No	「est orma	Mean 0.000 5.719  Ality Tea	3025 E-07	95% LCL	2.03  DF  1 8 9  Test Stat 2.52 0.905	2.29  F Stat 529  Critica 23.2 0.741	0.20 P-V <1.0 1 P-V 0.33 0.24	/alue 0E-05 /alue 927 468	Decision  Decision  Decision  Equal Normal	on(α:5%) ant Effect  on(α:1%) /ariances Distribution  Std Err	C		
IOSN 2019 RS 0.0345 0.034 0.0345 0.035 0.0355	Outlier  ANOVA Table Source Between Error Total  ANOVA Assu Attribute Variance Distribution  PCB 066 Sum Sample IOSN 2019	mpti	Sum Squa 0.0003025 4.575E-06 0.0003071 ons Tests Test Variance R Shapiro-W	Ratio F Tilk W No	「est orma	Mean 0.000 5.719  ality Te:  Mean 0.034	3025 E-07 st	<b>95% LCL</b> 0.034	2.03  DF  1 8 9  Test Stat 2.52 0.905  95% UCL 0.0354	2.29  F Stat 529  Critica 23.2 0.741  Median 0.0345	0.20 P-V <1.0 I P-V 0.39 0.24	/alue 0E-05 /alue 927 468	Decision Equal \ Normal	on(α:5%) cant Effect con(α:1%) /ariances Distribution Std Err 0.00025	<b>C</b> C 5 1	.64%	0.00%
IOSN 2019 RS 0.0345 0.034 0.0345 0.035 0.0355	Outlier  ANOVA Table Source Between Error Total  ANOVA Assu Attribute Variance Distribution  PCB 066 Sum Sample IOSN 2019 AT3-098	mpti	Sum Squa 0.0003025 4.575E-06 0.0003071 ons Tests Test Variance R Shapiro-W	Ratio F Tilk W No	「est orma	Mean 0.000 5.719  ality Te:  Mean 0.034	3025 E-07 st	<b>95% LCL</b> 0.034	2.03  DF  1 8 9  Test Stat 2.52 0.905  95% UCL 0.0354	2.29  F Stat 529  Critica 23.2 0.741  Median 0.0345	0.20 P-V <1.0 I P-V 0.39 0.24	/alue 0E-05 /alue 927 468	Decision Equal \ Normal	on(α:5%) cant Effect con(α:1%) /ariances Distribution Std Err 0.00025	<b>C</b> C 5 1	.64%	0.00%
ATC 000 0 04C 0 04F 0 04F4 0 04F0	Outlier  ANOVA Table Source Between Error Total  ANOVA Assu Attribute Variance Distribution  PCB 066 Sum Sample IOSN 2019 AT3-098  PCB 066 Deta	mpti	Sum Squa 0.0003025 4.575E-06 0.0003071 ons Tests Test Variance R Shapiro-W y Code RS	Ratio F Tilk W No	Γest orma	Mean 0.000 5.719  Ality Tes  Mean 0.034 0.045	3025 E-07 st	<b>95% LCL</b> 0.034 0.0446	2.03  DF  1 8 9  Test Stat 2.52 0.905  95% UCL 0.0354 0.0468	2.29  F Stat 529  Critica 23.2 0.741  Median 0.0345 0.0453	0.20 P-V <1.0 I P-V 0.39 0.24	/alue 0E-05 /alue 927 468	Decision Equal \ Normal	on(α:5%) cant Effect con(α:1%) /ariances Distribution Std Err 0.00025	<b>C</b> C 5 1	.64%	0.00%
AT3-098 0.046 0.045 0.0453 0.0451 0.0472	Outlier  ANOVA Table Source Between Error Total  ANOVA Assu Attribute Variance Distribution  PCB 066 Sum Sample IOSN 2019 AT3-098  PCB 066 Deta Sample	mpti	Sum Squa 0.0003025 4.575E-06 0.0003071 ons Tests Test Variance R Shapiro-W y Code RS	Ratio F Tilk W No	Γest orma	Mean 0.000 5.719  Mean 0.034 0.045	3025 E-07	95% LCL 0.034 0.0446 Rep 3	2.03  DF  1 8 9  Test Stat 2.52 0.905  95% UCL 0.0354 0.0468  Rep 4	2.29  F Stat 529  Critica 23.2 0.741  Median 0.0345 0.0453	0.20 P-V <1.0 1 P-V 0.38 0.24 n Min 0.03 0.04	/alue 0E-05 /alue 927 468	Decision Equal \ Normal	on(α:5%) cant Effect con(α:1%) /ariances Distribution Std Err 0.00025	<b>C</b> C 5 1	.64%	0.00%

Report Date: Test Code/ID: TN

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										-	est Co	40/151			4-0924-3837
Bioaccumula	tion	Evaluation -	PCB (	Cong	eners -	Ner	eis							EA-ES	T, Inc. PBC
Analysis ID: Analyzed: Edit Date:	19 <i>A</i>	8-8869-0510 Endpoin 9 Aug-23 6:57 Analysis 8 May-23 22:52 MD5 Has					3 101 ametric-Two 3241FC036	•	5C7670	8DBA23	CETIS Version: CETISv2.1.1 Status Level: 1 Editor ID:				
Batch ID: Start Date: Ending Date: Test Length:	08 N 05 A	8 Mar-23 11:33 <b>Protocol:</b> 5 Apr-23 10:33 <b>Species:</b>					Bioaccumlation - PCBs - Nv US ACE NED RIM (2004) Nereis virens Polychaeta					Analyst: Nancy Roka  Diluent: Not Applicable  Brine: Crystal Sea  Source: ARO - Aquatic Research Or Ag			
Sample Code Sample ID Sample					ple Da	te	Receipt	Date	Sample	Age	Clien	t Name	oject		
IOSN 2019 13-4648-8170 C					lar-23 eb-23 1	3:00	08 Mar- 09 Feb-		12h 27d 23l	า	Eco-A	Analysts, Ir	c. Dr	edged Sec	liment Evalu
Sample Code		Material T	уре			Sam	Sample Source Station Location Lat/Lo								
IOSN 2019		Reference	sedim	ent		Yachtsman Marina NAE-2004-00 IOSN Reference									
AT3-098		Marine Se	diment			Yacl	htsman Mar	ina NAE-20	04-00	10 Statio	ns at 4	Marinas N	1u		
Data Transfor	m		Alt H	lур					Comp	arison R	esult				PMSD
Untransformed	t		C < T	•		AT3-098 failed pcb 101 endpoint									2.73%
Equal Variand Sample I Reference Sec	vs	Sample II AT3-098*	Test	df 8	<b>Test \$</b> 21.9	Stat	Critical	<b>MSD</b> 0.00154	P-Typ		<b>/alue</b> 0E-05	<b>Decision</b> Significar	` '		
Auxiliary Test	ts														
Attribute		Test						Test Stat	Critica	al P-V	'alue	Decision	(α:5%)		
Outlier		Grubbs E	xtreme	Valu	e Test			2.03	2.29	0.2	090	No Outlie	rs Detected		
ANOVA Table	)														
Source	Source Sum Squares Mean				Mean	Squ	are	DF	F Stat	P-V	'alue	Decision(α:5%)			
Between		0.0008190 0.			0.0008190			1	478	<1.	0E-05	Significant Effect			
Error					1.713	E-06		8	_						
Total		0.0008327	,					9							
ANOVA Assu	mpti	ons Tests													
Attribute Test							Test Stat	Critica	al P-V	'alue	Decision	(α:1%)			
Variance		Variance Ratio F Test								0.3	588	Equal Variances			
Distribution	Shapiro-Wilk W Normality Te					st		0.906	0.741	0.2	574	Normal Distribution			
PCB 101 Sum	mar	y									-				
Sample		Code	Coun	nt	Mean		95% LCL	95% UCL	Media	n Mir	<u> </u>	Max	Std Err	CV%	%Effect
IOSN 2019		RS	5		0.056	4	0.0552	0.0576	0.056	0.0	555	0.058	0.00043	1.71%	0.00%
AT3-098			5		0.074	5	0.0725	0.0765	0.074	0.0	73	0.077	0.000707	2.12%	-32.09%
PCB 101 Deta	iil		•												
Sample		Code	Rep '	1	Rep 2	!	Rep 3	Rep 4	Rep 5						
IOSN 2019		RS	0.056	3	0.055	5	0.056	0.0565	0.058						
AT3-098			0.075	5	0.073		0.074	0.0735	0.077						

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								T	est Co	de/ID:	TN-23-302	NvPCB / 0	4-0924-3837		
Bioaccumula	tion Evaluatio	n - PCB C	onge	ners - N	lereis							EA-ES	T, Inc. PBC		
Analysis ID: Analyzed: Edit Date:	16-3802-4478 19 Aug-23 6:5 08 May-23 22	57	Endpoint: PCB 105 Analysis: Parametric-Two Sample MD5 Hash: 1C1EFD20B2ADE9BFADCF7730003EE						CETIS Version: CETISv2.1.1 Status Level: 1 Editor ID:						
Batch ID: Start Date: Ending Date: Test Length:	•	:33 I	Test Type: Protocol: Species: Taxon:		lioaccumlation IS ACE NED F Iereis virens l'olychaeta	NV		Analy Dilue Brine Sour	nt: Not : Crys	cy Roka Applicable tal Sea ) - Aquatic F	Research C	Or <b>Age:</b>			
Sample Code	Sample	ID :	Samp	le Date	Receipt	Date	Date Sample Age		Client Name		Pro	Project			
IOSN 2019 AT3-098	13-4648 07-1559		08 Ma 08 Fel	ır-23 b-23 13:	08 Mar- :00 09 Feb-		12h 27d 23h		Eco-Analysts, Inc.		c. Dre	Dredged Sediment Ev			
Sample Code	Materia	l Type		s	ample Source	9	St	ation l	ocatio	on	Lat/Long				
IOSN 2019 AT3-098		ce sedime Sediment	ent		′achtsman Mar ′achtsman Mar				ferencens		u				
Data Transform Alt Hyp Compariso										Result PMSD					
Untransformed	t	C < T	T AT3-098 faile						pcb 105 endpoint 3.06						
Equal Variand	ce t Two-Sam	ole Test													
Sample I	vs Sample	II	df '	Test Sta	at Critical	MSD	P-Type	P-V	alue	Decision(	α:5%)				
Reference Sec	d AT3-098	*	7	19.9	1.89	0.00155	CDF	<1.0	)E-05	Significant	Effect				
ANOVA Table	1														
Source	Sum S	quares	ı	Mean S	quare	DF	F Stat	P-V	alue	Decision(	α:5%)				
Between	0.00058	886	(	0.00058	86	1	397	<1.0	DE-05	Significant Effect					
Error	1.039E-		1.484		06	7	_								
Total	0.00059	99				8									
ANOVA Assu	mptions Tests	•													
Attribute	Test					Test Stat	Critical	P-V	alue	Decision(	α:1%)				
Variance		e Ratio F 1				2.99	24.3	0.31		Equal Variances					
Distribution	Shapiro	-Wilk W N	ormali	ity Test		0.904	0.701	0.27	792	Normal Di	stribution				
PCB 105 Sum	ımary														
Sample	Code	Count		Mean		95% UCL		Min		Max	Std Err	CV%	%Effect		
IOSN 2019	RS	5		0.0506	0.0495	0.0517	0.05	0.05		0.052	0.0004	1.77%	0.00%		
AT3-098		4	(	0.0669	0.0644	0.0693	0.066	0.06	555	0.069	0.000774	2.31%	-32.16%		
PCB 105 Deta	nil														
Sample	Code	Rep 1	I	Rep 2	Rep 3	Rep 4	Rep 5								
IOSN 2019	RS	0.05		0.05	0.05	0.051	0.052								
AT3-098		0.067	(	0.0655		0.066	0.069								

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		-								Т	est Co	de/ID:	TN-23-302	2NvPCB / 0	4-0924-3837	
Bioaccumulat	tion E	valuation -	РСВ (	Cong	eners -	Nere	is							EA-ES	T, Inc. PBC	
Analysis ID: Analyzed: Edit Date:	19 Au	l84-6417 ug-23 6:57 ay-23 22:52		Anal	ndpoint: PCB 118 nalysis: Parametric-Two Sample D5 Hash: 67AB8F66D4D401A34EA90AE79723069						CETIS Version: CETISv2.1.1 Status Level: 1 Editor ID:					
Batch ID: Start Date: Ending Date: Test Length:	<b>te:</b> 05 Apr-23 10:33				Type: ocol: cies: on:	US A	ccumlation ACE NED F is virens chaeta	- PCBs - N RIM (2004)	V		Dilue Brine	Analyst: Nancy Roka  Diluent: Not Applicable  Brine: Crystal Sea  Source: ARO - Aquatic R			Or <b>Age:</b>	
Sample Code Sample ID					ple Da	te	Receipt	Date	Sample Age		Clien	Client Name Pro				
IOSN 2019 13-4648-8170 AT3-098 07-1559-4974					lar-23 eb-23 1	08 Mar-23 13:00 09 Feb-23 16:30			12h Eco-Analysts 27d 23h			Analysts, Ir	nc. D	redged Sec	iment Evalu	
Sample Code		Material Ty	уре			Sample Source Station Location Lat/Lon							Lat/Long	1		
IOSN 2019		Reference	-	ent		Yachtsman Marina NAE-2004-00 IOSN Reference										
AT3-098		Marine Sec	diment			Yach	itsman Ma	rina NAE-20	004-00	10 Statio	ons at 4	Marinas N	Лu			
Data Transfor	m		Alt H	ур					Comp	arison R	Result				PMSD	
Untransformed	t		C < T						AT3-0	98 failed	pcb 11	8 endpoint			2.74%	
Equal Variand		vo-Sample Sample II	Test	df	Toet	Stat	Critical	MSD	Р-Тур	o P.\	/alue	Decision	n(a:5%)			
Reference Sec		AT3-098*		8	21.8		1.86	0.00146	CDF		0E-05	Significar	•			
Auxiliary Test Attribute Outlier	ts	Test Grubbs Ex	dreme	Valu	e Test			Test Stat 2.04	Critica 2.29		<b>/alue</b> 926	<b>Decision</b> No Outlie	ı(α:5%) ers Detected			
ANOVA Table	)															
Source		Sum Squa	res		Mean	Squa	ire	DF	F Stat	: P-\	/alue	Decision	ι(α:5%)			
Between Error Total	0.0007396 0.0000124 0.000752			0.0007396 1.55E-06				1 8 9	477 —	<1.	0E-05	Significa	nt Effect			
ANOVA Assur	mntio	ne Toete														
Attribute	iiiptioi	Test						Test Stat	Critica	al D_\	/alue	Decision	(a:1%)			
Variance		Variance R	atio F	Test				2.35	23.2		279	Decision(α:1%) Equal Variances				
Distribution		Shapiro-Wi			ality Te						713	Normal Distribution				
PCB 118 Sum	mary															
Sample		Code	Coun	t	Mean	_	95% LCL	95% UCL	Media	ın Mir	1	Max	Std Err	CV%	%Effect	
IOSN 2019		RS	5		0.053	4	0.0522	0.0546	0.053	0.0	525	0.055	0.00043	1.80%	0.00%	
AT3-098			5		0.070	6	0.0688	0.0724	0.07	0.0	695	0.073	0.00066	2.09%	-32.21%	
PCB 118 Deta	iil															
Sample		Code	Rep 1	ı	Rep 2	!	Rep 3	Rep 4	Rep 5							
IOSN 2019		RS	0.053		0.052		0.053	0.0535	0.055							
AT3-098			0.071		0.069	5	0.07	0.0695	0.073							

IOSN 2019

AT3-098

RS

0.063

0.084

0.062

0.082

Report Date: Test Code/ID: 19 Aug-23 06:58 (p 10 of 18) TN-23-302NvPCB / 04-0924-3837

Bioaccumulation Evaluation - PCB Congeners - Nereis **EA-EST. Inc. PBC** CETISv2.1.1 Analysis ID: 13-1827-6879 Endpoint: **PCB 128 CETIS Version:** Analyzed: Parametric-Two Sample 19 Aug-23 6:57 Analysis: Status Level: **Edit Date:** MD5 Hash: C3C4DC1056F0EFDEE07C5586D6C8947A Editor ID: 08 May-23 22:52 Batch ID: 16-3825-9393 Test Type: Bioaccumlation - PCBs - Nv Nancy Roka Analyst: Start Date: 08 Mar-23 11:33 Protocol: US ACE NED RIM (2004) Diluent: Not Applicable Ending Date: 05 Apr-23 10:33 Species: Nereis virens Brine: Crystal Sea Test Length: 27d 23h Taxon: Polychaeta Source: ARO - Aquatic Research Or Age: Sample Code Sample ID Sample Date Receipt Date Sample Age Client Name Project Eco-Analysts, Inc. **IOSN 2019** 13-4648-8170 08 Mar-23 08 Mar-23 12h Dredged Sediment Evalu AT3-098 07-1559-4974 08 Feb-23 13:00 09 Feb-23 16:30 27d 23h Sample Code **Station Location Material Type** Sample Source Lat/Long **IOSN 2019** Reference sediment Yachtsman Marina NAE-2004-00 **IOSN Reference** AT3-098 Marine Sediment Yachtsman Marina NAE-2004-00 10 Stations at 4 Marinas Mu **Data Transform PMSD** Alt Hyp Comparison Result Untransformed C < T AT3-098 failed pcb 128 endpoint 2.63% **Equal Variance t Two-Sample Test** P-Value Sample I Sample II df Test Stat Critical **MSD** P-Type Decision(a:5%) AT3-098\* 0.00166 <1.0E-05 Reference Sed 22.6 1.86 CDF Significant Effect **Auxiliary Tests** Attribute Test Test Stat Critical P-Value Decision(a:5%) 1.95 2.29 0.2878 Outlier Grubbs Extreme Value Test No Outliers Detected **ANOVA Table** Source DF P-Value **Sum Squares** Mean Square F Stat Decision(a:5%) Between 0.0010201 0.0010201 510 Significant Effect 1 <1.0E-05 0.000016 0.000002 8 Error Total 0.0010361 9 ANOVA Assumptions Tests **Attribute** Test Stat Critical P-Value Decision(a:1%) Variance Variance Ratio F Test 2.02 23.2 0.5130 **Equal Variances** 0.889 0.741 0.1636 Distribution Shapiro-Wilk W Normality Test Normal Distribution PCB 128 Summary Sample Code Count Mean 95% LCL 95% UCL Median Min Max Std Err CV% %Effect **IOSN 2019** RS 5 0.0632 0.0618 0.0646 0.00% 0.063 0.062 0.065 0.000515 1.82% AT3-098 5 0.0834 0.0814 0.0854 0.0825 0.082 0.086 0.000731 1.96% -31.96% PCB 128 Detail Sample Code Rep 1 Rep 2 Rep 3 Rep 4 Rep 5

0.0635

0.0825

0.065

0.086

0.0625

0.0825

Report Date: Test Code/ID: 19 Aug-23 06:58 (p 11 of 18) TN-23-302NvPCB / 04-0924-3837

Bioaccumulation Evaluation - PCB Congeners - Nereis **EA-EST. Inc. PBC** CETISv2.1.1 Analysis ID: 11-3728-5619 Endpoint: **PCB 138 CETIS Version:** Analyzed: Parametric-Two Sample 19 Aug-23 6:57 Analysis: Status Level: **Edit Date:** MD5 Hash: 399A7E177AF191AB1A826ABF483B5A30 **Editor ID:** 08 May-23 22:52 Batch ID: 16-3825-9393 Test Type: Bioaccumlation - PCBs - Nv Nancy Roka Analyst: Start Date: 08 Mar-23 11:33 Protocol: US ACE NED RIM (2004) Diluent: Not Applicable Ending Date: 05 Apr-23 10:33 Species: Nereis virens Brine: Crystal Sea Test Length: 27d 23h Taxon: Polychaeta Source: ARO - Aquatic Research Or Age: Sample Code Sample ID Sample Date Receipt Date Sample Age Client Name Project Eco-Analysts, Inc. **IOSN 2019** 13-4648-8170 08 Mar-23 08 Mar-23 12h Dredged Sediment Evalu AT3-098 07-1559-4974 08 Feb-23 13:00 09 Feb-23 16:30 27d 23h Sample Code **Station Location Material Type** Sample Source Lat/Long **IOSN 2019** Reference sediment Yachtsman Marina NAE-2004-00 **IOSN Reference** AT3-098 Marine Sediment Yachtsman Marina NAE-2004-00 10 Stations at 4 Marinas Mu **Data Transform PMSD** Alt Hyp Comparison Result AT3-098 passed pcb 138 endpoint Untransformed C < T 159.44% **Equal Variance t Two-Sample Test** Sample I Sample II df Test Stat Critical **MSD** P-Type P-Value Decision(a:5%) AT3-098 0.463 CDF Reference Sed 1.86 0.527 0.3277 Non-Significant Effect **Auxiliary Tests** Attribute Test Test Stat Critical P-Value Decision(a:5%) 2.29 0.8415 Outlier Grubbs Extreme Value Test 1.63 No Outliers Detected **ANOVA Table** Source DF P-Value **Sum Squares** Mean Square F Stat Decision(a:5%) Between 0.0431649 0.6554 Non-Significant Effect 0.0431649 1 0.215 0.200995 8 Error 1.60796 Total 1.65112 9 ANOVA Assumptions Tests **Attribute** Test Stat Critical P-Value Decision(a:1%) Variance Variance Ratio F Test 3.67 23.2 0.2361 **Equal Variances** 0.865 0.741 0.0886 Normal Distribution Distribution Shapiro-Wilk W Normality Test **PCB 138 Summary** Sample Code Count Mean 95% LCL 95% UCL Median Min Max Std Err CV% %Effect **IOSN 2019** RS 5 0.331 0.695 0.04 0.714 0.00% -0.0337 0.361 0.131 88.75% AT3-098 5 0.462 -0.236 1.16 0.055 0.0525 1.15 0.251 121.62% -39.73% PCB 138 Detail Sample Code Rep 1 Rep 2 Rep 3 Rep 4 Rep 5 IOSN 2019 RS 0.714 0.498 0.04 0.0405 0.361 AT3-098 1.15 0.053 0.0525 0.055 1

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Test Code/ID: TN-23-302NvPCB / 04-0924-3837

								Test Co	Juo/			1-0924-3837
Bioaccumula	tion Evaluation	on - PCB C	Conge	ners - N	ereis						EA-ES	Γ, Inc. PBC
Analysis ID: Analyzed: Edit Date:	20-6837-766 19 Aug-23 6 08 May-23 2	57	Endpo Analy MD5 I	sis: P	CB 153 arametric-Tw A012973E699	•	717A8201D	Stat	IS Versio us Level: or ID:		2.1.1	
Batch ID: Start Date: Ending Date: Test Length:	•	1:33 :33	Test 1 Proto Speci Taxor	ies: N	ioaccumlatior S ACE NED l ereis virens olychaeta		v	Ana Dilu Brin Sou	ent: N e: C	ancy Roka ot Applicable rystal Sea RO - Aquatic	Research C	r <b>Age:</b>
Sample Code	Sampl	e ID	Samp	le Date	Receip	t Date	Sample Ag	e Clie	nt Name	Р	roject	
IOSN 2019 AT3-098			08 Ma 08 Fel	ar-23 b-23 13:	08 Mar 00 09 Feb		12h 27d 23h	Eco-	Analysts,	Inc. D	redged Sed	ment Evalu
Sample Code	Materi	al Type		s	ample Sourc	e	Sta	tion Locat	ion	Lat/Long	1	
IOSN 2019		nce sedime	ent	Y	achtsman Ma	rina NAE-20	004-00 108	SN Reference	ce			
AT3-098	Marine	Sediment		Υ	achtsman Ma	rina NAE-20	004-00 10	Stations at	4 Marinas	Mu		
Data Transfor	m	Alt H	ур				Comparis	on Result				PMSD
Untransformed	t	C < T					AT3-098	passed pcb	153 endp	oint		57.00%
Equal Variand	ce t Two-Sam vs Sample	•	df	Test Sta	nt Critical	MSD	P-Type	P-Value	Decisio	on(α:5%)		
Sample I Reference Sec	•		8	0.403	1.86	0.435	CDF	0.3489	Non-Sig	nificant Effec	t	
	d AT3-09			0.403		0.435 <b>Test Stat</b> 2.14		0.3489 <b>P-Value</b> 0.1193	Decisio	pnificant Effection (α:5%) iers Detected	t	
Auxiliary Test Attribute Outlier	AT3-09	3		0.403		Test Stat	Critical	P-Value	Decisio	on(α:5%)	t	
Reference Sec Auxiliary Test Attribute	AT3-09	s Extreme	Value	0.403 • Test	1.86	Test Stat	Critical	P-Value	<b>Decisio</b> No Outl	on(α:5%)	t	
Auxiliary Test Attribute Outlier ANOVA Table	AT3-09	s Extreme quares	Value	0.403	1.86 quare	Test Stat 2.14	Critical 2.29	<b>P-Value</b> 0.1193	Decision No Outl	on(α:5%) iers Detected		
Auxiliary Test Attribute Outlier ANOVA Table Source	AT3-09.  Test  Grubb  Sum S	s Extreme quares	Value	0.403  Test  Mean S	1.86 <b>quare</b> 41	Test Stat 2.14	Critical 2.29	P-Value 0.1193 P-Value	Decision No Outl	on(α:5%) iers Detected on(α:5%)		
Auxiliary Test Attribute Outlier ANOVA Table Source Between	Test Grubb Sum S 0.0221	s Extreme quares 841 5	Value	0.403  Test  Mean S 0.02218	1.86 <b>quare</b> 41	Test Stat 2.14  DF 1	Critical 2.29	P-Value 0.1193 P-Value	Decision No Outl	on(α:5%) iers Detected on(α:5%)		
Auxiliary Test Attribute Outlier ANOVA Table Source Between Error	Test Grubb Sum S 0.0221 1.0945 1.1167	s Extreme quares 841 5 3	Value	0.403  Test  Mean S 0.02218	1.86 <b>quare</b> 41	Test Stat 2.14  DF 1 8	Critical 2.29	P-Value 0.1193 P-Value	Decision No Outl	on(α:5%) iers Detected on(α:5%)		
Auxiliary Test Attribute Outlier ANOVA Table Source Between Error Total	Test Grubb Sum S 0.0221 1.0945 1.1167	s Extreme quares 841 5 3	Value	0.403  Test  Mean S 0.02218	1.86 <b>quare</b> 41	Test Stat 2.14  DF 1 8	Critical 2.29  F Stat 0.162	P-Value 0.1193 P-Value	Decision No Outl	on(α:5%) iers Detected on(α:5%)		
Auxiliary Test Attribute Outlier ANOVA Table Source Between Error Total ANOVA Assur	Sum S 0.0221 1.0945 1.1167 mptions Test	s Extreme quares 841 5 3	Value	0.403  Test  Mean S 0.02218	1.86 <b>quare</b> 41	Test Stat 2.14  DF 1 8 9	Critical 2.29  F Stat 0.162	<b>P-Value</b> 0.1193 <b>P-Value</b> 0.6977	Decision Non-Signature Decision Decisio	on(α:5%) iers Detected on(α:5%) gnificant Effec		
Auxiliary Test Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assur Attribute	Sum S 0.0221 1.0945 1.1167 mptions Test Variance	s Extreme quares 841 5 3	Value	0.403  Test  Mean S 0.02218 0.13681	1.86 <b>quare</b> 41	Test Stat 2.14  DF 1 8 9	Critical 2.29  F Stat 0.162  Critical	P-Value 0.1193  P-Value 0.6977	Decision Non-Signature Decision Equal V	on(α:5%) iers Detected on(α:5%) gnificant Effection(α:1%)		
Auxiliary Test Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assur Attribute Variance	Sum S 0.0221 1.0945 1.1167 mptions Test Variant Shapir	s Extreme quares 841 5 3 s ce Ratio F	Value Test lormal	0.403  Test  Mean S 0.02218 0.13681	<b>quare</b> 41 9	Test Stat 2.14  DF 1 8 9  Test Stat 8.7 0.919	Critical 2.29  F Stat 0.162  Critical 23.2 0.741	P-Value 0.6977  P-Value 0.0594 0.3498	Decision Non-Signature Equal Voluments	on(α:5%) iers Detected on(α:5%) gnificant Effect on(α:1%) fariances Distribution	t	
Auxiliary Test Attribute Outlier ANOVA Table Source Between Error Total ANOVA Assur Attribute Variance Distribution PCB 153 Sum Sample	Sum S 0.0221 1.0945 1.1167 mptions Test Variant Shapir	s Extreme quares 841 5 3 s ce Ratio F Coun	Value Test Jormal	0.403  Prest  Mean S 0.02218 0.13681	1.86 quare 41 9	Test Stat 2.14  DF 1 8 9  Test Stat 8.7 0.919	Critical 2.29  F Stat 0.162  Critical 23.2 0.741  Median	P-Value 0.1193  P-Value 0.6977  P-Value 0.0594 0.3498  Min	Decision Non-Signal Pecision Non-Signal Pecision Normal	on(α:5%) iers Detected on(α:5%) gnificant Effect on(α:1%) fariances Distribution  Std Err	t CV%	%Effect
Auxiliary Test Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assur Attribute Variance Distribution  PCB 153 Sum Sample IOSN 2019	Sum S 0.0221 1.0945 1.1167 mptions Test Variant Shapir	s Extreme quares 841 5 3 s ce Ratio F Count 5	Value Test lormal	0.403  Prest  Mean S 0.02218 0.13681  lity Test  Mean 0.763	1.86  quare 41 9  95% LCL 0.555	Test Stat 2.14  DF 1 8 9  Test Stat 8.7 0.919  95% UCL 0.972	Critical 2.29  F Stat 0.162  Critical 23.2 0.741  Median 0.687	P-Value 0.1193  P-Value 0.6977  P-Value 0.0594 0.3498  Min 0.621	Decision Non-Signal Pecision Non-Signal Normal Max	on(α:5%) iers Detected on(α:5%) gnificant Effect on(α:1%) //ariances Distribution Std Err 0.0751	CV% 22.01%	0.00%
Auxiliary Test Attribute Outlier ANOVA Table Source Between Error Total ANOVA Assur Attribute Variance Distribution PCB 153 Sum Sample	Sum S 0.0221 1.0945 1.1167 mptions Test Variant Shapir	s Extreme quares 841 5 3 s ce Ratio F Coun	Value Test lormal	0.403  Prest  Mean S 0.02218 0.13681	1.86 quare 41 9	Test Stat 2.14  DF 1 8 9  Test Stat 8.7 0.919	Critical 2.29  F Stat 0.162  Critical 23.2 0.741  Median	P-Value 0.1193  P-Value 0.6977  P-Value 0.0594 0.3498  Min	Decision Non-Signal Pecision Non-Signal Pecision Normal	on(α:5%) iers Detected on(α:5%) gnificant Effect on(α:1%) fariances Distribution  Std Err	t CV%	
Auxiliary Test Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assur Attribute Variance Distribution  PCB 153 Sum Sample IOSN 2019	Sum S 0.0221 1.0945 1.1167 mptions Test Varian Shapin	s Extreme quares 841 5 3 s ce Ratio F Count 5	Value Test lormal	0.403  Prest  Mean S 0.02218 0.13681  lity Test  Mean 0.763	1.86  quare 41 9  95% LCL 0.555	Test Stat 2.14  DF 1 8 9  Test Stat 8.7 0.919  95% UCL 0.972	Critical 2.29  F Stat 0.162  Critical 23.2 0.741  Median 0.687	P-Value 0.1193  P-Value 0.6977  P-Value 0.0594 0.3498  Min 0.621	Decision Non-Signal Pecision Non-Signal Normal Max	on(α:5%) iers Detected on(α:5%) gnificant Effect on(α:1%) //ariances Distribution Std Err 0.0751	CV% 22.01%	0.00%
Auxiliary Test Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assur Attribute Variance Distribution  PCB 153 Sum Sample IOSN 2019 AT3-098	Sum S 0.0221 1.0945 1.1167 mptions Test Varian Shapin	s Extreme quares 841 5 3 s ce Ratio F Count 5	Value Test lormal	0.403  Prest  Mean S 0.02218 0.13681  lity Test  Mean 0.763	1.86  quare 41 9  95% LCL 0.555	Test Stat 2.14  DF 1 8 9  Test Stat 8.7 0.919  95% UCL 0.972	Critical 2.29  F Stat 0.162  Critical 23.2 0.741  Median 0.687	P-Value 0.1193  P-Value 0.6977  P-Value 0.0594 0.3498  Min 0.621	Decision Non-Signal Pecision Non-Signal Normal Max	on(α:5%) iers Detected on(α:5%) gnificant Effect on(α:1%) //ariances Distribution Std Err 0.0751	CV% 22.01%	0.00%
Auxiliary Test Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assur Attribute Variance Distribution  PCB 153 Sum Sample IOSN 2019 AT3-098  PCB 153 Deta	Sum S 0.0221 1.0945 1.1167 mptions Test Variand Shapir	s Extreme quares 841 5 3 s ce Ratio F count 5 5 5	Value Test lormal	0.403  Mean S 0.02218 0.13681  lity Test  Mean 0.763 0.857	95% LCL 0.555 0.242	Test Stat 2.14  DF 1 8 9  Test Stat 8.7 0.919  95% UCL 0.972 1.47	Critical 2.29  F Stat 0.162  Critical 23.2 0.741  Median 0.687 0.843	P-Value 0.1193  P-Value 0.6977  P-Value 0.0594 0.3498  Min 0.621	Decision Non-Signal Pecision Non-Signal Normal Max	on(α:5%) iers Detected on(α:5%) gnificant Effect on(α:1%) //ariances Distribution Std Err 0.0751	CV% 22.01%	0.00%

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Test Code/ID: TN-23-302NvPCB / 04-0924-3837

								Te	est Co	de/ID:	114 20 002	INVECD/C	04-0924-3837
Bioaccumulat	ion Evaluation	- PCB Cor	geners -	- Nereis								EA-ES	T, Inc. PBC
Analysis ID: Analyzed: Edit Date:	12-6194-5314 19 Aug-23 6:57 08 May-23 22:	7 An	dpoint: alysis: 05 Hash:	Parame	etric-Two	o Sample 46DF34D8	D0F06EC	:55ED6		S Versior s Level: r ID:	n: CETISv2 1	.1.1	
Batch ID: Start Date: Ending Date: Test Length:	16-3825-9393 08 Mar-23 11:3 05 Apr-23 10:3 27d 23h	33 <b>Pr</b> 3 <b>S</b> p	st Type: otocol: ecies: xon:		E NED R virens	- PCBs - N RIM (2004)	V		Analy Dilue Brine Sour	nt: No : Cr	ancy Roka ot Applicable ystal Sea RO - Aquatic F	Research (	Or <b>Age:</b>
Sample Code	Sample	ID Sa	mple Da	te	Receipt	Date	Sample /	Age	Clien	t Name	Pr	oject	
IOSN 2019 AT3-098	13-4648- 07-1559-		Mar-23 Feb-23 1		08 Mar-2 09 Feb-2		12h 27d 23h		Eco-A	nalysts, l	nc. Dr	edged Sec	diment Evalu
Sample Code	Material	Туре		Sample	e Source	Э	5	Station I	ocatio	n	Lat/Long		
IOSN 2019	Referenc	e sediment		Yachtsr	man Mar	rina NAE-20	04-00 I	OSN Re	ference	9			
AT3-098	Marine S	ediment		Yachtsr	man Mar	rina NAE-20	04-00 1	0 Statio	ns at 4	Marinas	Mu		
Data Transfor	m	Alt Hyp					Compa	rison R	esult				PMSD
Untransformed		C < T					AT3-09	8 failed <sub>l</sub>	pcb 170	) endpoin	t		2.70%
	vs Sample II AT3-098*			Stat Cr		MSD 0.000836	P-Type CDF		alue E-05	<b>Decisio</b> Significa	n(α:5%) int Effect		
Auxiliary Test Attribute Outlier	s Test Grubbs	Francis - Ma				Test Stat	Critical	P-V	alue	Decisio	n(α:5%)		
		Extreme va	lue Test			1.92	2.29	0.31	191	No Outli	ers Detected		
ANOVA Table	-	Extreme va	lue Test			1.92	2.29	0.31	91	No Outli	ers Detected		
ANOVA Table Source	-			Square	ı	1.92 <b>DF</b>	2.29 <b>F Stat</b>		191 alue	No Outli			
	Sum Squ 0.000245 4.047E-0	<b>uares</b> 55		2455	,	<b>DF</b> 1 8		P-V		Decisio			
Source Between Error Total	Sum Squ 0.000245 4.047E-0 0.000249	<b>uares</b> 55	<b>Mean</b> 0.000	2455	,	<b>DF</b> 1	F Stat	P-V	alue	Decisio	n(α:5%)		
Source Between Error Total ANOVA Assur	Sum Squ 0.000245 4.047E-0 0.000249 mptions Tests	<b>uares</b> 55	<b>Mean</b> 0.000	2455	)	<b>DF</b> 1 8	<b>F Stat</b> 485	P-V <1.(	alue DE-05	<b>Decisio</b> Significa	n(α:5%) ant Effect		
Source Between Error Total	Sum Squ 0.000245 4.047E-0 0.000249  mptions Tests Test Variance	<b>uares</b> 55	Mean 0.000 5.059	2455 E-07		<b>DF</b> 1 8	<b>F Stat</b> 485	P-V <1.(	alue DE-05 alue	Decisio  Decisio  Equal Va	n(α:5%) unt Effect n(α:1%)		
Source Between Error Total  ANOVA Assur Attribute Variance	Sum Squ 0.000245 4.047E-0 0.000249 mptions Tests Test Variance Shapiro-N	uares 55 66 96 Ratio F Te	Mean 0.000 5.059	2455 E-07		DF 1 8 9 Test Stat 1.7	F Stat 485  Critical 23.2	P-V <1.(	alue DE-05 alue	Decisio  Decisio  Equal Va	n(α:5%) unt Effect n(α:1%) ariances		
Source Between Error Total  ANOVA Assur Attribute Variance Distribution	Sum Squ 0.000245 4.047E-0 0.000249 mptions Tests Test Variance Shapiro-N	uares 55 66 96 Ratio F Te	Mean 0.000 5.059	2455 E-07	5% LCL	DF 1 8 9 7 Test Stat 1.7 0.846	F Stat 485  Critical 23.2	P-V <1.(	alue DE-05 alue 206 515	Decisio  Decisio  Equal Va	n(α:5%) Int Effect  n(α:1%) Interpretation  n(α:1%) Interpretation	CV%	%Effect
Source Between Error Total  ANOVA Assur Attribute  Variance Distribution  PCB 170 Sum	Sum Squ 0.000245 4.047E-0 0.000249 mptions Tests Test Variance Shapiro-N	uares 55 66 96 Ratio F Te Wilk W Nori	Mean 0.000 5.059	2455 E-07 st		DF 1 8 9 Test Stat 1.7	F Stat 485  Critical 23.2 0.741	P-V <1.0	alue DE-05 alue 206 515	Decisio  Decisio  Equal Va	n(α:5%) unt Effect n(α:1%) ariances	<b>CV%</b> 1.98%	%Effect 0.00%
Source Between Error Total  ANOVA Assur Attribute  Variance Distribution  PCB 170 Sum Sample	Sum Squ 0.000245 4.047E-0 0.000249 mptions Tests Test Variance Shapiro-\ mary Code	uares 55 66 96 Ratio F Tea Wilk W Nori	Mean 0.000 5.059 st mality Te	2455 E-07 st	5% LCL	DF 1 8 9 Test Stat 1.7 0.846	F Stat 485  Critical 23.2 0.741  Median	P-V <1.0	alue DE-05 alue 206 515	Decisio  Decisio  Equal Va Normal I	n(α:5%) Int Effect  n(α:1%) Interpretation  Std Err	1.98%	
Source Between Error Total  ANOVA Assur Attribute Variance Distribution  PCB 170 Sum Sample IOSN 2019	Sum Squ 0.000245 4.047E-0 0.000249 mptions Tests     Test     Variance     Shapiro-\ mary     Code     RS	uares 55 66 96 Ratio F Ter Wilk W Norr	Mean 0.000 5.059  st mality Te  Mean 0.031	2455 E-07 st	5% LCL 0302	DF 1 8 9  Test Stat 1.7 0.846  95% UCL 0.0318	F Stat 485  Critical 23.2 0.741  Median 0.031	P-V <1.0	alue DE-05 alue 206 515	Decisio  Decisio  Equal Va Normal I	n(α:5%) Int Effect  n(α:1%) Pariances Distribution  Std Err  0.000274	1.98%	0.00%
Source Between Error Total  ANOVA Assur Attribute Variance Distribution  PCB 170 Sum Sample IOSN 2019 AT3-098	Sum Squ 0.000245 4.047E-0 0.000249 mptions Tests     Test     Variance     Shapiro-\ mary     Code     RS	uares 55 66 96 Ratio F Ter Wilk W Norr	Mean 0.000 5.059  st mality Te  Mean 0.031	2455 E-07 st 95 0.0	5% LCL 0302	DF 1 8 9  Test Stat 1.7 0.846  95% UCL 0.0318	F Stat 485  Critical 23.2 0.741  Median 0.031	P-V <1.0	alue DE-05 alue 206 515	Decisio  Decisio  Equal Va Normal I	n(α:5%) Int Effect  n(α:1%) Pariances Distribution  Std Err  0.000274	1.98%	0.00%
Source Between Error Total  ANOVA Assur Attribute Variance Distribution  PCB 170 Sum Sample IOSN 2019 AT3-098  PCB 170 Deta	Sum Squ 0.000245 4.047E-0 0.000249 mptions Tests	uares 55 66 96 Ratio F Te Wilk W Nord	Mean 0.000 5.059  st mality Te  Mean 0.031 0.040	2455 E-07 st 95 0.0	<b>5% LCL</b> 0302 0399	DF 1 8 9 Test Stat 1.7 0.846  95% UCL 0.0318 0.0419	F Stat 485  Critical 23.2 0.741  Median 0.031 0.0406	P-V <1.0	alue DE-05 alue 206 515	Decisio  Decisio  Equal Va Normal I	n(α:5%) Int Effect  n(α:1%) Pariances Distribution  Std Err  0.000274	1.98%	0.00%

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									Te	est Co	de/ID:	11N-23-302	INVECTOR (	4-0924-3837
Bioaccumulat	tion Eva	aluation - P	CB Con	geners -	- Nerei	s							EA-ES	T, Inc. PBC
Analysis ID: Analyzed: Edit Date:	_	0-0024 1-23 6:57 7-23 22:52	Ana	lpoint: llysis: 5 Hash:	Parar	netric-Two	o Sample 0109F4274E	36108340	2572B		S Version s Level: r ID:	: CETISv2 1	.1.1	
Batch ID: Start Date: Ending Date: Test Length:	05 Apr	-23 11:33 -23 10:33	Pro	tocol:	US A Nerei		- PCBs - N RIM (2004)	V		Analy Dilue Brine Source	nt: No	ncy Roka t Applicable ⁄stal Sea O - Aquatic F	Research (	Or <b>Age:</b>
Sample Code	s	Sample ID	San	nple Da	te	Receipt	Date	Sample A	Age	Clien	t Name	Pr	oject	
IOSN 2019 AT3-098		3-4648-817 7-1559-497		Mar-23 Feb-23 1	13:00	08 Mar- 09 Feb-		12h 27d 23h		Eco-A	Analysts, Ir	nc. Dr	edged Sed	liment Evalu
Sample Code	N	Material Typ	e		Samp	le Source	Э	S	Station L	ocatio	on	Lat/Long		
IOSN 2019	F	Reference se	ediment		Yach	tsman Mar	rina NAE-20	004-00	OSN Re	ference	e			
AT3-098	N	/larine Sedir	nent		Yach	tsman Mar	rina NAE-20	004-00 1	0 Statio	ns at 4	Marinas N	Лu		
Data Transfor	m		Alt Hyp					Compa	rison Re	esult				PMSD
Untransformed	d		C < T					AT3-098	8 failed p	ocb 180	0 endpoint			2.45%
Sample I Reference Sec	vs Sa	o-Sample To ample II T3-098*	est df	<b>Test \$</b> 24.1		Critical	MSD 0.000778	P-Type CDF		alue E-05	<b>Decision</b> Significan	` '		
Auxiliary Test Attribute Outlier		<b>Test</b> Grubbs Extr	eme Val	ue Test			Test Stat	Critical 2.29	<b>P-V</b>	alue 372	<b>Decision</b> No Outlie	n(α:5%) ers Detected		
ANOVA Table														
Source	S	um Square	es	Mean	Squa	re	DF	F Stat	P-V	alue	Decision	ι(α:5%)		
Between Error Total	3	0.0002540 0.503E-06 0.0002575		0.000 4.379			1 8 9	580 —	<1.0	E-05	Significa	nt Effect		
ANOVA Assur	mptions	Tests												
Attribute	Т	est					Test Stat	Critical	P-V	alue	Decision	ι(α:1%)		
Attribute Variance Distribution	V				st		<b>Test Stat</b> 3.38 0.877	23.2 0.741	<b>P-V</b> 0.26 0.12	553	Equal Va	· ,		
Variance	V S	est /ariance Rat			st		3.38	23.2	0.26	553	Equal Va	riances		
Variance Distribution	wary	est /ariance Rai shapiro-Wilk				95% LCL	3.38	23.2	0.26 0.12	553 206	Equal Va	riances	CV%	%Effect
Variance Distribution PCB 180 Sum	omary	est /ariance Rai shapiro-Wilk	W Norm	ality Te	,	<b>95% LCL</b> 0.0312	3.38 0.877	23.2 0.741	0.26 0.12	653 206	Equal Va Normal D	riances Distribution	<b>CV%</b> 1.41%	%Effect 0.00%
Variance Distribution PCB 180 Sum Sample	omary	est /ariance Rat Shapiro-Wilk	Count	Mean	8 (		3.38 0.877 <b>95% UCL</b>	23.2 0.741 <b>Median</b>	0.26 0.12 <b>Min</b>	853 206 315	Equal Va	riances Distribution		
Variance Distribution  PCB 180 Sum Sample IOSN 2019	mary C	rest /ariance Rat Shapiro-Wilk  Code C	Count	Mean 0.031	8 (	0.0312	3.38 0.877 <b>95% UCL</b> 0.0324	23.2 0.741 <b>Median</b> 0.0315	0.26 0.12 <b>Min</b> 0.03	853 206 315	Equal Va Normal D Max 0.0325	riances Distribution  Std Err  0.0002	1.41%	0.00%
Variance Distribution PCB 180 Sum Sample IOSN 2019 AT3-098	omary C F	rest /ariance Rat Shapiro-Wilk Code C	Count	Mean 0.031	8 ( 9 (	0.0312	3.38 0.877 <b>95% UCL</b> 0.0324	23.2 0.741 <b>Median</b> 0.0315	0.26 0.12 <b>Min</b> 0.03	853 206 315	Equal Va Normal D Max 0.0325	riances Distribution  Std Err  0.0002	1.41%	0.00%
Variance Distribution  PCB 180 Sum Sample IOSN 2019 AT3-098  PCB 180 Deta	V S Imary C F	Code Code F	Count	Mean 0.031 0.041	9 (9 (1) (1) (1) (1) (1) (1) (1) (1) (1) (1)	0.0312 0.0409	3.38 0.877 <b>95% UCL</b> 0.0324 0.0429	23.2 0.741 <b>Median</b> 0.0315 0.0415	0.26 0.12 <b>Min</b> 0.03	853 206 315	Equal Va Normal D Max 0.0325	riances Distribution  Std Err  0.0002	1.41%	0.00%

Report Date: 19 Aug-23 06:58 (p 15 of 18)
Test Code/ID: TN-23-302NvPCB / 04-0924-3837

							Test Co	de/ID:	TN-23-302	NvPCB / 0	4-0924-3837
Bioaccumulati	on Evaluation	ı - PCB Co	ngeners ·	- Nereis						EA-ES	T, Inc. PBC
Analyzed:	05-4569-7612 19 Aug-23 6:5 08 May-23 22:	7 <b>A</b> ı	ndpoint: nalysis: D5 Hash:	PCB 187 Parametric-T 6C8EB23E4I		C3DE2C74I	Statu	S Version is Level: or ID:	: CETISv2 1	.1.1	
	•	33 Pı 33 Sı	est Type: rotocol: pecies: ixon:	Bioaccumlati US ACE NEI Nereis virens Polychaeta	O RIM (2004)	v	Analy Dilue Brine Sour	ent: No e: Cry	ncy Roka t Applicable ystal Sea tO - Aquatic F	Research (	Or <b>Age:</b>
Sample Code	Sample	ID Sa	ample Da	te Rece	ipt Date	Sample Ag	e Clien	nt Name	Pr	oject	
IOSN 2019 AT3-098	13-4648- 07-1559-		Mar-23 Feb-23 1	08 Ma 13:00 09 Fe	ar-23 eb-23 16:30	12h 27d 23h	Eco-/	Analysts, li	nc. Dr	edged Sed	liment Evalu
Sample Code	Material	Туре		Sample Sou	rce	Sta	ation Location	on	Lat/Long		
IOSN 2019		ce sedimen	t	Yachtsman N	/Jarina NAE-20	004-00 108	SN Referenc	e			
AT3-098	Marine S	Sediment		Yachtsman N	/larina NAE-20	004-00 10	Stations at 4	l Marinas I	Иu		
Data Transform	n	Alt Hyp				Comparis	son Result				PMSD
Untransformed		C < T				AT3-098 f	ailed pcb 18	7 endpoint			2.64%
Equal Variance Sample I v Reference Sed	s Sample I	Ι (	df Test 9	Stat Critical	<b>MSD</b> 0.00121	<b>P-Type</b> CDF	<b>P-Value</b> <1.0E-05	<b>Decision</b> Significat	· ,		
Auxiliary Tests Attribute	s Test				Test Stat	Critical	P-Value	Decision			
Outlier	Grubbs	Extreme Va	alue Test		1.97	2.29	0.2691	No Outlie	ers Detected		
Outlier  ANOVA Table	Grubbs	Extreme Va	alue Test		1.97	2.29	0.2691	No Outlie	ers Detected		
	Grubbs Sum Sq			Square	1.97 <b>DF</b>	2.29 <b>F Stat</b>	0.2691 P-Value	No Outlie			
ANOVA Table Source Between Error	Sum Sq 0.00052 8.4E-06	uares 56		5256	<b>DF</b> 1 8				η(α:5%)		
ANOVA Table Source Between Error Total	Sum Sq 0.00052: 8.4E-06 0.00053:	uares 56	<b>Mean</b> 0.000	5256	<b>DF</b> 1	F Stat	P-Value	Decision	η(α:5%)		
ANOVA Table Source Between Error Total ANOVA Assum	Sum Sq 0.000529 8.4E-06 0.000534 nptions Tests	uares 56	<b>Mean</b> 0.000	5256	<b>DF</b> 1 8	<b>F Stat</b> 501	<b>P-Value</b> <1.0E-05	<b>Decision</b> Significa	n(α:5%) nt Effect		
ANOVA Table Source Between Error Total ANOVA Assum Attribute	Sum Sq 0.00052: 8.4E-06 0.00053: nptions Tests Test	<b>uares</b> 56 40	<b>Mean</b> 0.000 1.05E	5256	DF 1 8 9	F Stat 501  Critical	P-Value <1.0E-05	Decision Significa	n(α:5%) nt Effect n(α:1%)		
ANOVA Table Source Between Error Total ANOVA Assum	Sum Sq 0.00052: 8.4E-06 0.00053: nptions Tests Test Variance	uares 56	Mean 0.000 1.05E	5256 -06	<b>DF</b> 1 8	<b>F Stat</b> 501	<b>P-Value</b> <1.0E-05	Decision Significa  Decision Equal Va	n(α:5%) nt Effect n(α:1%)		
ANOVA Table Source Between Error Total  ANOVA Assum Attribute Variance	Sum Sq 0.00052: 8.4E-06 0.00053: nptions Tests Test Variance Shapiro-	uares 56 40	Mean 0.000 1.05E	5256 -06	DF 1 8 9 Test Stat 2.11	F Stat 501  Critical 23.2	P-Value <1.0E-05 P-Value 0.4871	Decision Significa  Decision Equal Va	n(α:5%)  Int Effect  In (α:1%)  In (α:1%)		
ANOVA Table Source Between Error Total  ANOVA Assum Attribute Variance Distribution	Sum Sq 0.00052: 8.4E-06 0.00053: nptions Tests Test Variance Shapiro-	uares 56 40	Mean 0.000 1.05E	5256 -06	DF 1 8 9  Test Stat 2.11 0.852	F Stat 501	P-Value <1.0E-05 P-Value 0.4871	Decision Significa  Decision Equal Va	n(α:5%)  Int Effect  In (α:1%)  In (α:1%)	CV%	%Effect
ANOVA Table Source Between Error Total  ANOVA Assum Attribute Variance Distribution  PCB 187 Summ	Sum Sq 0.00052: 8.4E-06 0.00053: nptions Tests Test Variance Shapiro-	uares 56 40 • Ratio F Te Wilk W Nor	Mean 0.000 1.05E	5256 -06 st 95% LC	DF 1 8 9  Test Stat 2.11 0.852	F Stat 501	P-Value <1.0E-05 P-Value 0.4871 0.0610	Decision Significa Decision Equal Va Normal D	n(α:5%)  nt Effect  n(α:1%)  nriances  Distribution	<b>CV%</b> 1.80%	%Effect 0.00%
ANOVA Table Source Between Error Total  ANOVA Assum Attribute Variance Distribution  PCB 187 Summ Sample	Sum Sq 0.00052: 8.4E-06 0.00053: nptions Tests Test Variance Shapiro- mary Code	uares 56 40 • Ratio F Te Wilk W Nor	Mean 0.000 1.05E	5256 06 st 95% LC 6 0.0446	DF 1 8 9  Test Stat 2.11 0.852	F Stat 501	P-Value <1.0E-05 P-Value 0.4871 0.0610 Min	Decision Significa  Decision Equal Va Normal D	n(α:5%) nt Effect n(α:1%) uriances Distribution Std Err		
ANOVA Table Source Between Error Total  ANOVA Assum Attribute Variance Distribution  PCB 187 Summ Sample IOSN 2019	Sum Sq 0.000524 8.4E-06 0.000534 nptions Tests Test Variance Shapiro- mary Code	uares 56 40 Ratio F Te Wilk W Nor  Count 5	Mean 0.000 1.05E	5256 06 st 95% LC 6 0.0446	DF 1 8 9  Test Stat 2.11 0.852  L 95% UCL 0.0466	F Stat 501  Critical 23.2 0.741  Median 0.0455	P-Value <1.0E-05 P-Value 0.4871 0.0610 Min 0.045	Decision Significa  Decision Equal Va Normal D  Max 0.047	n(α:5%) nt Effect  n(α:1%) ariances Distribution  Std Err  0.000367	1.80%	0.00%
ANOVA Table Source Between Error Total  ANOVA Assum Attribute Variance Distribution  PCB 187 Summ Sample IOSN 2019 AT3-098	Sum Sq 0.000524 8.4E-06 0.000534 nptions Tests Test Variance Shapiro- mary Code	uares 56 40 Ratio F Te Wilk W Nor  Count 5 5	Mean 0.000 1.05E	5256 -06 st 95% LC 6 0.0446 1 0.0586	DF 1 8 9  Test Stat 2.11 0.852  L 95% UCL 0.0466 0.0616	F Stat 501  Critical 23.2 0.741  Median 0.0455	P-Value <1.0E-05 P-Value 0.4871 0.0610 Min 0.045	Decision Significa  Decision Equal Va Normal D  Max 0.047	n(α:5%) nt Effect  n(α:1%) ariances Distribution  Std Err  0.000367	1.80%	0.00%
ANOVA Table Source Between Error Total  ANOVA Assum Attribute Variance Distribution  PCB 187 Sumr Sample IOSN 2019 AT3-098  PCB 187 Detai	Sum Sq 0.00052: 8.4E-06 0.00053: hptions Tests	uares 56 40 Ratio F Te Wilk W Nor  Count 5	Mean 0.000 1.05E  sst mality Tes  Mean 0.045 0.060	5256 -06 st 95% LC 6 0.0446 1 0.0586	DF 1 8 9  Test Stat 2.11 0.852  L 95% UCL 0.0466	F Stat 501  Critical 23.2 0.741  Median 0.0455 0.0595	P-Value <1.0E-05 P-Value 0.4871 0.0610 Min 0.045	Decision Significa  Decision Equal Va Normal D  Max 0.047	n(α:5%) nt Effect  n(α:1%) ariances Distribution  Std Err  0.000367	1.80%	0.00%

Report Date: Test Code/ID: 19 Aug-23 06:58 (p 16 of 18) TN-23-302NvPCB / 04-0924-3837

								Test Co				
Bioaccumulat	tion Evalu	ıation - PCB	Cong	eners - N	lereis						EA-ES	T, Inc. PBC
Analysis ID: Analyzed: Edit Date:	02-2598- 19 Aug-2 08 May-2	3 6:57	Ana	lysis: F	PCB 195 Parametric-Two 8A1F3574672		6CB32D529	Statu	S Version is Level: or ID:	: CETISv2 1	.1.1	
Batch ID: Start Date: Ending Date: Test Length:	•	3 11:33	Prot	cies: N	Bioaccumlation JS ACE NED F Iereis virens Polychaeta		v	Analy Dilue Brine Sour	ent: No e: Cry	ncy Roka t Applicable ystal Sea tO - Aquatic F	Research (	Or <b>Age:</b>
Sample Code	Sar	mple ID	Sam	ple Date	Receip	t Date	Sample Age	e Clien	t Name	Pr	oject	
IOSN 2019 AT3-098	13-	4648-8170 1559-4974		Mar-23 eb-23 13	08 Mar- :00 09 Feb-	-23	12h 27d 23h		Analysts, Ir	nc. Dr	edged Sec	liment Evalu
Sample Code	Ma	terial Type		S	ample Sourc	е	Sta	tion Location	on	Lat/Long		
IOSN 2019	Ref	erence sedir	ment	Y	'achtsman Ma	rina NAE-20	04-00 IOS	N Referenc	e			
AT3-098	Ma	rine Sedimer	nt	Y	′achtsman Ma	rina NAE-20	004-00 10	Stations at 4	Marinas N	Ми 		
Data Transfor	m	Alt	Нур				Comparis	on Result				PMSD
Untransformed	ł	C <	Т				AT3-098 fa	ailed pcb 19	5 endpoint	t		2.65%
Equal Variand	ce t Two-S	Sample Test	:									
								P-Value	Dacision	/ =0/\		
<b>-</b>		nple II	df		at Critical	MSD	P-Type			η(α:5%)		
Sample I Reference Sec		nple II -098*	df 8	Test Sta	at Critical 1.86	<b>MSD</b> 0.00158	CDF	<1.0E-05	Significal	•		
<del></del>	d AT3	•				_				•		
Reference Sec	d AT3	-098*				_	CDF			nt Effect		
Reference Sec	d AT3	-098*	8	22.4		0.00158	CDF	<1.0E-05	Significal Decision	nt Effect		
Reference Sec Auxiliary Test Attribute	d AT3	-098* -st	8	22.4		0.00158  Test Stat	CDF  Critical	<1.0E-05	Significal Decision	nt Effect		
Auxiliary Test Attribute Outlier	d AT3	-098* -st	8	22.4	1.86	0.00158  Test Stat	CDF  Critical	<1.0E-05	Significal Decision	nt Effect n(α:5%) ers Detected		
Auxiliary Test Attribute Outlier ANOVA Table	d AT3	-098* -st -ubbs Extrem	8	22.4	1.86 quare	0.00158  Test Stat 1.9	CDF  Critical 2.29	<1.0E-05  P-Value  0.3527	Decision No Outlie	nt Effect n(α:5%) ers Detected n(α:5%)		
Auxiliary Test Attribute Outlier ANOVA Table Source	Te Gr	-098* ubbs Extrem	8	22.4 ne Test Mean S	1.86 quare	0.00158  Test Stat 1.9  DF 1 8	CDF  Critical 2.29  F Stat	<1.0E-05  P-Value  0.3527  P-Value	Decision No Outlie	nt Effect n(α:5%) ers Detected n(α:5%)		
Auxiliary Test Attribute Outlier ANOVA Table Source Between	Te Gr Sul	-098*  ubbs Extrem  squares 009025	8	22.4  ne Test  Mean S 0.00090	1.86 quare	0.00158  Test Stat 1.9  DF 1	CDF  Critical 2.29  F Stat	<1.0E-05  P-Value  0.3527  P-Value	Decision No Outlie	nt Effect n(α:5%) ers Detected n(α:5%)		
Auxiliary Test Attribute Outlier ANOVA Table Source Between Error	Te Gr Sui 0.0 0.0 0.0	-098*  ubbs Extrem  m Squares 009025 000144 009169	8	22.4  ne Test  Mean S 0.00090	1.86 quare	0.00158  Test Stat 1.9  DF 1 8	CDF  Critical 2.29  F Stat	<1.0E-05  P-Value  0.3527  P-Value	Decision No Outlie	nt Effect n(α:5%) ers Detected n(α:5%)		
Auxiliary Test Attribute Outlier ANOVA Table Source Between Error Total	Te Gr Sui 0.0 0.0 0.0	-098*  ubbs Extrem  m Squares 009025 000144 009169  Tests	8	22.4  ne Test  Mean S 0.00090	1.86 quare	0.00158  Test Stat 1.9  DF 1 8	CDF  Critical 2.29  F Stat 501	<1.0E-05  P-Value  0.3527  P-Value	Decision No Outlie	nt Effect  n(α:5%)  ers Detected  n(α:5%)  nt Effect		
Auxiliary Test Attribute Outlier ANOVA Table Source Between Error Total ANOVA Assur Attribute Variance	Sui 0.00 0.00 mptions Tes	m Squares 009025 000144 009169 Tests st	8 ne Valu	22.4  Mean S 0.00090 0.00000	1.86 quare	0.00158  Test Stat 1.9  DF 1 8 9  Test Stat 1.53	Critical 2.29  F Stat 501  Critical 23.2	P-Value 0.3527 P-Value <1.0E-05 P-Value 0.6920	Decisior No Outlie  Decisior Significan  Decisior Equal Va	n(α:5%) ers Detected n(α:5%) nt Effect n(α:1%) ariances		
Auxiliary Test Attribute Outlier ANOVA Table Source Between Error Total ANOVA Assur Attribute	Sui 0.00 0.00 mptions Tes	-098*  ubbs Extrem  m Squares 009025 000144 009169  Tests st	8 ne Valu	22.4  Mean S 0.00090 0.00000	1.86 quare	0.00158  Test Stat 1.9  DF 1 8 9	Critical 2.29  F Stat 501  Critical	P-Value 0.3527 P-Value <1.0E-05	Decisior No Outlie  Decisior Significan  Decisior Equal Va	nt Effect  n(α:5%) ers Detected  n(α:5%) nt Effect  n(α:1%)		
Auxiliary Test Attribute Outlier ANOVA Table Source Between Error Total ANOVA Assur Attribute Variance	Sun 0.0 0.0 0.0 mptions T Tes	m Squares 009025 000144 009169 Tests st	8 ne Valu	22.4  Mean S 0.00090 0.00000	1.86 quare	0.00158  Test Stat 1.9  DF 1 8 9  Test Stat 1.53	Critical 2.29  F Stat 501  Critical 23.2	P-Value 0.3527 P-Value <1.0E-05 P-Value 0.6920	Decisior No Outlie  Decisior Significan  Decisior Equal Va	n(α:5%) ers Detected n(α:5%) nt Effect n(α:1%) ariances		
Auxiliary Test Attribute Outlier ANOVA Table Source Between Error Total ANOVA Assur Attribute Variance Distribution PCB 195 Sum Sample	Sun 0.0 0.0 0.0 mptions T Tes Var Sha	m Squares 009025 000144 009169 Tests st riance Ratio apiro-Wilk W	8 ne Valu	Mean S 0.00090 0.00000  ality Test	1.86  quare 125 118	0.00158  Test Stat 1.9  DF 1 8 9  Test Stat 1.53 0.821	Critical 2.29  F Stat 501  Critical 23.2 0.741  Median	<1.0E-05  P-Value  0.3527  P-Value  <1.0E-05  P-Value  0.6920 0.0264  Min	Decision  Decision  Significan  Decision  Significan  Decision  Equal Va  Normal D	nt Effect  n(α:5%) ers Detected  n(α:5%) nt Effect  n(α:1%) eriances Distribution  Std Err	CV%	%Effect
Auxiliary Test Attribute Outlier ANOVA Table Source Between Error Total ANOVA Assur Attribute Variance Distribution PCB 195 Sum Sample IOSN 2019	Sul 0.0 0.0 0.0 Tes Var Sha	m Squares 009025 000144 009169 Tests st riance Ratio	8 ne Valu	22.4  Mean S 0.00090 0.00000  ality Test  Mean 0.0596	1.86  quare 125 118  95% LCL 0.0581	0.00158  Test Stat 1.9  DF 1 8 9  Test Stat 1.53 0.821  95% UCL 0.0611	Critical 2.29  F Stat 501  Critical 23.2 0.741  Median 0.059	<1.0E-05  P-Value 0.3527  P-Value <1.0E-05  P-Value 0.6920 0.0264  Min 0.0585	Decision Significan  Decision Significan  Decision Equal Va Normal E  Max  0.0615	nt Effect  n(a:5%) ers Detected  n(a:5%) nt Effect  n(a:1%) ariances Distribution  Std Err  0.000534	2.00%	0.00%
Auxiliary Test Attribute Outlier ANOVA Table Source Between Error Total ANOVA Assur Attribute Variance Distribution PCB 195 Sum Sample	Sun 0.0 0.0 0.0 mptions T Tes Var Sha	m Squares 009025 000144 009169 Tests st riance Ratio apiro-Wilk W	8 ne Valu	Mean S 0.00090 0.00000  ality Test	1.86  quare 125 118	0.00158  Test Stat 1.9  DF 1 8 9  Test Stat 1.53 0.821	Critical 2.29  F Stat 501  Critical 23.2 0.741  Median	<1.0E-05  P-Value  0.3527  P-Value  <1.0E-05  P-Value  0.6920 0.0264  Min	Decision  Decision  Significan  Decision  Significan  Decision  Equal Va  Normal D	nt Effect  n(α:5%) ers Detected  n(α:5%) nt Effect  n(α:1%) eriances Distribution  Std Err		
Auxiliary Test Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assur Attribute Variance Distribution  PCB 195 Sum Sample IOSN 2019	Sui 0.0 0.0 0.0 mptions T Tes Var Sha	m Squares 009025 000144 009169 Tests st riance Ratio	8 ne Valu	22.4  Mean S 0.00090 0.00000  ality Test  Mean 0.0596	1.86  quare 125 118  95% LCL 0.0581	0.00158  Test Stat 1.9  DF 1 8 9  Test Stat 1.53 0.821  95% UCL 0.0611	Critical 2.29  F Stat 501  Critical 23.2 0.741  Median 0.059	<1.0E-05  P-Value 0.3527  P-Value <1.0E-05  P-Value 0.6920 0.0264  Min 0.0585	Decision Significan  Decision Significan  Decision Equal Va Normal E  Max  0.0615	nt Effect  n(a:5%) ers Detected  n(a:5%) nt Effect  n(a:1%) ariances Distribution  Std Err  0.000534	2.00%	0.00%
Auxiliary Test Attribute Outlier ANOVA Table Source Between Error Total ANOVA Assur Attribute Variance Distribution PCB 195 Sum Sample IOSN 2019 AT3-098	Sui 0.0 0.0 0.0 mptions T Tes Var Sha	m Squares 009025 000144 009169 Tests st riance Ratio   apiro-Wilk W	F Test Norma	22.4  Mean S 0.00090 0.00000  ality Test  Mean 0.0596	1.86  quare 125 118  95% LCL 0.0581	0.00158  Test Stat 1.9  DF 1 8 9  Test Stat 1.53 0.821  95% UCL 0.0611	Critical 2.29  F Stat 501  Critical 23.2 0.741  Median 0.059	<1.0E-05  P-Value 0.3527  P-Value <1.0E-05  P-Value 0.6920 0.0264  Min 0.0585	Decision Significan  Decision Significan  Decision Equal Va Normal E  Max  0.0615	nt Effect  n(a:5%) ers Detected  n(a:5%) nt Effect  n(a:1%) ariances Distribution  Std Err  0.000534	2.00%	0.00%
Auxiliary Test Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assur Attribute Variance Distribution  PCB 195 Sum Sample IOSN 2019 AT3-098  PCB 195 Deta	Sui 0.0 0.0 0.0 Tes Var Sha	m Squares 009025 000144 009169 Tests st riance Ratio apiro-Wilk W de Cou 5 5	F Test Norma	22.4  Mean S 0.00090 0.00000  allity Test  Mean 0.0596 0.0786	95% LCL 0.0581 0.0768	0.00158  Test Stat 1.9  DF 1 8 9  Test Stat 1.53 0.821  95% UCL 0.0611 0.0804	Critical 2.29  F Stat 501  Critical 23.2 0.741  Median 0.059 0.078	<1.0E-05  P-Value 0.3527  P-Value <1.0E-05  P-Value 0.6920 0.0264  Min 0.0585	Decision Significan  Decision Significan  Decision Equal Va Normal E  Max  0.0615	nt Effect  n(a:5%) ers Detected  n(a:5%) nt Effect  n(a:1%) ariances Distribution  Std Err  0.000534	2.00%	0.00%

Report Date: Test Code/ID: 19 Aug-23 06:58 (p 17 of 18) TN-23-302NvPCB / 04-0924-3837

Bioaccumulation Evaluation - PCB Congeners - Nereis EA-EST. Inc. PBC CETISv2.1.1 Analysis ID: 03-1612-5429 Endpoint: **PCB 206 CETIS Version:** Analyzed: Parametric-Two Sample 19 Aug-23 6:57 Analysis: Status Level: MD5 Hash: 03526FED9E2B52E4C0A46B32B1EECFC **Edit Date: Editor ID:** 08 May-23 22:52 Batch ID: 16-3825-9393 Test Type: Bioaccumlation - PCBs - Nv Nancy Roka Analyst: Start Date: 08 Mar-23 11:33 Protocol: US ACE NED RIM (2004) Diluent: Not Applicable Ending Date: 05 Apr-23 10:33 Species: Nereis virens Brine: Crystal Sea Test Length: 27d 23h Taxon: Polychaeta Source: ARO - Aquatic Research Or Age: Sample Code Sample ID Sample Date Receipt Date Sample Age Client Name Project Eco-Analysts, Inc. **IOSN 2019** 13-4648-8170 08 Mar-23 08 Mar-23 12h Dredged Sediment Evalu AT3-098 07-1559-4974 08 Feb-23 13:00 09 Feb-23 16:30 27d 23h Sample Code **Station Location Material Type** Sample Source Lat/Long **IOSN 2019** Reference sediment Yachtsman Marina NAE-2004-00 **IOSN Reference** AT3-098 Marine Sediment Yachtsman Marina NAE-2004-00 10 Stations at 4 Marinas Mu **Data Transform PMSD** Alt Hyp Comparison Result 2.70% Untransformed C < T AT3-098 failed pcb 206 endpoint **Equal Variance t Two-Sample Test** P-Value Sample I Sample II df Test Stat Critical **MSD** P-Type Decision(a:5%) AT3-098\* 0.00164 <1.0E-05 Reference Sed 22 1.86 CDF Significant Effect **Auxiliary Tests** Attribute Test Test Stat Critical P-Value Decision(a:5%) 2.13 2.29 0.1299 Outlier Grubbs Extreme Value Test No Outliers Detected **ANOVA Table** Source DF P-Value **Sum Squares** Mean Square F Stat Decision(a:5%) Between 0.0009409 0.0009409 483 Significant Effect 1 <1.0E-05 0.0000156 8 Error 1.95E-06 Total 0.0009565 9 ANOVA Assumptions Tests **Attribute** Test Stat Critical P-Value Decision(a:1%) Variance Variance Ratio F Test 2.63 23.2 0.3721 **Equal Variances** 0.741 Distribution Shapiro-Wilk W Normality Test 0.842 0.0462 Normal Distribution PCB 206 Summary Sample Code Count Mean 95% LCL 95% UCL Median Min Max Std Err CV% %Effect **IOSN 2019** RS 5 0.0608 0.0621 1.71% 0.00% 0.0595 0.0605 0.06 0.0625 0.000464 AT3-098 5 0.0802 0.0781 0.0823 0.0795 0.079 0.083 0.000752 2.10% -31.91% PCB 206 Detail Sample Code Rep 1 Rep 2 Rep 3 Rep 4 Rep 5 IOSN 2019 RS 0.06 0.0605 0.06 0.061 0.0625 AT3-098 0.0805 0.079 0.0795 0.079 0.083

Report Date: Test Code/ID: 19 Aug-23 06:58 (p 18 of 18) TN-23-302NvPCB / 04-0924-3837

Bioaccumulat	tion Eva	aluation -	PCB C	onge	ners -	Nerei	is						EA-ES	T, Inc. PBC
Analysis ID: Analyzed: Edit Date:	•	0-5518 -23 6:57 -23 22:52	A	Analy		Parar	metric-Two	o Sample E4078D828	9235BEA0F	State	IS Versionus Level: or ID:	n: CETISv2 1	.1.1	
Batch ID: Start Date: Ending Date: Test Length:	05 Apr-	-23 11:33 -23 10:33	F	rest Test Test Test Test Test Test Test T	ies:	US A		- PCBs - N	V	Anal Dilu Brin Sou	ent: N	ancy Roka ot Applicable rystal Sea RO - Aquatic F	Research (	Or <b>Age:</b>
Sample Code	S	ample ID		Samp	ole Date	e	Receipt	Date	Sample Ag	e Cliei	nt Name	Pr	oject	
IOSN 2019 AT3-098	1	3-4648-81 7-1559-49			ar-23 eb-23 13	3:00	08 Mar- 09 Feb-		12h 27d 23h	Eco-	Analysts,	Inc. Dr	edged Sed	diment Evalu
Sample Code	· M	laterial Ty	ype			Samp	ole Source	Э	Sta	ition Locati	on	Lat/Long		
IOSN 2019	R	Reference	sedime	nt		Yacht	tsman Maı	rina NAE-20	04-00 108	SN Reference	е			
AT3-098	N	larine Sed	liment			Yacht	tsman Maı	rina NAE-20	04-00 10	Stations at	4 Marinas	Mu		
Data Transfor	rm		Alt Hy	γp					•	on Result				PMSD
Untransformed	b		C < T						AT3-098 f	ailed pcb 20	9 endpoir	nt		2.75%
Equal Variand			Test	df	Tost S	tat (	Critical	MSD	P-Type	P-Value	Decisio	on(α:5%)		
Sample I	vs Sa	ample II		uı	1621 3	ıaı v	•							
Sample I Reference Sec		T3-098*			21.6		1.86	0.00192	CDF	<1.0E-05	Significa	ant Effect		
•	d Al		ktreme \	8	21.6			0.00192  Test Stat  1.95		<1.0E-05 <b>P-Value</b> 0.2877	Decisio	ent Effect en(α:5%) iers Detected		
Reference Sec Auxiliary Test Attribute Outlier	d Al	Γ3-098* <b>Test</b>	ctreme \	8	21.6			Test Stat	Critical	P-Value	Decisio	on(α:5%)		
Reference Sec Auxiliary Test Attribute	ts (	Γ3-098* <b>Test</b>		8	21.6		1.86	Test Stat	Critical	P-Value	Decision No Outl	on(α:5%)		
Auxiliary Test Attribute Outlier ANOVA Table Source Between Error	d A1  ts  (	T3-098*  Test  Grubbs Ex  Gum Squa  .0012432 .0000213	res	8	21.6 e Test	Squa 432	1.86	<b>Test Stat</b> 1.95 <b>DF</b> 1 8	Critical 2.29	<b>P-Value</b> 0.2877	Decision No Outl	en(α:5%) iers Detected		
Auxiliary Test Attribute Outlier ANOVA Table Source Between Error Total	S S 0 0 0 0 0	T3-098*  Test  Grubbs Ex  Gum Squa  .0012432 .0000213 .0012645	res	8	21.6  Test  Mean : 0.0012	Squa 432	1.86	<b>Test Stat</b> 1.95 <b>DF</b> 1	Critical 2.29	P-Value 0.2877 P-Value	Decision No Outl	en(α:5%) iers Detected en(α:5%)		
Auxiliary Test Attribute Outlier ANOVA Table Source Between Error Total ANOVA Assur	d All All All All All All All All All Al	Test Grubbs Ex  Grubbs Ex  0012432 0000213 0012645 Tests	res	8	21.6  Test  Mean : 0.0012	Squa 432	1.86	<b>Test Stat</b> 1.95 <b>DF</b> 1 8 9	Critical 2.29  F Stat 467	P-Value 0.2877 P-Value <1.0E-05	Decision No Outl	en(α:5%) iers Detected en(α:5%) ant Effect		
Auxiliary Test Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assur Attribute	ts  S  O  O  mptions	Test Grubbs Ex  Grubbs Ex  0012432 .000213 .0012645 Grest Graft	res	8 Value	21.6  Test  Mean : 0.0012	Squa 432	1.86	Test Stat 1.95  DF 1 8 9	Critical 2.29  F Stat 467  Critical	P-Value 0.2877  P-Value <1.0E-05	Decision  Decision  Decision  Decision	on(α:5%) iers Detected on(α:5%) ant Effect on(α:1%)		
Auxiliary Test Attribute Outlier ANOVA Table Source Between Error Total ANOVA Assur	ts  S  O  O  mptions  T	Test Grubbs Ex  Grubbs Ex  0012432 0000213 0012645 Tests	res atio F T	8  Value	21.6  Test  Mean 9 0.0012 2.663E	<b>Squa</b> : 432 06	1.86	<b>Test Stat</b> 1.95 <b>DF</b> 1 8 9	Critical 2.29  F Stat 467	P-Value 0.2877 P-Value <1.0E-05	Decision  Decision  Signification  Decision  Equal V	en(α:5%) iers Detected en(α:5%) ant Effect		
Auxiliary Test Attribute Outlier ANOVA Table Source Between Error Total ANOVA Assur Attribute Variance	ts S O O O O O O O O O O O O O O O O O O	Test Grubbs Ex  Grubbs Ex  Gum Squa  .0012432 .0000213 .0012645 Grest  dest desirance R	res atio F T	8  Value	21.6  Test  Mean 9 0.0012 2.663E	<b>Squa</b> : 432 06	1.86	Test Stat 1.95  DF 1 8 9  Test Stat 1.73	Critical 2.29  F Stat 467  Critical 23.2	P-Value 0.2877  P-Value <1.0E-05  P-Value 0.6082	Decision  Decision  Signification  Decision  Equal V	on(a:5%) iers Detected on(a:5%) ant Effect on(a:1%)		
Auxiliary Test Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assur Attribute Variance Distribution	ts S O O O O O O O O O O O O O O O O O O	Test Grubbs Ex  Grubbs Ex  Gum Squa  .0012432 .0000213 .0012645 Grest  dest desirance R	res atio F T	8  /alue	21.6  Test  Mean 9 0.0012 2.663E	<b>Squa</b> l 43206	1.86	Test Stat 1.95  DF 1 8 9  Test Stat 1.73	Critical 2.29  F Stat 467  Critical 23.2	P-Value 0.2877  P-Value <1.0E-05  P-Value 0.6082	Decision  Decision  Signification  Decision  Equal V	on(a:5%) iers Detected on(a:5%) ant Effect on(a:1%)	CV%	%Effect
Auxiliary Test Attribute Outlier ANOVA Table Source Between Error Total ANOVA Assur Attribute Variance Distribution PCB 209 Sum	ts S S O O O mptions T V S S mmary C	Test Grubbs Ex G	res atio F T	8  /alue	21.6  Test  Mean 9 0.0012 2.663E	Squal 432 -06	1.86 re	Test Stat 1.95  DF 1 8 9  Test Stat 1.73 0.834	Critical 2.29  F Stat 467  Critical 23.2 0.741	P-Value 0.2877  P-Value <1.0E-05  P-Value 0.6082 0.0372	Decision  Decision  Signification  Decision  Equal V  Normal	on(α:5%) iers Detected on(α:5%) ant Effect on(α:1%) ariances Distribution	CV% 2.00%	%Effect 0.00%
Auxiliary Test Attribute Outlier ANOVA Table Source Between Error Total ANOVA Assur Attribute Variance Distribution PCB 209 Sum Sample	ts S S O O O mptions T V S S mmary C	Test Grubbs Ex Gum Squa 0.0012432 0.000213 0.0012645 Tests est dariance R Chapiro-Wi	atio F T	8  /alue	Mean : 0.0012 2.663E	Squal 432 -06	1.86 re	Test Stat 1.95  DF 1 8 9  Test Stat 1.73 0.834  95% UCL	Critical 2.29  F Stat 467  Critical 23.2 0.741  Median	P-Value 0.2877  P-Value <1.0E-05  P-Value 0.6082 0.0372  Min	Decision No Outl  Decision Significat  Decision Equal V Normal	on(α:5%) iers Detected on(α:5%) ant Effect on(α:1%) fariances Distribution Std Err	2.00%	
Auxiliary Test Attribute Outlier ANOVA Table Source Between Error Total ANOVA Assur Attribute Variance Distribution PCB 209 Sum Sample IOSN 2019	d A1 ts  S S 0 0 0 0 mptions T V S nmary C	Test Grubbs Ex Gum Squa 0.0012432 0.000213 0.0012645 Tests est dariance R Chapiro-Wi	atio F T	8  /alue	21.6  Mean : 0.0012   2.663E	Squal 432 -06	1.86 re 95% LCL 0.068	Test Stat 1.95  DF 1 8 9  Test Stat 1.73 0.834  95% UCL 0.0714	Critical 2.29  F Stat 467  Critical 23.2 0.741  Median 0.069	P-Value 0.2877  P-Value <1.0E-05  P-Value 0.6082 0.0372  Min 0.0685	Decision No Outl  Decision Significat  Decision Equal V Normal  Max 0.072	on(α:5%) iers Detected on(α:5%) ant Effect on(α:1%) // ariances // Distribution  Std Err // 0.000624	2.00%	0.00%
Auxiliary Test Attribute Outlier ANOVA Table Source Between Error Total ANOVA Assur Attribute Variance Distribution PCB 209 Sum Sample IOSN 2019 AT3-098	ts S O O O O O O O O O O O O O O O O O O	Test Grubbs Ex Gum Squa 0.0012432 0.000213 0.0012645 Tests est dariance R Chapiro-Wi	atio F T	8  /alue	21.6  Mean : 0.0012   2.663E	<b>Squa</b> 432 06	1.86 re 95% LCL 0.068	Test Stat 1.95  DF 1 8 9  Test Stat 1.73 0.834  95% UCL 0.0714	Critical 2.29  F Stat 467  Critical 23.2 0.741  Median 0.069	P-Value 0.2877  P-Value <1.0E-05  P-Value 0.6082 0.0372  Min 0.0685	Decision No Outl  Decision Significat  Decision Equal V Normal  Max 0.072	on(α:5%) iers Detected on(α:5%) ant Effect on(α:1%) // ariances // Distribution  Std Err // 0.000624	2.00%	0.00%
Auxiliary Test Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assur Attribute Variance Distribution  PCB 209 Sum Sample IOSN 2019 AT3-098  PCB 209 Deta	ts S O O O O O O O O O O O O O O O O O O	Test Grubbs Ex G	atio F T	8  Value	21.6  Mean : 0.0012   2.663E  Mean : 0.0697   0.092	Squar 432 3-06	re 95% LCL 0.068 0.0897	Test Stat 1.95  DF 1 8 9  Test Stat 1.73 0.834  95% UCL 0.0714 0.0943	Critical 2.29  F Stat 467  Critical 23.2 0.741  Median 0.069 0.091	P-Value 0.2877  P-Value <1.0E-05  P-Value 0.6082 0.0372  Min 0.0685	Decision No Outl  Decision Significat  Decision Equal V Normal  Max 0.072	on(α:5%) iers Detected on(α:5%) ant Effect on(α:1%) // ariances // Distribution  Std Err // 0.000624	2.00%	0.00%

# ATTACHMENT VII

Nereis virens 28-Day Solid Phase Bioaccumulation Testing Tissue Chemistry and Body Burden Statistical Analyses

Pesticides

(30 pages)

#### Yachtsman Marina NAE-2004-00319

#### APPENDIX A. CONCENTRATIONS OF COCs IN THE WORM (N. virens)

			<b>Pre-Assay</b>		
CONTAMINANT	REP1	REP2	REP3	REP4 *	REP5 *
Pesticides (ng/g wet weight)					
Aldrin	0.0400 U	0.0411 <b>U</b>	0.0401 U		
cis-Chlordane	0.0860 <mark>U</mark>	0.0885 <mark>U</mark>	0.0865 <mark>U</mark>		
trans-Chlordane	0.0243 U	0.0250 U	0.0244 U		
cis-Nonachlor	0.0116 <mark>U</mark>	0.0119 U	0.0116 <mark>U</mark>		
trans-Nonachlor	0.0107 U	0.0110 U	0.0107 U		
Oxychlordane	0.0495 <mark>U</mark>	0.0510 U	0.0497 <mark>U</mark>		
Total Chlordanes	0.182	0.187	0.183		
4,4'-DDT	0.0158 <mark>U</mark>	0.0162 U	0.0158 <mark>U</mark>		
4,4'-DDD	6.38 P	3.49 P	0.0120 U		
4,4'-DDE	0.00730 U	0.00750 U	0.00730 U		
Total DDT	6.40	3.51	0.0351		
Dieldrin	0.0241 U	0.0248 <mark>U</mark>	0.0241 <mark>U</mark>		
alpha-Endosulfan	0.0220 U	0.0226 U	0.0221 U		
beta-Endosulfan	0.0114 U	0.0117 U	0.0114 U		
Endosulfans	0.0334	0.0343	0.0334		
Endrin	0.0131 <mark>U</mark>	0.0135 <mark>U</mark>	0.0132 <mark>U</mark>		
Heptachlor	0.0250 U	0.0257 U	0.0251 U		
Heptachlor epoxide	0.0515 U	0.0530 U	0.0515 <mark>U</mark>		
Hexachlorobenzene	0.215 <mark>U</mark>	0.221 U	0.216 U		
Lindane	0.0361 U	0.0371 <b>U</b>	0.0362 <mark>U</mark>		
Methoxychlor	0.0570 U	0.0585 <mark>U</mark>	0.0570 U		
Toxaphene	1.04 <mark>U</mark>	1.07 <mark>U</mark>	1.04 <mark>U</mark>		

<sup>\* =</sup> Qualifiers

U Analyte not detected; below Method Detection Limit; value is one-half the Method Detection Limit

J Analyte estimated; detection below Reporting Limit but above Method Detection Limit

NA Not Analyzed

#### Yachtsman Marina NAE-2004-00319

#### APPENDIX A. CONCENTRATIONS OF COCs IN THE WORM (N. virens)

			OSN Reference		
CONTAMINANT	REP1	REP2	REP3	REP4	REP5
Pesticides (ng/g wet weight)	IXLII	INLI Z	INEI 3	IXLI 4	IXLI 3
	0.0600 <mark>U</mark>	0.0505.11	0.0600.11	0.0605 <mark>U</mark>	0.0625.11
Aldrin		0.0595 U	0.0600 U		0.0625 U
cis-Chlordane	0.130 U	0.129 U	0.130 <mark>U</mark>	0.131 U	0.135 U
trans-Chlordane	0.0365 <mark>U</mark>	0.0365 U	0.0365 <mark>U</mark>	0.0370 U	0.0380 U
cis-Nonachlor	0.0175 <mark>U</mark>	0.0175 <mark>U</mark>	0.0175 <b>U</b>	0.0175 <b>U</b>	0.0180 <b>U</b>
trans-Nonachlor	0.0160 <mark>U</mark>	0.0160 <mark>U</mark>	0.0160 <mark>U</mark>	0.0160 U	0.0165 <mark>U</mark>
Oxychlordane	0.0745 <b>U</b>	0.0740 U	0.0745 <mark>U</mark>	0.0755 U	0.0775 <mark>U</mark>
Total Chlordanes	0.275	0.273	0.274	0.277	0.285
4,4'-DDT	0.0235 <mark>U</mark>	0.0235 <mark>U</mark>	0.0235 <mark>U</mark>	0.0240 <mark>U</mark>	0.0245 <mark>U</mark>
4,4'-DDD	0.0180 <mark>U</mark>	0.0180 <mark>U</mark>	0.0180 <mark>U</mark>	0.0180 U	0.0190 U
4,4'-DDE	0.0110 U	0.0110 U	0.0110 U	0.0110 U	0.0115 U
Total DDT	0.0525	0.0525	0.0525	0.0530	0.0550
Dieldrin	0.0365 <mark>U</mark>	0.0360 <mark>U</mark>	0.0360 U	0.0365 U	0.0375 U
alpha-Endosulfan	0.0330 <mark>U</mark>	0.0330 <mark>U</mark>	0.0330 U	0.0335 U	0.0345 <mark>U</mark>
beta-Endosulfan	0.0170 U	0.0170 U	0.0170 U	0.0175 U	0.0180 U
Endosulfans	0.0500	0.0500	0.0500	0.0510	0.0525
Endrin	0.0200 U	0.0195 <mark>U</mark>	0.0195 <mark>U</mark>	0.0200 U	0.0205 U
Heptachlor	0.0375 U	0.0375 U	0.0375 U	0.0380 U	0.0390 U
Heptachlor epoxide	0.0775 U	0.0770 U	0.0770 U	0.0780 U	0.0805 U
Hexachlorobenzene	0.324 U	0.321 <mark>U</mark>	0.323 U	0.327 U	0.336 U
Lindane	0.0545 U	0.0540 U	0.0540 U	0.0550 U	0.0565 U
Methoxychlor	0.835 <mark>U</mark>	0.830 <mark>U</mark>	0.835 <mark>U</mark>	0.845 <mark>U</mark>	0.870 U
Toxaphene	1.57 <mark>U</mark>	1.55 <mark>U</mark>	1.56 <mark>U</mark>	1.58 <mark>U</mark>	1.63 <mark>U</mark>

<sup>\* =</sup> Qualifiers

U Analyte not detected; below J Analyte estimated; detection NA Not Analyzed

#### Yachtsman Marina NAE-2004-00319

#### APPENDIX A. CONCENTRATIONS OF COCs IN THE WORM (N. virens)

#### 10 Stations at 4 Marinas Mud

CONTAMINANT	REP1	REP2	REP3	REP4	REP5
Pesticides (ng/g wet weight)					
Aldrin	0.0402 U	0.0393 <mark>U</mark>	0.0396 U	0.0395 <mark>U</mark>	0.0412 U
cis-Chlordane	0.0870 U	0.0850 <mark>U</mark>	0.0855 <mark>U</mark>	0.0850 <mark>U</mark>	0.0890 U
trans-Chlordane	0.0245 <mark>U</mark>	0.0239 <mark>U</mark>	0.0241 <mark>U</mark>	0.0240 <mark>U</mark>	0.0251 U
cis-Nonachlor	0.0117 U	0.0114 <mark>U</mark>	0.0115 <mark>U</mark>	0.0115 <mark>U</mark>	0.0120 U
trans-Nonachlor	0.0107 U	0.0105 <mark>U</mark>	0.0106 <mark>U</mark>	0.0105 <mark>U</mark>	0.0110 U
Oxychlordane	0.0499 U	0.0488 <mark>U</mark>	0.0491 <b>U</b>	0.0489 <mark>U</mark>	0.0510 U
Total Chlordanes	0.184	0.180	0.181	0.180	0.188
4,4'-DDT	0.0159 U	0.0155 <mark>U</mark>	0.0156 U	0.0156 <mark>U</mark>	0.0163 <mark>U</mark>
4,4'-DDD	0.545	1.02	0.934	0.488	0.336
4,4'-DDE	0.00735 U	0.00715 <mark>U</mark>	0.00720 U	0.00720 U	0.00750 U
Total DDT	0.568	1.04	0.957	0.511	0.360
Dieldrin	0.0242 U	0.0237 U	0.0239 U	0.0238 <mark>U</mark>	0.0249 U
alpha-Endosulfan	0.0221 U	0.0217 U	0.0218 <mark>U</mark>	0.0217 U	0.0227 U
beta-Endosulfan	0.0114 <mark>U</mark>	0.0112 <mark>U</mark>	0.0113 <mark>U</mark>	0.0112 <mark>U</mark>	0.0117 U
Endosulfans	0.0335	0.0328	0.0331	0.0329	0.0344
Endrin	0.0132 <mark>U</mark>	0.0129 <mark>U</mark>	0.0130 U	0.0130 <mark>U</mark>	0.0135 U
Heptachlor	0.0252 U	0.0246 <mark>U</mark>	0.0248 <mark>U</mark>	0.0247 U	0.0258 U
Heptachlor epoxide	0.0520 U	0.0505 U	0.0510 U	0.0510 U	0.0530 U
Hexachlorobenzene	0.217 U	0.212 <mark>U</mark>	0.214 <mark>U</mark>	0.213 <mark>U</mark>	0.222 <mark>U</mark>
Lindane	0.0364 U	0.0356 <mark>U</mark>	0.0358 <mark>U</mark>	0.0357 <mark>U</mark>	0.0373 U
Methoxychlor	0.0570 U	0.0560 <mark>U</mark>	0.0565 <mark>U</mark>	0.0560 <mark>U</mark>	0.0585 <mark>U</mark>
Toxaphene	1.05 <mark>U</mark>	1.02 <mark>U</mark>	1.03 <mark>U</mark>	1.03 <mark>U</mark>	1.07 <b>U</b>

<sup>\* =</sup> Qualifiers

U Analyte not detected; belogJ Analyte estimated; detection

NA Not Analyzed

#### **CETIS Test Data Worksheet**

Report Date:

19 Aug-23 07:00 (p 1 of 1)

Test Code/ID:

TN-23-302NvPest / 04-3042-6729

**Bioaccumulation Evaluation - Pesticides - Nereis** 

EA-EST, Inc. PBC

Start Date:

End Date:

05 Apr-23 10:34

08 Mar-23 11:34 Species: Nereis virens

Sample Code: AT3-152 Protocol: US ACE NED RIM (2004)

Sample Source: Yachtsman Marina NAE-2004-00319

Sample Date: 03 Mar-23 Material: Laboratory Control Sediment Sample Station: Laboratory Control

Sample Date. US N	nai 20			iateria	i. Lo	iboraic	ny Coi	iti Oi O	cuiiiic	110			ampie	Otatio	,,,, _,	aborat	ory oc	7111101											
Sample	Rep	Pos	4-4'-DDD	4-4'-DDE	4-4'-DDT	aldrin	alpha chlordane	alpha-BHC	beta-BHC	cis-Nonachlor	delta-BHC	Dieldrin	endosulfan I	endosulfan II	endrin	gamma-BHC (Lindane)	gamma-chlordane	heptachlor	heptachlor epoxide	hexachlorobenzene	Methoxychlor	oxychlordane	toxaphene	trans-nonachlor	2-4'-DDD	2-4'-DDE	2-4'-DDT	endosulfan sulfate	Total DDTs
IOSN 2019	1	1	0.02	0.01	0.02	0.06	0.13			0.02		0.04	0.03	0.02	0.02	0.05	0.04	0.04	0.08	0.32	0.84	0.07	1.57	0.02					
IOSN 2019	2	3	0.02	0.01	0.02	0.06	0.13			0.02		0.04	0.03	0.02	0.02	0.05	0.04	0.04	0.08	0.32	0.83	0.07	1.55	0.02					
IOSN 2019	3	6	0.02	0.01	0.02	0.06	0.13			0.02		0.04	0.03	0.02	0.02	0.05	0.04	0.04	0.08	0.32	0.84	0.07	1.56	0.02					
IOSN 2019	4	8	0.02	0.01	0.02	0.06	0.13			0.02		0.04	0.03	0.02	0.02	0.06	0.04	0.04	0.08	0.33	0.85	0.08	1.58	0.02					
IOSN 2019	5	10	0.02	0.01	0.02	0.06	0.14			0.02		0.04	0.03	0.02	0.02	0.06	0.04	0.04	0.08	0.34	0.87	0.08	1.63	0.02					
AT3-098	1	2	0.55	0.007	0.02	0.04	0.09	0.02	0.02	0.01	0.02	0.02	0.02	0.01	0.01	0.04	0.02	0.03	0.05	0.22	0.06	0.05	1.05	0.01					
AT3-098	2	4	1.02	0.007	0.02	0.04	0.09	0.02	0.02	0.01	0.02	0.02	0.02	0.01	0.01	0.04	0.02	0.02	0.05	0.21	0.06	0.05	1.02	0.01					
AT3-098	3	5	0.93	0.007	0.02	0.04	0.09	0.02	0.02	0.01	0.02	0.02	0.02	0.01	0.01	0.04	0.02	0.02	0.05	0.21	0.06	0.05	1.03	0.01					
AT3-098	4	7	0.49	0.007	0.02	0.04	0.09	0.02	0.02	0.01	0.02	0.02	0.02	0.01	0.01	0.04	0.02	0.02	0.05	0.21	0.06	0.05	1.03	0.01					
AT3-098	5	9	0.34	0.008	0.02	0.04	0.09	0.03	0.02	0.01	0.02	0.02	0.02	0.01	0.01	0.04	0.03	0.03	0.05	0.22	0.06	0.05	1.07	0.01					

**Report Date:** 19 Aug-23 07:00 (p 1 of 5) **Test Code/ID:** TN-23-302NvPest / 04-3042-6729

#### **Bioaccumulation Evaluation - Pesticides - Nereis**

Batch ID: Start Date: Ending Date: Test Length:	08-2970-4074 08 Mar-23 11:34 05 Apr-23 10:34 27d 23h	Test Type: Protocol: Species: Taxon:	Bioaccumulation - Pestici US ACE NED RIM (2004) Nereis virens Polychaeta		Analyst: Diluent: Brine: Source:	Nancy Roka Not Applica Crystal Sea ARO - Aqua	ble
Sample ID: Sample Date: Receipt Date: Sample Age:	03 Mar-23 12:30	Code: Material: CAS (PC): Client:	AT3-152 Laboratory Control Sedim Eco-Analysts, Inc.	ent	Project: Source: Station:	ū	ediment Evaluation Marina NAE-2004-00319 ( Control
Sample Code	Sample ID	Sample Da	te Receipt Date	Sample Age	Client Nan	ne	Project
IOSN 2019 AT3-098	13-4648-8170 07-1559-4974	08 Mar-23 08 Feb-23 1	08 Mar-23 3:00 09 Feb-23 16:30	12h 27d 23h	Eco-Analys	sts, Inc.	Dredged Sediment Evalu
IOSN 2019	13-4648-8170 07-1559-4974			27d 23h	Eco-Analys Location	sts, Inc. Lat/L	
IOSN 2019 AT3-098	13-4648-8170 07-1559-4974	08 Feb-23 1	3:00 09 Feb-23 16:30	27d 23h  Station 2004-00 IOSN F		Lat/L	

arison Summary				
Endpoint	Comparison Method	P-Value	Comparison Result	s
4-4'-DDD	Unequal Variance t Two-Sample Test	0.0041	AT3-098 failed 4-4'-ddd	1
4-4'-DDE	Wilcoxon Rank Sum Two-Sample Test	1.0000	AT3-098 passed 4-4'-dde	1
4-4'-DDT	Equal Variance t Two-Sample Test	1.0000	AT3-098 passed 4-4'-ddt	1
aldrin	Equal Variance t Two-Sample Test	1.0000	AT3-098 passed aldrin	1
alpha chlordane	Equal Variance t Two-Sample Test	1.0000	AT3-098 passed alpha chlordane	1
cis-Nonachlor	Wilcoxon Rank Sum Two-Sample Test	1.0000	AT3-098 passed cis-nonachlor	1
Dieldrin	Equal Variance t Two-Sample Test	1.0000	AT3-098 passed dieldrin	1
endosulfan I	Equal Variance t Two-Sample Test	1.0000	AT3-098 passed endosulfan i	1
endosulfan II	Equal Variance t Two-Sample Test	1.0000	AT3-098 passed endosulfan ii	1
endrin	Equal Variance t Two-Sample Test	1.0000	AT3-098 passed endrin	1
gamma-BHC (Lindane)	Equal Variance t Two-Sample Test	1.0000	AT3-098 passed gamma-bhc (lindane)	1
gamma-chlordane	Wilcoxon Rank Sum Two-Sample Test	1.0000	AT3-098 passed gamma-chlordane	1
heptachlor	Equal Variance t Two-Sample Test	1.0000	AT3-098 passed heptachlor	1
heptachlor epoxide	Equal Variance t Two-Sample Test	1.0000	AT3-098 passed heptachlor epoxide	1
hexachlorobenzene	Equal Variance t Two-Sample Test	1.0000	AT3-098 passed hexachlorobenzene	1
Methoxychlor	Unequal Variance t Two-Sample Test	1.0000	AT3-098 passed methoxychlor	1
Methoxychlor	Wilcoxon Rank Sum Two-Sample Test	1.0000	AT3-098 passed methoxychlor	1
oxychlordane	Equal Variance t Two-Sample Test	1.0000	AT3-098 passed oxychlordane	1
toxaphene	Equal Variance t Two-Sample Test	1.0000	AT3-098 passed toxaphene	1
trans-nonachlor	Wilcoxon Rank Sum Two-Sample Test	1.0000	AT3-098 passed trans-nonachlor	1
	Endpoint  4-4'-DDD  4-4'-DDE  4-4'-DDT  aldrin  alpha chlordane  cis-Nonachlor  Dieldrin  endosulfan I  endosulfan II  endrin  gamma-BHC (Lindane)  gamma-chlordane  heptachlor  heptachlor  heptachlor epoxide  hexachlorobenzene  Methoxychlor  oxychlordane  toxaphene	Endpoint Comparison Method  4-4'-DDD Unequal Variance t Two-Sample Test  4-4'-DDE Wilcoxon Rank Sum Two-Sample Test  4-4'-DDT Equal Variance t Two-Sample Test  aldrin Equal Variance t Two-Sample Test  alpha chlordane Equal Variance t Two-Sample Test  cis-Nonachlor Wilcoxon Rank Sum Two-Sample Test  Dieldrin Equal Variance t Two-Sample Test  endosulfan I Equal Variance t Two-Sample Test  endosulfan II Equal Variance t Two-Sample Test  endrin Equal Variance t Two-Sample Test  gamma-BHC (Lindane) Equal Variance t Two-Sample Test  gamma-chlordane Wilcoxon Rank Sum Two-Sample Test  heptachlor Equal Variance t Two-Sample Test  heptachlor Equal Variance t Two-Sample Test  hexachlorobenzene Equal Variance t Two-Sample Test  Methoxychlor Unequal Variance t Two-Sample Test  Methoxychlor Wilcoxon Rank Sum Two-Sample Test  Methoxychlor Unequal Variance t Two-Sample Test  Methoxychlor Wilcoxon Rank Sum Two-Sample Test  Methoxychlor Unequal Variance t Two-Sample Test  Methoxychlor Equal Variance t Two-Sample Test  Methoxychlor Equal Variance t Two-Sample Test  Equal Variance t Two-Sample Test  Methoxychlor Wilcoxon Rank Sum Two-Sample Test  Equal Variance t Two-Sample Test  Equal Variance t Two-Sample Test  Equal Variance t Two-Sample Test  Equal Variance t Two-Sample Test	EndpointComparison MethodP-Value4-4'-DDDUnequal Variance t Two-Sample Test0.00414-4'-DDEWilcoxon Rank Sum Two-Sample Test1.00004-4'-DDTEqual Variance t Two-Sample Test1.0000aldrinEqual Variance t Two-Sample Test1.0000alpha chlordaneEqual Variance t Two-Sample Test1.0000cis-NonachlorWilcoxon Rank Sum Two-Sample Test1.0000DieldrinEqual Variance t Two-Sample Test1.0000endosulfan IEqual Variance t Two-Sample Test1.0000endrinEqual Variance t Two-Sample Test1.0000gamma-BHC (Lindane)Equal Variance t Two-Sample Test1.0000gamma-chlordaneWilcoxon Rank Sum Two-Sample Test1.0000heptachlorEqual Variance t Two-Sample Test1.0000heptachlor epoxideEqual Variance t Two-Sample Test1.0000hexachlorobenzeneEqual Variance t Two-Sample Test1.0000MethoxychlorUnequal Variance t Two-Sample Test1.0000MethoxychlorWilcoxon Rank Sum Two-Sample Test1.0000MethoxychlorWilcoxon Rank Sum Two-Sample Test1.0000oxychlordaneEqual Variance t Two-Sample Test1.0000toxapheneEqual Variance t Two-Sample Test1.0000	EndpointComparison MethodP-ValueComparison Result4-4'-DDDUnequal Variance t Two-Sample Test0.0041AT3-098 failed 4-4'-ddd4-4'-DDEWilcoxon Rank Sum Two-Sample Test1.0000AT3-098 passed 4-4'-dde4-4'-DDTEqual Variance t Two-Sample Test1.0000AT3-098 passed 4-4'-ddtaldrinEqual Variance t Two-Sample Test1.0000AT3-098 passed aldrinalpha chlordaneEqual Variance t Two-Sample Test1.0000AT3-098 passed alpha chlordanecis-NonachlorWilcoxon Rank Sum Two-Sample Test1.0000AT3-098 passed cis-nonachlorDieldrinEqual Variance t Two-Sample Test1.0000AT3-098 passed dieldrinendosulfan IEqual Variance t Two-Sample Test1.0000AT3-098 passed endosulfan iendrinEqual Variance t Two-Sample Test1.0000AT3-098 passed endrosulfan iigamma-BHC (Lindane)Equal Variance t Two-Sample Test1.0000AT3-098 passed gamma-bhc (lindane)gamma-chlordaneWilcoxon Rank Sum Two-Sample Test1.0000AT3-098 passed gamma-chlordaneheptachlorEqual Variance t Two-Sample Test1.0000AT3-098 passed heptachlorheptachlor epoxideEqual Variance t Two-Sample Test1.0000AT3-098 passed heptachlor epoxidehexachlorobenzeneEqual Variance t Two-Sample Test1.0000AT3-098 passed methoxychlorMethoxychlorUnequal Variance t Two-Sample Test1.0000AT3-098 passed methoxychlorMethoxychlorWilcoxon Rank Sum Two-Sample Test1.0000AT3-098 passed methoxychlor<

### **CETIS Summary Report**

Report Date: Test Code/ID: 19 Aug-23 07:00 (p 2 of 5) TN-23-302NvPest / 04-3042-6729

**Bioaccumulation Evaluation - Pesticides - Nereis** 

Sample	Code	Count	Mean	95% I CI	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effec
IOSN 2019	RS	5	0.0182	0.0176	0.0188	0.018	0.019	0.0002	0.000447	2.46%	0.00%
AT3-098	110	5	0.665	0.296	1.03	0.336	1.02	0.133	0.297	44.66%	-3551.6
4-4'-DDE Summ	ary										
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effec
IOSN 2019	RS	5	0.0111	0.0108	0.0114	0.011	0.0115	0.0001	0.000224	2.01%	0.00%
AT3-098		5	0.00728	0.0071	0.00746	0.00715	0.0075	0.0000644	0.000144	1.98%	34.41%
4-4'-DDT Summ	ary										
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effe
IOSN 2019	RS	5	0.0238	0.0232	0.0244	0.0235	0.0245	0.0002	0.000447	1.88%	0.00%
AT3-098		5	0.0157	0.0154	0.0161	0.0155	0.0162	0.000139	0.00031	1.97%	33.829
aldrin Summary	,										
Sample	Code	Count	Mean	95% LCL			Max	Std Err	Std Dev	CV%	%Effe
IOSN 2019	RS	5	0.0605	0.059	0.062	0.0595	0.0625	0.000524	0.00117	1.94%	0.00%
AT3-098		5	0.0399	0.039	0.0409	0.0393	0.0412	0.000348	0.000778	1.95%	33.979
alpha chlordane	-	_							<b>-</b>		o : —
Sample	Code	Count	Mean		95% UCL		Max	Std Err	Std Dev	CV%	%Effe
IOSN 2019	RS	5	0.131	0.128	0.134	0.129	0.135	0.00108	0.00241	1.84%	0.00%
AT3-098		5	0.0863	0.0842	0.0884	0.085	0.089	0.000768	0.00172	1.99%	34.079
cis-Nonachlor S	-										
Sample	Code	Count	Mean	95% LCL			Max	Std Err	Std Dev	CV%	%Effe
IOSN 2019	RS	5	0.0176	0.0173	0.0179	0.0175	0.018	0.0001	0.000224	1.27%	0.00%
AT3-098		5	0.0116	0.0113	0.0119	0.0114	0.012	0.000101	0.000226	1.95%	34.099
Dieldrin Summa	•										
Sample	Code	Count	Mean	95% LCL		Min	Max	Std Err	Std Dev	CV%	%Effe
IOSN 2019	RS	5	0.0365	0.0357	0.0373	0.036	0.0375	0.000274	0.000612	1.68%	0.00%
AT3-098		5	0.0241	0.0235	0.0247	0.0237	0.0248	0.000214	0.000478	1.98%	34.059
endosulfan I Su	•										
Sample	Code	Count	Mean	95% LCL		Min	Max	Std Err	Std Dev	CV%	%Effe
IOSN 2019	RS	5	0.0334	0.0326	0.0342	0.033	0.0345	0.000292	0.000652	1.95%	0.00%
AT3-098		5	0.022	0.0215	0.0225	0.0216	0.0227	0.000194	0.000434	1.97%	34.169
endosulfan II Su	-										
Sample	Code	Count	Mean	95% LCL			Max	Std Err	Std Dev	CV%	%Effe
IOSN 2019	RS	5	0.0173	0.0167	0.0179	0.017	0.018	0.0002	0.000447	2.59%	0.00%
AT3-098		5	0.0113	0.0111	0.0116	0.0111	0.0117	0.0000992	0.000222	1.96%	34.459
endrin Summar		_							<b>-</b>		
Sample	Code	Count	Mean		95% UCL		Max	Std Err	Std Dev	CV%	%Effe
IOSN 2019	RS	5	0.0199	0.0194	0.0204	0.0195	0.0205	0.000187	0.000418	2.10%	0.00%
AT3-098		5	0.0131	0.0128	0.0134	0.0129	0.0135	0.00011	0.000246	1.88%	34.129
gamma-BHC (Li	•	•									
Sample	Code	Count	Mean		95% UCL		Max	Std Err	Std Dev	CV%	%Effe
IOSN 2019	RS	5	0.0548	0.0535	0.0561	0.054	0.0565	0.000464	0.00104	1.89%	5.20%
AT3-098		5	0.0361	0.0352	0.037	0.0355	0.0373	0.000314	0.000703	1.95%	3.49%

### **CETIS Summary Report**

Report Date: Test Code/ID: 19 Aug-23 07:00 (p 3 of 5) TN-23-302NvPest / 04-3042-6729

**Bioaccumulation Evaluation - Pesticides - Nereis** 

gamma-chlordane	Summary										
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
IOSN 2019	RS	5	0.0369	0.0361	0.0377	0.0365	0.038	0.000292	0.000652	1.77%	3.56%
AT3-098		5	0.0243	0.0237	0.0249	0.0239	0.025	0.000209	0.000468	1.92%	2.37%
heptachlor Summa	ry										
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
IOSN 2019	RS	5	0.0379	0.0371	0.0387	0.0375	0.039	0.000292	0.000652	1.72%	0.00%
AT3-098		5	0.025	0.0244	0.0256	0.0246	0.0258	0.00022	0.000492	1.97%	33.98%
heptachlor epoxide	Summary										
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
IOSN 2019	RS	5	0.078	0.0762	0.0798	0.077	0.0805	0.000652	0.00146	1.87%	0.00%
AT3-098		5	0.0515	0.0503	0.0527	0.0505	0.053	0.000447	0.001	1.94%	33.97%
hexachlorobenzene	e Summary	1									
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
IOSN 2019	RS	5	0.326	0.319	0.334	0.321	0.336	0.00267	0.00596	1.83%	0.00%
AT3-098		5	0.215	0.21	0.22	0.212	0.222	0.00189	0.00424	1.97%	34.01%
Methoxychlor Sum	mary										
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
IOSN 2019	RS	5	0.843	0.823	0.863	0.83	0.87	0.00718	0.016	1.90%	0.00%
AT3-098		5	0.0568	0.0555	0.0581	0.056	0.0585	0.000464	0.00104	1.83%	93.26%
oxychlordane Sum	mary										
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
IOSN 2019	RS	5	0.0752	0.0735	0.0769	0.074	0.0775	0.000624	0.0014	1.86%	0.00%
AT3-098		5	0.0495	0.0484	0.0507	0.0487	0.051	0.000416	0.000929	1.88%	34.15%
toxaphene Summa	ry										
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
IOSN 2019	RS	5	1.58	1.54	1.61	1.55	1.63	0.0132	0.0295	1.87%	0.00%
AT3-098		5	1.04	1.01	1.06	1.02	1.07	0.00903	0.0202	1.94%	34.14%
trans-nonachlor Su	ımmary										
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
IOSN 2019	RS	5	0.0161	0.0158	0.0164	0.016	0.0165	0.0001	0.000224	1.39%	0.00%
AT3-098		5	0.0106	0.0104	0.0109	0.0104	0.011	0.0000992	0.000222	2.09%	33.91%

Report Date:

19 Aug-23 07:00 (p 4 of 5) TN-23-302NvPest / 04-3042-6729

oz no odmini	ary itop	0.1					Test Code/ID:	TN-23-302NvPest / 04-3042-6729
Bioaccumulation B	Evaluation	- Pesticides	s - Nereis					EA-EST, Inc. PBC
4-4'-DDD Detail							MD5: 3AC2F	24637BB4B91C14DF8039C1C2CD6
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5		
IOSN 2019	RS	0.018	0.018	0.018	0.018	0.019		
AT3-098		0.545	1.02	0.934	0.488	0.336		
4-4'-DDE Detail							MD5: 84E3C	18EA1D182D890C2937CB78D64AB
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5		
IOSN 2019	RS	0.011	0.011	0.011	0.011	0.0115		
AT3-098		0.00735	0.00715	0.0072	0.0072	0.0075		
4-4'-DDT Detail							MD5: B6AB7	2835EA8F5FD1C1DB81ACC073EDE
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5		
IOSN 2019	RS	0.0235	0.0235	0.0235	0.024	0.0245		
AT3-098		0.0159	0.0155	0.0156	0.0155	0.0162		
aldrin Detail							MD5: 4679F2	2E9C684641004BB74E92D0F039E
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5		
IOSN 2019	RS	0.06	0.0595	0.06	0.0605	0.0625		
AT3-098		0.0402	0.0393	0.0396	0.0395	0.0412		
alpha chlordane D	etail						MD5: CC2AD	DF7117E500C15BD9DA5DD158D663
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5		
IOSN 2019	RS	0.13	0.129	0.13	0.131	0.135		
AT3-098		0.087	0.085	0.0855	0.085	0.089		
cis-Nonachlor Det	ail						MD5: F48BA	D9D55CDAFA5A98435658706EC3E
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5		
IOSN 2019	RS	0.0175	0.0175	0.0175	0.0175	0.018		
AT3-098		0.0117	0.0114	0.0115	0.0115	0.012		
Dieldrin Detail							MD5: 100664	800AE1E04003B6578BDFD32221
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5		
IOSN 2019	RS	0.0365	0.036	0.036	0.0365	0.0375		
AT3-098		0.0242	0.0237	0.0238	0.0237	0.0248		
endosulfan I Detai	i						MD5: 6F87B9	91E6641DEEFABEB5CD93E1AC3A4
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5		
IOSN 2019	RS	0.033	0.033	0.033	0.0335	0.0345		
AT3-098		0.0221	0.0216	0.0218	0.0217	0.0227		
endosulfan II Deta	il						MD5: 3239C6	6E4B7D89C5811C9339447AF03BD
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5		
IOSN 2019	RS	0.017	0.017	0.017	0.0175	0.018		
AT3-098		0.0114	0.0111	0.0113	0.0112	0.0117		
endrin Detail							MD5: A0D2C	6B4F9ECDCA13F956098900D5B9E
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5		
IOSN 2019	RS	0.02	0.0195	0.0195	0.02	0.0205		
AT3-098		0.0132	0.0129	0.013	0.013	0.0135		
gamma-BHC (Lind	lane) Deta	il					MD5: 614F84	BF6F415E980BF132BF85F8F69F
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5		
IOSN 2019	RS	0.0545	0.054	0.054	0.055	0.0565		
AT3-098		0.0364	0.0355	0.0358	0.0356	0.0373		

#### **CETIS Summary Report**

Report Date: Test Code/ID: 19 Aug-23 07:00 (p 5 of 5) TN-23-302NvPest / 04-3042-6729

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gamma-chlorda	ane Detail						MD5: 3034683ECBB3B1BCF6404B54278E622E
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
IOSN 2019	RS	0.0365	0.0365	0.0365	0.037	0.038	
AT3-098		0.0245	0.0239	0.0241	0.024	0.025	
heptachlor Deta	ail						MD5: 3B9E0CBD8C081E007766E0A2EC3C44A5
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
IOSN 2019	RS	0.0375	0.0375	0.0375	0.038	0.039	
AT3-098		0.0252	0.0246	0.0248	0.0247	0.0258	
heptachlor epo	xide Detail						MD5: 13E302DC0DDE68B162D75B92B20650EF
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
IOSN 2019	RS	0.0775	0.077	0.077	0.078	0.0805	
AT3-098		0.052	0.0505	0.051	0.051	0.053	
hexachloroben	zene Detail						MD5: E1BBBA742E57DE5AD07AD219A57FDBF8
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
IOSN 2019	RS	0.324	0.321	0.322	0.327	0.336	
AT3-098		0.216	0.212	0.213	0.213	0.222	
Methoxychlor D	Detail						MD5: 955BF3943188CA3B8CA50ED459DEDBD1
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
IOSN 2019	RS	0.835	0.83	0.835	0.845	0.87	
AT3-098		0.057	0.056	0.0565	0.056	0.0585	
oxychlordane D	Detail						MD5: E6FB14D92CF4B671D06426A3C27C4B4E
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
IOSN 2019	RS	0.0745	0.074	0.0745	0.0755	0.0775	
AT3-098		0.0498	0.0487	0.0491	0.0489	0.051	
toxaphene Deta	ail						MD5: C865FEEA96D68486D2D8D5F0A836A757
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
IOSN 2019	RS	1.57	1.55	1.56	1.58	1.63	
AT3-098		1.04	1.02	1.03	1.02	1.07	
trans-nonachlo	r Detail						MD5: 794A571E5B6F9708107F5CDABCC8729A
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
IOSN 2019	RS	0.016	0.016	0.016	0.016	0.0165	
AT3-098		0.0107	0.0104	0.0105	0.0105	0.011	

STUDY: TN-23-302

CLIENT: Eco-Analysts, Inc.

PROJECT: Yachtsman Marina, Kennebunkport, ME NAE-2004-00319

ASSAY: *N. virens* 28-day Bioaccumulation Evaluation TASK: Statistical Analysis of Body Burden Pesticides

Endpoint	Method	С	<	Т	Statistic	Critical	P Level	Alpha	Reject Null	MSD	DF	Ties	P-Type
4-4'-DDD	Unequal Variance t Two-Sample Test	IOSN	<	Comp	4.869961	2.131847	0.00410996	0.05	TRUE	0.2829644	4		С
4-4'-DDE	Wilcoxon Rank Sum Two-Sample Test	IOSN	<	Comp	40		1	0.05	FALSE		8	0	E
4-4'-DDT	Equal Variance t Two-Sample Test	IOSN	<	Comp	-33.07133	1.859548	1	0.05	FALSE	0.000452639	8		С
aldrin	Equal Variance t Two-Sample Test	IOSN	<	Comp	-32.65609	1.859548	1	0.05	FALSE	0.001170186	8		С
alpha chlordane	Equal Variance t Two-Sample Test	IOSN	<	Comp	-33.7144	1.859548	1	0.05	FALSE	0.002459953	8		С
cis-Nonachlor	Wilcoxon Rank Sum Two-Sample Test	IOSN	<	Comp	40		1	0.05	FALSE		8	0	E
Dieldrin	Equal Variance t Two-Sample Test	IOSN	<	Comp	-35.78549	1.859548	1	0.05	FALSE	0.000645909	8		С
endosulfan I	Equal Variance t Two-Sample Test	IOSN	<	Comp	-32.5867	1.859548	1	0.05	FALSE	0.000651107	8		С
endosulfan II	Equal Variance t Two-Sample Test	IOSN	<	Comp	-26.69404	1.859548	1	0.05	FALSE	0.000415183	8		С
endrin	Equal Variance t Two-Sample Test	IOSN	<	Comp	-31.28667	1.859548	1	0.05	FALSE	0.000403569	8		С
gamma-BHC (Lindane)	Equal Variance t Two-Sample Test	IOSN	<	Comp	-33.34121	1.859548	1	0.05	FALSE	0.001041845	8		С
gamma-chlordane	Wilcoxon Rank Sum Two-Sample Test	IOSN	<	Comp	40		1	0.05	FALSE		8	0	E
heptachlor	Equal Variance t Two-Sample Test	IOSN	<	Comp	-35.26453	1.859548	1	0.05	FALSE	0.000679181	8		С
heptachlor epoxide	Equal Variance t Two-Sample Test	IOSN	<	Comp	-33.52015	1.859548	1	0.05	FALSE	0.001470102	8		С
hexachlorobenzene	Equal Variance t Two-Sample Test	IOSN	<	Comp	-33.90313	1.859548	1	0.05	FALSE	0.006082738	8		С
Methoxychlor	Wilcoxon Rank Sum Two-Sample Test	IOSN	<	Comp	40		1	0.05	FALSE		8	0	E
Methoxychlor	Unequal Variance t Two-Sample Test	IOSN	<	Comp	-245.1282	2.353364	1	0.05	FALSE	0.007483141	3		С
oxychlordane	Equal Variance t Two-Sample Test	IOSN	<	Comp	-34.23545	1.859548	1	0.05	FALSE	0.001394846	8		С
toxaphene	Equal Variance t Two-Sample Test	IOSN	<	Comp	-33.69084	1.859548	1	0.05	FALSE	0.02969462	8		С
trans-nonachlor	Wilcoxon Rank Sum Two-Sample Test	IOSN	<	Comp	40		1	0.05	FALSE		8	0	E

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Bioaccumulat	tion Evaluation - Pe	sticides	- Nereis							EA-ES	Γ, Inc. PBC
Analysis ID: Analyzed: Edit Date:	14-0552-7923 19 Aug-23 6:59 08 May-23 22:53	Ana	•	rametric-Tw	o Sample CCA1BDD10	003605E13C	Statu	S Version is Level: or ID:	: CETISv2	2.1.1	
Batch ID:	08-2970-4074	Test	Type: Bio	accumulatio	n - Pesticid	es	Anal	yst: Na	ncy Roka		
Start Date:	08 Mar-23 11:34	Prot	ocol: US	ACE NED I	RIM (2004)		Dilue	ent: No	t Applicable		
Ending Date:	05 Apr-23 10:34	Spe	cies: Ne	reis virens			Brine	e: Cry	ystal Sea		
Test Length:	27d 23h	Taxo	on: Pol	ychaeta			Sour	ce: AR	O - Aquatic	Research C	r <b>Age:</b>
Sample Code	Sample ID	Sam	ple Date	Receip	t Date	Sample Ag	e Clier	nt Name	Р	roject	
IOSN 2019	13-4648-8170	08 N	lar-23	08 Mar-		12h	Eco-	Analysts, lı	nc. D	redged Sed	iment Evalu
AT3-098	07-1559-4974	08 F	eb-23 13:00	09 Feb-	-23 16:30	27d 23h					
Sample Code	Material Type		Sai	mple Sourc	е	Sta	tion Locati	on	Lat/Long	1	
IOSN 2019	Reference sec	liment	Ya	chtsman Ma	rina NAE-20	004-00 109	SN Reference	e			
AT3-098	Marine Sedim	ent	Yad	chtsman Ma	rina NAE-20	004-00 10	Stations at 4	Marinas I	Mu		
Data Transfor	rm Al	t Hyp				Comparis	on Result				PMSD
Untransformed	d C	< T				AT3-098 f	ailed 4-4'-do	ld endpoint	t		1554.75%
Unequal Varia	ance t Two-Sample	Test									
Sample I	vs Sample II	df	Test Stat	Critical	MSD	P-Type	P-Value	Decision	η(α:5%)		
Reference Sec	d AT3-098*	4	4.87	2.13	0.283	CDF	0.0041	Significa	nt Effect		
Auxiliary Test	ts										
Attribute	Test				Test Stat	Critical	P-Value	Decision	η(α:5%)		
Outlier	Grubbs Extre	me Valu	e Test		1.8	2.29	0.5037	No Outlie	ers Detected		
ANOVA Table	)										
Source	Sum Squares	<b>;</b>	Mean Squ	uare	DF	F Stat	P-Value	Decision	n(α:5%)		
Between	1.04458		1.04458		1	23.7	0.0012	Significa	· · ·		
Error	0.352356		0.044044	5	8			3			
Total	1.39694					_					
					9						
ANOVA Assur	mptions Tests				9						
ANOVA Assur					9 Test Stat	Critical	P-Value	Decision	η(α:1%)		
	mptions Tests	F Test				23.2	<b>P-Value</b> <1.0E-05		n(α:1%) Variances		
Attribute	mptions Tests Test				Test Stat			Unequal	• •		
Attribute Variance	mptions Tests  Test  Variance Ratio Shapiro-Wilk \				<b>Test Stat</b> 440000	23.2	<1.0E-05	Unequal	Variances		
Attribute Variance Distribution	mptions Tests  Test  Variance Ratio Shapiro-Wilk N			95% LCL	<b>Test Stat</b> 440000 0.906	23.2 0.741	<1.0E-05	Unequal	Variances	CV%	%Effect
Attribute Variance Distribution  4-4'-DDD Sum	mptions Tests  Test  Variance Ratio Shapiro-Wilk N	V Norm	ality Test	<b>95% LCL</b> 0.0176	<b>Test Stat</b> 440000 0.906	23.2 0.741	<1.0E-05 0.2534	Unequal Normal E	Variances Distribution	<b>CV%</b> 2.46%	%Effect 0.00%
Attribute Variance Distribution  4-4'-DDD Sum Sample	mptions Tests  Test  Variance Ratio Shapiro-Wilk \	V Norm	Mean		Test Stat 440000 0.906	23.2 0.741 <b>Median</b>	<1.0E-05 0.2534 Min	Unequal Normal E	Variances Distribution		
Attribute Variance Distribution  4-4'-DDD Sum Sample IOSN 2019	mptions Tests  Test  Variance Ratio Shapiro-Wilk \  mary  Code Co  RS 5 5	V Norm	Mean 0.0182	0.0176	Test Stat 440000 0.906 95% UCL 0.0188	23.2 0.741 <b>Median</b> 0.018	<1.0E-05 0.2534 <b>Min</b> 0.018	Unequal Normal E Max 0.019	Variances Distribution  Std Err 0.0002	2.46%	0.00%
Attribute Variance Distribution  4-4'-DDD Sum Sample IOSN 2019 AT3-098	mptions Tests  Test  Variance Ration Shapiro-Wilk Numary  Code Code RS 5 5	V Norm	Mean 0.0182	0.0176	Test Stat 440000 0.906 95% UCL 0.0188	23.2 0.741 <b>Median</b> 0.018	<1.0E-05 0.2534 <b>Min</b> 0.018	Unequal Normal E Max 0.019	Variances Distribution  Std Err 0.0002	2.46%	0.00%
Attribute Variance Distribution  4-4'-DDD Sum Sample IOSN 2019 AT3-098  4-4'-DDD Deta	mptions Tests  Test  Variance Ratio Shapiro-Wilk Variance  Code Code Results  Test  Variance Ratio Shapiro-Wilk Variance Ratio Shapiro-Wilk Variance Ratio Shapiro-Wilk Variance Ratio Shapiro-Wilk Variance Results  Code Results  Code Results	V Norm	Mean 0.0182 0.665	0.0176 0.296	Test Stat 440000 0.906 95% UCL 0.0188 1.03	23.2 0.741 <b>Median</b> 0.018 0.545	<1.0E-05 0.2534 <b>Min</b> 0.018	Unequal Normal E Max 0.019	Variances Distribution  Std Err 0.0002	2.46%	0.00%

IOSN 2019

AT3-098

RS

0.011

0.00735

0.011

0.00715

0.011

0.0072

Report Date: Test Code/ID:

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							Test C	ode/ID:	TN-23-302	NvPest / 0	)4-3042-672
Bioaccumula	tion Evaluation	ı - Pesticide	es - Nereis							EA-ES	T, Inc. PBC
Analysis ID: Analyzed: Edit Date:	14-6121-4079 19 Aug-23 6:59 08 May-23 22:	9 <b>A</b> n	•	4'-DDE onparametric EEA41834C	•		Stat	TIS Version tus Level: tor ID:	: CETISv2.	.1.1	
Batch ID: Start Date: Ending Date: Test Length:	08-2970-4074 08 Mar-23 11:3 05 Apr-23 10:3 27d 23h	34 <b>Pr</b> 34 <b>S</b> p	otocol: US ecies: Ne	paccumulation  ACE NED Foreis virens  Sychaeta		es	Dilu Brir	ent: No	ncy Roka t Applicable /stal Sea .O - Aquatic F	Research (	Or <b>Age:</b>
Sample Code	Sample	ID Sa	mple Date	Receip	t Date	Sample Ag	ge Clie	nt Name	Pr	oject	
IOSN 2019 AT3-098	13-4648- 07-1559-	8170 08	Mar-23 Feb-23 13:0	08 Mar-	-23	12h 27d 23h		-Analysts, li		•	diment Evalı
Sample Code	Material	Туре	Sa	mple Sourc	e	St	ation Locat	ion	Lat/Long		
IOSN 2019 AT3-098	Referenc Marine S	ce sediment ediment		ichtsman Ma ichtsman Ma			SN Referen Stations at		Лu		
Data Transfo	rm	Alt Hyp				Compari	son Result				PMSD
Untransforme	d	C < T				AT3-098	passed 4-4'	-dde endpo	nt		1.99%
	nk Sum Two-Sa	•		Outstand.	T!	D.T	D. Valera	Destates	. ( 50/)		
Sample I Reference Se	vs Sample II	<u> </u>		: Critical	Ties 0	P-Type Exact	1.0000	Decision	ı(α:5%) nificant Effect		
			40			LXact	1.0000	14011-31gi	IIIICANI LITECT		
Auxiliary Tes <sup>.</sup> Attribute	ts Test				Test Stat	Critical	P-Value	Decision	n(α:5%)		
Outlier	Grubbs	Extreme Va	lue Test		2.26	2.29	0.0625		ers Detected		
ANOVA Table	<u> </u>										
Source	Sum Sq	uaroe	Mean Sq	uaro	DF	F Stat	P-Value	Decision	\(\ar\c=\(\ar\c)\)		
Between	3.648E-0		3.648E-0	'	1	1030	<1.0E-05		` ,		
Error	2.83E-07		3.538E-0		8	1000	11.02 00	Olgriilloa	ii Liioot		
Total	3.676E-0	)5			9						
ANOVA Assu	mptions Tests										
Attribute	Test				Test Stat	Critical	P-Value	Decision	η(α:1%)		
Variance	Variance	Ratio F Te	st		2.41	23.2	0.4152	Equal Va	· ,		
Distribution	Shapiro-	Wilk W Nor	mality Test		0.712	0.741	0.0012	Non-Nori	mal Distributio	on	
4-4'-DDE Sun	nmary										
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
IOSN 2019	RS	5	0.0111	0.0108	0.0114	0.011	0.011	0.0115	0.0001	2.01%	0.00%
AT3-098		5	0.00728	0.0071	0.00746	0.0072	0.00715	0.0075	0.0000644	1.98%	34.41%
4-4'-DDE Deta	ail										
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
<del> </del>											

0.011

0.0072

0.0115

0.0075

Report Date: Test Code/ID: 19 Aug-23 07:00 (p 3 of 19) TN-23-302NvPest / 04-3042-6729

Bioaccumulation Evaluation - Pesticides - Nereis EA-EST. Inc. PBC CETISv2.1.1 Analysis ID: 19-2680-5750 Endpoint: 4-4'-DDT **CETIS Version:** Parametric-Two Sample Analyzed: 19 Aug-23 6:59 Analysis: Status Level: **Edit Date:** MD5 Hash: 9D8A85229143661C7BED30254A154562 **Editor ID:** 08 May-23 22:53 Batch ID: 08-2970-4074 Test Type: Bioaccumulation - Pesticides Nancy Roka Analyst: Start Date: 08 Mar-23 11:34 Protocol: US ACE NED RIM (2004) Diluent: Not Applicable Ending Date: 05 Apr-23 10:34 Species: Nereis virens Brine: Crystal Sea Test Length: 27d 23h Taxon: Polychaeta Source: ARO - Aquatic Research Or Age: Sample Code Sample ID Sample Date Receipt Date Sample Age Client Name Project Eco-Analysts, Inc. **IOSN 2019** 13-4648-8170 08 Mar-23 08 Mar-23 12h Dredged Sediment Evalu AT3-098 07-1559-4974 08 Feb-23 13:00 09 Feb-23 16:30 27d 23h Sample Code **Station Location Material Type** Sample Source Lat/Long **IOSN 2019** Reference sediment Yachtsman Marina NAE-2004-00 **IOSN Reference** AT3-098 Marine Sediment Yachtsman Marina NAE-2004-00 10 Stations at 4 Marinas Mu **Data Transform PMSD** Alt Hyp Comparison Result Untransformed C < T AT3-098 passed 4-4'-ddt endpoint 1.90% **Equal Variance t Two-Sample Test** Sample I Sample II df Test Stat Critical **MSD** P-Type P-Value Decision(a:5%) AT3-098 0.000453 1.0000 Reference Sed -33.1 1.86 CDF Non-Significant Effect **Auxiliary Tests** Attribute Test Test Stat Critical P-Value Decision(a:5%) 1.93 2.29 0.3125 Outlier Grubbs Extreme Value Test No Outliers Detected **ANOVA Table** Source DF P-Value **Sum Squares** Mean Square F Stat Decision(a:5%) Between 0.0001620 0.0001620 Significant Effect 1 1090 <1.0E-05 1.185E-06 8 Error 1.481E-07 Total 0.0001632 9 ANOVA Assumptions Tests **Attribute** Test Stat Critical P-Value Decision(a:1%) Variance Variance Ratio F Test 2.08 23.2 0.4962 **Equal Variances** 0.741 0.0295 Distribution Shapiro-Wilk W Normality Test 0.825 Normal Distribution 4-4'-DDT Summary Code Count 95% LCL 95% UCL Median Min Max Std Err CV% %Effect Sample Mean **IOSN 2019** RS 5 1.88% 0.00% 0.0238 0.0232 0.0244 0.0235 0.0235 0.0245 0.0002 AT3-098 5 0.0157 0.0154 0.0161 0.0156 0.0155 0.0163 0.000139 1.97% 33.82% 4-4'-DDT Detail Sample Code Rep 1 Rep 2 Rep 3 Rep 4 Rep 5 IOSN 2019 RS 0.0235 0.0235 0.0235 0.024 0.0245 AT3-098 0.0159 0.0155 0.0156 0.0156 0.0163

Report Date: 19 Aug-23 07:00 (p 4 of 19)
Test Code/ID: TN-23-302NvPest / 04-3042-6729

		<u>-</u>								Т	est Co	de/ID:	TN-23-302	NvPest / 0	4-3042-6729
Bioaccumula	tion	Evaluation -	Pesti	cides	- Nere	is								EA-ES	T, Inc. PBC
Analysis ID: Analyzed: Edit Date:	19 <i>A</i>	5698-3625 Aug-23 6:59 May-23 22:53	3	Anal	point: ysis: Hash:	Parar	netric-Two	o Sample 01552897D	499768F	-D1B54		S Version is Level: or ID:	n: CETISv2 1	.1.1	
Batch ID: Start Date: Ending Date: Test Length:	08 N 05 A	•			ocol: cies:	US A	CE NED F s virens	n - Pesticid RIM (2004)	es		Analy Dilue Brine Sour	ent: No e: Cr	ancy Roka ot Applicable ystal Sea RO - Aquatic F	Research (	Or <b>Age:</b>
Sample Code		Sample ID	)	Sam	ple Da	te	Receipt	Date	Sample	Age	Clien	t Name	Pr	oject	
IOSN 2019 AT3-098		13-4648-8 07-1559-4	170		lar-23 eb-23 1	13:00	08 Mar-	23	12h 27d 23		Eco-/	Analysts, l		•	liment Evalu
Sample Code		Material T	уре			Samp	le Source	Э		Station	Location	on	Lat/Long		
IOSN 2019		Reference	sedim	ent		Yacht	sman Mai	rina NAE-20	04-00	IOSN Re	eferenc	е			
AT3-098		Marine Se	dimen	t		Yacht	sman Maı	rina NAE-20	004-00	10 Statio	ns at 4	Marinas	Mu		
Data Transfor	m		Alt I	<del>Т</del> ур					Comp	arison R	esult				PMSD
Untransformed	t		C < 7	Γ					AT3-0	98 passe	d aldrir	n endpoint			1.93%
Sample I Reference Sec	vs	wo-Sample Sample II AT3-098	Test	df 8	<b>Test :</b> -32.7		Critical	<b>MSD</b> 0.00117	P-Typ CDF	<b>e P-V</b>	<b>Yalue</b>	<b>Decisio</b> Non-Sig	n(α:5%) nificant Effect		
Auxiliary Test Attribute Outlier	s	Test Grubbs E	ytreme	- Valu	e Test			Test Stat	Critica 2.29	<b>al P-V</b>	alue	<b>Decisio</b>	n(α:5%) ers Detected		
		0.4555 2	XII OII I	- Valu	0 1000			2.10	2.20	0.11		110 04	olo Boloolou		
ANOVA Table Source	1	Sum Squa	ares		Mean	Squa	re	DF	F Stat	: P-V	'alue	Decisio	n(α:5%)		
Between Error Total		0.0010558 7.92E-06 0.0010637			0.001 9.9E-			1 8 9	1070 –	<1.	0E-05	Significa	int Effect		
ANOVA Assu	mpti														
Attribute	-	Test						Test Stat	Critica	al P-V	'alue	Decisio	n(α:1%)		
Variance Distribution		Variance F Shapiro-W			ality Te	st		2.27 0.837	23.2 0.741	0.4	461	Equal V			
aldrin Summa	ary														
Sample		Code	Cou	nt	Mean	ç	5% LCL	95% UCL	Media	ın Mir	1	Max	Std Err	CV%	%Effect
IOSN 2019		RS	5		0.060	5 (	0.059	0.062	0.06	0.0		0.0625	0.000524	1.94%	0.00%
AT3-098			5		0.039	9 (	0.039	0.0409	0.0396	6 0.0	393	0.0412	0.000348	1.95%	33.97%
aldrin Detail															
Sample		Code	Rep	1_	Rep 2	<u> </u>	Rep 3	Rep 4	Rep 5						
IOSN 2019		RS	0.06		0.059	5 (	0.06	0.0605	0.062	5					
AT3-098			0.040	02	0.039	3 (	0.0396	0.0395	0.0412	2					

**Report Date:** 19 Aug-23 07:00 (p 5 of 19) **Test Code/ID:** TN-23-302NvPest / 04-3042-6729

Bioaccumulati	ion Evaluation	- Pesticide	s - Nereis	<b>.</b>						EA-ES	T, Inc. PBC
Analyzed:	11-2031-6586 19 Aug-23 6:59 08 May-23 22:9	) An	alysis: F	alpha chlordan Parametric-Two 6CF43D826CA	o Sample	C430CBAF6	Statu	S Version is Level: or ID:	: CETISv2. 1	1.1	
	•	34 <b>Pr</b> o 4 <b>S</b> p	otocol: l ecies: 1	Bioaccumulation  JS ACE NED I  Nereis virens  Polychaeta		es	Analy Dilue Brine Sour	ent: No e: Cry	ncy Roka It Applicable Iystal Sea RO - Aquatic R	Research (	Or <b>Age</b> :
Sample Code	Sample	ID Sa	mple Date	Receip	t Date	Sample Ag	e Clien	t Name	Pro	oject	
IOSN 2019 AT3-098	13-4648- 07-1559-	8170 08	Mar-23 Feb-23 13	08 Mar-	23	12h 27d 23h		Analysts, li		•	liment Evalu
Sample Code	Material	Туре		Sample Sourc	e	Sta	ation Location	on	Lat/Long		
IOSN 2019	Reference	e sediment	`	Yachtsman Ma	rina NAE-20	04-00 10	SN Referenc	е			
AT3-098	Marine S	ediment	`	Yachtsman Ma	rina NAE-20	004-00 10	Stations at 4	Marinas N	Mu		
Data Transforr	m	Alt Hyp				Comparis	son Result				PMSD
Untransformed		C < T				AT3-098	passed alpha	a chlordane	e endpoint		1.88%
Equal Variance	•		f Test St	at Critical	MSD	P-Type	P-Value	Decision	n(α:5%)		
Reference Sed	AT3-098	8		1.86	0.00246	CDF	1.0000	Non-Sigr	nificant Effect		
Reference Sed	AT3-098						1.0000	Non-Sigr	nificant Effect		
•	AT3-098					CDF	1.0000 P-Value	Non-Sigr			
Reference Sed  Auxiliary Tests	AT3-098		-33.7		0.00246	CDF		Decision			
Reference Sed  Auxiliary Tests  Attribute	AT3-098	8	-33.7		0.00246  Test Stat	CDF  Critical	P-Value	Decision	n(α:5%)		
Reference Sed  Auxiliary Tests  Attribute  Outlier	AT3-098	8 Extreme Va	-33.7	1.86	0.00246  Test Stat	CDF  Critical	P-Value	Decision	n(α:5%) ers Detected		
Reference Sed  Auxiliary Tests  Attribute  Outlier  ANOVA Table	AT3-098  Test  Grubbs	8 Extreme Va uares	-33.7	1.86	0.00246  Test Stat 2.08	Critical 2.29	<b>P-Value</b> 0.1642	<b>Decision</b> No Outlie	n(α:5%) ers Detected n(α:5%)		
Auxiliary Tests Attribute Outlier ANOVA Table Source Between Error	AT3-098  Test  Grubbs  Sum Sqi  0.004972 3.500E-0	Extreme Va uares 29	-33.7	1.86  Gquare 729	0.00246  Test Stat 2.08  DF 1 8	Critical 2.29  F Stat	P-Value 0.1642 P-Value	Decisior  No Outlie	n(α:5%) ers Detected n(α:5%)		
Auxiliary Tests Attribute Outlier ANOVA Table Source Between Error Total	AT3-098  Test  Grubbs  Sum Squ 0.004972 3.500E-0 0.005007	Extreme Va uares 29	-33.7 lue Test  Mean S 0.0049	1.86  Gquare 729	0.00246  Test Stat 2.08  DF	Critical 2.29  F Stat	P-Value 0.1642 P-Value	Decisior  No Outlie	n(α:5%) ers Detected n(α:5%)		
Auxiliary Tests Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assum	AT3-098  Test Grubbs  Sum Sqi 0.004972 3.500E-0 0.005007	Extreme Va uares 29	-33.7 lue Test  Mean S 0.0049	1.86  Gquare 729	0.00246  Test Stat 2.08  DF 1 8 9	CDF  Critical 2.29  F Stat 1140	P-Value 0.1642 P-Value <1.0E-05	Decision No Outlie  Decision Significa	n(α:5%) ers Detected n(α:5%) nt Effect		
Auxiliary Tests Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assum Attribute	AT3-098  Test  Grubbs  Sum Squ  0.004972 3.500E-0 0.005007  Inptions Tests  Test	Extreme Va uares 29 55	-33.7 lue Test Mean S 0.0049; 4.375E	1.86  Gquare 729	0.00246  Test Stat 2.08  DF 1 8 9	Critical 2.29  F Stat 1140  Critical	P-Value 0.1642 P-Value <1.0E-05	Decision  No Outlie  Decision  Significa	n(α:5%) ers Detected n(α:5%) nt Effect n(α:1%)		
Auxiliary Tests Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assum Attribute Variance	AT3-098  Test Grubbs  Sum Squ 0.004972 3.500E-0 0.005007  Inptions Tests Test Variance	Extreme Valuares 29 55 79	-33.7 lue Test  Mean S 0.0049; 4.375E	1.86  Square 729 -06	0.00246  Test Stat 2.08  DF 1 8 9  Test Stat 1.97	Critical 2.29  F Stat 1140  Critical 23.2	P-Value 0.1642  P-Value <1.0E-05  P-Value 0.5287	Decision  Decision  Significa  Decision  Equal Va	n(α:5%) ers Detected n(α:5%) nt Effect n(α:1%) ariances		
Auxiliary Tests Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assun Attribute Variance Distribution	AT3-098  Test Grubbs  Sum Squ 0.004972 3.500E-0 0.005007  Inptions Tests Variance Shapiro-N	Extreme Va uares 29 55	-33.7 lue Test  Mean S 0.0049; 4.375E	1.86  Square 729 -06	0.00246  Test Stat 2.08  DF 1 8 9	Critical 2.29  F Stat 1140  Critical	P-Value 0.1642 P-Value <1.0E-05	Decision  Decision  Significa  Decision  Equal Va	n(α:5%) ers Detected n(α:5%) nt Effect n(α:1%)		
Reference Sed  Auxiliary Tests Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assum Attribute Variance Distribution  alpha chlordar	AT3-098  Test Grubbs  Sum Squ 0.004972 3.500E-0 0.005007  Inptions Tests Test Variance Shapiro-Ine Summary	Extreme Va  uares 29 55 79  Ratio F Tes Wilk W Norr	-33.7  lue Test  Mean \$ 0.00497 4.375E	1.86  Square 729 -06	0.00246  Test Stat 2.08  DF 1 8 9  Test Stat 1.97 0.832	Critical 2.29  F Stat 1140  Critical 23.2 0.741	P-Value 0.1642  P-Value <1.0E-05  P-Value 0.5287 0.0352	Decision  Significat  Decision  Equal Va  Normal E	n(α:5%) ers Detected n(α:5%) nt Effect n(α:1%) ariances Distribution	CV%	%Effect
Reference Sed  Auxiliary Tests Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assun Attribute Variance Distribution  alpha chlordar Sample	AT3-098  Test Grubbs  Sum Squ 0.004972 3.500E-0 0.005007  Inptions Tests Test Variance Shapiro-N  The Summary Code	Extreme Va  uares 29 25 79  Ratio F Tes Wilk W Norr	-33.7  lue Test  Mean \$ 0.00497 4.375E-  st mality Test	1.86  Gquare 729 -06	0.00246  Test Stat 2.08  DF 1 8 9  Test Stat 1.97 0.832	Critical 2.29  F Stat 1140  Critical 23.2 0.741  Median	P-Value 0.1642  P-Value <1.0E-05  P-Value 0.5287 0.0352  Min	Decision No Outlie  Decision Significa  Decision Equal Va Normal D	n(α:5%) ers Detected n(α:5%) nt Effect n(α:1%) ariances Distribution Std Err	CV%	%Effect
Reference Sed  Auxiliary Tests Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assum Attribute Variance Distribution  alpha chlordar	AT3-098  Test Grubbs  Sum Squ 0.004972 3.500E-0 0.005007  Inptions Tests Test Variance Shapiro-Ine Summary	Extreme Va  uares 29 55 79  Ratio F Tes Wilk W Norr	-33.7  lue Test  Mean \$ 0.00497 4.375E	1.86  Square 729 -06	0.00246  Test Stat 2.08  DF 1 8 9  Test Stat 1.97 0.832	Critical 2.29  F Stat 1140  Critical 23.2 0.741	P-Value 0.1642  P-Value <1.0E-05  P-Value 0.5287 0.0352	Decision  Significat  Decision  Equal Va  Normal E	n(α:5%) ers Detected n(α:5%) nt Effect n(α:1%) ariances Distribution	<b>CV%</b> 1.84% 1.99%	%Effect 0.00% 34.07%
Auxiliary Tests Attribute Outlier ANOVA Table Source Between Error Total ANOVA Assun Attribute Variance Distribution alpha chlordar Sample IOSN 2019 AT3-098	AT3-098  Test Grubbs  Sum Squ 0.004972 3.500E-0 0.005007  Inptions Tests Variance Shapiro-N  Test Variance Shapiro-N  Code  RS	Extreme Valuares 29 15 79  Ratio F Tea Wilk W Norr	-33.7  Iue Test  Mean \$ 0.00497 4.375E  st mality Test  Mean 0.131	1.86  Square 729 -06  95% LCL 0.128	0.00246  Test Stat 2.08  DF 1 8 9  Test Stat 1.97 0.832  95% UCL 0.134	Critical 2.29  F Stat 1140  Critical 23.2 0.741  Median 0.13	P-Value 0.1642  P-Value <1.0E-05  P-Value 0.5287 0.0352  Min 0.129	Decision No Outlie  Decision Significa  Decision Equal Va Normal E  Max 0.135	n(α:5%) ers Detected n(α:5%) nt Effect n(α:1%) ariances Distribution  Std Err 0.00108	1.84%	0.00%
Reference Sed  Auxiliary Tests Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assun Attribute Variance Distribution  alpha chlordar Sample IOSN 2019	AT3-098  Test Grubbs  Sum Squ 0.004972 3.500E-0 0.005007  Inptions Tests Variance Shapiro-N  Test Variance Shapiro-N  Code  RS	Extreme Valuares 29 15 79  Ratio F Tea Wilk W Norr	-33.7    lue Test	1.86  Square 729 -06  95% LCL 0.128 0.0842	0.00246  Test Stat 2.08  DF 1 8 9  Test Stat 1.97 0.832  95% UCL 0.134	Critical 2.29  F Stat 1140  Critical 23.2 0.741  Median 0.13	P-Value 0.1642  P-Value <1.0E-05  P-Value 0.5287 0.0352  Min 0.129	Decision No Outlie  Decision Significa  Decision Equal Va Normal E  Max 0.135	n(α:5%) ers Detected n(α:5%) nt Effect n(α:1%) ariances Distribution  Std Err 0.00108	1.84%	0.00%
Auxiliary Tests Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assum Attribute Variance Distribution alpha chlordar Sample IOSN 2019 AT3-098 alpha chlordar	AT3-098  Test Grubbs  Sum Squ 0.004972 3.500E-0 0.005007  Inptions Tests Test Variance Shapiro-N  The Summary Code RS  RS	Extreme Valuares 29 55 79  Ratio F Tes Wilk W Norr  Count 5 5	-33.7  Iue Test  Mean \$ 0.00497 4.375E  st mality Test  Mean 0.131	1.86  Square 729 -06  95% LCL 0.128	0.00246  Test Stat 2.08  DF 1 8 9  Test Stat 1.97 0.832  95% UCL 0.134 0.0884	Critical 2.29  F Stat 1140  Critical 23.2 0.741  Median 0.13 0.0855	P-Value 0.1642  P-Value <1.0E-05  P-Value 0.5287 0.0352  Min 0.129	Decision No Outlie  Decision Significa  Decision Equal Va Normal E  Max 0.135	n(α:5%) ers Detected n(α:5%) nt Effect n(α:1%) ariances Distribution  Std Err 0.00108	1.84%	0.00%

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Bioaccumulation Evaluation - Pesticides - Nereis EA-EST. Inc. PBC CETISv2.1.1 Analysis ID: 13-9152-9887 Endpoint: cis-Nonachlor **CETIS Version:** Analyzed: Nonparametric-Two Sample 19 Aug-23 6:59 Analysis: Status Level: MD5 Hash: 9365490B4EADE5D4DD63B353AD2D36FC Editor ID: **Edit Date:** 08 May-23 22:53 Batch ID: 08-2970-4074 Test Type: Bioaccumulation - Pesticides Nancy Roka Analyst: Start Date: 08 Mar-23 11:34 Protocol: US ACE NED RIM (2004) Diluent: Not Applicable Ending Date: 05 Apr-23 10:34 Species: Nereis virens Brine: Crystal Sea Test Length: 27d 23h Taxon: Polychaeta Source: ARO - Aquatic Research Or Age: Sample Code Sample ID Sample Date Receipt Date Sample Age Client Name **Project** Eco-Analysts, Inc. **IOSN 2019** 13-4648-8170 08 Mar-23 08 Mar-23 12h Dredged Sediment Evalu AT3-098 07-1559-4974 08 Feb-23 13:00 09 Feb-23 16:30 27d 23h Sample Code **Station Location Material Type** Sample Source Lat/Long **IOSN 2019** Reference sediment Yachtsman Marina NAE-2004-00 **IOSN Reference** AT3-098 Marine Sediment Yachtsman Marina NAE-2004-00 10 Stations at 4 Marinas Mu **Data Transform PMSD** Alt Hyp Comparison Result Untransformed C < T AT3-098 passed cis-nonachlor endpoint 1.50% Wilcoxon Rank Sum Two-Sample Test Sample I Sample II df Test Stat Critical Ties P-Type P-Value Decision(a:5%) AT3-098 40 0 1.0000 Reference Sed 8 Exact Non-Significant Effect **Auxiliary Tests** Attribute Test Test Stat Critical P-Value Decision(a:5%) 1.89 2.29 Outlier Grubbs Extreme Value Test 0.3684 No Outliers Detected **ANOVA Table** Source **Sum Squares** DF P-Value Mean Square F Stat Decision(a:5%) Between 0.00009 0.00009 1780 Significant Effect 1 <1.0E-05 4.05E-07 8 Error 5.062E-08 Total 9.041E-05 9 ANOVA Assumptions Tests **Attribute** Test Stat Critical P-Value Decision(a:1%) Variance Variance Ratio F Test 1.03 23.2 0.9815 **Equal Variances** Distribution 0.751 0.741 0.0037 Shapiro-Wilk W Normality Test Non-Normal Distribution cis-Nonachlor Summary Sample Code Count Mean 95% LCL 95% UCL Median Min Max Std Err CV% %Effect **IOSN 2019** RS 5 0.0176 0.0173 0.0179 0.0175 0.0175 0.018 1.27% 0.00% 0.0001 AT3-098 5 0.0116 0.0113 0.0119 0.0115 0.0114 0.012 0.000101 1.95% 34.09% cis-Nonachlor Detail Sample Code Rep 1 Rep 2 Rep 3 Rep 4 Rep 5 IOSN 2019 RS 0.018 0.0175 0.0175 0.0175 0.0175 AT3-098 0.0117 0.0114 0.0115 0.0115 0.012

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Bioaccumulation	Evaluation -	Pesticides	- Nereis	;						EA-ES	T, Inc. PBC
Analyzed: 19	0623-3039 Aug-23 6:59 May-23 22:53	Ana	•	Dieldrin Parametric-Two EFDBEC3403E		D0D611892	State	IS Version us Level: or ID:	: CETISv2.	.1.1	
	•	Prot	cies: N	Bioaccumulatio JS ACE NED F Nereis virens Polychaeta		es	Anal Dilud Brin Soul	ent: Not	ncy Roka t Applicable vstal Sea O - Aquatic F	Research (	Or <b>Age:</b>
Sample Code IOSN 2019 AT3-098	Sample ID 13-4648-81 07-1559-49	70 08 N	i <b>ple Date</b> Mar-23 eb-23 13	08 Mar-	23	<b>Sample Ag</b> 12h 27d 23h		<b>nt Name</b> Analysts, Ir		o <b>ject</b> edged Sed	liment Evalu
Sample Code IOSN 2019 AT3-098	Material Ty Reference s Marine Sed	sediment	١	Sample Source Yachtsman Mar Yachtsman Mar	rina NAE-20	004-00 108	ation Locati SN Reference Stations at	е	<b>Lat/Long</b> ∕lu		
Data Transform		Alt Hyp				Comparis	son Result				PMSD
Untransformed		C < T				AT3-098	passed dielo	Irin endpoin	nt		1.77%
Equal Variance t	Two-Sample	Test									
Sample I vs	Sample II	df	Test St		MSD	P-Type	P-Value	Decision	, ,		
Reference Sed	AT3-098	8	-35.8	1.86	0.000646	CDF	1.0000	Non-Sign	ificant Effect		
Auxiliary Tests											
Attribute	Test				Test Stat	Critical	P-Value	Decision	ι(α:5%)		
Outlier	Grubbs Ex	treme Valu	ie Test		1.93	2.29	0.3099	No Outlie	rs Detected		
ANOVA Table											
Source	Sum Squa	res	Mean S	Square	DF	F Stat	P-Value	Decision	ι(α:5%)		
Between	0.0003863		0.00038	363	1	1280	<1.0E-05	Significar	nt Effect		
Error	2.413E-06		3.016E-	-07	8	_					
Total	0.0003887				9						
ANOVA Assumpt	ions Tests										
Attribute	Test				Test Stat	Critical	P-Value	Decision	ι(α:1%)		
Variance	Variance R	atio F Test			1.64	23.2	0.6423	Equal Va	riances		
Distribution	Shapiro-Wi	lk W Norm	ality Test		0.856	0.741	0.0679	Normal D	istribution		
Dieldrin Summar	y										
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
IOSN 2019	RS	5	0.0365	0.0357	0.0373	0.0365	0.036	0.0375	0.000274	1.68%	0.00%
AT3-098		5	0.0241	0.0235	0.0247	0.0239	0.0237	0.0249	0.000214	1.98%	34.05%
Dieldrin Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
100110010	RS	0.0365	0.036	0.036	0.0365	0.0375					
IOSN 2019	NO.	0.0303	0.000	0.000	0.000	0.0070					

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Bioaccumula	ition Evalu	ıation - Pest	icides	- Nereis	 s						EA-ES	T, Inc. PBC
Analysis ID: Analyzed: Edit Date:	02-3083- 19 Aug-2 08 May-2	3 6:59	Anal	lysis:	endosulfan I Parametric-Tv 3C4B97B68Cl		93CC593B	Sta	TIS Version tus Level: tor ID:	: CETISv2		
Batch ID: Start Date: Ending Date: Test Length:	-	3 11:34 3 10:34	Prot	ocol: cies:	Bioaccumulati US ACE NED Nereis virens Polychaeta		es	Dilu Brii	ient: No ne: Cr	ncy Roka It Applicable Instal Sea Instal Sea	Research (	Or <b>Age</b> :
Sample Code IOSN 2019 AT3-098	13-	mple ID 4648-8170 1559-4974	08 N	i <b>ple Date</b> 1ar-23 1eb-23 13	08 Ma	ot Date -23 o-23 16:30	<b>Sample Ag</b> 12h 27d 23h		nt Name -Analysts, I		oject edged Sed	diment Evalu
Sample Code IOSN 2019 AT3-098	Re	terial Type ference sedin rine Sedimer			Sample Sourd Yachtsman Ma Yachtsman Ma	arina NAE-20	004-00 IO	ation Loca SN Referer Stations at	ce	<b>Lat/Long</b> Mu		
Data Transfor	rm	Alt	Нур				Compari	son Result				PMSD
Untransformed	d	C <					•		losulfan i en	ıdpoint		1.95%
Equal Variand								5.//		. =0/\		
Sample I Reference Sec		nple II	<b>df</b> 8	-32.6	tat Critical 1.86	MSD 0.000651	P-Type CDF	1.0000	Decision	, ,		
Reference Sec	a Als	-098	8	-32.0	1.80	0.000651	CDF	1.0000	Non-Sigi	nificant Effect		
Auxiliary Test	ts											
Attribute	Te	st				Test Stat	Critical	P-Value	Decisio	n(α:5%)		
Outlier	Gı	ubbs Extrem	e Valu	ie Test		2.11	2.29	0.1431	No Outlie	ers Detected		
ANOVA Table	e											
Source	Su	m Squares		Mean S	Square	DF	F Stat	P-Value	Decision	n(a:5%)		
Between		003255		0.0003	-	1	1060	<1.0E-05		, ,		
Error		52E-06		3.065E		8	1000	1.02 00	o o igi iii o a	in Liioot		
Total	0.0	003279				9	_					
ANOVA Assu	ımptions 1	ests										
Attribute	Tes					Test Stat	Critical	P-Value	Decisio	n(α:1%)		
Variance		riance Ratio F	- Test			2.26	23.2	0.4490	Equal Va	· ,		
Distribution		apiro-Wilk W			t	0.791	0.741	0.0114	•	Distribution		
endosulfan I				-								
Sample	Co		ınt	Mean	95% LCL	. 95% UCL	Median	Min	Max	Std Err	CV%	%Effect
IOSN 2019	RS			0.0334		0.0342	0.033	0.033	0.0345	0.000292	1.95%	0.00%
AT3-098	110	5		0.0334	0.0320	0.0342	0.033	0.033	0.0343	0.000292		34.16%
	_											
endosulfan I												
	Co	de Rep	1	Rep 2	Rep 3	Rep 4	Rep 5					
Sample												
Sample IOSN 2019 AT3-098	RS		3	0.033 0.0217	0.033 0.0218	0.0335 0.0217	0.0345 0.0227					

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	,									Т	est Co	de/ID:	TN-23-3021	NvPest / 0	4-3042-6729
Bioaccumula	tion	Evaluation -	- Pesti	cides	- Nere	is								EA-ES	T, Inc. PBC
Analysis ID: Analyzed: Edit Date:	19 <i>A</i>	6532-5065 Aug-23 6:59 May-23 22:53	3	Anal	ysis:	Parai	sulfan II metric-Two FC0525BI	o Sample 064452BBA	F68001	6AD88A		S Version: is Level: or ID:	CETISv2. 1	1.1	
Batch ID: Start Date: Ending Date: Test Length:	08 N 05 A	•			ocol: cies:	US A Nerei	ccumulatio CE NED F is virens chaeta	n - Pesticido RIM (2004)	es		Analy Dilue Brine Sour	ent: Not a e: Crys	cy Roka Applicable tal Sea ) - Aquatic R	esearch C	or <b>Age:</b>
Sample Code	)	Sample II	)	Sam	ple Da	te	Receipt	Date	Sample	Age	Clien	t Name	Pro	ject	
IOSN 2019 AT3-098		13-4648-8 07-1559-4			lar-23 eb-23 1	13:00	08 Mar- 09 Feb-		12h 27d 23l	า	Eco-/	Analysts, Ind	c. Dre	dged Sed	iment Evalu
Sample Code	)	Material T	уре			Samı	ple Source	9		Station	Location	on	Lat/Long		
IOSN 2019		Reference		ent		Yach	tsman Maı	rina NAE-20	04-00	IOSN Re	eferenc	е	<u>_</u>		
AT3-098		Marine Se	diment	t		Yach	tsman Maı	rina NAE-20	04-00	10 Static	ns at 4	Marinas M	u		
Data Transfor	rm		Alt I	Тур					Comp	arison R	esult				PMSD
Untransformed	d		C < 1	-					AT3-0	98 passe	d endo	sulfan ii end	lpoint		2.40%
Equal Variand	ce t 1 vs	wo-Sample	Test	df	Test	Stat	Critical	MSD	P-Typ	e P-V	'alue	Decision(	α:5%)		
Reference Sec	d	AT3-098		8	-26.7		1.86	0.000415	CDF	1.00	000	Non-Signif	icant Effect		
Auxiliary Test Attribute Outlier	ts	<b>Test</b> Grubbs E	xtreme	e Valu	e Test			Test Stat	Critica 2.29	al P-V	<b>'alue</b> 461	Decision(			
ANOVA Table	)	Sum Squ	ares		Mean	Squa	re	DF	F Stat	P-V	'alue	Decision(	a:5%)		
Between Error Total		8.880E-05 9.97E-07 8.980E-05	i		8.880 1.246	E-05		1 8 9	713		0E-05	Significant			
ANOVA Assu	mpti	ons Tests													
Attribute		Test						Test Stat	Critica	al P-V	'alue	Decision(	α:1%)		
Variance Distribution		Variance F Shapiro-W			ality Te	st		4.06 0.869	23.2 0.741	0.20		Equal Vari Normal Dis			
endosulfan II	Sum	mary													
Sample		Code	Cour	nt	Mean	,	95% LCL	95% UCL	Media	n Min	1	Max	Std Err	CV%	%Effect
IOSN 2019		RS	5		0.017	3	0.0167	0.0179	0.017	0.0	17	0.018	0.0002	2.58%	0.00%
AT3-098			5		0.011	3	0.0111	0.0116	0.0113	3 0.0	112	0.0117	0.0000992	1.96%	34.45%
endosulfan II	Deta	nil													
Sample		Code	Rep	1	Rep 2	2	Rep 3	Rep 4	Rep 5						
IOSN 2019		RS	0.017	7	0.017		0.017	0.0175	0.018						
AT3-098			0.011	14	0.011	2	0.0113	0.0112	0.0117	7					

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							Test Co	de/ID:	TN-23-302	NvPest / 0	4-3042-6729
Bioaccumulation	on Evaluation	- Pesticide	s - Nerei	s						EA-ES	T, Inc. PBC
Analyzed:	07-0975-2842 19 Aug-23 6:59 08 May-23 22:5	An	dpoint: alysis: 5 Hash:	endrin Parametric-Tw DD2B4538103		12113D055	Statu	S Version is Level: or ID:	: CETISv2 1	.1.1	
	•	4 Pro	st Type: otocol: ecies: con:	Bioaccumulation US ACE NED Nereis virens Polychaeta		es	Anal Dilue Brine Sour	ent: No e: Cry	ncy Roka t Applicable ⁄stal Sea O - Aquatic F	Research (	Or <b>Age:</b>
Sample Code	Sample I	D Sai	nple Dat	e Receip	t Date	Sample Ag	e Clier	t Name	Pr	oject	
IOSN 2019 AT3-098	13-4648-8 07-1559-4		Mar-23 Feb-23 1	08 Mar 3:00 09 Feb		12h 27d 23h	Eco-	Analysts, Ir	nc. Dr	edged Sec	liment Evalu
Sample Code	Material <sup>*</sup>	Туре		Sample Source	e	Sta	ation Locati	on	Lat/Long		
IOSN 2019		e sediment		Yachtsman Ma	rina NAE-20	004-00 10	SN Reference	e			
AT3-098	Marine Se	ediment		Yachtsman Ma	rina NAE-20	004-00 10	Stations at 4	Marinas N	Лu		
Data Transform	n	Alt Hyp				Comparis	son Result				PMSD
Untransformed		C < T				AT3-098	passed endr	n endpoint			2.03%
Equal Variance Sample I vs Reference Sed	•	e Test d	f <b>Test S</b> -31.3	Stat Critical 1.86	MSD 0.000404	<b>P-Type</b> CDF	<b>P-Value</b> 1.0000	<b>Decision</b> Non-Sign	ı(α:5%) ıificant Effect		
Auxiliary Tests Attribute	Test				Test Stat	Critical	P-Value	Decision	ι(α:5%)		
Outlier	Grubbs E	Extreme Va	ue Test		1.85	2.29	0.4121	No Outlie	ers Detected		
ANOVA Table	Grubbs E	Extreme Va	ue Test		1.85	2.29	0.4121	No Outlie	ers Detected		
	Grubbs E			Square	1.85 <b>DF</b>	2.29 <b>F Stat</b>	0.4121 P-Value	No Outlie			
ANOVA Table	Sum Squ 0.000115 9.42E-07	ares		1153					ı(α:5%)		
ANOVA Table Source Between Error Total	Sum Squ 0.000115 9.42E-07 0.000116	ares	<b>Mean</b> 0.000	1153	<b>DF</b> 1 8	F Stat	P-Value	Decision	ı(α:5%)		
ANOVA Table Source Between Error Total ANOVA Assum	Sum Squ 0.000115 9.42E-07 0.000116	ares	<b>Mean</b> 0.000	1153	<b>DF</b> 1 8 9	<b>F Stat</b> 979	P-Value <1.0E-05	<b>Decision</b> Significan	ı(α:5%) nt Effect		
ANOVA Table Source Between Error Total ANOVA Assum Attribute	Sum Squ 0.000115 9.42E-07 0.000116 ptions Tests Test	ares 3	<b>Mean</b> 0.000 <sup>2</sup> 1.178	1153	DF 1 8 9	F Stat 979 — Critical	P-Value <1.0E-05	Decision Significan	n(α:5%) nt Effect n(α:1%)		
ANOVA Table Source Between Error Total ANOVA Assum	Sum Squ 0.000115 9.42E-07 0.000116 ptions Tests Test Variance	ares	Mean 0.000° 1.178I	1153 E-07	<b>DF</b> 1 8 9	<b>F Stat</b> 979	P-Value <1.0E-05	Decision Significan  Decision Equal Va	n(α:5%) nt Effect n(α:1%)		
ANOVA Table Source Between Error Total  ANOVA Assum Attribute Variance	Sum Squ 0.000115 9.42E-07 0.000116 ptions Tests Test Variance Shapiro-V	ares 3 2 Ratio F Tes	Mean 0.000° 1.178I	1153 E-07	DF 1 8 9 Test Stat 2.89	F Stat 979  Critical 23.2	P-Value <1.0E-05 P-Value 0.3282	Decision Significan  Decision Equal Va	n(α:5%)  Int Effect  In(α:1%)  In (α:1%)		
ANOVA Table Source Between Error Total  ANOVA Assum Attribute Variance Distribution	Sum Squ 0.000115 9.42E-07 0.000116 ptions Tests Test Variance Shapiro-V	ares 3 2 Ratio F Tes	Mean 0.000° 1.178I	1153 E-07	DF 1 8 9  Test Stat 2.89 0.938	F Stat 979  Critical 23.2 0.741	P-Value <1.0E-05 P-Value 0.3282	Decision Significan  Decision Equal Va	n(α:5%)  Int Effect  In(α:1%)  In (α:1%)	CV%	%Effect
ANOVA Table Source Between Error Total  ANOVA Assum Attribute Variance Distribution  endrin Summa	Sum Squ 0.000115 9.42E-07 0.000116 ptions Tests Test Variance Shapiro-V	ares 3 2 Ratio F Tes Vilk W Norm	Mean 0.000° 1.178f t nality Tes	95% LCL	DF 1 8 9  Test Stat 2.89 0.938	F Stat 979  Critical 23.2 0.741	P-Value <1.0E-05 P-Value 0.3282 0.5309	Decision Significan  Decision Equal Va Normal D	n(α:5%)  Int Effect  In(α:1%)  In (α:1%)  In (α:1%)  In (α:1%)  In (α:1%)  In (α:1%)  In (α:1%)	CV% 2.10%	%Effect 0.00%
ANOVA Table Source Between Error Total  ANOVA Assum Attribute Variance Distribution endrin Summa Sample	Sum Squ 0.000115 9.42E-07 0.000116 ptions Tests Test Variance Shapiro-V ry Code	rares  2  Ratio F Tes Vilk W Norm  Count	Mean 0.000 1.1786 t nality Tes	95% LCL	DF 1 8 9  Test Stat 2.89 0.938	F Stat 979  Critical 23.2 0.741	P-Value <1.0E-05 P-Value 0.3282 0.5309 Min	Decision Significan  Decision Equal Va Normal D	n(α:5%)  Int Effect  In(α:1%)  In riances  Distribution  Std Err		
ANOVA Table Source Between Error Total  ANOVA Assum Attribute Variance Distribution endrin Summa Sample IOSN 2019	Sum Squ 0.000115 9.42E-07 0.000116 ptions Tests Test Variance Shapiro-V ry Code	Ratio F Tes Vilk W Norm	Mean 0.000 1.178t  t nality Tes  Mean 0.0198	95% LCL	DF 1 8 9  Test Stat 2.89 0.938  95% UCL 0.0204	F Stat 979  Critical 23.2 0.741  Median 0.02	P-Value <1.0E-05 P-Value 0.3282 0.5309 Min 0.0195	Decision Significan  Decision Equal Va Normal D  Max 0.0205	n(α:5%) Int Effect  n(α:1%) Iriances Distribution  Std Err  0.000187	2.10%	0.00%
ANOVA Table Source Between Error Total  ANOVA Assum Attribute Variance Distribution endrin Summa Sample IOSN 2019 AT3-098	Sum Squ 0.000115 9.42E-07 0.000116 ptions Tests Test Variance Shapiro-V ry Code	Ratio F Tes Vilk W Norm	Mean 0.000 1.178t  t nality Tes  Mean 0.0198	95% LCL 0 0.0194 1 0.0128	DF 1 8 9  Test Stat 2.89 0.938  95% UCL 0.0204	F Stat 979  Critical 23.2 0.741  Median 0.02	P-Value <1.0E-05 P-Value 0.3282 0.5309 Min 0.0195	Decision Significan  Decision Equal Va Normal D  Max 0.0205	n(α:5%) Int Effect  n(α:1%) Iriances Distribution  Std Err  0.000187	2.10%	0.00%
ANOVA Table Source Between Error Total  ANOVA Assum Attribute Variance Distribution  endrin Summa Sample IOSN 2019 AT3-098  endrin Detail	Sum Squ 0.000115 9.42E-07 0.000116 ptions Tests	Ratio F Tes Vilk W Norm	Mean 0.000 1.178f  t mality Tes  Mean 0.0198 0.013	95% LCL 0 0.0194 1 0.0128	DF 1 8 9 Test Stat 2.89 0.938  95% UCL 0.0204 0.0134	F Stat 979  Critical 23.2 0.741  Median 0.02 0.013	P-Value <1.0E-05 P-Value 0.3282 0.5309 Min 0.0195	Decision Significan  Decision Equal Va Normal D  Max 0.0205	n(α:5%) Int Effect  n(α:1%) Iriances Distribution  Std Err  0.000187	2.10%	0.00%

Report Date: Test Code/ID: 19 Aug-23 07:00 (p 11 of 19) TN-23-302NvPest / 04-3042-6729

	•								Test Co				
Bioaccumulat	tion F	Evaluation - I	Pestici	des -	- Nereis							EA-ES	T, Inc. PBC
Analysis ID: Analyzed: Edit Date:	19 A	3319-1425 Aug-23 6:59 May-23 22:53	A	Analy	<b>/sis:</b> Pa	mma-BHC (L rametric-Two FF9521D246	Sample	2BEF9E205	Statu	S Version is Level: or ID:	: CETISv2	.1.1	
Batch ID: Start Date: Ending Date: Test Length:	08 N 05 A	•	P S	Γest <sup>-</sup> Proto Speci Γaxοι	ocol: US ies: Ne	paccumulatio S ACE NED Fereis virens lychaeta		es	Analy Dilue Brine Sour	ent: No e: Cry	ncy Roka t Applicable ⁄stal Sea O - Aquatic F	Research (	Or <b>Age:</b>
Sample Code	,	Sample ID		Samp	ole Date	Receipt	t Date	Sample Ag	e Clien	t Name	Pr	oject	
IOSN 2019 AT3-098		13-4648-81 07-1559-49		)8 Ma )8 Fe	ar-23 b-23 13:0	08 Mar- 0 09 Feb-		12h 27d 23h	Eco-A	Analysts, Ir	nc. Dr	edged Sed	liment Evalu
Sample Code	)	Material Ty	 /pe		Sa	mple Source	e	Sta	tion Location	on	Lat/Long		
IOSN 2019		Reference s	sedimer	nt	Ya	chtsman Ma	rina NAE-20	04-00 105	SN Referenc	е			
AT3-098		Marine Sedi	iment		Ya	chtsman Ma	rina NAE-20	04-00 10	Stations at 4	Marinas N	Лu		
Data Transfor	rm		Alt Hy	γp				Comparis	on Result				PMSD
Untransformed	t		C < T					AT3-098 p	assed gamr	ma-bhc (lin	dane) endpoi	int	1.90%
Equal Variand									<b>D</b> V .		/ <b>=</b> 0/\		
Sample I Reference Sec		Sample II AT3-098			Test Stat	1.86	<b>MSD</b> 0.00104	P-Type CDF	<b>P-Value</b> 1.0000	Non-Sign	i(α:5%) ificant Effect		
Sample I	d	-						CDF			ificant Effect		
Sample I Reference Sec Auxiliary Test	d	AT3-098	treme V	8	-33.3		0.00104	CDF	1.0000	Non-Sign  Decision	ificant Effect		
Sample I Reference Sec Auxiliary Test Attribute	d ts	AT3-098	treme V	8	-33.3		0.00104  Test Stat	CDF  Critical	1.0000 P-Value	Non-Sign  Decision	ificant Effect n(α:5%)		
Sample I Reference Sec Auxiliary Test Attribute Outlier	d ts	AT3-098		8 /alue	-33.3	1.86	0.00104  Test Stat	CDF  Critical	1.0000 P-Value	Non-Sign  Decision	ificant Effect (α:5%) ers Detected		
Sample I Reference Sec Auxiliary Test Attribute Outlier ANOVA Table Source Between	d ts	Test Grubbs Ext Sum Squar 0.0008724		8 /alue	-33.3  Page Test  Mean Sq 0.000872	1.86 uare	0.00104  Test Stat 2.04  DF 1	CDF  Critical 2.29	1.0000 P-Value 0.2007	Non-Sign  Decision  No Outlie	ificant Effect  a(α:5%)  ers Detected  a(α:5%)		
Sample I Reference Sec Auxiliary Test Attribute Outlier ANOVA Table Source Between Error	d ts	Test Grubbs Ext  Sum Squar  0.0008724 6.278E-06		8 /alue	-33.3 e Test Mean Sq	1.86 uare	0.00104  Test Stat 2.04  DF 1 8	Critical 2.29  F Stat	1.0000  P-Value 0.2007  P-Value	Decision No Outlie	ificant Effect  a(α:5%)  ers Detected  a(α:5%)		
Reference Sector Auxiliary Testor Auxiliary Testor Attribute Outlier ANOVA Table Source Between Error Total	ts	Test Grubbs Ext  Sum Squar 0.0008724 6.278E-06 0.0008786		8 /alue	-33.3  Page Test  Mean Sq 0.000872	1.86 uare	0.00104  Test Stat 2.04  DF 1	Critical 2.29  F Stat	1.0000  P-Value 0.2007  P-Value	Decision No Outlie	ificant Effect  a(α:5%)  ers Detected  a(α:5%)		
Reference Sector Auxiliary Testor Attribute Outlier ANOVA Table Source Between Error Total ANOVA Assur	ts	Test Grubbs Ext  Sum Squar 0.0008724 6.278E-06 0.0008786 ons Tests		8 /alue	-33.3  Page Test  Mean Sq 0.000872	1.86 uare	0.00104  Test Stat 2.04  DF 1 8 9	CDF  Critical 2.29  F Stat 1110	1.0000  P-Value 0.2007  P-Value <1.0E-05	Decision No Outlie  Decision Significan	n(α:5%) ers Detected n(α:5%) nt Effect		
Reference Sec  Auxiliary Test Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assur Attribute	ts	Test Grubbs Ext  Sum Squar 0.0008724 6.278E-06 0.0008786 ons Tests Test	res	8 Value	-33.3  Page Test  Mean Sq 0.000872	1.86 uare	0.00104  Test Stat 2.04  DF 1 8 9  Test Stat	CDF  Critical 2.29  F Stat 1110  Critical	1.0000  P-Value 0.2007  P-Value <1.0E-05	Decision No Outlie Decision Significan	n(α:5%) ers Detected n(α:5%) nt Effect		
Reference Sec Auxiliary Test Attribute Outlier ANOVA Table Source Between Error Total ANOVA Assur Attribute Variance	ts	Test Grubbs Ext  Sum Squar 0.0008724 6.278E-06 0.0008786 ons Tests	res atio F T	8  //alue	-33.3  Mean Sq 0.000872 7.848E-0	1.86 uare	0.00104  Test Stat 2.04  DF 1 8 9	CDF  Critical 2.29  F Stat 1110	1.0000  P-Value 0.2007  P-Value <1.0E-05	Decision Significan  Decision Equal Va	n(α:5%) ers Detected n(α:5%) nt Effect		
Reference Sec Auxiliary Test Attribute Outlier ANOVA Table Source Between Error Total ANOVA Assur Attribute Variance Distribution	mptic	Test Grubbs Ext  Sum Squar 0.0008724 6.278E-06 0.0008786 ons Tests Test Variance Ra Shapiro-Wil	res atio F T Ik W No	8  //alue	-33.3  Mean Sq 0.000872 7.848E-0	1.86 uare	0.00104  Test Stat 2.04  DF 1 8 9  Test Stat 2.17	Critical 2.29  F Stat 1110  Critical 23.2	1.0000  P-Value 0.2007  P-Value <1.0E-05  P-Value 0.4705	Decision Significan  Decision Equal Va	n(α:5%) ers Detected n(α:5%) nt Effect n(α:1%) riances		
Reference Sec Auxiliary Test Attribute Outlier ANOVA Table Source Between Error Total ANOVA Assur Attribute Variance Distribution gamma-BHC (	mptic	Test Grubbs Ext  Sum Squar 0.0008724 6.278E-06 0.0008786 ons Tests Test Variance Ra Shapiro-Wil	res atio F T Ik W No	/alue	-33.3  Mean Sq 0.000872 7.848E-0	1.86 uare	0.00104  Test Stat 2.04  DF 1 8 9  Test Stat 2.17 0.86	Critical 2.29  F Stat 1110  Critical 23.2 0.741	1.0000  P-Value 0.2007  P-Value <1.0E-05  P-Value 0.4705	Decision Significan  Decision Equal Va	n(α:5%) ers Detected n(α:5%) nt Effect n(α:1%) riances	CV%	%Effect
Reference Sec Auxiliary Test Attribute Outlier ANOVA Table Source Between Error Total ANOVA Assur Attribute Variance Distribution gamma-BHC ( Sample IOSN 2019	mptic	Test Grubbs Ext  Sum Squar 0.0008724 6.278E-06 0.0008786 ons Tests Test Variance Ra Shapiro-Wil	res atio F T Ik W No	8  /alue	-33.3  Mean Sq 0.000872 7.848E-0  lity Test  Mean 0.0548	1.86  uare 4 7  95% LCL 0.0535	0.00104  Test Stat 2.04  DF 1 8 9  Test Stat 2.17 0.86  95% UCL 0.0561	Critical 2.29  F Stat 1110  Critical 23.2 0.741  Median 0.0545	P-Value 0.2007  P-Value <1.0E-05  P-Value 0.4705 0.0765	Decision Significan  Decision Significan  Decision Equal Va Normal D  Max  0.0565	a(α:5%)  ers Detected  a(α:5%)  nt Effect  a(α:1%)  riances  Distribution  Std Err  0.000464		%Effect 5.20%
Reference Sec Auxiliary Test Attribute Outlier ANOVA Table Source Between Error Total ANOVA Assur Attribute Variance Distribution gamma-BHC ( Sample IOSN 2019	mptic	Test Grubbs Ext  Sum Squar 0.0008724 6.278E-06 0.0008786  ons Tests Test Variance Ra Shapiro-Will  dane) Summa Code RS	atio F T lk W No ary Count	8  /alue	-33.3  Mean Sq 0.000872 7.848E-0	1.86  uare 4 7	0.00104  Test Stat 2.04  DF 1 8 9  Test Stat 2.17 0.86	Critical 2.29  F Stat 1110  Critical 23.2 0.741  Median	1.0000  P-Value 0.2007  P-Value <1.0E-05  P-Value 0.4705 0.0765  Min	Decision Significan  Decision Significan  Decision Equal Va Normal D	n(α:5%)  ers Detected  n(α:5%)  nt Effect  n(α:1%)  riances  Distribution  Std Err	CV%	
Reference Sec Auxiliary Test Attribute Outlier ANOVA Table Source Between Error Total ANOVA Assur Attribute Variance Distribution gamma-BHC ( Sample IOSN 2019 AT3-098	mptic	Test Grubbs Ext  Sum Squar 0.0008724 6.278E-06 0.0008786 ons Tests Test Variance Ra Shapiro-Wil dane) Summa Code RS	atio F T lk W No ary Count 5	8  /alue	-33.3  Mean Sq 0.000872 7.848E-0  lity Test  Mean 0.0548	1.86  uare 4 7  95% LCL 0.0535	0.00104  Test Stat 2.04  DF 1 8 9  Test Stat 2.17 0.86  95% UCL 0.0561	Critical 2.29  F Stat 1110  Critical 23.2 0.741  Median 0.0545	1.0000  P-Value 0.2007  P-Value <1.0E-05  P-Value 0.4705 0.0765  Min 0.054	Decision Significan  Decision Significan  Decision Equal Va Normal D  Max  0.0565	a(α:5%)  ers Detected  a(α:5%)  nt Effect  a(α:1%)  riances  Distribution  Std Err  0.000464	<b>CV%</b> 1.89%	5.20%
Reference Section Auxiliary Tests Attribute Outlier ANOVA Table Source Between Error Total ANOVA Assur Attribute Variance Distribution gamma-BHC ( Sample IOSN 2019 AT3-098 gamma-BHC (	mptic	Test Grubbs Ext  Sum Squar 0.0008724 6.278E-06 0.0008786  ons Tests Variance Ra Shapiro-Will dane) Summa Code RS	atio F T lk W No ary Count 5	8  /alue	-33.3  Mean Sq 0.000872 7.848E-0  lity Test  Mean 0.0548	1.86  uare 4 7  95% LCL 0.0535	0.00104  Test Stat 2.04  DF 1 8 9  Test Stat 2.17 0.86  95% UCL 0.0561	Critical 2.29  F Stat 1110  Critical 23.2 0.741  Median 0.0545	1.0000  P-Value 0.2007  P-Value <1.0E-05  P-Value 0.4705 0.0765  Min 0.054	Decision Significan  Decision Significan  Decision Equal Va Normal D  Max  0.0565	a(α:5%)  ers Detected  a(α:5%)  nt Effect  a(α:1%)  riances  Distribution  Std Err  0.000464	<b>CV%</b> 1.89%	5.20%
Reference Sec  Auxiliary Test Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assur Attribute	mptic	Test Grubbs Ext  Sum Squar 0.0008724 6.278E-06 0.0008786 ons Tests Test Variance Ra Shapiro-Wil dane) Summa Code RS	atio F T Ik W No ary Count 5	/alue	-33.3  Mean Sq 0.000872 7.848E-0  lity Test  Mean 0.0548 0.0361	1.86  uare 4 7  95% LCL 0.0535 0.0352	0.00104  Test Stat 2.04  DF 1 8 9  Test Stat 2.17 0.86  95% UCL 0.0561 0.037	Critical 2.29  F Stat 1110  Critical 23.2 0.741  Median 0.0545 0.0358	1.0000  P-Value 0.2007  P-Value <1.0E-05  P-Value 0.4705 0.0765  Min 0.054	Decision Significan  Decision Significan  Decision Equal Va Normal D  Max  0.0565	a(α:5%)  ers Detected  a(α:5%)  nt Effect  a(α:1%)  riances  Distribution  Std Err  0.000464	<b>CV%</b> 1.89%	5.20%

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Bioaccumulat	tion E	valuation -	Pesticide	s - Nere	is							EA-ES	T, Inc. PBC
Analysis ID: Analyzed: Edit Date:	19 A	006-7514 ug-23 6:59 lay-23 22:53	An	alysis:	Non	•	Two Sample			S Version is Level: or ID:	: CETISv2. 1	1.1	
Batch ID: Start Date: Ending Date: Test Length:	08 M 05 A <sub>l</sub>	•	Pro Sp	st Type: otocol: ecies: kon:	US A	ccumulatio ACE NED F eis virens chaeta	n - Pesticide RIM (2004)	es	Analy Dilue Brine Sour	ent: Not	ncy Roka t Applicable ⁄stal Sea O - Aquatic F	Research (	Or <b>Age</b> :
Sample Code	)	Sample ID	Sa	mple Da	te	Receipt	Date	Sample Ag	e Clien	t Name	Pro	oject	
IOSN 2019 AT3-098		13-4648-81 07-1559-49		Mar-23 Feb-23	13:00	08 Mar- 09 Feb-	23	12h 27d 23h		Analysts, Ir	nc. Dre	edged Sed	liment Evalu
Sample Code	•	Material T	уре		Sam	ple Source	Э	Sta	tion Location	on	Lat/Long		
IOSN 2019		Reference	sediment		Yach	ntsman Ma	rina NAE-20	04-00 IOS	N Referenc	e			
AT3-098		Marine Sec	diment		Yach	ntsman Ma	rina NAE-20	04-00 10	Stations at 4	Marinas N	Лu		
Data Transfor	rm		Alt Hyp					Comparis	on Result				PMSD
Untransformed	d		C < T					AT3-098 p	assed gamr	na-chlorda	ne endpoint		1.81%
Wilcoxon Rar	nk Su	m Two-Sam	nple Test							Desistan	( =0()		
<u> </u>		Sample II			Stat	Critical	Ties	P-Type	P-Value	Decision			
Sample I Reference Sec		Sample II AT3-098	<b>d</b> 8		Stat	Critical	Ties 0	P-Type Exact	1.0000		i(α:5%) iificant Effect		
	d	•			Stat			Exact			ificant Effect		
Reference Sec	d	AT3-098	8	40	Stat		0	Exact	1.0000	Non-Sign  Decision	ificant Effect		
Reference Sec Auxiliary Test Attribute	d ts	AT3-098	8	40	Stat		0 Test Stat	Exact  Critical	1.0000 P-Value	Non-Sign  Decision	ificant Effect n(α:5%)		
Reference Sec Auxiliary Test Attribute Outlier	d ts	AT3-098	8 xtreme Va	40	Stat ı Squa		0 Test Stat	Exact  Critical	1.0000 P-Value	Non-Sign  Decision	ificant Effect n(α:5%) ers Detected		
Auxiliary Test Attribute Outlier ANOVA Table Source Between Error	d ts	Test Grubbs Ex  Sum Squa 0.0003969 2.575E-06	xtreme Va	40	ı <b>Squ</b> a		0 Test Stat 2.06  DF 1 8	Critical 2.29	1.0000 P-Value 0.1825	Non-Sign  Decision  No Outlie	ificant Effect  a(α:5%)  ers Detected  a(α:5%)		
Auxiliary Test Attribute Outlier ANOVA Table Source Between	d ts	Test Grubbs Ex  Sum Squa 0.0003969	xtreme Va	40 lue Test Mean 0.000	ı <b>Squ</b> a		0 Test Stat 2.06  DF 1	Critical 2.29 F Stat	1.0000  P-Value  0.1825  P-Value	Decision No Outlie	ificant Effect  a(α:5%)  ers Detected  a(α:5%)		
Auxiliary Test Attribute Outlier ANOVA Table Source Between Error	d ts	Test Grubbs Ex  Sum Squa 0.0003969 2.575E-06 0.0003995	xtreme Va	40 lue Test Mean 0.000	ı <b>Squ</b> a		0 Test Stat 2.06  DF 1 8	Critical 2.29 F Stat	1.0000  P-Value  0.1825  P-Value	Decision No Outlie	ificant Effect  a(α:5%)  ers Detected  a(α:5%)		
Auxiliary Test Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assur Attribute	d ts	Test Grubbs Ex  Sum Squa 0.0003969 2.575E-06 0.0003995 ns Tests Test	xtreme Va	40  lue Test  Mean  0.000 3.219	ı <b>Squ</b> a		0  Test Stat 2.06  DF 1 8 9  Test Stat	Critical 2.29  F Stat 1230  Critical	1.0000  P-Value 0.1825  P-Value <1.0E-05	Decision No Outlie Decision Significan	n(α:5%) ers Detected n(α:5%) nt Effect		
Auxiliary Test Attribute Outlier ANOVA Table Source Between Error Total ANOVA Assur	d ts	Test Grubbs Ex  Sum Squa 0.0003969 2.575E-06 0.0003995 ns Tests	xtreme Va	40    Mean	1 <b>Squ</b> 13969 1E-07		0 Test Stat 2.06 DF 1 8 9	Critical 2.29  F Stat 1230	1.0000  P-Value 0.1825  P-Value <1.0E-05	Decision Significan  Decision Equal Va	n(α:5%) ers Detected n(α:5%) nt Effect	on	
Auxiliary Test Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assur Attribute Variance	ts mptio	Test Grubbs Ex  Sum Squa 0.0003969 2.575E-06 0.0003995 ns Tests Test Variance R Shapiro-W	xtreme Va	40    Mean	1 <b>Squ</b> 13969 1E-07		0 Test Stat 2.06  DF 1 8 9  Test Stat 1.94	Critical 2.29  F Stat 1230  Critical 23.2	P-Value 0.1825 P-Value <1.0E-05 P-Value 0.5359	Decision Significan  Decision Equal Va	n(α:5%) ers Detected n(α:5%) nt Effect n(α:1%) riances	on	
Auxiliary Test Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assur Attribute Variance Distribution	ts mptio	Test Grubbs Ex  Sum Squa 0.0003969 2.575E-06 0.0003995 ns Tests Test Variance R Shapiro-W	xtreme Va	40    Mean	s Squa 13969 1E-07		7 Test Stat 2.06  DF 1 8 9  Test Stat 1.94 0.785	Critical 2.29  F Stat 1230  Critical 23.2 0.741	P-Value 0.1825 P-Value <1.0E-05 P-Value 0.5359	Decision Significan  Decision Equal Va	n(α:5%) ers Detected n(α:5%) nt Effect n(α:1%) riances	on CV%	%Effect
Auxiliary Test Attribute Outlier ANOVA Table Source Between Error Total ANOVA Assur Attribute Variance Distribution gamma-chlore	ts mptio	Test Grubbs Ex  Sum Squa 0.0003969 2.575E-06 0.0003995 ns Tests Test Variance R Shapiro-W	xtreme Va	Mean 0.000 3.219	ı <b>Squ</b> i 3969 E-07	are	7 Test Stat 2.06  DF 1 8 9  Test Stat 1.94 0.785	Critical 2.29  F Stat 1230  Critical 23.2 0.741	P-Value 0.1825 P-Value <1.0E-05  P-Value 0.5359 0.0097	Decision Significan  Decision Significan  Decision Equal Va Non-Norr	ers Detected  (α:5%)  at (α:5%)  at Effect  (α:1%)  riances  mal Distribution		%Effect 3.56%
Reference Sec  Auxiliary Test Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assur Attribute Variance Distribution gamma-chlore Sample	ts mptio	Test Grubbs Ex  Sum Squa 0.0003969 2.575E-06 0.0003995 ns Tests Test Variance R Shapiro-W Summary Code	xtreme Va	Mean 0.000 3.219	s Squa 3969 E-07	are 95% LCL	0 Test Stat 2.06  DF 1 8 9  Test Stat 1.94 0.785	Critical 2.29  F Stat 1230  Critical 23.2 0.741  Median	1.0000  P-Value 0.1825  P-Value <1.0E-05  P-Value 0.5359 0.0097  Min	Decision Significan  Decision Significan  Max	ificant Effect  i(α:5%)  ers Detected  i(α:5%)  int Effect  i(α:1%)  riances  mal Distribution  Std Err	CV%	
Auxiliary Test Attribute Outlier ANOVA Table Source Between Error Total ANOVA Assur Attribute Variance Distribution gamma-chlore Sample IOSN 2019	ts mptio	Test Grubbs Ex  Sum Squa 0.0003969 2.575E-06 0.0003995 ns Tests Test Variance R Shapiro-W Summary Code RS	extreme Values  Ratio F Tes ilk W Norr  Count 5	Mean 0.036	s Squa 3969 E-07	95% LCL 0.0361	7 rest Stat 2.06  DF 1 8 9  Test Stat 1.94 0.785  95% UCL 0.0377	Critical 2.29  F Stat 1230  Critical 23.2 0.741  Median 0.0365	P-Value 0.1825 P-Value <1.0E-05  P-Value 0.5359 0.0097  Min 0.0365	Decision Significan  Decision Significan  Max 0.038	a(α:5%)  ers Detected  a(α:5%)  nt Effect  a(α:1%)  riances  mal Distribution  Std Err  0.000292	<b>CV%</b> 1.77%	3.56%
Auxiliary Test Attribute Outlier ANOVA Table Source Between Error Total ANOVA Assur Attribute Variance Distribution gamma-chlore Sample IOSN 2019 AT3-098	ts mptio	Test Grubbs Ex  Sum Squa 0.0003969 2.575E-06 0.0003995 ns Tests Test Variance R Shapiro-W Summary Code RS	extreme Values  Ratio F Tes ilk W Norr  Count 5	Mean 0.036	s Squa 3969 E-07	95% LCL 0.0361	7 rest Stat 2.06  DF 1 8 9  Test Stat 1.94 0.785  95% UCL 0.0377	Critical 2.29  F Stat 1230  Critical 23.2 0.741  Median 0.0365	P-Value 0.1825 P-Value <1.0E-05  P-Value 0.5359 0.0097  Min 0.0365	Decision Significan  Decision Significan  Max 0.038	a(α:5%)  ers Detected  a(α:5%)  nt Effect  a(α:1%)  riances  mal Distribution  Std Err  0.000292	<b>CV%</b> 1.77%	3.56%
Auxiliary Test Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assur Attribute Variance Distribution gamma-chlore Sample IOSN 2019 AT3-098 gamma-chlore	ts mptio	Test Grubbs Ext Sum Squa 0.0003969 2.575E-06 0.0003995 ns Tests Test Variance R Shapiro-W Summary Code RS	ares Ratio F Tes ilk W Norr Count 5 5	## Mean 0.000 3.219 ## Mean 0.036 0.024	st Squa st	95% LCL 0.0361 0.0237	0 Test Stat 2.06  DF 1 8 9  Test Stat 1.94 0.785  95% UCL 0.0377 0.0249	Critical 2.29  F Stat 1230  Critical 23.2 0.741  Median 0.0365 0.0241	P-Value 0.1825 P-Value <1.0E-05  P-Value 0.5359 0.0097  Min 0.0365	Decision Significan  Decision Significan  Max 0.038	a(α:5%)  ers Detected  a(α:5%)  nt Effect  a(α:1%)  riances  mal Distribution  Std Err  0.000292	<b>CV%</b> 1.77%	3.56%

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Rioaccumula											
Dioaccumula	tion Evaluation - F	Pesticides	- Nereis							EA-ES	T, Inc. PBC
Analysis ID: Analyzed: Edit Date:	03-5485-6177 19 Aug-23 6:59 08 May-23 22:53	Ana	lysis: Pai	otachlor epo rametric-Two 680CECAFI	o Sample	DD3C7F79		S Version: is Level: or ID:	CETISv2. 1	1.1	
Batch ID:	08-2970-4074	Test	Type: Bio	accumulatio	n - Pesticid	es	Analy	<b>/st:</b> Nar	ncy Roka		
Start Date:	08 Mar-23 11:34			ACE NED F			Dilue		Applicable		
Ending Date:	05 Apr-23 10:34	Spe		reis virens	, ,		Brine		stal Sea		
Test Length:	27d 23h	Taxo	on: Pol	ychaeta			Sour	ce: AR	O - Aquatic F	Research C	or <b>Age:</b>
Sample Code	Sample ID	Sam	ple Date	Receip	t Date	Sample Ag	e Clien	t Name	Pro	oject	
IOSN 2019	13-4648-817	70 08 N	/lar-23	08 Mar-	23	12h	Eco-A	Analysts, In	c. Dre	edged Sec	liment Evalı
AT3-098	07-1559-497	74 08 F	eb-23 13:00	09 Feb-	23 16:30	27d 23h					
Sample Code	Material Ty	ре	Sai	mple Sourc	е	Sta	tion Location	on	Lat/Long		
IOSN 2019	Reference s		Ya	chtsman Ma	rina NAE-20	004-00 105	SN Referenc	е			
AT3-098	Marine Sedi	ment	Yad	chtsman Ma	rina NAE-20	004-00 10	Stations at 4	Marinas M	1u		
Data Transfo	rm .	Alt Hyp				Comparis	on Result				PMSD
Untransforme	d	C < T				AT3-098 p	passed hepta	achlor epox	ide endpoint		1.88%
Equal Varian	ce t Two-Sample T	Test									
Sample I	vs Sample II	df	Test Stat	Critical	MSD	P-Type	P-Value	Decision	(α:5%)		
Reference Se	d AT3-098	8	-33.5	1.86	0.00147	CDF	1.0000	Non-Sign	ificant Effect		
Auxiliary Tes	ts										
Attribute	Test				Test Stat	Critical	P-Value	Decision	(α:5%)		
Outlier	Grubbs Ext	reme Valu	ıe Test		2.12	2.29	0.1335	No Outlie	rs Detected		
ANOVA Table	)										
Source	Sum Squar	es	Mean Squ	uare	DF	F Stat	P-Value	Decision	(α:5%)		
					1				· ,		
Between	0.0017556		0.0017556	3		1120	<1.0E-05	Significar	it Effect		
			0.0017556 1.563E-06		8	1120	<1.0E-05	Significar	it Effect		
Between	0.0017556					1120 —	<1.0E-05	Significar	It Effect		
Between Error Total	0.0017556 0.0000125				8	1120 —	<1.0E-05	Significar	t Effect		
Between Error Total	0.0017556 0.0000125 0.0017681				8		<1.0E-05 P-Value	Significar  Decision			
Between Error Total  ANOVA Assu Attribute Variance	0.0017556 0.0000125 0.0017681 mptions Tests Test Variance Ra		1.563E-06		8 9 <b>Test Stat</b> 2.13	Critical 23.2	<b>P-Value</b> 0.4833	<b>Decision</b> Equal Val	(α:1%) riances		
Between Error Total ANOVA Assu Attribute	0.0017556 0.0000125 0.0017681 mptions Tests Test		1.563E-06		8 9 Test Stat	Critical	P-Value	<b>Decision</b> Equal Val	(α:1%)		
Between Error Total  ANOVA Assu Attribute Variance Distribution	0.0017556 0.0000125 0.0017681  mptions Tests     Test     Variance Ra     Shapiro-Will	k W Norm	1.563E-06		8 9 <b>Test Stat</b> 2.13 0.826	<b>Critical</b> 23.2 0.741	P-Value 0.4833 0.0300	<b>Decision</b> Equal Val	(α:1%) riances istribution		
Between Error Total  ANOVA Assu Attribute Variance Distribution	0.0017556 0.0000125 0.0017681  mptions Tests  Test  Variance Ra Shapiro-Will  poxide Summary Code		1.563E-06  ality Test  Mean		8 9 <b>Test Stat</b> 2.13	<b>Critical</b> 23.2 0.741	<b>P-Value</b> 0.4833	<b>Decision</b> Equal Val	(α:1%) riances	CV%	%Effect
Between Error Total  ANOVA Assu Attribute Variance Distribution heptachlor ep Sample IOSN 2019	0.0017556 0.0000125 0.0017681  mptions Tests  Test  Variance Ra Shapiro-Will  poxide Summary Code	k W Norm	1.563E-06  ality Test  Mean  0.078	95% LCL 0.0762	9  Test Stat 2.13 0.826  95% UCL 0.0798	Critical 23.2 0.741  Median 0.0775	P-Value 0.4833 0.0300  Min 0.077	Decision Equal Val Normal D  Max 0.0805	(α:1%) riances istribution  Std Err 0.000652	1.87%	0.00%
Between Error Total  ANOVA Assu Attribute Variance Distribution heptachlor ep Sample	0.0017556 0.0000125 0.0017681  mptions Tests  Test  Variance Ra Shapiro-Will  poxide Summary  Code  RS	k W Norm	1.563E-06  ality Test  Mean	95% LCL	8 9 <b>Test Stat</b> 2.13 0.826 <b>95% UCL</b>	23.2 0.741	P-Value 0.4833 0.0300	Decision Equal Van Normal D	(α:1%) riances istribution  Std Err		
Between Error Total  ANOVA Assu Attribute Variance Distribution heptachlor ep Sample IOSN 2019	0.0017556 0.0000125 0.0017681  mptions Tests  Test  Variance Ra Shapiro-Will  poxide Summary Code  RS	k W Norm  Count	1.563E-06  ality Test  Mean  0.078	95% LCL 0.0762	9  Test Stat 2.13 0.826  95% UCL 0.0798	Critical 23.2 0.741  Median 0.0775	P-Value 0.4833 0.0300  Min 0.077	Decision Equal Val Normal D  Max 0.0805	(α:1%) riances istribution  Std Err 0.000652	1.87%	0.00%
Between Error Total  ANOVA Assu Attribute Variance Distribution heptachlor ep Sample IOSN 2019 AT3-098	0.0017556 0.0000125 0.0017681  mptions Tests  Test  Variance Ra Shapiro-Will  coxide Summary  Code  RS	k W Norm  Count	1.563E-06  ality Test  Mean  0.078	95% LCL 0.0762	9  Test Stat 2.13 0.826  95% UCL 0.0798	Critical 23.2 0.741  Median 0.0775	P-Value 0.4833 0.0300  Min 0.077	Decision Equal Val Normal D  Max 0.0805	(α:1%) riances istribution  Std Err 0.000652	1.87%	0.00%
Between Error Total  ANOVA Assu Attribute Variance Distribution heptachlor ep Sample IOSN 2019 AT3-098 heptachlor ep	0.0017556 0.0000125 0.0017681  mptions Tests  Test Variance Ra Shapiro-Will  coxide Summary Code RS  poxide Detail Code	Count 5	1.563E-06  ality Test  Mean  0.078  0.0515	95% LCL 0.0762 0.0503	8 9 Test Stat 2.13 0.826 95% UCL 0.0798 0.0527	Critical 23.2 0.741  Median 0.0775 0.051	P-Value 0.4833 0.0300  Min 0.077	Decision Equal Val Normal D  Max 0.0805	(α:1%) riances istribution  Std Err 0.000652	1.87%	0.00%

Report Date: Test Code/ID: 19 Aug-23 07:00 (p 14 of 19) TN-23-302NvPest / 04-3042-6729

Analysis ID: 11-6127-2344 Endpoint: heptachlor Analyzed: 19 Aug-23 6:59 Analysis: Parametric-Two Sample Edit Date: 08 May-23 22:53 MD5 Hash: B23F09EECF1AE81697FD4B637	CETIS Version: CETISv2.1.1 Status Level: 1
Batch ID:08-2970-4074Test Type:Bioaccumulation - PesticidesStart Date:08 Mar-23 11:34Protocol:US ACE NED RIM (2004)Ending Date:05 Apr-23 10:34Species:Nereis virensTest Length:27d 23hTaxon:Polychaeta	Analyst: Nancy Roka  Diluent: Not Applicable  Brine: Crystal Sea  Source: ARO - Aquatic Research Or Age:
Sample Code         Sample ID         Sample Date         Receipt Date         Sample ID           IOSN 2019         13-4648-8170         08 Mar-23         08 Mar-23         12h           AT3-098         07-1559-4974         08 Feb-23 13:00         09 Feb-23 16:30         27d 25	lle Age Client Name Project  Eco-Analysts, Inc. Dredged Sediment Eval
Sample CodeMaterial TypeSample SourceIOSN 2019Reference sedimentYachtsman Marina NAE-2004-00AT3-098Marine SedimentYachtsman Marina NAE-2004-00	
Data Transform Alt Hyp Com	nparison Result PMSD
<u> </u>	-098 passed heptachlor endpoint 1.79%
Equal Variance t Two-Sample Test       Sample I     vs     Sample II     df     Test Stat     Critical     MSD     P-Ty       Reference Sed     AT3-098     8     -35.3     1.86     0.000679     CDF	
Auxiliary Tests         Test Stat         Critical Countries           Outlier         Grubbs Extreme Value Test         2.02         2.29	( )
ANOVA Table Source Sum Squares Mean Square DF F Sta	at P-Value Decision(α:5%)
Between 0.0004147 0.0004147 1 1240 Error 2.668E-06 3.335E-07 8 Total 0.0004174 9	
ANOVA Assumptions Tests  Attribute Test Test Stat Critic	ical P-Value Decision(α:1%)
VarianceVariance Ratio F Test1.7623.2DistributionShapiro-Wilk W Normality Test0.7880.74	0.5988 Equal Variances
heptachlor Summary	
Sample Code Count Mean 95% LCL 95% UCL Med	lian Min Max Std Err CV% %Effect
IOSN 2019 RS 5 0.0379 0.0371 0.0387 0.037 AT3-098 5 0.025 0.0244 0.0256 0.024	
heptachlor Detail	
	5
Sample Code Rep 1 Rep 2 Rep 3 Rep 4 Rep	

Report Date: Test Code/ID: 19 Aug-23 07:00 (p 15 of 19) TN-23-302NvPest / 04-3042-6729

Bioaccumulat	tion E	valuation -	Pesticid	es - N	ereis							EA-ES	T, Inc. PBC
Analysis ID: Analyzed: Edit Date:	19 A	060-6268 ug-23 6:59 lay-23 22:53	Aı	ndpoir nalysis D5 Ha	s: Par	cachlorobenz rametric-Two D096EED56	Sample	756438884	Statu	S Version is Level: or ID:	ı: CETISv2 1	2.1.1	
Batch ID: Start Date: Ending Date: Test Length:	08 M 05 A	•	Pı Sı	est Typrotoco pecies axon:	l: US : Ne	accumulatio ACE NED F reis virens ychaeta		es	Analy Dilue Brine Sour	ent: No e: Cr	incy Roka ot Applicable ystal Sea RO - Aquatic I	Research (	Or <b>Age:</b>
Sample Code	,	Sample ID	) Si	ample	Date	Receipt	Date	Sample Ag	e Clien	t Name	Pı	oject	
IOSN 2019 AT3-098		13-4648-8 07-1559-4		3 Mar-2 3 Feb-2	23 23 13:00	08 Mar- 09 Feb-	23	12h 27d 23h		Analysts, I	nc. Di	redged Sed	diment Evalu
Sample Code	)	Material T	уре		Sar	mple Source	е	Sta	tion Location	on	Lat/Long		
IOSN 2019		Reference	sedimen	t	Yad	chtsman Ma	rina NAE-20	04-00 IOS	N Referenc	е			
AT3-098		Marine Se	diment		Yad	chtsman Ma	rina NAE-20	04-00 10	Stations at 4	Marinas I	Mu		
Data Transfor	rm		Alt Hyp	)				Comparis	on Result				PMSD
Untransformed	d		C < T					AT3-098 p	assed hexa	chloroben	zene endpoir	nt	1.87%
Equal Variand	ce t T	wo-Sample	Test					P-Type	P-Value	Decision	o(a:5%)		
•		Sample II AT3-098		<b>df Te</b> 8 -33	st Stat 3.9	Critical 1.86	<b>MSD</b> 0.00608	CDF	1.0000		nificant Effect	t	
Reference Sec Auxiliary Test Attribute	d	AT3-098	;	8 -33	3.9		0.00608  Test Stat	CDF  Critical	1.0000 P-Value	Non-Sign	nificant Effect	t	
Reference Sec Auxiliary Test Attribute Outlier	d ts	AT3-098	;	8 -33	3.9		0.00608	CDF	1.0000	Non-Sign	nificant Effect	t .	
Reference Sec Auxiliary Test Attribute	d ts	Test Grubbs E	xtreme V	8 -33 alue Te	est ean Squ	1.86	0.00608  Test Stat 2.03  DF	Critical 2.29  F Stat	1.0000  P-Value 0.2054  P-Value	Decision No Outlie	n(α:5%) ers Detected n(α:5%)	t	
Auxiliary Test Attribute Outlier ANOVA Table	d ts	AT3-098  Test  Grubbs E	xtreme V	8 -33 alue Te  Me  0.0	3.9 est	1.86 Jare	0.00608  Test Stat 2.03	CDF  Critical 2.29	1.0000 P-Value 0.2054	Non-Sign  Decision  No Outlie	n(α:5%) ers Detected n(α:5%)		
Reference Sec  Auxiliary Test Attribute Outlier  ANOVA Table Source Between Error	d ts	Test Grubbs E  Sum Squa 0.030747 0.000214 0.030961	xtreme V	8 -33 alue Te  Me  0.0	est  ean Squ 030747	1.86 Jare	0.00608  Test Stat 2.03  DF 1 8	Critical 2.29  F Stat	1.0000  P-Value 0.2054  P-Value	Decision No Outlie	n(α:5%) ers Detected n(α:5%)		
Auxiliary Test Attribute Outlier ANOVA Table Source Between Error Total	d ts	Test Grubbs E  Sum Squa 0.030747 0.000214 0.030961	xtreme V	8 -33 alue Te  Me  0.0	est  ean Squ 030747	1.86 Jare	0.00608  Test Stat 2.03  DF 1 8	CDF  Critical 2.29  F Stat 1150	1.0000  P-Value 0.2054  P-Value	Decision No Outlie	n(α:5%) ers Detected n(α:5%) nt Effect		
Auxiliary Test Attribute Outlier ANOVA Table Source Between Error Total ANOVA Assur Attribute Variance	d ts	Test Grubbs E  Sum Squa 0.030747 0.000214 0.030961 Ins Tests Test Variance F	xtreme Vares	8 -33  alue Te  Me  0.0  2.6	est ean Squ 030747 675E-05	1.86 Jare	0.00608  Test Stat 2.03  DF 1 8 9  Test Stat 1.98	Critical 2.29  F Stat 1150  Critical 23.2	1.0000  P-Value 0.2054  P-Value <1.0E-05  P-Value 0.5243	Decision Significa  Decision Equal Va	n(α:5%) ers Detected n(α:5%) nt Effect n(α:1%) ariances		
Reference Sec  Auxiliary Test Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assur Attribute Variance	d ts	Test Grubbs E  Sum Squa 0.030747 0.000214 0.030961 Ins Tests Test	xtreme Vares	8 -33  alue Te  Me  0.0  2.6	est ean Squ 030747 675E-05	1.86 Jare	0.00608  Test Stat 2.03  DF 1 8 9	Critical 2.29  F Stat 1150  Critical	1.0000  P-Value 0.2054  P-Value <1.0E-05	Decision Significa  Decision Equal Va	n(α:5%) ers Detected n(α:5%) nt Effect n(α:1%)		
Auxiliary Test Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assur Attribute Variance Distribution	ts mptio	Test Grubbs E  Sum Squa 0.030747 0.000214 0.030961 Ins Tests Test Variance F Shapiro-W	xtreme Vares Ratio F Te	8 -33  alue Te  Me  0.0  2.6	est ean Squ 030747 675E-05	1.86 Jare	0.00608  Test Stat 2.03  DF 1 8 9  Test Stat 1.98	Critical 2.29  F Stat 1150  Critical 23.2	1.0000  P-Value 0.2054  P-Value <1.0E-05  P-Value 0.5243	Decision Significa  Decision Equal Va	n(α:5%) ers Detected n(α:5%) nt Effect n(α:1%) ariances		
Auxiliary Test Attribute Outlier ANOVA Table Source Between Error Total ANOVA Assur Attribute Variance Distribution hexachlorobe	ts mptio	Test Grubbs E  Sum Squa 0.030747 0.000214 0.030961 Ins Tests Test Variance F Shapiro-W e Summary Code	xtreme Vares Ratio F Te	alue Te  Me  0.0 2.6  est -mality	est  ean Squ 030747 675E-05	1.86 Jare	0.00608  Test Stat 2.03  DF 1 8 9  Test Stat 1.98 0.86	Critical 2.29  F Stat 1150  Critical 23.2 0.741	1.0000  P-Value 0.2054  P-Value <1.0E-05  P-Value 0.5243	Decision Significa  Decision Equal Va	n(α:5%) ers Detected n(α:5%) nt Effect n(α:1%) ariances	CV%	%Effect
Auxiliary Test Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assur Attribute Variance Distribution hexachlorobe Sample IOSN 2019	ts mptio	Test Grubbs E  Sum Squa 0.030747 0.000214 0.030961  Ins Tests Test Variance F Shapiro-W e Summary	xtreme Vares Ratio F Te	Me O.C  est  mality  Me O.S	est  ean Squ 030747 675E-05  Test	1.86  Jare  95% LCL  0.319	0.00608  Test Stat 2.03  DF 1 8 9  Test Stat 1.98 0.86  95% UCL 0.334	Critical 2.29  F Stat 1150  Critical 23.2 0.741  Median 0.324	P-Value 0.2054  P-Value <1.0E-05  P-Value 0.5243 0.0769  Min 0.321	Decision Significa  Decision Significa  Decision Equal Va Normal I  Max 0.336	n(α:5%) ers Detected n(α:5%) nt Effect n(α:1%) ariances Distribution Std Err 0.00267	<b>CV%</b> 1.83%	0.00%
Auxiliary Test Attribute Outlier ANOVA Table Source Between Error Total ANOVA Assur Attribute Variance Distribution hexachlorobe Sample	ts mptio	Test Grubbs E  Sum Squa 0.030747 0.000214 0.030961 Ins Tests Test Variance F Shapiro-W e Summary Code	xtreme Vares Ratio F Tellik W Nor	Me O.C  est  mality  Me O.S	est  ean Squ 030747 675E-05	1.86  Jare  95% LCL	0.00608  Test Stat 2.03  DF 1 8 9  Test Stat 1.98 0.86	Critical 2.29  F Stat 1150  Critical 23.2 0.741  Median	1.0000  P-Value 0.2054  P-Value <1.0E-05  P-Value 0.5243 0.0769  Min	Decision Significa  Decision Significa  Decision Equal Va Normal [	n(α:5%) ers Detected n(α:5%) nt Effect n(α:1%) ariances Distribution Std Err	CV%	
Reference Sec  Auxiliary Test Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assur Attribute Variance Distribution hexachlorobe Sample IOSN 2019	mptio	Test Grubbs E  Sum Squa 0.030747 0.000214 0.030961 Ins Tests Variance F Shapiro-W e Summary Code RS	xtreme Vares Ratio F Tellik W Nor	Me O.C  est  mality  Me O.S	est  ean Squ 030747 675E-05  Test	1.86  Jare  95% LCL  0.319	0.00608  Test Stat 2.03  DF 1 8 9  Test Stat 1.98 0.86  95% UCL 0.334	Critical 2.29  F Stat 1150  Critical 23.2 0.741  Median 0.324	P-Value 0.2054  P-Value <1.0E-05  P-Value 0.5243 0.0769  Min 0.321	Decision Significa  Decision Significa  Decision Equal Va Normal I  Max 0.336	n(α:5%) ers Detected n(α:5%) nt Effect n(α:1%) ariances Distribution Std Err 0.00267	<b>CV%</b> 1.83%	0.00%
Auxiliary Test Attribute Outlier ANOVA Table Source Between Error Total ANOVA Assur Attribute Variance Distribution hexachlorobe Sample IOSN 2019 AT3-098	mptio	Test Grubbs E  Sum Squa 0.030747 0.000214 0.030961 Ins Tests Variance F Shapiro-W e Summary Code RS	xtreme Vares Ratio F Tellik W Nor	Me O.C 2.6  Pest rmality  Me O.3 0.2	est  ean Squ 030747 675E-05  Test	1.86  Jare  95% LCL  0.319	0.00608  Test Stat 2.03  DF 1 8 9  Test Stat 1.98 0.86  95% UCL 0.334	Critical 2.29  F Stat 1150  Critical 23.2 0.741  Median 0.324	P-Value 0.2054  P-Value <1.0E-05  P-Value 0.5243 0.0769  Min 0.321	Decision Significa  Decision Significa  Decision Equal Va Normal I  Max 0.336	n(α:5%) ers Detected n(α:5%) nt Effect n(α:1%) ariances Distribution Std Err 0.00267	<b>CV%</b> 1.83%	0.00%
Auxiliary Test Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assur Attribute Variance Distribution hexachlorobe Sample IOSN 2019 AT3-098 hexachlorobe	mptio	Test Grubbs E  Sum Squa 0.030747 0.000214 0.030961 Ins Tests Test Variance F Shapiro-W e Summary Code RS	xtreme Vares Ratio F Tellik W Nor	Meanue Te	est  ean Squ 030747 675E-05  Test  ean 326 215	1.86  Jare  95% LCL  0.319  0.21	0.00608  Test Stat 2.03  DF 1 8 9  Test Stat 1.98 0.86  95% UCL 0.334 0.22	Critical 2.29  F Stat 1150  Critical 23.2 0.741  Median 0.324 0.214	P-Value 0.2054  P-Value <1.0E-05  P-Value 0.5243 0.0769  Min 0.321	Decision Significa  Decision Significa  Decision Equal Va Normal I  Max 0.336	n(α:5%) ers Detected n(α:5%) nt Effect n(α:1%) ariances Distribution Std Err 0.00267	<b>CV%</b> 1.83%	0.00%

Report Date: Test Code/ID: 19 Aug-23 07:00 (p 16 of 19) TN-23-302NvPest / 04-3042-6729

Rioaccumulat	ion Evaluation	Doction	oc Nors	ie						EAFO	T Inc DDC
											T, Inc. PBC
Analysis ID:	17-5795-8568 19 Aug-23 6:59			Methoxychlo	r ric-Two Sampl	•		S Version	: CETISv2 1	.1.1	
Analyzed: Edit Date:	08 May-23 22:5		nalysis: D5 Hach:	•	10-1 wo Sampi 8AB8A5E6860			ıs Level:	I		
Euit Date.	00 May-20 22.0						ADAL EUIC				
Batch ID:	08-2970-4074				tion - Pesticid	es	Anal		ncy Roka		
Start Date:	08 Mar-23 11:3		rotocol:		D RIM (2004)		Dilue		t Applicable		
•	05 Apr-23 10:3		pecies:	Nereis virens	3		Brine	-	stal Sea		
Test Length:	27d 23h	18	axon:	Polychaeta			Sour	ce: AR	O - Aquatic F	Research (	Or <b>Age:</b>
Sample Code	Sample I	D Sa	ample Da	te Rece	ipt Date	Sample Ag	je Clier	t Name	Pr	oject	
IOSN 2019	13-4648-		3 Mar-23		ar-23	12h	Eco-/	Analysts, Ir	nc. Dr	edged Sed	diment Evalu
AT3-098	07-1559-	4974 08	3 Feb-23 1	3:00 09 F	eb-23 16:30	27d 23h					
Sample Code	Material	Туре		Sample Sou	rce	Sta	ation Location	on	Lat/Long		
IOSN 2019	Referenc	e sedimen	t	Yachtsman I	Marina NAE-20	004-00 10	SN Referenc	е			
AT3-098	Marine S	ediment		Yachtsman I	Marina NAE-20	004-00 10	Stations at 4	Marinas N	Лu		
Data Transfor	m	Alt Hyp	)			Comparis	son Result				PMSD
Untransformed		C < T				AT3-098	passed meth	oxychlor e	ndpoint		1.59%
Wilcoyon Ran	ık Sum Two-Sa	mnla Tasi									
		•		Stat Critical	Ties	D Time	D Value	Dagialan	/~·E0/)		
	vs Sample II			Stat Critical		P-Type	P-Value	Decision	` ,		
Deference Cod	1 777 000		0 10		Λ	Eveet	1 0000	Mon Cian	ificant Effact		
Reference Sed	I AT3-098	-	8 40		0	Exact	1.0000	Non-Sign	ificant Effect		
Reference Sed Auxiliary Test		-	8 40		0	Exact	1.0000	Non-Sign	ificant Effect		
		-	8 40		0 Test Stat		1.0000 P-Value	Non-Sign  Decision			
Auxiliary Test	s Test	Extreme V							n(α:5%)		
Auxiliary Test Attribute	s Test Grubbs I				Test Stat	Critical	P-Value	Decision	n(α:5%)		
Auxiliary Test Attribute Outlier	s Test Grubbs I	Extreme V	alue Test	Square	Test Stat	Critical	P-Value	Decision	a(α:5%) etected		
Auxiliary Test Attribute Outlier ANOVA Table	s Test Grubbs I	Extreme V	alue Test		Test Stat 2.52	Critical 2.29	<b>P-Value</b> 0.0067	<b>Decision</b> Outlier D	a(α:5%) etected a(α:5%)		
Auxiliary Test Attribute Outlier ANOVA Table Source	s Test Grubbs I Sum Squ	Extreme V	alue Test <b>Mean</b>	28	Test Stat 2.52 DF	Critical 2.29	P-Value 0.0067 P-Value	Decision Outlier D	a(α:5%) etected a(α:5%)		
Auxiliary Test Attribute Outlier ANOVA Table Source Between	Sum Squ	Extreme V	Mean 1.545	28	<b>Test Stat</b> 2.52 <b>DF</b> 1	Critical 2.29	P-Value 0.0067 P-Value	Decision Outlier D	a(α:5%) etected a(α:5%)		
Auxiliary Test Attribute Outlier ANOVA Table Source Between Error	Sum Squ 1.54528 0.001034 1.54631	Extreme V	Mean 1.545	28	Test Stat 2.52  DF 1 8	Critical 2.29	P-Value 0.0067 P-Value	Decision Outlier D	a(α:5%) etected a(α:5%)		
Auxiliary Test Attribute Outlier ANOVA Table Source Between Error Total	Sum Squ 1.54528 0.001034 1.54631	Extreme V	Mean 1.545	28	Test Stat 2.52  DF 1 8	Critical 2.29  F Stat 12000	P-Value 0.0067 P-Value	Decision Outlier D	etected etected e(α:5%) nt Effect		
Auxiliary Test Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assur	Sum Squ 1.54528 0.001034 1.54631 mptions Tests Test	Extreme V	Mean 1.545 0.000	28	Test Stat 2.52  DF 1 8 9	Critical 2.29  F Stat 12000	P-Value 0.0067 P-Value <1.0E-05	Decision Outlier D Decision Significan	etected etected e(α:5%) nt Effect		
Auxiliary Test Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assur Attribute	Sum Squ 1.54528 0.001034 1.54631 mptions Tests Test Variance	Extreme Values	Mean 1.545 0.000	28 1293	Test Stat 2.52  DF 1 8 9	Critical 2.29  F Stat 12000  Critical	P-Value 0.0067  P-Value <1.0E-05	Decision Outlier D Decision Significan Decision Unequal	n(α:5%) etected n(α:5%) nt Effect		
Auxiliary Test Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assur Attribute Variance	Sum Squ 1.54528 0.001034 1.54631 mptions Tests Test Variance Shapiro-V	Extreme Values  3  Ratio F Te	Mean 1.545 0.000	28 1293	Test Stat 2.52  DF 1 8 9  Test Stat 240	Critical 2.29  F Stat 12000  Critical 23.2	P-Value 0.0067  P-Value <1.0E-05  P-Value 0.0001	Decision Outlier D Decision Significan Decision Unequal	n(α:5%) etected n(α:5%) nt Effect n(α:1%) Variances		
Auxiliary Test Attribute Outlier ANOVA Table Source Between Error Total ANOVA Assur Attribute Variance Distribution Methoxychlor	Sum Squ 1.54528 0.001034 1.54631 mptions Tests Test Variance Shapiro-V	Extreme Values  3  Ratio F Te	Mean 1.545 0.000	28 1293 st	Test Stat 2.52  DF 1 8 9  Test Stat 240 0.783	Critical 2.29  F Stat 12000  Critical 23.2 0.741	P-Value 0.0067  P-Value <1.0E-05  P-Value 0.0001	Decision Outlier D Decision Significan Decision Unequal	n(α:5%) etected n(α:5%) nt Effect n(α:1%) Variances		%Effect
Auxiliary Test Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assur Attribute Variance Distribution	Sum Squ 1.54528 0.001034 1.54631 mptions Tests Test Variance Shapiro-V	Extreme Vi	Mean 1.545 0.000	28 1293 st 95% LC	Test Stat 2.52  DF 1 8 9  Test Stat 240 0.783	Critical 2.29  F Stat 12000  Critical 23.2 0.741	P-Value 0.0067  P-Value <1.0E-05  P-Value 0.0001 0.0090	Decision  Decision  Significan  Decision  Unequal  Non-Norr	etected  a(α:5%)  a(α:5%)  at Effect  a(α:1%)  Variances  mal Distribution	on	%Effect 0.00%
Auxiliary Test Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assur Attribute Variance Distribution  Methoxychlor Sample	Sum Squ 1.54528 0.001034 1.54631 mptions Tests Test Variance Shapiro-V Summary Code	Extreme Valuares  3  Ratio F Te Wilk W Noi	Mean 1.545 0.000 est mality Tes	28 1293 st <b>95% LC</b> 0.823	Test Stat 2.52  DF 1 8 9  Test Stat 240 0.783	Critical 2.29  F Stat 12000  Critical 23.2 0.741  Median	P-Value 0.0067  P-Value <1.0E-05  P-Value 0.0001 0.0090  Min	Decision Outlier D  Decision Significan  Decision Unequal Non-Norr	etected  n(α:5%)  nt Effect  n(α:1%)  Variances  mal Distribution	on CV%	
Auxiliary Test Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assur Attribute Variance Distribution  Methoxychlor Sample IOSN 2019	S Test  Sum Squ 1.54528 0.001034 1.54631  mptions Tests  Test  Variance Shapiro-V  Summary  Code  RS	Extreme Vi  Jares  Ratio F Te  Wilk W Nor  Count  5	Mean 1.545 0.000 est mality Tes	28 1293 st <b>95% LC</b> 0.823	Test Stat 2.52  DF 1 8 9  Test Stat 240 0.783  EL 95% UCL 0.863	Critical 2.29  F Stat 12000  Critical 23.2 0.741  Median 0.835	P-Value 0.0067  P-Value <1.0E-05  P-Value 0.0001 0.0090  Min 0.83	Decision Outlier D  Decision Significan  Decision Unequal Non-Norr  Max 0.87	etected  (α:5%)  etected  (α:5%)  Int Effect  (α:1%)  Variances  mal Distribution  Std Err  0.00718	on CV% 1.90%	0.00%
Auxiliary Test Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assur Attribute Variance Distribution  Methoxychlor Sample IOSN 2019 AT3-098	S Test  Sum Squ 1.54528 0.001034 1.54631  mptions Tests  Test  Variance Shapiro-V  Summary  Code  RS	Extreme Vi  Jares  Ratio F Te  Wilk W Nor  Count  5	Mean 1.545 0.000 est mality Tes	28 1293 st 95% LC 0.823 8 0.0555	Test Stat 2.52  DF 1 8 9  Test Stat 240 0.783  EL 95% UCL 0.863	Critical 2.29  F Stat 12000  Critical 23.2 0.741  Median 0.835	P-Value 0.0067  P-Value <1.0E-05  P-Value 0.0001 0.0090  Min 0.83	Decision Outlier D  Decision Significan  Decision Unequal Non-Norr  Max 0.87	etected  (α:5%)  etected  (α:5%)  Int Effect  (α:1%)  Variances  mal Distribution  Std Err  0.00718	on CV% 1.90%	0.00%
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Report Date:
Test Code/ID:

19 Aug-23 07:00 (p 17 of 19) TN-23-302NvPest / 04-3042-6729

Bioaccumulation Evaluation - Pesticides - Nereis EA-EST. Inc. PBC CETISv2.1.1 Analysis ID: 05-2281-2806 Endpoint: oxychlordane **CETIS Version:** Analyzed: Parametric-Two Sample 19 Aug-23 6:59 Analysis: Status Level: MD5 Hash: 865DF939E6D4B28903EE27C11A10CEE1 Editor ID: **Edit Date:** 08 May-23 22:53 Batch ID: 08-2970-4074 Test Type: Bioaccumulation - Pesticides Nancy Roka Analyst: Start Date: 08 Mar-23 11:34 Protocol: US ACE NED RIM (2004) Diluent: Not Applicable Ending Date: 05 Apr-23 10:34 Species: Nereis virens Brine: Crystal Sea Test Length: 27d 23h Taxon: Polychaeta Source: ARO - Aquatic Research Or Age: Sample Code Sample ID Sample Date Receipt Date Sample Age Client Name **Project IOSN 2019** 13-4648-8170 08 Mar-23 08 Mar-23 12h Eco-Analysts, Inc. Dredged Sediment Evalu AT3-098 07-1559-4974 08 Feb-23 13:00 09 Feb-23 16:30 27d 23h Sample Code **Station Location Material Type** Sample Source Lat/Long **IOSN 2019** Reference sediment Yachtsman Marina NAE-2004-00 **IOSN Reference** AT3-098 Marine Sediment Yachtsman Marina NAE-2004-00 10 Stations at 4 Marinas Mu **Data Transform PMSD** Alt Hyp Comparison Result Untransformed C < T 1.85% AT3-098 passed oxychlordane endpoint **Equal Variance t Two-Sample Test** Sample I Sample II df Test Stat Critical **MSD** P-Type P-Value Decision(a:5%) AT3-098 0.00139 1.0000 Reference Sed -34.2 1.86 CDF Non-Significant Effect **Auxiliary Tests** Attribute Test Test Stat Critical P-Value Decision(a:5%) 2.06 2.29 Outlier Grubbs Extreme Value Test 0.1821 No Outliers Detected **ANOVA Table** Source DF P-Value **Sum Squares** Mean Square F Stat Decision(a:5%) Between 0.0016487 0.0016487 1170 Significant Effect 1 <1.0E-05 1.125E-05 8 Error 1.407E-06 Total 0.0016599 9 **ANOVA Assumptions Tests Attribute** Test Stat Critical P-Value Decision(a:1%) 0.4494 Variance Variance Ratio F Test 2.26 23.2 **Equal Variances** Distribution 0.741 0.0646 Shapiro-Wilk W Normality Test 0.854 Normal Distribution oxychlordane Summary Sample Code Count Mean 95% LCL 95% UCL Median Min Max Std Err CV% %Effect **IOSN 2019** RS 5 0.0752 0.0735 0.0745 0.074 0.0775 1.86% 0.00% 0.0769 0.000625 AT3-098 5 0.0495 0.0484 0.0507 0.0491 0.0488 0.051 0.000416 1.88% 34.15% oxychlordane Detail Sample Code Rep 1 Rep 2 Rep 3 Rep 4 Rep 5 IOSN 2019 RS 0.0775 0.0745 0.074 0.0745 0.0755 AT3-098 0.0499 0.0488 0.0491 0.0489 0.051

Report Date: Test Code/ID: 19 Aug-23 07:00 (p 18 of 19) TN-23-302NvPest / 04-3042-6729

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Bioaccumulat	tion E	valuation -	Pestici	ides	- Nereis							EA-ES	T, Inc. PBC
Analysis ID: Analyzed: Edit Date:	19 A	624-1676 ug-23 6:59 lay-23 22:53		Analy	ysis: P	oxaphene arametric-Tw 4A9935CB03	•	931703F25D	Statu	S Versior Is Level: or ID:	n: CETISv2 1	2.1.1	
Batch ID: Start Date: Ending Date: Test Length:	08 M 05 A <sub>l</sub>	•	! ;	Test Proto Spec Taxo	ocol: U	ioaccumulation S ACE NED Dereis virens Olychaeta		es	Analy Dilue Brine Sour	ent: No e: Cr	ancy Roka ot Applicable rystal Sea RO - Aquatic	Research (	Or <b>Age:</b>
Sample Code	)	Sample ID	,	Samı	ole Date	Receip	t Date	Sample Age	e Clien	t Name	P	roject	
IOSN 2019 AT3-098		13-4648-81 07-1559-49			ar-23 eb-23 13:	08 Mar 00 09 Feb		12h 27d 23h	Eco-A	Analysts, l	Inc. D	redged Sed	diment Evalu
Sample Code	1	Material Ty	уре		s	ample Source	e	Sta	tion Location	on	Lat/Long		
IOSN 2019		Reference	sedime	nt	Y	achtsman Ma	rina NAE-20	004-00 IOS	N Referenc	е			
AT3-098		Marine Sec	diment		Υ	achtsman Ma	rina NAE-20	004-00 10	Stations at 4	Marinas	Mu		
Data Transfor	rm		Alt Hy	ур				Comparis	on Result				PMSD
Untransformed	d		C < T					AT3-098 p	assed toxap	hene end	lpoint		1.88%
Equal Variand		•						D. T	D Value	Dagiala	m/m.E0/ \		
Reference Sec	d	Sample II AT3-098			-33.7	1.86	<b>MSD</b> 0.0297	P-Type CDF	<b>P-Value</b> 1.0000		n(α:5%) nificant Effec	t	
Reference Sec	d							CDF		Non-Sig		t	
Reference Sec Auxiliary Test Attribute	d	AT3-098	ktreme '	8	-33.7		0.0297	CDF	1.0000	Non-Sig  Decisio	nificant Effec		
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Reference Sec Auxiliary Test Attribute Outlier	d ts	AT3-098		8	-33.7	1.86	0.0297 Test Stat	CDF  Critical	1.0000 P-Value	Non-Sig  Decisio  No Outli	nificant Effec n(α:5%)		
Reference Sec Auxiliary Test Attribute Outlier ANOVA Table Source Between Error	d ts	AT3-098  Test  Grubbs Ex	ıres	8	-33.7 e Test	1.86	0.0297  Test Stat 2.06	CDF  Critical 2.29	1.0000 P-Value 0.1808	Decisio No Outli Decisio	nificant Effec n(α:5%) ers Detected		
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Reference Sec Auxiliary Test Attribute Outlier ANOVA Table Source Between Error Total ANOVA Assur Attribute Variance Distribution	ts	Test Grubbs Ex  Sum Squa 0.72361 0.0051000 0.72871 ns Tests Test Variance R Shapiro-Wi	ires	8 Value	-33.7  Mean S 0.72361 0.00063	1.86	0.0297  Test Stat 2.06  DF 1 8 9  Test Stat 2.13 0.87	Critical 2.29  F Stat 1140  Critical 23.2 0.741	1.0000  P-Value 0.1808  P-Value <1.0E-05  P-Value 0.4823	Decisio  Decisio Significa  Decisio Equal Va	n(α:5%) ers Detected n(α:5%) ant Effect n(α:1%) ariances		%Effect
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Auxiliary Test Attribute Outlier ANOVA Table Source Between Error Total ANOVA Assur Attribute Variance Distribution toxaphene Su Sample IOSN 2019 AT3-098	mptio	Test Grubbs Ex  Sum Squa 0.72361 0.0051000 0.72871 ns Tests Test Variance R Shapiro-Wi	catio F 7	8  Value	-33.7  Mean S 0.72361 0.00063  Ility Test  Mean 1.58	1.86  quare 75  95% LCL 1.54	0.0297  Test Stat 2.06  DF 1 8 9  Test Stat 2.13 0.87  95% UCL 1.61	Critical 2.29  F Stat 1140  Critical 23.2 0.741  Median 1.57	1.0000  P-Value 0.1808  P-Value <1.0E-05  P-Value 0.4823 0.1002  Min 1.55	Decisio  Decisio Significa  Decisio Equal Vanormal  Max  1.63	n(α:5%) ers Detected n(α:5%) ant Effect n(α:1%) ariances Distribution Std Err 0.0132	<b>CV%</b> 1.87%	0.00%
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Report Date: 19 Aug-23 07:00 (p 19 of 19)
Test Code/ID: TN-23-302NvPest / 04-3042-6729

Bioaccumulati	ion Evaluation	- Pesticide	s - Nereis							EA-ES	T, Inc. PBC
Analyzed:	02-9910-1821 19 Aug-23 6:59	An	alysis: N	rans-nonachlo Ionparametric	-Two Sample		Statu	S Version	: CETISv2. 1	1.1	
Edit Date:	08 May-23 22:5	53 <b>M</b> D	5 Hash: 4	1665718E1BF	27DB31610	050171D2/	A19 Edito	or ID:			
Batch ID:	08-2970-4074	Tes	st Type: E	Bioaccumulatio	n - Pesticide	es	Analy	<b>/st:</b> Na	ncy Roka		
	08 Mar-23 11:3		otocol: l	JS ACE NED F	RIM (2004)		Dilue		t Applicable		
Ending Date:	•	•		lereis virens			Brine	,	stal Sea		
Test Length:	27d 23h	Tax	con: F	olychaeta			Sour	ce: AR	O - Aquatic R	esearch C	Or <b>Age:</b>
Sample Code	Sample I		nple Date	Receip		Sample Ag		t Name		ject	
IOSN 2019	13-4648-		Mar-23	08 Mar-		12h	Eco-/	Analysts, Ir	nc. Dre	edged Sec	liment Evalı
AT3-098	07-1559-	4974 08	Feb-23 13	:00 09 Feb-	23 16:30	27d 23h					
Sample Code	Material		5	ample Sourc	е	Sta	tion Location	on	Lat/Long		
IOSN 2019		e sediment		'achtsman Ma			SN Referenc				
AT3-098	Marine Se	ediment	<u> </u>	′achtsman Ma	rina NAE-20	04-00 10	Stations at 4	Marinas N	Лu		
Data Transform	m	Alt Hyp				Comparis	on Result				PMSD
Untransformed		C < T				AT3-098	passed trans	-nonachlor	endpoint		1.63%
Wilcoxon Ran	k Sum Two-Sa	mple Test									
			F Toot St	at Critical	Ties	P-Type	P-Value	Decision	ι(α:5%)		
Sample I v	/s Sample II	a.	เยรเจเ	at Criticai							
Reference Sed	AT3-098	<b>d</b>	40		0	Exact	1.0000		ificant Effect		
Reference Sed	AT3-098								• •		
•	AT3-098					Exact			ificant Effect		
Reference Sed  Auxiliary Tests	AT3-098		40		0	Exact	1.0000	Non-Sign  Decision	ificant Effect		
Reference Sed  Auxiliary Tests  Attribute	AT3-098	8	40		0 Test Stat	Exact  Critical	1.0000 P-Value	Non-Sign  Decision	ificant Effect		
Reference Sed  Auxiliary Tests  Attribute  Outlier	AT3-098	8 Extreme Val	40		0 Test Stat	Exact  Critical	1.0000 P-Value	Non-Sign  Decision	ificant Effect (α:5%) ers Detected		
Auxiliary Tests Attribute Outlier ANOVA Table	AT3-098  Test  Grubbs I	8 Extreme Va	40 ue Test	 quare	Test Stat	Critical 2.29	1.0000 P-Value 0.3433	Non-Sign  Decision  No Outlie	a(α:5%) ers Detected a(α:5%)		
Auxiliary Tests Attribute Outlier ANOVA Table Source	AT3-098  Test  Grubbs I	Extreme Valuares	40 lue Test <b>Mean S</b>	quare	Test Stat 1.9  DF	Critical 2.29  F Stat	1.0000  P-Value  0.3433  P-Value	Decision No Outlie	a(α:5%) ers Detected a(α:5%)		
Reference Sed  Auxiliary Tests  Attribute  Outlier  ANOVA Table  Source  Between	AT3-098  Test  Grubbs I  Sum Squ 7.453E-0	Extreme Valueres	ue Test  Mean S 7.453E-	quare	0  Test Stat 1.9  DF 1	Critical 2.29  F Stat	1.0000  P-Value  0.3433  P-Value	Decision No Outlie	a(α:5%) ers Detected a(α:5%)		
Auxiliary Tests Attribute Outlier ANOVA Table Source Between Error	AT3-098  Test Grubbs I  Sum Squ 7.453E-0 3.97E-07 7.493E-0	Extreme Valueres	ue Test  Mean S 7.453E-	quare	0 Test Stat 1.9 DF 1 8	Critical 2.29  F Stat	1.0000  P-Value  0.3433  P-Value	Decision No Outlie	a(α:5%) ers Detected a(α:5%)		
Auxiliary Tests Attribute Outlier ANOVA Table Source Between Error Total	AT3-098  Test Grubbs I  Sum Squ 7.453E-0 3.97E-07 7.493E-0	Extreme Valueres	ue Test  Mean S 7.453E-	quare	0 Test Stat 1.9 DF 1 8	Critical 2.29  F Stat 1500	1.0000  P-Value  0.3433  P-Value	Decision No Outlie	n(α:5%) ers Detected n(α:5%) nt Effect		
Auxiliary Tests Attribute Outlier ANOVA Table Source Between Error Total ANOVA Assun	AT3-098  Test  Grubbs I  Sum Squ 7.453E-0 3.97E-07 7.493E-0  Inptions Tests  Test  Variance	Extreme Valuares 5 Ratio F Tes	40  ue Test  Mean S 7.453E- 4.962E-	quare	0 Test Stat 1.9  DF 1 8 9  Test Stat 1.02	Critical 2.29  F Stat 1500  Critical 23.2	1.0000  P-Value 0.3433  P-Value <1.0E-05  P-Value 0.9887	Decision No Outlie  Decision Significan	n(α:5%) ers Detected n(α:5%) ht Effect		
Auxiliary Tests Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assun Attribute	AT3-098  Test  Grubbs I  Sum Squ 7.453E-0 3.97E-07 7.493E-0  Inptions Tests  Test  Variance	Extreme Valuares 5	40  ue Test  Mean S 7.453E- 4.962E-	quare	Test Stat 1.9  DF 1 8 9	Critical 2.29  F Stat 1500  Critical	1.0000  P-Value 0.3433  P-Value <1.0E-05	Decision Significan  Decision Equal Va	n(α:5%) ers Detected n(α:5%) ht Effect	n	
Auxiliary Tests Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assun Attribute Variance	AT3-098  Test  Grubbs I  Sum Squ 7.453E-0 3.97E-07 7.493E-0  Inptions Tests  Test  Variance Shapiro-V	Extreme Valuares 5 Ratio F Tes	40  ue Test  Mean S 7.453E- 4.962E-	quare	0 Test Stat 1.9  DF 1 8 9  Test Stat 1.02	Critical 2.29  F Stat 1500  Critical 23.2	1.0000  P-Value 0.3433  P-Value <1.0E-05  P-Value 0.9887	Decision Significan  Decision Equal Va	n(α:5%)  ers Detected  n(α:5%)  nt Effect  n(α:1%)  riances	n	
Auxiliary Tests Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assun Attribute Variance Distribution	AT3-098  Test  Grubbs I  Sum Squ 7.453E-0 3.97E-07 7.493E-0  Inptions Tests  Test  Variance Shapiro-V	Extreme Valuares 5 Ratio F Tes	40  ue Test  Mean S 7.453E- 4.962E-	quare	0 Test Stat 1.9  DF 1 8 9  Test Stat 1.02 0.73	Exact  Critical 2.29  F Stat 1500  Critical 23.2 0.741	1.0000  P-Value 0.3433  P-Value <1.0E-05  P-Value 0.9887	Decision Significan  Decision Equal Va	n(α:5%)  ers Detected  n(α:5%)  nt Effect  n(α:1%)  riances	n CV%	%Effect
Reference Sed  Auxiliary Tests Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assun Attribute Variance Distribution	AT3-098  Test Grubbs I  Sum Squ 7.453E-0 3.97E-07 7.493E-0  Inptions Tests Test Variance Shapiro-V  or Summary	Extreme Valueres 5 Ratio F Tes Vilk W Norm	we Test  Mean S 7.453E- 4.962E-	<b>quare</b> 05 08	0 Test Stat 1.9  DF 1 8 9  Test Stat 1.02 0.73	Exact  Critical 2.29  F Stat 1500  Critical 23.2 0.741	P-Value 0.3433  P-Value <1.0E-05  P-Value 0.9887 0.0021	Decision No Outlie Decision Significan  Decision Equal Va Non-Norr	n(α:5%)  ers Detected  n(α:5%)  nt Effect  n(α:1%)  riances  mal Distribution		%Effect 0.00%
Reference Sed  Auxiliary Tests Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assun Attribute Variance Distribution  trans-nonachle Sample	AT3-098  Test Grubbs I  Sum Squ 7.453E-0 3.97E-07 7.493E-0  Inptions Tests Test Variance Shapiro-V  or Summary Code	Extreme Valuares 5 Ratio F Tes Vilk W Norm	Mean S 7.453E- 4.962E- the nality Test	<b>quare</b> 05 08	0 Test Stat 1.9 DF 1 8 9 Test Stat 1.02 0.73	Exact  Critical 2.29  F Stat 1500  Critical 23.2 0.741  Median	1.0000  P-Value 0.3433  P-Value <1.0E-05  P-Value 0.9887 0.0021  Min	Decision Significan  Decision Significan  Max	n(α:5%)  Pris Detected  n(α:5%)  nt Effect  n(α:1%)  riances  mal Distribution  Std Err	<b>CV%</b> 1.39%	
Reference Sed  Auxiliary Tests Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assun Attribute Variance Distribution  trans-nonachle Sample IOSN 2019	AT3-098  Test  Grubbs I  Sum Squ 7.453E-0 3.97E-07 7.493E-0  Inptions Tests  Test  Variance Shapiro-V  or Summary  Code  RS	Extreme Valuares 5 Ratio F Tes Vilk W Norn Count 5	Mean S 7.453E- 4.962E- tt mality Test  Mean 0.0161	quare 05 08 95% LCL 0.0158	0 Test Stat 1.9  DF 1 8 9  Test Stat 1.02 0.73  95% UCL 0.0164	Exact  Critical 2.29  F Stat 1500  Critical 23.2 0.741  Median 0.016	1.0000  P-Value 0.3433  P-Value <1.0E-05  P-Value 0.9887 0.0021  Min 0.016	Decision Significan  Decision Significan  Max 0.0165	a(α:5%) ers Detected a(α:5%) nt Effect a(α:1%) riances mal Distribution Std Err 0.0001	<b>CV%</b> 1.39%	0.00%
Auxiliary Tests Attribute Outlier ANOVA Table Source Between Error Total ANOVA Assun Attribute Variance Distribution trans-nonachle Sample IOSN 2019 AT3-098	AT3-098  Test  Grubbs I  Sum Squ 7.453E-0 3.97E-07 7.493E-0  Inptions Tests  Test  Variance Shapiro-V  or Summary  Code  RS	Extreme Valuares 5 Ratio F Tes Vilk W Norn Count 5	Mean S 7.453E- 4.962E- tt mality Test  Mean 0.0161	quare 05 08 95% LCL 0.0158	0 Test Stat 1.9  DF 1 8 9  Test Stat 1.02 0.73  95% UCL 0.0164	Exact  Critical 2.29  F Stat 1500  Critical 23.2 0.741  Median 0.016	1.0000  P-Value 0.3433  P-Value <1.0E-05  P-Value 0.9887 0.0021  Min 0.016	Decision Significan  Decision Significan  Max 0.0165	a(α:5%) ers Detected a(α:5%) nt Effect a(α:1%) riances mal Distribution Std Err 0.0001	<b>CV%</b> 1.39%	0.00%
Auxiliary Tests Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assun Attribute Variance Distribution  trans-nonachle Sample IOSN 2019 AT3-098  trans-nonachle	AT3-098  Test Grubbs I  Sum Squ 7.453E-0 3.97E-07 7.493E-0  Inptions Tests Test Variance Shapiro-V  or Summary Code RS	Extreme Valuares 5 Ratio F Tes Vilk W Norm Count 5 5	40  we Test  Mean S 7.453E- 4.962E-  t nality Test  Mean 0.0161 0.0106	95% LCL 0.0158 0.0104	0 Test Stat 1.9  DF 1 8 9  Test Stat 1.02 0.73  95% UCL 0.0164 0.0109	Exact  Critical 2.29  F Stat 1500  Critical 23.2 0.741  Median 0.016 0.0106	1.0000  P-Value 0.3433  P-Value <1.0E-05  P-Value 0.9887 0.0021  Min 0.016	Decision Significan  Decision Significan  Max 0.0165	a(α:5%) ers Detected a(α:5%) nt Effect a(α:1%) riances mal Distribution Std Err 0.0001	<b>CV%</b> 1.39%	0.00%

# **ATTACHMENT VIII**

Macoma nasuta 28-Day Solid Phase Bioaccumulation Testing Tissue Chemistry and Body Burden Statistical Analyses

Metals

(17 pages)

# Yachtsman Marina APPENDIX A. CONCENTRATIONS OF COCs IN THE CLAM (*M. nasuta*) NAE-2004-00319

			Pre-Assay		
CONTAMINANT	REP1	REP2	REP3	REP4 *	REP5 *
Metals (ug/g wet weight)					
Arsenic	2.57	2.47	2.72		
Cadmium	0.0290 J	0.0260 J	0.0340 J		
Chromium	0.387	0.552	0.455		
Copper	3.72	2.98	2.60		
Lead	0.121	0.121	0.144		
Mercury	0.00173 U	0.00208 U	0.00175 U		
Nickel	0.636	0.769	0.733		
Zinc	11.5	11.1	12.3		

<sup>\* =</sup> Qualifiers

U Analyte not detected; below Method Detection Limit; value is one-half the Method Detection Limit

J Analyte estimated; detection below Reporting Limit but above Method Detection Limit

NA Not Analyzed

#### APPENDIX A. CONCENTRATIONS OF COCs IN THE CLAM (M. nasuta) Yachtsman Marina NAE-2004-00319

			IOSN Reference		
CONTAMINANT	REP1	REP2	REP3	REP4	REP5
Metals (ug/g wet weight)					
Arsenic	2.70	3.55	3.52	4.39	3.28
Cadmium	0.0220 J	0.0300 J	0.0210 J	0.0350 J	0.0370
Chromium	0.305 J	0.381 J	0.252 J	0.497	0.234 J
Copper	1.48	1.72	1.52	2.49	1.65
Lead	0.319	0.347	0.327	0.420	0.332
Mercury	0.00200 U	0.00150 U	0.00150 U	0.00200 U	0.00150 <mark>U</mark>
Nickel	0.394	0.499	0.450	0.844	0.416
Zinc	9.76	12.2	10.9	15.9	10.0

<sup>\* =</sup> Qualifiers

U Analyte not detected; below J Analyte estimated; detection NA Not Analyzed

#### APPENDIX A. CONCENTRATIONS OF COCs IN THE CLAM (M. nasuta) Yachtsman Marina NAE-2004-00319

		10 Stat	ions at 4 Marina	as Mud	
CONTAMINANT	REP1	REP2	REP3	REP4	REP5
Metals (ug/g wet weight)					
Arsenic	2.59	2.83	2.49	2.50	2.31
Cadmium	0.0250 J	0.0300 J	0.0250 J	0.0250 J	0.0280 J
Chromium	0.501	0.393 <mark>J</mark>	0.510	0.395 <mark>J</mark>	0.371 J
Copper	2.33	2.78	3.23	2.65	2.54
Lead	0.506	0.446	0.489	0.361	0.456
Mercury	0.00201 U	0.00213 U	0.00210 U	0.00215 U	0.00201 U
Nickel	0.608	0.563	0.610	0.519	0.549
Zinc	12.0	14.3	12.4	13.5	11.7

<sup>\* =</sup> Qualifiers

U Analyte not detected; below J Analyte estimated; detectio NA Not Analyzed

**CETIS Test Data Worksheet** 

Report Date:

19 Aug-23 06:44 (p 1 of 1)

Test Code/ID:

TN-23-303MnMet / 11-3134-1920

**Bioaccumulation Evaluation - Metals - Macoma** 

EA-EST, Inc. PBC

Start Date:

29 Mar-23 13:46

Species: Macoma nasuta

Sample Code: AT3-191

End Date: Sample Date: 20 Mar-23

26 Apr-23 12:46

Protocol: US ACE NED RIM (2004) Material: Laboratory Control Sediment Sample Source: Yachtsman Marina NAE-2004-00319

Sample Station: Laboratory Control

•				, -				,				
Sample	Rep	Pos	Body Burden	Arsenic	Cadmium	Chromiu m	Copper	Lead	Mercury	Nickel	Zinc	Silver
IOSN 2019	1	2		2.7	0.022	0.305	1.48	0.319	0.002	0.394	9.76	
IOSN 2019	2	3		3.55	0.03	0.381	1.72	0.347	0.0015	0.499	12.2	
IOSN 2019	3	6		3.52	0.021	0.252	1.52	0.327	0.0015	0.45	10.9	
IOSN 2019	4	7		4.39	0.035	0.497	2.49	0.42	0.002	0.844	15.9	
IOSN 2019	5	10		3.28	0.037	0.234	1.65	0.332	0.0015	0.416	10	
AT3-098	1	1		2.59	0.025	0.501	2.33	0.506	0.00201	0.608	12	
AT3-098	2	4		2.83	0.03	0.393	2.78	0.446	0.002125	0.563	14.3	
AT3-098	3	5		2.49	0.025	0.51	3.23	0.489	0.002095	0.61	12.4	
AT3-098	4	8		2.5	0.025	0.395	2.65	0.361	0.002145	0.519	13.5	
AT3-098	5	9		2.31	0.028	0.371	2.54	0.456	0.002005	0.549	11.7	

**Report Date:** 19 Aug-23 06:43 (p 1 of 3) **Test Code/ID:** TN-23-303MnMet / 11-3134-1920

#### **Bioaccumulation Evaluation - Metals - Macoma**

Bioaccumulat	tion Evaluation - Meta	als - Macoma					EA-EST,	Inc. PBC
Batch ID:	09-1240-8281	•	Bioaccumulation - Metals			lyst: Nancy		
Start Date:	29 Mar-23 13:46		JS ACE NED RIM (2004	)			plicable 	
	26 Apr-23 12:46		/lacoma nasuta		Brir		plicable	_
Test Length:	27d 23h	Taxon: B	Bivalvia		Sou	irce: ARO - A	Aquatic Research Or	Age:
Sample ID:	10-1907-8970	Code: A	T3-191		Pro	ject: Dredge	d Sediment Evaluatio	n
Sample Date:	: 20 Mar-23	Material: L	aboratory Control Sedin	nent	Sou	rce: Yachtsı	man Marina NAE-200	4-00319 (
Receipt Date:	: 20 Mar-23 16:00	CAS (PC):			Stat	t <b>ion:</b> Laborat	tory Control	
Sample Age:	9d 14h	Client: E	co-Analysts, Inc.					
Sample Code	Sample ID	Sample Date	Receipt Date	Sample	Age Clie	nt Name	Project	
IOSN 2019	13-4648-8170	08 Mar-23	08 Mar-23	21d 14l	n Eco	-Analysts, Inc.	Dredged Sedim	nent Evalu
AT3-098	07-1559-4974	08 Feb-23 13	00 09 Feb-23 16:30	49d 1h				
Sample Code	Material Type	S	ample Source		Station Locat	ion L	at/Long	
IOSN 2019	Reference sedir	ment Y	achtsman Marina NAE-	2004-00	IOSN Referen	се		
AT3-098	Marine Sedimer	nt Y	achtsman Marina NAE-	2004-00	10 Stations at	4 Marinas Mu		
Single Compa	arison Summary							
Analysis ID	Endpoint	Compa	rison Method		P-Value	Comparison	Result	S
03-4962-0856	Arsenic	Equal V	ariance t Two-Sample T	est	0.9947	AT3-098 pass	sed arsenic	1
18-5050-5224	Cadmium	Equal V	ariance t Two-Sample T	est	0.7481	AT3-098 pass	sed cadmium	1
08-7081-7384	Chromium	Equal V	ariance t Two-Sample T	est	0.0570	AT3-098 pass	sed chromium	1
13-3639-8676	Copper	Equal V	ariance t Two-Sample T	est	0.0022	AT3-098 faile	d copper	1
00-6439-9040	Lead	Equal V	ariance t Two-Sample T	est	0.0054	AT3-098 faile	d lead	1
03-3555-2818	Mercury	Equal V	ariance t Two-Sample T	est	0.0087	AT3-098 faile	d mercury	1
11-4066-2552	Nickel	Equal V	ariance t Two-Sample T	est	0.0012	AT3-098 faile	d nickel	1
02-4404-1166	Nickel	Wilcoxo	n Rank Sum Two-Samp	le Test	0.0754	AT3-098 pass	sed nickel	1
			ariance t Two-Sample T			AT3-098 pass		

### **CETIS Summary Report**

Report Date: Test Code/ID: 19 Aug-23 06:43 (p 2 of 3) TN-23-303MnMet / 11-3134-1920

**Bioaccumulation Evaluation - Metals - Macoma** 

Arsenic Summa	ry										
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
IOSN 2019	RS	5	3.49	2.73	4.24	2.7	4.39	0.272	0.609	17.45%	0.00%
AT3-098		5	2.54	2.31	2.78	2.31	2.83	0.0847	0.189	7.45%	27.06%
Cadmium Sumn	nary										
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
IOSN 2019	RS	5	0.029	0.0199	0.0381	0.021	0.037	0.00327	0.00731	25.22%	0.00%
AT3-098		5	0.0266	0.0237	0.0295	0.025	0.03	0.00103	0.0023	8.65%	8.28%
Chromium Sum	mary										
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
IOSN 2019	RS	5	0.334	0.2	0.467	0.234	0.497	0.0481	0.108	32.25%	0.00%
AT3-098		5	0.434	0.352	0.516	0.371	0.51	0.0295	0.066	15.21%	-30.02%
Copper Summa	ry										
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
IOSN 2019	RS	5	1.77	1.26	2.28	1.48	2.49	0.185	0.413	23.30%	0.00%
AT3-098		5	2.71	2.29	3.12	2.33	3.23	0.15	0.336	12.42%	-52.71%
Lead Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
IOSN 2019	RS	5	0.349	0.298	0.4	0.319	0.42	0.0183	0.041	11.74%	0.00%
AT3-098		5	0.452	0.382	0.521	0.361	0.506	0.0251	0.0562	12.44%	-29.40%
Mercury Summa	ary										
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
IOSN 2019	RS	5	0.0017	0.00136	0.00204	0.0015	0.002	0.000122	0.000274	16.11%	0.00%
AT3-098		5	0.00208	0.002	0.00216	0.002	0.00215	0.0000291	0.000065	3.13%	-22.12%
Nickel Summary	1										
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
IOSN 2019	RS	5	0.521	0.291	0.75	0.394	0.844	0.0828	0.185	35.55%	0.00%
AT3-098		5	0.57	0.521	0.618	0.519	0.61	0.0175	0.0392	6.87%	-9.45%
Zinc Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
IOSN 2019	RS	5	11.8	8.64	14.9	9.76	15.9	1.12	2.51	21.35%	0.00%
AT3-098		5	12.8	11.4	14.1	11.7	14.3	0.487	1.09	8.53%	-8.75%

## **CETIS Summary Report**

Report Date: Test Code/ID: 19 Aug-23 06:43 (p 3 of 3) TN-23-303MnMet / 11-3134-1920

**Bioaccumulation Evaluation - Metals - Macoma** 

Arsenic Detail							MD5: 7EE39F07D07100E28C7AE8E2EAAEFA0
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
IOSN 2019	RS	2.7	3.55	3.52	4.39	3.28	
AT3-098		2.59	2.83	2.49	2.5	2.31	
Cadmium Detail							MD5: 2151DA575B01797147656629E9B604EA
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
IOSN 2019	RS	0.022	0.03	0.021	0.035	0.037	
AT3-098		0.025	0.03	0.025	0.025	0.028	
Chromium Detail							MD5: 6C665E15D73B8FEF4A2BC28E229F0580
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
IOSN 2019	RS	0.305	0.381	0.252	0.497	0.234	
AT3-098		0.501	0.393	0.51	0.395	0.371	
Copper Detail							MD5: C4B152C21884FD0CC6558BA2092E22D3
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
IOSN 2019	RS	1.48	1.72	1.52	2.49	1.65	
AT3-098		2.33	2.78	3.23	2.65	2.54	
Lead Detail							MD5: 68ED2BA3FF8B3966BB42B7A580898625
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
IOSN 2019	RS	0.319	0.347	0.327	0.42	0.332	
AT3-098		0.506	0.446	0.489	0.361	0.456	
Mercury Detail							MD5: E1F90783EFA78EC21865622AA6184D54
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
IOSN 2019	RS	0.002	0.0015	0.0015	0.002	0.0015	
AT3-098		0.00201	0.00213	0.00209	0.00215	0.002	
Nickel Detail							MD5: FBFBFF68498CBDC1593DDF95B8A7AA5
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
IOSN 2019	RS	0.394	0.499	0.45	0.844	0.416	
AT3-098		0.608	0.563	0.61	0.519	0.549	
Zinc Detail							MD5: 5294BF2F64ACAF262C1DD0EFF03D3C5
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
IOSN 2019	RS	9.76	12.2	10.9	15.9	10	
AT3-098		12	14.3	12.4	13.5	11.7	

STUDY: TN-23-303

CLIENT: Eco-Analysts, Inc.

PROJECT: Yachtsman Marina, Kennebunkport, ME NAE-2004-00319

ASSAY: *M. nasuta* 28-day Bioaccumulation Evaluation TASK: Statistical Analysis of Body Burden Metals

Endpoint	Method	С	<	Т	Statistic	Critical	P Level	Alpha	Reject Null	MSD	DF	Ties	P-Type
Arsenic	Equal Variance t Two-Sample Test	IOSN	<	Comp	-3.310549	1.859548	0.9946553	0.05	FALSE	0.5302483	8		С
Cadmium	Equal Variance t Two-Sample Test	IOSN	<	Comp	-0.6998541	1.859548	0.7480713	0.05	FALSE	0.006376922	8		С
Chromium	Equal Variance t Two-Sample Test	IOSN	<	Comp	1.774371	1.859548	0.05696218	0.05	FALSE	0.10501	8		С
Copper	Equal Variance t Two-Sample Test	IOSN	<	Comp	3.922431	1.859548	0.002201654	0.05	TRUE	0.4427912	8		С
Lead	Equal Variance t Two-Sample Test	IOSN	<	Comp	3.299803	1.859548	0.005431016	0.05	TRUE	0.05781848	8		С
Mercury	Equal Variance t Two-Sample Test	IOSN	<	Comp	2.986949	1.859548	0.008707395	0.05	TRUE	0.000234082	8		С
Nickel	Equal Variance t Two-Sample Test	IOSN	<	Comp	4.604793	1.894579	0.001235069	0.05	TRUE	0.05350728	7		С
Nickel	Wilcoxon Rank Sum Two-Sample Test	IOSN	<	Comp	20		0.07539683	0.05	FALSE		8	0	E
Zinc	Equal Variance t Two-Sample Test	IOSN	<	Comp	0.8405069	1.859548	0.2125153	0.05	FALSE	2.27436	8		С

Report Date: Test Code/ID: 19 Aug-23 06:43 (p 1 of 8) TN-23-303MnMet / 11-3134-1920

Bioaccumulation Evaluation - Metals - Macoma EA-EST. Inc. PBC CETISv2.1.1 Analysis ID: 03-4962-0856 Endpoint: Arsenic **CETIS Version:** Analyzed: Parametric-Two Sample 19 Aug-23 6:42 Analysis: Status Level: **Edit Date:** MD5 Hash: FA1CA36C1E9D61BEE8C73B2C1B8A79B Editor ID: 08 May-23 22:42 Batch ID: 09-1240-8281 Nancy Roka Test Type: Bioaccumulation - Metals Analyst: Start Date: 29 Mar-23 13:46 Protocol: US ACE NED RIM (2004) Diluent: Not Applicable Ending Date: 26 Apr-23 12:46 Species: Macoma nasuta Brine: Not Applicable Test Length: 27d 23h Taxon: Bivalvia Source: ARO - Aquatic Research Or Age: Sample Date Sample Code Sample ID **Receipt Date** Sample Age Client Name Project **IOSN 2019** 13-4648-8170 08 Mar-23 08 Mar-23 21d 14h Eco-Analysts, Inc. Dredged Sediment Evalu AT3-098 07-1559-4974 08 Feb-23 13:00 09 Feb-23 16:30 49d 1h Sample Code **Material Type** Sample Source Station Location Lat/Long **IOSN 2019** Reference sediment Yachtsman Marina NAE-2004-00 **IOSN Reference** AT3-098 Marine Sediment Yachtsman Marina NAE-2004-00 10 Stations at 4 Marinas Mu **Data Transform PMSD** Alt Hyp Comparison Result Untransformed C < T AT3-098 passed arsenic endpoint 15.20% **Equal Variance t Two-Sample Test** Sample I Sample II df Test Stat Critical MSD P-Type P-Value Decision(a:5%) AT3-098 CDF 0.9947 Reference Sed -3.31 1.86 0.53 Non-Significant Effect **Auxiliary Tests** Attribute Test Test Stat Critical P-Value Decision(a:5%) 2.12 2.29 Outlier Grubbs Extreme Value Test 0.1330 No Outliers Detected **ANOVA Table** Source DF **Sum Squares** Mean Square F Stat P-Value Decision(a:5%) Between 11 0.0107 Significant Effect 2.22784 2.22784 1 8 Error 1.6262 0.203275 Total 3.85404 9 ANOVA Assumptions Tests **Attribute** Test Stat Critical P-Value Decision(a:1%) Variance Variance Ratio F Test 10.3 23.2 0.0440 **Equal Variances** 0.906 0.741 0.2549 Normal Distribution Distribution Shapiro-Wilk W Normality Test **Arsenic Summary** Sample Code Count 95% LCL 95% UCL Median Min Max Std Err CV% %Effect Mean **IOSN 2019** RS 5 3.49 2.7 4.39 17.45% 0.00% 2.73 4.24 3.52 0.272 AT3-098 5 2.54 2.31 2.78 2.5 2.31 2.83 0.0847 7.45% 27.06% Arsenic Detail Sample Code Rep 1 Rep 2 Rep 3 Rep 4 Rep 5 IOSN 2019 RS 2.7 4.39 3.28 3.55 3.52 AT3-098 2.59 2.83 2.49 2.5 2.31

Report Date: Test Code/ID: 19 Aug-23 06:43 (p 2 of 8) TN-23-303MnMet / 11-3134-1920

Bioaccumulation Evaluation - Metals - Macoma EA-EST. Inc. PBC 18-5050-5224 CETISv2.1.1 Analysis ID: Endpoint: Cadmium **CETIS Version:** Analyzed: Parametric-Two Sample 19 Aug-23 6:42 Analysis: Status Level: **Edit Date:** MD5 Hash: 2864B7DF258976A1EE19C7F4BEDDBE20 Editor ID: 08 May-23 22:42 Batch ID: 09-1240-8281 Nancy Roka Test Type: Bioaccumulation - Metals Analyst: Start Date: 29 Mar-23 13:46 Protocol: US ACE NED RIM (2004) Diluent: Not Applicable Ending Date: 26 Apr-23 12:46 Species: Macoma nasuta Brine: Not Applicable Test Length: 27d 23h Taxon: Bivalvia Source: ARO - Aquatic Research Or Age: Sample Date Sample Code Sample ID Receipt Date Sample Age Client Name **Project IOSN 2019** 13-4648-8170 08 Mar-23 08 Mar-23 21d 14h Eco-Analysts, Inc. Dredged Sediment Evalu AT3-098 07-1559-4974 08 Feb-23 13:00 09 Feb-23 16:30 49d 1h Sample Code **Material Type** Sample Source Station Location Lat/Long **IOSN 2019** Reference sediment Yachtsman Marina NAE-2004-00 **IOSN Reference** AT3-098 Marine Sediment Yachtsman Marina NAE-2004-00 10 Stations at 4 Marinas Mu **Data Transform PMSD** Alt Hyp Comparison Result Untransformed C < T 21.99% AT3-098 passed cadmium endpoint **Equal Variance t Two-Sample Test** Sample I Sample II df Test Stat Critical **MSD** P-Type P-Value Decision(a:5%) AT3-098 0.00638 0.7481 Reference Sed -0.7 1.86 CDF Non-Significant Effect **Auxiliary Tests** Attribute Test Test Stat Critical P-Value Decision(a:5%) 2.29 Outlier Grubbs Extreme Value Test 1.56 0.9963 No Outliers Detected **ANOVA Table** Source DF **Sum Squares** Mean Square F Stat P-Value Decision(a:5%) Between 0.0000144 0.0000144 0.5039 Non-Significant Effect 1 0.49 0.0000294 8 Error 0.0002352 Total 0.0002496 9 ANOVA Assumptions Tests **Attribute** Test Stat Critical P-Value Decision(a:1%) Variance Variance Ratio F Test 10.1 23.2 0.0458 **Equal Variances** Distribution Shapiro-Wilk W Normality Test 0.957 0.741 0.7475 Normal Distribution **Cadmium Summary** Sample Code Count Mean 95% LCL 95% UCL Median Min Max Std Err CV% %Effect **IOSN 2019** RS 5 0.029 0.0199 0.021 0.037 25.22% 0.00% 0.0381 0.03 0.00327 AT3-098 5 0.0266 0.0237 0.0295 0.025 0.025 0.03 0.00103 8.65% 8.28% Cadmium Detail Sample Code Rep 1 Rep 2 Rep 3 Rep 4 Rep 5 IOSN 2019 RS 0.03 0.022 0.021 0.035 0.037 AT3-098 0.025 0.03 0.025 0.025 0.028

**Report Date:** 19 Aug-23 06:43 (p 3 of 8) **Test Code/ID:** TN-23-303MnMet / 11-3134-1920

		•								Т	est Co	de/ID:		TN-23-30	03MnMet / 1	1-3134-1920
Bioaccumula	tion	Evaluation	- Metal	s - M	acoma										EA-ES	T, Inc. PBC
Analysis ID: Analyzed: Edit Date:	19 /	7081-7384 Aug-23 6:42 May-23 22:4:	2	Anal	point: ysis: Hash:	Para	metric-Two	o Sample D369122AE	9FE410	C4211C0		S Versions Us Level or ID:		CETISv 1	2.1.1	
Batch ID: Start Date: Ending Date: Test Length:	29 M	•			ocol: cies:	US A	ma nasuta	RIM (2004)			Analy Dilue Brine Sour	ent: N	Not Ap	Roka oplicable oplicable Aquatic		or <b>Age:</b>
Sample Code	,	Sample II	)	Sam	ple Da	te	Receipt	Date	Sample	Age	Clien	nt Name		Р	roject	
IOSN 2019 AT3-098		13-4648-8 07-1559-4			lar-23 eb-23 1	3:00	08 Mar- 09 Feb-		21d 14 49d 1h		Eco-/	Analysts	, Inc.	С	redged Sed	iment Evalu
Sample Code	)	Material 1	уре			Sam	ple Source	9		Station	Location	on		Lat/Long	3	
IOSN 2019		Reference	sedim	ent		Yach	tsman Maı	rina NAE-20	004-00	IOSN Re	eferenc	е				
AT3-098		Marine Se	dimen	t		Yach	tsman Maı	rina NAE-20	004-00	10 Statio	ns at 4	1 Marinas	s Mu			
Data Transfor	rm		Alt I	<del>l</del> ур					Comp	arison R	esult					PMSD
Untransformed	d		C < 7	Г					AT3-0	98 passe	d chroi	mium en	dpoin	t		31.46%
Sample I Reference Sec	vs	Sample II AT3-098	Test	df 8	<b>Test 9</b>		Critical 1.86	<b>MSD</b> 0.105	P-Typ CDF	e P-V	<b>alue</b> 570	<b>Decisi</b> Non-Si		<b>5%)</b> ant Effec	ct	
Auxiliary Test Attribute Outlier	ts	<b>Test</b> Grubbs E	xtreme	e Valu	e Test			Test Stat	Critic 2.29	al P-V	<b>'alue</b> 010	<b>Decisi</b> No Out		<b>5%)</b> Detected	ı	
ANOVA Table	,															
Source		Sum Squ	ares		Mean	Squa	re	DF	F Stat	P-V	alue	Decisi	on(α:	5%)		
Between Error Total		0.0251001 0.0637788 0.0888789	3		0.025 0.007			1 8 9	3.15 —	0.1	139	Non-Si	ignific	ant Effec	ot	
ANOVA Assu	mpti	ons Tests														
Attribute		Test						Test Stat	Critic	al P-V	'alue	Decisi	on(α:	1%)		
Variance Distribution		Variance f Shapiro-W			ality Te	st		2.66 0.917	23.2 0.741	0.36		Equal \		nces ribution		
Chromium Su	ımm	ary														
Sample		Code	Cou	nt	Mean		95% LCL	95% UCL	Media	an Min	ı	Max	;	Std Err	CV%	%Effect
IOSN 2019		RS	5		0.334		0.2	0.467	0.305	0.23	34	0.497	(	0.0481	32.25%	0.00%
AT3-098	_		5		0.434		0.352	0.516	0.395	0.3	71	0.51	(	0.0295	15.21%	-30.02%
Chromium De	etail															
Sample		Code	Rep	1	Rep 2	<u>!</u>	Rep 3	Rep 4	Rep 5	i						
IOSN 2019		RS	0.30	5	0.381		0.252	0.497	0.234							
AT3-098			0.50	1	0.393		0.51	0.395	0.371							

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		•								Т	est Co	de/ID:	TN-23-3	303MnMet / 1	1-3134-1920
Bioaccumulat	ion E	valuation -	Metal	ls - M	acoma									EA-ES	T, Inc. PBC
,	19 A	639-8676 .ug-23 6:42 lay-23 22:42	2	Ana	point: ysis: Hash:	Parar	metric-Two	o Sample 5EF9A525F	A03996	B28F54		S Versionus Level: or ID:	n: CETIS 1	v2.1.1	
Batch ID: Start Date: Ending Date: Test Length:	29 N 26 A	•		Prot	ocol: cies:	US A	ma nasuta	RIM (2004)			Analy Dilue Brine Sour	ent: No	ancy Roka ot Applicabl ot Applicabl RO - Aquati		or <b>Age:</b>
Sample Code		Sample ID	)	Sam	ple Da	te	Receipt	Date	Sample	Age	Clien	nt Name		Project	
IOSN 2019 AT3-098		13-4648-8 <sup>-</sup> 07-1559-49	170	08 N	lar-23 eb-23 1		08 Mar-	23	21d 14 49d 1h	h	Eco-/	Analysts,		Dredged Sed	iment Evalu
Sample Code		Material T	уре			Samp	ole Source	Э		Station	Location	on	Lat/Lon	ng	
IOSN 2019		Reference	sedim	ent		Yach	tsman Maı	rina NAE-20	004-00	IOSN Re	eferenc	e			
AT3-098		Marine Sec	dimen	t		Yach	tsman Maı	rina NAE-20	004-00	10 Statio	ons at 4	1 Marinas	Mu		
Data Transfor	n		Alt I	Нур					Comp	arison R	esult				PMSD
Untransformed			C < 7						AT3-0	98 failed	copper	endpoint			24.99%
Sample I Reference Sed	/S	wo-Sample Sample II AT3-098*	Test	df 8	<b>Test 9</b>		Critical 1.86	<b>MSD</b> 0.443	P-Typ CDF	e P-V	<b>/alue</b> 022		n(α:5%) ant Effect		
Auxiliary Tests Attribute Outlier	<b>S</b>	Test Grubbs Ex	xtreme	e Valu	e Test			Test Stat 2.02	Critic 2.29	<b>al P-V</b>	<b>/alue</b> 123		n(α:5%) ers Detecte	ed	
ANOVA Table															
Source		Sum Squa	ares		Mean	Squa	re	DF	F Stat	P-V	/alue	Decisio	n(α:5%)		
Between Error Total		2.18089 1.134 3.31489			2.180 0.141			1 8 9	15.4 —	0.0	044	Significa	ant Effect		
ANOVA Assur	nptic	ns Tests													
Attribute		Test						Test Stat	Critic	al P-V	/alue	Decisio	n(α:1%)		
Variance Distribution		Variance F Shapiro-W			ality Te	st		1.51 0.851	23.2 0.741	0.70	002 604	•	ariances Distribution		
Copper Summ	ary														
Sample		Code	Cou	nt	Mean	9	95% LCL	95% UCL	Media	an Min	1	Max	Std Err	CV%	%Effect
IOSN 2019		RS	5		1.77		1.26	2.28	1.65	1.48		2.49	0.185	23.30%	0.00%
AT3-098			5		2.71		2.29	3.12	2.65	2.3	3	3.23	0.15	12.42%	-52.71%
Copper Detail							_								
Sample		Code	Rep	1	Rep 2	<u>!</u>	Rep 3	Rep 4	Rep 5						
IOSN 2019		RS	1.48		1.72		1.52	2.49	1.65					<u>-</u>	-
AT3-098			2.33		2.78	;	3.23	2.65	2.54						
_			_	_							_			_	

Report Date: 19 Aug-23 06:43 (p 5 of 8)
Test Code/ID: TN-23-303MnMet / 11-3134-1920

										ı	est Co	de/ID:	1 IN-23	5-3U3IVII	iiviet / i	1-3134-1920
Bioaccumula	tion Ev	/aluation -	Metal	s - M	acoma										EA-ES	, Inc. PBC
Analysis ID: Analyzed: Edit Date:	19 Au	39-9040 g-23 6:42 ay-23 22:42	2	Ana	point: lysis: i Hash:	Para	ametric-Two	Sample F30570FE1	342E97F	BBD67	Statu	S Versions Level:		ISv2.1.1		
Batch ID: Start Date: Ending Date: Test Length:	29 Ma 26 Ap			Prot	ocol: cies:	US /	accumulatio ACE NED F oma nasuta Ilvia	RIM (2004)			Anal Dilue Brine Sour	ent: N	lancy Roka lot Applica lot Applica ARO - Aqua	ble ble	earch O	r <b>Age</b> :
Sample Code	,	Sample ID	)	Sam	ple Da	te	Receipt	Date	Sample	Age	Clier	nt Name		Proje	ct	
IOSN 2019 AT3-098		13-4648-8 07-1559-4			lar-23 eb-23 1	3:00	08 Mar- 09 Feb-		21d 14l 49d 1h		Eco-	Analysts,	Inc.	Dredo	jed Sedi	ment Evalu
Sample Code	)	Material T	уре			Sam	ple Sourc	9		Station	Locati	on	Lat/L	ong		
IOSN 2019		Reference	sedim	ent		Yacl	htsman Ma	rina NAE-20	004-00	IOSN Re	eferenc	e				
AT3-098		Marine Se	diment			Yacl	htsman Ma	rina NAE-20	004-00	10 Statio	ns at 4	1 Marinas	s Mu			
Data Transfor	rm		Alt H	lур					Comp	arison R	esult					PMSD
Untransformed	b		C < T	•					AT3-0	98 failed	lead er	ndpoint				16.57%
<del></del>	vs S	Sample II	Test		Test S	Stat	Critical	MSD	Р-Тур		'alue		on(α:5%)			
Reference Sec	d A	AT3-098*		8	3.3		1.86	0.0578	CDF	0.0	054	Signific	ant Effect			
Auxiliary Test Attribute Outlier	ts	Test Grubbs E	vtromo	Valu	uo Tost			Test Stat	Critica 2.29		<b>'alue</b> 825		on(α:5%) liers Detec	etod.		
Outilei		Grubbs L.	Alleine	vaic	C 1631			1.90	2.23	0.2	525	No Out	ilers Detec	ieu		
ANOVA Table						_					_					
Source		Sum Squa			Mean	_	are	DF	F Stat		alue		on(α:5%)			
Between Error Total		0.0263169 0.0193352 0.0456521	!		0.026			1 8 9	10.9 —	0.0	109	Signific	ant Effect			
ANOVA Assu	•	is rests Test						Test Stat	Critics	al D.V	'alue	Decisi	on(α:1%)			
Variance		Variance F	Ratio F	Test				1.88	23.2		565		/ariances			
Distribution		Shapiro-W			ality Te	st		0.956	0.741		435		Distributio	n		
Lead Summa	ry															
Sample		Code	Cour	nt	Mean		95% LCL	95% UCL	Media	ın Mir	1	Max	Std E	rr C	V%	%Effect
IOSN 2019		RS	5		0.349		0.298	0.4	0.332	0.3	19	0.42	0.018	3 1	1.74%	0.00%
AT3-098			5	_	0.452	_	0.382	0.521	0.456	0.3	61	0.506	0.025	1 1	2.44%	-29.40%
Lead Detail																
Sample		Code	Rep '	1	Rep 2	!	Rep 3	Rep 4	Rep 5							
IOSN 2019		RS	0.319	)	0.347		0.327	0.42	0.332							
AT3-098			0.506	6	0.446		0.489	0.361	0.456							

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Test Code/ID: TN-23-303MnMet / 11-3134-1920

	EA-EST	, Inc. PBC
TISv2.1.1		
ka able able uatic Rese	earch Or	Age:
Projec	et	
Dredg	ed Sedir	ment Evalu
Long		
		PMSD
		13.77%
t		
·L		
ected		
ected	V%	%Effect
ected  et  ion  Err C	<b>V%</b> 6.11%	%Effect 0.00%
ected  et  ion  Err C	6.11%	
ected  ct  cion  Err CV 0122 16	6.11%	0.00%
ected  ct  cion  Err CV 0122 16	6.11%	0.00%
ected  ct  cion  Err CV 0122 16	6.11%	0.00%
	able able uatic Rese Project Dredg	able able uatic Research Or Project Dredged Sedir

**Report Date:** 19 Aug-23 06:43 (p 7 of 8) **Test Code/ID:** TN-23-303MnMet / 11-3134-1920

							Test	Code/ID:	TN-23-30	3MnMet / 1	1-3134-1920
Bioaccumulat	tion Evaluation	- Metals -	Macoma							EA-ES	Γ, Inc. PBC
Analysis ID: Analyzed: Edit Date:	11-4066-2552 19 Aug-23 6:42 08 May-23 22:4	2 A	ndpoint: nalysis: ID5 Hash:	Nickel Parametric-Two DD1542AADF0	•	54A4604A0	St	TIS Version atus Level: itor ID:	n: CETISv: 1	2.1.1	
Batch ID: Start Date: Ending Date: Test Length:	09-1240-8281 29 Mar-23 13:4 26 Apr-23 12:4 27d 23h	6 <b>P</b>	est Type: rotocol: pecies: axon:	Bioaccumulatic US ACE NED F Macoma nasut Bivalvia	RIM (2004)		Di Br	uent: No	ancy Roka ot Applicable ot Applicable RO - Aquatic	Research C	or <b>Age:</b>
Sample Code	Sample I	D S	ample Dat	e Receip	t Date	Sample Ag	ge Cli	ent Name	P	roject	
IOSN 2019 AT3-098	13-4648- 07-1559-	8170 08	8 Mar-23 8 Feb-23 1	08 Mar- 3:00 09 Feb-	-23 -23 16:30	21d 14h 49d 1h		o-Analysts,	nc. D	redged Sed	iment Evalu
Sample Code	Material	Туре		Sample Sourc	е	St	ation Loc	ation	Lat/Long	l	
IOSN 2019 AT3-098	Referenc Marine S	e sedimen ediment	t	Yachtsman Ma Yachtsman Ma			SN Refere		Mu		
Data Transfor	m	Alt Hyp	)			Compari	son Resu	t			PMSD
Untransformed	i	C < T				AT3-098	failed nick	el endpoint			12.17%
Equal Variand	e t Two-Sampl	e Test									
Sample I	vs Sample II		df Test S	tat Critical	MSD	P-Type	P-Value	Decisio	n(α:5%)		
Reference Sec	d AT3-098*		7 4.6	1.89	0.0535	CDF	0.0012	Significa	int Effect		
ANOVA Table											
Source	Sum Squ	uares	Mean	Square	DF	F Stat	P-Value		n(α:5%)		
Between	0.037584		0.037		1	21.2	0.0025	Significa	nt Effect		
Error	0.012407		0.0017	7725	7	_					
Total	0.049992				8						
	mptions Tests				Toot Stat	Critical	D Volum	Daninia	m/m:49/)		
Attribute Variance	Test	Ratio F Te			Test Stat	24.3	<b>P-Value</b> 0.7479		ariances		
Distribution			rmality Tes	st	0.938	0.701	0.7479	•	Distribution		
Nickel Summa	ary										%Effect
	ary Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	/0L116Ct
	-	Count 4	<b>Mean</b> 0.44	<b>95% LCL</b> 0.367	<b>95% UCL</b> 0.513	Median 0.416	<b>Min</b> 0.394	<b>Max</b> 0.499	<b>Std Err</b> 0.0229	10.40%	0.00%
Sample IOSN 2019	Code										
	Code	4	0.44	0.367	0.513	0.416	0.394	0.499	0.0229	10.40%	0.00%
<b>Sample</b> IOSN 2019 AT3-098	Code	4	0.44	0.367 0.521	0.513	0.416	0.394	0.499	0.0229	10.40%	0.00%
Sample IOSN 2019 AT3-098  Nickel Detail	Code RS	4 5	0.44 0.57	0.367 0.521	0.513 0.618	0.416 0.563	0.394	0.499	0.0229	10.40%	0.00%

Report Date: Test Code/ID: 19 Aug-23 06:43 (p 8 of 8) TN-23-303MnMet / 11-3134-1920

Bioaccumulation Evaluation - Metals - Macoma EA-EST. Inc. PBC CETISv2.1.1 Analysis ID: 02-9970-4423 Endpoint: Zinc **CETIS Version:** 19 Aug-23 6:42 Analyzed: Parametric-Two Sample Analysis: Status Level: **Edit Date:** MD5 Hash: DAE55172D5F58B259B6FDFE024ABC7D **Editor ID:** 08 May-23 22:42 Batch ID: 09-1240-8281 Nancy Roka Test Type: Bioaccumulation - Metals Analyst: Start Date: 29 Mar-23 13:46 Protocol: US ACE NED RIM (2004) Diluent: Not Applicable Ending Date: 26 Apr-23 12:46 Species: Macoma nasuta Brine: Not Applicable Test Length: 27d 23h Taxon: Bivalvia Source: ARO - Aquatic Research Or Age: Sample Date Sample Code Sample ID **Receipt Date** Sample Age Client Name Project **IOSN 2019** 13-4648-8170 08 Mar-23 08 Mar-23 21d 14h Eco-Analysts, Inc. Dredged Sediment Evalu AT3-098 07-1559-4974 08 Feb-23 13:00 09 Feb-23 16:30 49d 1h Sample Code **Material Type** Sample Source Station Location Lat/Long **IOSN 2019** Reference sediment Yachtsman Marina NAE-2004-00 **IOSN Reference** Marine Sediment AT3-098 Yachtsman Marina NAE-2004-00 10 Stations at 4 Marinas Mu **Data Transform PMSD** Alt Hyp Comparison Result Untransformed C < T AT3-098 passed zinc endpoint 19.35% **Equal Variance t Two-Sample Test** Sample I Sample II df Test Stat Critical MSD P-Type P-Value Decision(a:5%) AT3-098 0.841 1.86 CDF 0.2125 Reference Sed 2.27 Non-Significant Effect **Auxiliary Tests** Attribute Test Test Stat Critical P-Value Decision(a:5%) 2.28 2.29 0.0552 Outlier Grubbs Extreme Value Test No Outliers Detected **ANOVA Table** Source DF P-Value **Sum Squares** Mean Square F Stat Decision(a:5%) Between 2.64196 0.4250 Non-Significant Effect 2.64196 1 0.706 8 Error 29.9181 3.73976 Total 32.56 9 ANOVA Assumptions Tests **Attribute** Test Stat Critical P-Value Decision(a:1%) Variance Variance Ratio F Test 5.3 23.2 0.1351 **Equal Variances** 0.89 0.1701 Normal Distribution Distribution Shapiro-Wilk W Normality Test 0.741 **Zinc Summary** Sample Code Count Mean 95% LCL 95% UCL Median Min Max Std Err CV% %Effect **IOSN 2019** RS 5 11.8 14.9 9.76 15.9 0.00% 8.64 10.9 1.12 21.35% AT3-098 5 12.8 11.4 14.1 12.4 11.7 14.3 0.487 8.53% -8.75% Zinc Detail Sample Code Rep 1 Rep 2 Rep 3 Rep 4 Rep 5 IOSN 2019 RS 9.76 12.2 10.9 15.9 10 AT3-098 12 14.3 12.4 13.5 11.7

# **ATTACHMENT IX**

Macoma nasuta 28-Day Solid Phase Bioaccumulation Testing Tissue Chemistry and Body Burden Statistical Analyses

**PAHs** 

(27 pages)

#### Yachtsman Marina NAE-2004-00319

### APPENDIX A. CONCENTRATIONS OF COCs IN THE CLAM (M. nasuta)

			<b>Pre-Assay</b>		
CONTAMINANT	REP1	REP2	REP3	REP4 *	REP5 *
PAHs (ng/g wet weight)					
Acenaphthene	0.610 <mark>U</mark>	0.620 U	1.98 J		
Acenaphthylene	0.376 <mark>U</mark>	0.382 <mark>U</mark>	0.376 <mark>U</mark>		
Anthracene	0.408 <mark>U</mark>	0.922 J	1.23 J		
Benzo(a)anthracene	0.765 <mark>U</mark>	1.57 <mark>J</mark>	1.61 <mark>J</mark>		
Benzo(a)pyrene	0.800 <mark>U</mark>	0.815 <mark>U</mark>	0.800 U		
Benzo(b)fluoranthene	1.06 <mark>U</mark>	1.08 <mark>U</mark>	1.06 <mark>U</mark>		
Benzo(k)fluoranthene	0.487 <mark>U</mark>	0.495 <mark>U</mark>	0.487 <mark>U</mark>		
Benzo(g,h,i)perylene	0.341 <mark>U</mark>	0.346 <mark>U</mark>	0.341 <mark>U</mark>		
Chrysene	2.25 J	1.82 J	1.96 J		
Dibenzo(a,h)anthracene	0.395 <mark>U</mark>	0.401 <mark>U</mark>	0.883 J		
Fluoranthene	2.40 J	2.50 J	2.81 J		
Fluorene	1.82 <mark>J</mark>	2.38 J	2.14 J		
Indeno(1,2,3-c,d)pyrene	0.800 <b>U</b>	0.810 <mark>U</mark>	0.800 <b>U</b>		
Naphthalene	4.11 J	3.64 J	3.59 J		
Phenanthrene	3.64 J	4.23 J	4.40 J		
Pyrene	2.82 J	2.99 J	2.77 J		
PAH Total	23.1	25.0	27.2		

<sup>\* =</sup> Qualifiers

U Analyte not detected; below Method Detection Limit; value is one-half the Method Detection Limit

J Analyte estimated; detection below Reporting Limit but above Method Detection Limit

NA Not Analyzed

#### Yachtsman Marina NAE-2004-00319

### APPENDIX A. CONCENTRATIONS OF COCs IN THE CLAM (M. nasuta)

		10	OSN Reference		
CONTAMINANT	REP1	REP2	REP3	REP4	REP5
PAHs (ng/g wet weight)					
Acenaphthene	0.450 <mark>U</mark>	0.462 <mark>U</mark>	0.443 <mark>U</mark>	0.473 U	0.440 U
Acenaphthylene	0.277 <mark>U</mark>	0.284 U	0.272 <mark>U</mark>	0.291 U	0.271 U
Anthracene	0.300 U	0.308 <mark>U</mark>	0.295 <mark>U</mark>	0.315 U	0.294 U
Benzo(a)anthracene	0.560 U	0.575 U	0.550 U	0.590 U	0.550 <mark>U</mark>
Benzo(a)pyrene	0.590 U	0.605 U	0.580 <mark>U</mark>	0.620 U	0.575 U
Benzo(b)fluoranthene	0.780 <mark>U</mark>	0.800 U	0.765 <mark>U</mark>	0.820 U	0.765 <mark>U</mark>
Benzo(k)fluoranthene	0.359 <mark>U</mark>	0.368 U	0.353 <mark>U</mark>	0.844 J	0.351 <mark>U</mark>
Benzo(g,h,i)perylene	0.527 J	0.536 J	0.614 J	0.670 J	0.245 <mark>U</mark>
Chrysene	0.545 <mark>U</mark>	0.560 U	0.535 <mark>U</mark>	0.575 U	0.535 <mark>U</mark>
Dibenzo(a,h)anthracene	2.95 J	3.00 J	2.91 J	3.11 J	2.86 J
Fluoranthene	2.09 J	2.23 J	2.41 J	2.48 J	1.38 <mark>J</mark>
Fluorene	0.251 <mark>U</mark>	0.258 U	0.247 <mark>U</mark>	0.263 U	0.245 <mark>U</mark>
Indeno(1,2,3-c,d)pyrene	3.35 <mark>J</mark>	3.57 J	3.46 J	3.93 <mark>J</mark>	3.40 J
Naphthalene	0.387 <mark>U</mark>	0.397 <b>U</b>	0.380 <mark>U</mark>	0.406 U	0.378 <mark>U</mark>
Phenanthrene	1.73 <b>J</b>	2.30 J	2.31 J	2.23 J	1.30 J
Pyrene	1.50 J	1.62 J	1.69 J	1.90 J	1.45 <mark>J</mark>
PAH Total	16.6	17.9	17.8	19.5	15.0

<sup>\* =</sup> Qualifiers

U Analyte not detected; belogJ Analyte estimated; detection

NA Not Analyzed

#### Yachtsman Marina NAE-2004-00319

#### APPENDIX A. CONCENTRATIONS OF COCs IN THE CLAM (M. nasuta)

#### 10 Stations at 4 Marinas Mud

		20 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	ono at iniainia		
CONTAMINANT	REP1	REP2	REP3	REP4	REP5
PAHs (ng/g wet weight)					
Acenaphthene	0.605 <mark>U</mark>	0.620 <mark>U</mark>	2.99 J	2.93 <mark>J</mark>	0.630 U
Acenaphthylene	0.372 <mark>U</mark>	0.382 <mark>U</mark>	0.384 <mark>U</mark>	0.380 <mark>U</mark>	0.389 <mark>U</mark>
Anthracene	2.36 J	2.61 J	3.40 J	3.39 J	1.69 J
Benzo(a)anthracene	6.45	4.37 J	5.43 J	5.14 J	5.60 J
Benzo(a)pyrene	2.42 J	0.815 <mark>U</mark>	1.64 J	1.71 <b>J</b>	2.10 J
Benzo(b)fluoranthene	5.53 <mark>J</mark>	3.32 J	4.04 J	3.64 J	5.52 J
Benzo(k)fluoranthene	2.14 J	0.496 <mark>U</mark>	1.08 J	1.04 J	1.48 <mark>J</mark>
Benzo(g,h,i)perylene	1.66 <mark>J</mark>	0.347 <mark>U</mark>	0.348 <mark>U</mark>	0.345 <mark>U</mark>	1.40 J
Chrysene	4.22 J	2.49 J	2.36 J	3.09 J	2.42 J
Dibenzo(a,h)anthracene	0.390 <mark>U</mark>	0.402 <mark>U</mark>	0.403 U	0.399 <mark>U</mark>	0.409 U
Fluoranthene	26.1	19.6	35.9	36.8	14.8
Fluorene	0.935 J	1.27 J	2.60 J	3.00 J	0.882 J
Indeno(1,2,3-c,d)pyrene	0.790 <mark>U</mark>	0.810 <mark>U</mark>	0.815 <mark>U</mark>	0.810 U	1.70 J
Naphthalene	2.00 J	1.66 J	1.91 <mark>J</mark>	1.81 J	1.45 J
Phenanthrene	4.86 J	4.73 J	10.7	10.1	4.23 J
Pyrene	23.4	13.0	23.0	22.5	22.0
PAH Total	84.2	56.9	97.0	97.1	66.7

<sup>\* =</sup> Qualifiers

U Analyte not detected; belogJ Analyte estimated; detection

NA Not Analyzed

#### **CETIS Test Data Worksheet**

Report Date:

19 Aug-23 06:44 (p 1 of 1)

Test Code/ID: TN-23-303MnPAH / 13-3685-4237

**Bioaccumulation Evaluation - PAHs - Macoma** 

EA-EST, Inc. PBC

Start Date: End Date: 26 Apr-23 12:47

29 Mar-23 13:47 Protocol: US ACE NED RIM (2004)

Species: Macoma nasuta

Sample Code: AT3-191

Sample Source: Yachtsman Marina NAE-2004-00319

Sample Date: 20 Mar-23 Material: Laboratory Control Sediment Sample Station: Laboratory Control

Sample Date: 20 N	iai-23		Wate	eriai: La	boratory	Control S	eaiment		Sam	pie Statio	n: Labo	oratory Co	TILIOI							
Sample	Rep	Pos	Acenaphthene	Acenaphthylene	Anthracene	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(g,h,l)perylene	Benzo(k)fluoranthene	Chrysene	Dibenz(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-cd)pyrene	Naphthalene	Phenanthrene	Pyrene	1,4-Dichlorobenze	Total PAHs
IOSN 2019	1	2	0.45	0.2765	0.3	0.56	0.59	0.78	0.527	0.359	0.545	2.95	2.09	0.251	3.35	0.387	1.73	1.5		
IOSN 2019	2	3	0.462	0.284	0.308	0.575	0.605	8.0	0.536	0.368	0.56	3	2.23	0.2575	3.57	0.397	2.3	1.62		
IOSN 2019	3	5	0.4425	0.272	0.295	0.55	0.58	0.765	0.614	0.3525	0.535	2.91	2.41	0.2465	3.46	0.38	2.31	1.69		
IOSN 2019	4	7	0.4725	0.2905	0.315	0.59	0.62	0.82	0.67	0.844	0.575	3.11	2.48	0.263	3.93	0.406	2.23	1.9		
IOSN 2019	5	9	0.44	0.2705	0.2935	0.55	0.575	0.765	0.245	0.3505	0.535	2.86	1.38	0.245	3.4	0.378	1.3	1.45		
AT3-098	1	1	0.605	0.3715	2.36	6.45	2.42	5.53	1.66	2.14	4.22	0.39	26.1	0.935	0.79	2	4.86	23.4		
AT3-098	2	4	0.62	0.382	2.61	4.37	0.815	3.32	0.3465	0.4955	2.49	0.4015	19.6	1.27	0.81	1.66	4.73	13		
AT3-098	3	6	2.99	0.384	3.4	5.43	1.64	4.04	0.348	1.08	2.36	0.403	35.9	2.6	0.815	1.91	10.7	23		
AT3-098	4	8	2.93	0.3795	3.39	5.14	1.71	3.64	0.3445	1.04	3.09	0.399	36.8	3	0.81	1.81	10.1	22.5		
AT3-098	5	10	0.63	0.389	1.69	5.6	2.1	5.52	1.4	1.48	2.42	0.4085	14.8	0.882	1.7	1.45	4.23	22		

**Report Date:** 19 Aug-23 06:45 (p 1 of 5) **Test Code/ID:** TN-23-303MnPAH / 13-3685-4237

#### **Bioaccumulation Evaluation - PAHs - Macoma**

Dioaccumulat	IOII EVAIUALIOII - PANS	s - Iviacoilla							EA-E31, III	C. PBC
Batch ID: Start Date: Ending Date: Test Length:	07-2064-6975 29 Mar-23 13:47 26 Apr-23 12:47 27d 23h	Test Type: Protocol: Species: Taxon:		nulation - PAHs NED RIM (2004) nasuta	1		Analy Dilue Brine Source	nt: Not Appli	icable	e:
Sample ID: Sample Date: Receipt Date: Sample Age:	20 Mar-23 16:00	Code: Material: CAS (PC): Client:		ry Control Sedim	ent		Proje Soure Static	ce: Yachtsm	Sediment Evaluation an Marina NAE-2004-0 ry Control	00319 (
Sample Code	Sample ID	Sample Da	te R	Receipt Date	Sample	e Age	Clien	t Name	Project	
IOSN 2019 AT3-098	13-4648-8170 07-1559-4974	08 Mar-23 08 Feb-23 1	-	8 Mar-23 9 Feb-23 16:30	21d 14 49d 1h		Eco-A	analysts, Inc.	Dredged Sedimer	nt Evalu
Sample Code	Material Type		Sample	Source		Station	Locatio	on Lat	t/Long	
IOSN 2019 AT3-098	Reference sedim Marine Sedimen			an Marina NAE-2 an Marina NAE-2		IOSN Re		e Marinas Mu		
Single Compa	arison Summary									
Analysis ID	Endpoint	Comp	oarison M	ethod		P-V	'alue	Comparison I	Result	s
07-7538-5618	Acenaphthene	Unequ	ual Varian	ce t Two-Sample	Test	0.0	636	AT3-098 passe	ed acenaphthene	1
11-6416-3760	Acenaphthylene	Equal	Variance	t Two-Sample T	est	<1.0	0E-05	AT3-098 failed	acenaphthylene	1
05-9439-4057	Anthracene	Unequ	ual Varian	ce t Two-Sample	Test	0.00	009	AT3-098 failed	anthracene	1
14-6989-9668	Benzo(a)anthracene	Unequ	ual Varian	ce t Two-Sample	Test	6.9	E-05	AT3-098 failed	benzo(a)anthracene	1

_					
Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	s
07-7538-5618	Acenaphthene	Unequal Variance t Two-Sample Test	0.0636	AT3-098 passed acenaphthene	1
11-6416-3760	Acenaphthylene	Equal Variance t Two-Sample Test	<1.0E-05	AT3-098 failed acenaphthylene	1
05-9439-4057	Anthracene	Unequal Variance t Two-Sample Test	0.0009	AT3-098 failed anthracene	1
14-6989-9668	Benzo(a)anthracene	Unequal Variance t Two-Sample Test	6.9E-05	AT3-098 failed benzo(a)anthracene	1
01-9784-4906	Benzo(a)pyrene	Unequal Variance t Two-Sample Test	0.0067	AT3-098 failed benzo(a)pyrene	1
15-8115-7379	Benzo(b)fluoranthene	Unequal Variance t Two-Sample Test	0.0008	AT3-098 failed benzo(b)fluoranthene	1
11-2901-4695	Benzo(g,h,i)perylene	Equal Variance t Two-Sample Test	0.1736	AT3-098 passed benzo(g,h,i)perylene	1
18-6572-8367	Benzo(k)fluoranthene	Equal Variance t Two-Sample Test	0.0128	AT3-098 failed benzo(k)fluoranthene	1
19-9439-8456	Chrysene	Unequal Variance t Two-Sample Test	0.0006	AT3-098 failed chrysene	1
10-9778-7549	Chrysene	Wilcoxon Rank Sum Two-Sample Test	0.0040	AT3-098 failed chrysene	1
04-5124-3396	Dibenz(a,h)anthracene	Unequal Variance t Two-Sample Test	1.0000	AT3-098 passed dibenz(a,h)anthracene	1
05-6250-1207	Fluoranthene	Unequal Variance t Two-Sample Test	0.0025	AT3-098 failed fluoranthene	1
14-9364-0252	Fluorene	Unequal Variance t Two-Sample Test	0.0143	AT3-098 failed fluorene	1
09-5016-7764	Indeno(1,2,3-cd)pyrene	Unequal Variance t Two-Sample Test	1.0000	AT3-098 passed indeno(1,2,3-cd)pyrene	1
07-5576-6393	Indeno(1,2,3-cd)pyrene	Wilcoxon Rank Sum Two-Sample Test	1.0000	AT3-098 passed indeno(1,2,3-cd)pyrene	1
12-2133-3190	Naphthalene	Unequal Variance t Two-Sample Test	7.2E-05	AT3-098 failed naphthalene	1
04-1490-0844	Phenanthrene	Unequal Variance t Two-Sample Test	0.0132	AT3-098 failed phenanthrene	1
04-1423-2436	Pyrene	Equal Variance t Two-Sample Test	<1.0E-05	AT3-098 failed pyrene	1
02-1982-1065	Pyrene	Wilcoxon Rank Sum Two-Sample Test	0.0040	AT3-098 failed pyrene	1

### **CETIS Summary Report**

Report Date: Test Code/ID: 19 Aug-23 06:45 (p 2 of 5) TN-23-303MnPAH / 13-3685-4237

**Bioaccumulation Evaluation - PAHs - Macoma** 

Sample	Code	Count	Mean	95%   01	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
•											
IOSN 2019 AT3-098	RS	5 5	0.453 1.56	0.436 -0.0378	0.47 3.15	0.44 0.605	0.472 2.99	0.00612 0.574	0.0137 1.28	3.02% 82.49%	0.00% -242.969
Acenaphthylene	Summary		1.00	0.0070	0.10	0.000	2.00	0.074	1.20	02.4070	242.007
	Code	Count	Moan	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
Sample IOSN 2019			Mean								
AT3-098	RS	5 5	0.279 0.381	0.268 0.373	0.289 0.389	0.271 0.371	0.29 0.389	0.00377 0.00288	0.00843 0.00645	3.02% 1.69%	0.00% -36.78%
Anthracene Sur	mmon.		0.361	0.373	0.309	0.57 1	0.369	0.00288	0.00043	1.0970	-30.7070
	•	0	Maan	95% LCL	050/ 1101	Min	Mari	O4-1 F	Ctd Dav	C) /0/	0/ <b>Ess</b> -4
Sample	Code	Count	Mean			Min	Max	Std Err	Std Dev	CV%	%Effect
IOSN 2019	RS	5	0.302	0.291	0.314	0.294	0.315	0.00406	0.00908	3.00%	0.00%
AT3-098		5	2.69	1.79	3.59	1.69	3.4	0.325	0.726	27.00%	-789.84%
Benzo(a)anthra		-									
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
IOSN 2019	RS	5	0.565	0.543	0.587	0.55	0.59	0.00775	0.0173	3.07%	0.00%
AT3-098		5	5.4	4.46	6.33	4.37	6.45	0.337	0.754	13.96%	-855.409
Benzo(a)pyrene	Summary										
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
IOSN 2019	RS	5	0.594	0.571	0.617	0.575	0.62	0.00828	0.0185	3.12%	0.00%
AT3-098		5	1.74	0.987	2.49	0.815	2.42	0.27	0.604	34.76%	-192.42%
Benzo(b)fluora	nthene Sumr	mary									
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
IOSN 2019	RS	5	0.786	0.756	0.816	0.765	0.82	0.0107	0.0238	3.03%	0.00%
AT3-098		5	4.41	3.11	5.71	3.32	5.53	0.469	1.05	23.79%	-461.07%
Benzo(g,h,i)per	ylene Summ	ary									
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
IOSN 2019	RS	5	0.518	0.315	0.722	0.245	0.67	0.0732	0.164	31.59%	0.00%
AT3-098		5	0.82	0.00675	1.63	0.345	1.66	0.293	0.655	79.87%	-58.14%
Benzo(k)fluorar	nthene Sumr	narv									
Sample	Code	Count	Mean	95% I CI	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
•										47.86%	
IOSN 2019 AT3-098	RS	5	0.455	0.185	0.725	0.35	0.844	0.0973	0.218		0.00%
		5	1.25	0.49	2	0.495	2.14	0.273	0.61	48.89%	-174.219
Chrysene Sumr	-										
Sample	Code	Count	Mean		95% UCL		Max	Std Err	Std Dev	CV%	%Effect
IOSN 2019	RS	5	0.55	0.528	0.572	0.535	0.575	0.00775	0.0173	3.15%	0.00%
AT3-098		5	2.92	1.94	3.89	2.36	4.22	0.351	0.785	26.93%	-430.18%
Dibenz(a,h)anth	racene Sum	mary									
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
IOSN 2019	RS	5	2.97	2.85	3.08	2.86	3.11	0.0427	0.0956	3.22%	0.00%
AT3-098		5	0.4	0.392	0.409	0.39	0.408	0.00303	0.00678	1.69%	86.50%
Fluoranthene S	ummary										
	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
Sample	RS	5	2.12	1.57	2.66	1.38	2.48	0.197	0.44	20.77%	0.00%
Sample IOSN 2019	KS.				38.7	14.8	36.8	4.35	9.73		

### **CETIS Summary Report**

Report Date: Test Code/ID: 19 Aug-23 06:45 (p 3 of 5) TN-23-303MnPAH / 13-3685-4237

Bioaccumulation Evaluation - PAHs - Macoma

Fluorene Sumr	nary										
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
IOSN 2019	RS	5	0.253	0.243	0.262	0.245	0.263	0.00339	0.00758	3.00%	0.00%
AT3-098		5	1.74	0.506	2.97	0.882	3	0.443	0.991	57.07%	-587.81%
Indeno(1,2,3-co	d)pyrene Sum	nmary									
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
IOSN 2019	RS	5	3.54	3.25	3.83	3.35	3.93	0.104	0.232	6.55%	0.00%
AT3-098		5	0.985	0.489	1.48	0.79	1.7	0.179	0.4	40.59%	72.19%
Naphthalene S	ummary										
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
IOSN 2019	RS	5	0.39	0.375	0.404	0.378	0.406	0.00528	0.0118	3.03%	0.00%
AT3-098		5	1.77	1.5	2.04	1.45	2	0.0971	0.217	12.29%	-353.29%
Phenanthrene	Summary										
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
IOSN 2019	RS	5	1.97	1.42	2.53	1.3	2.31	0.2	0.447	22.63%	0.00%
AT3-098		5	6.92	2.96	10.9	4.23	10.7	1.43	3.19	46.06%	-250.76%
Pyrene Summa	ıry										
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
IOSN 2019	RS	5	1.63	1.41	1.85	1.45	1.9	0.0793	0.177	10.87%	0.00%
AT3-098		5	20.8	15.3	26.2	13	23.4	1.96	4.38	21.08%	-1173.28

Report Date: Test Code/ID: 19 Aug-23 06:45 (p 4 of 5) TN-23-303MnPAH / 13-3685-4237

#### Bioaccumulation Evaluation - PAHs - Macoma

							EA-EST, Inc. PBC
Acenaphthene D	etail						MD5: E5B5D58470B8911B03E3A444CD72A835
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
IOSN 2019	RS	0.45	0.462	0.442	0.472	0.44	
AT3-098		0.605	0.62	2.99	2.93	0.63	
Acenaphthylene	Detail						MD5: B126413E64AFB02AA98C384725F0DFA2
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
IOSN 2019	RS	0.276	0.284	0.272	0.29	0.271	
AT3-098		0.371	0.382	0.384	0.38	0.389	
Anthracene Deta	nil						MD5: 60426D23768D2C28728EDBAC9882B215
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
IOSN 2019	RS	0.3	0.308	0.295	0.315	0.294	
AT3-098		2.36	2.61	3.4	3.39	1.69	
Benzo(a)anthrac	ene Detail						MD5: 1951C02D07B040E6EE2D0CF93503F4CB
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
IOSN 2019	RS	0.56	0.575	0.55	0.59	0.55	
AT3-098		6.45	4.37	5.43	5.14	5.6	
Benzo(a)pyrene	Detail						MD5: 2581DF2E71E7F8C3E6B9B596CC98B34D
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
IOSN 2019	RS	0.59	0.605	0.58	0.62	0.575	
AT3-098	NO	2.42	0.815	1.64	1.71	2.1	
	41 <b>D</b> -4-1						NDE: 4044027E4EB000000BEDE00E04B0E04
Benzo(b)fluoran					_		MD5: 184AC37F45B688263B5D502E21B35F91
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
IOSN 2019	RS	0.78	8.0	0.765	0.82	0.765	
AT3-098		5.53	3.32	4.04	3.64	5.52	
Benzo(g,h,i)pery	lene Detail						MD5: C795931A73D2727BC941E8445CFD11FB
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
IOSN 2019	RS	0.527	0.536	0.614	0.67	0.245	
AT3-098		1.66	0.347	0.348	0.345	1.4	
Benzo(k)fluorant	thene Detail	I					MD5: EA1BCC3872760ADB5077234B1A27DAD9
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
IOSN 2019	RS	0.359	0.368	0.352	0.844	0.35	
AT3-098		2.14	0.495	1.08	1.04	1.48	
Chrysene Detail							MD5: 51ACA5FD98A49CB3999C452E5009FD95
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
IOSN 2019	RS	0.545	0.56	0.535	0.575	0.535	
AT3-098		4.22	2.49	2.36	3.09	2.42	
Dibenz(a,h)anthr	acene Deta	il					MD5: FD1BF8DB86033846450D484A5E121790
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
IOSN 2019	RS	2.95	3	2.91	3.11	2.86	
AT3-098		0.39	0.401	0.403	0.399	0.408	
Fluoranthene De	etail						MD5: 02FE249E2ED2D91DEAEAA82D9706D753
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
IOSN 2019	RS	2.09	2.23	2.41	2.48	1.38	
AT3-098		26.1	19.6	35.9	36.8	14.8	

#### **CETIS Summary Report**

Report Date:

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**Test Code/ID:** TN-23-303MnPAH / 13-3685-4237

Rinaccumulation Evaluation - PA	Alla Massama

Fluorene Detail							MD5: ADB7E3D32CDAFFED1BF3E0C1F4B318D
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
IOSN 2019	RS	0.251	0.257	0.247	0.263	0.245	
AT3-098		0.935	1.27	2.6	3	0.882	
Indeno(1,2,3-cd)	)pyrene Deta	ail					MD5: 04EF0FDA4072F35B041FA8C366C6C059
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
IOSN 2019	RS	3.35	3.57	3.46	3.93	3.4	
AT3-098		0.79	0.81	0.815	0.81	1.7	
Naphthalene De	tail						MD5: A25DF7EFF98F86EA33A59A892C25ED5E
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
IOSN 2019	RS	0.387	0.397	0.38	0.406	0.378	
AT3-098		2	1.66	1.91	1.81	1.45	
Phenanthrene D	etail						MD5: C9F4DC5579DCB046DD6F1DF1A33B7C36
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
IOSN 2019	RS	1.73	2.3	2.31	2.23	1.3	
AT3-098		4.86	4.73	10.7	10.1	4.23	
Pyrene Detail							MD5: E41EFCCD8E706B9E9AABDEC3CCEBC5A
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
IOSN 2019	RS	1.5	1.62	1.69	1.9	1.45	
AT3-098		23.4	13	23	22.5	22	

STUDY: TN-23-303

CLIENT: Eco-Analysts, Inc.

PROJECT: Yachtsman Marina, Kennebunkport, ME NAE-2004-00319

ASSAY: *M. nasuta* 28-day Bioaccumulation Evaluation TASK: Statistical Analysis of Body Burden PAHs

Endpoint	Method	С	<	Т	Statistic	Critical	P Level	Alpha	Reject Null	MSD	DF	Ties	P-Type
Acenaphthene	Unequal Variance t Two-Sample Test	IOSN	<	Comp	1.920121	2.131847	0.06362686	0.05	FALSE	1.22307	4		С
Acenaphthylene	Equal Variance t Two-Sample Test	IOSN	<	Comp	21.59451	1.859548	0	0.05	TRUE	0.008826488	8		С
Anthracene	Unequal Variance t Two-Sample Test	IOSN	<	Comp	7.351591	2.131847	0.00091167	0.05	TRUE	0.6923958	4		С
Benzo(a)anthracene	Unequal Variance t Two-Sample Test	IOSN	<	Comp	14.33588	2.131847	6.87805E-05	0.05	TRUE	0.7187011	4		С
Benzo(a)pyrene	Unequal Variance t Two-Sample Test	IOSN	<	Comp	4.23065	2.131847	0.00668155	0.05	TRUE	0.5759637	4		С
Benzo(b)fluoranthene	Unequal Variance t Two-Sample Test	IOSN	<	Comp	7.720544	2.131847	0.000757623	0.05	TRUE	1.000682	4		С
Benzo(g,h,i)perylene	Equal Variance t Two-Sample Test	IOSN	<	Comp	0.9984897	1.859548	0.1736408	0.05	FALSE	0.5613155	8		С
Benzo(k)fluoranthene	Equal Variance t Two-Sample Test	IOSN	<	Comp	2.736334	1.859548	0.01279694	0.05	TRUE	0.5384284	8		С
Chrysene	Unequal Variance t Two-Sample Test	IOSN	<	Comp	12.07474	2.353364	0.000611206	0.05	TRUE	0.3975953	3		С
Chrysene	Wilcoxon Rank Sum Two-Sample Test	IOSN	<	Comp	15		0.003968254	0.05	TRUE		8	0	E
Dibenz(a,h)anthracene	Unequal Variance t Two-Sample Test	IOSN	<	Comp	-59.88929	2.131847	0.9999998	0.05	FALSE	0.09132629	4		С
Fluoranthene	Unequal Variance t Two-Sample Test	IOSN	<	Comp	5.627316	2.131847	0.002452458	0.05	TRUE	9.289891	4		С
Fluorene	Unequal Variance t Two-Sample Test	IOSN	<	Comp	3.348493	2.131847	0.01430444	0.05	TRUE	0.9453106	4		С
Indeno(1,2,3-cd)pyrene	Wilcoxon Rank Sum Two-Sample Test	IOSN	<	Comp	40		1	0.05	FALSE		8	0	E
Indeno(1,2,3-cd)pyrene	Unequal Variance t Two-Sample Test	IOSN	<	Comp	-26.3434	2.131847	0.9999938	0.05	FALSE	0.2213914	4		С
Naphthalene	Unequal Variance t Two-Sample Test	IOSN	<	Comp	14.15599	2.131847	7.22851E-05	0.05	TRUE	0.2072815	4		С
Phenanthrene	Unequal Variance t Two-Sample Test	IOSN	<	Comp	3.437374	2.131847	0.01317851	0.05	TRUE	3.069972	4		С
Pyrene	Equal Variance t Two-Sample Test	IOSN	<	Comp	74.90878	1.894579	0	0.05	TRUE	0.5334801	7		С
Pyrene	Wilcoxon Rank Sum Two-Sample Test	IOSN	<	Comp	15		0.003968254	0.05	TRUE		8	0	E

Report Date: 19 Test Code/ID: TN-23-3

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											est Co	de/ID:	114-23-303	IVIIII AII/ I	3-3685-4237
Bioaccumulat	tion E	valuation -	PAHs	- Ma	coma									EA-ES	T, Inc. PBC
Analysis ID: Analyzed: Edit Date:	19 A	538-5618 ug-23 6:45 lay-23 22:44	1	Ana	ysis:	Para	naphthene ametric-Two D3F048BC	Sample 1A568A37E	)9F572F	F6C7946	Statu	S Version is Level: or ID:	ı: CETISv2 1	2.1.1	
Batch ID: Start Date: Ending Date: Test Length:	29 M 26 A	•		Prot	ocol: cies:	US.	accumulatio ACE NED F oma nasuta Ilvia	RIM (2004)			Analy Dilue Brine Sour	ent: No e: No	incy Roka ot Applicable ot Applicable RO - Aquatic I	Research C	or <b>Age</b> :
Sample Code		Sample ID	)	Sam	ple Dat	te	Receipt	Date	Sample	Age	Clien	t Name	Pı	oject	
IOSN 2019 AT3-098		13-4648-8 07-1559-4			lar-23 eb-23 1	3:00	08 Mar- 09 Feb-		21d 14l 49d 1h	า	Eco-A	Analysts, I	nc. Dı	redged Sed	iment Evalu
Sample Code		Material T	уре			San	ple Source	9		Station	Location	on	Lat/Long		
IOSN 2019		Reference	sedim	ent		Yac	htsman Mai	rina NAE-20	04-00	IOSN Re	eferenc	е			
AT3-098		Marine Se	diment			Yac	htsman Mai	rina NAE-20	004-00	10 Statio	ons at 4	Marinas I	Mu		
Data Transfor	m		Alt F	lур					Comp	arison R	esult				PMSD
Untransformed	t		C < T	•					AT3-0	98 passe	d acen	aphthene	endpoint		269.76%
Unequal Varia	ance vs	t Two-Samı Sample II	ple Tes	st df	Test S	Stat	Critical	MSD	Р-Тур	e P-V	/alue	Decisio	n(α:5%)		
Reference Sec	t	AT3-098		4	1.92		2.13	1.22	CDF	0.0	636	Non-Sigi	nificant Effect	t	
Auxiliary Test Attribute Outlier	s	<b>Test</b> Grubbs E	vtromo	Volu	o Toot			Test Stat	Critica 2.29	al P-V	/alue	Decision	n(α:5%) ers Detected		
Outilei		Grubbs E	XIIEIIIE	valu	e rest			1.00	2.29	0.7.	200	No Outile	ers Detected		
ANOVA Table	1														
Source		Sum Squa	ares		Mean	_	are	DF	F Stat		/alue	Decision	• •		
Between Error Total		3.03381 6.58295 9.61676			3.033 0.822			1 8 9	3.69 _	0.0	911	Non-Sigi	nificant Effect	Ī	
	4!														
ANOVA Assur Attribute	mptic	Test						Test Stat	Critics	al P.V	/alue	Decisio	n(a:1%)		
Variance		Variance F	Ratio F	Test				8790	23.2		0E-05		Variances		
Distribution		Shapiro-W			ality Tes	st		0.827	0.741		310	•	Distribution		
Acenaphthene	e Sur	nmary													
Sample		Code	Cour	nt	Mean		95% LCL	95% UCL	Media	n Mir	1	Max	Std Err	CV%	%Effect
IOSN 2019		RS	5		0.453		0.436	0.47	0.45	0.4	4	0.473	0.00612	3.02%	0.00%
AT3-098			5		1.56		-0.0378	3.15	0.63	0.6	05	2.99	0.574	82.49%	-242.96%
Acenaphthen	e Det	ail													
Sample		Code	Rep	1	Rep 2		Rep 3	Rep 4	Rep 5						
IOSN 2019		RS	0.45		0.462		0.443	0.473	0.44						
AT3-098			0.605	5	0.62		2.99	2.93	0.63						

Report Date: 19 Test Code/ID: TN-23-3

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Bioaccumulati	ion Evaluation	- PAHs - N	lacoma							EA-ES	T, Inc. PBC
. ,	11-6416-3760		-	Acenaphthylei				S Version		2.1.1	
•	19 Aug-23 6:45		alysis:	Parametric-Tw	•	)		s Level:	1		
Edit Date:	08 May-23 22:4	44 <b>M</b> [	)5 Hash:	5C3DB5F62B	59D82EAE(	JFE53CB0C	21E2 <b>Edit</b> o	or ID:			
Batch ID:	07-2064-6975	Te	st Type:	Bioaccumulati	on - PAHs		Analy	<b>yst:</b> Na	incy Roka		
Start Date:	29 Mar-23 13:4	17 <b>P</b> r	otocol:	US ACE NED	RIM (2004)		Dilue	ent: No	t Applicable		
Ending Date:	•	7 <b>S</b> p	ecies:	Macoma nasu	ta		Brine		t Applicable		
Test Length:	27d 23h	Та	xon:	Bivalvia			Sour	ce: AF	RO - Aquatic	Research (	Or <b>Age:</b>
Sample Code	Sample	ID Sa	mple Dat	e Recei	t Date	Sample Ag	e Clien	t Name	Pi	roject	
IOSN 2019	13-4648-	8170 08	Mar-23	08 Mai	-23	21d 14h	Eco-/	Analysts, I	nc. D	redged Sed	diment Evalu
AT3-098	07-1559-	4974 08	Feb-23 1	3:00 09 Feb	-23 16:30	49d 1h					
Sample Code	Material	Туре		Sample Sour	е	Sta	tion Location	on	Lat/Long		
IOSN 2019		e sediment		Yachtsman Ma			SN Referenc	е			
AT3-098	Marine S	ediment		Yachtsman Ma	arina NAE-20	004-00 10	Stations at 4	Marinas I	Mu		
Data Transform	m	Alt Hyp				Comparis	on Result				PMSD
Untransformed		C < T				AT3-098 f	ailed acenap	hthylene o	endpoint		3.17%
Equal Variance	e t Two-Samp	le Test									
•	•		If Test S	Stat Critical	MSD	P-Type	P-Value	Decision	n(α:5%)		
Sample I v	/s Sample II								( )		
Sample I v	AT3-098*	8		1.86	0.00883	CDF	<1.0E-05	Significa	nt Effect		
•	AT3-098*				0.00883	CDF	<1.0E-05	Significa	nt Effect		
Reference Sed	AT3-098*				0.00883  Test Stat		<1.0E-05	Significa  Decision			
Reference Sed  Auxiliary Tests	AT3-098*		3 21.6					Decision			
Reference Sed  Auxiliary Tests  Attribute	AT3-098*	8	3 21.6		Test Stat	Critical	P-Value	Decision	n(α:5%)		
Reference Sed  Auxiliary Tests  Attribute  Outlier	AT3-098*	8 Extreme V <i>a</i>	3 21.6		Test Stat	Critical	P-Value	Decision	n(α:5%) ers Detected		
Auxiliary Tests Attribute Outlier ANOVA Table	AT3-098*  Test  Grubbs	Extreme V <i>a</i>	3 21.6	1.86 Square	Test Stat	Critical 2.29	<b>P-Value</b> 0.7506	<b>Decision</b> No Outlie	n(α:5%) ers Detected n(α:5%)		
Reference Sed  Auxiliary Tests  Attribute  Outlier  ANOVA Table  Source	AT3-098*  Test  Grubbs  Sum Squ	Extreme Vauares	3 21.6  alue Test  Mean	1.86  Square 2656	Test Stat 1.67	Critical 2.29	P-Value 0.7506 P-Value	Decision No Outlie	n(α:5%) ers Detected n(α:5%)		
Reference Sed  Auxiliary Tests  Attribute  Outlier  ANOVA Table  Source  Between	AT3-098*  Test  Grubbs  Sum Squ 0.026265	Extreme Vauares	Mean 0.026	1.86  Square 2656	<b>Test Stat</b> 1.67 <b>DF</b> 1	Critical 2.29	P-Value 0.7506 P-Value	Decision No Outlie	n(α:5%) ers Detected n(α:5%)		
Auxiliary Tests Attribute Outlier ANOVA Table Source Between Error	AT3-098*  Test  Grubbs  Sum Squ 0.026265 0.000450 0.026716	Extreme Vauares	Mean 0.026	1.86  Square 2656	Test Stat 1.67  DF 1 8	Critical 2.29	P-Value 0.7506 P-Value	Decision No Outlie	n(α:5%) ers Detected n(α:5%)		
Auxiliary Tests Attribute Outlier ANOVA Table Source Between Error Total	AT3-098*  Test  Grubbs  Sum Squ 0.026265 0.000450 0.026716	Extreme Vauares	Mean 0.026	1.86  Square 2656	Test Stat 1.67  DF 1 8	Critical 2.29  F Stat 466	P-Value 0.7506 P-Value	Decision No Outlie	n(α:5%) ers Detected n(α:5%) nt Effect		
Auxiliary Tests Attribute Outlier ANOVA Table Source Between Error Total ANOVA Assum	AT3-098*  Test  Grubbs  Sum Sqi  0.026265 0.000450 0.026716  inptions Tests Test	Extreme Vauares	Mean 0.026; 5.633	1.86  Square 2656	Test Stat 1.67  DF 1 8 9  Test Stat 1.71	Critical 2.29  F Stat 466	P-Value	Decision Significa  Decision Equal Va	n(α:5%) ers Detected n(α:5%) nt Effect n(α:1%) ariances		
Auxiliary Tests Attribute Outlier ANOVA Table Source Between Error Total ANOVA Assum Attribute	AT3-098*  Test  Grubbs  Sum Squ 0.026265 0.000450 0.026716  Inptions Tests Test Variance	Extreme Valuares 56 66 66	Mean 0.026: 5.633	1.86  Square 2656 =-05	Test Stat 1.67  DF 1 8 9	Critical 2.29  F Stat 466  Critical	P-Value 0.7506  P-Value <1.0E-05	Decision Significa  Decision Equal Va	n(α:5%) ers Detected n(α:5%) nt Effect n(α:1%)		
Auxiliary Tests Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assum Attribute Variance	AT3-098*  Test Grubbs  Sum Squ 0.026265 0.000450 0.026716  Inptions Tests Test Variance Shapiro-N	Extreme Vauares 56 56 52  Ratio F Te	Mean 0.026: 5.633	1.86  Square 2656 =-05	Test Stat 1.67  DF 1 8 9  Test Stat 1.71	Critical 2.29  F Stat 466  Critical 23.2	P-Value	Decision Significa  Decision Equal Va	n(α:5%) ers Detected n(α:5%) nt Effect n(α:1%) ariances		
Auxiliary Tests Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assun Attribute Variance Distribution	AT3-098*  Test Grubbs  Sum Squ 0.026265 0.000450 0.026716  Inptions Tests Test Variance Shapiro-N	Extreme Vauares 56 56 52  Ratio F Te	Mean 0.026: 5.633	1.86  Square 2656 =-05	Test Stat 1.67  DF 1 8 9  Test Stat 1.71 0.968	Critical 2.29  F Stat 466  Critical 23.2 0.741	P-Value	Decision Significa  Decision Equal Va	n(α:5%) ers Detected n(α:5%) nt Effect n(α:1%) ariances	CV%	%Effect
Auxiliary Tests Attribute Outlier ANOVA Table Source Between Error Total ANOVA Assum Attribute Variance Distribution Acenaphthyler	AT3-098*  Test Grubbs  Sum Squ 0.026265 0.000450 0.026716  Inptions Tests Test Variance Shapiro- The Summary	Extreme Vauares 66 66 62 Ratio F Tei	Mean 0.0262 5.6331	1.86  Square 2656 E-05	Test Stat 1.67  DF 1 8 9  Test Stat 1.71 0.968	Critical 2.29  F Stat 466  Critical 23.2 0.741	P-Value 0.7506  P-Value <1.0E-05  P-Value 0.6162 0.8715	Decision Significa  Decision Equal Va Normal [	n(α:5%) ers Detected n(α:5%) nt Effect n(α:1%) ariances Distribution		%Effect 0.00%
Reference Sed  Auxiliary Tests Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assun Attribute Variance Distribution  Acenaphthyler Sample	AT3-098*  Test Grubbs  Sum Squ 0.026265 0.000450 0.026716  Inptions Tests Test Variance Shapiro-Name Summary Code	Extreme Valuares 56 56 52  Ratio F Ter Wilk W Norre	Mean 0.026 5.633	1.86  Square 2656 =-05	Test Stat 1.67  DF 1 8 9  Test Stat 1.71 0.968	Critical 2.29  F Stat 466  Critical 23.2 0.741  Median	P-Value 0.7506  P-Value <1.0E-05  P-Value 0.6162 0.8715  Min	Decision Significa  Decision Equal Va Normal [	n(α:5%) ers Detected n(α:5%) nt Effect n(α:1%) eriances Distribution	CV%	
Reference Sed  Auxiliary Tests Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assun Attribute Variance Distribution  Acenaphthyler Sample IOSN 2019	AT3-098*  Test Grubbs  Sum Sqi 0.026265 0.000450 0.026716  Inptions Tests Test Variance Shapiro-Variance Shapiro-Variance RS	Extreme Valuares 56 56 52  Ratio F Ter Wilk W Norr	Mean 0.279	1.86  Square 2656 E-05  st  95% LCL 0.268	Test Stat 1.67  DF 1 8 9  Test Stat 1.71 0.968  95% UCL 0.289	Critical 2.29  F Stat 466  Critical 23.2 0.741  Median 0.277	P-Value 0.7506  P-Value <1.0E-05  P-Value 0.6162 0.8715  Min 0.271	Decision Significa  Decision Equal Va Normal [	n(α:5%) ers Detected n(α:5%) nt Effect n(α:1%) eriances Distribution  Std Err 0.00377	CV% 3.02%	0.00%
Auxiliary Tests Attribute Outlier ANOVA Table Source Between Error Total  ANOVA Assun Attribute Variance Distribution  Acenaphthyler Sample IOSN 2019 AT3-098	AT3-098*  Test Grubbs  Sum Sqi 0.026265 0.000450 0.026716  Inptions Tests Test Variance Shapiro-Variance Shapiro-Variance RS	Extreme Valuares 56 56 52  Ratio F Ter Wilk W Norr	Mean 0.279	1.86  Square 2656 E-05  95% LCL 0.268 0.373	Test Stat 1.67  DF 1 8 9  Test Stat 1.71 0.968  95% UCL 0.289	Critical 2.29  F Stat 466  Critical 23.2 0.741  Median 0.277	P-Value 0.7506  P-Value <1.0E-05  P-Value 0.6162 0.8715  Min 0.271	Decision Significa  Decision Equal Va Normal [	n(α:5%) ers Detected n(α:5%) nt Effect n(α:1%) eriances Distribution  Std Err 0.00377	CV% 3.02%	0.00%
Auxiliary Tests Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assum Attribute Variance Distribution  Acenaphthyler Sample IOSN 2019 AT3-098  Acenaphthyler	AT3-098*  Test Grubbs  Sum Squ 0.026265 0.000450 0.026716  Inptions Tests Test Variance Shapiro-V The Summary Code RS	Extreme Valuares 56 56 52  Ratio F Tea Wilk W Nora  Count 5 5	Mean 0.026; 5.633	1.86  Square 2656 E-05  95% LCL 0.268 0.373	Test Stat 1.67  DF 1 8 9  Test Stat 1.71 0.968  95% UCL 0.289 0.389	Critical 2.29  F Stat 466  Critical 23.2 0.741  Median 0.277 0.382	P-Value 0.7506  P-Value <1.0E-05  P-Value 0.6162 0.8715  Min 0.271	Decision Significa  Decision Equal Va Normal [	n(α:5%) ers Detected n(α:5%) nt Effect n(α:1%) eriances Distribution  Std Err 0.00377	CV% 3.02%	0.00%

Report Date: 19 Aug-23 06:45 (p 3 of 16)
Test Code/ID: TN-23-303MnPAH / 13-3685-4237

										Test C				3-3685-4237
Bioaccumula	tion I	Evaluation	- PAHs	- Ma	coma								EA-ES	T, Inc. PBC
Analysis ID: Analyzed: Edit Date:	19 A	9439-4057 Aug-23 6:45 May-23 22:4		Anal	point: ysis: Hash:	Para	metric-Two	Sample DECF606B	32A763491	Stat	IS Versio us Level: or ID:		/2.1.1	
Batch ID: Start Date: Ending Date: Test Length:	29 N	•	7		ocol: cies:	US A	ccumulatio ACE NED F oma nasuta Ivia	RIM (2004)		Ana Dilu Brin Sou	ent: N e: N	ancy Roka ot Applicable ot Applicable RO - Aquatic	9	Or <b>Age:</b>
Sample Code	•	Sample II	<u> </u>	Sam	ple Dat	te	Receipt	Date	Sample Ag	je Clie	nt Name	F	Project	
IOSN 2019 AT3-098		13-4648-8 07-1559-4			lar-23 eb-23 1	3:00	08 Mar- 09 Feb-		21d 14h 49d 1h	Eco	Analysts,	Inc. [	Oredged Sec	iment Evalu
Sample Code	)	Material T	Гуре			Sam	ple Source	е	St	ation Locat	ion	Lat/Lon	g	
IOSN 2019		Reference	sedime	ent		Yach	ntsman Ma	rina NAE-20	004-00 IO	SN Referen	се			
AT3-098		Marine Se	diment			Yach	ntsman Ma	rina NAE-20	004-00 10	Stations at	4 Marinas	Mu		
Data Transfor	rm		Alt H	ур					Compari	son Result				PMSD
Untransformed	d		C < T						AT3-098	failed anthra	cene end	point		229.04%
Unequal Varia	ance vs	t Two-Sam Sample II	ple Tes	t df	Test S	Stat	Critical	MSD	P-Type	P-Value	Decisio	on(α:5%)		
Reference Sec	d	AT3-098*		4	7.35		2.13	0.692	CDF	0.0009	Signific	ant Effect		
		AT3-098*					2.13	0.692 Test Stat		0.0009 P-Value		ant Effect on(α:5%)		
Reference Sec		AT3-098*	xtreme				2.13				Decisio		d	
Auxiliary Test Attribute	ts	AT3-098*	xtreme				2.13	Test Stat	Critical	P-Value	Decisio	on(α:5%)	d	
Auxiliary Test Attribute Outlier	ts	AT3-098*				Squa		Test Stat	Critical	P-Value	Decision No Outl	on(α:5%)	d	
Auxiliary Test Attribute Outlier ANOVA Table Source Between Error	ts	Test Grubbs E  Sum Squi 14.2528 2.10973			e Test	28		<b>Test Stat</b> 2.07 <b>DF</b> 1 8	Critical 2.29	<b>P-Value</b> 0.1751	Decision No Outl	on(α:5%) liers Detected	d	
Auxiliary Test Attribute Outlier ANOVA Table Source Between Error Total	e	Test Grubbs E  Sum Squi 14.2528 2.10973 16.3625			e Test  Mean 14.25	28		<b>Test Stat</b> 2.07 <b>DF</b> 1	Critical 2.29	P-Value 0.1751 P-Value	Decision No Outl	on(α:5%) liers Detected on(α:5%)	d	
Auxiliary Test Attribute Outlier ANOVA Table Source Between Error Total ANOVA Assu	e	Test Grubbs E  Sum Squ. 14.2528 2.10973 16.3625 Dons Tests			e Test  Mean 14.25	28		<b>Test Stat</b> 2.07 <b>DF</b> 1 8 9	Critical 2.29  F Stat 54	P-Value 0.1751  P-Value 8.0E-05	Decision No Outline Decision Signification	on(α:5%) liers Detected on(α:5%) ant Effect	d	
Auxiliary Test Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assu Attribute	e	Test Grubbs E  Sum Squi 14.2528 2.10973 16.3625 DDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDD	ares	Valu	e Test  Mean 14.25	28		Test Stat 2.07  DF 1 8 9  Test Stat	Critical 2.29  F Stat 54  Critical	P-Value 0.1751  P-Value 8.0E-05	Decision No Outline Decision Signific Decision D	on(α:5%) liers Detected on(α:5%) ant Effect	d	
Auxiliary Test Attribute Outlier ANOVA Table Source Between Error Total ANOVA Assu	e	Test Grubbs E  Sum Squ. 14.2528 2.10973 16.3625 Dons Tests	ares	Valu	e Test  Mean 14.25: 0.263	28 716		<b>Test Stat</b> 2.07 <b>DF</b> 1 8 9	Critical 2.29  F Stat 54	P-Value 0.1751  P-Value 8.0E-05	Decision Signification Decision Unequality	on(α:5%) liers Detected on(α:5%) ant Effect	d	
Auxiliary Test Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assu Attribute Variance	e	Test Grubbs E Sum Squ. 14.2528 2.10973 16.3625 Dons Tests Test Variance F Shapiro-W	ares	Valu	e Test  Mean 14.25: 0.263	28 716		Test Stat 2.07  DF 1 8 9  Test Stat 6400	Critical 2.29  F Stat 54  Critical 23.2	P-Value 0.1751  P-Value 8.0E-05  P-Value <1.0E-05	Decision Signification Decision Unequality	on(α:5%) iters Detected on(α:5%) ant Effect on(α:1%)	d	
Auxiliary Test Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assu Attribute Variance Distribution	e	Test Grubbs E Sum Squ. 14.2528 2.10973 16.3625 Dons Tests Test Variance F Shapiro-W	ares	Valu Test Jorma	e Test  Mean 14.25: 0.263	28 716 st		Test Stat 2.07  DF 1 8 9  Test Stat 6400 0.853	Critical 2.29  F Stat 54  Critical 23.2 0.741	P-Value 0.1751  P-Value 8.0E-05  P-Value <1.0E-05	Decision Signification Decision Unequality	on(α:5%) iters Detected on(α:5%) ant Effect on(α:1%)	d CV%	%Effect
Auxiliary Test Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assu Attribute Variance Distribution  Anthracene S	e	Test Grubbs E  Sum Squi 14.2528 2.10973 16.3625 Dons Tests Test Variance F Shapiro-W	ares Ratio F /ilk W N	Valu Test Jorma	Mean 14.25 0.263	28 716 st	are	Test Stat 2.07  DF 1 8 9  Test Stat 6400 0.853	Critical 2.29  F Stat 54  Critical 23.2 0.741	P-Value 0.1751  P-Value 8.0E-05  P-Value <1.0E-05 0.0636	Decision  Decision  Significa  Decision  Unequal  Normal	on(α:5%) liers Detected on(α:5%) ant Effect on(α:1%) al Variances Distribution	CV%	%Effect 0.00%
Auxiliary Test Auxiliary Test Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assu Attribute Variance Distribution  Anthracene S Sample	e	Test Grubbs E  Sum Squi 14.2528 2.10973 16.3625 Dons Tests Test Variance F Shapiro-W	ares Ratio F Vilk W N	Valu Test Jorma	e Test  Mean 14.25; 0.263	28 716 st	are	Test Stat 2.07  DF 1 8 9  Test Stat 6400 0.853	Critical 2.29  F Stat 54  Critical 23.2 0.741  Median	P-Value 0.1751  P-Value 8.0E-05  P-Value <1.0E-05  Min	Decision Signification Decision Unequal Normal	on(α:5%) itiers Detected on(α:5%) ant Effect on(α:1%) al Variances Distribution Std Err	CV%	
Auxiliary Test Auxiliary Test Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assu Attribute Variance Distribution  Anthracene S Sample IOSN 2019	mptic	Test Grubbs E  Sum Squi 14.2528 2.10973 16.3625 DOIS TESTS Test Variance R Shapiro-W DIARRY Code RS	ares Ratio F /ilk W N Coun	Valu Test Jorma	e Test  Mean 14.25: 0.263  ality Tes  Mean 0.302	28 716 st	95% LCL 0.291	Test Stat 2.07  DF 1 8 9  Test Stat 6400 0.853  95% UCL 0.314	Critical 2.29  F Stat 54  Critical 23.2 0.741  Median 0.3	P-Value 0.1751  P-Value 8.0E-05  P-Value <1.0E-05 0.0636  Min 0.294	Decision Signification Decision Unequal Normal Max 0.315	on(α:5%) itiers Detected on(α:5%) ant Effect on(α:1%) al Variances Distribution Std Err 0.00406	<b>CV%</b> 3.00%	0.00%
Auxiliary Test Auxiliary Test Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assu Attribute Variance Distribution  Anthracene S Sample IOSN 2019 AT3-098	mptic	Test Grubbs E  Sum Squi 14.2528 2.10973 16.3625 DOIS TESTS Test Variance R Shapiro-W DIARRY Code RS	ares Ratio F /ilk W N Coun	Valu Test	e Test  Mean 14.25: 0.263  ality Tes  Mean 0.302	28 716	95% LCL 0.291	Test Stat 2.07  DF 1 8 9  Test Stat 6400 0.853  95% UCL 0.314	Critical 2.29  F Stat 54  Critical 23.2 0.741  Median 0.3	P-Value 0.1751  P-Value 8.0E-05  P-Value <1.0E-05 0.0636  Min 0.294	Decision Signification Decision Unequal Normal Max 0.315	on(α:5%) itiers Detected on(α:5%) ant Effect on(α:1%) al Variances Distribution Std Err 0.00406	CV% 3.00%	0.00%
Auxiliary Test Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assu Attribute Variance Distribution  Anthracene S Sample IOSN 2019 AT3-098  Anthracene D	mptic	Test Grubbs E Sum Squa 14.2528 2.10973 16.3625 Dons Tests Test Variance F Shapiro-W Dary Code RS	ares Ratio F /ilk W N  Coun 5 5	Valu Test	Mean 14.25: 0.263  Mean 0.302 2.69	28 716	95% LCL 0.291 1.79	Test Stat 2.07  DF 1 8 9  Test Stat 6400 0.853  95% UCL 0.314 3.59	Critical 2.29  F Stat 54  Critical 23.2 0.741  Median 0.3 2.61	P-Value 0.1751  P-Value 8.0E-05  P-Value <1.0E-05 0.0636  Min 0.294	Decision Signification Decision Unequal Normal Max 0.315	on(α:5%) itiers Detected on(α:5%) ant Effect on(α:1%) al Variances Distribution Std Err 0.00406	CV% 3.00%	0.00%

**Report Date:** 19 Aug-23 06:45 (p 4 of 16) **Test Code/ID:** TN-23-303MnPAH / 13-3685-4237

									Test Co				3-3685-423
Bioaccumula	tion Eva	luation - PA	NHs - Ma	acoma								EA-ES	T, Inc. PBC
Analysis ID: Analyzed: Edit Date:	·	9-9668 -23 6:45 -23 22:44	Ana	alysis:	Param		acene o Sample 122B474A7	2A1DF292E	Statu	S Versior is Level: or ID:	n: CETISv2 1	2.1.1	
Batch ID: Start Date: Ending Date: Test Length:	26 Apr-	-23 13:47 -23 12:47	Pro Spe	t Type: tocol: ecies: on:	US AC	CE NED F ma nasuta	on - PAHs RIM (2004) a		Anal Dilue Brine Sour	ent: No	ancy Roka ot Applicable ot Applicable RO - Aquatic	Research C	or <b>Age:</b>
Sample Code	. s	ample ID	Sar	nple Dat	e	Receip	t Date	Sample Ag	e Clier	t Name	P	roject	
IOSN 2019 AT3-098		3-4648-8170 7-1559-4974		Mar-23 <sup>=</sup> eb-23 1	3:00	08 Mar- 09 Feb-		21d 14h 49d 1h	Eco-	Analysts, I	nc. D	redged Sed	iment Evalı
Sample Code	· N	laterial Type	)		Samp	le Sourc	e	Sta	tion Locati	on	Lat/Long		
IOSN 2019	R	eference se	diment		Yachts	sman Ma	rina NAE-20	004-00 109	SN Referenc	е			
AT3-098	N	larine Sedim	ent		Yachts	sman Ma	rina NAE-20	004-00 10	Stations at 4	Marinas	Mu		
Data Transfo	rm	Α	lt Hyp					Comparis	on Result				PMSD
Untransformed	d	С	< T					AT3-098 f	ailed benzo(	a)anthrac	ene endpoint		127.20%
Unequal Variation		wo-Sample imple II	Test df	Test S	Stat C	Critical	MSD	P-Type	P-Value	Decisio	n(α:5%)		
Reference Sec	d A	Г3-098*	4	14.3	2	13	0.719	CDF	6.9E-05	Significa	int Effect		
Auxiliary Test	ts	Γ3-098* <b>Γest</b>	4	14.3	2	2.13	0.719 Test Stat		6.9E-05 P-Value	Significa  Decisio			
Auxiliary Tes	ts				2	2.13				Decisio			
Auxiliary Tes	ts -	Test			2	2.13	Test Stat	Critical	P-Value	Decisio	n(α:5%)		
Auxiliary Test Attribute Outlier	ts .	Test	eme Val	ue Test	2 Square		Test Stat	Critical	P-Value	<b>Decisio</b> No Outli	n(α:5%)		
Auxiliary Test Attribute Outlier ANOVA Table	ts -	<b>Fest</b> Grubbs Extre	eme Val	ue Test	Square		Test Stat	Critical 2.29	<b>P-Value</b> 0.1534	Decisio No Outli Decisio	n(α:5%) ers Detected		
Auxiliary Test Attribute Outlier ANOVA Table Source Between Error	ts - (	Fest Grubbs Extre	eme Val	ue Test <b>Mean</b>	Square		<b>Test Stat</b> 2.09 <b>DF</b> 1 8	Critical 2.29	P-Value 0.1534 P-Value	Decisio No Outli Decisio	n(a:5%) ers Detected n(a:5%)		
Auxiliary Test Attribute Outlier ANOVA Table Source Between	ts - (	Fest Grubbs Extre um Squares 8.3947	eme Val	ue Test  Mean  58.394	Square		<b>Test Stat</b> 2.09 <b>DF</b> 1	Critical 2.29	P-Value 0.1534 P-Value	Decisio No Outli Decisio	n(a:5%) ers Detected n(a:5%)		
Auxiliary Test Attribute Outlier ANOVA Table Source Between Error	s S 5 2 6	Fest Grubbs Extre  Sum Squares 8.3947 .27308 0.6678	eme Val	ue Test  Mean  58.394	Square		<b>Test Stat</b> 2.09 <b>DF</b> 1 8	Critical 2.29	P-Value 0.1534 P-Value	Decisio No Outli Decisio	n(a:5%) ers Detected n(a:5%)		
Auxiliary Test Attribute Outlier  ANOVA Table Source Between Error Total	s S S S S S S S S S S S S S S S S S S S	Fest Grubbs Extre  Sum Squares 8.3947 .27308 0.6678	eme Val	ue Test  Mean  58.394	Square		<b>Test Stat</b> 2.09 <b>DF</b> 1 8	Critical 2.29  F Stat 206	P-Value 0.1534 P-Value	Decisio No Outli  Decisio Significa	n(a:5%) ers Detected n(a:5%)		
Auxiliary Test Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assu Attribute Variance	s S 5 2 6 6 mptions T V	Grubbs Extre  um Squares 8.3947 .27308 0.6678 6 Tests est ariance Rati	eme Val	Mean 58.394 0.284	<b>Squar</b> 17 135		Test Stat 2.09  DF 1 8 9  Test Stat 1890	Critical 2.29  F Stat 206  Critical 23.2	P-Value	Decisio No Outli  Decisio Significa  Decisio Unequal	n(α:5%) ers Detected n(α:5%) ant Effect n(α:1%) Variances		
Auxiliary Tesi Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assu Attribute	s S 5 2 6 6 mptions T V	Grubbs Extre um Squares 8.3947 .27308 0.6678 6 Tests est	eme Val	Mean 58.394 0.284	<b>Squar</b> 17 135		Test Stat 2.09  DF 1 8 9	Critical 2.29  F Stat 206  Critical	P-Value 0.1534  P-Value <1.0E-05	Decisio No Outli  Decisio Significa  Decisio Unequal	n(α:5%) ers Detected n(α:5%) ant Effect n(α:1%)		
Auxiliary Test Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assu Attribute Variance Distribution  Benzo(a)anth	S S S S S S S S S S S S S S S S S S S	Fest Grubbs Extre  Sum Squares 8.3947 .27308 0.6678 Fest est ariance Rati hapiro-Wilk	eme Val	Mean 58.394 0.284	Square 17 135	e	Test Stat 2.09  DF 1 8 9  Test Stat 1890 0.814	Critical 2.29  F Stat 206  Critical 23.2 0.741	P-Value	Decisio  Decisio  Significa  Decisio  Unequal Normal	n(a:5%) ers Detected n(a:5%) ent Effect n(a:1%) Variances Distribution		
Auxiliary Test Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assu Attribute Variance Distribution  Benzo(a)anth Sample	s S S S S S S S S S S S S S S S S S S S	Fest Grubbs Extre  um Squares 8.3947 .27308 0.6678 Fests est fariance Rati hapiro-Wilk Summary code C	eme Val	Mean 58.394 0.284	Square 47 135 et	e 5% LCL	Test Stat 2.09  DF 1 8 9  Test Stat 1890 0.814	Critical 2.29  F Stat 206  Critical 23.2 0.741  Median	P-Value 0.1534  P-Value <1.0E-05  P-Value <1.0E-05 0.0214  Min	Decisio No Outli  Decisio Significa  Decisio Unequal Normal I	n(a:5%) ers Detected  n(a:5%) ent Effect  n(a:1%) Variances Distribution	CV%	%Effect
Auxiliary Test Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assu Attribute Variance Distribution  Benzo(a)anth Sample IOSN 2019	s S S S S S S S S S S S S S S S S S S S	Grubbs Extre  um Squares 8.3947 .27308 0.6678 Tests est ariance Rati hapiro-Wilk Summary code Code S 5	eme Val	Mean 58.394 0.284  t hality Tes  Mean 0.565	<b>Squar</b> 47 135 st	<b>5% LCL</b>	Test Stat 2.09  DF 1 8 9  Test Stat 1890 0.814  95% UCL 0.587	Critical 2.29  F Stat 206  Critical 23.2 0.741  Median 0.56	P-Value 0.1534  P-Value <1.0E-05  P-Value <1.0E-05 0.0214  Min 0.55	Decisio No Outli  Decisio Significa  Decisio Unequal Normal I	n(a:5%) ers Detected  n(a:5%) ent Effect  n(a:1%) Variances Distribution  Std Err  0.00775	3.07%	0.00%
Auxiliary Test Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assu Attribute Variance Distribution  Benzo(a)anth Sample	s S S S S S S S S S S S S S S S S S S S	Fest Grubbs Extre  um Squares 8.3947 .27308 0.6678 Fests est fariance Rati hapiro-Wilk Summary code C	eme Val	Mean 58.394 0.284	<b>Squar</b> 47 135 st	e 5% LCL	Test Stat 2.09  DF 1 8 9  Test Stat 1890 0.814	Critical 2.29  F Stat 206  Critical 23.2 0.741  Median	P-Value 0.1534  P-Value <1.0E-05  P-Value <1.0E-05 0.0214  Min	Decisio No Outli  Decisio Significa  Decisio Unequal Normal I	n(a:5%) ers Detected  n(a:5%) ent Effect  n(a:1%) Variances Distribution		0.00%
Auxiliary Test Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assu Attribute Variance Distribution  Benzo(a)anth Sample IOSN 2019	s S S S S S S S S S S S S S S S S S S S	Grubbs Extre  Sum Squares 8.3947 .27308 0.6678 Tests est fariance Rati hapiro-Wilk Summary code Code S 5	eme Val	Mean 58.394 0.284  t hality Tes  Mean 0.565	<b>Squar</b> 47 135 st	<b>5% LCL</b>	Test Stat 2.09  DF 1 8 9  Test Stat 1890 0.814  95% UCL 0.587	Critical 2.29  F Stat 206  Critical 23.2 0.741  Median 0.56	P-Value 0.1534  P-Value <1.0E-05  P-Value <1.0E-05 0.0214  Min 0.55	Decisio No Outli  Decisio Significa  Decisio Unequal Normal I	n(a:5%) ers Detected  n(a:5%) ent Effect  n(a:1%) Variances Distribution  Std Err  0.00775	3.07%	
Auxiliary Test Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assu Attribute Variance Distribution  Benzo(a)anth Sample IOSN 2019 AT3-098	s S S S S S S S S S S S S S S S S S S S	Grubbs Extre  Sum Squares 8.3947 .27308 0.6678  Tests est ariance Rati hapiro-Wilk Summary code Collection 5 5 5 Detail	eme Val	Mean 58.394 0.284  t hality Tes  Mean 0.565	<b>Square</b> 47 135 et  9 0 4	<b>5% LCL</b>	Test Stat 2.09  DF 1 8 9  Test Stat 1890 0.814  95% UCL 0.587	Critical 2.29  F Stat 206  Critical 23.2 0.741  Median 0.56	P-Value 0.1534  P-Value <1.0E-05  P-Value <1.0E-05 0.0214  Min 0.55	Decisio No Outli  Decisio Significa  Decisio Unequal Normal I	n(a:5%) ers Detected  n(a:5%) ent Effect  n(a:1%) Variances Distribution  Std Err  0.00775	3.07%	0.00%
Auxiliary Test Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assu Attribute Variance Distribution  Benzo(a)anth Sample IOSN 2019 AT3-098  Benzo(a)anth	s S S S S S S S S S S S S S S S S S S S	Fest Grubbs Extre  Sum Squares 8.3947 .27308 0.6678 Fest Gariance Rati hapiro-Wilk Summary Gode Co S 5 5 Detail Gode Re	s o F Tes W Norm	Mean 58.394 0.284 t tality Tes Mean 0.565 5.4	<b>Squar</b> 47 135 st 9 0 4	<b>5% LCL</b> 0.543	Test Stat 2.09  DF 1 8 9  Test Stat 1890 0.814  95% UCL 0.587 6.33	Critical 2.29  F Stat 206  Critical 23.2 0.741  Median 0.56 5.43	P-Value 0.1534  P-Value <1.0E-05  P-Value <1.0E-05 0.0214  Min 0.55	Decisio No Outli  Decisio Significa  Decisio Unequal Normal I	n(a:5%) ers Detected  n(a:5%) ent Effect  n(a:1%) Variances Distribution  Std Err  0.00775	3.07%	0.00%

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			•							Т	est Co	de/ID:	TN-23-3	03MnPAH / 13	3-3685-4237
Bioaccumula	tion E	valuation - F	PAHs	- Ma	coma									EA-ES	Γ, Inc. PBC
Analysis ID: Analyzed: Edit Date:	19 A	784-4906 .ug-23 6:45 lay-23 22:44		Anal	point: ysis: Hash:	Parar	o(a)pyrene netric-Two CC872CB		EC64FF	C492DF		S Version is Level: or ID:	: CETIS	v2.1.1	
Batch ID: Start Date:		064-6975			• •		cumulatio				Anal		ncy Roka	•	
Ending Date:		lar-23 13:47			ocol: cies:		ma nasuta	RIM (2004)			Dilue Brine		t Applicabl t Applicabl		
Test Length:		•		Taxo		Bival		1			Sour			e c Research O	r <b>Age:</b>
Sample Code	1	Sample ID		Sam	ple Da	te	Receipt	Date	Sample	Age	Clier	ıt Name		Project	
IOSN 2019		13-4648-81	70	08 N	lar-23		08 Mar-	23	21d 14l	h	Eco-	Analysts, I	nc.	Dredged Sedi	ment Evalu
AT3-098		07-1559-49	74	08 F	eb-23 1	3:00	09 Feb-	23 16:30	49d 1h			•			
Sample Code	)	Material Ty	pe			Samp	ole Source	9		Station	Locati	on	Lat/Lor	ng	
IOSN 2019		Reference s	edime	ent		Yacht	tsman Mar	rina NAE-20	004-00	IOSN Re	eferenc	е			
AT3-098		Marine Sedi	ment			Yacht	tsman Mar	rina NAE-20	004-00	10 Statio	ns at 4	Marinas I	Мu		
Data Transfor	rm		Alt H	ур						arison R					PMSD
Untransformed	b		C < T						AT3-0	98 failed	benzo(	a)pyrene e	endpoint		96.96%
Unequal Vari	ance	t Two-Sampl	e Tes	t											
Sample I	vs	Sample II		df	Test S	Stat (	Critical	MSD	P-Typ	e P-V	'alue	Decision	n(α:5%)		
Reference Sec	d	AT3-098*		4	4.23	2	2.13	0.576	CDF	0.0	067	Significa	nt Effect		
Auxiliary Tes	ts														
Attribute		Test						Test Stat	Critica	al P-V	'alue	Decision	n(α:5%)		
Outlier		Grubbs Ext	treme	Valu	e Test			2.29	2.29	0.0	502	No Outlie	ers Detecte	ed	
ANOVA Table	•														
Source		Sum Squar	es		Mean	Squa	re	DF	F Stat	: P-V	'alue	Decision	η(α:5%)		
Between		3.26612			3.266	12		1	17.9	0.0	029	Significa	nt Effect		
Error		1.45985			0.182	481		8							
Total		4.72597						9							
ANOVA Assu	mptic	ns Tests													
Attribute		Test						Test Stat	Critica	al P-V	'alue	Decision	າ(α:1%)		
Variance		Variance Ra	atio F	Test				1060	23.2	<1.	0E-05	Unequal	Variances		
Distribution		Shapiro-Wil	k W N	lorma	ality Tes	st		0.81	0.741	0.0	193	Normal [	Distribution		
Benzo(a)pyre	ne Sı	ımmary													
Sample			Coun	t	Mean		95% LCL					Max	Std Err		%Effect
IOSN 2019		RS	5		0.594		0.571	0.617	0.59	0.5	75	0.62	0.00828		0.00%
AT3-098			5		1.74	(	0.987	2.49	1.71	0.8	15	2.42	0.27	34.76%	-192.42%
Benzo(a)pyre	ne De	etail													
Sample		Code	Rep 1		Rep 2	<u> </u>	Rep 3	Rep 4	Rep 5						
IOSN 2019		RS	0.59		0.605	(	0.58	0.62	0.575						
AT3-098			2.42		0.815		1.64	1.71	2.1						

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Bioaccumula	tion Evaluatio	n - PAHs - I	Macoma								EA-ES	Γ, Inc. PBC
Analysis ID: Analyzed: Edit Date:	15-8115-7379 19 Aug-23 6:4 08 May-23 22	5 <b>A</b>	ndpoint: nalysis: D5 Hash:	Parame	tric-Two	Sample	32437B23B	Statu	S Version is Level: or ID:	ı: CETISv2 1	2.1.1	
Batch ID: Start Date: Ending Date: Test Length:	07-2064-6975 29 Mar-23 13: 26 Apr-23 12: 27d 23h	47 P 47 S	est Type: rotocol: pecies: axon:	US ACE	E NED R a nasuta	RIM (2004)		Anal Dilue Brine Sour	ent: No e: No	incy Roka ot Applicable ot Applicable RO - Aquatic	Research C	er <b>Age:</b>
Sample Code	Sample	ID S	ample Da	te	Receipt	Date	Sample Ag	e Clier	ıt Name	Pi	roject	
IOSN 2019 AT3-098	13-4648 07-1559	3-8170 08	3 Mar-23 3 Feb-23 <i>′</i>		08 Mar-2 09 Feb-2	23	21d 14h 49d 1h		Analysts, I	nc. D	redged Sed	iment Evalu
Sample Code	Materia	I Туре		Sample	Source	)	Sta	tion Locati	on	Lat/Long		
IOSN 2019	Referen	ce sedimen	t	Yachtsn	man Mar	ina NAE-20	04-00 IOS	N Referenc	е			
AT3-098	Marine	Sediment		Yachtsn	man Mar	ina NAE-20	04-00 10	Stations at 4	Marinas I	Mu		
Data Transfor	rm	Alt Hyp	)				Comparis	on Result				PMSD
Untransformed	d	C < T					AT3-098 f	ailed benzo(	b)fluoranth	nene endpoir	nt	127.31%
	ance t Two-Sa vs Sample		df Test	Stat Cri	itical	MSD	P-Type	P-Value	Decision	n(α:5%)		
•	•											
Reference Sec	d AT3-098	*	4 7.72	2.1	13	1	CDF	0.0008	Significa	nt Effect		
Reference Sec	ts	*	4 7.72	2.1	13							
Reference Sec	ts Test	* Extreme V		2.1	13	Test Stat		0.0008  P-Value 0.9059	Decision			
Reference Sec Auxiliary Test Attribute	ts Test Grubbs			2.1	13	Test Stat	Critical	P-Value	Decision	n(α:5%)		
Auxiliary Test Attribute Outlier	ts Test Grubbs	Extreme V	alue Test	2.1		Test Stat	Critical	P-Value	Decision	n(a:5%) ers Detected		
Auxiliary Test Attribute Outlier ANOVA Table	Test Grubbs	Extreme V	alue Test	Square		Test Stat	Critical 2.29	<b>P-Value</b> 0.9059	<b>Decision</b> No Outlie	n(α:5%) ers Detected n(α:5%)		
Auxiliary Test Attribute Outlier ANOVA Table Source Between Error	Test Grubbs  Sum So 32.8334 4.40667	Extreme V	alue Test <b>Mea</b> n	Square		<b>Test Stat</b> 1.6 <b>DF</b> 1 8	Critical 2.29	P-Value 0.9059 P-Value	Decision No Outlie	n(α:5%) ers Detected n(α:5%)		
Auxiliary Test Attribute Outlier ANOVA Table Source Between	Test Grubbs Sum Sc 32.8334	Extreme V	alue Test  Mean 32.83	Square		<b>Test Stat</b> 1.6 <b>DF</b> 1	Critical 2.29	P-Value 0.9059 P-Value	Decision No Outlie	n(α:5%) ers Detected n(α:5%)		
Auxiliary Test Attribute Outlier ANOVA Table Source Between Error Total	Test Grubbs  Sum So 32.8334 4.40667	Extreme V	alue Test  Mean 32.83	Square		<b>Test Stat</b> 1.6 <b>DF</b> 1 8	Critical 2.29	P-Value 0.9059 P-Value	Decision No Outlie	n(α:5%) ers Detected n(α:5%)		
Auxiliary Test Attribute Outlier ANOVA Table Source Between Error Total	Test Grubbs  Sum So 32.8334 4.40667 37.2401	Extreme V	alue Test  Mean 32.83	Square		<b>Test Stat</b> 1.6 <b>DF</b> 1 8	Critical 2.29  F Stat 59.6  Critical	P-Value 0.9059 P-Value	Decision No Outlie	n(α:5%) ers Detected n(α:5%) nt Effect		
Auxiliary Test Attribute Outlier ANOVA Table Source Between Error Total ANOVA Assur Attribute Variance	Test Grubbs Sum Sc 32.8334 4.40667 37.2401 mptions Tests Test Variance	Extreme V	Mean 32.83 0.550	34 834		Test Stat 1.6  DF 1 8 9  Test Stat 1940	Critical 2.29  F Stat 59.6  Critical 23.2	P-Value  0.9059  P-Value  5.6E-05  P-Value  <1.0E-05	Decision  Decision  Significa  Decision  Unequal	n(α:5%) ers Detected n(α:5%) nt Effect n(α:1%) Variances		
Auxiliary Test Attribute Outlier ANOVA Table Source Between Error Total ANOVA Assur	Test Grubbs Sum Sc 32.8334 4.40667 37.2401 mptions Tests Test Variance	Extreme V	Mean 32.83 0.550	34 834		Test Stat 1.6  DF 1 8 9	Critical 2.29  F Stat 59.6  Critical	P-Value 0.9059 P-Value 5.6E-05	Decision  Decision  Significa  Decision  Unequal	n(α:5%) ers Detected n(α:5%) nt Effect n(α:1%)		
Auxiliary Test Attribute Outlier ANOVA Table Source Between Error Total ANOVA Assur Attribute Variance Distribution Benzo(b)fluore	Test Grubbs  Sum So 32.8334 4.40667 37.2401  mptions Tests  Test Variance Shapiro	e Ratio F Te-Wilk W No	Mean 32.83 0.550 est rmality Te	34 834 st		Test Stat 1.6  DF 1 8 9  Test Stat 1940 0.888	Critical 2.29  F Stat 59.6  Critical 23.2 0.741	P-Value 5.6E-05  P-Value <1.0E-05 0.1599	Decision  Decision  Significa  Decision  Unequal  Normal E	n(α:5%) ers Detected n(α:5%) nt Effect n(α:1%) Variances Distribution		
Auxiliary Test Attribute Outlier ANOVA Table Source Between Error Total ANOVA Assur Attribute Variance Distribution Benzo(b)fluor Sample	Test Grubbs Sum Sc 32.8334 4.40667 37.2401 mptions Tests Test Variance Shapiro ranthene Sum Code	e Ratio F Te-Wilk W No	Mean 32.83 0.550 est rmality Te	st 95	% LCL	Test Stat 1.6  DF 1 8 9  Test Stat 1940 0.888	Critical 2.29  F Stat 59.6  Critical 23.2 0.741  Median	P-Value 0.9059  P-Value 5.6E-05  P-Value <1.0E-05 0.1599  Min	Decision No Outlie  Decision Significa  Decision Unequal Normal [	n(α:5%) ers Detected n(α:5%) nt Effect n(α:1%) Variances Distribution	CV%	%Effect
Auxiliary Test Auxiliary Test Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assurattribute Variance Distribution  Benzo(b)fluor Sample IOSN 2019	Test Grubbs  Sum So 32.8334 4.40667 37.2401  mptions Tests  Test Variance Shapiro	e Ratio F Te-Wilk W No	Mean 32.83 0.550 est rmality Te  Mean 0.786	st 95°	% LCL 756	Test Stat  1.6  DF  1 8 9  Test Stat 1940 0.888  95% UCL 0.816	Critical 2.29  F Stat 59.6  Critical 23.2 0.741  Median 0.78	P-Value  0.9059  P-Value  5.6E-05  P-Value  <1.0E-05 0.1599  Min  0.765	Decision No Outlie  Decision Significa  Decision Unequal Normal E  Max 0.82	n(α:5%) ers Detected n(α:5%) nt Effect n(α:1%) Variances Distribution  Std Err 0.0107	CV% 3.03%	0.00%
Auxiliary Test Auxiliary Test Attribute Outlier ANOVA Table Source Between Error Total ANOVA Assur Attribute Variance Distribution Benzo(b)fluor Sample	Test Grubbs Sum Sc 32.8334 4.40667 37.2401 mptions Tests Test Variance Shapiro ranthene Sum Code	e Ratio F Te-Wilk W No	Mean 32.83 0.550 est rmality Te	st 95	% LCL 756	Test Stat 1.6  DF 1 8 9  Test Stat 1940 0.888	Critical 2.29  F Stat 59.6  Critical 23.2 0.741  Median	P-Value 0.9059  P-Value 5.6E-05  P-Value <1.0E-05 0.1599  Min	Decision No Outlie  Decision Significa  Decision Unequal Normal [	n(α:5%) ers Detected n(α:5%) nt Effect n(α:1%) Variances Distribution	CV%	0.00%
Auxiliary Test Auxiliary Test Attribute Outlier ANOVA Table Source Between Error Total ANOVA Assurattribute Variance Distribution Benzo(b)fluor Sample IOSN 2019 AT3-098	Test Grubbs Sum Sc 32.8334 4.40667 37.2401 mptions Tests Test Variance Shapiro code	e Ratio F Te-Wilk W No	Mean 32.83 0.550 est rmality Te  Mean 0.786	st 95°	% LCL 756	Test Stat  1.6  DF  1 8 9  Test Stat 1940 0.888  95% UCL 0.816	Critical 2.29  F Stat 59.6  Critical 23.2 0.741  Median 0.78	P-Value  0.9059  P-Value  5.6E-05  P-Value  <1.0E-05 0.1599  Min  0.765	Decision No Outlie  Decision Significa  Decision Unequal Normal E  Max 0.82	n(α:5%) ers Detected n(α:5%) nt Effect n(α:1%) Variances Distribution  Std Err 0.0107	CV% 3.03%	0.00%
Auxiliary Test Auxiliary Test Attribute Outlier ANOVA Table Source Between Error Total ANOVA Assurattribute Variance Distribution Benzo(b)fluor Sample IOSN 2019 AT3-098	Test Grubbs Sum Sc 32.8334 4.40667 37.2401 mptions Tests Variance Shapiro ranthene Sum Code RS	e Ratio F Te-Wilk W No	Mean 32.83 0.550 est rmality Te  Mean 0.786	st 95'	% LCL 756	Test Stat  1.6  DF  1 8 9  Test Stat 1940 0.888  95% UCL 0.816	Critical 2.29  F Stat 59.6  Critical 23.2 0.741  Median 0.78	P-Value  0.9059  P-Value  5.6E-05  P-Value  <1.0E-05 0.1599  Min  0.765	Decision No Outlie  Decision Significa  Decision Unequal Normal E  Max 0.82	n(α:5%) ers Detected n(α:5%) nt Effect n(α:1%) Variances Distribution  Std Err 0.0107	CV% 3.03%	0.00%
Auxiliary Test Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assurattribute Variance Distribution  Benzo(b)fluor Sample IOSN 2019 AT3-098  Benzo(b)fluor	Test Grubbs Sum Sc 32.8334 4.40667 37.2401 mptions Tests Test Variance Shapiro ranthene Sum Code RS	e Ratio F Te-Wilk W Normary Count 5 5	Mean 32.83 0.550 est rmality Te  Mean 0.786 4.41	st 95° 0.7 3.1	<b>% LCL</b> 756	Test Stat 1.6  DF 1 8 9  Test Stat 1940 0.888  95% UCL 0.816 5.71	Critical 2.29  F Stat 59.6  Critical 23.2 0.741  Median 0.78 4.04	P-Value  0.9059  P-Value  5.6E-05  P-Value  <1.0E-05 0.1599  Min  0.765	Decision No Outlie  Decision Significa  Decision Unequal Normal E  Max 0.82	n(α:5%) ers Detected n(α:5%) nt Effect n(α:1%) Variances Distribution  Std Err 0.0107	CV% 3.03%	

**Report Date:** 19 Aug-23 06:45 (p 7 of 16) **Test Code/ID:** TN-23-303MnPAH / 13-3685-4237

	<b>y</b> t.	oui itopo								Т	est Co	de/ID:	TN-23-30	3MnPAH / 13	3-3685-4237
Bioaccumula	tion	Evaluation -	PAHs	- Ма	coma									EA-ES	Γ, Inc. PBC
Analysis ID: Analyzed: Edit Date:	19 <i>A</i>	2901-4695 Aug-23 6:45 May-23 22:44		Anal	ysis:	Parai	o(g,h,i)per metric-Two FF6E6369	-	FCD3E8	F54598		S Version: is Level: or ID:	CETISv 1	2.1.1	
Batch ID: Start Date: Ending Date: Test Length:	29 N	•		Prot	ocol: cies:	US A	ma nasuta	RIM (2004)			Anal Dilue Brine Sour	ent: Not e: Not	ncy Roka : Applicable : Applicable O - Aquatic		r <b>Age:</b>
Sample Code	•	Sample ID		Sam	ple Da	te	Receipt	Date	Sample	Age	Clier	it Name	Р	roject	
IOSN 2019 AT3-098		13-4648-81 07-1559-49			1ar-23 eb-23 1	3:00	08 Mar- 09 Feb-		21d 14h 49d 1h	1	Eco-	Analysts, In	ic. C	redged Sed	ment Evalu
Sample Code	•	Material Ty	уре			Samı	ole Source	Э		Station	Locati	on	Lat/Long	3	
IOSN 2019		Reference	sedim	ent		Yach	tsman Maı	rina NAE-20	004-00	IOSN Re	eferenc	e			
AT3-098		Marine Sec	liment	t		Yach	tsman Maı	rina NAE-20	004-00	10 Static	ns at 4	Marinas M	⁄lu		
Data Transfo	rm		Alt H	<del>l</del> yp					Comp	arison R	esult				PMSD
Untransforme	d		C < 1	Γ					AT3-09	98 passe	d benz	o(g,h,i)pery	lene endpo	oint	108.28%
Equal Varian	ce t T	wo-Sample	Test												
Sample I	vs	Sample II		df	Test S	Stat	Critical	MSD	P-Type	e P-V	'alue	Decision	(α:5%)		
Reference Se	d	AT3-098		8	0.998		1.86	0.561	CDF	0.17	736	Non-Sign	ificant Effec	t	
Auxiliary Tes	ts	Test						Test Stat	Critica	al P-V	'alue	Decision	(a:5%)		
Outlier		Grubbs Ex	treme	e Valu	e Test			1.87	2.29	0.39			rs Detected	1	
ANOVA Table	9														
Source		Sum Squa	res		Mean	Squa	re	DF	F Stat	P-V	'alue	Decision	(α:5%)		
Between		0.227105			0.227	105		1	0.997	0.34	473	Non-Sign	ificant Effec	ct	
Error		1.82234			0.227	792		8	_						
Total		2.04944						9							
ANOVA Assu	mpti	ons Tests													
Attribute		Test						Test Stat	Critica	al P-V	'alue	Decision	(α:1%)		
Variance Distribution		Variance R Shapiro-Wi				st		16 0.9	23.2 0.741	0.02 0.2		Equal Val Normal D	riances istribution		
Benzo(g,h,i)p	ervle				-										
Sample	•	Code	Cour	nt	Mean	,	95% LCL	95% UCL	Media	n Min	1	Max	Std Err	CV%	%Effect
IOSN 2019		RS	5		0.518		0.315	0.722	0.536	0.24		0.67	0.0732	31.59%	0.00%
AT3-098			5		0.82		0.00675	1.63	0.348	0.34		1.66	0.293	79.87%	-58.14%
Benzo(g,h,i)p	eryle	ne Detail													
Sample		Code	Rep	1	Rep 2	!	Rep 3	Rep 4	Rep 5						
IOSN 2019		RS	0.527		0.536		0.614	0.67	0.245						
AT3-098			1.66		0.347		0.348	0.345	1.4						

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Test Code/ID: TN-23-303MnPAH / 13-3685-4237

									Test Co				3-3685-423
Bioaccumula	tion Ev	valuation - I	PAHs -	Масо	oma							EA-ES	T, Inc. PBC
Analysis ID: Analyzed: Edit Date:	19 Au	572-8367 ug-23 6:45 ay-23 22:44	Α	nalys	sis: Pa	enzo(k)fluora arametric-Tw C2EE81F8C8	o Sample	-2421269DI	State	IS Versior us Level: or ID:	n: CETISv2 1	2.1.1	
Batch ID: Start Date: Ending Date: Test Length:	29 Ma 26 Ap		P S	est Ty rotoc pecie axon:	col: US	oaccumulation S ACE NED acoma nasul valvia	RIM (2004)		Anal Dilud Brin Soul	ent: No	ancy Roka ot Applicable ot Applicable RO - Aquatic	Research C	er <b>Age</b> :
Sample Code	)	Sample ID	S	ampl	e Date	Receip	t Date	Sample Ag	e Clier	nt Name	P	roject	
IOSN 2019 AT3-098		13-4648-81 07-1559-49		8 Mar 8 Feb	r-23 o-23 13:0	08 Mar 00 09 Feb		21d 14h 49d 1h	Eco-	Analysts, I	Inc. D	redged Sed	iment Evalu
Sample Code	)	Material Ty	ре		Sa	ample Source	e	Sta	tion Locati	on	Lat/Long	l	
IOSN 2019		Reference s		ıt	Ya	achtsman Ma	rina NAE-20	004-00 109	SN Reference	ce			
AT3-098		Marine Sed	iment		Ya	achtsman Ma	arina NAE-20	004-00 10	Stations at	4 Marinas	Mu		
Data Transfo	rm		Alt Hyp	)				Comparis	on Result				PMSD
Untransformed	d		C < T					AT3-098 f	ailed benzo	(k)fluorantl	hene endpoir	nt	118.39%
•	vs S	vo-Sample <sup>-</sup> Sample II AT3-098*			Test Sta		MSD	P-Type	P-Value	Decisio	•		
Reference Sec	u <i>F</i>	A 1 3-090		0 2	2.74	1.86	0.538	CDF	0.0128	Significa	ant Effect		
Auxiliary Tes		Test				1.86	Test Stat	Critical	P-Value	Decisio	n(α:5%)		
Auxiliary Test Attribute Outlier	ts					1.86				Decisio			
Auxiliary Tes	ts	Test Grubbs Ex	treme V	alue	Test		Test Stat	Critical 2.29	P-Value	Decisio	n(α:5%)		
Auxiliary Tesi Attribute Outlier ANOVA Table Source	ts	Test Grubbs Ex	treme V	alue Î	Test Mean Sc		Test Stat 2.07	Critical 2.29	P-Value 0.1724 P-Value	Decisio No Outli	n(α:5%) ers Detected n(α:5%)		
Auxiliary Test Attribute Outlier ANOVA Table Source Between	ts	Test Grubbs Ex Sum Squar 1.56935	treme V	′alue ′	Test  Mean Sc  1.56935	juare	<b>Test Stat</b> 2.07 <b>DF</b> 1	Critical 2.29	<b>P-Value</b> 0.1724	Decisio No Outli	n(α:5%) ers Detected		
Auxiliary Test Attribute Outlier ANOVA Table Source Between Error	ts	Test Grubbs Ex  Sum Squar 1.56935 1.67676	treme V	′alue ′	Test Mean Sc	juare	Test Stat 2.07  DF 1 8	Critical 2.29	P-Value 0.1724 P-Value	Decisio No Outli	n(α:5%) ers Detected n(α:5%)		
Auxiliary Test Attribute Outlier  ANOVA Table Source Between Error Total	ts	Test Grubbs Ex  Sum Squar 1.56935 1.67676 3.24611	treme V	′alue ′	Test  Mean Sc  1.56935	juare	<b>Test Stat</b> 2.07 <b>DF</b> 1	Critical 2.29	P-Value 0.1724 P-Value	Decisio No Outli	n(α:5%) ers Detected n(α:5%)		
Auxiliary Test Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assu	ts	Test Grubbs Ex  Sum Squar 1.56935 1.67676 3.24611 ns Tests	treme V	′alue ′	Test  Mean Sc  1.56935	juare	Test Stat 2.07  DF 1 8 9	Critical 2.29  F Stat 7.49	P-Value 0.1724 P-Value 0.0256	Decisio No Outli  Decisio Significa	n(α:5%) lers Detected n(α:5%) ant Effect		
Auxiliary Tesi Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assu Attribute	mptior	Test Grubbs Ex  Sum Squar 1.56935 1.67676 3.24611 ns Tests Test	res	alue N	Test  Mean Sc  1.56935	juare	Test Stat 2.07  DF 1 8 9  Test Stat	Critical 2.29  F Stat 7.49  Critical	P-Value 0.1724  P-Value 0.0256	Decisio No Outli  Decisio Significa	n(α:5%) fers Detected n(α:5%) ant Effect n(α:1%)		
Auxiliary Test Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assu	mptior	Test Grubbs Ex  Sum Squar 1.56935 1.67676 3.24611 ns Tests	res	alue 1	Test  Mean Sc 1.56935 0.209595	juare	Test Stat 2.07  DF 1 8 9	Critical 2.29  F Stat 7.49	P-Value 0.1724 P-Value 0.0256	Decisio  No Outli  Decisio  Significa  Decisio  Equal Va	n(α:5%) lers Detected n(α:5%) ant Effect		
Auxiliary Test Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assu Attribute Variance	mptior	Test Grubbs Ex  Sum Squar 1.56935 1.67676 3.24611 ns Tests Test Variance Ra Shapiro-Wil	res atio F Te	alue 1	Test  Mean Sc 1.56935 0.209595	juare	Test Stat 2.07  DF 1 8 9  Test Stat 7.85	Critical 2.29  F Stat 7.49  Critical 23.2	P-Value 0.0256  P-Value 0.0256	Decisio  No Outli  Decisio  Significa  Decisio  Equal Va	n(α:5%) fers Detected n(α:5%) ant Effect n(α:1%) ariances		
Auxiliary Test Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assu Attribute Variance Distribution	mptior	Test Grubbs Ex  Sum Squar 1.56935 1.67676 3.24611 ns Tests Test Variance Ra Shapiro-Wil	res atio F Te	M 1 C	Test  Mean Sc 1.56935 0.209595	juare	Test Stat 2.07  DF 1 8 9  Test Stat 7.85	Critical 2.29  F Stat 7.49  Critical 23.2 0.741	P-Value 0.0256  P-Value 0.0256	Decisio  No Outli  Decisio  Significa  Decisio  Equal Va	n(α:5%) fers Detected n(α:5%) ant Effect n(α:1%) ariances	CV%	%Effect
Auxiliary Test Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assu Attribute Variance Distribution  Benzo(k)fluor	mptior	Test Grubbs Ex  Sum Squar 1.56935 1.67676 3.24611 ns Tests Test Variance Ra Shapiro-Will ne Summar Code	res atio F Te	M 1 C	Test  Wean Sc 1.56935 0.209595	juare	Test Stat 2.07  DF 1 8 9  Test Stat 7.85 0.899	Critical 2.29  F Stat 7.49  Critical 23.2 0.741	P-Value 0.0256  P-Value 0.0709 0.2138	Decisio No Outli  Decisio Significa  Decisio Equal Va Normal I	n(α:5%) ers Detected n(α:5%) ant Effect n(α:1%) ariances Distribution		%Effect 0.00%
Auxiliary Test Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assu Attribute Variance Distribution  Benzo(k)fluor Sample	mptior	Test Grubbs Ex  Sum Squar 1.56935 1.67676 3.24611 ns Tests Test Variance Ra Shapiro-Wil ne Summar Code	res atio F Tek W No	M 1 C C C C C C C C C C C C C C C C C C	Test  Mean Sc 1.56935 0.209595  ty Test	juare	Test Stat 2.07  DF 1 8 9  Test Stat 7.85 0.899	Critical 2.29  F Stat 7.49  Critical 23.2 0.741  Median	P-Value 0.0256  P-Value 0.0709 0.2138	Decisio No Outli  Decisio Significa  Decisio Equal Va Normal I	n(α:5%) ers Detected n(α:5%) ant Effect n(α:1%) ariances Distribution	CV%	
Auxiliary Test Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assu Attribute Variance Distribution  Benzo(k)fluor Sample IOSN 2019	mptior	Test Grubbs Ex  Sum Squar 1.56935 1.67676 3.24611 ns Tests Test Variance Ra Shapiro-Will ne Summar Code RS	res atio F Telk W No	M 1 C C C C C C C C C C C C C C C C C C	Test  Mean Sc 1.56935 0.209595  ty Test  Mean 0.455	guare  95% LCL  0.185	Test Stat 2.07  DF 1 8 9  Test Stat 7.85 0.899  95% UCL 0.725	Critical 2.29  F Stat 7.49  Critical 23.2 0.741  Median 0.359	P-Value 0.0256  P-Value 0.0709 0.2138  Min 0.351	Decisio No Outli  Decisio Significa  Decisio Equal Va Normal I	n(α:5%) lers Detected n(α:5%) ant Effect n(α:1%) ariances Distribution Std Err 0.0973	<b>CV%</b> 47.86%	0.00%
Auxiliary Test Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assu Attribute Variance Distribution  Benzo(k)fluor Sample IOSN 2019 AT3-098	mptior	Test Grubbs Ex  Sum Squar 1.56935 1.67676 3.24611 ns Tests Test Variance Ra Shapiro-Will ne Summar Code RS	res atio F Telk W No	M 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Test  Mean Sc 1.56935 0.209595  ty Test  Mean 0.455	guare  95% LCL  0.185	Test Stat 2.07  DF 1 8 9  Test Stat 7.85 0.899  95% UCL 0.725	Critical 2.29  F Stat 7.49  Critical 23.2 0.741  Median 0.359	P-Value 0.0256  P-Value 0.0709 0.2138  Min 0.351	Decisio No Outli  Decisio Significa  Decisio Equal Va Normal I	n(α:5%) lers Detected n(α:5%) ant Effect n(α:1%) ariances Distribution Std Err 0.0973	<b>CV%</b> 47.86%	0.00%
Auxiliary Test Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assu Attribute Variance Distribution  Benzo(k)fluor Sample IOSN 2019 AT3-098  Benzo(k)fluor	mptior	Test Grubbs Ex  Sum Squar 1.56935 1.67676 3.24611 ns Tests Variance Ra Shapiro-Wil ne Summar Code RS  ne Detail Code	res atio F Te k W No  Count 5 5	M 1 C C C C C C C C C C C C C C C C C C	Test  Mean Sc 1.56935 0.209595  ty Test  Mean 0.455 1.25	95% LCL 0.185 0.49	Test Stat 2.07  DF 1 8 9  Test Stat 7.85 0.899  95% UCL 0.725 2	Critical 2.29  F Stat 7.49  Critical 23.2 0.741  Median 0.359 1.08	P-Value 0.0256  P-Value 0.0709 0.2138  Min 0.351	Decisio No Outli  Decisio Significa  Decisio Equal Va Normal I	n(α:5%) lers Detected n(α:5%) ant Effect n(α:1%) ariances Distribution Std Err 0.0973	<b>CV%</b> 47.86%	0.00%

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Test Code/ID: TN-23-303MnPAH / 13-3685-4237

	, , , , , , , , , , , , , , , , , , , ,						Test Co	de/ID:	TN-23-303	MnPAH / 1	3-3685-4237
Bioaccumula	tion Evaluation	ı - PAHs - N	lacoma							EA-ES	Γ, Inc. PBC
Analysis ID: Analyzed: Edit Date:	19-9439-8456 19 Aug-23 6:4 08 May-23 22:	5 <b>A</b> r	idpoint: ialysis: D5 Hash:	Chrysene Parametric-Two B1108F814D75		39DD0B743I	Statu	S Version: us Level: or ID:	CETISv2	!.1.1	
Batch ID: Start Date: Ending Date: Test Length:	07-2064-6975 29 Mar-23 13:4 26 Apr-23 12:4 27d 23h	47 <b>Pr</b> 47 <b>S</b> p	st Type: otocol: pecies: xon:	Bioaccumulatio US ACE NED F Macoma nasuta Bivalvia	RIM (2004)		Anal Dilue Brine Sour	ent: Not e: Not	ncy Roka Applicable Applicable O - Aquatic l	Research C	r Age:
Sample Code	Sample	ID Sa	mple Dat	e Receipt	t Date	Sample Ag	e Clier	nt Name	Pı	oject	
IOSN 2019 AT3-098	13-4648- 07-1559-		Mar-23 Feb-23 1	08 Mar- 3:00 09 Feb-		21d 14h 49d 1h	Eco-	Analysts, In	ic. Di	redged Sed	iment Evalu
Sample Code	e Material	Туре		Sample Sourc	e	Sta	ation Locati	on	Lat/Long		
IOSN 2019 AT3-098	Reference Marine S	ce sediment Sediment		Yachtsman Ma Yachtsman Ma			SN Reference Stations at 4		1u		
Data Transfor	rm	Alt Hyp				Comparis	son Result				PMSD
Untransformed	d	C < T				AT3-098 f	ailed chryse	ne endpoin	t		72.29%
Unequal Vari	ance t Two-Sai	nple Test									
Sample I	vs Sample I	l c	If Test S	Stat Critical	MSD	P-Type	P-Value	Decision	(α:5%)		
Reference Sec	d AT3-098*	3	3 12.1	2.35	0.398	CDF	0.0006	Significan	t Effect		
ANOVA Table	<del></del>										
Source	Sum Sq	uares	Mean	Square	DF	F Stat	P-Value	Decision	(α:5%)		
Between	9.248		9.248	-	1	189	<1.0E-05	Significar	t Effect		
Error	0.343		0.049		7	_					
Total	9.591				8						
ANOVA Assu	mptions Tests										
Attribute	Test				Test Stat	Critical	P-Value	Decision	(α:1%)		
Variance		Ratio F Te			380	24.3	4.6E-05	Unequal \			
Distribution	Shapiro-	Wilk W Nor	mality Tes	st	0.775	0.701	0.0107	Normal D	istribution		
Chrysene Sui	mmary										
Sample	Code	Count	Mean		95% UCL		Min	Max	Std Err	CV%	%Effect
IOSN 2019	RS	5	0.55	0.528	0.572	0.545	0.535	0.575	0.00775	3.15%	0.00%
		4	2.59	2.05	3.13	2.42	2.36	3.09	0.169	13.03%	-370.91%
AT3-098											
Chrysene Det	tail										
	tail Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
Chrysene Det		Rep 1 0.545	<b>Rep 2</b> 0.56 2.49	Rep 3 0.535 2.36	<b>Rep 4</b> 0.575 3.09	Rep 5 0.535 2.42					

Report Date: 19 Test Code/ID: TN-23

19 Aug-23 06:45 (p 10 of 16) TN-23-303MnPAH / 13-3685-4237

Bioaccumulation Evaluation - PAHs - Macoma EA-EST. Inc. PBC CETISv2.1.1 Analysis ID: 04-5124-3396 Endpoint: Dibenz(a,h)anthracene **CETIS Version:** Analyzed: Parametric-Two Sample 19 Aug-23 6:45 Analysis: Status Level: MD5 Hash: 2095720A7786D968BC7EBB4D69170523 **Edit Date: Editor ID:** 08 May-23 22:44 Batch ID: 07-2064-6975 Test Type: Bioaccumulation - PAHs Nancy Roka Analyst: Start Date: 29 Mar-23 13:47 Protocol: US ACE NED RIM (2004) Diluent: Not Applicable Ending Date: 26 Apr-23 12:47 Species: Macoma nasuta Brine: Not Applicable Test Length: 27d 23h Taxon: Bivalvia Source: ARO - Aquatic Research Or Age: Sample Date Sample Code Sample ID Receipt Date Sample Age Client Name **Project IOSN 2019** 13-4648-8170 08 Mar-23 08 Mar-23 21d 14h Eco-Analysts, Inc. Dredged Sediment Evalu AT3-098 07-1559-4974 08 Feb-23 13:00 09 Feb-23 16:30 49d 1h Sample Code **Material Type** Sample Source Station Location Lat/Long **IOSN 2019** Reference sediment Yachtsman Marina NAE-2004-00 **IOSN Reference** AT3-098 Marine Sediment Yachtsman Marina NAE-2004-00 10 Stations at 4 Marinas Mu **Data Transform PMSD** Alt Hyp Comparison Result Untransformed C < T AT3-098 passed dibenz(a,h)anthracene endpoint 3.08% **Unequal Variance t Two-Sample Test** Sample I Sample II df Test Stat Critical **MSD** P-Type P-Value Decision(a:5%) AT3-098 0.0913 1.0000 Reference Sed -59.9 2.13 CDF Non-Significant Effect **Auxiliary Tests** Attribute Test Test Stat Critical P-Value Decision(a:5%) 2.25 2.29 Outlier Grubbs Extreme Value Test 0.0628 No Outliers Detected **ANOVA Table** Source DF P-Value **Sum Squares** Mean Square F Stat Decision(a:5%) Between 16.4558 16.4558 3590 Significant Effect 1 <1.0E-05 0.0367037 0.004588 8 Error Total 16.4925 9 **ANOVA Assumptions Tests Attribute** Test Stat Critical P-Value Decision(a:1%) Variance Variance Ratio F Test 199 23.2 0.0001 **Unequal Variances** 0.882 0.741 0.1367 Distribution Shapiro-Wilk W Normality Test Normal Distribution Dibenz(a,h)anthracene Summary Sample Code Count 95% LCL 95% UCL Median Min Max Std Err CV% %Effect Mean **IOSN 2019** RS 2.97 2.86 0.00% 5 2.85 3.08 2.95 3.11 0.0427 3.22% AT3-098 5 0.4 0.392 0.409 0.402 0.39 0.409 0.00303 1.69% 86.50% Dibenz(a,h)anthracene Detail Sample Code Rep 1 Rep 2 Rep 3 Rep 4 Rep 5 IOSN 2019 RS 2.95 2.86 3 2.91 3.11 AT3-098 0.39 0.402 0.403 0.399 0.409

Report Date: Test Code/ID: TN-2

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Bioaccumulation Evaluation - PAHs - Macoma EA-EST. Inc. PBC CETISv2.1.1 Analysis ID: 05-6250-1207 Endpoint: Fluoranthene **CETIS Version:** Analyzed: Parametric-Two Sample 19 Aug-23 6:45 Analysis: Status Level: MD5 Hash: C656B55B4D6FA492965B4472C7B4590E **Edit Date: Editor ID:** 08 May-23 22:44 Batch ID: 07-2064-6975 Nancy Roka **Test Type:** Bioaccumulation - PAHs Analyst: Start Date: 29 Mar-23 13:47 Protocol: US ACE NED RIM (2004) Diluent: Not Applicable Ending Date: 26 Apr-23 12:47 Species: Macoma nasuta Brine: Not Applicable Test Length: 27d 23h Taxon: Bivalvia Source: ARO - Aquatic Research Or Age: Sample Date Sample Code Sample ID Receipt Date Sample Age Client Name Project **IOSN 2019** 13-4648-8170 08 Mar-23 08 Mar-23 21d 14h Eco-Analysts, Inc. Dredged Sediment Evalu AT3-098 07-1559-4974 08 Feb-23 13:00 09 Feb-23 16:30 49d 1h Sample Code **Material Type** Sample Source Station Location Lat/Long **IOSN 2019** Reference sediment Yachtsman Marina NAE-2004-00 **IOSN Reference** AT3-098 Marine Sediment Yachtsman Marina NAE-2004-00 10 Stations at 4 Marinas Mu **Data Transform PMSD** Alt Hyp Comparison Result Untransformed C < T AT3-098 failed fluoranthene endpoint 438.62% **Unequal Variance t Two-Sample Test** Sample I Sample II df Test Stat Critical MSD P-Type P-Value Decision(a:5%) AT3-098\* 5.63 CDF 0.0025 Reference Sed 2.13 9.29 Significant Effect **Auxiliary Tests** Attribute Test Test Stat Critical P-Value Decision(a:5%) 1.82 2.29 Outlier Grubbs Extreme Value Test 0.4607 No Outliers Detected **ANOVA Table** Source DF **Sum Squares** Mean Square F Stat P-Value Decision(a:5%) Between 31.7 0.0005 Significant Effect 1503.32 1503.32 1 8 Error 379.786 47.4733 Total 1883.11 9 **ANOVA Assumptions Tests Attribute** Test Stat Critical P-Value Decision(a:1%) Variance Variance Ratio F Test 490 23.2 2.5E-05 **Unequal Variances** Distribution 0.884 0.741 Shapiro-Wilk W Normality Test 0.1467 Normal Distribution Fluoranthene Summary Sample Code Count 95% LCL 95% UCL Median Min Max Std Err CV% %Effect Mean **IOSN 2019** RS 5 2.12 2.48 0.197 0.00% 1.57 2.66 2.23 1.38 20.77% AT3-098 5 26.6 14.6 38.7 26.1 14.8 36.8 4.35 36.54% -1157.79% Fluoranthene Detail Sample Code Rep 1 Rep 2 Rep 3 Rep 4 Rep 5 IOSN 2019 RS 2.09 2.23 2 48 2.41 1.38 AT3-098 26.1 19.6 35.9 36.8 14.8

Report Date: Test Code/ID: 19 Aug-23 06:45 (p 12 of 16) TN-23-303MnPAH / 13-3685-4237

Bioaccumulat	ion Evaluation	- PAHs - N	/lacoma							EA-ES	T, Inc. PBC
Analysis ID: Analyzed: Edit Date:	14-9364-0252 19 Aug-23 6:45 08 May-23 22:4	Ar	ndpoint: nalysis: D5 Hash:	Fluorene Parametric-Tv 50355D2D139	•	2D52468F3	State	IS Versior us Level: or ID:	n: CETISv2	2.1.1	
Batch ID: Start Date: Ending Date: Test Length:	07-2064-6975 29 Mar-23 13:4 26 Apr-23 12:4 27d 23h	7 <b>Pr</b> 7 <b>S</b> p	est Type: rotocol: pecies: xon:	Bioaccumulati US ACE NED Macoma nasu Bivalvia	RIM (2004)		Anal Dilu Brin Sou	ent: No e: No	ancy Roka ot Applicable ot Applicable RO - Aquatic	Research C	Or <b>Age:</b>
Sample Code IOSN 2019 AT3-098	Sample I 13-4648-8 07-1559-4	3170 08	ample Da Mar-23 Feb-23 1	08 Ma	r-23	<b>Sample Ag</b> 21d 14h 49d 1h		nt Name Analysts, I		roject redged Sed	iment Evalu
Sample Code IOSN 2019 AT3-098	Material Reference	e sediment	i	Sample Sour Yachtsman M Yachtsman M	arina NAE-20	004-00 10	ation Locati SN Reference Stations at	е	<b>Lat/Long</b> Mu		
Data Transfor	m	Alt Hyp				Comparis	son Result				PMSD
Untransformed		C < T				AT3-098 f	failed fluorer	ne endpoin	nt		374.23%
	vs Sample II AT3-098*		df Test \$	Stat Critical 2.13	<b>MSD</b> 0.945	P-Type CDF	<b>P-Value</b> 0.0143	<b>Decisio</b> Significa	n(α:5%) ant Effect		
Auxiliary Test Attribute	Test		alua Taak		Test Stat		P-Value		n(α:5%)		
Outlier  ANOVA Table	Grupps i	Extreme Va	alue l'est		1.91	2.29	0.3362	No Outil	ers Detected		
Source	Sum Squ	iares	Mean	Square	DF	F Stat	P-Value	Decisio	n(α:5%)		
Between Error Total	5.51158 3.93249 9.44406		5.511 0.491		1 8 9	11.2 —	0.0101	Significa	ant Effect		
ANOVA Assur	mptions Tests Test				Test Stat	Critical	P-Value	Decisio	n(α:1%)		
Variance Distribution		Ratio F Te Vilk W Nor		st	17100 0.886	23.2 0.741	<1.0E-05 0.1543		l Variances Distribution		
Fluorene Sum	mary										
Sample	Code	Count	Mean		. 95% UCL		Min	Max	Std Err	CV%	%Effect
IOSN 2019 AT3-098	RS	5 5	0.253 1.74	0.243 0.506	0.262 2.97	0.251 1.27	0.245 0.882	0.263 3	0.00339 0.443	3.00% 57.07%	0.00% -587.81%
Fluorene Deta	nil										
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
IOSN 2019 AT3-098	RS	0.251 0.935	0.258 1.27	0.247 2.6	0.263 3	0.245 0.882					

**Report Date:** 19 Aug-23 06:45 (p 13 of 16) **Test Code/ID:** TN-23-303MnPAH / 13-3685-4237

Bioaccumulati	on Evaluation	- PAHs - N	lacoma							EA-ES	Γ, Inc. PBC
. ,	07-5576-6393		•	Indeno(1,2,3-c	,. ·	_		S Version		2.1.1	
•	19 Aug-23 6:45 08 May-23 22:4		•	Nonparametric 6E4371FDEEA				s Level:	1		
						D7 CZOLI O					
	07-2064-6975			Bioaccumulation			Anal		ancy Roka		
	29 Mar-23 13:4		otocol:	US ACE NED	` ,		Dilue		ot Applicable		
Ending Date:	•	•	ecies:	Macoma nasu	a		Brine		ot Applicable		
Test Length:	27d 23h	Ta	kon:	Bivalvia			Sour	ce: AF	RO - Aquatic	Research C	r Age:
Sample Code	Sample I	D Sa	mple Dat	e Receip	t Date	Sample Ag	e Clien	t Name	Pı	roject	
IOSN 2019	13-4648-		Mar-23	08 Mar		21d 14h	Eco-/	Analysts, I	Inc. D	redged Sed	iment Evalı
AT3-098	07-1559-	4974 08	Feb-23 1	3:00 09 Feb	-23 16:30	49d 1h					
Sample Code	Material	Туре		Sample Source	e	Sta	ation Location	on	Lat/Long		
IOSN 2019	Referenc	e sediment		Yachtsman Ma			SN Referenc	е			
AT3-098	Marine S	ediment		Yachtsman Ma	arina NAE-20	04-00 10	Stations at 4	Marinas	Mu		
Data Transforr	n	Alt Hyp				Comparis	son Result				PMSD
Untransformed		C < T				AT3-098	passed inder	no(1,2,3-c	d)pyrene end	point	10.85%
Wilcoxon Ran	k Sum Two-Sa	mple Test									
		•	f Test S	stat Critical	Ties	P-Type	P-Value	Decisio	n(α:5%)		
Samble i v	's Samble II					, , , ,			( )		
Sample I v	AT3-098	8			0	Exact	1.0000	Non-Sig	nificant Effec	t	
Reference Sed	AT3-098				0	Exact	1.0000	Non-Sig	nificant Effec	t	
•	AT3-098				0 Test Stat		1.0000 P-Value		nificant Effect	t	
Reference Sed  Auxiliary Tests	AT3-098  Test		40						n(α:5%)	t	
Reference Sed  Auxiliary Tests  Attribute	AT3-098  Test	8	40		Test Stat	Critical	P-Value	Decisio	n(α:5%)	t	
Reference Sed  Auxiliary Tests  Attribute  Outlier	AT3-098  Test	8 Extreme Va	40		Test Stat	Critical	P-Value	Decisio	n(α:5%) Detected	t	
Reference Sed  Auxiliary Tests  Attribute  Outlier  ANOVA Table	AT3-098  Test  Grubbs I	8 Extreme Va	40	 Square	Test Stat	Critical 2.29	<b>P-Value</b> 0.0405	Decisio Outlier D	n(α:5%) Detected	t	
Reference Sed  Auxiliary Tests  Attribute  Outlier  ANOVA Table  Source	AT3-098  Test  Grubbs I	8 Extreme Va	40 lue Test Mean	Square	Test Stat 2.32	Critical 2.29	P-Value 0.0405 P-Value	Decisio Outlier D	n(α:5%) Detected n(α:5%)	t	
Reference Sed  Auxiliary Tests  Attribute  Outlier  ANOVA Table  Source  Between	AT3-098  Test  Grubbs I  Sum Squ  16.3456	8 Extreme Va	40 lue Test Mean 16.345	Square	Test Stat 2.32  DF 1	Critical 2.29	P-Value 0.0405 P-Value	Decisio Outlier D	n(α:5%) Detected n(α:5%)	t	
Auxiliary Tests Attribute Outlier ANOVA Table Source Between Error	AT3-098  Test  Grubbs I  Sum Squ  16.3456 0.85448 17.2001	8 Extreme Va	40 lue Test Mean 16.345	Square	Test Stat 2.32  DF 1 8	Critical 2.29	P-Value 0.0405 P-Value	Decisio Outlier D	n(α:5%) Detected n(α:5%)	t	
Auxiliary Tests Attribute Outlier ANOVA Table Source Between Error Total	AT3-098  Test  Grubbs I  Sum Squ  16.3456 0.85448 17.2001	8 Extreme Va	40 lue Test Mean 16.345	Square	Test Stat 2.32  DF 1 8	Critical 2.29  F Stat 153	P-Value 0.0405 P-Value	Decisio Outlier E  Decisio Significa	n(α:5%) Detected n(α:5%)	t	
Auxiliary Tests Attribute Outlier ANOVA Table Source Between Error Total ANOVA Assum	AT3-098  Test  Grubbs  Sum Squ  16.3456 0.85448 17.2001  Inptions Tests  Test	8 Extreme Va	40 lue Test Mean 16.345 0.1068	Square	Test Stat 2.32  DF 1 8 9	Critical 2.29  F Stat 153	P-Value 0.0405 P-Value <1.0E-05	Decisio Outlier D Decisio Significa	n(α:5%) Detected  n(α:5%) ant Effect	t	
Auxiliary Tests Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assum Attribute	AT3-098  Test Grubbs  Sum Squ 16.3456 0.85448 17.2001  Inptions Tests Test Variance	Extreme Va	40 lue Test  Mean 16.345 0.1068	<b>Square</b> 56 31	Test Stat 2.32  DF 1 8 9	Critical 2.29  F Stat 153  Critical	P-Value 0.0405  P-Value <1.0E-05	Decisio  Decisio  Significa  Decisio  Equal Va	n(α:5%) Detected  n(α:5%) ant Effect  n(α:1%)		
Auxiliary Tests Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assun Attribute Variance Distribution	Sum Squ 16.3456 0.85448 17.2001 nptions Tests Test Variance Shapiro-V	Extreme Values  Jares  Ratio F Tee  Vilk W Nori	40 lue Test  Mean 16.345 0.1068	<b>Square</b> 56 31	Test Stat 2.32  DF 1 8 9  Test Stat 2.97	Critical 2.29  F Stat 153  Critical 23.2	P-Value 0.0405  P-Value <1.0E-05  P-Value 0.3164	Decisio  Decisio  Significa  Decisio  Equal Va	n(α:5%) Detected  n(α:5%) ant Effect  n(α:1%) ariances		
Auxiliary Tests Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assun Attribute Variance Distribution	Sum Squ 16.3456 0.85448 17.2001 nptions Tests Test Variance Shapiro-V	Extreme Values  Jares  Ratio F Tee  Vilk W Nori	40 lue Test  Mean 16.345 0.1068	<b>Square</b> 56 31	Test Stat 2.32  DF 1 8 9  Test Stat 2.97 0.692	Critical 2.29  F Stat 153  Critical 23.2 0.741	P-Value 0.0405  P-Value <1.0E-05  P-Value 0.3164	Decisio  Decisio  Significa  Decisio  Equal Va	n(α:5%) Detected  n(α:5%) ant Effect  n(α:1%) ariances		%Effect
Reference Sed  Auxiliary Tests Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assum Attribute Variance Distribution  Indeno(1,2,3-c	Sum Squ 16.3456 0.85448 17.2001 nptions Tests Test Variance Shapiro-V	Extreme Va  Jares  Ratio F Tee  Vilk W Norn  mary	Mean 16.345 0.1068	Square 566 31	Test Stat 2.32  DF 1 8 9  Test Stat 2.97 0.692	Critical 2.29  F Stat 153  Critical 23.2 0.741	P-Value 0.0405  P-Value <1.0E-05  P-Value 0.3164 0.0007	Decisio Significa  Decisio Equal Va Non-Nor	n(α:5%) Detected  n(α:5%) ant Effect  n(α:1%) ariances rmal Distributi	ion	%Effect 0.00%
Reference Sed  Auxiliary Tests Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assun Attribute Variance Distribution  Indeno(1,2,3-c Sample	AT3-098  Test Grubbs I  Sum Squ 16.3456 0.85448 17.2001  Inptions Tests Test Variance Shapiro-V  d)pyrene Sum Code	Extreme Valuares  Ratio F Tere Vilk W Norre mary Count	Mean 16.345 0.1068	 Square 56 31 st 95% LCL	Test Stat 2.32  DF 1 8 9  Test Stat 2.97 0.692  95% UCL	Critical 2.29  F Stat 153  Critical 23.2 0.741  Median	P-Value 0.0405  P-Value <1.0E-05  P-Value 0.3164 0.0007  Min	Decisio  Decisio  Significa  Decisio  Equal Va  Non-Nor	n(α:5%) Detected  n(α:5%) ant Effect  n(α:1%) ariances rmal Distributi	ion	
Reference Sed  Auxiliary Tests Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assun Attribute Variance Distribution  Indeno(1,2,3-c Sample IOSN 2019	AT3-098  Test Grubbs I  Sum Squ 16.3456 0.85448 17.2001  Inptions Tests Test Variance Shapiro-V  d)pyrene Sum Code RS	Extreme Valuares  Ratio F Ter Vilk W Norr mary Count 5 5	Mean 16.345 0.1068 st mality Tes  Mean 3.54	Square 56 31 95% LCL 3.25	Test Stat 2.32  DF 1 8 9  Test Stat 2.97 0.692  95% UCL 3.83	Critical 2.29  F Stat 153  Critical 23.2 0.741  Median 3.46	P-Value 0.0405  P-Value <1.0E-05  P-Value 0.3164 0.0007  Min 3.35	Decisio Significa  Decisio Equal Va Non-Nor	n(α:5%) Detected  n(α:5%) ant Effect  n(α:1%) ariances rmal Distributi  Std Err  0.104	ion  CV%  6.55%	0.00%
Auxiliary Tests Attribute Outlier ANOVA Table Source Between Error Total  ANOVA Assun Attribute Variance Distribution Indeno(1,2,3-c) Sample IOSN 2019 AT3-098	AT3-098  Test Grubbs I  Sum Squ 16.3456 0.85448 17.2001  Inptions Tests Test Variance Shapiro-V  d)pyrene Sum Code RS	Extreme Valuares  Ratio F Ter Vilk W Norr mary Count 5 5	Mean 16.345 0.1068 st mality Tes  Mean 3.54	Square 56 31 95% LCL 3.25 0.489	Test Stat 2.32  DF 1 8 9  Test Stat 2.97 0.692  95% UCL 3.83	Critical 2.29  F Stat 153  Critical 23.2 0.741  Median 3.46	P-Value 0.0405  P-Value <1.0E-05  P-Value 0.3164 0.0007  Min 3.35	Decisio Significa  Decisio Equal Va Non-Nor	n(α:5%) Detected  n(α:5%) ant Effect  n(α:1%) ariances rmal Distributi  Std Err  0.104	ion  CV%  6.55%	0.00%
Auxiliary Tests Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assum Attribute Variance Distribution Indeno(1,2,3-c Sample IOSN 2019 AT3-098 Indeno(1,2,3-c	AT3-098  Test Grubbs I  Sum Squ 16.3456 0.85448 17.2001  Inptions Tests Test Variance Shapiro-V d)pyrene Sum Code RS  d)pyrene Deta	Extreme Valuares  Ratio F Tervilk W Normary  Count 5 5	40    Mean	Square 56 31 95% LCL 3.25 0.489	Test Stat 2.32  DF 1 8 9  Test Stat 2.97 0.692  95% UCL 3.83 1.48	Critical 2.29  F Stat 153  Critical 23.2 0.741  Median 3.46 0.81	P-Value 0.0405  P-Value <1.0E-05  P-Value 0.3164 0.0007  Min 3.35	Decisio Significa  Decisio Equal Va Non-Nor	n(α:5%) Detected  n(α:5%) ant Effect  n(α:1%) ariances rmal Distributi  Std Err  0.104	ion  CV%  6.55%	0.00%

Report Date: 19 Aug-23 06:45 (p 14 of 16)
Test Code/ID: TN-23-303MnPAH / 13-3685-4237

Bioaccumulati	ion Evaluation	- PAHs - N	lacoma							EA-ES	Γ, Inc. PBC
	12-2133-3190		dpoint:	Naphthalene			CETI	S Versior	: CETISv2	2.1.1	
•	19 Aug-23 6:45		alysis:	Parametric-Tw				ıs Level:	1		
Edit Date:	08 May-23 22:4	14 <b>M</b> C	)5 Hash:	18048F756F90	04A0CF0BB	10D204271	968 Edito	or ID:			
Batch ID:	07-2064-6975	Te	st Type:	Bioaccumulation	on - PAHs		Analy	yst: Na	ncy Roka		
Start Date:	29 Mar-23 13:4	7 <b>Pr</b>	otocol:	US ACE NED	RIM (2004)		Dilue	ent: No	t Applicable		
Ending Date:	•	7 <b>Sp</b>	ecies:	Macoma nasut	a		Brine	e: No	t Applicable		
Test Length:	27d 23h	Tax	kon:	Bivalvia			Sour	ce: AF	RO - Aquatic	Research O	r <b>Age:</b>
Sample Code	Sample I	D Sa	mple Dat	e Receip	t Date	Sample Ag	e Clien	t Name	P	roject	
IOSN 2019	13-4648-	8170 08	Mar-23	08 Mar	-23	21d 14h	Eco-/	Analysts, I	nc. D	redged Sedi	ment Evalu
AT3-098	07-1559-	4974 08	Feb-23 1	3:00 09 Feb	-23 16:30	49d 1h					
Sample Code	Material	Туре		Sample Source	e	Sta	ation Location	on	Lat/Long		
IOSN 2019	Referenc	e sediment		Yachtsman Ma	ırina NAE-20	04-00 108	SN Referenc	е			
AT3-098	Marine S	ediment		Yachtsman Ma	rina NAE-20	004-00 10	Stations at 4	Marinas	Mu		
Data Transforr	m	Alt Hyp				Comparis	son Result				PMSD
Untransformed		C < T				AT3-098 f	ailed naphth	alene end	point		53.20%
Unequal Varia	nce t Two-San	nple Test									
<b>-</b>			f Test S	tat Critical	MSD	P-Type	P-Value	Decision	n(α:5%)		
Sample I v	s Sample II	d				, , , ,	· · · · · · · · · · · · · · · · · · · ·		(۵.070)		
Sample I v Reference Sed	AT3-098*	d		2.13	0.207	CDF	7.2E-05	Significa	nt Effect		
Reference Sed	AT3-098*				0.207	CDF	7.2E-05	Significa	nt Effect		
•	AT3-098*				0.207 Test Stat		7.2E-05 <b>P-Value</b>	Significa			
Reference Sed  Auxiliary Tests	AT3-098* s Test		14.2					Decision			
Reference Sed  Auxiliary Tests  Attribute	AT3-098* s Test	4	14.2		Test Stat	Critical	P-Value	Decision	n(α:5%)		
Reference Sed  Auxiliary Tests  Attribute  Outlier	AT3-098* s Test	4 Extreme Va	14.2		Test Stat	Critical	P-Value	Decision	n(α:5%) ers Detected		
Auxiliary Tests Attribute Outlier ANOVA Table	AT3-098* s Test Grubbs I	4 Extreme Va	14.2	2.13 Square	Test Stat 2.18	Critical 2.29	<b>P-Value</b> 0.0978	Decision  No Outlin  Decision	n(α:5%) ers Detected		
Auxiliary Tests Attribute Outlier ANOVA Table Source	AT3-098* s Test Grubbs I	Extreme Va	14.2	2.13  Square	Test Stat 2.18	Critical 2.29	P-Value 0.0978 P-Value	Decision  No Outlin  Decision	n(α:5%) ers Detected n(α:5%)		
Reference Sed  Auxiliary Tests  Attribute  Outlier  ANOVA Table  Source  Between	AT3-098*  S  Test  Grubbs I  Sum Squ  4.73619	Extreme Va	14.2 lue Test  Mean  4.736	2.13  Square	<b>Test Stat</b> 2.18 <b>DF</b> 1	Critical 2.29	P-Value 0.0978 P-Value	Decision  No Outlin  Decision	n(α:5%) ers Detected n(α:5%)		
Auxiliary Tests Attribute Outlier ANOVA Table Source Between Error	AT3-098*  Sum Squ 4.73619 0.189077 4.92527	Extreme Va	14.2 lue Test  Mean  4.736	2.13  Square	Test Stat 2.18  DF 1 8	Critical 2.29	P-Value 0.0978 P-Value	Decision  No Outlin  Decision	n(α:5%) ers Detected n(α:5%)		
Auxiliary Tests Attribute Outlier ANOVA Table Source Between Error Total	AT3-098*  Sum Squ 4.73619 0.189077 4.92527	Extreme Va	14.2 lue Test  Mean  4.736	2.13  Square	Test Stat 2.18  DF 1 8	Critical 2.29  F Stat 200	P-Value 0.0978 P-Value	Decision  No Outlin  Decision	n(α:5%) ers Detected n(α:5%) nt Effect		
Auxiliary Tests Attribute Outlier ANOVA Table Source Between Error Total ANOVA Assum	AT3-098*  Test  Grubbs  Sum Squ  4.73619  0.189077  4.92527  Inptions Tests  Test	Extreme Va	14.2 lue Test  Mean 4.736 0.0236	2.13  Square	Test Stat 2.18  DF 1 8 9	Critical 2.29  F Stat 200	P-Value 0.0978 P-Value <1.0E-05	Decision  Decision  Signification	n(α:5%) ers Detected n(α:5%) nt Effect		
Auxiliary Tests Attribute Outlier ANOVA Table Source Between Error Total ANOVA Assum Attribute	AT3-098*  Test  Grubbs  Sum Squ  4.73619  0.189077  4.92527  Inptions Tests  Test  Variance	Extreme Va	14.2  lue Test  Mean  4.736  0.0236	2.13  Square 19 3347	Test Stat 2.18  DF 1 8 9	Critical 2.29  F Stat 200  Critical	P-Value 0.0978  P-Value <1.0E-05	Decision Signification Decision Unequal	n(a:5%) ers Detected n(a:5%) int Effect n(a:1%)		
Auxiliary Tests Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assum Attribute Variance	AT3-098*  Test  Grubbs I  Sum Squ  4.73619  0.189077  4.92527  Inptions Tests  Test  Variance  Shapiro-V	Extreme Va	14.2  lue Test  Mean  4.736  0.0236	2.13  Square 19 3347	Test Stat 2.18  DF 1 8 9  Test Stat 338	Critical 2.29  F Stat 200  Critical 23.2	P-Value 0.0978  P-Value <1.0E-05  P-Value 5.2E-05	Decision Signification Decision Unequal	n(α:5%) ers Detected n(α:5%) int Effect n(α:1%) Variances		
Auxiliary Tests Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assum Attribute Variance Distribution	AT3-098*  Test  Grubbs I  Sum Squ  4.73619  0.189077  4.92527  Inptions Tests  Test  Variance  Shapiro-V	Extreme Va	14.2  lue Test  Mean  4.736  0.0236	2.13  Square 19 6347	Test Stat 2.18  DF 1 8 9  Test Stat 338	Critical 2.29  F Stat 200  Critical 23.2 0.741	P-Value 0.0978  P-Value <1.0E-05  P-Value 5.2E-05	Decision Signification Decision Unequal	n(α:5%) ers Detected n(α:5%) int Effect n(α:1%) Variances	CV%	%Effect
Reference Sed  Auxiliary Tests Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assum Attribute Variance Distribution  Naphthalene S	Sum Squ 4.73619 0.189077 4.92527  Inptions Tests  Test  Variance Shapiro-V	Extreme Va	Mean 4.736 0.0236	2.13  Square 19 6347	Test Stat 2.18  DF 1 8 9  Test Stat 338 0.903	Critical 2.29  F Stat 200  Critical 23.2 0.741	P-Value 0.0978  P-Value <1.0E-05  P-Value 5.2E-05 0.2387	Decision Significat  Decision Unequal Normal I	n(α:5%) ers Detected n(α:5%) ent Effect n(α:1%) Variances Distribution	CV% 3.03%	%Effect 0.00%
Reference Sed  Auxiliary Tests Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assum Attribute Variance Distribution  Naphthalene S Sample	AT3-098*  S Test Grubbs I  Sum Squ 4.73619 0.189077 4.92527  Inptions Tests Test Variance Shapiro-V  Code	Extreme Va	Mean 4.736 0.0236 st mality Tes	2.13  Square 19 6347	Test Stat 2.18  DF 1 8 9  Test Stat 338 0.903	Critical 2.29  F Stat 200  Critical 23.2 0.741  Median	P-Value 0.0978  P-Value <1.0E-05  P-Value 5.2E-05 0.2387  Min	Decision No Outlin  Decision Significa  Decision Unequal Normal I	n(a:5%) ers Detected n(a:5%) int Effect n(a:1%) Variances Distribution Std Err		0.00%
Reference Sed  Auxiliary Tests Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assum Attribute Variance Distribution  Naphthalene S Sample IOSN 2019	AT3-098*  S Test Grubbs I  Sum Squ 4.73619 0.189077 4.92527  Inptions Tests Test Variance Shapiro-V  Summary Code RS	Extreme Va	Mean 4.736 0.0236 st mality Tes  Mean 0.39	2.13  Square 19 6347  et 95% LCL 0.375	Test Stat 2.18  DF 1 8 9  Test Stat 338 0.903  95% UCL 0.404	Critical 2.29  F Stat 200  Critical 23.2 0.741  Median 0.387	P-Value 0.0978  P-Value <1.0E-05  P-Value 5.2E-05 0.2387  Min 0.378	Decision Significat  Decision Unequal Normal I  Max 0.406	n(α:5%) ers Detected n(α:5%) int Effect n(α:1%) Variances Distribution  Std Err 0.00528	3.03%	0.00%
Auxiliary Tests Attribute Outlier ANOVA Table Source Between Error Total  ANOVA Assum Attribute Variance Distribution  Naphthalene S Sample IOSN 2019 AT3-098	AT3-098*  S Test Grubbs I  Sum Squ 4.73619 0.189077 4.92527  Inptions Tests Test Variance Shapiro-V  Summary Code RS	Extreme Va	Mean 4.736 0.0236 st mality Tes  Mean 0.39	2.13  Square  19 5347  95% LCL  0.375 1.5	Test Stat 2.18  DF 1 8 9  Test Stat 338 0.903  95% UCL 0.404	Critical 2.29  F Stat 200  Critical 23.2 0.741  Median 0.387	P-Value 0.0978  P-Value <1.0E-05  P-Value 5.2E-05 0.2387  Min 0.378	Decision Significat  Decision Unequal Normal I  Max 0.406	n(α:5%) ers Detected n(α:5%) int Effect n(α:1%) Variances Distribution  Std Err 0.00528	3.03%	0.00%
Auxiliary Tests Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assum Attribute Variance Distribution  Naphthalene S Sample IOSN 2019 AT3-098  Naphthalene D	AT3-098*  S Test Grubbs    Sum Squ 4.73619 0.189077 4.92527  Inptions Tests Test Variance Shapiro-V  Code RS  Detail	Extreme Va	14.2    Mean	2.13  Square  19 5347  95% LCL  0.375 1.5	Test Stat 2.18  DF 1 8 9  Test Stat 338 0.903  95% UCL 0.404 2.04	Critical 2.29  F Stat 200  Critical 23.2 0.741  Median 0.387 1.81	P-Value 0.0978  P-Value <1.0E-05  P-Value 5.2E-05 0.2387  Min 0.378	Decision Significat  Decision Unequal Normal I  Max 0.406	n(α:5%) ers Detected n(α:5%) int Effect n(α:1%) Variances Distribution  Std Err 0.00528	3.03%	

Report Date: Test Code/ID:

19 Aug-23 06:45 (p 15 of 16) TN-23-303MnPAH / 13-3685-4237

Rioaccumula	tion Evaluation	- DAHe -	Macor	na							EV-ES.	Γ, Inc. PBC
Analysis ID: Analyzed: Edit Date:	04-1490-0844 19 Aug-23 6:45 08 May-23 22:4	E A	ndpoi nalysi	nt: Ph	nenanthrene arametric-Two AB9E6A0C2E		\A05D78A	State	S Versior us Level: or ID:	n: CETISv2		i, iiic. F Bo
Batch ID: Start Date: Ending Date: Test Length:	07-2064-6975 29 Mar-23 13:4 26 Apr-23 12:4 27d 23h	7 <b>P</b> 7 <b>S</b>	est Ty rotoco pecies axon:	ol: US s: M	oaccumulations ACE NED Facoma nasutivalvia	RIM (2004)		Anal Dilud Brin Soul	ent: No e: No	ancy Roka ot Applicable ot Applicable RO - Aquatic	Research O	r <b>Age:</b>
Sample Code IOSN 2019 AT3-098	Sample I 13-4648- 07-1559-	8170 08	ample 3 Mar- 3 Feb-		Receip 08 Mar- 00 09 Feb-	23	<b>Sample Ag</b> 21d 14h 49d 1h		<b>nt Name</b> Analysts, I		roject redged Sed	iment Evalu
Sample Code	Material	Type		Sa	ample Sourc	e	Sta	tion Locati	on	Lat/Long		
IOSN 2019 AT3-098		e sedimen	t	Ya	achtsman Ma achtsman Ma	rina NAE-20	04-00 10	SN Reference	e			
Data Transfor	rm	Alt Hyp	)				Comparis	son Result				PMSD
Untransformed	d	C < T					AT3-098 f	ailed phena	nthrene er	ndpoint		155.52%
·	ance t Two-San  vs Sample II  d AT3-098*	•		est Sta	t Critical	<b>MSD</b> 3.07	P-Type CDF	<b>P-Value</b> 0.0132	Decisio	n(α:5%) ant Effect		
Reference Sec	u A13-096		4 3.	44	2.13	3.07	CDF	0.0132	Significa	iiii Eileci		
Auxiliary Test	ts											
Auxiliary Test	ts Test					Test Stat		P-Value	Decisio	n(α:5%)		
-	Test	Extreme V	alue T	est		Test Stat	Critical 2.29	<b>P-Value</b> 0.5686		n(α:5%) ers Detected		
Attribute	Test Grubbs	Extreme V	alue T	est								
Attribute Outlier	Test Grubbs			est	<sub>l</sub> uare					ers Detected		
Attribute Outlier ANOVA Table	Test Grubbs		М		juare	1.76	2.29	0.5686	No Outli	ers Detected		
Attribute Outlier ANOVA Table Source Between Error	Test Grubbs  Sum Squ 61.2563 41.475		<b>M</b>	ean Sc	<sub>l</sub> uare	1.76 <b>DF</b> 1	2.29 F Stat	0.5686 P-Value	No Outli	ers Detected n(α:5%)		
Attribute Outlier ANOVA Table Source Between	Test Grubbs  Sum Squ 61.2563		<b>M</b>	<b>ean Sc</b> 1.2563	juare	1.76 <b>DF</b>	2.29 F Stat	0.5686 P-Value	No Outli	ers Detected n(α:5%)		
Attribute Outlier ANOVA Table Source Between Error Total	Test Grubbs  Sum Squ 61.2563 41.475		<b>M</b>	<b>ean Sc</b> 1.2563	<b>Juare</b>	1.76 <b>DF</b> 1	2.29 F Stat	0.5686 P-Value	No Outli	ers Detected n(α:5%)		
Attribute Outlier ANOVA Table Source Between Error Total	Test Grubbs  Sum Squ 61.2563 41.475 102.731		<b>M</b>	<b>ean Sc</b> 1.2563	<b>Juare</b>	1.76 <b>DF</b> 1	2.29  F Stat  11.8	0.5686 P-Value	No Outli	ers Detected n(α:5%) ant Effect		
Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assur Attribute Variance	Sum Squ 61.2563 41.475 102.731 mptions Tests Test Variance	uares	<b>M</b> 67 5.	<b>ean Sc</b> 1.2563 18438	juare	1.76  DF  1 8 9  Test Stat 50.9	2.29  F Stat  11.8  Critical  23.2	0.5686  P-Value 0.0089  P-Value 0.0022	Decisio Significa  Decisio Unequal	n(α:5%) ant Effect n(α:1%)		
Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assur Attribute	Sum Squ 61.2563 41.475 102.731 mptions Tests Test Variance	uares	<b>M</b> 67 5.	<b>ean Sc</b> 1.2563 18438	juare	1.76  DF  1 8 9	F Stat 11.8 Critical	0.5686  P-Value 0.0089	Decisio Significa  Decisio Unequal	ers Detected n(α:5%) ant Effect n(α:1%)		
Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assur Attribute Variance	Sum Squ 61.2563 41.475 102.731 mptions Tests Test Variance Shapiro-N	uares	<b>M</b> 67 5.	<b>ean Sc</b> 1.2563 18438	juare	1.76  DF  1 8 9  Test Stat 50.9	2.29  F Stat  11.8  Critical  23.2	0.5686  P-Value 0.0089  P-Value 0.0022	Decisio Significa  Decisio Unequal	n(α:5%) ant Effect n(α:1%)		
Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assur Attribute  Variance Distribution	Sum Squ 61.2563 41.475 102.731 mptions Tests Test Variance Shapiro-N	uares	M 61 5.	<b>ean Sc</b> 1.2563 18438	juare 95% LCL	1.76  DF 1 8 9  Test Stat 50.9 0.908	2.29  F Stat  11.8  Critical  23.2  0.741	0.5686  P-Value 0.0089  P-Value 0.0022	Decisio Significa  Decisio Unequal	n(α:5%) ant Effect n(α:1%)	CV%	%Effect
Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assuratificate Variance Distribution  Phenanthrene Sample IOSN 2019	Sum Squ 61.2563 41.475 102.731 mptions Tests Test Variance Shapiro-\ e Summary	ares Ratio F Te Vilk W No	M 67 5.	ean Sc 1.2563 18438 / Test ean 97	<b>95% LCL</b> 1.42	1.76  DF  1 8 9  Test Stat 50.9 0.908  95% UCL 2.53	2.29  F Stat  11.8  Critical  23.2  0.741  Median  2.23	0.5686  P-Value 0.0089  P-Value 0.0022 0.2657	Decisio Significa  Decisio Unequal Normal	n(α:5%) ant Effect n(α:1%) I Variances Distribution		0.00%
Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assurattribute Variance Distribution  Phenanthrene Sample	Sum Squ 61.2563 41.475 102.731 mptions Tests Test Variance Shapiro-\ e Summary Code	Ratio F Te Vilk W No Count	M 67 5.	ean Sc 1.2563 18438 / Test	95% LCL	1.76  DF  1 8 9  Test Stat 50.9 0.908	2.29  F Stat  11.8  Critical  23.2  0.741  Median	0.5686  P-Value 0.0089  P-Value 0.0022 0.2657  Min	Decisio Significa  Decisio Unequal Normal I	n(α:5%) ant Effect  n(α:1%) I Variances Distribution  Std Err	CV%	
Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assuratificate Variance Distribution  Phenanthrene Sample IOSN 2019	Sum Squ 61.2563 41.475 102.731 mptions Tests Variance Shapiro-V e Summary Code RS	Ratio F Te Vilk W No Count	M 67 5.	ean Sc 1.2563 18438 / Test ean 97	<b>95% LCL</b> 1.42	1.76  DF  1 8 9  Test Stat 50.9 0.908  95% UCL 2.53	2.29  F Stat  11.8  Critical  23.2  0.741  Median  2.23	0.5686  P-Value 0.0089  P-Value 0.0022 0.2657  Min 1.3	Decisio Significa  Decisio Unequal Normal I	n(α:5%) ant Effect  n(α:1%) I Variances Distribution  Std Err  0.2	<b>CV%</b> 22.63%	0.00%
Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assuratificate Variance Distribution  Phenanthrene Sample IOSN 2019 AT3-098	Sum Squ 61.2563 41.475 102.731 mptions Tests Variance Shapiro-V e Summary Code RS	Ratio F Te Vilk W No Count	M 61 5.	ean Sc 1.2563 18438 / Test ean 97	<b>95% LCL</b> 1.42	1.76  DF  1 8 9  Test Stat 50.9 0.908  95% UCL 2.53	2.29  F Stat  11.8  Critical  23.2  0.741  Median  2.23	0.5686  P-Value 0.0089  P-Value 0.0022 0.2657  Min 1.3	Decisio Significa  Decisio Unequal Normal I	n(α:5%) ant Effect  n(α:1%) I Variances Distribution  Std Err  0.2	<b>CV%</b> 22.63%	0.00%
Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assur Attribute Variance Distribution  Phenanthrene Sample IOSN 2019 AT3-098  Phenanthrene	Sum Squ 61.2563 41.475 102.731 mptions Tests Test Variance Shapiro-\ e Summary Code RS	Ratio F Te Vilk W No Count 5	M 61 5.	ean Sc 1.2563 18438 / Test ean 97 92 ep 2	<b>95% LCL</b> 1.42 2.96	1.76  DF  1 8 9  Test Stat 50.9 0.908  95% UCL 2.53 10.9	2.29  F Stat  11.8  Critical  23.2  0.741  Median  2.23  4.86	0.5686  P-Value 0.0089  P-Value 0.0022 0.2657  Min 1.3	Decisio Significa  Decisio Unequal Normal I	n(α:5%) ant Effect  n(α:1%) I Variances Distribution  Std Err  0.2	<b>CV%</b> 22.63%	0.00%

Report Date: 19 Aug-23 06:45 (p 16 of 16) Test Code/ID: TN-23-303MnPAH / 13-3685-4237

							Test Co	ae/ID:	11N-23-303	WINPAH / I	3-3685-4237
Bioaccumulation	n Evaluation -	PAHs - Ma	coma							EA-ES	Γ, Inc. PBC
Analyzed: 19	1-1423-2436 9 Aug-23 6:45 3 May-23 22:44	Anal	ysis: Pa	rene rametric-Two C81C009542		D918D23F2	Statu	S Version us Level: or ID:	ı: CETISv2 1	2.1.1	
	•	Prot	ocol: US cies: Ma	paccumulatio S ACE NED F acoma nasuta /alvia	RIM (2004)		Anal Dilue Brine Soui	ent: No e: No	incy Roka ot Applicable ot Applicable RO - Aquatic I	Research C	er <b>Age</b> :
Sample Code IOSN 2019 AT3-098	Sample ID 13-4648-81 07-1559-49	170 08 N	<b>ple Date</b> lar-23 eb-23 13:0	Receipt 08 Mar- 0 09 Feb-	23	<b>Sample Ag</b> 21d 14h 49d 1h		<b>nt Name</b> Analysts, I		<b>roject</b> redged Sed	iment Evalu
Sample Code IOSN 2019 AT3-098	Material Ty Reference Marine Sec	sediment	Ya	mple Source chtsman Ma chtsman Ma	rina NAE-20	004-00 108	<b>Ition Locati</b> SN Reference Stations at 4	e	<b>Lat/Long</b> Mu		
Data Transform		Alt Hyp				Comparis	on Result				PMSD
Untransformed		C < T				AT3-098 f	ailed pyrene	endpoint			32.69%
Equal Variance of Sample I vs Reference Sed	Sample II AT3-098*	Test df 7	Test Stat	Critical	MSD 0.533	<b>P-Type</b> CDF	<b>P-Value</b> <1.0E-05	<b>Decision</b> Significa	• •		
ANOVA Table Source	Sum Squa	res	Mean Sq	uare	DF	F Stat	P-Value	Decision			
Between Error Total	988.699 1.23338 989.933		988.699 0.176197		1 7 8	5610 —	<1.0E-05	Significa	nt Effect		
ANOVA Assump	tions Tests Test				Test Stat	Critical	P-Value	Decisio	n(a:1%)		
Variance Distribution	Variance R Shapiro-Wi		ality Test		11.7 0.97	24.3 0.701	0.0377 0.8905	Equal Va			
Pyrene Summar	у										
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
IOSN 2019 AT3-098	RS	5 4	1.63 22.7	1.41 21.8	1.85 23.7	1.62 22.5	1.45 22	1.9 23.4	0.0793 0.304	10.87% 2.67%	0.00% -1292.46%
Pyrene Detail Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
IOSN 2019 AT3-098	RS	1.5 23.4	1.62	1.69 23	1.9 22.5	1.45 22					

# ATTACHMENT X

Macoma nasuta 28-Day Solid Phase Bioaccumulation Testing Tissue Chemistry and Body Burden Statistical Analyses

**PCBs** 

(29 pages)

#### Yachtsman Marina NAE-2004-00319

### APPENDIX A. CONCENTRATIONS OF COCs IN THE CLAM (M. nasuta)

			Pre-Assay		
CONTAMINANT	REP1	REP2	REP3	REP4 *	REP5 *
PCB Congeners (ng/g wet wt.)					
PCB 8	0.0630 U	0.0640 U	0.0630 U		
PCB 18	0.0459 <b>U</b>	0.0466 U	0.0458 U		
PCB 28	0.0780 <mark>U</mark>	0.0790 U	0.0780 U		
PCB 44	0.0870 U	0.0880 U	0.0870 <b>U</b>		
PCB 52	1.83	2.74	1.71		
PCB 66	0.0455 U	0.0462 U	0.0455 U		
PCB 101	0.0740 U	0.0755 U	0.0740 U		
PCB 105	0.0665 <mark>U</mark>	0.0675 U	0.0665 <mark>U</mark>		
PCB 118	0.0705 <mark>U</mark>	0.0715 U	0.0705 <b>U</b>		
PCB 128	0.0830 U	0.0845 U	0.0830 U		
PCB 138	1.07	0.0540 U	0.0530 U		
PCB 153	0.111 <b>U</b>	0.113 <mark>U</mark>	0.111 <mark>U</mark>		
PCB 170	0.0408 U	0.0414 U	0.0408 U		
PCB 180	0.0417 U	0.0424 U	0.0417 <b>U</b>		
PCB 187	0.0600 U	0.0610 U	0.0600 U		
PCB 195	0.0785 U	0.0795 U	0.0780 U		
PCB 206	0.0800 <b>U</b>	0.0810 U	0.0800 <b>U</b>		
PCB 209	0.0915 <mark>U</mark>	0.0930 <mark>U</mark>	0.0915 U		
Total PCBs	8.03	7.85	5.76		

<sup>\* =</sup> Qualifiers

U Analyte not detected; below Method Detection Limit; value is one-half the Method Detection Limit

J Analyte estimated; detection below Reporting Limit but above Method Detection Limit

NA Not Analyzed

#### Yachtsman Marina NAE-2004-00319

### APPENDIX A. CONCENTRATIONS OF COCs IN THE CLAM (M. nasuta)

			IOSN Reference		
CONTAMINANT	REP1	REP2	REP3	REP4	REP5
PCB Congeners (ng/g wet wt					
PCB 8	0.0465 U	0.0475 <mark>U</mark>	0.0455 <del>U</del>	0.0485 U	0.0455 <mark>U</mark>
PCB 18	0.0340 U	0.0345 <mark>U</mark>	0.0330 U	0.0355 U	0.0330 U
PCB 28	0.0575 U	0.0590 <mark>U</mark>	0.0565 <del>U</del>	0.0600 U	0.0560 U
PCB 44	0.0640 U	0.0655 U	0.0630 U	0.0670 U	0.0625 U
PCB 52	0.0355 U	0.0365 <mark>U</mark>	0.0350 U	0.0375 U	0.0350 <mark>U</mark>
PCB 66	0.0335 U	0.0345 U	0.0330 U	0.0350 U	0.0330 U
PCB 101	0.0545 U	0.0560 <mark>U</mark>	0.0535 <mark>U</mark>	0.0575 U	0.0535 <mark>U</mark>
PCB 105	0.0490 U	0.0500 U	0.0480 <mark>U</mark>	0.0515 <mark>U</mark>	0.0480 <mark>U</mark>
PCB 118	0.0520 U	0.0530 U	0.0510 U	0.0545 U	0.0505 <mark>U</mark>
PCB 128	0.0610 U	0.0630 U	0.0600 U	0.0640 U	0.0600 U
PCB 138	0.0390 U	0.0400 U	0.0385 <mark>U</mark>	0.0410 U	0.0385 <mark>U</mark>
PCB 153	0.0815 U	0.0835 <mark>U</mark>	0.0800 U	0.0855 U	0.0795 <mark>U</mark>
PCB 170	0.0300 U	0.0310 <mark>U</mark>	0.0295 <mark>U</mark>	0.0315 <mark>U</mark>	0.0295 <mark>U</mark>
PCB 180	0.0305 U	0.0315 U	0.0300 U	0.0325 U	0.0300 U
PCB 187	0.0440 U	0.0455 U	0.0435 <mark>U</mark>	0.0465 <mark>U</mark>	0.0430 U
PCB 195	0.0575 U	0.0590 U	0.0565 U	0.0605 U	0.0565 <mark>U</mark>
PCB 206	0.0590 U	0.0605 U	0.0580 <del>U</del>	0.0620 U	0.0575 U
PCB 209	0.0675 <mark>U</mark>	0.0690 <mark>U</mark>	0.0665 <mark>U</mark>	0.0710 U	0.0660 <mark>U</mark>
Total PCBs	1.79	1.84	1.76	1.88	1.76

<sup>\* =</sup> Qualifiers

U Analyte not detected; belov

J Analyte estimated; detectio

NA Not Analyzed

#### Yachtsman Marina NAE-2004-00319

### APPENDIX A. CONCENTRATIONS OF COCs IN THE CLAM (M. nasuta)

#### 10 Stations at 4 Marinas Mud

CONTAMINANT	REP1	REP2	REP3	REP4	REP5
PCB Congeners (ng/g wet wt					
PCB 8	0.0625 <mark>U</mark>	0.0640 U	0.0645 U	0.0635 U	0.0650 U
PCB 18	0.0453 U	0.0467 <mark>U</mark>	0.0469 <mark>U</mark>	0.0464 <mark>U</mark>	0.0475 <mark>U</mark>
PCB 28	0.0770 U	0.0795 <mark>U</mark>	0.0795 <b>U</b>	0.0790 <b>U</b>	0.0805 U
PCB 44	0.0860 U	0.0885 <mark>U</mark>	0.0890 <b>U</b>	0.0880 <b>U</b>	0.0900 U
PCB 52	0.0479 U	0.0492 <mark>U</mark>	0.0495 U	0.662	0.0500 U
PCB 66	0.0450 U	0.0463 U	0.0465 U	0.0460 U	0.0471 U
PCB 101	0.0735 U	0.0755 <mark>U</mark>	0.0760 U	0.0750 U	0.0770 U
PCB 105	0.0660 U	0.0675 <mark>U</mark>	0.0680 U	0.0670 U	0.0690 U
PCB 118	0.0695 U	0.423 J	0.0720 U	0.0710 U	0.0730 U
PCB 128	0.0820 U	0.0845 <mark>U</mark>	0.0850 U	0.0840 U	0.0860 U
PCB 138	0.0525 <mark>U</mark>	0.0540 U	0.0545 U	0.0535 U	0.0550 U
PCB 153	0.110 U	0.113 <mark>U</mark>	0.113 <mark>U</mark>	0.260 J	0.115 <mark>U</mark>
PCB 170	0.0403 U	0.0415 U	0.0416 U	0.0412 U	0.0422 U
PCB 180	0.0412 U	0.0424 U	0.0426 U	0.0422 U	0.0432 U
PCB 187	0.0590 U	0.0610 U	0.0610 U	0.0605 U	0.0620 U
PCB 195	0.0775 U	0.0795 U	0.0800 <b>U</b>	0.0790 U	0.0810 U
PCB 206	0.0790 U	0.0810 U	0.0815 U	0.0810 U	0.0825 U
PCB 209	0.0905 <mark>U</mark>	0.0930 U	0.0935 <mark>U</mark>	0.0925 U	0.0950 <mark>U</mark>
Total PCBs	2.41	3.18	2.49	3.98	2.52

<sup>\* =</sup> Qualifiers

U Analyte not detected; below

J Analyte estimated; detectio

NA Not Analyzed

**CETIS Test Data Worksheet** 

Report Date:

19 Aug-23 06:47 (p 1 of 1)

Test Code/ID:

TN-23-303MnPCB / 17-0778-2871

**Bioaccumulation Evaluation - PCB Congeners - Macoma** 

EA-EST, Inc. PBC

Start Date: End Date:

26 Apr-23 12:48

29 Mar-23 13:48

Species: Macoma nasuta

Sample Code: AT3-191

Sample Source: Yachtsman Marina NAE-2004-00319

Sample Date: 20 Mar-23

Protocol: US ACE NED RIM (2004) Material: Laboratory Control Sediment

Sample Station: Laboratory Control

Campio Date: 20	20										• • • • • • • • • • • • • • • • • • • •	p. 0 0 10.			., oo										
Sample	Rep	Pos	PBC 008	PCB 018	PCB 028	PCB 044	PCB 052	PCB 066	PCB 101	PCB 105	PCB 118	PCB 128	PCB 138	PCB 153	PCB 170	PCB 180	PCB 187	PCB 195	PCB 206	PCB 209	PCB 087	PCB 049	PCB 183	PCB 184	Total PCBs
IOSN 2019	1	2	0.047	0.034	0.058	0.064	0.036	0.034	0.055	0.049	0.052	0.061	0.039	0.082	0.03	0.031	0.044	0.058	0.059	0.068	0.027	0.063	0.017	0.034	
IOSN 2019	2	3	0.048	0.035	0.059	0.066	0.037	0.035	0.056	0.05	0.053	0.063	0.04	0.084	0.031	0.032	0.046	0.059	0.061	0.069	0.028	0.064	0.017	0.035	
IOSN 2019	3	6	0.046	0.033	0.057	0.063	0.035	0.033	0.054	0.048	0.051	0.06	0.039	0.08	0.03	0.03	0.044	0.057	0.058	0.067	0.027	0.062	0.017	0.033	
IOSN 2019	4	7	0.049	0.036	0.06	0.067	0.038	0.035	0.058	0.052	0.055	0.064	0.041	0.086	0.032	0.033	0.047	0.061	0.062	0.071	0.029	0.066	0.018	0.036	
IOSN 2019	5	10	0.046	0.033	0.056	0.063	0.035	0.033	0.054	0.048	0.051	0.06	0.039	0.08	0.03	0.03	0.043	0.057	0.058	0.066	0.027	0.061	0.016	0.033	
AT3-098	1	1	0.063	0.045	0.077	0.086	0.048	0.045	0.074	0.066	0.07	0.082	0.053	0.11	0.040	0.041	0.059	0.078	0.079	0.091	0.037	0.084	0.022	0.045	
AT3-098	2	4	0.064	0.047	0.08	0.089	0.049	0.046	0.076	0.068	0.423	0.085	0.054	0.113	0.041	0.042	0.061	0.08	0.081	0.093	0.038	0.087	0.023	0.047	
AT3-098	3	5	0.065	0.047	0.08	0.089	0.049	0.047	0.076	0.068	0.072	0.085	0.055	0.113	0.042	0.043	0.061	0.08	0.082	0.094	0.038	0.087	0.023	0.047	
AT3-098	4	8	0.064	0.046	0.079	0.088	0.662	0.046	0.075	0.067	0.071	0.084	0.054	0.26	0.041	0.042	0.061	0.079	0.081	0.093	0.037	0.551	0.023	0.046	
AT3-098	5	9	0.065	0.047	0.081	0.09	0.05	0.047	0.077	0.069	0.073	0.086	0.055	0.115	0.042	0.043	0.062	0.081	0.083	0.095	0.038	0.088	0.023	0.047	

**Report Date:** 19 Aug-23 06:48 (p 1 of 5) **Test Code/ID:** TN-23-303MnPCB / 17-0778-2871

#### **Bioaccumulation Evaluation - PCB Congeners - Macoma**

EA-EST, Inc. PBC

Batch ID:	14-7703-1847	Test Type:	Bioaccumulation - PCBs - Mn	Analyst:	Nancy Roka
Start Date:	29 Mar-23 13:48	Protocol:	US ACE NED RIM (2004)	Diluent:	Not Applicable
Ending Date:	26 Apr-23 12:48	Species:	Macoma nasuta	Brine:	Not Applicable
Test Length:	27d 23h	Taxon:	Bivalvia	Source:	ARO - Aquatic Research Or Age:

Sample ID: 10-1907-8970 Code: AT3-191 Project: Dredged Sediment Evaluation

Sample Date: 20 Mar-23 Material: Laboratory Control Sediment Source: Yachtsman Marina NAE-2004-00319 (

Receipt Date: 20 Mar-23 16:00 CAS (PC): Station: Laboratory Control

Sample Age: 9d 14h Client: Eco-Analysts, Inc.

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
IOSN 2019	13-4648-8170	08 Mar-23	08 Mar-23	21d 14h	Eco-Analysts, Inc.	Dredged Sediment Evalu
AT3-098	07-1559-4974	08 Feb-23 13:00	09 Feb-23 16:30	49d 1h		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
IOSN 2019	Reference sediment	Yachtsman Marina NAE-2004-00	IOSN Reference	
AT3-098	Marine Sediment	Yachtsman Marina NAE-2004-00	10 Stations at 4 Marinas Mu	I

Single Compa	arison Summary			
Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result S
11-6719-3611	PCB 008	Equal Variance t Two-Sample Test	<1.0E-05	AT3-098 failed pcb 008
16-3276-0407	PCB 018	Equal Variance t Two-Sample Test	<1.0E-05	AT3-098 failed pcb 018
13-9608-7387	PCB 028	Equal Variance t Two-Sample Test	<1.0E-05	AT3-098 failed pcb 028
19-3839-9687	PCB 044	Equal Variance t Two-Sample Test	<1.0E-05	AT3-098 failed pcb 044
05-0591-9058	PCB 052	Equal Variance t Two-Sample Test	<1.0E-05	AT3-098 failed pcb 052
09-3696-3646	PCB 052	Wilcoxon Rank Sum Two-Sample Test	0.0040	AT3-098 failed pcb 052
14-5817-1474	PCB 066	Equal Variance t Two-Sample Test	<1.0E-05	AT3-098 failed pcb 066
14-9269-7357	PCB 101	Equal Variance t Two-Sample Test	<1.0E-05	AT3-098 failed pcb 101
04-1507-5714	PCB 105	Equal Variance t Two-Sample Test	<1.0E-05	AT3-098 failed pcb 105
20-1325-5525	PCB 118	Equal Variance t Two-Sample Test	<1.0E-05	AT3-098 failed pcb 118
11-1662-6316	PCB 118	Wilcoxon Rank Sum Two-Sample Test	0.0040	AT3-098 failed pcb 118
11-7225-5352	PCB 128	Equal Variance t Two-Sample Test	<1.0E-05	AT3-098 failed pcb 128
09-9129-8390	PCB 138	Equal Variance t Two-Sample Test	<1.0E-05	AT3-098 failed pcb 138
10-1176-5480	PCB 153	Equal Variance t Two-Sample Test	<1.0E-05	AT3-098 failed pcb 153
08-1735-4110	PCB 153	Wilcoxon Rank Sum Two-Sample Test	0.0040	AT3-098 failed pcb 153
12-8292-6359	PCB 170	Equal Variance t Two-Sample Test	<1.0E-05	AT3-098 failed pcb 170
15-8865-0666	PCB 180	Equal Variance t Two-Sample Test	<1.0E-05	AT3-098 failed pcb 180
01-5676-1440	PCB 187	Equal Variance t Two-Sample Test	<1.0E-05	AT3-098 failed pcb 187
02-4694-1435	PCB 195	Equal Variance t Two-Sample Test	<1.0E-05	AT3-098 failed pcb 195
03-3708-3472	PCB 206	Equal Variance t Two-Sample Test	<1.0E-05	AT3-098 failed pcb 206
08-3719-0550	PCB 209	Equal Variance t Two-Sample Test	<1.0E-05	AT3-098 failed pcb 209

Report Date: Test Code/ID: 19 Aug-23 06:48 (p 2 of 5) TN-23-303MnPCB / 17-0778-2871

#### **Bioaccumulation Evaluation - PCB Congeners - Macoma**

EA-EST, Inc. PBC

Sample	Code	Count	Mean	95% I CI	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
IOSN 2019	RS	5	0.0467	0.0451	0.0483	0.0455	0.0485	0.000583	0.0013	2.79%	0.00%
AT3-098	NO	5	0.0639	0.0627	0.0651	0.0625	0.065	0.000303	0.000962	1.51%	-36.83%
PCB 018 Summ	ary										
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
IOSN 2019	RS	5	0.034	0.0327	0.0353	0.033	0.0355	0.000474	0.00106	3.12%	0.00%
AT3-098		5	0.0465	0.0455	0.0475	0.0453	0.0474	0.000354	0.000792	1.70%	-36.82%
PCB 028 Summ	ary										
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
IOSN 2019	RS	5	0.0578	0.0557	0.0599	0.056	0.06	0.000752	0.00168	2.91%	0.00%
AT3-098		5	0.0791	0.0775	0.0807	0.077	0.0805	0.000579	0.00129	1.64%	-36.85%
PCB 044 Summ	ary										
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
IOSN 2019	RS	5	0.0644	0.0621	0.0667	0.0625	0.067	0.000828	0.00185	2.87%	0.00%
AT3-098		5	0.0883	0.0865	0.0901	0.086	0.09	0.000663	0.00148	1.68%	-37.11%
PCB 052 Summ	ary										
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
IOSN 2019	RS	5	0.0359	0.0346	0.0372	0.035	0.0375	0.000485	0.00108	3.02%	0.00%
AT3-098		5	0.172	-0.169	0.512	0.0479	0.662	0.123	0.274	159.63%	-378.27%
PCB 066 Summ	ary										
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
IOSN 2019	RS	5	0.0338	0.0327	0.0349	0.033	0.035	0.000406	0.000908	2.69%	0.00%
AT3-098		5	0.0462	0.0452	0.0471	0.045	0.0471	0.000346	0.000773	1.67%	-36.63%
PCB 101 Summ	ary										
Sample	Code	Count	Mean	95% LCL	95% UCL		Max	Std Err	Std Dev	CV%	%Effect
IOSN 2019	RS	5	0.055	0.0528	0.0572	0.0535	0.0575	0.000775	0.00173	3.15%	0.00%
AT3-098		5	0.0754	0.0738	0.077	0.0735	0.077	0.000579	0.00129	1.72%	-37.09%
PCB 105 Summ	ary										
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
IOSN 2019	RS	5	0.0493	0.0475	0.0511	0.048	0.0515	0.000663	0.00148	3.01%	0.00%
AT3-098		5	0.0675	0.0661	0.0689	0.066	0.069	0.0005	0.00112	1.66%	-36.92%
PCB 118 Summ	ary										
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
IOSN 2019	RS	5	0.0522	0.0502	0.0542	0.0505	0.0545	0.000718	0.0016	3.07%	0.00%
AT3-098		5	0.142	-0.0536	0.337	0.0695	0.423	0.0703	0.157	110.98%	-171.46%
PCB 128 Summ	ary										
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
IOSN 2019	RS	5	0.0616	0.0593	0.0639	0.06	0.064	0.000812	0.00182	2.95%	0.00%
AT3-098		5	0.0843	0.0825	0.0861	0.082	0.086	0.000663	0.00148	1.76%	-36.85%
PCB 138 Summ	ary										
Sample	Code	Count	Mean	95% LCL		Min	Max	Std Err	Std Dev	CV%	%Effect
IOSN 2019	RS	5	0.0394	0.0381	0.0407	0.0385	0.041	0.000485	0.00108	2.75%	0.00%
AT3-098		5	0.0539	0.0527	0.0551	0.0525	0.055	0.00043	0.000962	1.78%	-36.80%

### **CETIS Summary Report**

Report Date: Test Code/ID: 19 Aug-23 06:48 (p 3 of 5) TN-23-303MnPCB / 17-0778-2871

**Bioaccumulation Evaluation - PCB Congeners - Macoma** 

EA-EST, Inc. PBC

PCB 153 Summ	arv										
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
IOSN 2019	RS	5	0.082	0.0789	0.0851	0.0795	0.0855	0.00112	0.0025	3.05%	0.00%
AT3-098		5	0.142	0.0599	0.224	0.109	0.26	0.0295	0.066	46.54%	-73.05%
PCB 170 Summ	ary										
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
IOSN 2019	RS	5	0.0303	0.0292	0.0314	0.0295	0.0315	0.000406	0.000908	3.00%	0.00%
AT3-098		5	0.0414	0.0405	0.0422	0.0403	0.0422	0.00031	0.000693	1.68%	-36.47%
PCB 180 Summ	ary										
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
IOSN 2019	RS	5	0.0309	0.0296	0.0322	0.03	0.0325	0.000485	0.00108	3.51%	0.00%
AT3-098		5	0.0423	0.0414	0.0432	0.0412	0.0432	0.000321	0.000717	1.69%	-36.89%
PCB 187 Summ	ary										
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
IOSN 2019	RS	5	0.0445	0.0427	0.0463	0.043	0.0465	0.000652	0.00146	3.28%	0.00%
AT3-098		5	0.0607	0.0593	0.0621	0.059	0.062	0.00049	0.0011	1.80%	-36.40%
PCB 195 Summ	ary										
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
IOSN 2019	RS	5	0.058	0.0558	0.0602	0.0565	0.0605	0.000775	0.00173	2.99%	0.00%
AT3-098		5	0.0794	0.0778	0.081	0.0775	0.081	0.000579	0.00129	1.63%	-36.90%
PCB 206 Summ	ary										
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
IOSN 2019	RS	5	0.0594	0.0571	0.0617	0.0575	0.062	0.000828	0.00185	3.12%	0.00%
AT3-098		5	0.081	0.0794	0.0826	0.079	0.0825	0.00057	0.00127	1.57%	-36.36%
PCB 209 Summ	ary										
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
IOSN 2019	RS	5	0.068	0.0655	0.0705	0.066	0.071	0.000908	0.00203	2.99%	0.00%
AT3-098		5	0.0929	0.0909	0.0949	0.0905	0.095	0.000731	0.00164	1.76%	-36.62%

Report Date: Test Code/ID: 19 Aug-23 06:48 (p 4 of 5) TN-23-303MnPCB / 17-0778-2871

Bioaccumulation Evaluation - PCB Congeners - M	Macoma
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EA-EST, Inc. PBC

IOSN 2019 AT3-098  PCB 018 Detail Sample Co IOSN 2019 AT3-098  PCB 028 Detail Sample Co IOSN 2019 AT3-098  PCB 044 Detail Sample Co IOSN 2019 AT3-098  PCB 052 Detail Sample Co IOSN 2019 AT3-098  PCB 066 Detail Sample Co IOSN 2019 AT3-098	ode S ode S	Rep 1 0.0465 0.0625  Rep 1 0.034 0.0453  Rep 1 0.0575 0.077	Rep 2 0.0475 0.064  Rep 2 0.0345 0.0466  Rep 2 0.059 0.0795	Rep 3 0.0455 0.0645  Rep 3 0.033 0.0468	Rep 4 0.0485 0.0635  Rep 4 0.0355 0.0463	Rep 5 0.0455 0.065 Rep 5 0.033 0.0474	MD5: DD9BEDC40F682A4349BA0136904F97C7
AT3-098  PCB 018 Detail  Sample Co  IOSN 2019 RS  AT3-098  PCB 028 Detail  Sample Co  IOSN 2019 RS  AT3-098  PCB 044 Detail  Sample Co  IOSN 2019 RS  AT3-098  PCB 052 Detail  Sample Co  IOSN 2019 RS  AT3-098  PCB 066 Detail  Sample Co  IOSN 2019 RS  AT3-098	ode S ode S	Rep 1 0.034 0.0453 Rep 1 0.0575 0.077	0.064  Rep 2 0.0345 0.0466  Rep 2 0.059	0.0645  Rep 3 0.033 0.0468  Rep 3	0.0635 <b>Rep 4</b> 0.0355	0.065 <b>Rep 5</b> 0.033	MD5: DD9BEDC40F682A4349BA0136904F97C7
PCB 018 Detail Sample Co IOSN 2019 RS AT3-098 PCB 028 Detail Sample Co IOSN 2019 RS AT3-098 PCB 044 Detail Sample Co IOSN 2019 RS AT3-098 PCB 052 Detail Sample Co IOSN 2019 RS AT3-098 PCB 066 Detail Sample Co IOSN 2019 RS	ode S	Rep 1 0.034 0.0453  Rep 1 0.0575 0.077	Rep 2 0.0345 0.0466  Rep 2 0.059	Rep 3 0.033 0.0468 Rep 3	<b>Rep 4</b> 0.0355	Rep 5 0.033	MD5: DD9BEDC40F682A4349BA0136904F97C7
Sample         Co           IOSN 2019         RS           AT3-098         PCB 028 Detail           Sample         Co           IOSN 2019         RS           AT3-098         Co           IOSN 2019         RS           AT3-098         RS           PCB 044 Detail         RS           AT3-098         Co           IOSN 2019         RS           AT3-098         Co           IOSN 2019         RS           AT3-098         PCB 066 Detail           Sample         Co           IOSN 2019         RS           AT3-098         Co           RS         RS	ode S	0.034 0.0453 <b>Rep 1</b> 0.0575 0.077	0.0345 0.0466 <b>Rep 2</b> 0.059	0.033 0.0468 Rep 3	0.0355	0.033	MD5: DD9BEDC40F682A4349BA0136904F97C7
IOSN 2019	ode S	0.034 0.0453 <b>Rep 1</b> 0.0575 0.077	0.0345 0.0466 <b>Rep 2</b> 0.059	0.033 0.0468 Rep 3	0.0355	0.033	
AT3-098  PCB 028 Detail  Sample Co  IOSN 2019 RS  AT3-098  PCB 044 Detail  Sample Co  IOSN 2019 RS  AT3-098  PCB 052 Detail  Sample Co  IOSN 2019 RS  AT3-098  PCB 066 Detail  Sample Co  IOSN 2019 RS	ode S	0.0453  Rep 1 0.0575 0.077	0.0466 <b>Rep 2</b> 0.059	0.0468 Rep 3	0.0355		
PCB 028 Detail  Sample Co  IOSN 2019 RS  AT3-098  PCB 044 Detail  Sample Co  IOSN 2019 RS  AT3-098  PCB 052 Detail  Sample Co  IOSN 2019 RS  AT3-098  PCB 066 Detail  Sample Co  IOSN 2019 RS	S ode	Rep 1 0.0575 0.077	<b>Rep 2</b> 0.059	Rep 3	0.0463	0 0474	
Sample         Co           IOSN 2019         RS           AT3-098         PCB 044 Detail           Sample         Co           IOSN 2019         RS           AT3-098         PCB 052 Detail           Sample         Co           IOSN 2019         RS           AT3-098         PCB 066 Detail           Sample         Co           IOSN 2019         RS           AT3-098         PCB 066 Detail           Sample         Co           IOSN 2019         RS	S ode	0.0575 0.077	0.059			0.0	
IOSN 2019 RS AT3-098  PCB 044 Detail  Sample Co IOSN 2019 RS AT3-098  PCB 052 Detail  Sample Co IOSN 2019 RS AT3-098  PCB 066 Detail  Sample Co IOSN 2019 RS	S ode	0.0575 0.077	0.059				MD5: 786773990FB8BBB1B08C3594EEA9CE4D
AT3-098  PCB 044 Detail  Sample Co  IOSN 2019 RS  AT3-098  PCB 052 Detail  Sample Co  IOSN 2019 RS  AT3-098  PCB 066 Detail  Sample Co  IOSN 2019 RS	ode	0.077			Rep 4	Rep 5	
PCB 044 Detail  Sample Co  IOSN 2019 RS  AT3-098  PCB 052 Detail  Sample Co  IOSN 2019 RS  AT3-098  PCB 066 Detail  Sample Co  IOSN 2019 RS			0.0795	0.0565	0.06	0.056	
Sample         Co           IOSN 2019         RS           AT3-098         RS           PCB 052 Detail         Sample         Co           IOSN 2019         RS           AT3-098         PCB 066 Detail           Sample         Co           IOSN 2019         RS				0.0795	0.079	0.0805	
IOSN 2019 RS AT3-098  PCB 052 Detail  Sample Co IOSN 2019 RS AT3-098  PCB 066 Detail  Sample Co IOSN 2019 RS							MD5: D2EFAD9773BDE40510B0CEAEF31B9A2I
AT3-098  PCB 052 Detail  Sample Co  IOSN 2019 RS  AT3-098  PCB 066 Detail  Sample Co  IOSN 2019 RS	S	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
PCB 052 Detail  Sample Co  IOSN 2019 RS  AT3-098  PCB 066 Detail  Sample Co  IOSN 2019 RS		0.064	0.0655	0.063	0.067	0.0625	
Sample         Co           IOSN 2019         RS           AT3-098         RS           PCB 066 Detail         Sample         Co           IOSN 2019         RS		0.086	0.0885	0.089	0.088	0.09	
IOSN 2019 RS AT3-098  PCB 066 Detail  Sample Co IOSN 2019 RS							MD5: 936FDE147307595B0DD61AD9E6253183
IOSN 2019 RS AT3-098  PCB 066 Detail  Sample Co IOSN 2019 RS	ode	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
AT3-098  PCB 066 Detail  Sample Co  IOSN 2019 RS		0.0355	0.0365	0.035	0.0375	0.035	_
Sample Co		0.0479	0.0492	0.0494	0.662	0.05	
Sample Co							MD5: 7A24F9E788E803B4DB65AED846AE44FA
IOSN 2019 RS	ode	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
		0.0335	0.0345	0.033	0.035	0.033	
AT3-098		0.045	0.0463	0.0465	0.046	0.0471	
PCB 101 Detail							MD5: 030FC5C2EC3878D6CB1097D3BD05BD50
	ode	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
IOSN 2019 RS		0.0545	0.056	0.0535	0.0575	0.0535	
AT3-098	-	0.0735	0.0755	0.076	0.075	0.077	
PCB 105 Detail							MD5: D02B9D3F2A01B1B333F2F0D7963B1648
	ode	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
IOSN 2019 RS		0.049	0.05	0.048	0.0515	0.048	
AT3-098		0.066	0.0675	0.068	0.067	0.069	
PCB 118 Detail							MD5: F4A31E554A76400BC4D54496C71B1A3E
	ode	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
IOSN 2019 RS		0.052	0.053	0.051	0.0545	0.0505	
AT3-098		0.0695	0.423	0.072	0.071	0.073	
PCB 128 Detail							MD5: F7C2E9EACAC0BEBB404EE5A1AC418C2
Sample Co	ode	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
IOSN 2019 RS	S	0.061	0.063	0.06	0.064	0.06	
AT3-098		0.082	0.0845	0.085	0.084	0.086	
PCB 138 Detail							MD5: EB396B64B9D31D9A53B859815C4B1256
Sample Co	ode	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
IOSN 2019 RS	s	0.039	0.04	0.0385	0.041	0.0385	
AT3-098		0.0525	0.054	0.0545	0.0535	0.055	

### **CETIS Summary Report**

AT3-098

005-341-210-5

0.0905

0.093

0.0935

0.0925

0.095

Report Date: Test Code/ID: 19 Aug-23 06:48 (p 5 of 5) TN-23-303MnPCB / 17-0778-2871

Bioaccumulation	Evaluation	ı - PCB Con	geners - Ma	acoma			EA-EST, Inc. PBC
PCB 153 Detail							MD5: BFDB7A2262DFC5BD213F5DAA527DC792
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
IOSN 2019	RS	0.0815	0.0835	0.08	0.0855	0.0795	
AT3-098		0.109	0.112	0.113	0.26	0.115	
PCB 170 Detail							MD5: 5B285380C382208B75EA8F6FD2806A3E
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
IOSN 2019	RS	0.03	0.031	0.0295	0.0315	0.0295	
AT3-098		0.0403	0.0415	0.0416	0.0412	0.0422	
PCB 180 Detail							MD5: E7A91940C4BA30C77459FE5B9AFB47F1
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
IOSN 2019	RS	0.0305	0.0315	0.03	0.0325	0.03	
AT3-098		0.0412	0.0424	0.0426	0.0421	0.0432	
PCB 187 Detail							MD5: 2CB198593AF1373895ED983CC6673022
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
IOSN 2019	RS	0.044	0.0455	0.0435	0.0465	0.043	
AT3-098		0.059	0.061	0.061	0.0605	0.062	
PCB 195 Detail							MD5: 4BD0DE09D74BAE601C1618D06FEEEE3I
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
IOSN 2019	RS	0.0575	0.059	0.0565	0.0605	0.0565	
AT3-098		0.0775	0.0795	0.08	0.079	0.081	
PCB 206 Detail							MD5: 3D17519E07607620A736093499E06742
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
IOSN 2019	RS	0.059	0.0605	0.058	0.062	0.0575	
AT3-098		0.079	0.081	0.0815	0.081	0.0825	
PCB 209 Detail							MD5: 927A5DA40F4466C5BFC0586882D4BFFD
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
IOSN 2019	RS	0.0675	0.069	0.0665	0.071	0.066	

STUDY: TN-23-303

CLIENT: Eco-Analysts, Inc.

PROJECT: Yachtsman Marina, Kennebunkport, ME NAE-2004-00319

ASSAY: *M. nasuta* 28-day Bioaccumulation Evaluation TASK: Statistical Analysis of Body Burden PCBs

Endpoint	Method	С	<	T	Statistic	Critical	P Level	Alpha	Reject Null	MSD	DF	Ties	P-Type
PCB 008	Equal Variance t Two-Sample Test	IOSN	<	Comp	23.73826	1.859548	0	0.05	TRUE	0.00134737	8		С
PCB 018	Equal Variance t Two-Sample Test	IOSN	<	Comp	21.15057	1.859548	0	0.05	TRUE	0.001100752	8		С
PCB 028	Equal Variance t Two-Sample Test	IOSN	<	Comp	22.45218	1.859548	0	0.05	TRUE	0.001764121	8		С
PCB 044	Equal Variance t Two-Sample Test	IOSN	<	Comp	22.53314	1.859548	0	0.05	TRUE	0.001972349	8		С
PCB 052	Wilcoxon Rank Sum Two-Sample Test	IOSN	<	Comp	15		0.003968254	0.05	TRUE		8	0	E
PCB 052	Equal Variance t Two-Sample Test	IOSN	<	Comp	19.43555	1.894579	1.20916E-07	0.05	TRUE	0.001289174	7		С
PCB 066	Equal Variance t Two-Sample Test	IOSN	<	Comp	23.21432	1.859548	0	0.05	TRUE	0.000991681	8		С
PCB 101	Equal Variance t Two-Sample Test	IOSN	<	Comp	21.09718	1.859548	0	0.05	TRUE	0.001798097	8		С
PCB 105	Equal Variance t Two-Sample Test	IOSN	<	Comp	21.91023	1.859548	0	0.05	TRUE	0.001544656	8		С
PCB 118	Equal Variance t Two-Sample Test	IOSN	<	Comp	18.34905	1.894579	1.78724E-07	0.05	TRUE	0.00197986	7		С
PCB 118	Wilcoxon Rank Sum Two-Sample Test	IOSN	<	Comp	15		0.003968254	0.05	TRUE		8	0	E
PCB 128	Equal Variance t Two-Sample Test	IOSN	<	Comp	21.64359	1.859548	0	0.05	TRUE	0.001950312	8		С
PCB 138	Equal Variance t Two-Sample Test	IOSN	<	Comp	22.37398	1.859548	0	0.05	TRUE	0.001205125	8		С
PCB 153	Wilcoxon Rank Sum Two-Sample Test	IOSN	<	Comp	15		0.003968254	0.05	TRUE		8	0	E
PCB 153	Equal Variance t Two-Sample Test	IOSN	<	Comp	19.38645	1.894579	1.23008E-07	0.05	TRUE	0.002968457	7		С
PCB 170	Equal Variance t Two-Sample Test	IOSN	<	Comp	21.62928	1.859548	0	0.05	TRUE	0.000950009	8		С
PCB 180	Equal Variance t Two-Sample Test	IOSN	<	Comp	19.61586	1.859548	0	0.05	TRUE	0.0010807	8		С
PCB 187	Equal Variance t Two-Sample Test	IOSN	<	Comp	19.86572	1.859548	0	0.05	TRUE	0.001516415	8		С
PCB 195	Equal Variance t Two-Sample Test	IOSN	<	Comp	22.13136	1.859548	0	0.05	TRUE	0.001798097	8		С
PCB 206	Equal Variance t Two-Sample Test	IOSN	<	Comp	21.49281	1.859548	0	0.05	TRUE	0.001868822	8		С
PCB 209	Equal Variance t Two-Sample Test	IOSN	<	Comp	21.35157	1.859548	0	0.05	TRUE	0.002168588	8		С

**Report Date:** 19 Aug-23 06:48 (p 1 of 18) **Test Code/ID:** TN-23-303MnPCB / 17-0778-2871

									Test Co				
Bioaccumula	tion E	valuation -	PCB Co	ngen	iers - Ma	acoma						EA-ES	T, Inc. PBC
Analysis ID: Analyzed: Edit Date:	19 A	719-3611 .ug-23 6:47 lay-23 22:45	Aı	nalysi		CB 008 arametric-Two ECC1FE80AF		:C8BA3C0E	Statı	S Versior us Level: or ID:	n: CETISv2 1	.1.1	
Batch ID: Start Date: Ending Date: Test Length:	29 M 26 A	•	Pi Si	est Ty rotoce pecies axon:	ol: US	oaccumulatio S ACE NED F acoma nasut valvia	RIM (2004)	Mn	Anal Dilue Brine Soul	ent: No e: No	ancy Roka ot Applicable ot Applicable RO - Aquatic I	Research (	Or <b>Age:</b>
Sample Code	)	Sample ID	Sa	ample	e Date	Receip	t Date	Sample Ag	e Clier	nt Name	Pr	oject	
IOSN 2019 AT3-098		13-4648-81 07-1559-49		3 Mar- 3 Feb-	-23 -23 13:0	08 Mar- 00 09 Feb-		21d 14h 49d 1h	Eco-	Analysts, I	Inc. Dr	edged Sed	diment Evalu
Sample Code		Material Ty	уре		Sa	ample Sourc	е	Sta	ition Locati	on	Lat/Long		
IOSN 2019		Reference	sedimen	t	Ya	achtsman Ma	rina NAE-20	04-00 108	SN Reference	e			
AT3-098		Marine Sed	diment		Ya	achtsman Ma	rina NAE-20	004-00 10	Stations at 4	1 Marinas	Mu		
Data Transfor	rm		Alt Hyp	,				Comparis	on Result				PMSD
Untransformed	b		C < T					AT3-098 f	ailed pcb 00	8 endpoin	ıt		2.89%
Equal Variand	ce t Tv	wo-Sample	Test										
								P-Type	P-Value	Decisio	n/a: 50/.)		
		Sample II				t Critical	MSD				,		
Sample I Reference Sec		Sample II AT3-098*			est Star 3.7	t Critical 1.86	<b>MSD</b> 0.00135	CDF	<1.0E-05		ant Effect		
	d										,		
Reference Sec	d							CDF			ant Effect		
Reference Sec	d	AT3-098*	,	8 2:	3.7		0.00135	CDF	<1.0E-05	Significa	ant Effect		
Reference Sec Auxiliary Test Attribute	d ts	AT3-098*  Test	,	8 2:	3.7		0.00135  Test Stat	CDF  Critical	<1.0E-05	Significa	n(α:5%)		
Auxiliary Test Attribute Outlier	d ts	AT3-098*  Test	ktreme V	8 23 alue T	3.7	1.86	0.00135  Test Stat	CDF  Critical	<1.0E-05	Significa	n(α:5%) ers Detected		
Auxiliary Test Attribute Outlier ANOVA Table	d ts	AT3-098*  Test  Grubbs Ex	ktreme V	8 23 alue T	Test	1.86	0.00135  Test Stat 1.67	CDF  Critical 2.29	<1.0E-05  P-Value  0.7532	Decisio No Outli  Decisio	n(α:5%) ers Detected		
Auxiliary Test Attribute Outlier ANOVA Table Source Between Error	d ts	AT3-098*  Test  Grubbs Ex  Sum Squa	ktreme V	alue T	Test	1.86 Juare	0.00135  Test Stat 1.67  DF 1 8	Critical 2.29  F Stat	<1.0E-05  P-Value 0.7532  P-Value	Decisio No Outli  Decisio	n(α:5%) ers Detected n(α:5%)		
Auxiliary Test Attribute Outlier  ANOVA Table Source Between	d ts	Test Grubbs Ex  Sum Squa 0.0007396	ktreme V	alue T	Test  Mean Sq	1.86 Juare	0.00135  Test Stat 1.67  DF 1	Critical 2.29  F Stat	<1.0E-05  P-Value 0.7532  P-Value	Decisio No Outli  Decisio	n(α:5%) ers Detected n(α:5%)		
Auxiliary Test Attribute Outlier ANOVA Table Source Between Error	ts	Test Grubbs Ex  Sum Squa 0.0007396 0.0000105 0.0007501	ktreme V	alue T	Test  Mean Sq	1.86 Juare	0.00135  Test Stat 1.67  DF 1 8	Critical 2.29  F Stat	<1.0E-05  P-Value 0.7532  P-Value	Decisio No Outli  Decisio	n(α:5%) ers Detected n(α:5%)		
Auxiliary Test Attribute Outlier  ANOVA Table Source Between Error Total	ts	Test Grubbs Ex  Sum Squa 0.0007396 0.0000105 0.0007501 ons Tests Test	ktreme V	alue T  M 0. 1.	Test  Mean Sq	1.86 Juare	0.00135  Test Stat 1.67  DF 1 8	CDF  Critical 2.29  F Stat 564  Critical	<1.0E-05  P-Value 0.7532  P-Value	Decisio No Outli  Decisio	n(α:5%) ers Detected n(α:5%) ant Effect		
Auxiliary Test Attribute Outlier ANOVA Table Source Between Error Total ANOVA Assur Attribute Variance	ts	Test Grubbs Ex  Sum Squa 0.0007396 0.0000105 0.0007501  ons Tests Test Variance R	res	alue T  M  0. 1.	73.7 Test Mean Sq .000739 .313E-0	1.86 Juare	0.00135  Test Stat 1.67  DF 1 8 9  Test Stat 1.84	Critical 2.29  F Stat 564  Critical 23.2	P-Value 0.7532 P-Value <1.0E-05  P-Value 0.5700	Decisio  Decisio Significa  Decisio Equal Va	n(a:5%) ers Detected n(a:5%) ant Effect n(a:1%) ariances		
Auxiliary Test Attribute Outlier ANOVA Table Source Between Error Total ANOVA Assur	ts	Test Grubbs Ex  Sum Squa 0.0007396 0.0000105 0.0007501 ons Tests Test	res	alue T  M  0. 1.	73.7 Test Mean Sq .000739 .313E-0	1.86 Juare	0.00135  Test Stat 1.67  DF 1 8 9	CDF  Critical 2.29  F Stat 564  Critical	P-Value 0.7532 P-Value <1.0E-05	Decisio  Decisio Significa  Decisio Equal Va	n(a:5%) ers Detected n(a:5%) ant Effect		
Auxiliary Test Attribute Outlier ANOVA Table Source Between Error Total ANOVA Assur Attribute Variance	ts mptio	Test Grubbs Ex  Sum Squa 0.0007396 0.0000105 0.0007501 ons Tests Test Variance R Shapiro-Wi	res atio F Te	8 23  MM 0. 1.	Test  Mean Sq 0.000739 .313E-0	1.86 <b>Juare</b> 96 96	0.00135  Test Stat 1.67  DF 1 8 9  Test Stat 1.84 0.949	Critical 2.29  F Stat 564  Critical 23.2 0.741	P-Value 0.7532  P-Value <1.0E-05  P-Value 0.5700 0.6522	Decisio No Outli  Decisio Significa  Decisio Equal Va Normal I	n(a:5%) ers Detected n(a:5%) ant Effect  n(a:1%) ariances Distribution		
Auxiliary Test Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assur Attribute Variance Distribution  PCB 008 Sum Sample	ts mptio	Test Grubbs Ex  Sum Squa 0.0007396 0.0000105 0.0007501  ons Tests Test Variance R Shapiro-Wi	res atio F Te	Months and the second s	3.7  Test  Mean Sq. 0.000739 .313E-0	1.86 <b>juare</b> 96 95% LCL	0.00135  Test Stat 1.67  DF 1 8 9  Test Stat 1.84 0.949  95% UCL	Critical 2.29  F Stat 564  Critical 23.2 0.741  Median	P-Value 0.7532  P-Value <1.0E-05  P-Value 0.5700 0.6522  Min	Decisio No Outli Decisio Significa  Decisio Equal Va Normal I	n(a:5%) ers Detected n(a:5%) ant Effect  n(a:1%) ariances Distribution  Std Err	CV%	%Effect
Auxiliary Test Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assur Attribute Variance Distribution  PCB 008 Sum Sample IOSN 2019	ts mptio	Test Grubbs Ex  Sum Squa 0.0007396 0.0000105 0.0007501 ons Tests Test Variance R Shapiro-Wi	res Latio F Te	M 0. 1. MM	7.3.7  Test  Mean Sq. 0.000739 .313E-0	1.86  juare 96 95% LCL 0.0451	0.00135  Test Stat 1.67  DF 1 8 9  Test Stat 1.84 0.949  95% UCL 0.0483	Critical 2.29  F Stat 564  Critical 23.2 0.741  Median 0.0465	P-Value 0.7532  P-Value <1.0E-05  P-Value 0.5700 0.6522  Min 0.0455	Decisio  Decisio Significa  Decisio Significa  Decisio Equal Va Normal I	n(a:5%) ers Detected  n(a:5%) ent Effect  n(a:1%) eriances Distribution  Std Err  0.000583	2.79%	0.00%
Auxiliary Test Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assur Attribute Variance Distribution  PCB 008 Sum Sample	ts mptio	Test Grubbs Ex  Sum Squa 0.0007396 0.0000105 0.0007501  ons Tests Test Variance R Shapiro-Wi	res atio F Te	M 0. 1. MM	3.7  Test  Mean Sq. 0.000739 .313E-0	1.86 <b>juare</b> 96 95% LCL	0.00135  Test Stat 1.67  DF 1 8 9  Test Stat 1.84 0.949  95% UCL	Critical 2.29  F Stat 564  Critical 23.2 0.741  Median	P-Value 0.7532  P-Value <1.0E-05  P-Value 0.5700 0.6522  Min	Decisio No Outli Decisio Significa  Decisio Equal Va Normal I	n(a:5%) ers Detected n(a:5%) ant Effect  n(a:1%) ariances Distribution  Std Err		
Auxiliary Test Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assur Attribute Variance Distribution  PCB 008 Sum Sample IOSN 2019	mptio	Test Grubbs Ex  Sum Squa 0.0007396 0.0000105 0.0007501  ons Tests Test Variance R Shapiro-Wi	res Latio F Te	M 0. 1. MM	7.3.7  Test  Mean Sq. 0.000739 .313E-0	1.86  juare 96 95% LCL 0.0451	0.00135  Test Stat 1.67  DF 1 8 9  Test Stat 1.84 0.949  95% UCL 0.0483	Critical 2.29  F Stat 564  Critical 23.2 0.741  Median 0.0465	P-Value 0.7532  P-Value <1.0E-05  P-Value 0.5700 0.6522  Min 0.0455	Decisio  Decisio Significa  Decisio Significa  Decisio Equal Va Normal I	n(a:5%) ers Detected  n(a:5%) ent Effect  n(a:1%) eriances Distribution  Std Err  0.000583	2.79%	0.00%
Auxiliary Test Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assur Attribute Variance Distribution  PCB 008 Sum Sample IOSN 2019 AT3-098	mptio	Test Grubbs Ex  Sum Squa 0.0007396 0.0000105 0.0007501  ons Tests Test Variance R Shapiro-Wi	res Latio F Te	M 0. 1. M M 0. 1. M M 0. 1. M M M M M M M M M M M M M M M M M M	7.3.7  Test  Mean Sq. 0.000739 .313E-0	1.86  juare 96 95% LCL 0.0451	0.00135  Test Stat 1.67  DF 1 8 9  Test Stat 1.84 0.949  95% UCL 0.0483	Critical 2.29  F Stat 564  Critical 23.2 0.741  Median 0.0465	P-Value 0.7532  P-Value <1.0E-05  P-Value 0.5700 0.6522  Min 0.0455	Decisio  Decisio Significa  Decisio Significa  Decisio Equal Va Normal I	n(a:5%) ers Detected  n(a:5%) ent Effect  n(a:1%) eriances Distribution  Std Err  0.000583	2.79%	0.00%
Auxiliary Test Attribute Outlier ANOVA Table Source Between Error Total ANOVA Assur Attribute Variance Distribution PCB 008 Sum Sample IOSN 2019 AT3-098 PCB 008 Deta	mptio	Test Grubbs Ex  Sum Squa 0.0007396 0.0007501 ons Tests Test Variance R Shapiro-Wi	res atio F Teilk W Nor	8 23  M 0 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	7.000739 .313E-0	1.86 juare 96 96 95% LCL 0.0451 0.0627	0.00135  Test Stat 1.67  DF 1 8 9  Test Stat 1.84 0.949  95% UCL 0.0483 0.0651	Critical 2.29  F Stat 564  Critical 23.2 0.741  Median 0.0465 0.064	P-Value 0.7532  P-Value <1.0E-05  P-Value 0.5700 0.6522  Min 0.0455	Decisio  Decisio Significa  Decisio Significa  Decisio Equal Va Normal I	n(a:5%) ers Detected  n(a:5%) ent Effect  n(a:1%) eriances Distribution  Std Err  0.000583	2.79%	0.00%

Report Date: 19 Aug-23 06:48 (p 2 of 18)
Test Code/ID: TN-23-303MnPCB / 17-0778-2871

									rest C	ode/ID:	TN-23-	.3031	/IIII OD / I	1-0110-201
Bioaccumulat	tion Evalu	ation - PCB	Cong	eners -	Масс	oma							EA-ES	T, Inc. PBC
Analysis ID: Analyzed: Edit Date:	16-3276-0 19 Aug-2 08 May-2	3 6:47	Anal	ooint: ysis: Hash:	Parai	metric-Two	o Sample 78C71526F	3FF6A664I	Sta	TIS Versi tus Level tor ID:		ISv2.	1.1	
Batch ID: Start Date: Ending Date: Test Length:		3 13:48		ocol: cies:	US A	CE NED Forma nasuta	n - PCBs - I RIM (2004) a	Mn	Dili Bri	uent:	Nancy Roka Not Applica Not Applica ARO - Aqua	ble ble	lesearch (	Or <b>Age:</b>
Sample Code	Sar	nple ID	Sam	ple Dat	te	Receipt	t Date	Sample Ag	e Cli	ent Name		Pro	oject	
IOSN 2019 AT3-098		4648-8170 1559-4974		ar-23 eb-23 1	3:00	08 Mar- 09 Feb-		21d 14h 49d 1h	Eco	o-Analysts	s, Inc.	Dre	edged Sed	diment Evalu
Sample Code	Ma	erial Type			Samı	ple Sourc	е	Sta	ation Loca	tion	Lat/Lo	ong		
IOSN 2019	Ref	erence sedir	nent		Yach	tsman Ma	rina NAE-20	004-00 10	SN Refere	nce				
AT3-098	Maı	ine Sedimer	nt		Yach	tsman Ma	rina NAE-20	004-00 10	Stations a	t 4 Marina	s Mu			
Data Transfor	m	Alt	Нур					Comparis	son Resul					PMSD
Untransformed		C <	Т					AT3-098	ailed pcb (	18 endpo	oint			3.24%
Equal Variand		ample Test		Test S	Stat	Critical	MSD	P-Type	P-Value	Decisi	ion(α:5%)			
<b>-</b>		•					0.0044	005	44 OF O	O: : £:				
Sample I Reference Sec		-098*	8	21.2		1.86	0.0011	CDF	<1.0E-0	5 Signifi	cant Effect			
	ETA b	•					0.0011	CDF	<1.0E-0	5 Signifi	cant Effect			
Reference Sec Auxiliary Test Attribute	d AT3	-098* st	8	21.2			Test Stat	Critical	P-Value	Decis	ion(α:5%)			
Reference Sec Auxiliary Test	d AT3	-098*	8	21.2						Decis		ted		
Reference Sec Auxiliary Test Attribute	d AT3 s Te Gr	-098* st	8	21.2			Test Stat	Critical	P-Value	Decis	ion(α:5%)	eted		
Auxiliary Test Attribute Outlier	d AT3	-098* st	8	21.2		1.86	Test Stat	Critical	P-Value	<b>Decis</b> No Ou	ion(α:5%)	eted		
Auxiliary Test Attribute Outlier ANOVA Table	d AT3	st ubbs Extrem	8	21.2 e Test	Squa	1.86	Test Stat	Critical 2.29	<b>P-Value</b> 0.6826	Decisi No Ou	ion(α:5%) itliers Detec	eted		
Auxiliary Test Attribute Outlier ANOVA Table Source Between Error	Te Gr	st ubbs Extrem	8	21.2 e Test Mean	<b>Squa</b> 3919	1.86	Test Stat 1.7  DF 1 8	Critical 2.29	P-Value 0.6826	Decisi No Ou	ion(α:5%) itliers Detection	eted		
Auxiliary Test Attribute Outlier ANOVA Table Source Between	Te Gr Sun 0.00 7.00	st ubbs Extrem n Squares	8	21.2 e Test  Mean 0.0003	<b>Squa</b> 3919	1.86	Test Stat 1.7  DF 1	Critical 2.29	P-Value 0.6826	Decisi No Ou	ion(α:5%) itliers Detection	eted		
Auxiliary Test Attribute Outlier ANOVA Table Source Between Error	Te Gr Sui 0.00 7.00 0.00	st ubbs Extrem  n Squares  003919 08E-06 003989	8	21.2 e Test  Mean 0.0003	<b>Squa</b> 3919	1.86	Test Stat 1.7  DF 1 8	Critical 2.29	P-Value 0.6826	Decisi No Ou	ion(α:5%) itliers Detection	eted		
Auxiliary Test Attribute Outlier ANOVA Table Source Between Error Total	Te Gr Sui 0.00 7.00 0.00	st ubbs Extrem  n Squares  003919 08E-06 003989  ests	8	21.2 e Test  Mean 0.0003	<b>Squa</b> 3919	1.86	Test Stat 1.7  DF 1 8	Critical 2.29  F Stat 447	P-Value 0.6826	Decisi No Ou  Decisi 5 Signifi	ion(α:5%) itliers Detection	sted		
Auxiliary Test Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assur Attribute Variance	Sur 0.00 7.00 0.00 Tes	st ubbs Extrem n Squares 003919 08E-06 003989 ests t iance Ratio	e Valu	e Test  Mean 0.0003 8.76E	<b>Squa</b> 3919 -07	1.86	Test Stat 1.7  DF 1 8 9  Test Stat 1.79	Critical 2.29  F Stat 447  Critical 23.2	P-Value 0.6826  P-Value <1.0E-09  P-Value 0.5851	Decisi  Decisi  Decisi  Decisi  Equal	ion(α:5%) itliers Detection(α:5%) cant Effect ion(α:1%) Variances			
Auxiliary Test Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assur Attribute	Sur 0.00 7.00 0.00 Tes	st ubbs Extrem m Squares 003919 08E-06 003989 ests t	e Valu	e Test  Mean 0.0003 8.76E	<b>Squa</b> 3919 -07	1.86	Test Stat 1.7  DF 1 8 9  Test Stat	Critical 2.29  F Stat 447  Critical	P-Value 0.6826  P-Value <1.0E-09	Decisi  Decisi  Decisi  Decisi  Equal	ion(α:5%) itliers Detection(α:5%) cant Effect ion(α:1%)			
Auxiliary Test Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assur Attribute Variance	Sur 0.00 7.00 0.00 Warners Tes	st ubbs Extrem Squares 003919 08E-06 003989 ests t iance Ratio I	e Valu	e Test  Mean 0.0003 8.76E	<b>Squa</b> 3919 -07	1.86	Test Stat 1.7  DF 1 8 9  Test Stat 1.79 0.952	Critical 2.29  F Stat 447  Critical 23.2 0.741	P-Value 0.6826  P-Value <1.0E-09  P-Value 0.5851 0.6974	Decision Signification Decision Equal Norma	ion(α:5%) ittliers Detection(α:5%) cant Effect ion(α:1%) Variances al Distribution	on		
Auxiliary Test Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assur Attribute Variance Distribution  PCB 018 Sum Sample	Sur 0.00 7.00 0.00 mptions T Tes Var Sha	st ubbs Extrem m Squares 003919 08E-06 003989 ests t iance Ratio	e Valu	e Test  Mean 0.0003 8.76E	<b>Squa</b> 33919 -07	1.86 ire	Test Stat 1.7  DF 1 8 9  Test Stat 1.79 0.952	Critical 2.29  F Stat 447  Critical 23.2 0.741  Median	P-Value 0.6826  P-Value <1.0E-03  P-Value 0.5851 0.6974  Min	Decisi No Ou  Decisi Signifi  Decisi Equal Norma	ion(α:5%) itliers Detect ion(α:5%) cant Effect ion(α:1%) Variances al Distributio	on rr	CV%	%Effect
Auxiliary Test Attribute Outlier ANOVA Table Source Between Error Total ANOVA Assur Attribute Variance Distribution PCB 018 Sum Sample IOSN 2019	Sur 0.00 7.00 0.00 Warners Tes	st ubbs Extrem n Squares 003919 08E-06 003989 ests it iance Ratio I	e Valu	e Test  Mean 0.0003 8.76E	<b>Squa</b> 3919 -07	1.86  95% LCL 0.0327	Test Stat 1.7  DF 1 8 9  Test Stat 1.79 0.952  95% UCL 0.0353	Critical 2.29  F Stat 447  Critical 23.2 0.741  Median 0.034	P-Value 0.6826  P-Value <1.0E-03  P-Value 0.5851 0.6974  Min 0.033	Decisi  Decisi  Signifi  Decisi Equal Norma  Max 0.0355	ion(α:5%) itliers Detection(α:5%) cant Effect ion(α:1%) Variances al Distribution Std E	on <b>rr</b>	3.12%	0.00%
Auxiliary Test Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assur Attribute Variance Distribution  PCB 018 Sum Sample	Sur 0.00 7.00 0.00 mptions T Tes Var Sha	st ubbs Extrem m Squares 003919 08E-06 003989 ests t iance Ratio	e Valu	e Test  Mean 0.0003 8.76E	<b>Squa</b> 3919 -07	1.86 ire	Test Stat 1.7  DF 1 8 9  Test Stat 1.79 0.952	Critical 2.29  F Stat 447  Critical 23.2 0.741  Median	P-Value 0.6826  P-Value <1.0E-03  P-Value 0.5851 0.6974  Min	Decisi No Ou  Decisi Signifi  Decisi Equal Norma	ion(α:5%) itliers Detection(α:5%) cant Effect ion(α:1%) Variances al Distribution Std E	on <b>rr</b>		
Auxiliary Test Attribute Outlier ANOVA Table Source Between Error Total ANOVA Assur Attribute Variance Distribution PCB 018 Sum Sample IOSN 2019	Sur 0.00 7.00 0.00 mptions T Tes Var Sha	st ubbs Extrem n Squares 003919 08E-06 003989 ests it iance Ratio I	e Valu	e Test  Mean 0.0003 8.76E	<b>Squa</b> 3919 -07	1.86  95% LCL 0.0327	Test Stat 1.7  DF 1 8 9  Test Stat 1.79 0.952  95% UCL 0.0353	Critical 2.29  F Stat 447  Critical 23.2 0.741  Median 0.034	P-Value 0.6826  P-Value <1.0E-03  P-Value 0.5851 0.6974  Min 0.033	Decisi  Decisi  Signifi  Decisi Equal Norma  Max 0.0355	ion(α:5%) itliers Detection(α:5%) cant Effect ion(α:1%) Variances al Distribution Std E	on <b>rr</b>	3.12%	0.00%
Auxiliary Test Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assur Attribute Variance Distribution  PCB 018 Sum Sample IOSN 2019 AT3-098	Sur 0.00 7.00 0.00 mptions T Tes Var Sha	st ubbs Extrem m Squares 003919 08E-06 003989 fests t iance Ratio I	e Valu	e Test  Mean 0.0003 8.76E	<b>Squa</b> 3919 -07	1.86  95% LCL 0.0327	Test Stat 1.7  DF 1 8 9  Test Stat 1.79 0.952  95% UCL 0.0353	Critical 2.29  F Stat 447  Critical 23.2 0.741  Median 0.034	P-Value 0.6826  P-Value <1.0E-03  P-Value 0.5851 0.6974  Min 0.033	Decisi  Decisi  Signifi  Decisi Equal Norma  Max 0.0355	ion(α:5%) itliers Detection(α:5%) cant Effect ion(α:1%) Variances al Distribution Std E	on <b>rr</b>	3.12%	0.00%
Auxiliary Test Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assur Attribute Variance Distribution  PCB 018 Sum Sample IOSN 2019 AT3-098  PCB 018 Deta	Sur O.00 7.00 0.00 Var Sha	st ubbs Extrem m Squares 003919 08E-06 003989 fests t iance Ratio I	e Valu	e Test  Mean 0.0003 8.76E	<b>Squa</b> 3919 -07	1.86  95% LCL 0.0327 0.0455	Test Stat 1.7  DF 1 8 9  Test Stat 1.79 0.952  95% UCL 0.0353 0.0475	Critical 2.29  F Stat 447  Critical 23.2 0.741  Median 0.034 0.0467	P-Value 0.6826  P-Value <1.0E-03  P-Value 0.5851 0.6974  Min 0.033	Decisi  Decisi  Signifi  Decisi Equal Norma  Max 0.0355	ion(α:5%) itliers Detection(α:5%) cant Effect ion(α:1%) Variances al Distribution Std E	on <b>rr</b>	3.12%	0.00%

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Test Code/ID: TN-23-303MnPCB / 17-0778-2871

									rest	Code	•	0 000		17-0778-287
Bioaccumulat	tion Evalua	tion - PCB	Cong	eners -	Mac	oma							EA-ES	ST, Inc. PBC
Analysis ID: Analyzed: Edit Date:	13-9608-73 19 Aug-23 08 May-23	6:47	Anal	point: ysis: Hash:	Para	metric-Two	o Sample F9732FE5E	94EDBB42	s		Version Level: ID:	: CETISv2	2.1.1	
Batch ID: Start Date: Ending Date: Test Length:	•	13:48		ocol: cies:	US A	ACE NED F oma nasuta	n - PCBs - I RIM (2004) a	Mn	D B	nalys iluent rine: ource	t: No No	ncy Roka t Applicable t Applicable tO - Aquatic	Research (	Or <b>Age</b> :
Sample Code	Sam	ole ID	Sam	ple Da	te	Receipt	t Date	Sample Ag	je C	lient	Name	P	roject	
IOSN 2019 AT3-098		648-8170 559-4974		lar-23 eb-23 1	3:00	08 Mar- 09 Feb-		21d 14h 49d 1h	E	co-An	nalysts, li	nc. D	redged Se	diment Evalu
Sample Code	Mate	rial Type			Sam	ple Sourc	е	St	ation Loc	ation	า	Lat/Long		
IOSN 2019		ence sedim	ent		Yach	itsman Ma	rina NAE-20	04-00 IO	SN Refer	ence				
AT3-098	Marir	e Sediment	t		Yach	itsman Ma	rina NAE-20	004-00 10	Stations	at 4 N	Marinas I	Иu		
Data Transfor	rm	Alt F	<del>l</del> ур					Compari	son Resi	ult				PMSD
Untransformed	d	C < T	Γ					AT3-098	failed pcb	028	endpoint	t		3.05%
Equal Variand	ce t Two-Sa vs Samp	•	df	Test S	Stat	Critical	MSD	P-Type	P-Valu	ie l	Decisior	n(α:5%)		
Reference Sec	d AT3-0	98*	8	22.5		1.86	0.00176	CDF	<1.0E-	05	Significa	nt Effect		
Reference Sec Auxiliary Test Attribute			8	22.5		1.86	0.00176  Test Stat		<1.0E-					
Auxiliary Test	ts Test					1.86				ie l	Decision			
Auxiliary Test Attribute	ts Test Grut	:				1.86	Test Stat	Critical	P-Valu	ie l	Decision	η(α:5%)		
Auxiliary Test Attribute Outlier	ts Test Grut	:					Test Stat	Critical	P-Valu	ie i	Decision	n(α:5%) ers Detected		
Auxiliary Test Attribute Outlier ANOVA Table	ts Test Grut	bbs Extreme		e Test	Squa		Test Stat	Critical 2.29	<b>P-Valu</b>	ie l	Decision No Outlie	n(α:5%) ers Detected		
Auxiliary Test Attribute Outlier ANOVA Table Source	ts Test Grut	Squares		e Test Mean	<b>Squa</b> 1342		Test Stat 1.56	Critical 2.29	P-Valu	ie l	Decision No Outlie	n(α:5%) ers Detected n(α:5%)		
Auxiliary Test Attribute Outlier ANOVA Table Source Between	Sum 0.000	Squares		e Test  Mean  0.001	<b>Squa</b> 1342		<b>Test Stat</b> 1.56 <b>DF</b> 1	Critical 2.29	P-Valu	ie l	Decision No Outlie	n(α:5%) ers Detected n(α:5%)		
Auxiliary Test Attribute Outlier ANOVA Table Source Between Error	Sum 0.001 0.000	Squares 1342 1018 1522		e Test  Mean  0.001	<b>Squa</b> 1342		<b>Test Stat</b> 1.56 <b>DF</b> 1 8	Critical 2.29	P-Valu	ie l	Decision No Outlie	n(α:5%) ers Detected n(α:5%)		
Auxiliary Test Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assur Attribute	Test  Grut  Sum  0.001  0.001  mptions Test	Squares 1342 1018 1522	e Valu	e Test  Mean  0.001	<b>Squa</b> 1342		Test Stat 1.56  DF 1 8 9	Critical 2.29  F Stat 504  Critical	P-Valu 1.0000 P-Valu <1.0E-	ie i	Decision  Decision  Significa	n(α:5%) ers Detected n(α:5%) nt Effect		
Auxiliary Test Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assur Attribute Variance	Sum 0.001 0.000 0.001 mptions Test Varia	Squares 1342 1018 1522 sts	e Valu	e Test  Mean 0.001 2.25E	<b>Squ</b> a 1342 -06		Test Stat 1.56  DF 1 8 9  Test Stat 1.69	Critical 2.29  F Stat 504  Critical 23.2	P-Valu 1.0000 P-Valu <1.0E-	ie i 0.5 3	Decision  Decision  Significa  Decision  Equal Va	n(α:5%) ers Detected n(α:5%) nt Effect n(α:1%) ariances		
Auxiliary Test Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assur Attribute Variance Distribution	Sum 0.000 0.000 0.001 mptions Test Varia Shap	Squares 1342 1018 1522	e Valu	e Test  Mean 0.001 2.25E	<b>Squ</b> a 1342 -06		Test Stat 1.56  DF 1 8 9	Critical 2.29  F Stat 504  Critical	P-Valu 1.0000 P-Valu <1.0E-	ie i 0.5 3	Decision  Decision  Significa  Decision  Equal Va	n(α:5%) ers Detected n(α:5%) nt Effect		
Auxiliary Test Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assur Attribute Variance Distribution  PCB 028 Sum	Sum 0.001 0.001 mptions Test Varia Shap	Squares 1342 1018 1522 sts nce Ratio F iro-Wilk W I	Yalu Test Norma	e Test  Mean 0.001 2.25E	<b>Squa</b> 1342 -06	are	Test Stat 1.56  DF 1 8 9  Test Stat 1.69 0.962	Critical 2.29  F Stat 504  Critical 23.2 0.741	P-Valu 1.0000 P-Valu <1.0E- P-Valu 0.6250 0.8099		Decision  Decision  Significa  Decision  Equal Va  Normal [	n(α:5%) ers Detected n(α:5%) nt Effect n(α:1%) ariances Distribution		
Auxiliary Test Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assur Attribute Variance Distribution  PCB 028 Sum Sample	Sum 0.001 0.000 0.001 mptions Test Varia Shap	Squares 1342 1018 1522 sts nce Ratio F iro-Wilk W I	Yalu Test Norma	e Test  Mean 0.001 2.25E	<b>Squa</b> 1342 -06	95% LCL	Test Stat 1.56  DF 1 8 9  Test Stat 1.69 0.962  95% UCL	Critical 2.29  F Stat 504  Critical 23.2 0.741  Median	P-Valu 1.0000 P-Valu <1.0E- P-Valu 0.6250 0.8099		Decision No Outlie Decision Significa Decision Equal Va Normal [	n(α:5%) ers Detected n(α:5%) nt Effect n(α:1%) ariances Distribution	CV%	%Effect
Auxiliary Test Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assur Attribute Variance Distribution  PCB 028 Sum Sample IOSN 2019	Sum 0.001 0.001 mptions Test Varia Shap	Squares 1342 1018 1522 sts nce Ratio F iro-Wilk W I	Yalu Test Norma	e Test  Mean 0.001 2.25E  ality Tes  Mean 0.0576	<b>Squa</b> 1342 -06	95% LCL 0.0557	Test Stat 1.56  DF 1 8 9  Test Stat 1.69 0.962  95% UCL 0.0599	Critical 2.29  F Stat 504  Critical 23.2 0.741  Median 0.0575	P-Valu 1.0000 P-Valu <1.0E- P-Valu 0.6250 0.8099 Min 0.056	1	Decision No Outlie Decision Significa  Decision Equal Va Normal [	n(α:5%) ers Detected n(α:5%) nt Effect n(α:1%) ariances Distribution  Std Err 0.000752	2.91%	0.00%
Auxiliary Test Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assur Attribute Variance Distribution  PCB 028 Sum Sample	Sum 0.001 0.000 0.001 mptions Test Varia Shap	Squares 1342 1018 1522 sts nce Ratio F iro-Wilk W I	Yalu Test Norma	e Test  Mean 0.001 2.25E	<b>Squa</b> 1342 -06	95% LCL	Test Stat 1.56  DF 1 8 9  Test Stat 1.69 0.962  95% UCL	Critical 2.29  F Stat 504  Critical 23.2 0.741  Median	P-Valu 1.0000 P-Valu <1.0E- P-Valu 0.6250 0.8099	1	Decision No Outlie Decision Significa Decision Equal Va Normal [	n(α:5%) ers Detected n(α:5%) nt Effect n(α:1%) ariances Distribution	2.91%	
Auxiliary Test Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assur Attribute Variance Distribution  PCB 028 Sum Sample IOSN 2019	Sum 0.000 0.000 0.001 mptions Test Varia Shap mmary Code	Squares 1342 1018 1522 sts nce Ratio F iro-Wilk W I	Yalu Test Norma	e Test  Mean 0.001 2.25E  ality Tes  Mean 0.0576	<b>Squa</b> 1342 -06	95% LCL 0.0557	Test Stat 1.56  DF 1 8 9  Test Stat 1.69 0.962  95% UCL 0.0599	Critical 2.29  F Stat 504  Critical 23.2 0.741  Median 0.0575	P-Valu 1.0000 P-Valu <1.0E- P-Valu 0.6250 0.8099 Min 0.056	1	Decision No Outlie Decision Significa  Decision Equal Va Normal [	n(α:5%) ers Detected n(α:5%) nt Effect n(α:1%) ariances Distribution  Std Err 0.000752	2.91%	0.00%
Auxiliary Test Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assur Attribute Variance Distribution  PCB 028 Sum Sample IOSN 2019 AT3-098	Sum 0.000 0.000 0.001 mptions Test Varia Shap mmary Code	Squares 1342 1018 1522 sts nce Ratio F iro-Wilk W I  Cour 5 5	Test Norma	e Test  Mean 0.001 2.25E  ality Tes  Mean 0.0576	<b>Squa</b> 134206	95% LCL 0.0557	Test Stat 1.56  DF 1 8 9  Test Stat 1.69 0.962  95% UCL 0.0599	Critical 2.29  F Stat 504  Critical 23.2 0.741  Median 0.0575	P-Valu 1.0000 P-Valu <1.0E- P-Valu 0.6250 0.8099 Min 0.056	1	Decision No Outlie Decision Significa  Decision Equal Va Normal [	n(α:5%) ers Detected n(α:5%) nt Effect n(α:1%) ariances Distribution  Std Err 0.000752	2.91%	0.00%
Auxiliary Test Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assur Attribute Variance Distribution  PCB 028 Sum Sample IOSN 2019 AT3-098  PCB 028 Deta	Sum 0.001 0.000 0.001 mptions Te Test Varia Shap mmary Code	Squares 1342 1018 1522 sts nce Ratio F iro-Wilk W I  Cour 5 5	Test Norma	e Test  Mean 0.001 2.25E  Mean 0.0576 0.079	<b>Squa</b> 1342 -06	95% LCL 0.0557 0.0775	Test Stat 1.56  DF 1 8 9  Test Stat 1.69 0.962  95% UCL 0.0599 0.0807	Critical 2.29  F Stat 504  Critical 23.2 0.741  Median 0.0575 0.0795	P-Valu 1.0000 P-Valu <1.0E- P-Valu 0.6250 0.8099 Min 0.056	1	Decision No Outlie Decision Significa  Decision Equal Va Normal [	n(α:5%) ers Detected n(α:5%) nt Effect n(α:1%) ariances Distribution  Std Err 0.000752	2.91%	0.00%

Report Date: Test Code/ID: TN-23

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										I	est Co	de/ID:	TN-23-303	IMINPUB /	7-0778-2871
Bioaccumula	tion Eva	aluation - I	РСВ С	ong	eners -	Мас	oma							EA-ES	T, Inc. PBC
Analysis ID: Analyzed: Edit Date:	19 Aug	9-9687 1-23 6:48 1-23 22:45		Anal	point: ysis: Hash:	Para	044 Imetric-Two C3D0D791	o Sample 6F43F6F89	F40898	1BBB9F		S Versions S Level: or ID:	n: CETISv2 1	2.1.1	
Batch ID: Start Date: Ending Date: Test Length:	29 Mar 26 Apr		F	Prot	ocol: cies:	US A	ACE NED F oma nasuta	` ,	Mn		Analy Dilue Brine Sour	ent: No	ancy Roka ot Applicable ot Applicable RO - Aquatic	Research (	Or <b>Age:</b>
Sample Code		Sample ID		Sam	ple Dat	e	Receipt	Date	Sample	Age	Clien	t Name	Pı	roject	
IOSN 2019 AT3-098		3-4648-81 7-1559-49			lar-23 eb-23 1	3:00	08 Mar- 09 Feb-		21d 14 49d 1h		Eco-A	Analysts,	Inc. Di	redged Sed	diment Evalu
Sample Code	N	laterial Ty	ре			Sam	ple Source	9		Station	Locatio	on	Lat/Long		
IOSN 2019	F	Reference s	sedime	nt		Yacl	ntsman Mai	rina NAE-20	004-00	IOSN Re	eferenc	е			
AT3-098	N	/larine Sedi	iment			Yacl	ntsman Mai	rina NAE-20	004-00	10 Statio	ons at 4	Marinas	Mu		
Data Transfor	m		Alt Hy	/p					Comp	arison R	esult				PMSD
Untransformed	t		C < T						AT3-0	98 failed	pcb 04	4 endpoir	nt		3.06%
<del></del>	vs Sa	ample II	Test	df	Test S	Stat	Critical	MSD	Р-Тур	e P-\	/alue		on(α:5%)		
Reference Sec	'A b	T3-098*		8	22.5		1.86	0.00197	CDF	<1.	0E-05	Significa	ant Effect		
Auxiliary Test Attribute		Test						Test Stat	Critic	al P-\	/alue	Decisio	on(α:5%)		
Outlier		Grubbs Ext	treme \	√alu	e Test			1.64	2.29	0.8	024	No Outl	iers Detected		
ANOVA Table	)														
Source	S	um Squar	res		Mean	Squa	are	DF	F Stat	: P-V	'alue	Decisio	n(α:5%)		
Between Error	0	.0014280			0.001 <sup>2</sup> 2.813E			1 8	508 —	<1.	0E-05	Significa	ant Effect		
Total	0	.0014505						9							
ANOVA Assu	mptions	s Tests													
Attribute	T	est						Test Stat	Critic	al P-V	/alue		n(α:1%)		
Variance Distribution		/ariance Ra Shapiro-Wil			ality Tes	st		1.56 0.976	23.2 0.741		785 412	•	ariances Distribution		
PCB 044 Sum	mary										_				
Sample	c	ode	Count		Mean		95% LCL	95% UCL	Media	an Mir	1	Max	Std Err	CV%	%Effect
IOSN 2019	F	RS	5		0.0644	1	0.0621	0.0667	0.064	0.0	625	0.067	0.000828	2.87%	0.00%
AT3-098			5		0.0883	3	0.0865	0.0901	0.088	5 0.0	86	0.09	0.000663	1.68%	-37.11%
PCB 044 Deta	il														
Sample	c	ode	Rep 1		Rep 2		Rep 3	Rep 4	Rep 5						
IOSN 2019	F	RS	0.064		0.0655	5	0.063	0.067	0.062	5					
AT3-098			0.086		0.0885	5	0.089	0.088	0.09						

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Test Code/ID: TN-23-303MnPCB / 17-0778-2871

								Test Co	ue/ID.	TN-23-303	02 /	0110 201
Bioaccumulat	tion Evaluatio	n - PCB C	onge	ners - Ma	acoma						EA-EST	, Inc. PBC
Analysis ID: Analyzed: Edit Date:	09-3696-3646 19 Aug-23 6:4 08 May-23 22	48	Analys		CB 052 onparametric BE4B4C3D6E	•		Statu	S Version is Level: or ID:	: CETISv2 1	.1.1	
Batch ID: Start Date: Ending Date: Test Length:	•	:48 :48	Test T Protoo Specio Taxon	col: US es: Ma	oaccumulatio S ACE NED l acoma nasut valvia	RIM (2004)	Mn	Anal Dilue Brine Sour	ent: No e: No	ncy Roka ot Applicable ot Applicable RO - Aquatic F	Research Oi	r Age:
Sample Code	Sample	) ID	Samp	le Date	Receip	t Date	Sample Age	e Clier	t Name	Pr	oject	
IOSN 2019 AT3-098	13-464 07-155		08 Ma 08 Fel	r-23 b-23 13:0	08 Mar 00 09 Feb		21d 14h 49d 1h	Eco-	Analysts, I	nc. Dr	edged Sedi	ment Evalı
Sample Code	Materia	ıl Type		Sa	mple Sourc	e	Sta	tion Locati	on	Lat/Long		
IOSN 2019	Referer	nce sedime	ent	Ya	achtsman Ma	ırina NAE-20	04-00 IOS	N Referenc	е			
AT3-098	Marine	Sediment		Ya	achtsman Ma	rina NAE-20	004-00 10 \$	Stations at 4	Marinas I	Mu		
Data Transfor	m	Alt H	ур				Comparis	on Result				PMSD
Untransformed	t	C < T					AT3-098 fa	ailed pcb 05	2 endpoint	t		634.92%
Wilcoxon Ran Sample I	าห Sum Two-S vs Sample	-		Test Sta	t Critical	Ties	P-Type	P-Value	Decision	n(α:5%)		
Reference Sec	-	<b>;</b> *	8 -	15		0	Exact	0.0040	Significa	nt Effect		
•	d AT3-098	*	8			0	Exact	0.0040	Significa	nt Effect		
Reference Sec	d AT3-098	*	8			0 Test Stat		0.0040  P-Value	Significa  Decision			
Reference Sec	d AT3-098	s Extreme		15						n(α:5%)		
Reference Sec Auxiliary Test Attribute	d AT3-098			15		Test Stat	Critical	P-Value	Decision	n(α:5%)		
Reference Sec Auxiliary Test Attribute Outlier	d AT3-098	s Extreme	Value	15		Test Stat	Critical	P-Value	Decision	n(α:5%) Detected		
Auxiliary Test Attribute Outlier ANOVA Table	ts Test Grubbs	s Extreme	Value	Test	 uare	Test Stat	Critical 2.29	<b>P-Value</b> 0.0004	Decision Outlier D	n(α:5%) Detected		
Auxiliary Test Attribute Outlier ANOVA Table Source Between Error	d AT3-098 ts Test Grubbs	s Extreme	Value I	Test  Mean Sq	uare	Test Stat 2.68  DF 1 8	Critical 2.29	P-Value 0.0004	Decision Outlier D	n(α:5%) Detected		
Auxiliary Test Attribute Outlier ANOVA Table Source Between	Test Grubbs Sum S 0.04616	s Extreme quares 041	Value I	Test  Mean Sq 0.046104	uare	<b>Test Stat</b> 2.68 <b>DF</b> 1	Critical 2.29	P-Value 0.0004	Decision Outlier D	n(α:5%) Detected		
Auxiliary Test Attribute Outlier ANOVA Table Source Between Error Total ANOVA Assur	Sum S 0.04610 0.3005 0.34660	s Extreme quares 041	Value I	Test  Mean Sq 0.046104	uare	Test Stat 2.68  DF 1 8 9	Critical 2.29  F Stat 1.23	P-Value 0.0004 P-Value 0.3001	Decision Outlier D Decision Non-Sign	n(α:5%) Detected n(α:5%) nificant Effect		
Auxiliary Test Attribute Outlier ANOVA Table Source Between Error Total ANOVA Assur	Sum S 0.04610 0.3005 0.34660 mptions Tests	quares 041	Value I	Test  Mean Sq 0.046104	uare	Test Stat 2.68  DF 1 8 9	Critical 2.29  F Stat 1.23  Critical	P-Value 0.0004  P-Value 0.3001  P-Value	Decision  Decision  Non-Sign	n(α:5%) Detected  n(α:5%) Inificant Effect  n(α:1%)		
Auxiliary Test Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assur Attribute Variance	AT3-098	quares 041 04 s e Ratio F	Value I (	Test  Mean Sq 0.046104 0.037562	uare	Test Stat 2.68  DF 1 8 9  Test Stat 63900	Critical 2.29  F Stat 1.23  Critical 23.2	P-Value 0.3001  P-Value 0.3001  P-Value <1.0E-05	Decision Non-Sign Decision Unequal	n(α:5%) Detected  n(α:5%) Inificant Effect  n(α:1%) Variances		
Auxiliary Test Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assur Attribute Variance Distribution	Sum S 0.04610 0.3005 0.34660 mptions Test Variance Shapire	quares 041	Value I (	Test  Mean Sq 0.046104 0.037562	uare	Test Stat 2.68  DF 1 8 9	Critical 2.29  F Stat 1.23  Critical	P-Value 0.0004  P-Value 0.3001  P-Value	Decision Non-Sign Decision Unequal	n(α:5%) Detected  n(α:5%) Inificant Effect  n(α:1%)		
Auxiliary Test Attribute Outlier ANOVA Table Source Between Error Total ANOVA Assur Attribute Variance Distribution PCB 052 Sum	Sum S 0.04610 0.3005 0.34660 mptions Tests Variance Shapire	quares 041 04 s se Ratio F	Value I ( ( Test Iormali	Test  Mean Sq 0.046104 0.037562	uare 11 25	Test Stat 2.68  DF 1 8 9  Test Stat 63900 0.628	Critical 2.29  F Stat 1.23  Critical 23.2 0.741	P-Value 0.3001  P-Value	Decision Non-Sign  Decision Unequal Non-Non	n(α:5%) Detected  n(α:5%) nificant Effect  n(α:1%)  Variances mal Distribution	on	%Effact
Auxiliary Test Attribute Outlier ANOVA Table Source Between Error Total ANOVA Assur Attribute Variance Distribution PCB 052 Sum Sample	Sum S 0.04610 0.3005 0.34660 mptions Tests Variance Shapiro	quares 041 04 see Ratio F	Value I ( ( Test lormali	Test  Mean Sq 0.046104 0.037562	 juare 11 25	Test Stat 2.68  DF 1 8 9  Test Stat 63900 0.628	Critical 2.29  F Stat 1.23  Critical 23.2 0.741  Median	P-Value 0.3001  P-Value 0.3001  P-Value <1.0E-05 0.0001  Min	Decision  Decision  Non-Sign  Decision  Unequal  Non-Non  Max	n(α:5%) Detected  n(α:5%) nificant Effect  n(α:1%) Variances mal Distribution	on CV%	%Effect
Auxiliary Test Attribute Outlier ANOVA Table Source Between Error Total ANOVA Assur Attribute Variance Distribution PCB 052 Sum	Sum S 0.04610 0.3005 0.34660 mptions Tests Variance Shapire	quares 041 04 s se Ratio F	Value I ( ( Test Iormali	Test  Mean Sq 0.046104 0.037562	uare 11 25	Test Stat 2.68  DF 1 8 9  Test Stat 63900 0.628	Critical 2.29  F Stat 1.23  Critical 23.2 0.741	P-Value 0.3001  P-Value	Decision Non-Sign  Decision Unequal Non-Non	n(α:5%) Detected  n(α:5%) nificant Effect  n(α:1%)  Variances mal Distribution	on	0.00%
Auxiliary Test Attribute Outlier ANOVA Table Source Between Error Total ANOVA Assur Attribute Variance Distribution PCB 052 Sum Sample IOSN 2019 AT3-098	Sum S 0.04610 0.3005 0.34660 mptions Test Variance Shapire mary Code RS	quares 041 04 s ee Ratio F 0-Wilk W N Count	Value I ( ( Test Iormali	Test  Mean Sq 0.046104 0.037562  ity Test  Mean 0.0359	95% LCL 0.0346	Test Stat 2.68  DF 1 8 9  Test Stat 63900 0.628  95% UCL 0.0372	Critical 2.29  F Stat 1.23  Critical 23.2 0.741  Median 0.0355	P-Value 0.3001  P-Value 1.0E-05 0.0001  Min 0.035	Decision Non-Sign  Decision Unequal Non-Non  Max 0.0375	n(α:5%) Detected  n(α:5%) Inificant Effect  n(α:1%) Variances mal Distribution  Std Err  0.000485	ON CV% 3.02%	0.00%
Auxiliary Test Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assur Attribute Variance Distribution  PCB 052 Sum Sample IOSN 2019 AT3-098  PCB 052 Deta	Sum S 0.04610 0.3005 0.34660 mptions Tests Variance Shapire code RS	quares 041 04 s e Ratio F -Wilk W N Count 5 5	Value I ( ) Test Iormali ( (	Test  Mean Sq 0.046104 0.037562  ity Test  Mean 0.0359 0.172	95% LCL 0.0346 -0.169	Test Stat 2.68  DF 1 8 9  Test Stat 63900 0.628  95% UCL 0.0372 0.512	Critical 2.29  F Stat 1.23  Critical 23.2 0.741  Median 0.0355 0.0495	P-Value 0.3001  P-Value 1.0E-05 0.0001  Min 0.035	Decision Non-Sign  Decision Unequal Non-Non  Max 0.0375	n(α:5%) Detected  n(α:5%) Inificant Effect  n(α:1%) Variances mal Distribution  Std Err  0.000485	ON CV% 3.02%	
Auxiliary Test Attribute Outlier ANOVA Table Source Between Error Total ANOVA Assur Attribute Variance Distribution PCB 052 Sum Sample IOSN 2019 AT3-098	Sum S 0.04610 0.3005 0.34660 mptions Test Variance Shapire mary Code RS	quares 041 04 s ee Ratio F 0-Wilk W N Count	Value I ( ) Test lormali ( )	Test  Mean Sq 0.046104 0.037562  ity Test  Mean 0.0359	95% LCL 0.0346	Test Stat 2.68  DF 1 8 9  Test Stat 63900 0.628  95% UCL 0.0372	Critical 2.29  F Stat 1.23  Critical 23.2 0.741  Median 0.0355	P-Value 0.3001  P-Value 1.0E-05 0.0001  Min 0.035	Decision Non-Sign  Decision Unequal Non-Non  Max 0.0375	n(α:5%) Detected  n(α:5%) Inificant Effect  n(α:1%) Variances mal Distribution  Std Err  0.000485	ON CV% 3.02%	0.00%

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										Т	est Co	de/ID:	TN-23-303	MINPCB /	17-0778-2871
Bioaccumulat	tion E	valuation -	- PCB	Cong	eners -	Мас	oma							EA-ES	ST, Inc. PBC
Analysis ID: Analyzed: Edit Date:	19 A	817-1474 ug-23 6:48 lay-23 22:4	5	Anal	point: lysis: i Hash:	Para	metric-Two	o Sample BE0EFD14[	D69E0CI	FCD9004	Statu	S Versio is Level: or ID:		2.1.1	
Batch ID: Start Date: Ending Date: Test Length:	29 M 26 A	•		Prot	ocol: cies:	US A	ACE NED Formal nasuta	` '	Mn		Analy Dilue Brine Sour	ent: N e: N	ancy Roka ot Applicable ot Applicable RO - Aquatic	Research (	Or <b>Age:</b>
Sample Code		Sample IE	)	Sam	ple Da	te	Receipt	Date	Sample	Age	Clien	t Name	Pi	roject	
IOSN 2019 AT3-098		13-4648-8 07-1559-4			lar-23 eb-23 1	3:00	08 Mar- 09 Feb-		21d 14l 49d 1h	h	Eco-A	Analysts,	Inc. D	redged Se	diment Evalu
Sample Code		Material T	уре			Sam	ple Source	Э		Station I	Locatio	on	Lat/Long		
IOSN 2019		Reference	sedim	ent		Yach	ntsman Mai	rina NAE-20	004-00	IOSN Re	ferenc	е			
AT3-098		Marine Se	dimen	t		Yach	ntsman Mai	rina NAE-20	004-00	10 Statio	ns at 4	Marinas	Mu		
Data Transfor	m		Alt I	Јур					Comp	arison R	esult				PMSD
Untransformed	t		C < 7	Γ					AT3-0	98 failed	pcb 06	6 endpoir	nt		2.93%
Equal Variance	ce t T	wo-Sample	Test												
Sample I	vs	Sample II		df	Test S	Stat	Critical	MSD	Р-Тур	e P-V	alue	Decisio	n(α:5%)		
Reference Sec	t	AT3-098*		8	23.2		1.86	0.000992	CDF	<1.0	DE-05	Significa	ant Effect		
Auxiliary Test	ts														
Attribute		Test						Test Stat	Critica	al P-V	alue	Decisio	n(α:5%)		
Outlier		Grubbs E	xtreme	e Valu	e Test			1.51	2.29	1.00	000	No Outl	iers Detected		
ANOVA Table	)														
Source		Sum Squa	ares		Mean	Squa	are	DF	F Stat	P-V	alue	Decisio	on(α:5%)		
Between		0.0003832	2		0.000	3832		1	539	<1.0	0E-05	Signific	ant Effect		
Error		5.688E-06	i		7.11E	-07		8	_						
Total		0.0003888	3					9							
ANOVA Assur	mptio														
Attribute		Test						Test Stat			alue		on(α:1%)		
Variance		Variance F				<b>.</b> •		1.38	23.2	0.76		•	ariances		
Distribution		Shapiro-W	IIK VV	NOLLI	anty 16	SI.		0.963	0.741	0.82	243	inormal	Distribution		
PCB 066 Sum	ımary		Carr	<b>-</b> 4	Mes		0.50/ 1.01	059/ 1101	Mad:-	n M:		Max	Ctal E	CV9/	0/ <b>⊑</b> #5
Sample		Code	Cou	ıı	Mean		95% LCL	95% UCL				Max	Std Err	CV%	%Effect
IOSN 2019 AT3-098		RS	5 5		0.033		0.0327 0.0452	0.0349	0.033			0.035 0.0471	0.000406 0.000346		0.00% -36.63%
			5		0.040		0.0432	0.0471	0.040	0.02	ŧJ	0.047 1	0.000340	1.07 70	-50.05%
PCB 066 Deta	iil	Code	D		De:: 1		Don 2	Dan 4	Den 5						
Sample		Code	Rep		Rep 2		Rep 3	Rep 4	Rep 5						
IOSN 2019 AT3-098		RS	0.03		0.034		0.033 0.0465	0.035 0.046	0.033 0.047	1					
V12-090			0.04	,	0.040	J	0.0400	0.040	0.047	ı					

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Bioaccumulat	tion Evaluati	on - PCB	Conge	eners - N	lacoma						EA-ES	T, Inc. PBC
Analysis ID: Analyzed: Edit Date:	14-9269-735 19 Aug-23 6 08 May-23 2	:48	Analy	•	CB 101 arametric-Tw 353EB38044B		C4E48E04E	Statu	S Version is Level: or ID:	: CETISv2.	1.1	
Batch ID: Start Date: Ending Date: Test Length:	•	3:48	Test Proto Spec Taxo	ocol: L	ioaccumulatio S ACE NED l lacoma nasut ivalvia	RIM (2004)	Mn	Analy Dilue Brine Sour	ent: No e: No	ncy Roka t Applicable t Applicable tO - Aquatic F	Research (	Or <b>Age:</b>
Sample Code	Sampl	e ID	Samı	ple Date	Receip	t Date	Sample Ag	e Clien	t Name	Pre	oject	
IOSN 2019 AT3-098	13-464	8-8170 9-4974	08 M 08 Fe	ar-23 eb-23 13:	08 Mar 00 09 Feb		21d 14h 49d 1h	Eco-/	Analysts, li	nc. Dr	edged Sed	liment Evalu
Sample Code	Materi	al Type		S	ample Sourc	е	Sta	tion Location	on	Lat/Long		
IOSN 2019	Refere	nce sedim	ent	Y	achtsman Ma	rina NAE-20	04-00 IOS	N Referenc	е			
AT3-098	Marine	Sediment	İ	Y	achtsman Ma	rina NAE-20	004-00 10	Stations at 4	Marinas I	Mu		
Data Transfor	m	Alt F					Comparis	on Result				PMSD
Untransformed	t	C < T	Γ				AT3-098 f	ailed pcb 10	1 endpoint	t		3.27%
Equal Variand	ce t Two-San	ple Test										
	vs Sample	e II	df	Test Sta	t Critical	MSD	P-Type	P-Value	Decision	η(α:5%)		
Sample I	vo oumpi											
Reference Sec	-			21.1	1.86	0.0018	CDF	<1.0E-05	Significa	nt Effect		
Reference Sec	d AT3-09				1.86	0.0018	CDF	<1.0E-05	Significa	nt Effect		
•	d AT3-09				1.86	0.0018  Test Stat		<1.0E-05 P-Value				
Reference Sec	d AT3-09		8	21.1	1.86				Decision			
Reference Sec Auxiliary Test Attribute	AT3-09  Test  Grubb	8*	8	21.1	1.86	Test Stat	Critical	P-Value	Decision	າ(α:5%)		
Reference Sec Auxiliary Test Attribute Outlier	AT3-09  Test  Grubb	8* os Extreme	8	21.1 e Test		Test Stat	Critical	P-Value	Decision No Outlie	n(α:5%) ers Detected		
Auxiliary Test Attribute Outlier ANOVA Table	AT3-09  Test  Grubb	8* es Extreme	8	21.1	quare	Test Stat 1.73	Critical 2.29	<b>P-Value</b> 0.6144	Decision	n(α:5%) ers Detected n(α:5%)		
Auxiliary Test Attribute Outlier ANOVA Table Source	AT3-09 Test Grubb Sum S	s Extreme  quares	8	21.1 e Test Mean S	<b>quare</b> 04	Test Stat 1.73	Critical 2.29	P-Value 0.6144 P-Value	Decisior No Outlie	n(α:5%) ers Detected n(α:5%)		
Auxiliary Test Attribute Outlier ANOVA Table Source Between	Test Grubb Sum S 0.0010	8* s Extreme squares 404 187	8	21.1  e Test  Mean S 0.00104	<b>quare</b> 04	<b>Test Stat</b> 1.73 <b>DF</b> 1	Critical 2.29	P-Value 0.6144 P-Value	Decisior No Outlie	n(α:5%) ers Detected n(α:5%)		
Auxiliary Test Attribute Outlier ANOVA Table Source Between Error	Sum S 0.0010 0.0010	8* s Extreme squares 404 1187	8	21.1  e Test  Mean S 0.00104	<b>quare</b> 04	Test Stat 1.73  DF 1 8	Critical 2.29	P-Value 0.6144 P-Value	Decisior No Outlie	n(α:5%) ers Detected n(α:5%)		
Auxiliary Test Attribute Outlier ANOVA Table Source Between Error Total	Sum S 0.0010 0.0010	8* s Extreme squares 404 1187	8	21.1  e Test  Mean S 0.00104	<b>quare</b> 04	Test Stat 1.73  DF 1 8	Critical 2.29  F Stat 445	P-Value 0.6144 P-Value	Decisior No Outlie	n(α:5%) ers Detected n(α:5%) nt Effect		
Auxiliary Test Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assur Attribute Variance	Sum S 0.0010 0.0000 0.0010 mptions Test Varian	es Extreme  squares  404 1187 591  ss	8 Value	21.1 e Test  Mean S 0.00104 2.338E-	<b>quare</b> 04	Test Stat 1.73  DF 1 8 9  Test Stat 1.79	Critical 2.29  F Stat 445  Critical 23.2	P-Value	Decision Significa  Decision Equal Va	n(α:5%) ers Detected n(α:5%) nt Effect n(α:1%) ariances		
Auxiliary Test Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assur Attribute	Sum S 0.0010 0.0000 0.0010 mptions Test Varian	es Extreme  squares 404 1187 1591	8 Value	21.1 e Test  Mean S 0.00104 2.338E-	<b>quare</b> 04	Test Stat 1.73  DF 1 8 9	Critical 2.29  F Stat 445  Critical	P-Value  P-Value  <1.0E-05	Decision Significa  Decision Equal Va	n(α:5%) ers Detected n(α:5%) nt Effect n(α:1%)		
Auxiliary Test Attribute Outlier ANOVA Table Source Between Error Total ANOVA Assur Attribute Variance	Sum S 0.0010 0.0000 0.0010 mptions Test Varian Shapir	es Extreme  equares  404  187  591  s  ce Ratio F  o-Wilk W I	8 Value Test	21.1 e Test  Mean S 0.00104 2.338E-	<b>quare</b> 04	Test Stat 1.73  DF 1 8 9  Test Stat 1.79	Critical 2.29  F Stat 445  Critical 23.2	P-Value	Decision Significa  Decision Equal Va	n(α:5%) ers Detected n(α:5%) nt Effect n(α:1%) ariances		
Auxiliary Test Auxiliary Test Attribute Outlier ANOVA Table Source Between Error Total ANOVA Assur Attribute Variance Distribution PCB 101 Sum Sample	Sum S 0.0010 0.0000 0.0010 mptions Test Varian Shapir	es Extreme  Squares  1404 1187 1591 15s  Ce Ratio F  o-Wilk W I	8 Value Test	e Test  Mean S 0.00104 2.338E-	<b>quare</b> 04 06 95% LCL	Test Stat 1.73  DF 1 8 9  Test Stat 1.79 0.959	Critical 2.29  F Stat 445  Critical 23.2 0.741  Median	P-Value	Decision No Outlie  Decision Significa  Decision Equal Va Normal E	n(α:5%) ers Detected n(α:5%) nt Effect n(α:1%) ariances Distribution	CV%	%Effect
Auxiliary Test Attribute Outlier ANOVA Table Source Between Error Total ANOVA Assur Attribute Variance Distribution PCB 101 Sum Sample IOSN 2019	Sum S 0.0010 0.0000 0.0010 mptions Test Varian Shapir	s Extreme squares 404 1187 591 ss ce Ratio F o-Wilk W I	8 Value Test	21.1  Mean S 0.00104 2.338E-  Mean 0.055	<b>quare</b> 04 06 <b>95% LCL</b> 0.0528	Test Stat 1.73  DF 1 8 9  Test Stat 1.79 0.959  95% UCL 0.0572	Critical 2.29  F Stat 445  Critical 23.2 0.741  Median 0.0545	P-Value	Decision Significa  Decision Equal Va Normal E  Max 0.0575	n(α:5%) ers Detected n(α:5%) nt Effect n(α:1%) ariances Distribution  Std Err 0.000775	3.15%	0.00%
Auxiliary Test Attribute Outlier ANOVA Table Source Between Error Total ANOVA Assur Attribute Variance Distribution PCB 101 Sum Sample	Sum S 0.0010 0.0000 0.0010 mptions Test Varian Shapir	es Extreme  Squares  1404 1187 1591 15s  Ce Ratio F  o-Wilk W I	8 Value Test	e Test  Mean S 0.00104 2.338E-	<b>quare</b> 04 06 95% LCL	Test Stat 1.73  DF 1 8 9  Test Stat 1.79 0.959	Critical 2.29  F Stat 445  Critical 23.2 0.741  Median	P-Value	Decision No Outlie  Decision Significa  Decision Equal Va Normal E	n(α:5%) ers Detected n(α:5%) nt Effect n(α:1%) ariances Distribution		
Auxiliary Test Attribute Outlier ANOVA Table Source Between Error Total ANOVA Assur Attribute Variance Distribution PCB 101 Sum Sample IOSN 2019	Sum S 0.0010 0.0000 0.0010 mptions Test Varian Shapir	s Extreme squares 404 1187 591 ss ce Ratio F o-Wilk W I	8 Value Test	21.1  Mean S 0.00104 2.338E-  Mean 0.055	<b>quare</b> 04 06 <b>95% LCL</b> 0.0528	Test Stat 1.73  DF 1 8 9  Test Stat 1.79 0.959  95% UCL 0.0572	Critical 2.29  F Stat 445  Critical 23.2 0.741  Median 0.0545	P-Value	Decision Significa  Decision Equal Va Normal E  Max 0.0575	n(α:5%) ers Detected n(α:5%) nt Effect n(α:1%) ariances Distribution  Std Err 0.000775	3.15%	0.00%
Auxiliary Test Attribute Outlier ANOVA Table Source Between Error Total ANOVA Assur Attribute Variance Distribution PCB 101 Sum Sample IOSN 2019 AT3-098	Sum S 0.0010 0.0000 0.0010 mptions Test Varian Shapir	s Extreme squares 404 1187 591 ss ce Ratio F o-Wilk W I	Test Norma	21.1  Mean S 0.00104 2.338E-  Mean 0.055	<b>quare</b> 04 06 <b>95% LCL</b> 0.0528	Test Stat 1.73  DF 1 8 9  Test Stat 1.79 0.959  95% UCL 0.0572	Critical 2.29  F Stat 445  Critical 23.2 0.741  Median 0.0545	P-Value	Decision Significa  Decision Equal Va Normal E  Max 0.0575	n(α:5%) ers Detected n(α:5%) nt Effect n(α:1%) ariances Distribution  Std Err 0.000775	3.15%	0.00%
Auxiliary Test Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assur Attribute Variance Distribution  PCB 101 Sum Sample IOSN 2019 AT3-098  PCB 101 Deta	Sum S 0.0010 0.0000 0.0010 mptions Test Varian Shapir mary Code RS	es Extreme  squares  404 1187 1591  ss  ce Ratio F o-Wilk W I  Cour  5 5	Test Norma	21.1  e Test  Mean S 0.00104 2.338E-  Mean 0.055 0.0754	95% LCL 0.0528 0.0738	Test Stat 1.73  DF 1 8 9  Test Stat 1.79 0.959  95% UCL 0.0572 0.077	Critical 2.29  F Stat 445  Critical 23.2 0.741  Median 0.0545 0.0755	P-Value	Decision Significa  Decision Equal Va Normal E  Max 0.0575	n(α:5%) ers Detected n(α:5%) nt Effect n(α:1%) ariances Distribution  Std Err 0.000775	3.15%	0.00%

Report Date:
Test Code/ID:

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Bioaccumulation	Evaluation - PO	CB Cong	eners -	Macoma						EA-ES	T, Inc. PBC
Analyzed: 19 /	1507-5714 Aug-23 6:48 May-23 22:45	Anal	ysis:	PCB 105 Parametric-Tw 99C7BBF4546		BDFFE560F	Statu	S Version: is Level: or ID:	: CETISv2. 1	1.1	
			ocol: cies:	Bioaccumulati US ACE NED Macoma nasu Bivalvia	RIM (2004)	Mn	Analy Dilue Brine Sour	ent: Not e: Not	ncy Roka t Applicable t Applicable O - Aquatic F	Research (	Or <b>Age:</b>
Sample Code IOSN 2019 AT3-098	Sample ID 13-4648-8170 07-1559-4974	08 M	<b>ple Dat</b> lar-23 eb-23 1	08 Ma	-23	<b>Sample Ag</b> 21d 14h 49d 1h		<b>t Name</b> Analysts, Ir		<b>oject</b> edged Sec	liment Evalu
Sample Code IOSN 2019 AT3-098	Material Type Reference se Marine Sedim	diment		Sample Sour Yachtsman Ma Yachtsman Ma	arina NAE-20	04-00 105	tion Location SN Reference Stations at 4	е	<b>Lat/Long</b>		
Data Transform	A	It Hyp				Comparis	on Result				PMSD
Untransformed	С	< T				AT3-098 f	ailed pcb 10	5 endpoint			3.13%
Equal Variance t 3 Sample I vs Reference Sed	Two-Sample Te Sample II AT3-098*	est df 8	<b>Test S</b> 21.9	tat Critical	MSD	P-Type CDF	<b>P-Value</b> <1.0E-05	<b>Decision</b> Significar	, ,		
510101100 000	A13-030	O	21.9	1.00	0.00154	CDF	<b>►1.0E-03</b>	Olgrillical	IL LITECL		
Auxiliary Tests			21.9	1.00							
Auxiliary Tests Attribute	Test			1.00	Test Stat	Critical	P-Value	Decision	ι(α:5%)		
Auxiliary Tests				1.00				Decision			
Auxiliary Tests Attribute	Test			1.00	Test Stat	Critical	P-Value	Decision	ι(α:5%)		
Auxiliary Tests Attribute Outlier	Test	eme Valu	e Test	Square	Test Stat	Critical	P-Value	Decision	n(α:5%) ers Detected		
Auxiliary Tests Attribute Outlier ANOVA Table Source Between	Test Grubbs Extre Sum Square: 0.0008281	eme Valu	e Test  Mean  0.0008	Square 3281	<b>Test Stat</b> 1.78 <b>DF</b> 1	Critical 2.29	<b>P-Value</b> 0.5371	<b>Decision</b> No Outlie	r(α:5%) ers Detected er(α:5%)		
Auxiliary Tests Attribute Outlier ANOVA Table Source Between Error	Test Grubbs Extre  Sum Square: 0.0008281 0.0000138	eme Valu	e Test Mean	Square 3281	Test Stat 1.78  DF 1 8	Critical 2.29	P-Value 0.5371 P-Value	Decision No Outlie	r(α:5%) ers Detected er(α:5%)		
Auxiliary Tests Attribute Outlier ANOVA Table Source Between	Test Grubbs Extre Sum Square: 0.0008281	eme Valu	e Test  Mean  0.0008	Square 3281	<b>Test Stat</b> 1.78 <b>DF</b> 1	Critical 2.29	P-Value 0.5371 P-Value	Decision No Outlie	r(α:5%) ers Detected er(α:5%)		
Auxiliary Tests Attribute Outlier ANOVA Table Source Between Error	Test Grubbs Extre  Sum Square: 0.0008281 0.0000138 0.0008419	eme Valu	e Test  Mean  0.0008	Square 3281	Test Stat 1.78  DF 1 8	Critical 2.29	P-Value 0.5371 P-Value	Decision No Outlie	r(α:5%) ers Detected er(α:5%)		
Auxiliary Tests Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assumpti Attribute	Test Grubbs Extre  Sum Squaree 0.0008281 0.0000138 0.0008419 ons Tests Test	eme Valu	e Test  Mean  0.0008	Square 3281	Test Stat 1.78  DF 1 8 9	Critical 2.29  F Stat 480  Critical	P-Value  9.5371  P-Value  <1.0E-05	Decision  No Outlie  Decision  Significan	ers Detected  ers Detected  ers (α:5%)  ent Effect  ers (α:1%)		
Auxiliary Tests Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assumpti Attribute Variance	Test Grubbs Extre  Sum Squares 0.0008281 0.0000138 0.0008419 ons Tests Test Variance Rati	eme Valu s	e Test  Mean 0.0008 1.725E	<b>Square</b> 3281 E-06	Test Stat 1.78  DF 1 8 9  Test Stat 1.76	Critical 2.29  F Stat 480  Critical 23.2	P-Value	Decision Significar  Decision Equal Va	ers Detected  e		
Auxiliary Tests Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assumpti Attribute Variance Distribution	Test Grubbs Extre  Sum Squaree 0.0008281 0.0000138 0.0008419  ons Tests  Test  Variance Rati Shapiro-Wilk	eme Valu s	e Test  Mean 0.0008 1.725E	<b>Square</b> 3281 E-06	Test Stat 1.78  DF 1 8 9	Critical 2.29  F Stat 480  Critical	P-Value  9.5371  P-Value  <1.0E-05	Decision Significar  Decision Equal Va	ers Detected  ers Detected  ers (α:5%)  ent Effect  ers (α:1%)		
Auxiliary Tests Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assumpti Attribute Variance Distribution  PCB 105 Summar	Test Grubbs Extre  Sum Square: 0.0008281 0.0000138 0.0008419 ons Tests Test Variance Rati Shapiro-Wilk	s io F Test W Norma	e Test  Mean 0.0008 1.725E	<b>Square</b> 3281 E-06	Test Stat 1.78  DF 1 8 9  Test Stat 1.76 0.943	Critical 2.29  F Stat 480  Critical 23.2 0.741	P-Value 0.5371  P-Value <1.0E-05  P-Value 0.5974 0.5867	Decision Significan  Decision Equal Va Normal D	a(α:5%) ars Detected a(α:5%) at Effect a(α:1%) riances bistribution		
Auxiliary Tests Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assumpti Attribute Variance Distribution  PCB 105 Summar Sample	Test Grubbs Extre  Sum Square: 0.0008281 0.0008419 ons Tests Test Variance Rati Shapiro-Wilk  y Code C	eme Valu s io F Test W Norma	e Test  Mean  0.0008 1.725E	<b>Square</b> 3281 E-06	Test Stat 1.78  DF 1 8 9  Test Stat 1.76 0.943	Critical 2.29  F Stat 480  Critical 23.2 0.741  Median	P-Value 0.5371  P-Value <1.0E-05  P-Value 0.5974 0.5867  Min	Decision Significan  Decision Equal Va Normal D	ers Detected  ers Detected  e(α:5%)  nt Effect  er(α:1%)  riances  elistribution  Std Err	CV%	%Effect
Auxiliary Tests Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assumpti Attribute Variance Distribution  PCB 105 Summar Sample IOSN 2019	Test Grubbs Extre  Sum Squares 0.0008281 0.0008419 ons Tests Test Variance Rati Shapiro-Wilk  y Code C RS 5	s io F Test W Norma	e Test  Mean 0.0008 1.7258  Mean 0.0493	Square 3281 E-06  t 95% LCL 0.0475	Test Stat 1.78  DF 1 8 9  Test Stat 1.76 0.943  95% UCL 0.0511	Critical 2.29  F Stat 480  Critical 23.2 0.741  Median 0.049	P-Value 0.5371  P-Value <1.0E-05  P-Value 0.5974 0.5867  Min 0.048	Decision Significan  Decision Equal Va Normal D  Max 0.0515	a(α:5%) ers Detected a(α:5%) at Effect a(α:1%) riances bistribution  Std Err 0.000663	3.01%	0.00%
Auxiliary Tests Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assumpti Attribute Variance Distribution  PCB 105 Summar Sample	Test Grubbs Extre  Sum Square: 0.0008281 0.0008419 ons Tests Test Variance Rati Shapiro-Wilk  y Code C	s io F Test W Norma	e Test  Mean  0.0008 1.725E	Square 3281 E-06  t 95% LCL 0.0475	Test Stat 1.78  DF 1 8 9  Test Stat 1.76 0.943	Critical 2.29  F Stat 480  Critical 23.2 0.741  Median	P-Value 0.5371  P-Value <1.0E-05  P-Value 0.5974 0.5867  Min	Decision Significan  Decision Equal Va Normal D	ers Detected  ers Detected  e(α:5%)  nt Effect  er(α:1%)  riances  elistribution  Std Err		
Auxiliary Tests Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assumpti Attribute Variance Distribution  PCB 105 Summar Sample IOSN 2019	Test Grubbs Extre  Sum Squares 0.0008281 0.0008419 ons Tests Test Variance Rati Shapiro-Wilk  y Code C RS 5	s io F Test W Norma	e Test  Mean 0.0008 1.7258  Mean 0.0493	Square 3281 E-06  t 95% LCL 0.0475	Test Stat 1.78  DF 1 8 9  Test Stat 1.76 0.943  95% UCL 0.0511	Critical 2.29  F Stat 480  Critical 23.2 0.741  Median 0.049	P-Value 0.5371  P-Value <1.0E-05  P-Value 0.5974 0.5867  Min 0.048	Decision Significan  Decision Equal Va Normal D  Max 0.0515	a(α:5%) ers Detected a(α:5%) at Effect a(α:1%) riances bistribution  Std Err 0.000663	3.01%	0.00%
Auxiliary Tests Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assumpti Attribute Variance Distribution  PCB 105 Summar Sample IOSN 2019 AT3-098	Test Grubbs Extre  Sum Squares 0.0008281 0.0000138 0.0008419 ons Tests Test Variance Rati Shapiro-Wilk  y Code C RS 5 5	s io F Test W Norma	e Test  Mean 0.0008 1.7258  Mean 0.0493	Square 3281 E-06  t 95% LCL 0.0475	Test Stat 1.78  DF 1 8 9  Test Stat 1.76 0.943  95% UCL 0.0511	Critical 2.29  F Stat 480  Critical 23.2 0.741  Median 0.049	P-Value 0.5371  P-Value <1.0E-05  P-Value 0.5974 0.5867  Min 0.048	Decision Significan  Decision Equal Va Normal D  Max 0.0515	a(α:5%) ers Detected a(α:5%) at Effect a(α:1%) riances bistribution  Std Err 0.000663	3.01%	0.00%
Auxiliary Tests Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assumpti Attribute Variance Distribution  PCB 105 Summar Sample IOSN 2019 AT3-098  PCB 105 Detail	Test Grubbs Extre  Sum Squares 0.0008281 0.0000138 0.0008419  ons Tests Test Variance Rati Shapiro-Wilk  Y Code C RS 5 5 Code R	s io F Test W Norma	e Test  Mean 0.0008 1.725E  Mean 0.0493 0.0675	Square 3281 5-06 st  95% LCL 3 0.0475 5 0.0661	Test Stat 1.78  DF 1 8 9  Test Stat 1.76 0.943  95% UCL 0.0511 0.0689	Critical 2.29  F Stat 480  Critical 23.2 0.741  Median 0.049 0.0675	P-Value 0.5371  P-Value <1.0E-05  P-Value 0.5974 0.5867  Min 0.048	Decision Significan  Decision Equal Va Normal D  Max 0.0515	a(α:5%) ers Detected a(α:5%) at Effect a(α:1%) riances bistribution  Std Err 0.000663	3.01%	0.00%

Report Date: Test Code/ID: TN-23

19 Aug-23 06:48 (p 9 of 18) TN-23-303MnPCB / 17-0778-2871

		-					Test Co	de/ID:	TN-23-303I	MnPCB / 1	7-0778-2871
Bioaccumula	tion Evaluatio	on - PCB Co	ngeners -	Macoma						EA-ES	T, Inc. PBC
Analysis ID: Analyzed: Edit Date:	20-1325-552 19 Aug-23 6: 08 May-23 22	48 <b>A</b>	ndpoint: nalysis: D5 Hash:	PCB 118 Parametric-Tw 0597AABE8A5		5199110DC7	Statu	S Version: is Level: or ID:	: CETISv2 1	1.1	
Batch ID: Start Date: Ending Date: Test Length:	•	:48 <b>P</b> :48 <b>S</b>	est Type: rotocol: pecies: axon:	Bioaccumulatic US ACE NED I Macoma nasut Bivalvia	RIM (2004)	Mn	Analy Dilue Brine Sour	ent: Not	ncy Roka t Applicable t Applicable O - Aquatic F	Research (	Or <b>Age:</b>
Sample Code IOSN 2019 AT3-098	Sample 13-464 07-155	8-8170 08	ample Dat 3 Mar-23 3 Feb-23 1	08 Mar-	-23	Sample Age 21d 14h 49d 1h		<b>t Name</b> Analysts, Ir		oject edged Sed	diment Evalu
Sample Code IOSN 2019 AT3-098	Referer	al Type nce sedimen Sediment	t	Sample Source Yachtsman Ma Yachtsman Ma	rina NAE-20	004-00 IOS	tion Location N Referenc Stations at 4	е	<b>Lat/Long</b> ∕lu		
Data Transfor	rm	Alt Hyp	)			Comparis	on Result				PMSD
Untransformed	d	C < T				AT3-098 fa	ailed pcb 11	8 endpoint			3.79%
Equal Variand Sample I Reference Sec	vs Sample	II	<b>df Test S</b> 7 18.3	Stat Critical 1.89	<b>MSD</b> 0.00198	P-Type CDF	<b>P-Value</b> <1.0E-05	<b>Decision</b> Significar	• •		
ANOVA Table Source Between	Sum S 0.0008	-	<b>Mean</b> 0.0008	<b>Square</b> 3171	<b>DF</b>	<b>F Stat</b> 337	P-Value <1.0E-05	<b>Decision</b> Significar	<u> </u>		
Error Total	1.699E 0.0008		2.427	<b>Ξ-06</b>	7 8	_					
ANOVA Assu	mptions Test	s									
Attribute Variance Distribution		ce Ratio F Te o-Wilk W No		st	1.16 0.955	46.2 0.701	<b>P-Value</b> 0.9433 0.7426	Decision Equal Va Normal D	· · ·		
PCB 118 Sum	nmary										
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
IOSN 2019 AT3-098	RS	5 4	0.0522 0.0714		0.0542 0.0738	0.052 0.071	0.0505 0.0695	0.0545 0.073	0.000718 0.000747	3.07% 2.09%	0.00% -36.73%
PCB 118 Deta	ail										
1 OD 110 Dett											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					

Report Date: Test Code/ID:

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									Т	est Co	de/ID:	TN-23-303I	MnPCB / 1	7-0778-287
Bioaccumula	tion Evalu	uation - PC	B Con	geners -	Масо	ma							EA-ES	T, Inc. PBC
Analysis ID: Analyzed: Edit Date:	11-7225- 19 Aug-2 08 May-2	23 6:48	Ana	•	Paran	netric-Two	o Sample 018A32DDC	6548680	69831		S Version is Level: or ID:	ı: CETISv2 1	.1.1	
Batch ID: Start Date: Ending Date: Test Length:	•	3 13:48 3 12:48	Pro	tocol:	US A	CE NED F ma nasuta	n - PCBs - I RIM (2004) a	Mn		Analy Dilue Brine Sour	ent: No e: No	ncy Roka ot Applicable ot Applicable RO - Aquatic F	Research (	Or <b>Age</b> :
Sample Code	Sa	mple ID	San	nple Date	е	Receipt	t Date	Sample	Age	Clien	t Name	Pr	oject	
IOSN 2019 AT3-098		-4648-8170 -1559-4974		Лаг-23 Feb-23 1	3:00	08 Mar- 09 Feb-		21d 14h 49d 1h	ı	Eco-A	Analysts, I	nc. Dr	edged Sed	liment Evalu
Sample Code	e Ma	terial Type			Samp	le Sourc	е		Station I	ocatio	on	Lat/Long		
IOSN 2019	Re	ference sed	iment		Yacht	sman Ma	rina NAE-20	04-00	IOSN Re	ferenc	е			
AT3-098	Ма	rine Sedime	ent		Yacht	sman Ma	rina NAE-20	004-00	10 Statio	ns at 4	Marinas I	Mu		
Data Transfor	rm	Alt	Нур					Compa	arison R	esult				PMSD
Untransformed	d	C ·	< T					AT3-09	8 failed	pcb 12	8 endpoin	t		3.17%
Sample I Reference Sec	vs San	Sample Tes nple II 3-098*	<b>df</b> 8	<b>Test S</b> 21.6		Critical	<b>MSD</b> 0.00195	P-Type		alue E-05	<b>Decision</b> Significa	• •		
Auxiliary Test Attribute Outlier	Te	est rubbs Extrer	ne Valı	ue Test			Test Stat	Critica 2.29	I P-V	alue	<b>Decisio</b> No Outlie	n(α:5%) ers Detected		
ANOVA Table Source		m Squares		Mean	Squar	'e	DF	F Stat	P-V	alue	Decisio	n(a·5%)		
Between Error Total	0.0 0.0	012882 000022 013102		0.0012 2.75E-	2882		1 8 9	468		DE-05	Significa	• •		
ANOVA Assu	mptions 1	Tests												
Attribute	Te	st					Test Stat	Critica	I P-V	alue	Decision	n(α:1%)		
Variance Distribution		riance Ratio apiro-Wilk V			st		1.5 0.964	23.2 0.741	0.70 0.82		Equal Va Normal [	ariances Distribution		
PCB 128 Sum	nmary		·											
Sample	Co	de Co	unt	Mean	9	5% LCL	95% UCL	Media	n Min		Max	Std Err	CV%	%Effect
IOSN 2019	RS	5		0.0616	6 (	0.0593	0.0639	0.061	0.06	6	0.064	0.000812	2.95%	0.00%
AT3-098		5		0.0843	3 (	0.0825	0.0861	0.0845	0.08	32	0.086	0.000663	1.76%	-36.85%
PCB 128 Deta	ail													
Sample	Co	de Re	p 1	Rep 2	F	Rep 3	Rep 4	Rep 5						
IOSN 2019	RS	0.0	061	0.063	C	0.06	0.064	0.06						
AT3-098		0.0	82	0.0845	5 (	).085	0.084	0.086						
	_			_		_		_	_	_	_		_	

Report Date: 19 Aug-23 06:48 (p 11 of 18)
Test Code/ID: TN-23-303MnPCB / 17-0778-2871

		-								T	est Co	de/ID:	TN-23-303	MnPCB / 1	7-0778-2871
Bioaccumulat	tion E	valuation -	PCB (	Cong	eners -	Масо	ma							EA-ES	T, Inc. PBC
Analysis ID: Analyzed: Edit Date:	19 A	129-8390 ug-23 6:48 lay-23 22:45	5	Anal	point: ysis: Hash:	Parar	netric-Two	Sample FB15B6C7I	D55433F	7C843E	Statu	S Version is Level: or ID:	: CETISv2 1	.1.1	
Batch ID: Start Date: Ending Date: Test Length:	29 M 26 A	•			ocol: cies:	US A	CE NED F ma nasuta	n - PCBs - I RIM (2004) a	Mn		Analy Dilue Brine Sour	ent: No e: No	ncy Roka t Applicable t Applicable tO - Aquatic F	Research (	Or <b>Age:</b>
Sample Code		Sample ID	)	Sam	ple Dat	te	Receipt	Date	Sample	Age	Clien	t Name	Pr	oject	
IOSN 2019 AT3-098		13-4648-8 07-1559-49			- lar-23 eb-23 1	3:00	08 Mar- 09 Feb-	23	21d 14h 49d 1h	_	Eco-A	Analysts, I	nc. Dr	edged Sed	diment Evalu
Sample Code		Material T	уре			Samp	le Source	)		Station I	Locatio	on	Lat/Long		
IOSN 2019		Reference	sedim	ent		Yacht	tsman Mar	ina NAE-20	04-00	IOSN Re	ferenc	e			
AT3-098		Marine Sec	diment			Yacht	tsman Mar	ina NAE-20	004-00	10 Statio	ns at 4	Marinas I	Мu		
Data Transfor	m		Alt H	lyp					Compa	arison R	esult				PMSD
Untransformed	d		C < T						AT3-09	8 failed	pcb 13	8 endpoint	ţ		3.06%
Sample I Reference Sec	vs	wo-Sample Sample II AT3-098*	Test	df 8	<b>Test 5</b> 22.4		Critical	MSD 0.00121	P-Type		alue DE-05	<b>Decision</b> Significa	,		
Auxiliary Test Attribute Outlier	ts	<b>Test</b> Grubbs Ex	xtreme	Valu	e Test			Test Stat	Critica 2.29	I <b>P-V</b>	<b>alue</b> 759	<b>Decision</b> No Outlie	n(α:5%) ers Detected		
ANOVA Table	,														
Source		Sum Squa			Mean	Squa	re	DF	F Stat	P-V	alue	Decision	, ,		
Between Error Total		0.0005256 8.400E-06 0.0005340			0.000 1.05E			1 8 9	501 —	<1.0	0E-05	Significa	nt Effect		
ANOVA Assur	mptic														
Attribute	•	Test						Test Stat	Critica	I P-V	alue	Decision	n(α:1%)		
Variance Distribution		Variance R Shapiro-W			ality Tes	st		1.27 0.963	23.2 0.741	0.82	223	Equal Va	· ,		
PCB 138 Sum	mary	,													
PCB 138 Sum Sample	ımary	Code	Coun	ıt	Mean	ç	95% LCL	95% UCL	Media	n Min		Max	Std Err	CV%	%Effect
	ımary		Coun	nt	<b>Mean</b> 0.0394		95% LCL 0.0381	<b>95% UCL</b> 0.0407	Mediai 0.039	n Min		<b>Max</b> 0.041	<b>Std Err</b> 0.000485	<b>CV%</b> 2.75%	%Effect 0.00%
Sample	ımary	Code		nt		4 (					385				
Sample IOSN 2019		Code	5	it	0.0394	4 (	0.0381	0.0407	0.039	0.03	385	0.041	0.000485	2.75%	0.00%
Sample IOSN 2019 AT3-098		Code	5		0.0394	4 ( 9 (	0.0381	0.0407	0.039	0.03	385	0.041	0.000485	2.75%	0.00%
Sample IOSN 2019 AT3-098  PCB 138 Deta		<b>Code</b> RS	5 5	1	0.0394	4 (9 (	0.0381 0.0527	0.0407 0.0551	0.039 0.054	0.03 0.05	385	0.041	0.000485	2.75%	0.00%

Report Date: Test Code/ID: 19 Aug-23 06:48 (p 12 of 18) TN-23-303MnPCB / 17-0778-2871

Di	41 <b></b>	DOD 0								E4 E0	
Bioaccumulat	tion Evaluation	- PCB Con	geners - M	acoma						EA-ES	Γ, Inc. PBC
Analysis ID:	08-1735-4110		dpoint: P		<b>T</b> 0 1			S Version		.1.1	
Analyzed: Edit Date:	19 Aug-23 6:48 08 May-23 22:4		•	onparametric- DECE76B49D	•			us Level: or ID:	1		
Euit Date.							74LO EUIT				
Batch ID:	14-7703-1847			oaccumulatio		Иn	Anal	-	ncy Roka		
Start Date:	29 Mar-23 13:48 26 Apr-23 12:48			S ACE NED F acoma nasuta	` ,		Dilue Brine		t Applicable		
Test Length:	•	•		acoma nasut valvia	1		Soui		t Applicable O - Aquatic I	Research O	r Δαe·
Test Length.	274 2011		- Di	vaivia					-		- Age.
Sample Code	•		mple Date	Receipt		Sample Ag		nt Name		oject	
IOSN 2019	13-4648-8		Mar-23	08 Mar-		21d 14h	Eco-	Analysts, Ir	nc. Dr	edged Sedi	ment Evalu
AT3-098	07-1559-4	1974 08	Feb-23 13:0	09 Feb-	23 16:30	49d 1h					
Sample Code	Material 1	Гуре	Sa	ample Source	9	Sta	ation Locati	on	Lat/Long		
IOSN 2019		e sediment		achtsman Ma			SN Reference				
AT3-098	Marine Se	ediment	Ya	achtsman Ma	rina NAE-20	004-00 10	Stations at 4	4 Marinas N	Ли 		
Data Transfor	rm	Alt Hyp				Comparis	son Result				PMSD
Untransformed	d	C < T				AT3-098 f	failed pcb 15	3 endpoint			67.03%
Wilcoxon Rar	nk Sum Two-Sai	mple Test									
	vs Sample II	d	f Test Sta	t Critical	Ties	P-Type	P-Value	Decision	(a:5%)		
Reference Sec	-	8			0	Exact	0.0040	Significal	• •		
Auxiliary Test					_						
Attribute	Test				Test Stat		P-Value	Decision	•		
Outlier	Grubbs E	xtreme Va	lue Test		2.68	2.29	0.0005	Outlier D	etected		
ANOVA Table	•										
Source	Sum Squ	ares	Mean So	quare	DF	F Stat	P-Value	Decision	ι(α:5%)		
Between	0.0089700	า	0.00007/	20					=		
Error		9	0.008970	)0	1	4.11	0.0773	Non-Sigr	ificant Effect	I	
	0.0174727	7	0.008970		8	4.11 —	0.0773	Non-Sigr	nificant Effect	[	
Total	0.0174727 0.0264427	7			-	4.11 _	0.0773	Non-Sigr	inficant Effect		
Total		7			8	4.11 - -	0.0773	Non-Sigr	inficant Effect		
Total	0.026442	7			8		0.0773  P-Value	Non-Sigr			
ANOVA Assur Attribute Variance	0.0264422 mptions Tests Test Variance	7 7 Ratio F Tes	0.002184		9			Decision			
Total  ANOVA Assur	0.0264422 mptions Tests Test Variance	7	0.002184		8 9 Test Stat	Critical	P-Value	<b>Decision</b> Unequal	η(α:1%)		
ANOVA Assur Attribute Variance	0.026442 mptions Tests Test Variance I Shapiro-W	7 7 Ratio F Tes	0.002184		8 9 <b>Test Stat</b> 698	Critical 23.2	<b>P-Value</b> 1.2E-05	<b>Decision</b> Unequal	ı(α:1%) Variances		
ANOVA Assur Attribute Variance Distribution	0.026442 mptions Tests Test Variance I Shapiro-W	7 7 Ratio F Tes	0.002184		8 9 <b>Test Stat</b> 698 0.655	<b>Critical</b> 23.2 0.741	<b>P-Value</b> 1.2E-05	<b>Decision</b> Unequal	ı(α:1%) Variances		%Effect
ANOVA Assur Attribute Variance Distribution PCB 153 Sum	mptions Tests Test Variance   Shapiro-W	7 7 Ratio F Tes Vilk W Norr	0.002184	11	8 9 <b>Test Stat</b> 698 0.655	<b>Critical</b> 23.2 0.741	P-Value 1.2E-05 0.0003	<b>Decisior</b> Unequal Non-Norr	ı(α:1%) Variances mal Distributi	on	%Effect 0.00%
ANOVA Assur Attribute Variance Distribution PCB 153 Sum Sample	0.0264422 mptions Tests Test Variance I Shapiro-W	7 7 Ratio F Tes Vilk W Norr Count	0.002184 st nality Test  Mean	95% LCL	8 9 <b>Test Stat</b> 698 0.655	<b>Critical</b> 23.2 0.741 <b>Median</b>	P-Value 1.2E-05 0.0003	Decision Unequal Non-Nom	ı(α:1%) Variances mal Distributi Std Err	on CV%	
ANOVA Assur Attribute Variance Distribution PCB 153 Sum Sample IOSN 2019	0.0264422 mptions Tests Test Variance I Shapiro-W mary Code RS	Ratio F Tes Vilk W Norr	0.002184 st nality Test  Mean 0.082	95% LCL 0.0789	8 9 <b>Test Stat</b> 698 0.655 <b>95% UCL</b> 0.0851	23.2 0.741 Median 0.0815	P-Value 1.2E-05 0.0003 Min 0.0795	Decision Unequal Non-Norr  Max 0.0855	o(α:1%) Variances mal Distributi  Std Err  0.00112	on  CV%  3.05%	0.00%
ANOVA Assur Attribute Variance Distribution PCB 153 Sum Sample IOSN 2019 AT3-098	0.0264422 mptions Tests Test Variance I Shapiro-W mary Code RS	Ratio F Tes Vilk W Norr	0.002184 st nality Test  Mean 0.082	95% LCL 0.0789	8 9 <b>Test Stat</b> 698 0.655 <b>95% UCL</b> 0.0851	23.2 0.741 Median 0.0815	P-Value 1.2E-05 0.0003 Min 0.0795	Decision Unequal Non-Norr  Max 0.0855	o(α:1%) Variances mal Distributi  Std Err  0.00112	on  CV%  3.05%	0.00%
ANOVA Assur Attribute Variance Distribution PCB 153 Sum Sample IOSN 2019 AT3-098 PCB 153 Deta	0.0264422 mptions Tests Test Variance I Shapiro-W mary Code RS	Ratio F Tes Vilk W Norr Count 5	0.002184  st nality Test  Mean  0.082  0.142	95% LCL 0.0789 0.0599	8 9 <b>Test Stat</b> 698 0.655 <b>95% UCL</b> 0.0851 0.224	Critical 23.2 0.741  Median 0.0815 0.113	P-Value 1.2E-05 0.0003 Min 0.0795	Decision Unequal Non-Norr  Max 0.0855	o(α:1%) Variances mal Distributi  Std Err  0.00112	on  CV%  3.05%	0.00%

Report Date: Test Code/ID:

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Bioaccumulat	tion Evaluation	n - PCB Co	ngeners -	Macoma						EA-ES	T, Inc. PBC
Analysis ID: Analyzed: Edit Date:	12-8292-6359 19 Aug-23 6:4 08 May-23 22	8 <b>A</b> r	•	PCB 170 Parametric-Two 67E462D9ADC	•	55A068B00	Statu	S Version is Level: or ID:	: CETISv2. 1	.1.1	
Batch ID: Start Date: Ending Date: Test Length:	•	48 <b>P</b> r 48 <b>S</b> j	otocol: pecies:	Bioaccumulatic US ACE NED f Macoma nasut Bivalvia	RIM (2004)	Mn	Analy Dilue Brine Sour	ent: Not	ncy Roka t Applicable t Applicable O - Aquatic F	Research (	Or <b>Age:</b>
Sample Code	Sample	ID Sa	mple Date	Receip	t Date	Sample Age	e Clien	t Name	Pre	oject	
IOSN 2019 AT3-098	13-4648 07-1559		Mar-23 Feb-23 13	08 Mar- 3:00 09 Feb-	-23	21d 14h 49d 1h		Analysts, Ir	nc. Dr	edged Sed	liment Evalu
Sample Code	Materia	l Type		Sample Sourc	е	Sta	tion Location	on	Lat/Long		
IOSN 2019	Referen	ce sediment	t	Yachtsman Ma	rina NAE-20	04-00 IOS	SN Referenc	е			
AT3-098	Marine S	Sediment		Yachtsman Ma	rina NAE-20	04-00 10	Stations at 4	Marinas N	Лu		
Data Transfor	m	Alt Hyp	ı			Comparis	on Result				PMSD
Untransformed	i	C < T				AT3-098 fa	ailed pcb 17	0 endpoint			3.14%
<b>Equal Variance</b>	e t iwo-Samp	ne rest				D Tymo	P-Value	Decision	\(\article\)		
Sample I Reference Sed	vs Sample I		df Test S 3 21.6	tat Critical 1.86	<b>MSD</b> 0.00095	<b>P-Type</b> CDF	<1.0E-05	Significar	• •		
Reference Sed Auxiliary Test Attribute	AT3-098 <sup>3</sup> s Test	* {	3 21.6		0.00095  Test Stat	CDF  Critical	<1.0E-05	Significar Decision	nt Effect n(α:5%)		
Reference Sed	AT3-098 <sup>3</sup> s Test		3 21.6		0.00095	CDF	<1.0E-05	Significar Decision	nt Effect		
Reference Sed Auxiliary Test Attribute	AT3-098° s Test Grubbs	* {	3 21.6		0.00095  Test Stat	CDF  Critical	<1.0E-05	Significar Decision	nt Effect n(α:5%)		
Reference Sed  Auxiliary Test  Attribute  Outlier	AT3-098° s Test Grubbs	* {	3 21.6		0.00095  Test Stat	CDF  Critical	<1.0E-05	Significar Decision	nt Effect n(α:5%) ers Detected		
Auxiliary Test Attribute Outlier ANOVA Table	AT3-098° s Test Grubbs	Extreme Valuares	3 21.6	1.86  Square  053	0.00095  Test Stat 1.58	CDF  Critical 2.29	<1.0E-05  P-Value 0.9685	Significar  Decision  No Outlie	n(α:5%) ers Detected n(α:5%)		
Auxiliary Test Attribute Outlier ANOVA Table Source Between	Test Grubbs Sum Sq 0.00030	Extreme Valuares 53	3 21.6  Mean 9 0.0003	1.86  Square  053	0.00095  Test Stat 1.58  DF 1	Critical 2.29  F Stat	<1.0E-05  P-Value 0.9685  P-Value	Decision No Outlie	n(α:5%) ers Detected n(α:5%)		
Auxiliary Test Attribute Outlier ANOVA Table Source Between Error	Test Grubbs  Sum Sq 0.00030 5.22E-0 0.00031	Extreme Valuares 53 6 05	3 21.6  Mean 9 0.0003	1.86  Square  053	0.00095  Test Stat 1.58  DF 1 8	Critical 2.29  F Stat	<1.0E-05  P-Value 0.9685  P-Value	Decision No Outlie	n(α:5%) ers Detected n(α:5%)		
Auxiliary Test Attribute Outlier ANOVA Table Source Between Error Total	Test Grubbs  Sum Sq 0.00030 5.22E-0 0.00031	Extreme Valuares 53 6 05	3 21.6  Mean 9 0.0003	1.86  Square  053	0.00095  Test Stat 1.58  DF 1 8	CDF  Critical 2.29  F Stat 468	<1.0E-05  P-Value 0.9685  P-Value	Decision No Outlie	n(α:5%) ers Detected n(α:5%) nt Effect		
Auxiliary Test Attribute Outlier ANOVA Table Source Between Error Total ANOVA Assur	Test Grubbs Sum Sq 0.00030 5.22E-0 0.00031 mptions Tests Test	Extreme Valuares 53 6 05	Mean : 0.0003 6.525E	1.86  Square  053	0.00095  Test Stat 1.58  DF 1 8 9	CDF  Critical 2.29  F Stat 468	<1.0E-05  P-Value 0.9685  P-Value <1.0E-05	Decision No Outlie  Decision Significan	n(α:5%) ers Detected n(α:5%) nt Effect n(α:1%)		
Auxiliary Test Attribute Outlier ANOVA Table Source Between Error Total ANOVA Assur Attribute	Sum Sq 0.00030 5.22E-0 0.00031 mptions Tests Variance	Extreme Valuares 53 6 05	3 21.6  Mean 3 0.0003 6.525E	1.86  Square  053 -07	0.00095  Test Stat 1.58  DF 1 8 9	Critical 2.29  F Stat 468  Critical	<1.0E-05  P-Value 0.9685  P-Value <1.0E-05	Decision  No Outlie  Decision  Significan  Decision  Equal Va	n(α:5%) ers Detected n(α:5%) nt Effect n(α:1%)		
Auxiliary Test Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assur Attribute Variance	Test Grubbs Sum Sq 0.00030 5.22E-0 0.00031 mptions Tests Variance Shapiro-	Extreme Valuares 53 6 05	3 21.6  Mean 3 0.0003 6.525E	1.86  Square  053 -07	0.00095  Test Stat 1.58  DF 1 8 9  Test Stat 1.72	Critical 2.29  F Stat 468  Critical 23.2	<1.0E-05  P-Value 0.9685  P-Value <1.0E-05  P-Value 0.6127	Decision  No Outlie  Decision  Significan  Decision  Equal Va	n(α:5%) ers Detected n(α:5%) nt Effect n(α:1%) riances		
Auxiliary Test Auxiliary Test Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assur Attribute Variance Distribution	Test Grubbs Sum Sq 0.00030 5.22E-0 0.00031 mptions Tests Variance Shapiro-	Extreme Valuares 53 6 05	3 21.6  Mean 3 0.0003 6.525E	1.86  Square  053 -07	0.00095  Test Stat 1.58  DF 1 8 9  Test Stat 1.72 0.955	Critical 2.29  F Stat 468  Critical 23.2 0.741	<1.0E-05  P-Value 0.9685  P-Value <1.0E-05  P-Value 0.6127	Decision  No Outlie  Decision  Significan  Decision  Equal Va	n(α:5%) ers Detected n(α:5%) nt Effect n(α:1%) riances	CV%	%Effect
Reference Sed Auxiliary Test Attribute Outlier ANOVA Table Source Between Error Total ANOVA Assur Attribute Variance Distribution PCB 170 Sum Sample IOSN 2019	Sum Sq 0.00030 5.22E-0 0.00031 mptions Tests Variance Shapiro-	Extreme Valuares 53 6 05 e Ratio F Te	Mean: 0.0003 6.525E  st mality Tes  Mean 0.0303	1.86  Square  053 6-07  95% LCL  0.0292	0.00095  Test Stat 1.58  DF 1 8 9  Test Stat 1.72 0.955  95% UCL 0.0314	Critical 2.29  F Stat 468  Critical 23.2 0.741  Median 0.03	<1.0E-05  P-Value 0.9685  P-Value <1.0E-05  P-Value 0.6127 0.7278  Min 0.0295	Decision No Outlie  Decision Significan  Decision Equal Va Normal D	n(α:5%) ers Detected n(α:5%) nt Effect n(α:1%) riances Distribution  Std Err 0.000406	3.00%	%Effect 0.00%
Reference Sed Auxiliary Test Attribute Outlier ANOVA Table Source Between Error Total ANOVA Assur Attribute Variance Distribution PCB 170 Sum Sample	Test Grubbs  Sum Sq 0.00030 5.22E-0 0.00031  mptions Tests  Test Variance Shapiro-	Extreme Valuares 53 6 05 e Ratio F Te Wilk W Nor	Mean: 0.0003 6.525E	1.86  Square  053 6-07  95% LCL  0.0292	0.00095  Test Stat 1.58  DF 1 8 9  Test Stat 1.72 0.955	Critical 2.29  F Stat 468  Critical 23.2 0.741  Median	<1.0E-05  P-Value 0.9685  P-Value <1.0E-05  P-Value 0.6127 0.7278  Min	Decision  No Outlie  Decision  Significan  Decision  Equal Va  Normal D	n(α:5%) ers Detected n(α:5%) nt Effect n(α:1%) priances Distribution  Std Err		
Reference Sed Auxiliary Test Attribute Outlier ANOVA Table Source Between Error Total ANOVA Assur Attribute Variance Distribution PCB 170 Sum Sample IOSN 2019	Test Grubbs  Sum Sq 0.00030 5.22E-0 0.00031  mptions Tests Variance Shapiro- mary Code RS	Extreme Valuares  53 6 05  Ratio F Te Wilk W Nor  Count 5	Mean: 0.0003 6.525E  st mality Tes  Mean 0.0303	1.86  Square  053 6-07  95% LCL  0.0292	0.00095  Test Stat 1.58  DF 1 8 9  Test Stat 1.72 0.955  95% UCL 0.0314	Critical 2.29  F Stat 468  Critical 23.2 0.741  Median 0.03	<1.0E-05  P-Value 0.9685  P-Value <1.0E-05  P-Value 0.6127 0.7278  Min 0.0295	Decision Significan  Decision Significan  Decision Equal Va Normal D  Max  0.0315	n(α:5%) ers Detected n(α:5%) nt Effect n(α:1%) riances Distribution  Std Err 0.000406	3.00%	0.00%
Auxiliary Test Auxiliary Test Attribute Outlier ANOVA Table Source Between Error Total ANOVA Assur Attribute Variance Distribution PCB 170 Sum Sample IOSN 2019 AT3-098	Test Grubbs  Sum Sq 0.00030 5.22E-0 0.00031  mptions Tests Variance Shapiro- mary Code RS	Extreme Valuares  53 6 05  Ratio F Te Wilk W Nor  Count 5	Mean: 0.0003 6.525E  st mality Tes  Mean 0.0303	1.86  Square  053 6-07  95% LCL  0.0292	0.00095  Test Stat 1.58  DF 1 8 9  Test Stat 1.72 0.955  95% UCL 0.0314	Critical 2.29  F Stat 468  Critical 23.2 0.741  Median 0.03	<1.0E-05  P-Value 0.9685  P-Value <1.0E-05  P-Value 0.6127 0.7278  Min 0.0295	Decision Significan  Decision Significan  Decision Equal Va Normal D  Max  0.0315	n(α:5%) ers Detected n(α:5%) nt Effect n(α:1%) riances Distribution  Std Err 0.000406	3.00%	0.00%
Auxiliary Test Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assur Attribute Variance Distribution  PCB 170 Sum Sample IOSN 2019 AT3-098  PCB 170 Deta	Sum Sq 0.00030 5.22E-0 0.00031 mptions Tests Variance Shapiro- mary Code RS	Extreme Valuares  53 6 005  Ratio F Te Wilk W Nor  Count 5 5	Mean : 0.0003 6.525E  st mality Tes  Mean 0.0303 0.0414	1.86  Square  053 -07   95% LCL  0.0292  0.0405	0.00095  Test Stat 1.58  DF 1 8 9  Test Stat 1.72 0.955  95% UCL 0.0314 0.0422	Critical 2.29  F Stat 468  Critical 23.2 0.741  Median 0.03 0.0415	<1.0E-05  P-Value 0.9685  P-Value <1.0E-05  P-Value 0.6127 0.7278  Min 0.0295	Decision Significan  Decision Significan  Decision Equal Va Normal D  Max  0.0315	n(α:5%) ers Detected n(α:5%) nt Effect n(α:1%) riances Distribution  Std Err 0.000406	3.00%	0.00%

Report Date: 19 Aug-23 06:48 (p 14 of 18)
Test Code/ID: TN-23-303MnPCB / 17-0778-2871

	- <b>,</b>									Т	est Co	de/ID:	TN-23-303	MnPCB / 1	7-0778-2871
Bioaccumula	tion	Evaluation -	РСВ	Cong	eners -	Mac	oma							EA-ES	T, Inc. PBC
Analysis ID: Analyzed: Edit Date:	19 <i>A</i>	15-8865-0666 19 Aug-23 6:48 08 May-23 22:45			lysis:	PCB 180 Parametric-Two Sample 03DC1AB4E1FD1E4DFD5ACE341B1943A				Statu	S Version is Level: or ID:	: CETISv2 1	.1.1		
Batch ID: Start Date: Ending Date: Test Length:	te: 26 Apr-23 12:48			Prot	ocol: cies:	Bioaccumulation - PCBs - US ACE NED RIM (2004) Macoma nasuta Bivalvia			Mn	In Anal Dilu Brin Sou		ent: Not Applicable e: Not Applicable		Research (	Or <b>Age:</b>
Sample Code	Sample ID	Sample ID Sa		Sample Date		Receipt Date		Sample Age C		Clien	t Name	Pr	oject		
IOSN 2019 AT3-098	13-4648-8 07-1559-4		08 Mar-23 08 Feb-23		08 Mar-23 13:00 09 Feb-23 16:30			21d 14h E 49d 1h		Eco-/	Analysts, Ir	nc. Dr	edged Sed	liment Evalu	
Sample Code Material Type				Sample Source				•	Station Lo			on	Lat/Long		
IOSN 2019 Reference sedir				•				ina NAE-20	E-2004-00 IOSN Refe			e	<u>_</u>		
AT3-098		Marine Se	dimen	t		Yach	tsman Mar	ina NAE-20	004-00	10 Statio	ns at 4	Marinas N	Лu		
Data Transform Alt Hyp Con									Comp	parison Result PMSD					
Untransformed C <				•						98 failed	pcb 180 endpoint				3.50%
Equal Variand Sample I Reference Sed	vs	Two-Sample Sample II AT3-098*	Test	df 8	<b>Test 9</b>		Critical 1.86	<b>MSD</b> 0.00108	P-Typ		'alue DE-05	<b>Decision</b> Significal	` '		
Auxiliary Test Attribute Outlier	ts	<b>Test</b> Grubbs E	xtreme	e Valu	e Test			Test Stat	Critica 2.29	<b>al P-V</b>	<b>'alue</b> 236	<b>Decisior</b> No Outlie	n(α:5%) ers Detected		
ANOVA Table	,														
Source	Sum Squa	Sum Squares			Squa	re	DF	F Stat	P-V	alue	Decision(α:5%)				
Between Error		0.0003249 6.755E-06			0.000 8.444			1 8	385 —	<1.0	0E-05	Significant Effect			
Total		0.0003317						9							
ANOVA Assu	mpti														
Attribute Test							Test Stat			alue	Decision	` '			
Variance Distribution		Variance Ratio F Test Shapiro-Wilk W Normality Te				2.29 est 0.957			23.2 0.741	0.44 0.74		Equal Variances Normal Distribution			
PCB 180 Sum	ımar	y	_	_		_									
Sample		Code	Cou	nt	Mean		95% LCL	95% UCL	Media	an Min	1	Max	Std Err	CV%	%Effect
IOSN 2019		RS	5		0.030	9	0.0296	0.0322	0.030	5 0.03	3	0.0325	0.000485	3.51%	0.00%
AT3-098	_		5		0.042	3	0.0414	0.0432	0.0424	4 0.04	412	0.0432	0.000321	1.69%	-36.89%
PCB 180 Deta	ail														
Sample		Code	Rep	1	Rep 2	<b>?</b>	Rep 3	Rep 4	Rep 5						
IOSN 2019		RS	0.030		0.031		0.03	0.0325	0.03						
AT3-098			0.04		0.042		0.0426	0.0422	0.0432	2					

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Bioaccumula	tion Evaluation	- PCB Co	ngeners	- Macoma						EA-ES	T, Inc. PBC
Analysis ID: Analyzed: Edit Date:	01-5676-1440 19 Aug-23 6:48 08 May-23 22:	<b>E</b>	ndpoint: nalysis:	PCB 187 Parametric-Tw	•	72405948C	Statu	S Version is Level: or ID:	: CETISv2.		,
Batch ID: Start Date: Ending Date: Test Length:	14-7703-1847 29 Mar-23 13:4 26 Apr-23 12:4 27d 23h	18 P 8 S	est Type: rotocol: pecies: axon:	Bioaccumulation US ACE NED Macoma nasura Bivalvia	RIM (2004)	Mn	Analy Dilue Brine Sour	ent: No	ncy Roka t Applicable t Applicable O - Aquatic F	Research (	Or <b>Age:</b>
Sample Code IOSN 2019 AT3-098	Sample 13-4648- 07-1559-	8170 08	ample Da 3 Mar-23 3 Feb-23	08 Mar	-23	<b>Sample Ag</b> 21d 14h 49d 1h		<b>t Name</b> Analysts, Ir		<b>oject</b> edged Sec	diment Evalu
Sample Code	Material	Type		Sample Source	e	Sta	tion Location	on	Lat/Long		
IOSN 2019 AT3-098		e sedimen	t	Yachtsman Ma Yachtsman Ma			SN Referenc Stations at 4		Мu		
Data Transfor	rm	Alt Hyp	)			Comparis	on Result				PMSD
Untransformed	d	C < T				•	ailed pcb 18	7 endpoint			3.41%
	ce t Two-Samp vs Sample II d AT3-098*	I	<b>df Test</b> 8 19.9	Stat Critical	MSD 0.00152	P-Type CDF	<b>P-Value</b> <1.0E-05	<b>Decision</b> Significan	, ,		
Treference Sec	d A15-090		0 13.3	1.00	0.00132	СЫ	₹1.0L-03	Olgrillical	it Lifect		
Auxiliary Test											
Attribute	Test				Test Stat		P-Value	Decision	•		
-	Test	Extreme V	alue Test		Test Stat	Critical 2.29	<b>P-Value</b> 0.8005		n(α:5%) ers Detected		
Attribute	<b>Test</b> Grubbs	Extreme V	alue Test						•		
Attribute Outlier	<b>Test</b> Grubbs			Square					ers Detected		
Attribute Outlier ANOVA Table Source Between	Test Grubbs	uares			1.65	2.29	0.8005	No Outlie	ers Detected n(α:5%)		
Attribute Outlier ANOVA Table Source Between Error	Test Grubbs  Sum Sq  0.000656 0.000013	uares 61 33	Mean	6561	1.65 <b>DF</b> 1	2.29 F Stat	0.8005 P-Value	No Outlie	ers Detected n(α:5%)		
Attribute Outlier ANOVA Table Source Between	Test Grubbs Sum Sq 0.000656	uares 61 33	<b>Mean</b> 0.000	6561	1.65 <b>DF</b>	2.29 F Stat	0.8005 P-Value	No Outlie	ers Detected n(α:5%)		
Attribute Outlier ANOVA Table Source Between Error Total	Test Grubbs  Sum Sq  0.000656 0.000013	uares 61 33	<b>Mean</b> 0.000	6561	1.65 <b>DF</b> 1	2.29 F Stat	0.8005 P-Value	No Outlie	ers Detected n(α:5%)		
Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assur Attribute	Test Grubbs  Sum Sq 0.000656 0.000013 0.000669 mptions Tests Test	uares 61 33 94	<b>Mean</b> 0.000 1.663	6561	1.65  DF  1 8 9	F Stat 395 Critical	0.8005  P-Value <1.0E-05  P-Value	Decision Significan  Decision	n(α:5%) nt Effect		
Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assur Attribute Variance	Test Grubbs  Sum Sq 0.000656 0.000013 0.000669  mptions Tests Test Variance	uares 61 33 94 Ratio F Te	Mean 0.000 1.663	6561 E-06	1.65  DF  1 8 9  Test Stat 1.77	2.29  F Stat 395  Critical 23.2	0.8005  P-Value <1.0E-05  P-Value 0.5935	Decision Significan  Decision Equal Va	n(α:5%) nt Effect n(α:1%) riances		
Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assur Attribute	Test Grubbs  Sum Sq 0.000656 0.000013 0.000669  mptions Tests Test Variance	uares 61 33 94	Mean 0.000 1.663	6561 E-06	1.65  DF  1 8 9	F Stat 395 Critical	0.8005  P-Value <1.0E-05  P-Value	Decision Significan  Decision Equal Va	n(α:5%) nt Effect		
Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assur Attribute Variance	Test Grubbs  Sum Sq 0.000656 0.000065 0.000666 mptions Tests Test Variance Shapiro-	uares 61 33 94 Ratio F Te Wilk W No	Mean 0.000 1.663	6561 E-06	1.65  DF  1 8 9  Test Stat 1.77	2.29  F Stat 395  Critical 23.2	0.8005  P-Value <1.0E-05  P-Value 0.5935	Decision Significan  Decision Equal Va	n(α:5%) nt Effect n(α:1%) nriances Distribution		
Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assuratibute Variance Distribution  PCB 187 Sum Sample	Test Grubbs  Sum Sq 0.000656 0.000013 0.000668  mptions Tests Test Variance Shapiro-	uares 61 33 94 Ratio F Te Wilk W No	Mean 0.000 1.663  est rmality Te	6561 E-06 st 95% LCL	1.65  DF  1 8 9  Test Stat 1.77 0.969	2.29  F Stat 395  Critical 23.2 0.741  Median	P-Value <1.0E-05 P-Value 0.5935 0.8860	Decision Significan  Decision Equal Va Normal D	n(α:5%) nt Effect n(α:1%) rriances Distribution	CV%	%Effect
Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assuratificate Variance Distribution  PCB 187 Sum Sample IOSN 2019	Test Grubbs  Sum Sq 0.000656 0.000065 0.000666 mptions Tests Test Variance Shapiro-	uares 61 33 94 Ratio F Te Wilk W No Count 5	Mean 0.000 1.663  est rmality Te  Mean 0.044	6561 E-06 st 95% LCL 5 0.0427	1.65  DF  1 8 9  Test Stat 1.77 0.969  95% UCL 0.0463	2.29  F Stat 395  Critical 23.2 0.741  Median 0.044	P-Value <1.0E-05  P-Value 0.5935 0.8860  Min 0.043	Decision Significan  Decision Equal Va Normal D  Max 0.0465	n(α:5%) Int Effect  n(α:1%) Irriances Distribution  Std Err  0.000652	3.28%	0.00%
Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assurattribute Variance Distribution  PCB 187 Sum Sample	Test Grubbs  Sum Sq 0.000656 0.000013 0.000668  mptions Tests Test Variance Shapiro-	uares 61 33 94 Ratio F Te Wilk W No	Mean 0.000 1.663  est rmality Te	6561 E-06 st 95% LCL 5 0.0427	1.65  DF  1 8 9  Test Stat 1.77 0.969	2.29  F Stat 395  Critical 23.2 0.741  Median	P-Value <1.0E-05 P-Value 0.5935 0.8860	Decision Significan  Decision Equal Va Normal D	n(α:5%) nt Effect n(α:1%) rriances Distribution		
Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assuratificate Variance Distribution  PCB 187 Sum Sample IOSN 2019	Test Grubbs  Sum Sq  0.000656 0.000013 0.000668  mptions Tests  Test Variance Shapiro- nmary Code  RS	uares 61 33 94 Ratio F Te Wilk W No Count 5	Mean 0.000 1.663  est rmality Te  Mean 0.044	6561 E-06 st 95% LCL 5 0.0427	1.65  DF  1 8 9  Test Stat 1.77 0.969  95% UCL 0.0463	2.29  F Stat 395  Critical 23.2 0.741  Median 0.044	P-Value <1.0E-05  P-Value 0.5935 0.8860  Min 0.043	Decision Significan  Decision Equal Va Normal D  Max 0.0465	n(α:5%) Int Effect  n(α:1%) Irriances Distribution  Std Err  0.000652	3.28%	0.00%
Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assuratificate Variance Distribution  PCB 187 Sum Sample IOSN 2019 AT3-098	Test Grubbs  Sum Sq  0.000656 0.000013 0.000668  mptions Tests  Test Variance Shapiro- nmary Code  RS	uares 61 33 94 Ratio F Te Wilk W No Count 5	Mean 0.000 1.663  est rmality Te  Mean 0.044	6561 E-06 st 95% LCL 5 0.0427 7 0.0593	1.65  DF  1 8 9  Test Stat 1.77 0.969  95% UCL 0.0463	2.29  F Stat 395  Critical 23.2 0.741  Median 0.044	P-Value <1.0E-05  P-Value 0.5935 0.8860  Min 0.043	Decision Significan  Decision Equal Va Normal D  Max 0.0465	n(α:5%) Int Effect  n(α:1%) Irriances Distribution  Std Err  0.000652	3.28%	0.00%
Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assur Attribute Variance Distribution  PCB 187 Sum Sample IOSN 2019 AT3-098  PCB 187 Deta	Test Grubbs  Sum Sq 0.000656 0.000013 0.000669  mptions Tests Test Variance Shapiro-	uares 61 33 94 Ratio F Te Wilk W No  Count 5	Mean 0.000 1.663 est rmality Te  Mean 0.044 0.060	st  95% LCL 5 0.0427 7 0.0593	1.65  DF  1 8 9  Test Stat 1.77 0.969  95% UCL 0.0463 0.0621	2.29  F Stat 395  Critical 23.2 0.741  Median 0.044 0.061	P-Value <1.0E-05  P-Value 0.5935 0.8860  Min 0.043	Decision Significan  Decision Equal Va Normal D  Max 0.0465	n(α:5%) Int Effect  n(α:1%) Irriances Distribution  Std Err  0.000652	3.28%	0.00%

Report Date: 19 Aug-23 06:48 (p 16 of 18)
Test Code/ID: TN-23-303MnPCB / 17-0778-2871

Bioaccumulati	ion Evaluation	- PCB Con	geners - M	acoma						EA-ES	T, Inc. PBC
	02-4694-1435		dpoint: P				CETI	S Version	: CETISv2.	.1.1	
•	19 Aug-23 6:48		•	arametric-Two				s Level:	1		
Edit Date:	08 May-23 22:4	15 <b>M</b> D	<b>5 Hash:</b> 52	2480CC6C96	7322F8696E	37D2B1073	D17 Edito	or ID:			
Batch ID:	14-7703-1847	Tes	st Type: B	ioaccumulatio	on - PCBs - N	Иn	Analy	<b>/st:</b> Na	ncy Roka		
Start Date:	29 Mar-23 13:4	8 <b>Pro</b>	otocol: U	S ACE NED F	RIM (2004)		Dilue	nt: No	t Applicable		
Ending Date:	•	•		acoma nasut	a		Brine		t Applicable		
Test Length:	27d 23h	Tax	on: B	valvia			Sour	ce: AR	O - Aquatic F	Research C	Or <b>Age:</b>
Sample Code	Sample I	D Sai	mple Date	Receip	t Date	Sample Ag	e Clien	t Name	Pro	oject	
IOSN 2019	13-4648-	8170 08	Mar-23	08 Mar-	23	21d 14h	Eco-	Analysts, Ir	nc. Dre	edged Sec	diment Evalu
AT3-098	07-1559-	4974 08	Feb-23 13:	00 09 Feb-	23 16:30	49d 1h					
Sample Code	Material	Туре	s	ample Sourc	е	Sta	tion Location	on	Lat/Long		
IOSN 2019	Referenc	e sediment		achtsman Ma			SN Referenc	е			
AT3-098	Marine S	ediment	Y	achtsman Ma	rina NAE-20	04-00 10	Stations at 4	Marinas N	Иu		
Data Transform	m	Alt Hyp				Comparis	on Result				PMSD
Untransformed		C < T				AT3-098 f	ailed pcb 19	5 endpoint			3.10%
Equal Variance	e t Two-Sampl	e Test									
				4 0-1411	MSD	P-Type	P-Value	Decision	η(α:5%)		
Sample I v	s Sample II	ď	f Test Sta	t Critical	IVIOD						
Sample I v Reference Sed	•	<b>d</b> 8	22.1	1.86	0.0018	CDF	<1.0E-05	Significar	• •		
	AT3-098*								• •		
Reference Sed	AT3-098*					CDF			nt Effect		
Reference Sed  Auxiliary Tests	AT3-098* s Test		22.1		0.0018	CDF	<1.0E-05	Significan	nt Effect		
Reference Sed  Auxiliary Tests  Attribute	AT3-098* s Test	8	22.1		0.0018  Test Stat	CDF  Critical	<1.0E-05	Significan	nt Effect n(α:5%)		
Reference Sed  Auxiliary Tests  Attribute  Outlier	AT3-098* s Test	8 Extreme Val	22.1	1.86	0.0018  Test Stat	CDF  Critical	<1.0E-05	Significan	nt Effect n(α:5%) ers Detected		
Auxiliary Tests Attribute Outlier ANOVA Table	AT3-098* s Test Grubbs I	8 Extreme Va	22.1 ue Test	1.86	0.0018  Test Stat 1.73	CDF  Critical 2.29	<1.0E-05  P-Value  0.6144	Decision No Outlie	n(α:5%) ers Detected n(α:5%)		
Auxiliary Tests Attribute Outlier ANOVA Table Source	AT3-098* s Test Grubbs I	Extreme Valuares	22.1 ue Test Mean So	1.86 quare 49	0.0018  Test Stat 1.73  DF	Critical 2.29  F Stat	<1.0E-05  P-Value  0.6144  P-Value	Decision No Outlie	n(α:5%) ers Detected n(α:5%)		
Reference Sed  Auxiliary Tests  Attribute  Outlier  ANOVA Table  Source  Between	AT3-098*  S  Test  Grubbs I  Sum Squ  0.001144	Extreme Valuares 9	22.1  ue Test  Mean Se  0.00114	1.86 quare 49	0.0018  Test Stat 1.73  DF 1	Critical 2.29  F Stat	<1.0E-05  P-Value  0.6144  P-Value	Decision No Outlie	n(α:5%) ers Detected n(α:5%)		
Auxiliary Tests Attribute Outlier ANOVA Table Source Between Error	AT3-098*  S  Test  Grubbs I  Sum Squ  0.001144  0.000018  0.001163	Extreme Valuares 9	22.1  ue Test  Mean Se  0.00114	1.86 quare 49	0.0018  Test Stat 1.73  DF 1 8	Critical 2.29  F Stat	<1.0E-05  P-Value  0.6144  P-Value	Decision No Outlie	n(α:5%) ers Detected n(α:5%)		
Auxiliary Tests Attribute Outlier ANOVA Table Source Between Error Total	AT3-098*  S  Test  Grubbs I  Sum Squ  0.001144  0.000018  0.001163	Extreme Valuares 9	22.1  ue Test  Mean Se  0.00114	1.86 quare 49	0.0018  Test Stat 1.73  DF 1 8	CDF  Critical 2.29  F Stat 490	<1.0E-05  P-Value  0.6144  P-Value	Decision No Outlie	n(α:5%) ers Detected n(α:5%) nt Effect		
Auxiliary Tests Attribute Outlier ANOVA Table Source Between Error Total ANOVA Assum	AT3-098*  Test  Grubbs I  Sum Squ  0.001144  0.000018  0.001163  nptions Tests  Test	Extreme Valuares 9	22.1 ue Test  Mean So 0.00114 2.338E-0	1.86 quare 49	0.0018  Test Stat 1.73  DF 1 8 9  Test Stat 1.79	Critical 2.29  F Stat 490  Critical 23.2	P-Value 0.6144  P-Value <1.0E-05  P-Value 0.5862	Decision No Outlie  Decision Significan	n(α:5%) ers Detected n(α:5%) nt Effect n(α:1%)		
Auxiliary Tests Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assum Attribute	AT3-098*  Test  Grubbs I  Sum Squ  0.001144  0.000018  0.001163  nptions Tests  Test  Variance	Extreme Valueres 9 77	22.1 ue Test  Mean Se 0.00114 2.338E-0	1.86 quare 49	0.0018  Test Stat 1.73  DF 1 8 9	Critical 2.29  F Stat 490  Critical	P-Value 0.6144  P-Value <1.0E-05	Decision  Decision  Significan  Decision  Equal Va	n(α:5%) ers Detected n(α:5%) nt Effect n(α:1%)		
Auxiliary Tests Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assum Attribute Variance	Sum Squ 0.001144 0.000018 0.001163 nptions Tests Variance Shapiro-V	Extreme Valuares 9 77 6	22.1 ue Test  Mean Se 0.00114 2.338E-0	1.86 quare 49	0.0018  Test Stat 1.73  DF 1 8 9  Test Stat 1.79	Critical 2.29  F Stat 490  Critical 23.2	P-Value 0.6144  P-Value <1.0E-05  P-Value 0.5862	Decision  Decision  Significan  Decision  Equal Va	n(α:5%) ers Detected n(α:5%) nt Effect n(α:1%) uriances		
Auxiliary Tests Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assum Attribute Variance Distribution	Sum Squ 0.001144 0.000018 0.001163 nptions Tests Variance Shapiro-V	Extreme Valuares 9 77 6	22.1 ue Test  Mean Se 0.00114 2.338E-0	1.86 quare 49	0.0018  Test Stat 1.73  DF 1 8 9  Test Stat 1.79 0.959	Critical 2.29  F Stat 490  Critical 23.2 0.741	P-Value 0.6144  P-Value <1.0E-05  P-Value 0.5862	Decision  Decision  Significan  Decision  Equal Va	n(α:5%) ers Detected n(α:5%) nt Effect n(α:1%) uriances	CV%	%Effect
Reference Sed  Auxiliary Tests Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assum Attribute Variance Distribution  PCB 195 Sumr	AT3-098*  Test  Grubbs I  Sum Squ  0.001144  0.000018  0.001163  nptions Tests  Test  Variance Shapiro-V	Extreme Valuares 9 67 66  Ratio F Tes Wilk W Norm	we Test  Mean So 0.00114 2.338E-0	1.86 quare 49 06	0.0018  Test Stat 1.73  DF 1 8 9  Test Stat 1.79 0.959	Critical 2.29  F Stat 490  Critical 23.2 0.741	P-Value 0.6144  P-Value <1.0E-05  P-Value 0.5862 0.7763	Decision  No Outlie  Decision  Significan  Decision  Equal Va  Normal D	n(α:5%) ers Detected n(α:5%) nt Effect n(α:1%) uriances Distribution	<b>CV%</b> 2.99%	%Effect 0.00%
Reference Sed  Auxiliary Tests Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assum Attribute Variance Distribution  PCB 195 Summ Sample	AT3-098*  S Test Grubbs I  Sum Squ 0.001144 0.000018 0.001163  Inptions Tests Test Variance Shapiro-V  mary Code	Extreme Valuares 9 67 66 Ratio F Tes Wilk W Norm	22.1  Wean St 0.00114 2.338E-t	1.86 quare 49 06	0.0018  Test Stat 1.73  DF 1 8 9  Test Stat 1.79 0.959	Critical 2.29  F Stat 490  Critical 23.2 0.741  Median	P-Value 0.6144  P-Value <1.0E-05  P-Value 0.5862 0.7763  Min	Decision  Decision  Significan  Decision  Equal Va  Normal D	n(α:5%) ers Detected n(α:5%) nt Effect n(α:1%) priances Distribution  Std Err		
Reference Sed  Auxiliary Tests Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assum Attribute Variance Distribution  PCB 195 Sumr Sample IOSN 2019	AT3-098*  S Test Grubbs I  Sum Squ 0.001144 0.000018 0.001163  Inptions Tests Test Variance Shapiro-V  mary Code RS	Extreme Valuares 9 17 16 Ratio F Tes Wilk W Norm Count 5	we Test  Mean So 0.00114 2.338E-0  tt mality Test  Mean 0.058	1.86  quare 49 06  95% LCL 0.0558	0.0018  Test Stat 1.73  DF 1 8 9  Test Stat 1.79 0.959  95% UCL 0.0602	Critical 2.29  F Stat 490  Critical 23.2 0.741  Median 0.0575	P-Value 0.6144  P-Value <1.0E-05  P-Value 0.5862 0.7763  Min 0.0565	Decision Significan  Decision Significan  Decision Equal Va Normal D  Max  0.0605	n(a:5%) ers Detected n(a:5%) nt Effect n(a:1%) ariances Distribution  Std Err 0.000775	2.99%	0.00%
Auxiliary Tests Attribute Outlier ANOVA Table Source Between Error Total  ANOVA Assum Attribute Variance Distribution  PCB 195 Sumr Sample IOSN 2019 AT3-098	AT3-098*  S Test Grubbs I  Sum Squ 0.001144 0.000018 0.001163  Inptions Tests Test Variance Shapiro-V  mary Code RS	Extreme Valuares 9 17 16 Ratio F Tes Wilk W Norm Count 5	we Test  Mean So 0.00114 2.338E-0  tt mality Test  Mean 0.058	1.86  quare 49 06  95% LCL 0.0558	0.0018  Test Stat 1.73  DF 1 8 9  Test Stat 1.79 0.959  95% UCL 0.0602	Critical 2.29  F Stat 490  Critical 23.2 0.741  Median 0.0575	P-Value 0.6144  P-Value <1.0E-05  P-Value 0.5862 0.7763  Min 0.0565	Decision Significan  Decision Significan  Decision Equal Va Normal D  Max  0.0605	n(a:5%) ers Detected n(a:5%) nt Effect n(a:1%) ariances Distribution  Std Err 0.000775	2.99%	0.00%
Auxiliary Tests Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assum Attribute Variance Distribution  PCB 195 Sumr Sample IOSN 2019 AT3-098  PCB 195 Detai	AT3-098*  S Test Grubbs I  Sum Squ 0.001144 0.000018 0.001163  nptions Tests Test Variance Shapiro-V  mary Code RS	Extreme Valuares 9 77 6 Ratio F Tes Wilk W Norm Count 5 5	22.1  we Test  Mean So 0.00114 2.338E-0  t nality Test  Mean 0.058 0.0794	1.86  quare 49 06  95% LCL 0.0558 0.0778	0.0018  Test Stat 1.73  DF 1 8 9  Test Stat 1.79 0.959  95% UCL 0.0602 0.081	Critical 2.29  F Stat 490  Critical 23.2 0.741  Median 0.0575 0.0795	P-Value 0.6144  P-Value <1.0E-05  P-Value 0.5862 0.7763  Min 0.0565	Decision Significan  Decision Significan  Decision Equal Va Normal D  Max  0.0605	n(a:5%) ers Detected n(a:5%) nt Effect n(a:1%) ariances Distribution  Std Err 0.000775	2.99%	0.00%

**Report Date:** 19 Aug-23 06:48 (p 17 of 18) **Test Code/ID:** TN-23-303MnPCB / 17-0778-2871

										Т	est Co	ae/ID:	TN-23-30	SIVINPCB /	17-0778-287 <sup>-</sup>
Bioaccumula	tion E	/aluation -	- PCB (	Cong	eners -	- Mac	oma							EA-ES	ST, Inc. PBC
Analysis ID: Analyzed: Edit Date:	19 Au	08-3472 ig-23 6:48 ay-23 22:45		Anal	point: lysis: i Hash:	Para	3 206 ametric-Tw 2B1A254D	o Sample 0C6A3EC0F	- 1C6513	96EBD1	Statu	S Version s Level: or ID:	n: CETISv: 1	2.1.1	
Batch ID: Start Date: Ending Date: Test Length:	29 Ma 26 Ap		3	Prot	ocol: cies:	US /	ACE NED loma nasut	on - PCBs - RIM (2004) a	Mn		Analy Dilue Brine Sour	ent: No	ancy Roka ot Applicable ot Applicable RO - Aquatic	Research	Or <b>Age:</b>
Sample Code	)	Sample IE	)	Sam	ple Da	te	Receip	t Date	Sample	Age	Clien	t Name	Р	roject	
IOSN 2019 AT3-098		13-4648-8 07-1559-4			lar-23 eb-23 1	13:00	08 Mar 09 Feb		21d 14h 49d 1h	า	Eco-A	Analysts, l	Inc. D	redged Se	diment Evalu
Sample Code	)	Material T	ype			Sam	ple Sourc	e		Station I	Location	on	Lat/Long	<u> </u>	
IOSN 2019		Reference	sedim	ent		Yacl	ntsman Ma	rina NAE-20	004-00	IOSN Re	eferenc	е			
AT3-098		Marine Se	diment			Yacl	ntsman Ma	rina NAE-20	004-00	10 Statio	ns at 4	Marinas	Mu		
Data Transfor	rm		Alt H	lyp					Comp	arison R	esult				PMSD
Untransformed	d		C < T						AT3-0	98 failed	pcb 20	6 endpoin	nt		3.15%
Equal Variand Sample I Reference Sec	vs S	vo-Sample Sample II AT3-098*	Test	df 8	<b>Test :</b> 21.5	Stat	Critical	<b>MSD</b> 0.00187	P-Type		<b>/alue</b> 0E-05	<b>Decisio</b> Significa	n(α:5%) ant Effect		
Auxiliary Test Attribute	เร	Test						Test Stat	Critica	al DV	'alue	Docisio	n(α:5%)		
Outlier		Grubbs E	xtreme	Valu	e Test			1.74	2.29	0.6			ers Detected		
ANOVA Table	<u> </u>														
Source		Sum Squa	ares		Mean	Sau	are	DF	F Stat	P-V	'alue	Decisio	n(a:5%)		
Between		0.0011664			0.001			1	462		0E-05		ant Effect		
Error		0.0000202	<u> </u>		2.525	E-06		8	_			J			
Total		0.0011866	3					9							
ANOVA Assu	mptior	ns Tests													
Attribute		Test						Test Stat	Critica	al P-V	'alue	Decisio	n(α:1%)		
Variance		Variance F						2.11	23.2	0.48		•	ariances		
Distribution		Shapiro-W	/ilk W N	Norma	ality Te	st		0.96	0.741	0.78	875	Normal	Distribution		
PCB 206 Sum	•														
Sample		Code	Coun	ıt	Mean		95% LCL					Max	Std Err	CV%	%Effect
IOSN 2019		RS	5		0.059		0.0571	0.0617	0.059	0.0		0.062	0.000828		0.00%
AT3-098			5		0.081		0.0794	0.0826	0.081	0.07	/9	0.0825	0.00057	1.57%	-36.36%
PCB 206 Deta	ail			_		_									
l		Code	Rep 1	1	Rep 2	2	Rep 3	Rep 4	Rep 5						
Sample															
IOSN 2019 AT3-098		RS	0.059 0.079		0.060 0.081		0.058 0.0815	0.062 0.081	0.0575 0.0825						

Report Date: 19 Aug-23 06:48 (p 18 of 18)
Test Code/ID: TN-23-303MnPCB / 17-0778-2871

										Tes							
Bioaccumula	ition l	Evaluation -	PCB Co	ngen	ners - N	Macom	а								EA-E	ST, Inc. P	ВС
Analysis ID: Analyzed: Edit Date:	19 <i>A</i>	3719-0550 Aug-23 6:48 May-23 22:45	Α	nalys	sis: F		tric-Two	o Sample 6D1A63C7 <i>F</i>	A3EFA1334	5		S Versio s Level: r ID:		ISv2.	.1.1		
Batch ID: Start Date: Ending Date: Test Length:	29 N	•	P S	est Ty rotoc pecie axon:	ol: les: N		NED F	n - PCBs - I RIM (2004) a	Mn	E	Analy Dilue Brine Sourc	nt: N : N	ancy Roka ot Applica ot Applica RO - Aqua	ble ble	Research	Or <b>Age:</b>	
Sample Code	)	Sample ID	S	ample	e Date	) I	Receipt	t Date	Sample Ag	ge (	Clien	t Name		Pro	oject		
IOSN 2019 AT3-098		13-4648-8 <sup>2</sup> 07-1559-49		8 Mar 8 Feb	-23 -23 13		08 Mar- 09 Feb-		21d 14h 49d 1h	E	Eco-A	nalysts,	Inc.	Dre	edged Se	diment Ev	valu
Sample Code	)	Material T	уре		5	Sample	Source	e	St	ation Lo	catio	n	Lat/L	ong			
IOSN 2019		Reference	sedimer	nt	١	<b>Y</b> achtsn	nan Ma	rina NAE-20	04-00 IO	SN Refe	rence	)					
AT3-098		Marine Sec	diment		١	∕achtsn	nan Ma	rina NAE-20	04-00 10	Stations	s at 4	Marinas	Mu				
Data Transfor	rm		Alt Hy	p					Compari	son Res	sult					PMSI	D
Untransformed	d		C < T						AT3-098	failed pc	b 209	endpoir	nt			3.19%	6
Equal Variand	ce t T	「wo-Sample	Test														
Sample I	vs	Sample II		df T	Test St	at Cri	tical	MSD	P-Type	P-Val	ue	Decisio	n(α:5%)				
i Sailibie i																	
Reference Sec	d	AT3-098*		8 2	21.4	1.8	6	0.00217	CDF	<1.0E	-05	Significa	ant Effect				
Reference Sec				8 2	21.4	1.8	6										
Reference Sec Auxiliary Test Attribute		Test				1.8	6	Test Stat	Critical	P-Val	ue	Decisio	on(α:5%)	41			
Reference Sec Auxiliary Test Attribute Outlier	ts					1.8	6				ue	Decisio		ted			
Reference Sec Auxiliary Test Attribute	ts	Test				1.8	6	Test Stat	Critical	P-Val	ue	Decisio	on(α:5%)	eted			
Reference Sec Auxiliary Test Attribute Outlier	ts	Test	xtreme V	′alue ∃	Test	1.8 Square	6	Test Stat	Critical	P-Val	<b>ue</b> 2	Decision No Outl	on(α:5%)	eted			
Auxiliary Test Attribute Outlier  ANOVA Table Source Between	ts	Test Grubbs Ex Sum Squa 0.0015500	xtreme V	/alue ☐ <b>N</b> 0	Test  Mean S  0.00155	Square 500	6	<b>Test Stat</b> 1.73 <b>DF</b> 1	Critical 2.29	<b>P-Val</b> 0.631	ue 2 ue	Decision No Outl	on(α:5%) iers Detec	eted			
Auxiliary Test Attribute Outlier ANOVA Table Source Between Error	ts	Test Grubbs Ex  Sum Squa 0.0015500 0.0000272	xtreme V	/alue ☐ <b>N</b> 0	Test <b>Mean S</b>	Square 500	6	Test Stat 1.73  DF 1 8	Critical 2.29	P-Val 0.631	ue 2 ue	Decision No Outl	on(α:5%) iers Detec on(α:5%)	eted			
Auxiliary Test Attribute Outlier  ANOVA Table Source Between Error Total	e	Test Grubbs Ex  Sum Squa 0.0015500 0.0000272 0.0015772	xtreme V	/alue ☐ <b>N</b> 0	Test  Mean S  0.00155	Square 500	6	<b>Test Stat</b> 1.73 <b>DF</b> 1	Critical 2.29	P-Val 0.631	ue 2 ue	Decision No Outl	on(α:5%) iers Detec on(α:5%)	eted			
Auxiliary Test Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assur	e	Test Grubbs Ex  Sum Squa 0.0015500 0.0000272 0.0015772 ons Tests	xtreme V	/alue ☐ <b>N</b> 0	Test  Mean S  0.00155	Square 500	6	Test Stat 1.73  DF 1 8 9	Critical 2.29  F Stat 456	P-Val 0.631: P-Val <1.0E	ue 2 ue :-05	Decision No Outl	on(α:5%) iers Detection on(α:5%) ant Effect	eted			
Auxiliary Test Attribute Outlier ANOVA Table Source Between Error Total ANOVA Assur Attribute	e	Test Grubbs Ex  Sum Squa 0.0015500 0.0000272 0.0015772 ons Tests Test	ures	/alue ☐ <b>N</b> 0 0	Test  Mean S  0.00155	Square 500	6	Test Stat 1.73  DF 1 8 9	Critical 2.29  F Stat 456  Critical	P-Val 0.631: P-Val <1.0E	ue 2 ue -05	Decision No Outl Decision Signification	on(α:5%) iers Detection on(α:5%) ant Effect on(α:1%)	eted			
Auxiliary Test Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assur	e	Test Grubbs Ex  Sum Squa 0.0015500 0.0000272 0.0015772 ons Tests	ares	Value ☐  N 0 0 0	Test  Mean S 0.00155 0.00000	<b>Square</b> 500 034	6	Test Stat 1.73  DF 1 8 9	Critical 2.29  F Stat 456	P-Val 0.631: P-Val <1.0E	ue 2 ue :-05	Decision  Decision  Signification  Decision  Equal V	on(α:5%) iers Detection on(α:5%) ant Effect				
Auxiliary Test Attribute Outlier ANOVA Table Source Between Error Total ANOVA Assur Attribute Variance	mptic	Sum Squa 0.0015500 0.0000272 0.0015772 ons Tests Test Variance R Shapiro-W	ares	Value ☐  N 0 0 0	Test  Mean S 0.00155 0.00000	<b>Square</b> 500 034	6	Test Stat 1.73  DF 1 8 9  Test Stat 1.54	Critical 2.29  F Stat 456  Critical 23.2	P-Val <1.0E	ue 2 ue :-05	Decision  Decision  Signification  Decision  Equal V	on(α:5%) iers Detection on(α:5%) ant Effect on(α:1%) 'ariances				
Auxiliary Test Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assur Attribute Variance Distribution	mptic	Sum Squa 0.0015500 0.0000272 0.0015772 ons Tests Test Variance R Shapiro-W	ares	N N 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Test  Mean S 0.00155 0.00000	<b>Square</b> 500 034	6 % LCL	Test Stat 1.73  DF 1 8 9  Test Stat 1.54	Critical 2.29  F Stat 456  Critical 23.2	P-Val <1.0E	ue 2 ue :-05	Decision  Decision  Signification  Decision  Equal V	on(α:5%) iers Detection on(α:5%) ant Effect on(α:1%) 'ariances	on	CV%	%Effe	ct
Auxiliary Test Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assur Attribute Variance Distribution  PCB 209 Sum	mptic	Test Grubbs Ex  Sum Squa 0.0015500 0.0000272 0.0015772 ons Tests Test Variance R Shapiro-W	ares Ratio F To	Notes that the second s	Test  Mean \$ 0.00155 0.00000	<b>Square</b> 500 034		Test Stat 1.73  DF 1 8 9  Test Stat 1.54 0.97	Critical 2.29  F Stat 456  Critical 23.2 0.741	P-Val 0.631: P-Val <1.0E P-Val 0.685: 0.895:	ue 2 ue :-05	Decision  Decision  Signification  Decision  Equal V  Normal	on(α:5%) iers Detect on(α:5%) ant Effect on(α:1%) driances Distribution	on rr	<b>CV%</b> 2.99%	%Effe.	
Auxiliary Test Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assur Attribute Variance Distribution  PCB 209 Sum Sample	mptic	Test Grubbs Ex  Sum Squa 0.0015500 0.0000272 0.0015772 ons Tests Test Variance R Shapiro-W y Code	extreme V	N N O O O O O O O O O O O O O O O O O O	Test  Mean S  0.00155 0.00000	95°	% LCL	Test Stat 1.73  DF 1 8 9  Test Stat 1.54 0.97	Critical 2.29  F Stat 456  Critical 23.2 0.741  Median	P-Val 0.631: P-Val <1.0E P-Val 0.685 0.895	ue 2 ue :-05 ue 0 3	Decision  Decision  Signification  Decision  Equal V  Normal	on(α:5%) iers Detect on(α:5%) ant Effect on(α:1%) draiances Distribution	on 			,
Auxiliary Test Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assur Attribute Variance Distribution  PCB 209 Sum Sample IOSN 2019	mptic	Test Grubbs Ex  Sum Squa 0.0015500 0.0000272 0.0015772 ons Tests Test Variance R Shapiro-W y Code	ares Ratio F To ilk W No  Count 5	N N O O O O O O O O O O O O O O O O O O	Test  Mean S  0.00155  0.00000  ty Test  Mean  0.068	95°	% LCL 655	Test Stat 1.73  DF 1 8 9  Test Stat 1.54 0.97  95% UCL 0.0705	Critical 2.29  F Stat 456  Critical 23.2 0.741  Median 0.0675	P-Val 0.631: P-Val <1.0E P-Val 0.685: 0.895: Min 0.066	ue 2 ue :-05 ue 0 3	Decision Signification Decision Equal V Normal Max 0.071	on(α:5%) iers Detect on(α:5%) ant Effect on(α:1%) cariances Distribution Std E 0.000	on 	2.99%	0.00%	,
Auxiliary Test Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assur Attribute Variance Distribution  PCB 209 Sum Sample IOSN 2019 AT3-098	mptic	Test Grubbs Ex  Sum Squa 0.0015500 0.0000272 0.0015772 ons Tests Test Variance R Shapiro-W y Code	ares Ratio F To ilk W No  Count 5	N 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Test  Mean S  0.00155  0.00000  ty Test  Mean  0.068	95° 0.0	% LCL 655	Test Stat 1.73  DF 1 8 9  Test Stat 1.54 0.97  95% UCL 0.0705	Critical 2.29  F Stat 456  Critical 23.2 0.741  Median 0.0675	P-Val 0.631: P-Val <1.0E P-Val 0.685: 0.895: Min 0.066	ue 2 ue :-05 ue 0 3	Decision Signification Decision Equal V Normal Max 0.071	on(α:5%) iers Detect on(α:5%) ant Effect on(α:1%) cariances Distribution Std E 0.000	on 	2.99%	0.00%	,
Auxiliary Test Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assur Attribute Variance Distribution  PCB 209 Sum Sample IOSN 2019 AT3-098  PCB 209 Deta	mptic	Test Grubbs Ex  Sum Squa 0.0015500 0.0000272 0.0015772 ons Tests Test Variance R Shapiro-W  Code RS	atio F To ilk W No Count 5	N 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Test  Mean S  0.00155 0.00000  ty Test  Mean  0.068 0.0929	95° 0.0 0.0	% <b>LCL</b> 655 909	Test Stat 1.73  DF 1 8 9  Test Stat 1.54 0.97  95% UCL 0.0705 0.0949	Critical 2.29  F Stat 456  Critical 23.2 0.741  Median 0.0675 0.093	P-Val 0.631: P-Val <1.0E P-Val 0.685: 0.895: Min 0.066	ue 2 ue :-05 ue 0 3	Decision Signification Decision Equal V Normal Max 0.071	on(α:5%) iers Detect on(α:5%) ant Effect on(α:1%) cariances Distribution Std E 0.000	on 	2.99%	0.00%	)

## **ATTACHMENT XI**

Macoma nasuta 28-Day Solid Phase Bioaccumulation Testing Tissue Chemistry and Body Burden Statistical Analyses

Pesticides

(30 pages)

#### Yachtsman Marina NAE-2004-00319

#### APPENDIX A. CONCENTRATIONS OF COCs IN THE CLAM (M. nasuta)

			Pre-Assay		
CONTAMINANT	REP1	REP2	REP3	REP4 *	REP5 *
Pesticides (ng/g wet weight)					
Aldrin	0.0199 <mark>U</mark>	0.0202 <mark>U</mark>	0.0199 <mark>U</mark>		
cis-Chlordane	0.0430 U	0.0437 U	0.0430 U		
trans-Chlordane	0.0121 U	0.0123 <mark>U</mark>	0.0121 <mark>U</mark>		
cis-Nonachlor	0.00580 U	0.00585 <mark>U</mark>	0.00580 U		
trans-Nonachlor	0.00530 U	0.00540 U	0.00530 U		
Oxychlordane	0.0247 <mark>U</mark>	0.0251 <mark>U</mark>	0.0247 U		
Total Chlordanes	0.0908	0.0923	0.0908		
4,4'-DDT	0.00785 U	0.00795 U	0.00785 <mark>U</mark>		
4,4'-DDD	0.00595 U	0.00605 <mark>U</mark>	0.00595 U		
4,4'-DDE	0.00363 U	0.00369 U	0.00363 U		
Total DDT	0.0174	0.0177	0.0174		
Dieldrin	0.0120 U	0.0122 <mark>U</mark>	0.0120 U		
alpha-Endosulfan	0.0110 U	0.0111 <mark>U</mark>	0.0110 <mark>U</mark>		
beta-Endosulfan	0.00565 U	0.00575 U	0.00565 U		
Endosulfans	0.0166	0.0169	0.0166		
Endrin	0.00650 U	0.00660 U	0.00650 U		
Heptachlor	0.0125 <mark>U</mark>	0.0127 <mark>U</mark>	0.0125 <mark>U</mark>		
Heptachlor epoxide	0.0256 U	0.0260 U	0.0256 U		
Hexachlorobenzene	0.107 U	0.109 <mark>U</mark>	0.107 U		
Lindane	0.0180 <mark>U</mark>	0.0183 <mark>U</mark>	0.0180 <mark>U</mark>		
Methoxychlor	0.0284 <mark>U</mark>	0.0288 <mark>U</mark>	0.0283 <mark>U</mark>		
Toxaphene	0.515 <mark>U</mark>	0.525 <mark>U</mark>	0.515 <mark>U</mark>		

<sup>\* =</sup> Qualifiers

U Analyte not detected; below Method Detection Limit; value is one-half the Method Detection Limit

J Analyte estimated; detection below Reporting Limit but above Method Detection Limit

NA Not Analyzed

#### Yachtsman Marina NAE-2004-00319

## APPENDIX A. CONCENTRATIONS OF COCs IN THE CLAM (M. nasuta)

			IOSN Reference		
CONTAMINANT	REP1	REP2	REP3	REP4	REP5
Pesticides (ng/g wet weight)					
Aldrin	0.0295 <mark>U</mark>	0.0300 <mark>U</mark>	0.0290 <mark>U</mark>	0.0310 U	0.0285 <mark>U</mark>
cis-Chlordane	0.0635 <mark>U</mark>	0.0650 <del>U</del>	0.0620 <mark>U</mark>	0.0665 U	0.0620 U
trans-Chlordane	0.0180 <mark>U</mark>	0.0185 <mark>U</mark>	0.0175 <mark>U</mark>	0.0185 <mark>U</mark>	0.0175 <mark>U</mark>
cis-Nonachlor	0.00850 U	0.00900 U	0.00850 U	0.00900 U	0.00850 <mark>U</mark>
trans-Nonachlor	0.00800 U	0.00800 U	0.00750 U	0.00800 <b>U</b>	0.00750 U
Oxychlordane	0.0365 <mark>U</mark>	0.0375 U	0.0355 <mark>U</mark>	0.0380 U	0.0355 <mark>U</mark>
Total Chlordanes	0.135	0.138	0.131	0.140	0.131
4,4'-DDT	0.0115 <mark>U</mark>	0.0120 U	0.0115 <mark>U</mark>	0.0120 U	0.0115 <mark>U</mark>
4,4'-DDD	0.00900 U	0.00900 <b>U</b>	0.00850 <mark>U</mark>	0.00900 U	0.00850 U
4,4'-DDE	0.191 <mark>J</mark>	0.224 J	0.228 J	0.213 <mark>J</mark>	0.239
Total DDT	0.212	0.245	0.248	0.234	0.259
Dieldrin	0.0175 <mark>U</mark>	0.0180 <mark>U</mark>	0.0175 <mark>U</mark>	0.0185 <mark>U</mark>	0.0175 <mark>U</mark>
alpha-Endosulfan	0.0160 <mark>U</mark>	0.0165 <mark>U</mark>	0.0160 <mark>U</mark>	0.0170 <b>U</b>	0.0160 <mark>U</mark>
beta-Endosulfan	0.00850 <mark>U</mark>	0.00850 <b>U</b>	0.00800 <mark>U</mark>	0.00900 <b>U</b>	0.00800 <mark>U</mark>
Endosulfans	0.0245	0.0250	0.0240	0.0260	0.0240
Endrin	0.00950 <mark>U</mark>	0.0100 <b>U</b>	0.00950 <mark>U</mark>	0.0100 <b>U</b>	0.00950 <mark>U</mark>
Heptachlor	0.0185 <mark>U</mark>	0.0190 <mark>U</mark>	0.0180 <mark>U</mark>	0.0195 <mark>U</mark>	0.0180 <mark>U</mark>
Heptachlor epoxide	0.0380 <mark>U</mark>	0.0390 <b>U</b>	0.0370 <mark>U</mark>	0.0395 <mark>U</mark>	0.0370 <b>U</b>
Hexachlorobenzene	0.158 <mark>U</mark>	0.162 <mark>U</mark>	0.155 <mark>U</mark>	0.166 <mark>U</mark>	0.154 <mark>U</mark>
Lindane	0.0265 <mark>U</mark>	0.0270 <b>U</b>	0.0260 <mark>U</mark>	0.0280 U	0.0260 <mark>U</mark>
Methoxychlor	0.408 <mark>U</mark>	0.419 <mark>U</mark>	0.401 <mark>U</mark>	0.428 <mark>U</mark>	0.399 <mark>U</mark>
Toxaphene	0.760 <mark>U</mark>	0.780 <b>U</b>	0.750 <mark>U</mark>	0.800 <b>U</b>	0.745 <mark>U</mark>

<sup>\* =</sup> Qualifiers

U Analyte not detected; belowJ Analyte estimated; detection

NA Not Analyzed

#### Yachtsman Marina NAE-2004-00319

### APPENDIX A. CONCENTRATIONS OF COCs IN THE CLAM (M. nasuta)

#### 10 Stations at 4 Marinas Mud

CONTAMINANT	REP1	REP2	REP3	REP4	REP5
Pesticides (ng/g wet weight)					
Aldrin	0.0197 <mark>U</mark>	0.0203 <mark>U</mark>	0.0203 U	0.0201 U	0.0206 U
cis-Chlordane	0.0425 U	0.0437 <mark>U</mark>	0.0439 U	0.0435 U	0.0445 <mark>U</mark>
trans-Chlordane	0.0120 U	0.0123 <mark>U</mark>	0.0124 <mark>U</mark>	0.0122 U	0.0125 <mark>U</mark>
cis-Nonachlor	0.00570 U	0.00590 U	0.00590 U	0.00585 U	0.00600 U
trans-Nonachlor	0.00525 U	0.00540 U	0.00540 U	0.00535 U	0.00550 U
Oxychlordane	0.0244 <mark>U</mark>	0.0251 <mark>U</mark>	0.0252 <mark>U</mark>	0.0250 U	0.0256 <mark>U</mark>
Total Chlordanes	0.0898	0.0924	0.0928	0.0918	0.0941
4,4'-DDT	0.00775 U	0.00800 U	0.00800 U	0.00795 U	0.00810 U
4,4'-DDD	0.485	0.299	0.381	0.414	0.374
4,4'-DDE	0.546	0.434	0.456	0.532	0.528
Total DDT	1.04	0.741	0.845	0.954	0.910
Dieldrin	0.0119 <mark>U</mark>	0.0122 <mark>U</mark>	0.0123 U	0.0121 U	0.0124 <mark>U</mark>
alpha-Endosulfan	0.0108 <mark>U</mark>	0.0112 <mark>U</mark>	0.0112 U	0.0111 <b>U</b>	0.0114 <mark>U</mark>
beta-Endosulfan	0.00560 U	0.00575 U	0.00575 U	0.00570 U	0.00585 U
Endosulfans	0.0164	0.0169	0.0170	0.0168	0.0172
Endrin	0.00645 U	0.00665 <mark>U</mark>	0.00665 U	0.00660 U	0.00675 U
Heptachlor	0.0123 <mark>U</mark>	0.0127 <mark>U</mark>	0.0128 <mark>U</mark>	0.0126 U	0.0129 <mark>U</mark>
Heptachlor epoxide	0.0254 U	0.0261 <mark>U</mark>	0.0262 <mark>U</mark>	0.0259 U	0.0265 <mark>U</mark>
Hexachlorobenzene	0.106 U	0.109 <mark>U</mark>	0.110 <b>U</b>	0.108 <mark>U</mark>	0.111 <mark>U</mark>
Lindane	0.0178 <mark>U</mark>	0.0183 <mark>U</mark>	0.0184 U	0.0182 <mark>U</mark>	0.0186 <mark>U</mark>
Methoxychlor	0.0280 U	0.0288 <mark>U</mark>	0.0290 U	0.0287 U	0.0293 U
Toxaphene	0.510 U	0.525 <mark>U</mark>	0.530 <mark>U</mark>	0.520 U	0.535 <mark>U</mark>

<sup>\* =</sup> Qualifiers

U Analyte not detected; belowJ Analyte estimated; detection

NA Not Analyzed

#### **CETIS Test Data Worksheet**

Report Date:

19 Aug-23 06:50 (p 1 of 1)

Test Code/ID:

TN-23-303MnPest / 17-4167-8246

**Bioaccumulation Evaluation - Pesticides - Macoma** 

EA-EST, Inc. PBC

Start Date:

29 Mar-23 13:49

Species: Macoma nasuta

Sample Code: AT3-191

Sample Source: Yachtsman Marina NAE-2004-00319

End Date: Sample Date: 20 Mar-23

26 Apr-23 12:49

Protocol: US ACE NED RIM (2004) Material: Laboratory Control Sediment

Sample Station: Laboratory Control

_							-										-												
Sample	Rep	Pos	4-4'-DDD	4-4'-DDE	4-4'-DDT	aldrin	alpha chlordane	alpha-BHC	beta-BHC	cis-Nonachlor	delta-BHC	Dieldrin	endosulfan I	endosulfan II	endrin	gamma-BHC (Lindane)	gamma-chlordane	heptachlor	heptachlor epoxide	hexachlorobenzene	Methoxychlor	oxychlordane	toxaphene	trans-nonachlor	2-4'-DDD	2-4'-DDE	2-4'-DDT	endosulfan sulfate	Total DDTs
IOSN 2019	1	1	0.009	0.19	0.01	0.03	0.06			0.009		0.02	0.02	0.009	0.01	0.03	0.02	0.02	0.04	0.16	0.41	0.04	0.76	0.008					
IOSN 2019	2	4	0.009	0.22	0.01	0.03	0.07			0.009		0.02	0.02	0.009	0.01	0.03	0.02	0.02	0.04	0.16	0.42	0.04	0.78	0.008					
IOSN 2019	3	6	0.009	0.23	0.01	0.03	0.06			0.009		0.02	0.02	0.008	0.01	0.03	0.02	0.02	0.04	0.16	0.40	0.04	0.75	0.008					
IOSN 2019	4	7	0.009	0.21	0.01	0.03	0.07			0.009		0.02	0.02	0.009	0.01	0.03	0.02	0.02	0.04	0.17	0.43	0.04	0.8	0.008					
IOSN 2019	5	10	0.009	0.24	0.01	0.03	0.06			0.009		0.02	0.02	0.008	0.01	0.03	0.02	0.02	0.04	0.15	0.4	0.04	0.75	0.008					
AT3-098	1	2	0.49	0.55	0.008	0.02	0.04	0.01	0.008	0.006	0.009	0.01	0.01	0.006	0.006	0.02	0.01	0.01	0.03	0.11	0.03	0.02	0.51	0.005					
AT3-098	2	3	0.3	0.43	0.008	0.02	0.04	0.01	0.008	0.006	0.01	0.01	0.01	0.006	0.007	0.02	0.01	0.01	0.03	0.11	0.03	0.03	0.53	0.005					
AT3-098	3	5	0.38	0.46	0.008	0.02	0.04	0.01	0.008	0.006	0.01	0.01	0.01	0.006	0.007	0.02	0.01	0.01	0.03	0.11	0.03	0.03	0.53	0.005					
AT3-098	4	8	0.41	0.53	0.008	0.02	0.04	0.01	0.008	0.006	0.01	0.01	0.01	0.006	0.007	0.02	0.01	0.01	0.03	0.11	0.03	0.02	0.52	0.005					
AT3-098	5	9	0.37	0.53	0.008	0.02	0.04	0.01	0.009	0.006	0.01	0.01	0.01	0.006	0.007	0.02	0.01	0.01	0.03	0.11	0.03	0.03	0.54	0.006					

**Report Date:** 19 Aug-23 06:51 (p 1 of 5) **Test Code/ID:** TN-23-303MnPest / 17-4167-8246

#### **Bioaccumulation Evaluation - Pesticides - Macoma**

Dioaccamala	ion Evaluation 1 con	Ciaco inaci	oma					1, 1110.1 20
Batch ID: Start Date: Ending Date: Test Length:	16-7638-7277 29 Mar-23 13:49 26 Apr-23 12:49 27d 23h	Test Type: Protocol: Species: Taxon:	Bioaccumulation - Pes US ACE NED RIM (20 Macoma nasuta Bivalvia		Analy Dilue Brine Soure	nt: Not App : Not App	licable	Or <b>Age:</b>
Sample ID: Sample Date: Receipt Date: Sample Age:	20 Mar-23 16:00	Code: Material: CAS (PC): Client:	AT3-191 Laboratory Control Sec Eco-Analysts, Inc.	diment	Proje Soure Statio	ce: Yachtsm	Sediment Evalua nan Marina NAE-20 ory Control	
Sample Code	Sample ID	Sample Da	te Receipt Date	Sample Aç	ge Clien	t Name	Project	
IOSN 2019 AT3-098	13-4648-8170 07-1559-4974	08 Mar-23 08 Feb-23	08 Mar-23 13:00 09 Feb-23 16:3	21d 14h 30 49d 1h	Eco-A	Analysts, Inc.	Dredged Sed	iment Evalu
Sample Code	Material Type		Sample Source	St	ation Location	on La	t/Long	
IOSN 2019 AT3-098	Reference sedin Marine Sedimen		Yachtsman Marina NA Yachtsman Marina NA		SN Reference Stations at 4	_		
Single Compa	arison Summary							
Analysis ID	Endpoint	Com	parison Method		P-Value	Comparison	Result	s
04-1300-9223	4-4'-DDD	Uneq	ual Variance t Two-Sam	ple Test	0.0001	AT3-098 failed	l 4-4'-ddd	1
19-1389-8615	4-4'-DDE	Equal	l Variance t Two-Sample	e Test	<1.0E-05	AT3-098 failed	I 4-4'-dde	1
13-4412-8912	4-4'-DDT	Equal	l Variance t Two-Sample	e Test	1.0000	AT3-098 pass	ed 4-4'-ddt	1
44 0747 7070	- Labelia		1 1 /! 4 T O 1	T 4	4 0000	ATO 000	and a Labelia	

## **CETIS Summary Report**

Report Date: Test Code/ID: 19 Aug-23 06:51 (p 2 of 5) TN-23-303MnPest / 17-4167-8246

**Bioaccumulation Evaluation - Pesticides - Macoma** 

Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effec
IOSN 2019	RS	5	0.0088	0.00846	0.00914	0.0085	0.009	0.000122	0.000274	3.11%	0.00%
AT3-098	110	5	0.391	0.307	0.474	0.299	0.485	0.0302	0.0675	17.28%	-4338.0
4-4'-DDE Summ	ary										
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effe
IOSN 2019	RS	5	0.219	0.196	0.242	0.191	0.239	0.00814	0.0182	8.31%	0.00%
AT3-098		5	0.499	0.436	0.562	0.434	0.546	0.0226	0.0505	10.12%	-127.9
4-4'-DDT Summa	ary										
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effe
IOSN 2019	RS	5	0.0117	0.0114	0.012	0.0115	0.012	0.000122	0.000274	2.34%	0.00%
AT3-098		5	0.00796	0.0078	0.00812	0.00775	0.0081	0.0000579	0.000129	1.63%	31.979
aldrin Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effe
IOSN 2019	RS	5	0.0296	0.0284	0.0308	0.0285	0.031	0.00043	0.000962	3.25%	0.00%
AT3-098		5	0.0202	0.0197	0.0206	0.0196	0.0206	0.000155	0.000347	1.72%	31.829
alpha chlordane	Summary										
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effe
IOSN 2019	RS	5	0.0638	0.0614	0.0662	0.062	0.0665	0.000875	0.00196	3.07%	0.00%
AT3-098		5	0.0436	0.0427	0.0445	0.0425	0.0445	0.000327	0.000732	1.68%	31.659
cis-Nonachlor S	ummary										
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effe
IOSN 2019	RS	5	0.0087	0.00836	0.00904	0.0085	0.009	0.000122	0.000274	3.15%	0.00%
AT3-098		5	0.00587	0.00573	0.00601	0.0057	0.006	0.000049	0.00011	1.87%	32.539
Dieldrin Summa	iry										
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effe
IOSN 2019	RS	5	0.0178	0.0172	0.0184	0.0175	0.0185	0.0002	0.000447	2.51%	0.00%
AT3-098		5	0.0122	0.0119	0.0124	0.0119	0.0124	0.0000914	0.000204	1.68%	31.699
endosulfan I Su	mmary										
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effe
IOSN 2019	RS	5	0.0163	0.0157	0.0169	0.016	0.017	0.0002	0.000447	2.74%	0.00%
AT3-098		5	0.0111	0.0109	0.0114	0.0108	0.0114	0.0000914	0.000204	1.84%	31.849
endosulfan II Sเ	ımmary										
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effe
IOSN 2019	RS	5	0.0084	0.00788	0.00892	0.008	0.009	0.000187	0.000418	4.98%	0.00%
AT3-098		5	0.00573	0.00562	0.00584	0.0056	0.00585	0.0000406	0.0000908	1.59%	31.799
endrin Summar	У										
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effe
IOSN 2019	RS	5	0.0097	0.00936	0.01	0.0095	0.01	0.000122	0.000274	2.82%	0.00%
AT3-098		5	0.00662	0.00648	0.00676	0.00645	0.00675	0.000049	0.00011	1.65%	31.759
gamma-BHC (Li	ndane) Sum	mary									
Sample	Code	Count	Mean		95% UCL		Max	Std Err	Std Dev	CV%	%Effe
IOSN 2019	RS	5	0.0267	0.0257	0.0277	0.026	0.028	0.000374	0.000837	3.13%	2.60%
AT3-098		5	0.0183	0.0179	0.0186	0.0178	0.0186	0.000133	0.000297	1.62%	1.79%

## **CETIS Summary Report**

Report Date: Test Code/ID: 19 Aug-23 06:51 (p 3 of 5) TN-23-303MnPest / 17-4167-8246

**Bioaccumulation Evaluation - Pesticides - Macoma** 

gamma-chlorda	ne Summary	у									
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
IOSN 2019	RS	5	0.018	0.0174	0.0186	0.0175	0.0185	0.000224	0.0005	2.78%	1.77%
AT3-098		5	0.0123	0.012	0.0125	0.012	0.0125	0.0000914	0.000204	1.67%	1.21%
heptachlor Sum	ımary										
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
IOSN 2019	RS	5	0.0186	0.0178	0.0194	0.018	0.0195	0.000292	0.000652	3.50%	0.00%
AT3-098		5	0.0126	0.0124	0.0129	0.0123	0.0129	0.0001	0.000224	1.77%	31.99%
heptachlor epox	cide Summa	ry									
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
IOSN 2019	RS	5	0.0381	0.0367	0.0395	0.037	0.0395	0.00051	0.00114	2.99%	0.00%
AT3-098		5	0.026	0.0255	0.0265	0.0254	0.0265	0.00019	0.000426	1.64%	31.76%
hexachlorobenz	zene Summa	ıry									
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
IOSN 2019	RS	5	0.159	0.153	0.165	0.154	0.166	0.00216	0.00483	3.04%	0.00%
AT3-098		5	0.109	0.106	0.111	0.106	0.111	0.000831	0.00186	1.71%	31.59%
Methoxychlor S	ummary										
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
IOSN 2019	RS	5	0.411	0.395	0.426	0.398	0.428	0.00552	0.0124	3.01%	0.00%
AT3-098		5	0.0287	0.0281	0.0293	0.028	0.0293	0.000214	0.000479	1.67%	93.00%
oxychlordane S	ummary										
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
IOSN 2019	RS	5	0.0366	0.0352	0.038	0.0355	0.038	0.00051	0.00114	3.12%	0.00%
AT3-098		5	0.025	0.0245	0.0256	0.0244	0.0256	0.000188	0.00042	1.68%	31.58%
toxaphene Sum	mary										
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
IOSN 2019	RS	5	0.767	0.739	0.795	0.745	0.8	0.0102	0.0228	2.97%	0.00%
AT3-098		5	0.524	0.512	0.536	0.51	0.535	0.0043	0.00962	1.84%	31.68%
trans-nonachlor	r Summary										
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
IOSN 2019	RS	5	0.0078	0.00746	0.00814	0.0075	0.008	0.000122	0.000274	3.51%	0.00%
AT3-098		5									

Report Date: Test Code/ID: 19 Aug-23 06:51 (p 4 of 5) TN-23-303MnPest / 17-4167-8246

Bioaccumulation	Evaluation	Docticidos	Macoma
Bioaccumulation	Evaluation .	- Pesticines -	iviacoma

<b>Code</b> RS	Rep 1	Rep 2	Dam 2	_			
RS			Rep 3	Rep 4	Rep 5		
	0.009	0.009	0.0085	0.009	0.0085		
	0.485	0.299	0.381	0.414	0.374		
						MD5:	F4D550F088660B59635932B36EB9DF79
Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5		
RS	0.191	0.224	0.228	0.213	0.239		
	0.546	0.434	0.456	0.532	0.528		
						MD5:	AF75DA90CA351C43F7C196271A7F16D6
Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5		
RS	0.0115	0.012	0.0115	0.012	0.0115		
	0.00775	0.008	0.008	0.00795	0.0081		
						MD5:	301E73616502E2670F5FC3318FEE7A12
Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5		
RS	0.0295	0.03	0.029	0.031	0.0285		
	0.0196	0.0203	0.0203	0.0201	0.0206		
etail						MD5:	703F861370B0A94C257C3A8C12D3CC37
Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5		
RS	0.0635	0.065	0.062	0.0665	0.062		
	0.0425	0.0437	0.0439	0.0435	0.0445		
ail						MD5:	D2850062905152A4167463F1E3886452
Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5		
RS	0.0085	0.009	0.0085	0.009	0.0085		
	0.0057	0.0059	0.0059	0.00585	0.006		
						MD5:	02D3602EC2A5FCEFFEAC483B9BD8EEF8
Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5		
RS	0.0175	0.018	0.0175	0.0185	0.0175		
	0.0119	0.0122	0.0122	0.0121	0.0124		
I						MD5:	2179FD1F268BFEB969D482E0762F6824
Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5		
RS	0.016	0.0165	0.016	0.017	0.016		
	0.0108	0.0111	0.0112	0.011	0.0114		
il						MD5:	DD9592CFE4FFDEFA1D01AFBD9A3C3E3
Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5		
RS	0.0085	0.0085	0.008	0.009	0.008		
	0.0056	0.00575	0.00575	0.0057	0.00585		
						MD5:	0B41949737A6651ACC510A71D8D476CA
Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5		
RS	0.0095	0.01	0.0095	0.01	0.0095		
	0.00645	0.00665	0.00665	0.0066	0.00675		
lane) Deta	il					MD5:	60251AA948AC95E51588C67755903211
Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5		
RS	0.0265	0.027	0.026	0.028	0.026		
	0.0178	0.0183	0.0184	0.0182	0.0186		
	Code RS  Code RS  Code RS  Code RS  II Code RS  II Code RS  II Code RS  III Code RS	Code   Rep 1     RS	RS       0.191 0.224 0.546       0.434         Code       Rep 1 Rep 2 0.00115 0.0012 0.00775 0.008         Code       Rep 1 Rep 2 0.003 0.0196 0.0203         RS       0.0295 0.03 0.0196 0.0203         Detail       Rep 1 Rep 2 0.065 0.0437         RS       0.0635 0.065 0.0425 0.0437         ail       Rep 1 Rep 2 0.0057 0.0059         Code       Rep 1 Rep 2 0.0057 0.0059         Code       Rep 1 Rep 2 0.0175 0.018 0.0119 0.0122         III       Code       Rep 1 Rep 2 0.0165 0.0165 0.00575         Code       Rep 1 Rep 2 0.00575       Rep 2 0.00575 0.010 0.00575         Code       Rep 1 Rep 2 0.00575       Rep 2 0.00575 0.01 0.00665         Iane) Detail       Code       Rep 1 Rep 2 0.00665 0.0027         Rs       0.00265 0.027	RS	RS         0.191 0.224 0.434         0.228 0.532           Code         Rep 1 Rep 2 0.00115 0.012 0.0115 0.012 0.00775 0.008 0.008 0.00795           Code         Rep 1 Rep 2 Rep 3 Rep 4 0.00115 0.012 0.00775 0.008 0.008 0.00795           Code         Rep 1 Rep 2 Rep 3 Rep 4 0.0196 0.0203 0.0203 0.0201 0.0203 0.0201 0.0203 0.0201 0.0203 0.0201 0.0203 0.0201 0.0203 0.0201 0.0203 0.0201 0.0203 0.0201 0.0203 0.0201 0.0203 0.0201 0.0203 0.0201 0.0201 0.0203 0.0201 0.0201 0.0203 0.0201	RS         0.191         0.224         0.228         0.213         0.239           0.546         0.434         0.456         0.532         0.528           Code         Rep 1         Rep 2         Rep 3         Rep 4         Rep 5           RS         0.0115         0.012         0.0115         0.012         0.0115         0.002         0.0081           Code         Rep 1         Rep 2         Rep 3         Rep 4         Rep 5           RS         0.0295         0.03         0.029         0.031         0.0285           0.0196         0.0203         0.0203         0.0201         0.0206           Petail         Rep 2         Rep 3         Rep 4         Rep 5           RS         0.0635         0.065         0.062         0.0665         0.062           0.0425         0.0437         0.0439         0.0435         0.0445           ail         Code         Rep 1         Rep 2         Rep 3         Rep 4         Rep 5           RS         0.0085         0.009         0.0085         0.009         0.0085         0.006           Code         Rep 1         Rep 2         Rep 3         Rep 4 <td< td=""><td>  RS</td></td<>	RS

### **CETIS Summary Report**

Report Date: Test Code/ID: 19 Aug-23 06:51 (p 5 of 5) TN-23-303MnPest / 17-4167-8246

Bioaccumulation	on Evaluation	ı - Pesticide	s - Macoma	a			EA-EST, Inc. PBC
gamma-chlorda	ane Detail						MD5: 49923285CFE98A4BA040D71D755F8CAA
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
IOSN 2019	RS	0.018	0.0185	0.0175	0.0185	0.0175	
AT3-098		0.012	0.0123	0.0124	0.0122	0.0125	
heptachlor Det	ail						MD5: 53B685F92CDB3914E9196B3D340E172D
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
IOSN 2019	RS	0.0185	0.019	0.018	0.0195	0.018	
AT3-098		0.0123	0.0127	0.0127	0.0126	0.0129	
heptachlor epo	xide Detail						MD5: E354D5595899229516607BE234C05DC9
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
IOSN 2019	RS	0.038	0.039	0.037	0.0395	0.037	
AT3-098		0.0254	0.026	0.0262	0.0259	0.0265	
hexachloroben	zene Detail						MD5: DCABBBE8D68BA42551D06690801EE595
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
IOSN 2019	RS	0.158	0.162	0.155	0.166	0.154	
AT3-098		0.106	0.109	0.109	0.108	0.111	
Methoxychlor [	Detail						MD5: A2FD57269A20FEF0C987EC0129C39497
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
IOSN 2019	RS	0.408	0.419	0.401	0.428	0.398	
AT3-098		0.028	0.0288	0.029	0.0287	0.0293	
oxychlordane [	Detail						MD5: 67211C76559A024E63B0B7BF0F707FB0
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
IOSN 2019	RS	0.0365	0.0375	0.0355	0.038	0.0355	
AT3-098		0.0244	0.0251	0.0252	0.0249	0.0256	
toxaphene Deta	ail						MD5: DBF200E2A25282F09214EF29AE0B7FB9
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
IOSN 2019	RS	0.76	0.78	0.75	0.8	0.745	

MD5: F12EA705331241F011416BDAB4D4E33C

AT3-098

Sample

AT3-098

IOSN 2019

trans-nonachlor Detail

Code

RS

0.51

Rep 1

800.0

0.00525

0.525

Rep 2

800.0

0.0054

0.53

Rep 3

0.0075

0.0054

0.52

Rep 4

800.0

0.00535

0.535

Rep 5

0.0075

0.0055

STUDY: TN-23-303

CLIENT: Eco-Analysts, Inc.

PROJECT: Yachtsman Marina, Kennebunkport, ME NAE-2004-00319

ASSAY: *M. nasuta* 28-day Bioaccumulation Evaluation TASK: Statistical Analysis of Body Burden Pesticides

Endpoint	Method	С	<	Т	Statistic	Critical	P Level	Alpha	Reject Null	MSD	DF	Ties	P-Type
4-4'-DDD	Unequal Variance t Two-Sample Test	IOSN	<	Comp	12.65047	2.131847	0.000112413	0.05	TRUE	0.06434064	4		С
4-4'-DDE	Equal Variance t Two-Sample Test	IOSN	<	Comp	11.66548	1.859548	1.32927E-06	0.05	TRUE	0.04466556	8		С
4-4'-DDT	Equal Variance t Two-Sample Test	IOSN	<	Comp	-27.60917	1.859548	1	0.05	FALSE	0.000251899	8		С
aldrin	Equal Variance t Two-Sample Test	IOSN	<	Comp	-20.59785	1.859548	1	0.05	FALSE	0.000850426	8		С
alpha chlordane	Equal Variance t Two-Sample Test	IOSN	<	Comp	-21.61987	1.859548	1	0.05	FALSE	0.001736563	8		С
cis-Nonachlor	Equal Variance t Two-Sample Test	IOSN	<	Comp	-21.45421	1.859548	1	0.05	FALSE	0.000245291	8		С
Dieldrin	Equal Variance t Two-Sample Test	IOSN	<	Comp	-25.64962	1.859548	1	0.05	FALSE	0.000408889	8		С
endosulfan I	Equal Variance t Two-Sample Test	IOSN	<	Comp	-23.60311	1.859548	1	0.05	FALSE	0.000408889	8		С
endosulfan II	Equal Variance t Two-Sample Test	IOSN	<	Comp	-13.9468	1.859548	0.9999996	0.05	FALSE	0.000355995	8		С
endrin	Equal Variance t Two-Sample Test	IOSN	<	Comp	-23.34941	1.859548	1	0.05	FALSE	0.000245291	8		С
gamma-BHC (Lindane)	Equal Variance t Two-Sample Test	IOSN	<	Comp	-21.26005	1.859548	1	0.05	FALSE	0.00073822	8		С
gamma-chlordane	Equal Variance t Two-Sample Test	IOSN	<	Comp	-23.76246	1.859548	1	0.05	FALSE	0.000449188	8		С
heptachlor	Equal Variance t Two-Sample Test	IOSN	<	Comp	-19.30434	1.859548	1	0.05	FALSE	0.000573152	8		С
heptachlor epoxide	Equal Variance t Two-Sample Test	IOSN	<	Comp	-22.23085	1.859548	1	0.05	FALSE	0.001012131	8		С
hexachlorobenzene	Equal Variance t Two-Sample Test	IOSN	<	Comp	-21.70335	1.859548	1	0.05	FALSE	0.004301147	8		С
Methoxychlor	Unequal Variance t Two-Sample Test	IOSN	<	Comp	-69.11124	2.131847	0.9999999	0.05	FALSE	0.01178525	4		С
oxychlordane	Equal Variance t Two-Sample Test	IOSN	<	Comp	-21.27108	1.859548	1	0.05	FALSE	0.001010592	8		С
toxaphene	Equal Variance t Two-Sample Test	IOSN	<	Comp	-21.95524	1.859548	1	0.05	FALSE	0.02058143	8		С
trans-nonachlor	Equal Variance t Two-Sample Test	IOSN	<	Comp	-18.7546	1.859548	1	0.05	FALSE	0.000239947	8		С

**Report Date:** 19 Aug-23 06:51 (p 1 of 19) **Test Code/ID:** TN-23-303MnPest / 17-4167-8246

Bioaccumula	tion Evaluatio	n - Pesticio	des - Ma	coma	l						EA-ES	Γ, Inc. PBC
Analysis ID: Analyzed: Edit Date:	04-1300-922 19 Aug-23 6: 08 May-23 22	50 <b>A</b>	ndpoint nalysis: ID5 Has	Pai	'-DDD rametric-Two 5E136C7AB	•	FB05BD0FE	Statu	S Version is Level: or ID:	: CETISv2	.1.1	
Batch ID: Start Date: Ending Date: Test Length:	•	:49 <b>P</b> :49 <b>S</b>	est Type rotocol: pecies: axon:	US Ma	accumulation ACE NED for accommendation of the commendation of the	RIM (2004)	es	Analy Dilue Brine Sour	ent: No e: No	ncy Roka It Applicable It Applicable RO - Aquatic F	Research C	r <b>Age</b> :
Sample Code	Sample	D S	ample D	ate	Receip	t Date	Sample Ag	e Clien	t Name	Pr	oject	
IOSN 2019 AT3-098	13-464 07-155	8-8170 0	8 Mar-23 8 Feb-23		08 Mar- 0 09 Feb-	-23	21d 14h 49d 1h		Analysts, I	nc. Dr	edged Sed	ment Evalu
Sample Code	Materia	al Type		Sai	mple Sourc	е	Sta	tion Location	on	Lat/Long		
IOSN 2019	Referer	nce sedimer	nt	Ya	chtsman Ma	rina NAE-20	04-00 IOS	N Referenc	е			
AT3-098	Marine	Sediment		Ya	chtsman Ma	rina NAE-20	004-00 10	Stations at 4	Marinas I	Mu		
Data Transfor	m	Alt Hy	р				Comparis	on Result				PMSD
Untransformed	t	C < T					AT3-098 f	ailed 4-4'-dd	d endpoin	t		731.14%
Unequal Varia	ance t Two-Sa		df Too	t Stat	Critical	MSD	P-Type	P-Value	Decision	n(α:5%)		
Sample I	vs Sample	II	df Tes	ı Sıaı	Critical	IVIOD				( )		
Sample I Reference Sec	•		4 12.7		2.13	0.0643	CDF	0.0001	Significa	• •		
Reference Sec	AT3-098					0.0643	CDF			nt Effect		
Reference Sec Auxiliary Test Attribute	d AT3-098	<b>)</b> *	4 12.7	7		0.0643	CDF  Critical	P-Value	Decision	nt Effect		
Auxiliary Test Attribute Outlier	ts Test Grubb		4 12.7	7		0.0643	CDF		Decision	nt Effect		
Auxiliary Test Attribute Outlier ANOVA Table	d AT3-098 ts Test Grubb	s Extreme V	4 12.7	st	2.13	0.0643  Test Stat 2.1	CDF  Critical 2.29	<b>P-Value</b> 0.1497	<b>Decision</b> No Outlie	nt Effect n(α:5%) ers Detected		
Auxiliary Test Attribute Outlier ANOVA Table Source	d AT3-098 ts Test Grubb Sum S	s Extreme V	4 12.7  /alue Tes	st an Squ	2.13	0.0643  Test Stat 2.1  DF	Critical 2.29  F Stat	P-Value 0.1497 P-Value	Decision No Outlie	nt Effect n(α:5%) ers Detected n(α:5%)		
Auxiliary Test Attribute Outlier ANOVA Table	d AT3-098 ts Test Grubb	s Extreme V quares 28	4 12.7  /alue Tes  Mea  0.36	st	2.13	0.0643  Test Stat 2.1	CDF  Critical 2.29	<b>P-Value</b> 0.1497	<b>Decision</b> No Outlie	nt Effect n(α:5%) ers Detected n(α:5%)		
Auxiliary Test Attribute Outlier ANOVA Table Source Between	Test Grubb Sum S 0.3644	s Extreme V quares 28 175	4 12.7  /alue Tes  Mea  0.36	st <b>an Sq</b> i	2.13	0.0643  Test Stat 2.1  DF 1	Critical 2.29  F Stat	P-Value 0.1497 P-Value	Decision No Outlie	nt Effect n(α:5%) ers Detected n(α:5%)		
Auxiliary Test Attribute Outlier ANOVA Table Source Between Error	Test Grubb  Sum S  0.36444 0.0182 0.3826	s Extreme V quares 28 175	4 12.7  /alue Tes  Mea  0.36	st <b>an Sq</b> i	2.13	0.0643  Test Stat 2.1  DF 1 8	Critical 2.29  F Stat	P-Value 0.1497 P-Value	Decision No Outlie	nt Effect n(α:5%) ers Detected n(α:5%)		
Auxiliary Test Attribute Outlier ANOVA Table Source Between Error Total	Test Grubb  Sum S  0.36444 0.0182 0.3826	s Extreme V quares 28 175	4 12.7  /alue Tes  Mea  0.36	st <b>an Sq</b> i	2.13	0.0643  Test Stat 2.1  DF 1 8	CDF  Critical 2.29  F Stat 160	P-Value 0.1497 P-Value	Decision No Outlie	nt Effect  n(α:5%) ers Detected  n(α:5%) nt Effect		
Auxiliary Test Attribute Outlier ANOVA Table Source Between Error Total ANOVA Assur	Test  Sum S  0.3644  0.0182  0.3826  mptions Test	s Extreme V quares 28 175	4 12.7  'alue Tes  Mea  0.36  0.00	st <b>an Sq</b> i	2.13	0.0643  Test Stat 2.1  DF 1 8 9	CDF  Critical 2.29  F Stat 160	P-Value 0.1497 P-Value <1.0E-05	Decision  Decision  Significa	nt Effect  n(α:5%) ers Detected  n(α:5%) nt Effect		
Auxiliary Test Attribute Outlier ANOVA Table Source Between Error Total ANOVA Assur Attribute	Test  Sum S  0.3644  0.0182  0.3826  mptions Test  Variance	s Extreme V quares 28 175 46	4 12.7  /alue Tes  Mea  0.36  0.00	an <b>Sq</b> u 64428 022772	2.13	0.0643  Test Stat 2.1  DF 1 8 9	CDF  Critical 2.29  F Stat 160  Critical	P-Value 0.1497 P-Value <1.0E-05	Decision  Decision  Significa  Decision  Unequal	nt Effect  n(α:5%) ers Detected  n(α:5%) nt Effect  n(α:1%)		
Auxiliary Test Attribute Outlier ANOVA Table Source Between Error Total ANOVA Assur Attribute Variance	Sum S 0.3644: 0.0182 0.3826 mptions Test Variance Shapire	s Extreme V quares 28 175 46 s	4 12.7  /alue Tes  Mea  0.36  0.00	an <b>Sq</b> u 64428 022772	2.13	0.0643  Test Stat 2.1  DF 1 8 9  Test Stat 60700	Critical 2.29  F Stat 160  Critical 23.2	P-Value	Decision  Decision  Significa  Decision  Unequal	nt Effect  n(α:5%) ers Detected  n(α:5%) nt Effect  n(α:1%)  Variances		
Auxiliary Test Attribute Outlier ANOVA Table Source Between Error Total ANOVA Assur Attribute Variance Distribution	Sum S 0.3644: 0.0182 0.3826 mptions Test Variance Shapire	s Extreme V quares 28 175 46 s	4 12.7  /alue Tes  Mea  0.36  0.00	an <b>Squ</b> 34428 022772	2.13	0.0643  Test Stat 2.1  DF 1 8 9  Test Stat 60700	Critical 2.29  F Stat 160  Critical 23.2	P-Value	Decision  Decision  Significa  Decision  Unequal	nt Effect  n(α:5%) ers Detected  n(α:5%) nt Effect  n(α:1%)  Variances	CV%	%Effect
Auxiliary Test Attribute Outlier ANOVA Table Source Between Error Total ANOVA Assur Attribute Variance Distribution 4-4'-DDD Sur	Test Output Sum S 0.3644 0.0182 0.3826 Test Variance Shapire	s Extreme V quares 28 175 46 s ee Ratio F To	/alue Tes  Mea  0.36  0.00  est  rmality 1	est Squ 54428 522772	2.13 uare 2	0.0643  Test Stat 2.1  DF 1 8 9  Test Stat 60700 0.818	Critical 2.29  F Stat 160  Critical 23.2 0.741	P-Value  <1.0E-05  P-Value  <1.0E-05  0.0238	Decision  Decision  Significa  Decision  Unequal  Normal E	nt Effect  n(α:5%) ers Detected  n(α:5%) nt Effect  n(α:1%)  Variances  Distribution	CV% 3.11%	%Effect 0.00%
Auxiliary Test Attribute Outlier ANOVA Table Source Between Error Total ANOVA Assur Attribute Variance Distribution 4-4'-DDD Sum Sample	Sum S 0.3644 0.0182 0.3826 mptions Test Variance Shapire	s Extreme V quares 28 175 46 s ee Ratio F To-Wilk W No	/alue Tes  Mea  0.36 0.00  est  rmality 1	est	2.13 uare 2 95% LCL	0.0643  Test Stat 2.1  DF 1 8 9  Test Stat 60700 0.818	Critical 2.29  F Stat 160  Critical 23.2 0.741  Median	P-Value 0.1497  P-Value <1.0E-05  P-Value <1.0E-05 0.0238	Decision No Outlie  Decision Significa  Decision Unequal Normal [	nt Effect  n(α:5%) ers Detected  n(α:5%) nt Effect  n(α:1%) Variances Distribution  Std Err		0.00%
Auxiliary Test Auxiliary Test Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assur Attribute Variance Distribution  4-4'-DDD Surr Sample IOSN 2019	Sum S 0.3644: 0.0182 0.3826 mptions Test Variance Shapire  Tode RS	s Extreme V quares 28 175 46 s ee Ratio F To D-Wilk W No	/alue Tes  //alue	est	2.13  uare  2  95% LCL  0.00846	0.0643  Test Stat 2.1  DF 1 8 9  Test Stat 60700 0.818  95% UCL 0.00914	Critical 2.29  F Stat 160  Critical 23.2 0.741  Median 0.009	P-Value 0.1497 P-Value <1.0E-05 0.0238 Min 0.0085	Decision No Outlie  Decision Significa  Decision Unequal Normal E  Max 0.009	nt Effect  n(a:5%) ers Detected  n(a:5%) nt Effect  n(a:1%) Variances Distribution  Std Err  0.000122	3.11%	0.00%
Auxiliary Test Attribute Outlier ANOVA Table Source Between Error Total ANOVA Assur Attribute Variance Distribution 4-4'-DDD Sum Sample IOSN 2019 AT3-098	Sum S 0.3644: 0.0182 0.3826 mptions Test Variance Shapire  Tode RS	s Extreme V quares 28 175 46 s ee Ratio F To D-Wilk W No	/alue Tes  //alue	est  -est -088 -01	2.13  uare  2  95% LCL  0.00846	0.0643  Test Stat 2.1  DF 1 8 9  Test Stat 60700 0.818  95% UCL 0.00914	Critical 2.29  F Stat 160  Critical 23.2 0.741  Median 0.009	P-Value 0.1497 P-Value <1.0E-05 0.0238 Min 0.0085	Decision No Outlie  Decision Significa  Decision Unequal Normal E  Max 0.009	nt Effect  n(a:5%) ers Detected  n(a:5%) nt Effect  n(a:1%) Variances Distribution  Std Err  0.000122	3.11%	0.00%
Auxiliary Test Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assur Attribute Variance Distribution  4-4'-DDD Sum Sample IOSN 2019 AT3-098  4-4'-DDD Deta	Sum S 0.3644 0.0182 0.3826 mptions Test Variance Shapire  Code RS	s Extreme V quares 28 175 46 s e Ratio F To -Wilk W No Count 5 5	/alue Tes  //alue Tes  // Mea  0.36  0.00   Mea  0.00  0.38	est  G4428 022772  est  088 01	2.13  uare  2  95% LCL  0.00846  0.307	0.0643  Test Stat 2.1  DF 1 8 9  Test Stat 60700 0.818  95% UCL 0.00914 0.474	Critical 2.29  F Stat 160  Critical 23.2 0.741  Median 0.009 0.381	P-Value 0.1497 P-Value <1.0E-05 0.0238 Min 0.0085	Decision No Outlie  Decision Significa  Decision Unequal Normal E  Max 0.009	nt Effect  n(a:5%) ers Detected  n(a:5%) nt Effect  n(a:1%) Variances Distribution  Std Err  0.000122	3.11%	

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Significant Effect

Bioaccumulation Evaluation - Pesticides - Macoma **EA-EST. Inc. PBC** 19-1389-8615 CETISv2.1.1 Analysis ID: Endpoint: 4-4'-DDE **CETIS Version:** Analyzed: 19 Aug-23 6:50 Analysis: Parametric-Two Sample Status Level: **Edit Date:** MD5 Hash: 0449532986689BF4D27ED639AF32C67A **Editor ID:** 08 May-23 22:45 Batch ID: 16-7638-7277 Test Type: Bioaccumulation - Pesticides Analyst: Nancy Roka Start Date: US ACE NED RIM (2004) Diluent: 29 Mar-23 13:49 Protocol: Not Applicable Ending Date: 26 Apr-23 12:49 Species: Macoma nasuta Brine: Not Applicable Test Length: 27d 23h Taxon: Bivalvia Source: ARO - Aquatic Research Or Age: Sample Code Sample Date Sample ID Receipt Date Sample Age Client Name Project **IOSN 2019** 13-4648-8170 08 Mar-23 08 Mar-23 21d 14h Eco-Analysts, Inc. Dredged Sediment Evalu AT3-098 07-1559-4974 08 Feb-23 13:00 09 Feb-23 16:30 49d 1h Sample Code **Station Location Material Type** Sample Source Lat/Long **IOSN 2019** Reference sediment Yachtsman Marina NAE-2004-00 **IOSN Reference** AT3-098 Marine Sediment Yachtsman Marina NAE-2004-00 10 Stations at 4 Marinas Mu **Data Transform PMSD** Alt Hyp **Comparison Result** Untransformed C < T AT3-098 failed 4-4'-dde endpoint 20.40% **Equal Variance t Two-Sample Test** Sample I Sample II df Test Stat Critical **MSD** P-Type P-Value Decision(a:5%) AT3-098\* 1.86 0.0447 CDF <1.0E-05 Significant Effect Reference Sed 11.7 **Auxiliary Tests** Attribute Test Test Stat Critical P-Value Decision(a:5%) 1.82 2.29 Outlier Grubbs Extreme Value Test 0.4634 No Outliers Detected **ANOVA Table** Source DF F Stat P-Value **Sum Squares** Mean Square Decision(a:5%)

ANOVA Assumptions T	ests
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0.19628

0.0115388

0.207819

0.19628

0.0014424

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	7.7	23.2	0.0732	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.952	0.741	0.6872	Normal Distribution

1

8

9

136

<1.0E-05

#### 4-4'-DDE Summary

Between

Error Total

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
IOSN 2019	RS	5	0.219	0.196	0.242	0.224	0.191	0.239	0.00814	8.31%	0.00%
AT3-098		5	0.499	0.436	0.562	0.528	0.434	0.546	0.0226	10.12%	-127.95%

#### 4-4'-DDE Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
IOSN 2019	RS	0.191	0.224	0.228	0.213	0.239
AT3-098		0.546	0.434	0.456	0.532	0.528

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Test Code/ID: TN-23-303MnPest / 17-4167-8246

		•								Т	est Co	de/ID:	TN-23-303	/InPest / 1	7-4167-8246
Bioaccumulat	tion E	Evaluation -	Pesti	cides	- Mac	oma								EA-ES	T, Inc. PBC
Analysis ID: Analyzed: Edit Date:	19 A	412-8912 .ug-23 6:50 lay-23 22:45	5	Ana	point: ysis: Hash:	Parar	netric-Two	Sample 'F409154A	4A5FFE	3A4206		S Version is Level: or ID:	n: CETISv2. 1	1.1	
Batch ID: Start Date: Ending Date: Test Length:	29 N 26 A	•		Prot	ocol: cies:	US A	CE NED R ma nasuta	n - Pesticid RIM (2004) a	es		Analy Dilue Brine Sour	ent: No e: No	ancy Roka ot Applicable ot Applicable RO - Aquatic R	Research (	Or <b>Age:</b>
Sample Code		Sample ID	)	Sam	ple Da	te	Receipt	Date	Sample	Age	Clien	ıt Name	Pro	oject	
IOSN 2019 AT3-098		13-4648-8 07-1559-4			- lar-23 eb-23 1	3:00	08 Mar-2 09 Feb-2	23	21d 14l 49d 1h	_	Eco-A	Analysts, I	nc. Dre	edged Sed	liment Evalu
Sample Code		Material T	уре			Samp	le Source	)		Station I	Locatio	on	Lat/Long		
IOSN 2019		Reference	sedim	ent		Yacht	sman Mar	ina NAE-20	04-00	IOSN Re	eference	е			
AT3-098		Marine Se	diment			Yacht	sman Mar	ina NAE-20	04-00	10 Statio	ns at 4	Marinas I	Mu		
Data Transfor	m		Alt H	lyp					Comp	arison R	esult				PMSD
Untransformed	d		C < T						AT3-0	98 passe	d 4-4'-c	ddt endpoi	nt		2.15%
Sample I Reference Sec	vs	wo-Sample Sample II AT3-098	Test	<b>df</b> 8	<b>Test 9</b>		Critical	MSD 0.000252	P-Typ CDF	e P-V	alue 000	<b>Decisio</b> Non-Sign	n(α:5%) nificant Effect		
Auxiliary Test Attribute Outlier	is	<b>Test</b> Grubbs E	xtreme	Valu	e Test			Test Stat	Critica 2.29	al <b>P-V</b>	alue	<b>Decision</b> No Outlie	n(α:5%) ers Detected		
ANOVA Table															
Source		Sum Squa	ares		Mean	Squa	re	DF	F Stat	P-V	alue	Decisio	n(α:5%)		
Between Error Total		3.497E-05 3.67E-07 3.534E-05			3.497 4.588			1 8 9	762 –	<1.0	0E-05	Significa	nt Effect		
ANOVA Assur	mptic														
Attribute		Test						Test Stat	Critica	al P-V	'alue	Decisio	n(α:1%)		
Variance Distribution		Variance F Shapiro-W			ality Te	st		4.48 0.859	23.2 0.741	0.17	756	Equal Va			
4-4'-DDT Sum	mary	,													
Sample	•	Code	Cour	ıt	Mean	ç	95% LCL	95% UCL	Media	n Min	ı	Max	Std Err	CV%	%Effect
Janipie							0.0114	0.012	0.0115			0.012	0.000122		0.00%
IOSN 2019		RS	5		0.011	, (									
		RS	5 5		0.011 0.007		0.0078	0.00812	0.008	0.00	0775	0.0081	0.0000579		31.97%
IOSN 2019	nil	RS								0.00	0775	0.0081	0.0000579		
IOSN 2019 AT3-098	nil	RS Code		1		96 (					0775	0.0081	0.0000579		
IOSN 2019 AT3-098 <b>4-4'-DDT Deta</b>	iil		5		0.007	96 (	0.0078	0.00812	0.008		0775	0.0081	0.0000579		

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Test Code/ID: TN-23-303MnPest / 17-4167-8246

							Test Co				7-4167-824
Bioaccumulat	tion Evaluation	- Pesticide	s - Macom	na						EA-ES	T, Inc. PB0
Analysis ID: Analyzed: Edit Date:	11-0747-7870 19 Aug-23 6:50 08 May-23 22:4	Ana	•	ldrin arametric-Two F40C84C6B90		EFFDDB21	Statu	S Version: is Level: or ID:	: CETISv2. 1	1.1	
Batch ID: Start Date: Ending Date: Test Length:	16-7638-7277 29 Mar-23 13:49 26 Apr-23 12:49 27d 23h	Pro Spe	otocol: U ecies: M	ioaccumulatio IS ACE NED F lacoma nasuta ivalvia	RIM (2004)	es	Analy Dilue Brine Sour	ent: Not e: Not	ncy Roka t Applicable t Applicable O - Aquatic R	Research (	Or <b>Age:</b>
Sample Code	Sample II	) Sar	nple Date	Receipt	t Date	Sample Ag	e Clien	t Name	Pro	oject	
IOSN 2019 AT3-098	13-4648-8 07-1559-4		Mar-23 Feb-23 13:	08 Mar- 00 09 Feb-		21d 14h 49d 1h	Eco-A	Analysts, Ir	nc. Dre	edged Sec	liment Eval
Sample Code	Material 1	Гуре	s	ample Source	е	Sta	tion Location	on	Lat/Long		
IOSN 2019	Reference	sediment	Y	achtsman Ma	rina NAE-20	04-00 105	SN Referenc	е			
AT3-098	Marine Se	diment	Y	achtsman Ma	rina NAE-20	004-00 10	Stations at 4	Marinas N	Иu		
Data Transfor	rm	Alt Hyp				Comparis	on Result				PMSD
Untransformed	d	C < T				AT3-098 p	oassed aldrir	n endpoint			2.87%
Sample I	ce t Two-Sample vs Sample II	d		at Critical	MSD	P-Type	P-Value	Decision			
Reference Sec	d AT3-098	8	-20.6	1.86	0.00085	CDF	1.0000	Non-Sign	ificant Effect		
<b>Auxiliary Test</b>	ts										
Attribute	Test				Test Stat	Critical	P-Value	Decision	(α:5%)		
Outlier	Grubbs E	xtreme Val	ue Test		2.05	2.29	0.1849	No Outlie	rs Detected		
ANOVA Table	•										
ANOVA Table Source	Sum Squ	ares	Mean S	quare	DF	F Stat	P-Value	Decision	(α:5%)		
			Mean S		<b>DF</b>	F Stat	<b>P-Value</b> <1.0E-05	<b>Decision</b> Significar	, ,		
Source Between Error	Sum Squ 0.0002218 4.183E-06	3		18	1 8				, ,		
Source Between	Sum Squ 0.0002218	3	0.00022	18	1				, ,		
Source Between Error Total	Sum Squ 0.0002218 4.183E-06	3	0.00022	18	1 8				, ,		
Source Between Error Total ANOVA Assur	Sum Squ 0.0002218 4.183E-06 0.0002260  mptions Tests Test	3 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	0.00022 5.229E-	18	1 8 9 Test Stat	424 Critical	<1.0E-05	Significar	nt Effect		
Source Between Error Total  ANOVA Assur Attribute Variance	Sum Squ 0.0002218 4.183E-06 0.0002260 mptions Tests Test Variance	3 5 ) Ratio F Tes	0.00022 5.229E-	18	1 8 9 <b>Test Stat</b> 7.66	424 Critical 23.2	<1.0E-05  P-Value 0.0738	Significan  Decision  Equal Va	nt Effect (α:1%) riances		
Source Between Error Total  ANOVA Assur Attribute Variance Distribution	Sum Squ 0.0002218 4.183E-06 0.0002260  mptions Tests Test Variance I Shapiro-W	3 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	0.00022 5.229E-	18	1 8 9 Test Stat	424 Critical	<1.0E-05	Significan  Decision  Equal Va	nt Effect		
Source Between Error Total  ANOVA Assur Attribute Variance Distribution  aldrin Summa	Sum Squ 0.0002218 4.183E-06 0.0002260  mptions Tests  Test  Variance I Shapiro-W	3 5 ) Ratio F Tes /ilk W Norn	0.00022 5.229E- t t nality Test	18	1 8 9 <b>Test Stat</b> 7.66 0.958	424 Critical 23.2 0.741	<b>P-Value</b> 0.0738 0.7671	Decision Equal Va Normal D	nt Effect  (α:1%)  riances  vistribution		
Source Between Error Total  ANOVA Assur Attribute Variance Distribution aldrin Summa Sample	Sum Squ 0.0002218 4.183E-06 0.0002260  mptions Tests Test Variance I Shapiro-W  ary Code	Ratio F Tes	0.00022 5.229E- t t nality Test	95% LCL	1 8 9 <b>Test Stat</b> 7.66 0.958	424  Critical 23.2 0.741  Median	<1.0E-05  P-Value 0.0738 0.7671  Min	Decision Equal Va Normal D	(α:1%) riances pistribution  Std Err	CV%	%Effect
Source Between Error Total  ANOVA Assur Attribute Variance Distribution aldrin Summa Sample IOSN 2019	Sum Squ 0.0002218 4.183E-06 0.0002260  mptions Tests  Test  Variance I Shapiro-W	Ratio F Tes /ilk W Norn  Count	0.00022 5.229E- t t nality Test Mean 0.0296	95% LCL 0.0284	1 8 9 <b>Test Stat</b> 7.66 0.958 <b>95% UCL</b> 0.0308	424  Critical 23.2 0.741  Median 0.0295	<1.0E-05  P-Value 0.0738 0.7671  Min 0.0285	Decision Equal Va Normal D  Max 0.031	riances pistribution  Std Err 0.00043	3.25%	0.00%
Source Between Error Total  ANOVA Assur Attribute Variance Distribution aldrin Summa Sample	Sum Squ 0.0002218 4.183E-06 0.0002260  mptions Tests Test Variance I Shapiro-W  ary Code	Ratio F Tes	0.00022 5.229E- t t nality Test	95% LCL	1 8 9 <b>Test Stat</b> 7.66 0.958	424  Critical 23.2 0.741  Median	<1.0E-05  P-Value 0.0738 0.7671  Min	Decision Equal Va Normal D	(α:1%) riances pistribution  Std Err		
Source Between Error Total  ANOVA Assur Attribute Variance Distribution aldrin Summa Sample IOSN 2019	Sum Squ 0.0002218 4.183E-06 0.0002260  mptions Tests Test Variance I Shapiro-W  ary Code	Ratio F Tes /ilk W Norn  Count	0.00022 5.229E- t t mality Test Mean 0.0296	95% LCL 0.0284	1 8 9 <b>Test Stat</b> 7.66 0.958 <b>95% UCL</b> 0.0308	424  Critical 23.2 0.741  Median 0.0295	<1.0E-05  P-Value 0.0738 0.7671  Min 0.0285	Decision Equal Va Normal D  Max 0.031	riances pistribution  Std Err 0.00043	3.25%	0.00%
Source Between Error Total  ANOVA Assur Attribute Variance Distribution  aldrin Summa Sample IOSN 2019 AT3-098  aldrin Detail Sample	Sum Squ  0.0002218 4.183E-06 0.0002260  mptions Tests  Test  Variance   Shapiro-W  ary  Code  RS	Ratio F Tes //ilk W Norm  Count 5 5	0.00022 5.229E- t t nality Test Mean 0.0296 0.0202	95% LCL 0.0284 0.0197	1 8 9 <b>Test Stat</b> 7.66 0.958 <b>95% UCL</b> 0.0308 0.0206	424  Critical 23.2 0.741  Median 0.0295 0.0203	<1.0E-05  P-Value 0.0738 0.7671  Min 0.0285	Decision Equal Va Normal D  Max 0.031	riances pistribution  Std Err 0.00043	3.25%	0.00%
Source Between Error Total  ANOVA Assur Attribute Variance Distribution aldrin Summa Sample IOSN 2019 AT3-098 aldrin Detail	Sum Squ  0.0002218 4.183E-06 0.0002260  mptions Tests  Test  Variance   Shapiro-W  ary  Code  RS	Ratio F Tes //ilk W Norn  Count 5 5	0.00022 5.229E- t mality Test Mean 0.0296 0.0202	95% LCL 0.0284 0.0197	1 8 9 <b>Test Stat</b> 7.66 0.958 <b>95% UCL</b> 0.0308 0.0206	424  Critical 23.2 0.741  Median 0.0295 0.0203	<1.0E-05  P-Value 0.0738 0.7671  Min 0.0285	Decision Equal Va Normal D  Max 0.031	riances pistribution  Std Err 0.00043	3.25%	0.00%

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Test Code/ID: TN-23-303MnPest / 17-4167-8246

		•								Т	est Co	de/ID:	TN-23-303	MnPest / 1	7-4167-8246
Bioaccumulat	tion I	Evaluation -	Pesti	cides	- Macc	ma								EA-ES	T, Inc. PBC
Analysis ID: Analyzed: Edit Date:	19 A	761-2761 Aug-23 6:50 May-23 22:45	5	Ana	ysis:	Paran	chlordane netric-Two 3EA7D282		3A54019	9B9B4		S Version is Level: or ID:	n: CETISv2 1	1.1	
Batch ID: Start Date: Ending Date: Test Length:	29 N 26 A	•		Prot	ocol: cies:	US A	CE NED F ma nasuta	n - Pesticido RIM (2004) a	es		Analy Dilue Brine Sour	ent: No e: No	ancy Roka ot Applicable ot Applicable RO - Aquatic F	Research (	Or <b>Age:</b>
Sample Code		Sample ID	)	Sam	ple Dat	ie	Receipt	Date	Sample	Age	Clien	t Name	Pr	oject	
IOSN 2019 AT3-098		13-4648-8 <sup>2</sup> 07-1559-49	170	08 N	lar-23 eb-23 1		08 Mar-	23	21d 14l 49d 1h	_		Analysts, I		•	diment Evalu
Sample Code		Material T	уре			Samp	le Source	)		Station I	Location	on	Lat/Long		
IOSN 2019		Reference	sedim	ent		Yacht	sman Mar	ina NAE-20	04-00	IOSN Re	ferenc	е			
AT3-098		Marine Sec	diment			Yacht	sman Mar	ina NAE-20	004-00	10 Statio	ns at 4	Marinas I	Mu		
Data Transfor	m		Alt F	lур					Comp	arison R	esult				PMSD
Untransformed	d		C < T	•					AT3-0	98 passe	d alpha	chlordan	e endpoint		2.72%
Sample I Reference Sec	vs	Sample II AT3-098	Test	df 8	Test S		Critical	<b>MSD</b> 0.00174	P-Typ CDF	e P-V	alue	<b>Decision</b> Non-Sign	n(α:5%) nificant Effect		
Auxiliary Test Attribute Outlier	s	Test Grubbs Ex	xtreme	· Valu	e Test			Test Stat	Critica 2.29	al <b>P-V</b>	alue 000	<b>Decision</b> No Outlie	n(α:5%) ers Detected		
ANOVA Table	1														
Source		Sum Squa	ares		Mean	Squar	·e	DF	F Stat	P-V	alue	Decision	, ,		
Between Error Total		0.0010191 1.744E-05 0.0010365			0.0010 2.180I			1 8 9	467 —	<1.0	0E-05	Significa	int Effect		
	mntia														
ANOVA Assur	mpuc	Test						Test Stat	Critica	al D.V	'alue	Decisio	n(a:1%)		
Variance Distribution		Variance R Shapiro-W				st		7.14 0.954	23.2 0.741	0.08 0.7	331	Equal Va	· ,		
alpha chlorda	ne S	ummary													
Sample		Code	Cour	nt	Mean	9	5% LCL	95% UCL	Media	n Min	1	Max	Std Err	CV%	%Effect
IOSN 2019		RS	5		0.0638	3 0	0.0614	0.0662	0.0635			0.0665	0.000875	3.07%	0.00%
AT3-098			5		0.0436	6 C	0.0427	0.0445	0.0437	7 0.04	425	0.0445	0.000327	1.68%	31.65%
alpha chlorda	ne D	etail													
Sample		Code	Rep	1	Rep 2	F	Rep 3	Rep 4	Rep 5						
Sample IOSN 2019		<b>Code</b> RS	<b>Rep</b> 0.063		Rep 2 0.065		<b>Rep 3</b> 0.062	<b>Rep 4</b> 0.0665	Rep 5 0.062						

**Report Date:** 19 Aug-23 06:51 (p 6 of 19) **Test Code/ID:** TN-23-303MnPest / 17-4167-8246

									Т-	est Co	ae/ID:	TN-23-303	ivinPest / 1	17-4167-8246
Bioaccumulat	ion Eva	luation - Pes	ticides	- Maco	ma								EA-ES	T, Inc. PBC
Analyzed:	12-1877 19 Aug- 08 May-		Ana	lysis:	Param	onachlor netric-Two 2F890F99	o Sample 19B426D2D	24A520	5E0A8E		S Version is Level: or ID:	: CETISv2 1	.1.1	
	26 Apr-2	23 13:49 23 12:49	Prof	cies:	US AC	CE NED F na nasuta	n - Pesticido RIM (2004) a	es		Analy Dilue Brine Sour	ent: No	ncy Roka t Applicable t Applicable tO - Aquatic I	Research (	Or <b>Age:</b>
Sample Code	Sa	ample ID	San	ple Dat	e	Receipt	Date	Sample	Age	Clien	t Name	Pr	oject	
IOSN 2019 AT3-098		3-4648-8170 7-1559-4974		/lar-23 eb-23 1	3:00	08 Mar- 09 Feb-		21d 14l 49d 1h		Eco-A	Analysts, I	nc. Dr	edged Sed	diment Evalu
Sample Code	М	aterial Type			Samp	le Source	9		Station I	Locatio	on	Lat/Long		
IOSN 2019	Re	eference sedi	ment		Yacht	sman Maı	rina NAE-20	04-00	IOSN Re	eferenc	е			
AT3-098	М	arine Sedime	nt		Yacht	sman Maı	rina NAE-20	04-00	10 Statio	ns at 4	Marinas I	Mu		
Data Transfori	m	Alt	Нур					Comp	arison R	esult				PMSD
Untransformed	l	C <	Т					AT3-0	98 passe	d cis-n	onachlor e	ndpoint		2.82%
Equal Varianc Sample I Reference Sed	vs Sa	-Sample Tes mple II 3-098		<b>Test S</b>		ritical .86	MSD 0.000245	P-Typ	e P-V	alue	Decision	n(α:5%) nificant Effect		
Auxiliary Tests Attribute Outlier	Т	est Grubbs Extrem	ne Valu	ıe Test			Test Stat	Critica 2.29	al P-V	alue	Decision			
ANOVA Table														
Source		um Squares		Mean	Squar	е	DF	F Stat	P-V	alue	Decision	η(α:5%)		
Between Error Total	3.	002E-05 48E-07 037E-05		2.002E 4.35E			1 8 9	460 —	<1.0	0E-05	Significa	nt Effect		
ANOVA Assun	nptions	Tests												
Attribute	Te	est					Test Stat	Critica	al P-V	'alue	Decision	η(α:1%)		
Variance Distribution		ariance Ratio napiro-Wilk W			st		6.25 0.865	23.2 0.741	0.10 0.08		Equal Va Normal [	ariances Distribution		
cis-Nonachlor	r Summa	ary												
Sample	C	ode Co	unt	Mean	9	5% LCL	95% UCL	Media	ın Min	l	Max	Std Err	CV%	%Effect
IOSN 2019	R	S 5		0.0087	7 0	.00836	0.00904	0.008	5 0.00	085	0.009	0.000122	3.15%	0.00%
AT3-098		5		0.0058	37 0	.00573	0.00601	0.0059	0.00	057	0.006	0.000049	1.87%	32.53%
cis-Nonachlor	r Detail													
		ode Rej	p 1	Rep 2	F	Rep 3	Rep 4	Rep 5						
cis-Nonachlor		<b>'</b>		<b>Rep 2</b> 0.009		Rep 3	<b>Rep 4</b> 0.009	Rep 5						

AT3-098

0.0119

0.0122

0.0123

**Report Date:** 19 Aug-23 06:51 (p 7 of 19) **Test Code/ID:** TN-23-303MnPest / 17-4167-8246

Bioaccumulation Evaluation - Pesticides - Macoma EA-EST. Inc. PBC 07-6660-5254 CETISv2.1.1 Analysis ID: Endpoint: Dieldrin **CETIS Version:** Analyzed: Parametric-Two Sample 19 Aug-23 6:50 Analysis: Status Level: **Edit Date:** MD5 Hash: B1F5A087058062B2C2CD2637621354E4 **Editor ID:** 08 May-23 22:45 Batch ID: 16-7638-7277 Nancy Roka Test Type: Bioaccumulation - Pesticides Analyst: Start Date: 29 Mar-23 13:49 Protocol: US ACE NED RIM (2004) Diluent: Not Applicable Ending Date: 26 Apr-23 12:49 Species: Macoma nasuta Brine: Not Applicable Test Length: 27d 23h Taxon: Bivalvia Source: ARO - Aquatic Research Or Age: Sample Date Sample Code Sample ID Receipt Date Sample Age Client Name **Project** Eco-Analysts, Inc. **IOSN 2019** 13-4648-8170 08 Mar-23 08 Mar-23 21d 14h Dredged Sediment Evalu AT3-098 07-1559-4974 08 Feb-23 13:00 09 Feb-23 16:30 49d 1h Sample Code **Material Type** Sample Source Station Location Lat/Long **IOSN 2019** Reference sediment Yachtsman Marina NAE-2004-00 **IOSN Reference** AT3-098 Marine Sediment Yachtsman Marina NAE-2004-00 10 Stations at 4 Marinas Mu **Data Transform PMSD** Alt Hyp Comparison Result 2.30% Untransformed C < T AT3-098 passed dieldrin endpoint **Equal Variance t Two-Sample Test** Sample I Sample II df Test Stat Critical **MSD** P-Type P-Value Decision(a:5%) 0.000409 1.0000 Reference Sed AT3-098 -25.6 1.86 CDF Non-Significant Effect **Auxiliary Tests** Attribute Test Test Stat Critical P-Value Decision(a:5%) 2.14 2.29 Outlier Grubbs Extreme Value Test 0.1241 No Outliers Detected **ANOVA Table** Source DF P-Value **Sum Squares** Mean Square F Stat Decision(a:5%) Between Significant Effect 7.952E-05 7.952E-05 1 658 <1.0E-05 9.67E-07 8 Error 1.209E-07 Total 8.049E-05 9 ANOVA Assumptions Tests **Attribute** Test Stat Critical P-Value Decision(a:1%) Variance Variance Ratio F Test 4.79 23.2 0.1583 **Equal Variances** 0.868 0.741 0.0948 Distribution Shapiro-Wilk W Normality Test Normal Distribution **Dieldrin Summary** Sample Code Count Mean 95% LCL 95% UCL Median Min Max Std Err CV% %Effect **IOSN 2019** RS 5 0.0178 0.0172 0.0175 0.0185 2.51% 0.00% 0.0184 0.0175 0.0002 AT3-098 5 0.0122 0.0119 0.0124 0.0122 0.0119 0.0124 0.0000914 1.68% 31.69% **Dieldrin Detail** Sample Code Rep 1 Rep 2 Rep 3 Rep 4 Rep 5 IOSN 2019 RS 0.0175 0.0175 0.018 0.0175 0.0185

0.0121

0.0124

**Report Date:** 19 Aug-23 06:51 (p 8 of 19) **Test Code/ID:** TN-23-303MnPest / 17-4167-8246

								Test Co	acrib.	TN-23-303N		
Bioaccumula	tion Evaluatio	n - Pestici	des - Ma	coma							EA-ES	T, Inc. PBC
Analysis ID: Analyzed: Edit Date:	03-9121-3921 19 Aug-23 6:5 08 May-23 22	0 4	indpoint Inalysis: ID5 Has	Para	ametric-Two	o Sample 8E950BFB2	23279C7F3F	Statu	S Version is Level: or ID:	: CETISv2. 1	1.1	
Batch ID: Start Date: Ending Date: Test Length:	16-7638-7277 29 Mar-23 13: 26 Apr-23 12: 27d 23h	49 <b>F</b> 49 <b>S</b>	est Type Protocol: Species: axon:	US .	ACE NED Formation	` ,	es	Anal Dilue Brine Sour	ent: No	ncy Roka t Applicable t Applicable O - Aquatic R	esearch (	Or <b>Age:</b>
Sample Code	Sample	ID S	Sample D	ate	Receip	t Date	Sample Ag	e Clier	nt Name	Pro	oject	
IOSN 2019 AT3-098	13-4648 07-1559		8 Mar-23 8 Feb-23		08 Mar- 09 Feb-		21d 14h 49d 1h	Eco-	Analysts, Ir	nc. Dre	edged Sed	liment Eval
Sample Code	Materia	l Type		San	nple Sourc	e	Sta	tion Locati	on	Lat/Long		
IOSN 2019	Referen	ce sedime	nt	Yac	htsman Ma	rina NAE-20	004-00 108	SN Referenc	е			
AT3-098	Marine	Sediment		Yac	htsman Ma	rina NAE-20	004-00 10	Stations at 4	1 Marinas N	Лu		
Data Transfor	rm	Alt Hy	р				Comparis	on Result				PMSD
Untransformed	d	C < T					AT3-098 p	passed endo	sulfan i en	dpoint		2.51%
	ce t Two-Samp		df Tes	t Stat	Critical	MSD	P-Type	P-Value	Decision	η(α:5%)		
•			8 -23			0.000400	CDE	1 0000	Non-Sign	ificant Effect		
Reference Sec	d AT3-098		8 -23.		1.86	0.000409	CDF	1.0000	Non-Sign	nificant Effect		
•	d AT3-098		8 -23.			0.000409 Test Stat		1.0000 P-Value	Non-Sign  Decision			
Reference Sec	d AT3-098	Extreme \		6					Decision			
Reference Sec Auxiliary Test Attribute	d AT3-098  ts  Test  Grubbs			6		Test Stat	Critical	P-Value	Decision	n(α:5%)		
Reference Sec Auxiliary Test Attribute Outlier	d AT3-098  ts  Test  Grubbs	Extreme \	/alue Tes	6	1.86	Test Stat	Critical	P-Value	Decision	n(α:5%) ers Detected		
Reference Sec  Auxiliary Test Attribute Outlier  ANOVA Table	ts Test Grubbs	Extreme \	/alue Tes Mea	6 st	1.86 are	Test Stat 2.14	Critical 2.29	<b>P-Value</b> 0.1241	<b>Decision</b> No Outlie	n(α:5%) ers Detected n(α:5%)		
Auxiliary Test Attribute Outlier ANOVA Table Source Between Error	d AT3-098  ts  Test  Grubbs  Sum Sc	Extreme \ uares 05	/alue Tes Mea 6.73	et an Squ	1.86 are	Test Stat 2.14  DF 1 8	Critical 2.29	P-Value 0.1241 P-Value	Decision No Outlie	n(α:5%) ers Detected n(α:5%)		
Auxiliary Test Attribute Outlier ANOVA Table Source Between	d AT3-098  ts  Test  Grubbs  Sum Sc  6.734E-	Extreme \ uares 05 7	/alue Tes Mea 6.73	6 st an <b>Squ</b> 34E-05	1.86 are	<b>Test Stat</b> 2.14 <b>DF</b> 1	Critical 2.29	P-Value 0.1241 P-Value	Decision No Outlie	n(α:5%) ers Detected n(α:5%)		
Auxiliary Test Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assur	d AT3-098  ts  Test  Grubbs  Sum Sc  6.734E- 9.67E-0	Extreme \ uares 05 7 05	/alue Tes Mea 6.73	6 st an <b>Squ</b> 34E-05	1.86 are	<b>Test Stat</b> 2.14 <b>DF</b> 1 8 9	Critical 2.29  F Stat 557	P-Value 0.1241 P-Value <1.0E-05	Decision No Outlie	n(α:5%) ers Detected n(α:5%)		
Auxiliary Test Attribute Outlier ANOVA Table Source Between Error Total ANOVA Assur	ts  Test  Grubbs  Sum Sc  6.734E- 9.67E-0 6.831E- mptions Tests Test	Extreme \ uares 05 7 05	/alue Tes <b>Me</b> a 6.73 1.20	6 st an <b>Squ</b> 34E-05	1.86 are	Test Stat 2.14  DF 1 8 9  Test Stat	Critical 2.29  F Stat 557  Critical	P-Value 0.1241  P-Value <1.0E-05	Decision No Outlie Decision Significan	n(α:5%) ers Detected n(α:5%) nt Effect n(α:1%)		
Auxiliary Test Attribute Outlier ANOVA Table Source Between Error Total ANOVA Assur Attribute Variance	d AT3-098 ts Test Grubbs Sum Sc 6.734E- 9.67E-0 6.831E- mptions Tests Test Variance	Extreme \ uares 05 7 05 e Ratio F T	/alue Tes	6 an Squ 34E-05 39E-07	1.86 are	Test Stat 2.14  DF 1 8 9  Test Stat 4.79	Critical 2.29  F Stat 557  Critical 23.2	P-Value 0.1241  P-Value <1.0E-05  P-Value 0.1583	Decision  No Outlie  Decision  Significan  Decision  Equal Va	n(α:5%) ers Detected n(α:5%) nt Effect n(α:1%) riances		
Auxiliary Test Auxiliary Test Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assur Attribute Variance Distribution	ts Test Grubbs Sum Sc 6.734E- 9.67E-0 6.831E- mptions Tests Variance Shapiro	Extreme \ uares 05 7 05	/alue Tes	6 an Squ 34E-05 39E-07	1.86 are	Test Stat 2.14  DF 1 8 9  Test Stat	Critical 2.29  F Stat 557  Critical	P-Value 0.1241  P-Value <1.0E-05	Decision  No Outlie  Decision  Significan  Decision  Equal Va	n(α:5%) ers Detected n(α:5%) nt Effect n(α:1%)		
Reference Sec Auxiliary Test Attribute Outlier ANOVA Table Source Between Error Total ANOVA Assur Attribute Variance Distribution endosulfan I S	ts Test Grubbs Sum Sc 6.734E- 9.67E-0 6.831E- mptions Tests Variance Shapiro-	Extreme \ uares 05 7 05 e Ratio F T	Mea 6.73 1.20	6 an Squ 34E-05 99E-07	are	Test Stat 2.14  DF 1 8 9  Test Stat 4.79 0.868	Critical 2.29  F Stat 557  Critical 23.2 0.741	P-Value 0.1241  P-Value <1.0E-05  P-Value 0.1583 0.0948	Decision  Significan  Decision  Equal Va  Normal D	n(α:5%) ers Detected n(α:5%) nt Effect n(α:1%) ariances Distribution		
Reference Sec  Auxiliary Test Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assur Attribute Variance Distribution endosulfan I S Sample	ts Test Grubbs Sum Sc 6.734E- 9.67E-0 6.831E- mptions Tests Variance Shapiro- Summary Code	Extreme \  juares 05 7 05 e Ratio F T -Wilk W No	Mea 6.73 1.20  Test  Mea	6 an Squ 34E-05 99E-07	1.86  are  95% LCL	Test Stat 2.14  DF 1 8 9  Test Stat 4.79 0.868	Critical 2.29  F Stat 557  Critical 23.2 0.741  Median	P-Value 0.1241  P-Value <1.0E-05  P-Value 0.1583 0.0948  Min	Decision No Outlie  Decision Significan  Decision Equal Va Normal D	n(α:5%) ers Detected n(α:5%) nt Effect n(α:1%) eriances Distribution	CV%	%Effect
Auxiliary Test Auxiliary Test Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assur Attribute Variance Distribution endosulfan I s Sample IOSN 2019	ts Test Grubbs Sum Sc 6.734E- 9.67E-0 6.831E- mptions Tests Variance Shapiro-	Extreme \  uares  05  7  05  e Ratio F T  Wilk W No  Count  5	Mea 6.73 1.20 est primality T	6 an Squ 34E-05 09E-07	1.86  are  95% LCL 0.0157	Test Stat 2.14  DF 1 8 9  Test Stat 4.79 0.868  95% UCL 0.0169	Critical 2.29  F Stat 557  Critical 23.2 0.741  Median 0.016	P-Value 0.1241  P-Value <1.0E-05  P-Value 0.1583 0.0948  Min 0.016	Decision No Outlie  Decision Significan  Decision Equal Va Normal D  Max 0.017	n(α:5%) ers Detected n(α:5%) nt Effect n(α:1%) rriances Distribution  Std Err 0.0002	2.74%	0.00%
Auxiliary Test Auxiliary Test Attribute Outlier ANOVA Table Source Between Error Total ANOVA Assur Attribute Variance Distribution endosulfan I S	ts Test Grubbs Sum Sc 6.734E- 9.67E-0 6.831E- mptions Tests Variance Shapiro- Summary Code	Extreme \  juares 05 7 05 e Ratio F T -Wilk W No	Mea 6.73 1.20  Test  Mea	6 an Squ 34E-05 09E-07	1.86  are  95% LCL	Test Stat 2.14  DF 1 8 9  Test Stat 4.79 0.868	Critical 2.29  F Stat 557  Critical 23.2 0.741  Median	P-Value 0.1241  P-Value <1.0E-05  P-Value 0.1583 0.0948  Min	Decision No Outlie  Decision Significan  Decision Equal Va Normal D	n(α:5%) ers Detected n(α:5%) nt Effect n(α:1%) eriances Distribution	2.74%	
Auxiliary Test Auxiliary Test Attribute Outlier ANOVA Table Source Between Error Total ANOVA Assur Attribute Variance Distribution endosulfan I S Sample IOSN 2019	ts Test Grubbs Sum Sc 6.734E- 9.67E-0 6.831E- mptions Tests Variance Shapiro Summary Code RS	Extreme \  uares  05  7  05  e Ratio F T  Wilk W No  Count  5	Mea 6.73 1.20 est primality T	6 an Squ 34E-05 09E-07	1.86  are  95% LCL 0.0157	Test Stat 2.14  DF 1 8 9  Test Stat 4.79 0.868  95% UCL 0.0169	Critical 2.29  F Stat 557  Critical 23.2 0.741  Median 0.016	P-Value 0.1241  P-Value <1.0E-05  P-Value 0.1583 0.0948  Min 0.016	Decision No Outlie  Decision Significan  Decision Equal Va Normal D  Max 0.017	n(α:5%) ers Detected n(α:5%) nt Effect n(α:1%) rriances Distribution  Std Err 0.0002	2.74%	0.00%
Auxiliary Test Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assur Attribute Variance Distribution endosulfan I Sample IOSN 2019 AT3-098 endosulfan I Sample	ts Test Grubbs Sum Sc 6.734E- 9.67E-0 6.831E- mptions Tests Variance Shapiro- Summary Code RS  Detail Code	Extreme \ Juares 05 7 05 e Ratio F T -Wilk W No Count 5 5	Mea 6.73 1.20 Sest ormality T Mea 0.01 0.01	6 an Squ 34E-05 39E-07 est an 163 111	95% LCL 0.0157 0.0109	Test Stat 2.14  DF 1 8 9  Test Stat 4.79 0.868  95% UCL 0.0169	Critical 2.29  F Stat 557  Critical 23.2 0.741  Median 0.016	P-Value 0.1241  P-Value <1.0E-05  P-Value 0.1583 0.0948  Min 0.016	Decision No Outlie  Decision Significan  Decision Equal Va Normal D  Max 0.017	n(α:5%) ers Detected n(α:5%) nt Effect n(α:1%) rriances Distribution  Std Err 0.0002	2.74%	0.00%
Auxiliary Test Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assur Attribute Variance Distribution endosulfan I S Sample IOSN 2019 AT3-098 endosulfan I	ts Test Grubbs Sum Sc 6.734E- 9.67E-0 6.831E- mptions Tests Variance Shapiro- Summary Code RS	Extreme \ Juares 05 7 05 e Ratio F T Wilk W No Count 5 5	Mea 6.73 1.20 est ormality T	6 an Squ 34E-05 39E-07 est an 163 111	95% LCL 0.0157 0.0109	Test Stat 2.14  DF 1 8 9  Test Stat 4.79 0.868  95% UCL 0.0169 0.0114	Critical 2.29  F Stat 557  Critical 23.2 0.741  Median 0.016 0.0112	P-Value 0.1241  P-Value <1.0E-05  P-Value 0.1583 0.0948  Min 0.016	Decision No Outlie  Decision Significan  Decision Equal Va Normal D  Max 0.017	n(α:5%) ers Detected n(α:5%) nt Effect n(α:1%) rriances Distribution  Std Err 0.0002	2.74%	0.00%

**Report Date:** 19 Aug-23 06:51 (p 9 of 19) **Test Code/ID:** TN-23-303MnPest / 17-4167-8246

		-								Т	est Co	de/ID:	TN-23-303N	/InPest / 1	7-4167-8246
Bioaccumula	tion Ev	aluation - F	Pestici	des	- Macc	ma								EA-ES	Γ, Inc. PBC
Analysis ID: Analyzed: Edit Date:	19 Auզ	61-3119 g-23 6:50 y-23 22:45		Anal	ysis:	Parar	sulfan II netric-Two 2A5DA7BE	Sample EE8060169	4F53081	195EDA		S Version: Is Level: or ID:	: CETISv2. 1	1.1	
Batch ID: Start Date: Ending Date: Test Length:	29 Mar 26 Apr		F	Prot	ocol: cies:	US A	CE NED F ma nasuta	n - Pesticido RIM (2004) a	es		Analy Dilue Brine Sour	nt: Not	ncy Roka Applicable Applicable O - Aquatic R	esearch C	r <b>Age</b> :
Sample Code		Sample ID		Sam	ple Dat	te	Receipt	Date	Sample	Age	Clien	t Name	Pro	ject	
IOSN 2019 AT3-098		13-4648-817 07-1559-497			ar-23 eb-23 1	3:00	08 Mar- 09 Feb-		21d 14l 49d 1h	า	Eco-A	Analysts, Ir	nc. Dre	edged Sed	iment Evalu
Sample Code		Material Ty	pe			Samı	ole Source	•		Station	Locatio	on	Lat/Long		
IOSN 2019		Reference s		nt		Yach	tsman Mar	ina NAE-20	04-00	IOSN Re	ferenc	e	<u> </u>		
AT3-098	ľ	Marine Sedi	ment			Yach	tsman Mar	ina NAE-20	004-00	10 Static	ns at 4	Marinas N	<b>1</b> u		
Data Transfor	m	,	Alt Hy	/p					Comp	arison R	esult				PMSD
Untransformed	t		C < T						AT3-0	98 passe	d endo	sulfan ii en	dpoint		4.24%
Equal Variand		o-Sample 1 ample II	Гest	df	Test S	Stat	Critical	MSD	Р-Тур	e P-V	'alue	Decision	(α:5%)		
Reference Sec		.T3-098		8	-13.9		1.86	0.000356	CDF	1.00	000	Non-Sign	ificant Effect		
Auxiliary Test Attribute Outlier		<b>Test</b> Grubbs Ext	reme \	√alu	e Test			Test Stat	Critica 2.29	al P-V	<b>'alue</b> 467	<b>Decision</b> No Outlie	ı(α:5%) ers Detected		
ANOVA Table															
Source		Sum Squar	es		Mean	Squa	re	DF	F Stat	P-V	alue	Decision	(α:5%)		
Between Error Total	7	1.782E-05 7.33E-07 1.856E-05			1.782I 9.162I			1 8 9	195 _	<1.0	0E-05	Significar	nt Effect		
ANOVA Assu	mption	s Tests													
Attribute		Test						Test Stat	Critica	al P-V	'alue	Decision	(α:1%)		
Variance	\	√ariance Ra			lity To			21.2 0.895	23.2	0.0	118	Equal Va	· ,		
Distribution	•	Shapiro-Will	K VV INC	OHHE	anty res	51		0.090	0.741	0.19	930	Normal D	ristribution		
endosulfan II		•													
Sample			Count		Mean		95% LCL	95% UCL	Media			Max	Std Err	CV%	%Effect
IOSN 2019	F		5		0.0084		0.00788	0.00892	0.0085			0.009	0.000187	4.98%	0.00%
AT3-098			5		0.0057	/3	0.00562	0.00584	0.0057	75 0.00	J56 	0.00585	0.0000406	1.59%	31.79%
endosulfan II															
Sample			Rep 1		Rep 2		Rep 3	Rep 4	Rep 5						
IOSN 2019	F		0.0085		0.008		0.008	0.009	0.008						
AT3-098			0.0056	6	0.0057	75	0.00575	0.0057	0.0058	35					

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Test Code/ID: TN-23-303MnPest / 17-4167-8246

							Test Co	acrib.			7-4167-824
Bioaccumulat	ion Evaluation	- Pesticide	s - Macoma	1						EA-ES	T, Inc. PBC
Analyzed:	12-3923-0051 19 Aug-23 6:50 08 May-23 22:4	Ana	•	drin rametric-Two 88CC605516		8D8338BEB	Statu	S Version: is Level: or ID:	CETISv2.	.1.1	
	16-7638-7277 29 Mar-23 13:49 26 Apr-23 12:49 27d 23h	9 <b>Pro</b> 9 <b>Spe</b>	otocol: US ecies: Ma	paccumulatio S ACE NED F acoma nasuta valvia	RIM (2004)	es	Analy Dilue Brine Sour	ent: Not e: Not	ncy Roka Applicable Applicable O - Aquatic F	Research (	Or <b>Age:</b>
Sample Code	Sample II	D Sar	nple Date	Receipt	t Date	Sample Age	Clien	t Name	Pr	oject	
IOSN 2019 AT3-098	13-4648-8 07-1559-4		Mar-23 Feb-23 13:0	08 Mar- 0 09 Feb-		21d 14h 49d 1h	Eco-/	Analysts, In	ic. Dr	edged Sed	liment Eval
Sample Code	Material <sup>-</sup>	Туре	Sa	mple Sourc	e	Stat	ion Location	on	Lat/Long		
IOSN 2019		e sediment		chtsman Ma		04-00 IOS	N Referenc	e	<u>v</u>		
AT3-098	Marine Se	ediment	Ya	ichtsman Ma	rina NAE-20	004-00 10 5	Stations at 4	Marinas M	<b>1</b> u		
Data Transfori	m	Alt Hyp				Comparis	on Result				PMSD
Untransformed		C < T				AT3-098 p	assed endri	n endpoint			2.53%
	vs Sample II	df	Test Stat	Critical	MSD	P-Type	P-Value	Decision	(α:5%)		
Reference Sed  Auxiliary Tests		8	-23.3	1.86	0.000245	CDF	1.0000	Non-Sign	ificant Effect		
		8	-23.3	1.86	0.000245  Test Stat	Critical	1.0000 P-Value	Non-Sign  Decision			
Auxiliary Tests	s Test	8 Extreme Val		1.86				Decision			
Auxiliary Tests Attribute	s Test Grubbs E			1.86	Test Stat	Critical	P-Value	Decision	(α:5%)		
Auxiliary Tests Attribute Outlier	s Test Grubbs E	Extreme Val			Test Stat	Critical	P-Value	Decision	(α:5%) rs Detected		
Auxiliary Tests Attribute Outlier ANOVA Table Source Between	Sum Squ	Extreme Valuares	ue Test  Mean Sq 2.372E-0	uare 5	<b>Test Stat</b> 1.53 <b>DF</b> 1	Critical 2.29	<b>P-Value</b> 1.0000	<b>Decision</b> No Outlie	(α:5%) rs Detected (α:5%)		
Auxiliary Tests Attribute Outlier ANOVA Table Source Between Error	Sum Squ 2.372E-09 3.48E-07	Extreme Val	ue Test <b>Mean S</b> q	uare 5	Test Stat 1.53  DF 1 8	Critical 2.29	P-Value 1.0000	Decision No Outlie	(α:5%) rs Detected (α:5%)		
Auxiliary Tests Attribute Outlier  ANOVA Table Source Between Error Total	Sum Squ 2.372E-09 3.48E-07 2.406E-09	Extreme Val	ue Test  Mean Sq 2.372E-0	uare 5	<b>Test Stat</b> 1.53 <b>DF</b> 1	Critical 2.29	P-Value 1.0000	Decision No Outlie	(α:5%) rs Detected (α:5%)		
Auxiliary Tests Attribute Outlier ANOVA Table Source Between Error Total ANOVA Assun	Sum Squ 2.372E-09 3.48E-07 2.406E-09	Extreme Val	ue Test  Mean Sq 2.372E-0	uare 5	Test Stat 1.53 DF 1 8 9	Critical 2.29  F Stat 545	P-Value 1.0000 P-Value <1.0E-05	Decision No Outlie	(α:5%) rs Detected (α:5%)		
Auxiliary Tests Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assun Attribute	Sum Squ 2.372E-09 3.48E-07 2.406E-09 mptions Tests Test	Extreme Val	ue Test  Mean Sq 2.372E-0 4.35E-08	uare 5	Test Stat 1.53  DF 1 8 9  Test Stat	Critical 2.29  F Stat 545  Critical	P-Value 1.0000  P-Value <1.0E-05	Decision  Decision  Significan	(α:5%) rs Detected  (α:5%) nt Effect  (α:1%)		
Auxiliary Tests Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assun Attribute Variance	Sum Squ 2.372E-09 3.48E-07 2.406E-09 mptions Tests Test Variance	Extreme Valuares 5 Ratio F Tes	ue Test  Mean Sq 2.372E-0 4.35E-08	uare 5	Test Stat 1.53 DF 1 8 9 Test Stat 6.25	Critical 2.29  F Stat 545  Critical 23.2	P-Value 1.0000  P-Value <1.0E-05  P-Value 0.1037	Decision Significar  Decision Equal Val	(α:5%) rs Detected  (α:5%) nt Effect  (α:1%) riances		
Auxiliary Tests Attribute Outlier ANOVA Table Source Between Error Total ANOVA Assun Attribute Variance Distribution	S Test Grubbs E Sum Squ 2.372E-09 3.48E-07 2.406E-09 mptions Tests Test Variance Shapiro-V	Extreme Val	ue Test  Mean Sq 2.372E-0 4.35E-08	uare 5	Test Stat 1.53  DF 1 8 9  Test Stat	Critical 2.29  F Stat 545  Critical	P-Value 1.0000  P-Value <1.0E-05	Decision Significar  Decision Equal Val	(α:5%) rs Detected  (α:5%) nt Effect  (α:1%)		
Auxiliary Tests Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assun Attribute Variance Distribution endrin Summa	SUM Squ 2.372E-09 3.48E-07 2.406E-09 mptions Tests Test Variance Shapiro-V	Extreme Val	we Test  Mean Sq 2.372E-0 4.35E-08	uare 5	Test Stat 1.53  DF 1 8 9  Test Stat 6.25 0.865	Critical 2.29  F Stat 545  Critical 23.2 0.741	P-Value 1.0000  P-Value <1.0E-05  P-Value 0.1037 0.0873	Decision  Significar  Decision  Equal Van Normal D	(α:5%) rs Detected  (α:5%) nt Effect  (α:1%) riances istribution		
Auxiliary Tests Attribute Outlier ANOVA Table Source Between Error Total ANOVA Assun Attribute Variance Distribution endrin Summa	S Test Grubbs E Sum Squ 2.372E-09 3.48E-07 2.406E-09 mptions Tests Test Variance Shapiro-V ary Code	Extreme Valuares 5 Ratio F Tes Vilk W Norm	ue Test  Mean Sq 2.372E-0 4.35E-08	<b>uare</b> 5 95% LCL	Test Stat 1.53  DF 1 8 9  Test Stat 6.25 0.865	Critical 2.29  F Stat 545  Critical 23.2 0.741  Median	P-Value 1.0000 P-Value <1.0E-05  P-Value 0.1037 0.0873  Min	Decision No Outlie  Decision Significar  Decision Equal Van Normal D	(α:5%) rs Detected  (α:5%) ht Effect  (α:1%) riances istribution	CV%	
Auxiliary Tests Attribute Outlier ANOVA Table Source Between Error Total ANOVA Assun Attribute Variance Distribution endrin Summa Sample IOSN 2019	SUM Squ 2.372E-09 3.48E-07 2.406E-09 mptions Tests Test Variance Shapiro-V	Extreme Valuares 5 Ratio F Tes Vilk W Norm  Count 5	Mean Sq 2.372E-0 4.35E-08 t tality Test Mean 0.0097	<b>95% LCL</b> 0.00936	Test Stat 1.53  DF 1 8 9  Test Stat 6.25 0.865  95% UCL 0.01	Critical 2.29  F Stat 545  Critical 23.2 0.741  Median 0.0095	P-Value 1.0000  P-Value <1.0E-05  P-Value 0.1037 0.0873  Min 0.0095	Decision No Outlie  Decision Significan  Decision Equal Van Normal D  Max 0.01	(α:5%) rs Detected  (α:5%) ht Effect  (α:1%) riances istribution  Std Err  0.000122	<b>CV%</b> 2.82%	0.00%
Auxiliary Tests Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assun Attribute Variance Distribution endrin Summa Sample IOSN 2019	S Test Grubbs E Sum Squ 2.372E-09 3.48E-07 2.406E-09 mptions Tests Test Variance Shapiro-V ary Code	Extreme Valuares 5 Ratio F Tes Vilk W Norm	ue Test  Mean Sq 2.372E-0 4.35E-08	<b>uare</b> 5 95% LCL	Test Stat 1.53  DF 1 8 9  Test Stat 6.25 0.865	Critical 2.29  F Stat 545  Critical 23.2 0.741  Median	P-Value 1.0000 P-Value <1.0E-05  P-Value 0.1037 0.0873  Min	Decision No Outlie  Decision Significar  Decision Equal Van Normal D	(α:5%) rs Detected  (α:5%) ht Effect  (α:1%) riances istribution	CV%	
Auxiliary Tests Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assun Attribute Variance Distribution endrin Summa Sample IOSN 2019 AT3-098 endrin Detail	S Test Grubbs E Sum Squ 2.372E-09 3.48E-07 2.406E-09 mptions Tests Test Variance Shapiro-V ary Code RS	Extreme Valuares 5 Ratio F Tes Vilk W Norm  Count 5	we Test  Mean Sq 2.372E-0 4.35E-08  t nality Test  Mean 0.0097 0.00662	<b>95% LCL</b> 0.00936 0.00648	Test Stat 1.53  DF 1 8 9  Test Stat 6.25 0.865  95% UCL 0.01	Critical 2.29  F Stat 545  Critical 23.2 0.741  Median 0.0095 0.00665	P-Value 1.0000  P-Value <1.0E-05  P-Value 0.1037 0.0873  Min 0.0095	Decision No Outlie  Decision Significan  Decision Equal Van Normal D  Max 0.01	(α:5%) rs Detected  (α:5%) ht Effect  (α:1%) riances istribution  Std Err  0.000122	<b>CV%</b> 2.82%	0.00%
Auxiliary Tests Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assun Attribute Variance Distribution endrin Summa Sample IOSN 2019 AT3-098 endrin Detail Sample	S Test Grubbs E Sum Squ 2.372E-09 3.48E-07 2.406E-09 mptions Tests Variance Shapiro-V ary Code RS Code	Extreme Valuares 5 Ratio F Tes Vilk W Norm  Count 5 5	we Test  Mean Sq 2.372E-0 4.35E-08  t mality Test  Mean 0.0097 0.00662  Rep 2	95% LCL 0.00936 0.00648	Test Stat 1.53  DF 1 8 9  Test Stat 6.25 0.865  95% UCL 0.01 0.00676	Critical 2.29  F Stat 545  Critical 23.2 0.741  Median 0.0095 0.00665	P-Value 1.0000  P-Value <1.0E-05  P-Value 0.1037 0.0873  Min 0.0095	Decision No Outlie  Decision Significan  Decision Equal Van Normal D  Max 0.01	(α:5%) rs Detected  (α:5%) ht Effect  (α:1%) riances istribution  Std Err  0.000122	<b>CV%</b> 2.82%	
Auxiliary Tests Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assun Attribute Variance Distribution endrin Summa Sample IOSN 2019 AT3-098 endrin Detail	S Test Grubbs E Sum Squ 2.372E-09 3.48E-07 2.406E-09 mptions Tests Test Variance Shapiro-V ary Code RS	Extreme Valuares 5 Ratio F Tes Vilk W Norm  Count 5 5	we Test  Mean Sq 2.372E-0 4.35E-08  t nality Test  Mean 0.0097 0.00662	<b>95% LCL</b> 0.00936 0.00648	Test Stat 1.53  DF 1 8 9  Test Stat 6.25 0.865  95% UCL 0.01 0.00676	Critical 2.29  F Stat 545  Critical 23.2 0.741  Median 0.0095 0.00665	P-Value 1.0000  P-Value <1.0E-05  P-Value 0.1037 0.0873  Min 0.0095	Decision No Outlie  Decision Significan  Decision Equal Van Normal D  Max 0.01	(α:5%) rs Detected  (α:5%) ht Effect  (α:1%) riances istribution  Std Err  0.000122	<b>CV%</b> 2.82%	0.00%

IOSN 2019

AT3-098

RS

0.0265

0.0178

0.027

0.0183

0.026

0.0184

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Bioaccumulat	tion Evaluation	- Pesticide	s - Macom	ıa						EA-ES	T, Inc. PBC
Analysis ID: Analyzed: Edit Date:	06-4834-6007 19 Aug-23 6:50 08 May-23 22:4	Ana	alysis: P	amma-BHC (I arametric-Two 52F1413F8BB	o Sample	0951D723E	Stat	IS Version us Level: or ID:	: CETISv2 1	.1.1	
Batch ID: Start Date: Ending Date: Test Length:	16-7638-7277 29 Mar-23 13:49 26 Apr-23 12:49 27d 23h	Pro Spo	otocol: U ecies: M	ioaccumulatio S ACE NED I lacoma nasut ivalvia	RIM (2004)	les	Ana Dilu Brin Sou	ent: No	ncy Roka t Applicable t Applicable tO - Aquatic F	Research (	Or <b>Age:</b>
Sample Code	Sample II	) Sar	nple Date	Receip	t Date	Sample Ag	ae Clie	nt Name	Pr	oject	
IOSN 2019 AT3-098	13-4648-8 07-1559-4	170 08	Mar-23 Feb-23 13:	08 Mar		21d 14h 49d 1h		Analysts, I		•	diment Evalu
Sample Code	Material T	уре	s	ample Sourc	e	St	ation Locat	ion	Lat/Long		
IOSN 2019 AT3-098	Reference Marine Se	sediment diment		achtsman Ma achtsman Ma			SN Referend Stations at		Мu		
Data Transfor	m	Alt Hyp				Compari	son Result				PMSD
Untransformed	I	C < T				AT3-098	passed gam	ıma-bhc (lir	ndane) endpo	int	2.76%
-	ce t Two-Sample										
•	vs Sample II	d		t Critical	MSD	P-Type	P-Value	Decision	, ,		
Reference Sec	d AT3-098	8	-21.3	1.86	0.000738	CDF	1.0000	Non-Sigr	nificant Effect		
Auxiliary Test	s										
Attribute	Test					Critical	P-Value	Decision	<u> </u>		
Outlier	Grubbs E	xtreme Val	ue l'est		2.2	2.29	0.0891	No Outlie	ers Detected		
ANOVA Table			M 0		<b>D</b> E	E 04-4	D. Valer		( <b>=</b> 0()		
Source Between	0.0001781		Mean S 0.00017	-	<b>DF</b>	<b>F Stat</b> 452	<b>P-Value</b> <1.0E-05	Decision Significa	<u> </u>		
Error	3.152E-06		3.94E-0		8	402	11.0L-00	Olgrinica	iii Liicot		
Total	0.0001812	2			9						
ANOVA Assur	mptions Tests										
Attribute	Test				Test Stat	Critical	P-Value	Decision	n(α:1%)		
Variance	Variance F	Ratio F Tes	t		7.95	23.2	0.0693	Equal Va	riances		
Distribution	Shapiro-W	/ilk W Norn	nality Test		0.915	0.741	0.3168	Normal [	Distribution		
gamma-BHC	(Lindane) Summ	nary									
Sample	Code	Count	Mean	95% LCL	95% UCL	. Median	Min	Max	Std Err	CV%	%Effect
IOSN 2019	RS	5	0.0267	0.0257	0.0277	0.0265	0.026	0.028	0.000374	3.13%	2.60%
AT3-098		5	0.0183	0.0179	0.0186	0.0183	0.0178	0.0186	0.000133	1.62%	1.79%
gamma-BHC	(Lindane) Detail										
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
		_			_	_	_	_		_	

0.028

0.0182

0.026

0.0186

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Test Code/ID: TN-23-303MnPest / 17-4167-8246

Bioaccumulat	ion Evaluation	- Pesticid	es - Maco	ma						EA-ES	T, Inc. PBC
Analyzed:	00-5738-4808 19 Aug-23 6:50 08 May-23 22:4	) An	alysis:	gamma-chlorda Parametric-Two EB91F29CD13	o Sample	ED1666723	Statu	S Version is Level: or ID:	: CETISv2. 1	1.1	
Batch ID: Start Date: Ending Date: Test Length:	•	9 <b>Pr</b> 9 <b>S</b> p	otocol: ecies:	Bioaccumulatio US ACE NED I Macoma nasut Bivalvia	RIM (2004)	es	Analy Dilue Brine Sour	ent: No	ncy Roka t Applicable t Applicable O - Aquatic R	lesearch (	Or <b>Age:</b>
Sample Code	Sample I	D Sa	mple Date	e Receip	t Date	Sample Ag	e Clien	t Name	Pro	oject	
IOSN 2019 AT3-098	13-4648- 07-1559-	8170 08	Mar-23 Feb-23 13	08 Mar-	-23	21d 14h 49d 1h		Analysts, Ir		•	liment Evalu
Sample Code	Material	Туре	;	Sample Sourc	е	Sta	ation Location	on	Lat/Long		
IOSN 2019	Referenc	e sediment	,	Yachtsman Ma	rina NAE-20	04-00 108	SN Referenc	е			
AT3-098	Marine S	ediment	,	Yachtsman Ma	rina NAE-20	004-00 10	Stations at 4	Marinas N	Лu		
Data Transfori	m	Alt Hyp				Comparis	son Result				PMSD
Untransformed		C < T				AT3-098	oassed gamr	ma-chlorda	ne endpoint		2.50%
	e t Two-Sampl /s Sample II		If Test S	tat Critical	MSD	P-Type	P-Value	Decision	η(α:5%)		
Reference Sed	-	8		1.86	0.000449	CDF	1.0000	Non-Sign	ificant Effect		
Reference Sed	AT3-098				0.000449	CDF	1.0000	Non-Sign	ificant Effect		
•	AT3-098				0.000449  Test Stat		1.0000 P-Value	Non-Sign  Decision			
Reference Sed  Auxiliary Tests	AT3-098 s Test		-23.8					Decision			
Reference Sed  Auxiliary Tests  Attribute	AT3-098 s Test	8	-23.8		Test Stat	Critical	P-Value	Decision	n(α:5%)		
Reference Sed  Auxiliary Tests  Attribute  Outlier	AT3-098 s Test	8 Extreme V <i>a</i>	-23.8		Test Stat	Critical	P-Value	Decision	a(α:5%) ers Detected		
Auxiliary Tests Attribute Outlier ANOVA Table	AT3-098 s Test Grubbs	Extreme V <i>a</i>	-23.8	1.86 Square	Test Stat 1.39	Critical 2.29	<b>P-Value</b> 1.0000	<b>Decision</b> No Outlie	a(α:5%) ers Detected a(α:5%)		
Auxiliary Tests Attribute Outlier ANOVA Table Source Between Error	AT3-098  Test  Grubbs  Sum Squ  8.237E-0 1.167E-0	Extreme V <i>a</i> Jares  5  6	-23.8 Ilue Test	1.86 Square :-05	Test Stat 1.39  DF 1 8	Critical 2.29	P-Value 1.0000 P-Value	Decision No Outlie	a(α:5%) ers Detected a(α:5%)		
Auxiliary Tests Attribute Outlier ANOVA Table Source Between Error Total	AT3-098  Test  Grubbs  Sum Squ  8.237E-0  1.167E-0  8.354E-0	Extreme V <i>a</i> Jares  5  6	Mean \$ 8.237E	1.86 Square :-05	<b>Test Stat</b> 1.39 <b>DF</b> 1	Critical 2.29	P-Value 1.0000 P-Value	Decision No Outlie	a(α:5%) ers Detected a(α:5%)		
Auxiliary Tests Attribute Outlier ANOVA Table Source Between Error Total ANOVA Assum	AT3-098  S  Test  Grubbs  Sum Squ  8.237E-0  1.167E-0  8.354E-0  nptions Tests	Extreme V <i>a</i> Jares  5  6	Mean \$ 8.237E	1.86 Square :-05	Test Stat 1.39  DF 1 8 9	Critical 2.29  F Stat 565	P-Value 1.0000 P-Value <1.0E-05	Decision No Outlie  Decision Significan	n(α:5%) ers Detected n(α:5%) nt Effect		
Auxiliary Tests Attribute Outlier ANOVA Table Source Between Error Total ANOVA Assun Attribute	AT3-098  Test  Grubbs  Sum Squ  8.237E-0  1.167E-0  8.354E-0  nptions Tests  Test	Extreme Value valu	Mean \$ 8.237E 1.459E	1.86 Square :-05	Test Stat 1.39  DF 1 8 9  Test Stat	Critical 2.29  F Stat 565  Critical	P-Value 1.0000  P-Value <1.0E-05	Decision  No Outlie  Decision  Significan	ers Detected  ers Detected  e(α:5%)  nt Effect  ers (α:1%)		
Auxiliary Tests Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assun Attribute Variance	AT3-098  Test Grubbs  Sum Squ 8.237E-0 1.167E-0 8.354E-0  Inptions Tests Test Variance	Extreme Values  Jares  5  6  5  Ratio F Te	Mean \$ 8.237E 1.459E	1.86  Square :-05 :-07	Test Stat 1.39  DF 1 8 9  Test Stat 5.99	Critical 2.29  F Stat 565  Critical 23.2	P-Value 1.0000  P-Value <1.0E-05  P-Value 0.1111	Decision Significan  Decision Equal Va	n(α:5%) ers Detected n(α:5%) ent Effect n(α:1%) riances		
Auxiliary Tests Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assun Attribute Variance Distribution	Sum Squ 8.237E-0 1.167E-0 8.354E-0 nptions Tests Test Variance Shapiro-\	Extreme Value  Jares  5  6  5  Ratio F Tei  Wilk W Nori	Mean \$ 8.237E 1.459E	1.86  Square :-05 :-07	Test Stat 1.39  DF 1 8 9  Test Stat	Critical 2.29  F Stat 565  Critical	P-Value 1.0000  P-Value <1.0E-05	Decision Significan  Decision Equal Va	ers Detected  ers Detected  e(α:5%)  nt Effect  ers (α:1%)		
Auxiliary Tests Attribute Outlier ANOVA Table Source Between Error Total ANOVA Assur Attribute Variance Distribution gamma-chlore	Sum Squ 8.237E-0 1.167E-0 8.354E-0 nptions Tests Test Variance Shapiro-V	Extreme Values  Jares  5  6  5  Ratio F Tellority	Mean \$ 8.237E 1.459E	1.86  Square :-05 :-07	Test Stat 1.39  DF 1 8 9  Test Stat 5.99 0.928	Critical 2.29  F Stat 565  Critical 23.2 0.741	P-Value 1.0000  P-Value <1.0E-05  P-Value 0.1111 0.4274	Decision Significan  Decision Equal Va Normal D	a(α:5%) ers Detected a(α:5%) nt Effect a(α:1%) riances distribution	CV%	%Effect
Reference Sed  Auxiliary Tests Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assure Attribute Variance Distribution  gamma-chlore Sample	AT3-098  S Test Grubbs  Sum Squ 8.237E-0 1.167E-0 8.354E-0  Inptions Tests Test Variance Shapiro-V  Code	Extreme Valuares 5 6 5 Ratio F Ter	Mean \$ 8.237E 1.459E	1.86  Square :-05 :-07	Test Stat 1.39  DF 1 8 9  Test Stat 5.99 0.928	Critical 2.29  F Stat 565  Critical 23.2 0.741  Median	P-Value 1.0000  P-Value <1.0E-05  P-Value 0.1111 0.4274  Min	Decision Significan  Decision Equal Va Normal D	ers Detected  e(α:5%)  ers Detected  e(α:5%)  nt Effect  e(α:1%)  riances  Distribution  Std Err	CV% 2.78%	%Effect 1.77%
Auxiliary Tests Attribute Outlier ANOVA Table Source Between Error Total ANOVA Assur Attribute Variance Distribution gamma-chlore	Sum Squ 8.237E-0 1.167E-0 8.354E-0 nptions Tests Test Variance Shapiro-V	Extreme Values  Jares  5  6  5  Ratio F Tellority	Mean \$ 8.237E 1.459E	1.86  Square 6-05 6-07  t  95% LCL 0.0174	Test Stat 1.39  DF 1 8 9  Test Stat 5.99 0.928	Critical 2.29  F Stat 565  Critical 23.2 0.741	P-Value 1.0000  P-Value <1.0E-05  P-Value 0.1111 0.4274	Decision Significan  Decision Equal Va Normal D	a(α:5%) ers Detected a(α:5%) nt Effect a(α:1%) riances distribution	2.78%	%Effect 1.77% 1.21%
Auxiliary Tests Attribute Outlier ANOVA Table Source Between Error Total  ANOVA Assun Attribute Variance Distribution gamma-chloro Sample IOSN 2019 AT3-098	Sum Squ 8.237E-0 1.167E-0 8.354E-0 nptions Tests Variance Shapiro-V dane Summary Code RS	Extreme Valuares 5 6 5 Ratio F Ter Vilk W Norr	Mean \$ 8.237E 1.459E  st mality Test	1.86  Square 6-05 6-07  t  95% LCL 0.0174	Test Stat 1.39  DF 1 8 9  Test Stat 5.99 0.928  95% UCL 0.0186	Critical 2.29  F Stat 565  Critical 23.2 0.741  Median 0.018	P-Value 1.0000  P-Value <1.0E-05  P-Value 0.1111 0.4274  Min 0.0175	Decision Significan  Decision Equal Va Normal D  Max 0.0185	a(α:5%) ers Detected a(α:5%) Int Effect a(α:1%) riances Distribution  Std Err 0.000224	2.78%	1.77%
Auxiliary Tests Attribute Outlier ANOVA Table Source Between Error Total ANOVA Assun Attribute Variance Distribution gamma-chloro Sample IOSN 2019	Sum Squ 8.237E-0 1.167E-0 8.354E-0 nptions Tests Variance Shapiro-V dane Summary Code RS	Extreme Valuares 5 6 5 Ratio F Ter Vilk W Norr	Mean \$ 8.237E 1.459E st mality Test	1.86  Square  -05 -07  t  95% LCL  0.0174  0.012	Test Stat 1.39  DF 1 8 9  Test Stat 5.99 0.928  95% UCL 0.0186	Critical 2.29  F Stat 565  Critical 23.2 0.741  Median 0.018	P-Value 1.0000  P-Value <1.0E-05  P-Value 0.1111 0.4274  Min 0.0175	Decision Significan  Decision Equal Va Normal D  Max 0.0185	a(α:5%) ers Detected a(α:5%) Int Effect a(α:1%) riances Distribution  Std Err 0.000224	2.78%	1.77%
Auxiliary Tests Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assum Attribute Variance Distribution gamma-chloro Sample IOSN 2019 AT3-098 gamma-chloro gamma-chloro gamma-chloro gamma-chloro gamma-chloro	AT3-098  Test Grubbs  Sum Squ 8.237E-0 1.167E-0 8.354E-0  Inptions Tests Test Variance Shapiro-\ Idane Summary Code RS	Extreme Valuares 5 6 5 Ratio F Ter Wilk W Norr	Mean \$ 8.237E 1.459E  st mality Test	1.86  Square 3-05 3-07  t  95% LCL 0.0174 0.012  Rep 3	Test Stat 1.39  DF 1 8 9  Test Stat 5.99 0.928  95% UCL 0.0186 0.0125	Critical 2.29  F Stat 565  Critical 23.2 0.741  Median 0.018 0.0123	P-Value 1.0000  P-Value <1.0E-05  P-Value 0.1111 0.4274  Min 0.0175	Decision Significan  Decision Equal Va Normal D  Max 0.0185	a(α:5%) ers Detected a(α:5%) Int Effect a(α:1%) riances Distribution  Std Err 0.000224	2.78%	1.77%

AT3-098

0.0254

0.0261

0.0262

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Bioaccumulat	ion Evaluatio	n - Pesticide	s - Macoma	a						EA-ES	T, Inc. PB0
Analysis ID: Analyzed: Edit Date:	15-0976-0545 19 Aug-23 6:5 08 May-23 22	50 <b>An</b>	alysis: Pa	ptachlor epo arametric-Two A5EA41BA8	o Sample	B5F2F725E	Statu	S Version: us Level: or ID:	: CETISv2 1	.1.1	
Batch ID: Start Date: Ending Date: Test Length:	•	:49 <b>Pr</b> :49 <b>Sp</b>	otocol: US ecies: Ma	oaccumulations ACE NED For acoma nasutavalvia	RIM (2004)	es	Anal Dilue Brine Soul	ent: Not	ncy Roka t Applicable t Applicable O - Aquatic l	Research (	Or <b>Age:</b>
Sample Code IOSN 2019 AT3-098	<b>Sample</b> 13-4648 07-1559	3-8170 08	mple Date Mar-23 Feb-23 13:0	Receip 08 Mar- 00 09 Feb-	-23	<b>Sample A</b> ç 21d 14h 49d 1h		<b>nt Name</b> Analysts, Ir		roject redged Sed	liment Eval
Sample Code IOSN 2019 AT3-098		<b>II Type</b> nce sediment Sediment	Ya	ample Source achtsman Ma achtsman Ma	rina NAE-20	004-00 IO	ation Locati SN Reference Stations at	е	<b>Lat/Long</b> ⁄lu		
Data Transfor	m	Alt Hyp				Compari	son Result				PMSD
Untransformed		C < T				AT3-098	passed hept	achlor epox	ide endpoin	t	2.66%
Sample I Reference Sed Auxiliary Test Attribute	AT3-098	II d		t Critical 1.86	MSD 0.00101 Test Stat	P-Type CDF	P-Value 1.0000 P-Value	Decision Non-Sign Decision	ificant Effect	i .	
Outlier		s Extreme Va	lue Test		1.73	2.29	0.6316		ers Detected		
ANOVA Table Source Between	Sum S	_	<b>Mean Sq</b>	•	<b>DF</b>	F Stat	P-Value <1.0E-05	<b>Decision</b> Significar	• •		
Error Total	5.925E- 0.00037	-06	7.406E-0		8	_	11.02 00	- Olgriinodi	T Elicot		
ANOVA Assur Attribute	Test				Test Stat	Critical	P-Value	Decision	<u> </u>		
Variance Distribution	Shapiro	e Ratio F Tes -Wilk W Norr			7.17 0.957	23.2 0.741	0.0825 0.7545	Equal Va Normal D	riances Distribution		
heptachlor ep Sample	oxide Summa Code	ary Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
IOSN 2019 AT3-098	RS	5 5	0.0381 0.026	0.0367 0.0255	0.0395 0.0265	0.038 0.0261	0.037 0.0254	0.0395 0.0265	0.00051 0.00019	2.99% 1.64%	0.00% 31.76%
heptachlor ep	oxide Detail										
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
IOSN 2019	RS	0.038	0.039	0.037	0.0395	0.037					

0.0259

0.0265

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Bioaccumulation Evaluation - Pesticides - Macoma EA-EST, Inc. PBC

Analysis ID: 16-1399-3357 Endpoint: heptachlor CETIS Version: CETISv2.1.1

Analyzed: 19 Aug-23 6:50 Analysis: Parametric-Two Sample Status Level: 1

**Edit Date:** 08 May-23 22:45 **MD5 Hash:** 11143760E14E109A61EEF9D035EBD914 **Editor ID:** 

Batch ID:16-7638-7277Test Type:Bioaccumulation - PesticidesAnalyst:Nancy RokaStart Date:29 Mar-23 13:49Protocol:US ACE NED RIM (2004)Diluent:Not ApplicableEnding Date:26 Apr-23 12:49Species:Macoma nasutaBrine:Not Applicable

**Test Length:** 27d 23h **Taxon:** Bivalvia **Source:** ARO - Aquatic Research Or **Age:** 

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
IOSN 2019	13-4648-8170	08 Mar-23	08 Mar-23	21d 14h	Eco-Analysts, Inc.	Dredged Sediment Evalu
AT3-098	07-1559-4974	08 Feb-23 13:00	09 Feb-23 16:30	49d 1h		

Sample CodeMaterial TypeSample SourceStation LocationLat/LongIOSN 2019Reference sedimentYachtsman Marina NAE-2004-00IOSN ReferenceAT3-098Marine SedimentYachtsman Marina NAE-2004-0010 Stations at 4 Marinas Mu

<b>Data Transform</b>	Alt Hyp	Comparison Result	PMSD
Untransformed	C < T	AT3-098 passed heptachlor endpoint	3.08%

### Equal Variance t Two-Sample Test

Sample I vs	Sample II	df	Test Stat	Critical	MSD	P-Type	P-Value	Decision(α:5%)
Reference Sed	AT3-098	8	-19.3	1.86	0.000573	CDF	1.0000	Non-Significant Effect

#### **Auxiliary Tests**

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Outlier	Grubbs Extreme Value Test	1.96	2.29	0.2778	No Outliers Detected

#### ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	8.851E-05	8.851E-05	1	373	<1.0E-05	Significant Effect
Error	0.0000019	2.375E-07	8			
Total	9.041E-05		9			

#### **ANOVA Assumptions Tests**

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	8.5	23.2	0.0618	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.955	0.741	0.7224	Normal Distribution

#### heptachlor Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
IOSN 2019	RS	5	0.0186	0.0178	0.0194	0.0185	0.018	0.0195	0.000292	3.50%	0.00%
AT3-098		5	0.0126	0.0124	0.0129	0.0127	0.0123	0.0129	0.0001	1.77%	31.99%

#### heptachlor Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
IOSN 2019	RS	0.0185	0.019	0.018	0.0195	0.018
AT3-098		0.0123	0.0127	0.0128	0.0126	0.0129

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									est Co				
Bioaccumula	tion Eva	luation - Pest	ticides -	Масо	ma							EA-ES	ST, Inc. PBC
Analysis ID: Analyzed: Edit Date:	Ū	9-7799 -23 6:50 -23 22:45	Endpo Analy MD5 I	sis:		obenzene c-Two Sample FACB3A5649C	F9480030	0475F0		S Version s Level: r ID:	n: CETISv2 1	2.1.1	
Batch ID: Start Date: Ending Date: Test Length:	26 Apr-	23 13:49 23 12:49	Test T Proto Speci Taxon	col: es:		ulation - Pesticio ED RIM (2004) asuta	les		Analy Dilue Brine Source	nt: No	ancy Roka ot Applicable ot Applicable RO - Aquatic	Research	Or <b>Age:</b>
Sample Code	e S	ample ID	Samp	le Dat	e Re	ceipt Date	Sample	Age	Clien	t Name	P	roject	
IOSN 2019 AT3-098		3-4648-8170 7-1559-4974	08 Ma 08 Fel	r-23 b-23 1		Mar-23 Feb-23 16:30	21d 14h 49d 1h	1	Eco-A	nalysts,	Inc. D	redged Se	diment Evalu
Sample Code	e M	aterial Type			Sample S	ource		Station L	.ocatio	n	Lat/Long		
IOSN 2019		eference sedii			Yachtsma	n Marina NAE-2	004-00	IOSN Re	ference	Э			
AT3-098	M	arine Sedime	nt		Yachtsma	n Marina NAE-2	004-00	10 Statio	ns at 4	Marinas	Mu		
Data Transfor	rm	Alt	Нур				Compa	arison Re	esult				PMSD
Untransformed	d	C <	T				AT3-09	98 passed	d hexad	chlorober	zene endpoir	nt	2.71%
Equal Variand Sample I Reference Sed	vs Sa	-Sample Test imple II 73-098	df	Test S -21.7	Stat Critic	al MSD 0.0043	P-Type	9 <b>P-V</b> 3			n(α:5%) nificant Effec	t	
Auxiliary Test	ts.												
Attribute		Test				Test Stat	Critica	ıl P-Va	alue	Decisio	n(α:5%)		
o													
Outlier	(	Grubbs Extrem	ne Value	Test		1.91	2.29	0.33	10	No Outli	ers Detected		
Outlier  ANOVA Table		Grubbs Extrem	ne Value	Test		1.91	2.29	0.33	10	No Outl	ers Detected		
	)	Grubbs Extremus			Square	1.91 <b>DF</b>	2.29 <b>F Stat</b>		alue		ers Detected n(α:5%)		
ANOVA Table	s				•			P-Va		Decisio			
ANOVA Table Source Between Error	<b>S</b> 0.	um Squares 0063001 000107		Mean	3001	<b>DF</b> 1 8	F Stat	P-Va	alue	Decisio	n(α:5%)		
ANOVA Table Source Between Error Total	<b>S</b> 0.00	um Squares 0063001 000107 0064071		<b>Mean</b> 0.0063	3001	<b>DF</b>	F Stat	P-Va	alue	Decisio	n(α:5%)		
ANOVA Table Source Between Error Total ANOVA Assur	S 0 0 0	um Squares 0063001 000107 0064071 Tests		<b>Mean</b> 0.0063	3001	<b>DF</b> 1 8 9	<b>F Stat</b> 471	<b>P-V</b> a<1.0	alue 0E-05	<b>Decisio</b> Significa	n(α:5%) ant Effect		
ANOVA Table Source Between Error Total ANOVA Assur	9 S 0. 0. 0. mptions	um Squares 0063001 000107 0064071 Tests		<b>Mean</b> 0.0063	3001	DF 1 8 9	F Stat 471 —	P-V: <1.0	alue DE-05	Decision Signification	n(α:5%) ant Effect n(α:1%)		
ANOVA Table Source Between Error Total ANOVA Assur Attribute Variance	S 0 0 0 mptions	um Squares 0063001 000107 0064071 Tests est ariance Ratio	F Test	<b>Mean</b> 90.0063	3001 E-05	DF 1 8 9  Test State 6.75	F Stat 471 Critica 23.2	P-V: <1.0  11 P-V: 0.09	alue DE-05 alue	Decisio  Decisio  Equal V	n(α:5%) ant Effect n(α:1%) ariances		
ANOVA Table Source Between Error Total  ANOVA Assur Attribute Variance Distribution	S 0 0 0 0 mptions T.	um Squares 0063001 000107 0064071  Tests est ariance Ratio hapiro-Wilk W	F Test	<b>Mean</b> 90.0063	3001 E-05	DF 1 8 9	F Stat 471 —	P-V: <1.0	alue DE-05 alue	Decisio  Decisio  Equal V	n(α:5%) ant Effect n(α:1%)		
ANOVA Table Source Between Error Total ANOVA Assur Attribute Variance	S 0 0 0 mptions T V S	um Squares 0063001 000107 0064071  Tests est ariance Ratio hapiro-Wilk W	F Test V Normali	<b>Mean</b> 90.0063	8001 E-05	DF 1 8 9  Test State 6.75	F Stat 471 ———————————————————————————————————	P-V: <1.0  11 P-V: 0.09 0.94	alue DE-05 alue 112 .28	Decisio  Decisio  Equal V	n(α:5%) ant Effect n(α:1%) ariances	CV%	%Effect
ANOVA Table Source Between Error Total  ANOVA Assur Attribute Variance Distribution hexachlorobe	S 0 0 0 mptions T V S	um Squares 0063001 000107 0064071  Tests est ariance Ratio hapiro-Wilk W summary ode Cou	F Test Normal	<b>Mean</b> : 0.0063 1.338E	8001 E-05	DF 1 8 9  Test Star 6.75 0.976	F Stat 471 ———————————————————————————————————	P-V: <1.0  11 P-V: 0.09 0.94	alue DE-05 alue 112 28	Decisio Significa Decisio Equal V Normal	n(α:5%) ant Effect n(α:1%) ariances Distribution	<b>CV%</b> 3.04%	<b>%Effect</b> 0.00%
ANOVA Table Source Between Error Total  ANOVA Assur Attribute Variance Distribution hexachlorobe Sample	S S 0 0 0 mptions Ti V S enzene S	um Squares 0063001 000107 0064071  Tests est ariance Ratio hapiro-Wilk W summary ode Cou	F Test ' Normal	Mean 0.0063 1.338E	95%	DF 1 8 9  Test Stat 6.75 0.976  LCL 95% UCL 0.165	F Stat 471 ———————————————————————————————————	P-Va < 1.0	alue DE-05 alue 112 -28	Decision  Decision  Equal V  Normal	n(α:5%) ant Effect  n(α:1%) ariances Distribution  Std Err	3.04%	
ANOVA Table Source Between Error Total  ANOVA Assur Attribute Variance Distribution hexachlorobe Sample IOSN 2019	S S 0 0 0 mptions To V S enzene S C	um Squares 0063001 000107 0064071  Tests est ariance Ratio hapiro-Wilk W summary ode Cou	F Test ' Normal	Mean : 0.0063   1.338E   ity Tes   Mean   0.159	95% 0.153	DF 1 8 9  Test Stat 6.75 0.976  LCL 95% UCL 0.165	F Stat 471 Critica 23.2 0.741 Media 0.158	P-V: <1.0  1 P-V: 0.09 0.94  n Min 0.15	alue DE-05 alue 112 -28	Decision  Decision  Equal V  Normal  Max  0.166	n(α:5%) ant Effect  n(α:1%) ariances Distribution  Std Err  0.00216	3.04%	0.00%
ANOVA Table Source Between Error Total  ANOVA Assur Attribute Variance Distribution hexachlorobe Sample IOSN 2019 AT3-098	S 0 0 0 mptions Tr V S enzene S C	um Squares 0063001 000107 0064071  Tests est ariance Ratio hapiro-Wilk W summary ode Cou	F Test   Normal	Mean : 0.0063   1.338E   ity Tes   Mean   0.159	95% 0.153 0.106	DF  1 8 9  Test Stat 6.75 0.976  LCL 95% UCL 0.165 0.111	F Stat 471 Critica 23.2 0.741 Media 0.158	P-V: <1.0  1 P-V: 0.09 0.94  n Min 0.15	alue DE-05 alue 112 -28	Decision  Decision  Equal V  Normal  Max  0.166	n(α:5%) ant Effect  n(α:1%) ariances Distribution  Std Err  0.00216	3.04%	0.00%
ANOVA Table Source Between Error Total  ANOVA Assur Attribute Variance Distribution  hexachlorobe Sample IOSN 2019 AT3-098  hexachlorobe	S 0 0 0 mptions Tr V S enzene S C	um Squares 0063001 000107 0064071  Tests est ariance Ratio hapiro-Wilk W Summary ode Cou S 5 5 Detail ode Rep	F Test Normali unt	Mean : 0.0063   1.338E   ity Tes   Mean   0.159   0.109	95% 0.153 0.106	DF 1 8 9  Test Star 6.75 0.976  LCL 95% UCL 0.165 0.111	F Stat 471  Critical 23.2 0.741  Median 0.158 0.109	P-V: <1.0  1 P-V: 0.09 0.94  n Min 0.15	alue DE-05 alue 112 -28	Decision  Decision  Equal V  Normal  Max  0.166	n(α:5%) ant Effect  n(α:1%) ariances Distribution  Std Err  0.00216	3.04%	0.00%

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Mariyation   Mar											est Co	ae/ID:	11N-23-303	vinPest / i	7-4167-8246
Mary   Mary	Bioaccumula	tion Ev	aluation - P	esticide	s - Maco	ma								EA-ES	T, Inc. PBC
Start Date	Analysis ID: Analyzed: Edit Date:	19 Au	g-23 6:50	Ana	alysis:	Para	metric-Two	•	71DEE8	1281D0	Statu	s Level:	_	.1.1	
13-4648-8170		29 Ma 26 Apı	r-23 13:49 -23 12:49	Pro Spe	otocol: ecies:	US A	ACE NED F oma nasuta	RIM (2004)	es		Dilue Brine	ent: Not	Applicable Applicable	Research (	Or <b>Age:</b>
Name	Sample Code	, ,	Sample ID	Sar	nple Dat	te	Receipt	Date	Sample	Age	Clien	t Name	Pr	oject	
No. No. No. No. No. No. No. No. No. No.	IOSN 2019 AT3-098					3:00					Eco-A	Analysts, Ir	nc. Dr	edged Sec	liment Evalu
Marine Sediment   Yashtaman Marina NAE-2004-00   10 Stations at 4 Marinas Marina Marina NAE-2004-00   10 Stations at 4 Marinas Marina Marina Marina Marina MaE-2004-00   10 Stations at 4 Marinas Mathematical Mathematical Mathematical Mathematical Mathematical Mathematical Mathem	Sample Code	ı	Material Typ	е		Sam	ple Source	9		Station	Locatio	on	Lat/Long		
Part   Part	IOSN 2019	F	Reference se	ediment		Yach	ıtsman Maı	rina NAE-20	04-00	IOSN Re	ferenc	е			
Dutransforme   C < T   Fat Stat   Critical   P-Value   Decision(α:5%)   Fat Stat   P-Value   Decision(α:5%)   P-Value   Decision(α:5%)   Fat Stat   P-Value   Decision(α:5%)   P-Value	AT3-098	I	Marine Sedir	nent		Yach	itsman Mai	rina NAE-20	04-00	10 Static	ns at 4	Marinas N	∕lu		
Unequal Variance   Two-Sample   Test   Sample     vs   Sample   vs   Sample   Sample   vs   Sample   vs   Sample   vs   Sample   vs   Sample   Sample   vs   Sample   Sa	Data Transfor	m	P	Alt Hyp					Comp	arison R	esult				PMSD
Sample I         of Test State         Critical         MSD         P-Type         P-Value         Decision(α:5%)           Reference Sed         AT3-098         4         -69.1         2.13         0.0118         CDF         1.0000         Non-Significant Effect           Auxiliary Tests           Test         Test Stat         Critical         P-Value         Decision(α:5%)           Auxiliary Test         2.09         2.29         0.1580         No Outliers Detected           Auxiliary Test         5 grubbs Extreme Value Test         2.09         2.29         0.1580         No Outliers Detected           Auxiliary Test         5 ms Squares         Mean Squares         DF         F Stat         P-Value         Decision(α:5%)           Auxiliary Test         0.364925         1         4780         <1.0E-05	Untransformed	d	C	< T					AT3-0	98 passe	d meth	oxychlor e	ndpoint		2.87%
Natipart   National					f Test S	Stat	Critical	MSD	Р-Тур	e P-V	alue	Decision	(α:5%)		
Attribute         Test         Test Stat         Critical         P-Value         Decision(α:5%)           ANOVA Table         Source         Sum Squres         Mean Squre         DF         F Stat         P-Value         Decision(α:5%)           Between         0.364925         0.364925         1         4780         <1.0E-05	Reference Sec	A b	T3-098	4	-69.1		2.13	0.0118	CDF	1.00	000	Non-Sign	ificant Effect		
No	Attribute	ts		om a Val	ua Taat								· ,		
Source         Sum Squ = √ 0.364925         Mean Squ = √ 0.364925         1 4780         Y-Value √ 1.0E-05         Significant Effect           Error 0.0006112 / 0.365536         7.640E-05 / 8         8         9         8         7.640E-05 / 8         8         9         8         7.640E-05 / 8         9         8         7.640E-05 / 8         9         9         8         7.640E-05 / 8         9	Outlier		Grubbs Extr	eme vai	ue rest			2.09	2.29	0.13	080	No Outile	rs Detected		
Between   0.364925   0.364925   1   4780   <1.0E-05   Significant Effect	ANOVA Table	•													
Total   0.0006112   7.640E-05   8   9	Source		Sum Square	s	Mean	Squa	ire	DF	F Stat	P-V	alue	Decision	(α:5%)		
ANOVA Assumptions Tests  Attribute Test Test Stat Critical P-Value Decision(α:1%)  Variance Variance Ratio F Test 0.905 0.741 0.2509 Normal Distribution  Methoxychlor Summary  Sample Code Count Mean 95% LCL 95% UCL Median Min Max Std Err CV% %Effect  IOSN 2019 RS 5 0.411 0.395 0.426 0.408 0.399 0.428 0.00552 3.01% 0.00%  AT3-098 Code Rep 1 Rep 2 Rep 3 Rep 4 Rep 5  IOSN 2019 RS 0.408 0.419 0.401 0.428 0.399	Between Error Total	(	0.0006112					8	4780 –	<1.0	0E-05	Significar	nt Effect		
Attribute         Test         Test Stat         Critical Critical P-Value         P-Value Decision(α:1%)           Variance Distribution         Variance Ratio F Test Shapiro-Wilk W Normality Test         666         23.2         1.3E-05 Normal Distribution         Unequal Variances Normal Distribution           Methoxychlor Summary         Sample Code Count Mean 95% LCL 95% UCL Median Min Max Std Err CV% %Effect         Std Err CV% %Effect           IOSN 2019 RS 5 0.411 0.395 0.426 0.408 0.399 0.428 0.00552 3.01% 0.00% AT3-098         5 0.0287 0.0281 0.0293 0.0288 0.028 0.028 0.0293 0.000214 1.67% 93.00%           Methoxychlor Detail         Sample Code Rep 1 Rep 2 Rep 3 Rep 4 Rep 5         Rep 5 Rep 4 Rep 5           IOSN 2019 RS 0.408 0.419 0.401 0.428 0.399         0.399 0.399								·							
Variance Distribution         Variance Ratio F Test Shapiro-Wilk W Normality Test         666 0.905 0.741 0.2509         1.3E-05 0.2509 Normal Distribution         Unequal Variances Normal Distribution           Methoxychlor Summary           Sample         Code         Count         Mean         95% LCL         95% UCL         Median Min         Max         Std Err         CV%         %Effect           IOSN 2019         RS         5         0.411 0.395 0.426 0.408 0.399 0.428 0.028 0.028 0.0293 0.00552 3.01% 0.00%         0.00%           AT3-098         5         0.0287 0.0281 0.0293 0.0288 0.028 0.028 0.0293 0.000214 1.67% 93.00%           Methoxychlor Detail           Sample         Code         Rep 1         Rep 2         Rep 3         Rep 4         Rep 5           IOSN 2019         RS         0.408 0.419 0.401 0.428 0.399         0.399		•						Test Stat	Critica	al P-V	alue	Decision	(α:1%)		
Methoxychlor Summary   Sample   Code   Count   Mean   95% LCL   95% UCL   Median   Min   Max   Std Err   CV%   %Effect   Code   Count   Mean   0.395   0.426   0.408   0.399   0.428   0.00552   3.01%   0.00%   AT3-098   S   5   0.0287   0.0281   0.0293   0.0288   0.028   0.028   0.0293   0.000214   1.67%   93.00%   Methoxychlor Detail   Sample   Code   Rep 1   Rep 2   Rep 3   Rep 4   Rep 5   Rep 5   Rep 1   0.401   0.428   0.399   Rep 4   Rep 5   Rep 5   Rep 6   Rep 6   Rep 7   Rep 7   Rep 8   Re				io F Tes	t								<u> </u>		
Sample         Code         Count         Mean         95% LCL         95% UCL         Median         Min         Max         Std Err         CV%         %Effect           IOSN 2019         RS         5         0.411         0.395         0.426         0.408         0.399         0.428         0.00552         3.01%         0.00%           AT3-098         5         0.0287         0.0281         0.0293         0.0288         0.028         0.0293         0.000214         1.67%         93.00%           Methoxychlor Detail           Sample         Code         Rep 1         Rep 2         Rep 3         Rep 4         Rep 5           IOSN 2019         RS         0.408         0.419         0.401         0.428         0.399	Distribution	(	Shapiro-Wilk	W Norn	nality Tes	st		0.905	0.741	0.2	509	•			
IOSN 2019   RS   5   0.411   0.395   0.426   0.408   0.399   0.428   0.00552   3.01%   0.00%     AT3-098   5   0.0287   0.0281   0.0293   0.0288   0.028   0.0293   0.000214   1.67%   93.00%     Methoxychlor Detail   Sample   Code   Rep 1   Rep 2   Rep 3   Rep 4   Rep 5     IOSN 2019   RS   0.408   0.419   0.401   0.428   0.399	Methoxychlor	Summ	nary												
AT3-098 5 0.0287 0.0281 0.0293 0.0288 0.028 0.0293 0.000214 1.67% 93.00%  Methoxychlor Detail  Sample Code Rep 1 Rep 2 Rep 3 Rep 4 Rep 5  IOSN 2019 RS 0.408 0.419 0.401 0.428 0.399	Sample	(	Code C	ount	Mean		95% LCL	95% UCL	Media	ın Min	l	Max	Std Err	CV%	%Effect
Methoxychlor Detail           Sample         Code         Rep 1         Rep 2         Rep 3         Rep 4         Rep 5           IOSN 2019         RS         0.408         0.419         0.401         0.428         0.399	IOSN 2019	ı	RS 5	j	0.411		0.395	0.426	0.408	0.39	99	0.428	0.00552	3.01%	0.00%
Sample         Code         Rep 1         Rep 2         Rep 3         Rep 4         Rep 5           IOSN 2019         RS         0.408         0.419         0.401         0.428         0.399	AT3-098		5	i	0.0287	7	0.0281	0.0293	0.0288	0.02	28	0.0293	0.000214	1.67%	93.00%
IOSN 2019 RS 0.408 0.419 0.401 0.428 0.399	Methoxychlor	r Detail													
	Sample	(	Code F	Rep 1	Rep 2		Rep 3	Rep 4	Rep 5						
AT3-098 0.028 0.0288 0.029 0.0287 0.0293	IOSN 2019	ı													
	AT3-098		0	.028	0.0288	8	0.029	0.0287	0.0293	3					

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Test Code/ID: TN-23-303MnPest / 17-4167-8246

	,	•								Te	st Co	de/ID:	IN-23-3	USIVI	nPest/ i	7-4167-824
Bioaccumulati	ion Ev	valuation -	Pestici	ides	- Maco	ma									EA-ES	T, Inc. PBC
Analyzed:	19 Au	:50-5714 ıg-23 6:50 ay-23 22:45		Anal	ysis:		etric-Two	Sample F223B0DAI	D46500D2	D3437		S Versior s Level: r ID:	n: CETIS 1	v2.1	.1	
	29 Ma 26 Ap		! ;		ocol: ies:	US ACI	E NED F a nasuta	n - Pesticide RIM (2004) a	es		Analy Dilue Brine Source	<b>nt</b> : No : No	ancy Roka ot Applicabl ot Applicabl RO - Aquati	е	esearch (	Or <b>Age:</b>
Sample Code		Sample ID	) ;	Sam	ple Date	е	Receipt	Date	Sample A	ge	Clien	t Name		Proj	ect	
IOSN 2019 AT3-098		13-4648-8 <sup>2</sup> 07-1559-49			ar-23 eb-23 13	3:00	08 Mar- 09 Feb-		21d 14h 49d 1h		Eco-A	nalysts, l	nc.	Dred	dged Sec	diment Eval
Sample Code		Material T	уре		;	Sample	Source	<del></del>	S	tation L	ocatio	n	Lat/Lor	ng		
IOSN 2019		Reference		nt				ina NAE-20	04-00 IC	SN Ref	erence	Э				
AT3-098		Marine Sed	diment			Yachtsı	man Mar	ina NAE-20	04-00 10	Station	ns at 4	Marinas	Mu			
Data Transform	m		Alt Hy	ур					Compar	ison Re	sult					PMSD
Untransformed			C < T						AT3-098	passed	loxych	nlordane e	endpoint			2.76%
Equal Variana	e t Tw	vo-Sample	Test	Аf	Test S	tat Cı	ritical	MSD	P-Type	P-Va	alue	Decisio	n(α:5%)			
•		Sample II AT3-098		8	-21.3	1.8		0.00101	CDF	1.00	00	Non-Sig	nificant Effe	ect		
Sample I v Reference Sed Auxiliary Tests Attribute	P	AT3-098  Test		8	-21.3			0.00101  Test Stat	Critical	1.00	alue	Decisio	nificant Effe			
Sample I v Reference Sed Auxiliary Tests	P	AT3-098	xtreme \	8	-21.3			0.00101		1.00	alue	Decisio	nificant Effe			
Sample I v Reference Sed Auxiliary Tests Attribute	P	AT3-098  Test	xtreme '	8	-21.3			0.00101  Test Stat	Critical	1.00	alue	Decisio	nificant Effe			
Sample I v Reference Sed Auxiliary Tests Attribute Outlier	s	AT3-098  Test		8	-21.3 e Test		86	0.00101  Test Stat	Critical	1.00	alue 65	Decisio	nificant Effe n(α:5%) ers Detecte			
Sample I v Reference Sed  Auxiliary Tests Attribute Outlier  ANOVA Table Source Between Error	s s	Test Grubbs Ex  Sum Squa 0.0003341 5.907E-06		8	-21.3 e Test	Square	86	0.00101  Test Stat 1.73  DF 1 8	Critical 2.29	1.000 P-Va 0.620 P-Va	alue 65	Decisio No Outli Decisio	nificant Effe n(α:5%) ers Detecte			
Auxiliary Tests Attribute Outlier  ANOVA Table Source Between Error Total	s	Test Grubbs Ex  Sum Squa 0.0003341 5.907E-06 0.00034		8	-21.3 e Test Mean 9 0.0003	Square	86	0.00101  Test Stat 1.73  DF 1	Critical 2.29	1.000 P-Va 0.620 P-Va	alue 65 alue	Decisio No Outli Decisio	nificant Effe n(α:5%) ers Detecte n(α:5%)			
Sample I v Reference Sed  Auxiliary Tests Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assum	s nption	Test Grubbs Ex  Sum Squa 0.0003341 5.907E-06 0.00034 ns Tests		8	-21.3 e Test Mean 9 0.0003	Square	86	0.00101  Test Stat 1.73  DF 1 8 9	Critical 2.29  F Stat 452	1.000 P-Va 0.62	alue 65 alue E-05	Decisio No Outli  Decisio Significa	n(α:5%) ers Detecte n(α:5%) unt Effect			
Auxiliary Tests Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assum Attribute	s nption	Test Grubbs Ex  Sum Squa 0.0003341 5.907E-06 0.00034 ms Tests Test	nres	8 Walue	-21.3 e Test Mean 9 0.0003	Square	86	0.00101  Test Stat 1.73  DF 1 8 9  Test Stat	Critical 2.29  F Stat 452  Critical	1.000 P-Va 0.622 P-Va <1.0	alue 65 alue E-05	Decisio  Decisio  Significa  Decisio	n(α:5%) ers Detecte n(α:5%) int Effect n(α:1%)			
Sample I v Reference Sed  Auxiliary Tests Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assum	s nption	Test Grubbs Ex  Sum Squa 0.0003341 5.907E-06 0.00034 ns Tests	ares	8 Value	-21.3 e Test Mean 3 0.0003 7.384E	1.i Square 3341 E-07	86	0.00101  Test Stat 1.73  DF 1 8 9	Critical 2.29  F Stat 452	1.000 P-Va 0.62	alue 65 alue E-05	Decisio Significa  Decisio Equal Va	n(α:5%) ers Detecte n(α:5%) int Effect n(α:1%)	ed		
Sample I v Reference Sed  Auxiliary Tests Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assum Attribute Variance	s nption	Test Grubbs Ex  Sum Squa 0.0003341 5.907E-06 0.00034  Test Test Variance R Shapiro-W	ares	8 Value	-21.3 e Test Mean 3 0.0003 7.384E	1.i Square 3341 E-07	86	0.00101  Test Stat 1.73  DF 1 8 9  Test Stat 7.36	Critical 2.29  F Stat 452  Critical 23.2	1.000 P-Va 0.622 P-Va <1.0	alue 65 alue E-05	Decisio Significa  Decisio Equal Va	n(α:5%) ers Detecte n(α:5%) int Effect n(α:1%) ariances	ed		
Reference Sed  Auxiliary Tests Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assum Attribute  Variance Distribution	nption	Test Grubbs Ex  Sum Squa 0.0003341 5.907E-06 0.00034  Test Test Variance R Shapiro-W	ares	8 Value Γest orma	-21.3 e Test Mean 3 0.0003 7.384E	1.s Square 3341 E-07	86	0.00101  Test Stat 1.73  DF 1 8 9  Test Stat 7.36 0.956	Critical 2.29  F Stat 452  Critical 23.2 0.741	1.000 P-Va 0.622 P-Va <1.0	alue 65 alue E-05	Decisio Significa  Decisio Equal Va	n(α:5%) ers Detecte n(α:5%) int Effect n(α:1%) ariances	ed	CV%	%Effect
Reference Sed  Auxiliary Tests Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assum Attribute  Variance Distribution  oxychlordane	nption Sumn	Test Grubbs Ex  Sum Squa 0.0003341 5.907E-06 0.00034  ms Tests Test Variance R Shapiro-W mary	res Ratio F∃	8 Value Γest orma	-21.3  Mean 9 0.0003 7.384E	1.i Square 3341 E-07	86	0.00101  Test Stat 1.73  DF 1 8 9  Test Stat 7.36 0.956	Critical 2.29  F Stat 452  Critical 23.2 0.741	P-Va 0.624 < 1.00 P-Va 0.074	alue 65 alue E-05 alue 91 24	Decisio Significa  Decisio Equal Va Normal I	n(α:5%) ers Detecte n(α:5%) ant Effect  n(α:1%) ariances Distribution	ed .	<b>CV%</b> 3.12%	%Effect 0.00%
Sample I v Reference Sed  Auxiliary Tests Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assum Attribute Variance Distribution  oxychlordane Sample	nption Sumn	Test Grubbs Ex  Sum Squa 0.0003341 5.907E-06 0.00034  Ins Tests Test Variance R Shapiro-W mary Code	atio F∃ ilk W N	8 Value Γest orma	-21.3  Pe Test  Mean: 0.0003 7.384E	1.6 Square 3341 E-07	86 % LCL	0.00101  Test Stat 1.73  DF 1 8 9  Test Stat 7.36 0.956	Critical 2.29  F Stat 452  Critical 23.2 0.741  Median	P-Va 0.624 P-Va 0.074  Min	Alue 65 Alue E-05 Alue 91 24	Decisio Significa  Decisio Equal Va Normal I	n(α:5%) ers Detecte n(α:5%) ant Effect n(α:1%) ariances Distribution Std Err			
Reference Sed  Auxiliary Tests Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assum Attribute Variance Distribution  oxychlordane Sample IOSN 2019	nption Sumn	Test Grubbs Ex  Sum Squa 0.0003341 5.907E-06 0.00034  Test Variance R Shapiro-W  mary Code RS	Ratio F 7 ilk W N	8 Value Γest orma	-21.3  Mean 3 0.0003 7.384E	1.6 Square 3341 E-07	86 % LCL 0352	0.00101  Test Stat 1.73  DF 1 8 9  Test Stat 7.36 0.956  95% UCL 0.038	Critical 2.29  F Stat 452  Critical 23.2 0.741  Median 0.0365	P-Va 0.622 P-Va <1.00 P-Va 0.74:  Min 0.03:	Alue 65 Alue E-05 Alue 91 24	Decisio Significa  Decisio Equal Va Normal I	n(α:5%) ers Detecte n(α:5%) int Effect  n(α:1%) ariances Distribution  Std Err 0.0005		3.12%	0.00%
Reference Sed  Auxiliary Tests Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assum Attribute Variance Distribution  oxychlordane Sample IOSN 2019 AT3-098	nption Sumn	Test Grubbs Ex  Sum Squa 0.0003341 5.907E-06 0.00034  Test Variance R Shapiro-W  mary Code RS	Ratio F 7 ilk W N	8  Value	-21.3  Mean 3 0.0003 7.384E	1.6 Square 3341 E-07  t 95 0.0	86 % LCL 0352	0.00101  Test Stat 1.73  DF 1 8 9  Test Stat 7.36 0.956  95% UCL 0.038	Critical 2.29  F Stat 452  Critical 23.2 0.741  Median 0.0365	P-Va 0.622 P-Va <1.00 P-Va 0.74:  Min 0.03:	Alue 65 Alue E-05 Alue 91 24	Decisio Significa  Decisio Equal Va Normal I	n(α:5%) ers Detecte n(α:5%) int Effect  n(α:1%) ariances Distribution  Std Err 0.0005		3.12%	0.00%
Reference Sed  Auxiliary Tests Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assun Attribute Variance Distribution  oxychlordane Sample IOSN 2019 AT3-098  oxychlordane	nption Sumn	Test Grubbs Ex  Sum Squa 0.0003341 5.907E-06 0.00034 ms Tests Test Variance R Shapiro-W mary Code RS	Ratio F 1 ilk W No	8  Value	-21.3  Mean : 0.0003 7.384E  Mean : 0.0366 0.025	1.6 Square 6341 6-07 t	86 % LCL 0352 0245	0.00101  Test Stat 1.73  DF 1 8 9  Test Stat 7.36 0.956  95% UCL 0.038 0.0256	Critical 2.29  F Stat 452  Critical 23.2 0.741  Median 0.0365 0.0251	P-Va 0.622 P-Va <1.00 P-Va 0.74:  Min 0.03:	Alue 65 Alue E-05 Alue 91 24	Decisio Significa  Decisio Equal Va Normal I	n(α:5%) ers Detecte n(α:5%) int Effect  n(α:1%) ariances Distribution  Std Err 0.0005		3.12%	0.00%

**Report Date:** 19 Aug-23 06:51 (p 18 of 19) **Test Code/ID:** TN-23-303MnPest / 17-4167-8246

		•								Т	est Co	de/ID:	TN-23-3	03MnPest /	17-4167-8246
Bioaccumula	tion	Evaluation -	- Pesti	cides	- Mac	oma								EA-E	ST, Inc. PBC
Analysis ID: Analyzed: Edit Date:	19 <i>A</i>	3031-3246 Aug-23 6:50 Лау-23 22:4	5	Anal	point: ysis: Hash:	Parar	netric-Two	o Sample 98257BBB	6938370	667970		S Versions S Level Or ID:		Sv2.1.1	
Batch ID: Start Date: Ending Date: Test Length:	29 N 26 A	•			ocol: cies:	US A	CE NED F ma nasuta	n - Pesticid RIM (2004) a	es		Analy Dilue Brine Sour	ent: N e: N	Nancy Roka Not Applicab Not Applicab NRO - Aquati		Or <b>Age</b> :
Sample Code		Sample II	)	Sam	ple Da	te	Receipt	Date	Sample	Age	Clien	t Name		Project	
IOSN 2019 AT3-098		13-4648-8 07-1559-4			- lar-23 eb-23 1	3:00	08 Mar- 09 Feb-	23	21d 14 49d 1h	h	Eco-/	Analysts	, Inc.	Dredged Se	diment Evalu
Sample Code		Material T	уре			Samp	ole Source	Э		Station	Locati	on	Lat/Loi	ng	
IOSN 2019		Reference	sedim	ent		Yach	tsman Maı	rina NAE-20	004-00	IOSN R	eferenc	е			
AT3-098		Marine Se	dimen	t		Yach	tsman Maı	rina NAE-20	004-00	10 Statio	ons at 4	Marinas	s Mu		
Data Transfor	m		Alt I	<del>Т</del> ур					Comp	arison R	esult				PMSD
Untransformed	t		C < 7	Γ					AT3-0	98 passe	d toxap	hene er	dpoint		2.68%
Sample I Reference Sec	vs	Sample II AT3-098	Test	<b>df</b> 8	<b>Test 9</b>		Critical 1.86	MSD 0.0206	P-Typ CDF		<b>/alue</b> 000		on(α:5%) gnificant Eff	ect	
Auxiliary Test Attribute Outlier	ts	Test Grubbs E	xtreme	e Valu	e Test			Test Stat	Critic		<b>/alue</b> 341		on(α:5%) tliers Detecte	ed	
ANOVA Table	)														
Source		Sum Squa	ares		Mean	Squa	re	DF	F Stat	: P-\	/alue	Decisi	on(α:5%)		
Between Error Total		0.147623 0.00245 0.150073			0.147 0.000			1 8 9	482 —	<1.	0E-05	Signific	cant Effect		
ANOVA Assu	mpti	ons Tests													
Attribute		Test						Test Stat	Critic	al P-\	/alue	Decisi	on(α:1%)		
Variance Distribution		Variance F Shapiro-W			ality Te	st		5.62 0.963	23.2 0.741		231 219		Variances I Distribution	ı	
toxaphene Su	ımma	ary													
Sample		Code	Cou	nt	Mean	9	95% LCL	95% UCL	Media	an Mir	1	Max	Std Err	cv%	%Effect
IOSN 2019		RS	5		0.767	(	0.739	0.795	0.76	0.7		8.0	0.0102		0.00%
AT3-098			5		0.524		0.512	0.536	0.525	0.5	1	0.535	0.0043	1.84%	31.68%
toxaphene De	etail														
Sample		Code	Rep	1	Rep 2	<u> </u>	Rep 3	Rep 4	Rep 5						
IOSN 2019		RS	0.76		0.78		0.75	0.8	0.745						
AT3-098			0.51		0.525		0.53	0.52	0.535						

Report Date: 19 Aug-23 06:51 (p 19 of 19)
Test Code/ID: TN-23-303MnPest / 17-4167-8246

Bioaccumulat	ion Evaluation	- Pesticide	s - Macoma	1						EA-ES	T, Inc. PBC
Analysis ID: Analyzed: Edit Date:	21-2045-5284 19 Aug-23 6:50 08 May-23 22:4	Ana	ı <b>lysis:</b> Pa	ns-nonachlo rametric-Two 00AD219B0	o Sample	DF2B2F53	Statu	S Version: is Level: or ID:	: CETISv2. 1	1.1	
Batch ID: Start Date: Ending Date: Test Length:	16-7638-7277 29 Mar-23 13:4 26 Apr-23 12:4 27d 23h	9 <b>Pro</b> 9 <b>Spe</b>	tocol: US ecies: Ma	paccumulations ACE NED Facoma nasuta	RIM (2004)	es	Anal Dilue Brine Sour	ent: Not	ncy Roka t Applicable t Applicable O - Aquatic R	esearch (	Or <b>Age:</b>
Sample Code	Sample I	D Sar	nple Date	Receip	t Date	Sample Ag	je Clien	t Name	Pro	oject	
IOSN 2019 AT3-098	13-4648- 07-1559-		Mar-23 Feb-23 13:0	08 Mar- 0 09 Feb-		21d 14h 49d 1h	Eco- <i>i</i>	Analysts, Ir	nc. Dre	edged Sec	liment Evalu
Sample Code	Material	Туре	Sa	mple Sourc	е	Sta	ation Location	on	Lat/Long		
IOSN 2019	Referenc	e sediment		chtsman Ma			SN Referenc	е			
AT3-098	Marine S	ediment	Ya	chtsman Ma	rina NAE-20	04-00 10	Stations at 4	Marinas N	Лu		
Data Transfor	m	Alt Hyp				Comparis	son Result				PMSD
Untransformed		C < T				AT3-098	passed trans	-nonachlor	endpoint		3.08%
	e t Two-Sampl vs Sample II		Test Stat	Critical	MSD	P-Type	P-Value	Decision	• •		
Reference Sed	AT3-098	8	-18.8	1 86	0.00024	CDF	1 0000	Non-Sign	ificant Effect		
Reference Sed		8	-18.8	1.86	0.00024	CDF	1.0000	Non-Sign	ificant Effect		
Auxiliary Test		8	-18.8	1.86	0.00024  Test Stat		1.0000 P-Value	Non-Sign  Decision			
Auxiliary Test	s Test	8 Extreme Val		1.86				Decision			
Auxiliary Test	s Test			1.86	Test Stat	Critical	P-Value	Decision	ι(α:5%)		
Auxiliary Test: Attribute Outlier	s Test	Extreme Val			Test Stat	Critical	P-Value	Decision	n(α:5%) ers Detected		
Auxiliary Tests Attribute Outlier ANOVA Table	s Test Grubbs	Extreme Val	ue Test	uare	Test Stat	Critical 2.29	P-Value 1.0000	<b>Decision</b> No Outlie	n(α:5%) ers Detected n(α:5%)		
Auxiliary Test: Attribute Outlier ANOVA Table Source Between Error	Sum Squ 1.464E-0 3.330E-0	Extreme Valuares 5	ue Test <b>Mean S</b> q	uare 5	Test Stat 1.56  DF 1 8	Critical 2.29	P-Value 1.0000 P-Value	Decision No Outlie	n(α:5%) ers Detected n(α:5%)		
Auxiliary Tests Attribute Outlier ANOVA Table Source Between Error Total	Sum Squ 1.464E-0 3.330E-0 1.497E-0	Extreme Valuares 5	ue Test  Mean Sq 1.464E-0	uare 5	Test Stat 1.56  DF 1	Critical 2.29	P-Value 1.0000 P-Value	Decision No Outlie	n(α:5%) ers Detected n(α:5%)		
Auxiliary Tests Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assur	Sum Squ 1.464E-0 3.330E-0 1.497E-0	Extreme Valuares 5	ue Test  Mean Sq 1.464E-0	uare 5	Test Stat 1.56  DF 1 8 9	Critical 2.29  F Stat 352	P-Value 1.0000 P-Value <1.0E-05	Decision No Outlie  Decision Significan	ers Detected  e(a:5%)  e(a:5%)  ht Effect		
Auxiliary Tests Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assur Attribute	Sum Squ 1.464E-0 3.330E-0 1.497E-0 mptions Tests Test	Extreme Valuares 5 7	ue Test  Mean Sq 1.464E-0 4.163E-0	uare 5	Test Stat 1.56  DF 1 8 9	Critical 2.29  F Stat 352  Critical	P-Value 1.0000 P-Value <1.0E-05	Decision  No Outlie  Decision  Significan	ers Detected  ers Detected  ers (α:5%)  ent Effect  ers (α:1%)		
Auxiliary Tests Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assur	Sum Squ 1.464E-0 3.330E-0 1.497E-0 mptions Tests Test Variance	Extreme Valuares 5	we Test  Mean Sq 1.464E-0 4.163E-0	uare 5	Test Stat 1.56  DF 1 8 9	Critical 2.29  F Stat 352	P-Value 1.0000 P-Value <1.0E-05	Decision Significar  Decision Equal Va	ers Detected  ers Detected  ers (α:5%)  ent Effect  ers (α:1%)		
Auxiliary Tests Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assur Attribute Variance	Sum Squ 1.464E-0 3.330E-0 1.497E-0 mptions Tests Test Variance Shapiro-\	Extreme Valuares 5 7 5 Ratio F Tes	we Test  Mean Sq 1.464E-0 4.163E-0	uare 5	Test Stat 1.56  DF 1 8 9  Test Stat 9.09	Critical 2.29  F Stat 352  Critical 23.2	P-Value 1.0000 P-Value <1.0E-05 P-Value 0.0550	Decision Significar  Decision Equal Va	ers Detected  ers Detected  ers (α:5%)  ers Detected  ers (α:5%)  ers Detected  ers (α:5%)  ers Detected  ers (α:5%)  ers Detected  ers (α:5%)  ers Detected  ers (α:5%)  ers Detected  ers (α:5%)  ers Detected  ers (α:5%)  ers (α:1%)  ers (α:1%)  ers (α:1%)  ers (α:1%)		
Auxiliary Tests Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assur Attribute Variance Distribution	Sum Squ 1.464E-0 3.330E-0 1.497E-0 mptions Tests Test Variance Shapiro-\	Extreme Valuares 5 7 5 Ratio F Tes	we Test  Mean Sq 1.464E-0 4.163E-0	uare 5	Test Stat 1.56  DF 1 8 9  Test Stat 9.09 0.877	Critical 2.29  F Stat 352  Critical 23.2 0.741	P-Value 1.0000 P-Value <1.0E-05 P-Value 0.0550	Decision Significar  Decision Equal Va	ers Detected  ers Detected  ers (α:5%)  ers Detected  ers (α:5%)  ers Detected  ers (α:5%)  ers Detected  ers (α:5%)  ers Detected  ers (α:5%)  ers Detected  ers (α:5%)  ers Detected  ers (α:5%)  ers Detected  ers (α:5%)  ers (α:1%)  ers (α:1%)  ers (α:1%)  ers (α:1%)	CV%	%Effect
Auxiliary Test: Attribute Outlier ANOVA Table Source Between Error Total ANOVA Assur Attribute Variance Distribution trans-nonachl	Sum Squ 1.464E-0 3.330E-0 1.497E-0 mptions Tests Test Variance Shapiro-V	Extreme Val  Jares  5  7  5  Ratio F Tes  Vilk W Norm	Mean Sq 1.464E-0 4.163E-0	<b>uare</b> 5 8	Test Stat 1.56  DF 1 8 9  Test Stat 9.09 0.877	Critical 2.29  F Stat 352  Critical 23.2 0.741	P-Value 1.0000  P-Value <1.0E-05  P-Value 0.0550 0.1214	Decision Significar  Decision Equal Va Normal D	a(α:5%)  ars Detected  a(α:5%)  at Effect  a(α:1%)  riances  bistribution	<b>CV%</b> 3.51%	%Effect 0.00%
Auxiliary Test: Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assur Attribute Variance Distribution  trans-nonachl Sample	Sum Squ 1.464E-0 3.330E-0 1.497E-0 mptions Tests Test Variance Shapiro-\ or Summary Code	Extreme Valuares 5 7 5 Ratio F Tes Vilk W Norm	Mean Sq 1.464E-0 4.163E-0	<b>uare</b> 5 8	Test Stat 1.56  DF 1 8 9  Test Stat 9.09 0.877	Critical 2.29  F Stat 352  Critical 23.2 0.741  Median	P-Value 1.0000  P-Value <1.0E-05  P-Value 0.0550 0.1214  Min	Decision No Outlie  Decision Significar  Decision Equal Va Normal D	n(α:5%) ers Detected  n(α:5%) ent Effect  n(α:1%) eriances elistribution  Std Err	3.51%	
Auxiliary Tests Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assur Attribute Variance Distribution  trans-nonachl Sample IOSN 2019	S Test Grubbs Sum Squ 1.464E-0 3.330E-0 1.497E-0 mptions Tests Test Variance Shapiro-V or Summary Code RS	Extreme Valuares 5 7 5 Ratio F Tes Vilk W Norm Count 5	Mean Sq 1.464E-0 4.163E-0 t hality Test  Mean 0.0078	<b>95% LCL</b> 0.00746	Test Stat 1.56  DF 1 8 9  Test Stat 9.09 0.877  95% UCL 0.00814	Critical 2.29  F Stat 352  Critical 23.2 0.741  Median 0.008	P-Value 1.0000  P-Value <1.0E-05  P-Value 0.0550 0.1214  Min 0.0075	Decision Significan  Decision Equal Va Normal D  Max 0.008	a(α:5%) ers Detected  a(α:5%) ent Effect  a(α:1%) riances distribution  Std Err  0.000122	3.51%	0.00%
Auxiliary Test: Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assur Attribute Variance Distribution  trans-nonachl Sample IOSN 2019 AT3-098	S Test Grubbs Sum Squ 1.464E-0 3.330E-0 1.497E-0 mptions Tests Test Variance Shapiro-V or Summary Code RS	Extreme Valuares 5 7 5 Ratio F Tes Vilk W Norm Count 5	Mean Sq 1.464E-0 4.163E-0 t hality Test  Mean 0.0078	<b>95% LCL</b> 0.00746	Test Stat 1.56  DF 1 8 9  Test Stat 9.09 0.877  95% UCL 0.00814	Critical 2.29  F Stat 352  Critical 23.2 0.741  Median 0.008	P-Value 1.0000  P-Value <1.0E-05  P-Value 0.0550 0.1214  Min 0.0075	Decision Significan  Decision Equal Va Normal D  Max 0.008	a(α:5%) ers Detected  a(α:5%) ent Effect  a(α:1%) riances distribution  Std Err  0.000122	3.51%	0.00%
Auxiliary Tests Attribute Outlier  ANOVA Table Source Between Error Total  ANOVA Assur Attribute Variance Distribution  trans-nonachl Sample IOSN 2019 AT3-098  trans-nonachl	Sum Squ 1.464E-0 3.330E-0 1.497E-0 mptions Tests Test Variance Shapiro-\ or Summary Code RS	Extreme Valuares 5 7 5 Ratio F Tes Vilk W Norm Count 5 5	Mean Sq 1.464E-0 4.163E-0 t nality Test Mean 0.0078 0.00538	<b>95% LCL</b> 0.00746 0.00527	Test Stat 1.56  DF 1 8 9  Test Stat 9.09 0.877  95% UCL 0.00814 0.00549	Critical 2.29  F Stat 352  Critical 23.2 0.741  Median 0.008 0.0054	P-Value 1.0000  P-Value <1.0E-05  P-Value 0.0550 0.1214  Min 0.0075	Decision Significan  Decision Equal Va Normal D  Max 0.008	a(α:5%) ers Detected  a(α:5%) ent Effect  a(α:1%) riances distribution  Std Err  0.000122	3.51%	0.00%

## ATTACHMENT XII

Report Quality Assurance Record (2 pages)



# REPORT QUALITY ASSURANCE RECORD

Cli	ent: Eco Analyst	Project Number:	EA.TOX
Au	thor:	EA Report Number:	9/80
	REPOR	RT CHECKLIST	
	QA/QC ITEM	REVIEWER	DATE
1.	Samples collected, transported, and received according to study plan requirements.	Mel	9/5/2
2.	Samples prepared and processed according to study plan requirements.	luff	1/5/13
3.	Data collected using calibrated instruments and equipment.	luft	9/5/2
4.	Calculations checked: - Hand calculations checked	MIL	9/5/2
	<ul> <li>Documented and verified statistical procedure used.</li> </ul>	lafe	9/5/15
5.	Data input/statistical analyses complete and correct.	Los Medil =	9/6/2023
6.	Reported results and facts checked against original sources.	fre medil	9/6/2023
7.	Data presented in figures and tables correct and in agreement with text.	Los m Redil 5	9161203
8.	Results reviewed for compliance with study plan requirements.	_w/_	9/5/23
9.	Commentary reviewed and resolved.	IN IL	DATE 9/1/25
10.	All study plan and quality assurance/control requirements have been met and the report is approved		
	* *************************************	PROJECT MANAGER	
		Cos medilas	9/6/2023
	•	QUALITY CONTROL OFFICER	DATE
		Mills	916/23
		SENIOR TECHNICAL OFFICER	DATE

DATE

# **ATTACHMENT** XIII

Army Corps of Engineers Quality Assurance Records (3 pages)

Table II-1: Completeness Checklist

Quality Assurance/Quality Control Quantions	Yes/No? Comments?
Quality Assurance/Quality Control Questions	Lesting Comments (
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
If not, were deviations documented?	NA
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
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
Were the preservation and storage requirements in Chapter 8 of the EPA/Corps QA/QC Manual (EPA/USACE 1995) and EPA (2001d) followed?	Yes
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?	See Tissue Chemistry report under separate cover
14. Was the MDL study performed on each matrix (with this data submission) or within the last 12 months?	See Tissue Chemistry report under separate cover
15. Were the SRM/CRM analyses within acceptance criteria?	See Tissue Chemistry report under separate cover
16. Were the matrix spike/matrix spike duplicates run at the required frequency and was the percent recovery/RPD within the acceptance criteria?	See Tissue Chemistry report under separate cover
17. Were the duplicate samples analyzed and were the RPDs within the required acceptance criteria?	See Tissue Chemistry report under separate cover
18. For each analytical fraction of organic compounds, were recoveries for the internal standard within the acceptance criteria?	See Tissue Chemistry report under separate cover
19. Were surrogate recoveries within the required acceptance criteria?	See Tissue Chemistry report under separate cover
20. Were corrective action forms provided for all non-conforming data?	NA
21. Were all the species-specific test conditions in Appendix V met?	Yes
22. Were the test-specific age requirements met for each test species?	Yes
23. Was the bulk physical/chemical testing performed on the sediments/composites that were biologically tested?	See data package from first phase of testing
24. Were the mortality acceptance criteria met for the water column and sediment toxicity tests?	Yes
25. Were the test performance requirements in Table 11.3 of EPA (1994a) met?	Yes

Table II-8: Quality Control Summary for Biological Toxicity Testing only

#### Method Reference Numbers:

Quality Control (QC) Element	Acceptance Criteria*	Criteria Met?	List results outside criteria	Location of Results
		Yes/No	(Cross-reference results table in data report)	(Retained at Lab or in Data Package)
Test condition requirements for each species:				
Temperature, Salinity, pH, D.O., Ammonia (Total, Un- ionized)	Test conditions within the requirements specified for each species	Yes		Data Package
Test species age	Age/health within guidelines for each species (Appendix V)	Yes		Data Package
Bulk physical/chemical analyses (If required by the Sampling plan)	Required? If so, performed? Yes or No	Yes		Data Package (separate cover)
Water column toxicity test: Control mortality Control abnormality	≤ 10% mean ≤ 30% mussel/oyster; < 40% clam larvae, < 30% sea urchin larvae	NA		
Sediment toxicity test:  Control mortality  Compliance with applicable test acceptability requirements in Table 11.3 (EPA 1994a)	≤ 10% mean (no chamber > 20%) See EPA (1994a) Section 9; Table 11.3	Yes		Data Package

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

# ATTACHMENT XIV

Email Communications (7 pages)

#### **Tissue Reporting**

Fri, Mar 30, 2018 at 10:17 AM

To: Cc:

#### Good morning -

Please see the below confirmation just received from NAE regarding the handling of statistics under their recently requested "totals" calculation protocol. Please proceed using the below guidance and let us know if any questions etc

#### **Best**

----Original Message-----

From: Loyd, Richard B CIV USARMY CENAE (US) [mailto:Richard.B.Loyd@usace.army.mil]

Sent: Friday, March 30, 2018 10:12 AM

To: Cc: Su

#### Hey there,

I agree with ESI's recommendation to use 1/2 MDL for non-detects for both the computation of totals and for statistical analysis. It took a little while to get you an answer because I was waiting on a call back from our regulatory office to make sure they were ok with that methodology as well. In future ESI should follow the proposed protocol for both federal and private projects.

Thanks, Ben

Richard B. Loyd US Army Corps of Engineers 696 Virginia Road Concord, MA 01742 Office: (978) 318-8048 Cell: (978) 763-5438

Richard.B.Loyd@usace.army.mil

----Original Message-----

From:

Sent: Wednesday, March 28, 2018 4:56 PM

To: Log usace.army.mil>

Cc:

Subject: [Non-DoD Source] Tissue Reporting

1 of 3 3/30/2018, 11:53 AM

Based on the recent directive regarding reporting on non-detects and summation of totals, we have some further questions regarding statistical evaluation. The issue, paraphrased from ESI is as follows:

"Historically the Bioaccumulation EDD, where totals for PCBs etc are provided, uses the MDL when a value is a non-detect "ND" and the statistical analysis on the individual compounds are run using the MDL in place of the ND. Going forward, as per direction from USACE, we will use 1/2 of the MDL to compute the "Total" concentration for specified compounds. Under this scenario what number should be incorporated into the statistical analysis program, the 1/2 MDL or the MDL? As indicated, the "Total" numbers have not been included in the statistical analysis historically. However, a potential issue arises if the stats were run using the MDL then a review of the full data package differs shows different numbers which could potentially lead to some level of confusion. ESI's suggestion would be to use the 1/2 MDL for the computation of totals and for the statistical analysis, for those groups where total are generated, PCBs, Pesticides and PAHs.

Do you concur with ESI's recommendation?

Thanks Ben,

----Original Message-----

From: Loyd, Richard B CIV USARMY CENAE (US) [mailto:Richard.B.Loyd@usace.army.mil

<mailto:Richard.B.Loyd@usace.army.mil> ]
Sent: Monday, March 26, 2018 2:28 PM

To: Cc:

Subject: RE: Draft Report

Hello,

I realize that the reporting methods we requested are in conflict with the guidance of the RIM and the 2009 errata. The 2009 errata is the most recent RIM update. Please stick to the guidance we gave you in our last conference call, which is summarized below:

- Please continue to report NDs as the full RL. We are in the process of changing our methods to report NDs as the full MDL, but this change might not take place in the near future.
- For totals calculations (PCBs, DDT, PAHs) please use 1/2 the MDL for NDs. Please remember that PCB totals are calculated using only the NOAA 18 congeners. Also, despite what the errata guidance, please continue to calculate PCB totals for sediment chemistry.

Thanks, Ben

Richard B. Loyd US Army Corps of Engineers 696 Virginia Road Concord, MA 01742 Office: (978) 318-8048

Cell: (978) 763-5438

Richard.B.Loyd@usace.army.mil <mailto:Richard.B.Loyd@usace.army.mil>

2 of 3 3/30/2018, 11:53 AM

From: Loyd, Richard B CIV USARMY CENAE (USA) <Richard.B.Loyd@usace.army.mil> on behalf

of Loyd, Richard B CIV USARMY CENAE (USA)

**Sent:** Tuesday, July 28, 2020 1:08 PM

To: Cc:

Subject: RE: [Non-DoD Source] Re: CLDS and CCBDS reference area data

Hello,

Please continue to use 1/2 the MDL for non-detects and add appropriate qualifiers as you have done in the past.

The only thing that is changing is the removal of the 'c' qualifier and the requirement to run statistics in a scenario where you have measurable analyte concentrations in your dredge area samples but non-detects in the reference area sample.

Thanks, Ben

Richard B. Loyd US Army Corps of Engineers 696 Virginia Road Concord, MA 01742 Office: (978) 318-8048

Office: (978) 318-8048 Cell: (978) 763-5438

Richard.B.Loyd@usace.army.mil

----Original Message-----

From:

Sent: Tuesday, July 28, 2020 12:53 PM

To: Loyd, Richard B CIV USARMY CENAE (USA) < Richard.B.Loyd@usace.army.mil>

Cc:

Subject: [Non-DoD Source] Re: CLDS and CCBDS reference area data

Greetings,

For the statistical analysis of the bioaccumulation data we have been using half the MDL when a replicate is reported as a non-detect.

Moving forward, what value are we using for instances where the replicate is reported as a non-detect?

Regards,

<pre><blockedhttps: 0="" 0gqevw3ihhw3fcmarsramz0mw0gejsr655w30proa_axugmmsr-diycxx="" ?ui="2&amp;ik=5daaac60f2&amp;attid=0.1&amp;permmsgid=msg-" f%3a1626109999743927214&th="16911a6de47283ae&amp;view=fimg&amp;sz=s0-I75-ft&amp;attbid=ANGjdJ-0i0-" ickoctnsl25z4zfmo422i3fdafvbsfnv4b17pjvxhvuwxwavhz6hm-="" mail="" mail.google.com="" qeq&disp="emb&amp;realattid=677ce2b6e9998d9d_0.1" u=""></blockedhttps:></pre>
Please take a moment to provide Customer Feedback <blockedhttps: r="" t2ssr8w="" www.surveymonkey.com=""></blockedhttps:>
Please consider the environment before printing this email
This message is intended solely for the use of the individual or entity to whom it is addressed and contains information that is privileged, confidential and exempt from disclosure under applicable law. If you are not the intended recipient, be aware that any disclosure, copying, distribution or use of the contents of this material or of the attachments is prohibited. If you received this e-mail in error, please notify use by return e-mail immediately
On Tue, Jul 28, 2020 at 11:49 AM Loyd, Richard B CIV USARMY CENAE (USA) <richard.b.loyd@usace.army.mil <mailto:richard.b.loyd@usace.army.mil=""> &gt; wrote:</richard.b.loyd@usace.army.mil>
Hello, The 10-day / 28-day survival and the tissue chemistry results for the standard CLDS and CCBDS reference area data sets are attached. I believe these are the only two sites you are working with at the moment. Please reach out to me for data for other reference areas as needed. Please note that we plan to update these data sets every few years.
When you run bioaccumulation stats we want you to treat the reference site values as a detectable concentrations even if there are 'u'/'a' qualifiers in the data. This will eliminate the use of the 'c' qualifier for the dredge area samples. This is being done to simplify the data input process for the EPA risk assessment model. In the past we have seen elevated dredge area tissue concentrations that are flagged with a 'c' because the analyte was not detected in the reference area sample. This means we have to go through the EDD manually to determine if any of the analytes with a 'C' qualifier need to be included in the model run.
Please let me know if you have any questions.
Thanks, Ben
Richard B. Loyd

From: Loyd, Richard B CIV USARMY CENAE (USA) <Richard.B.Loyd@usace.army.mil> on behalf

of Loyd, Richard B CIV USARMY CENAE (USA)

**Sent:** Friday, October 09, 2020 3:58 PM

To: Cc:

Subject: RE: [Non-DoD Source] Re: CLDS and CCBDS reference area data

I think it would be fine to use the 'c' qualifier, but please be sure to update the footnote descriptions accordingly so that no one gets confused.

best, Ben

Richard B. Loyd US Army Corps of Engineers 696 Virginia Road Concord, MA 01742 Office: (978) 318-8048

Cell: (978) 763-5438

Richard.B.Loyd@usace.army.mil

----Original Message-----

From:

Sent: Friday, October 9, 2020 3:53 PM

To: Loyd, Richard B CIV USARMY CENAE (USA) < Richard.B.Loyd@usace.army.mil>;

Cc:

Subject: RE: [Non-DoD Source] Re: CLDS and CCBDS reference area data

Hello Ben, I do have a follow up question.

The COCs that will be eliminated from further evaluation because they are not detected in any of the reference and dredge area replicates would be footnoted as such. Should we use the "c" footnote in that instance? Or will that get confused with the prior definition of "c" in the Corps' EDD?

Thanks again-

----Original Message-----

From: Loyd, Richard B CIV USARMY CENAE (USA) < Richard.B.Loyd@usace.army.mil>

Sent: Friday, October 09, 2020 3:34 PM

To: Cc:

Subject: RE: [Non-DoD Source] Re: CLDS and CCBDS reference area data

Hello ,

If both the reference and dredge area samples are 'a' qualified with non-detects for all replicates then you can eliminate them from further evaluation. If one or more of the dredge area replicates came back with a detectable concentration then you should proceed with further evaluation.

Let me know if you have any other questions. Thanks, Ben Richard B. Loyd **US Army Corps of Engineers** 696 Virginia Road Concord, MA 01742 Office: (978) 318-8048 Cell: (978) 763-5438 Richard.B.Loyd@usace.army.mil ----Original Message----From: Sent: Thursday, October 8, 2020 1:41 PM To: Loyd, Richard B CIV USARMY CENAE (USA) <Richard.B.Loyd@usace.army.mil>; Subject: RE: [Non-DoD Source] Re: CLDS and CCBDS reference area data Good afternoon Ben-

dood arternoon ben

I am in the beginning stages of reporting two 28-day bioaccumulation evaluations (private and IDIQ projects), and am seeking clarification on the new approach for treating "c" qualified data as outlined in your email below. My understanding from your email is that "c" qualifiers should be eliminated, and those COCs that had been removed from further consideration because they were "c" qualified will now be retained for further evaluation.

My question is this: How should we treat COCs that are not detected in either the historic reference tissue or in any current (i.e., project-specific) site composite tissues? Should those COCs be retained for further evaluation or should they be eliminated?

Much appreciated-



# ECOTOXICOLOGICAL TESTING WATER COLUMN BIOASSAYS

#### KENNEBUNKPORT, MAINE

Prepared for:

Eco-Analysts, Inc. P.O. Box 224 Bath, Maine 04530

*Prepared by:* 

EA Engineering, Science, and Technology, Inc., PBC
231 Schilling Circle
Hunt Valley, Maryland 21031
For questions concerning this report, please contact Michael Chanov
ph: 410-584-7000

Results relate only to the items tested or to the samples as received by the laboratory.

This report shall not be reproduced, except in full, without written approval of EA Engineering, Science, and Technology, Inc., PBC

This report contains 21 pages plus 6 attachments.

Michael K. Chanov II Laboratory Director Date

8 August 2023



#### 1. INTRODUCTION

In accordance with the US Army Corps of Engineers, New England District (CENAE), EA Engineering, Science, and Technology, Inc., PBC performed water column toxicity testing on sediment samples collected from the area of dredging proposed for the marinas located on the Kennebunk River in Kennebunkport, Maine. Placement of dredge materials is proposed at the Isles of Shoals North (IOSN) Disposal Site. Samples were provided by Eco-Analysts, Inc., Bath, Maine. The purpose of this study was to evaluate the toxicity of standard elutriates prepared from the sediment samples on water column organisms.

The toxicity testing program consisted of acute water column bioassays with *Mytilus* sp. (blue mussel), *Americamysis bahia* (opossum shrimp), and *Menidia beryllina* (inland silverside). The acute water column bioassays evaluated the effects of exposure to the sediment elutriates on survival of the test organisms, and on the development of embryonic *Mytilus* sp. All biological testing was completed at EA Engineering, Science and Technology, Inc. PBC (EA), Hunt Valley, Maryland. All chemical analyses of elutriate solutions were completed by Alpha Analytical, Westborough, Massachusetts.

#### 2. MATERIALS AND METHODS

#### 2.1 SAMPLE RECEIPT AND PREPARATION

Ten sediment samples were collected by Eco-Analysts personnel from locations in the dredge footprint identified in the Sampling and Analysis Plan. One sediment composite was created for the project and placed into five 5-gallon buckets. Water collected from the dredge footprint was collected in 5-gallon pails. The samples were held at ≤4°C and were hand delivered to EA's Ecotoxicology Laboratory in Hunt Valley, Maryland. The samples were logged in and assigned an EA laboratory accession number and stored in the dark in a secured walk-in cooler at ≤4°C until used for testing. Table 1 summarizes the sample identification, accession numbers, and collection and receipt information for the sediment and site water samples. Chain-of-custody records are included in Attachment I.

#### 2.2 TOXICITY TEST METHODS

All toxicity testing was conducted following EA's standard operating procedures (EA 2022) which are in accordance with the *Regional Implementation Manual for Evaluation of Dredged Material Proposed for Disposal in New England Waters* (US EPA, CENAE 2004), USEPA/USACE guidance (1991, 1998) and USEPA guidance (2002).

#### 2.2.1 Water Column Toxicity Testing

Elutriates were prepared using the sediment composite samples and the site water. A subsample of homogenized sediment was combined with site water in a 1:4 sediment to water ratio, on a volume/volume basis. The sediment/water combination was vigorously mixed by aeration and manual stirring for 30 minutes and was then allowed to settle for a minimum of one hour. After settling, the supernatant was siphoned off and adjusted, if necessary, to 30 ppt salinity using Crystal Sea Bioassay Grade synthetic sea salts. The elutriate was used for the water column acute toxicity testing within 24 hours of preparation. Aliquots of the prepared elutriate were couriered overnight and on ice to Alpha Analytical for chemical analysis.

Static, non-renewal bioassays were conducted on the prepared elutriates using *Americamysis bahia* (opossum shrimp) and *Menidia beryllina* (inland silverside). The blue mussel (*Mytilus* sp.) was used as the test species for embryo development tests. The test organisms were acquired from outside vendors. Acquired lots of organisms were gradually acclimated to test temperature and salinity prior to use in testing.

Test concentrations of 100, 50, and 10 percent elutriate were prepared by measuring aliquots of elutriate in a graduated cylinder and bringing to final volume with 30 ppt artificial sea water. A test was also prepared for an undiluted site water sample. The artificial seawater was prepared by mixing Crystal Sea synthetic sea salts with laboratory water to a final salinity of 30 ppt. The source of the laboratory water was the City of Baltimore municipal tap water that was passed through a high-capacity, activated carbon filtration system. This synthetic seawater formulation has proven acceptable for aquatic toxicological studies, and has been used successfully at EA for maintaining multigeneration cultures, and for holding healthy populations of estuarine and marine species. Batches of artificial seawater were aerated and aged at least 24 hours prior to use in testing.

In order to evaluate the toxicity of ammonia to the test species, separate toxicity tests were conducted in which the test organisms were exposed to a graded concentration of ammonia, administered as ammonium chloride (NH<sub>4</sub>Cl).

#### 2.2.1.1 Mytilus sp. Water Column Toxicity Testing

Larval development tests were conducted with the blue mussel (*Mytilus* sp.) on the prepared elutriate. Adult mussels were acquired from Aquatic Research Organisms (Hampton, New Hampshire). Upon receipt at EA, the adult mussels were visually inspected, were scrubbed clean (e.g., barnacles removed) and were placed in 30 ppt artificial seawater at 4°C. The collection of mussel eggs and sperm, and preparation of gamete dilution were performed according to EA's standard operating procedures (EA 2022) which follow guidelines in USEPA/USACE (1998), USEPA (1995) and ASTM (2012). Spawning was temperature induced by placing the mussels individually into 125 ml cups containing 30 ppt artificial seawater and raising the temperature of

the water from 12°C and 20°C. Gametes were microscopically inspected to determine normality of eggs and motility of sperm. Gametes that were determined to be acceptable for testing were pooled and were used to prepare the sperm and egg suspensions for the fertilization procedures. Care was taken to keep male and female gametes completely separate to avoid accidental fertilization during gamete preparation. Only combined gamete preparations that had achieved a minimum of 90 percent fertilization were used in testing. Toxicity tests were initiated within 4 hours of egg fertilization.

Test chambers were 30-ml scintillation vials with screw caps. Each test concentration and control had five replicate test chambers containing 10 ml of test solution. At test initiation, 100 µl of fertilized gamete preparation was delivered into each test chamber containing test dilution. Extra replicates of controls were prepared to monitor embryo counts at test initiation and termination. The tests were maintained at a target temperature of 16±1°C with a 16-hour light/8-hour dark photoperiod. Water quality parameters (temperature, pH, dissolved oxygen, and salinity) were measured in separate water quality cups at test initiation and daily during the 48-hour exposure period. Summaries of water quality parameters can be found in Table 4.

The toxicity tests were terminated by adding 250 µl of 37 percent buffered formalin to each test chamber. The preserved samples were then observed microscopically to determine the percent survival of control organisms, and the percentage of embryos in each test treatment and control that had normally developed (C-shaped, hinged, prodissoconch larvae) shells.

In order to evaluate the toxicity of ammonia to *Mytilus* sp., a separate toxicity test was conducted in which the *Mytilus* sp. embryos were exposed to a graded concentration of ammonia, administered as ammonium chloride (NH<sub>4</sub>Cl). Copies of all data sheets from the mussel toxicity tests are included in Attachment II.

#### 2.2.1.2 Americamysis bahia and Menidia beryllina Water Column Toxicity Testing

The 96-hour toxicity tests with *A. bahia* and *M. beryllina* were initiated using test organisms received from Aquatic BioSystems (Fort Collins, Colorado). At test initiation, the *A. bahia* were

5 days old. The *M. beryllina* were 12 days old at test initiation. The opossum shrimp and inland silversides were fed *Artemia* sp. nauplii (<24 hours old) during holding, prior to use in testing.

The *A. bahia* and *M. beryllina* testing was conducted in 1-L beakers. Each beaker contained 200 ml of test solution, with five replicate beakers per test concentration. Ten organisms were randomly introduced into each replicate for a total of 50 organisms per concentration. The test chambers were maintained at 20±1°C and 30 ppt ±10%. Dissolved oxygen was maintained at ≥40% saturation using aeration as needed. Illumination was kept at 16-hour light/8-hour dark photoperiod. The *A. bahia* and *M. beryllina* were fed a small ration of brine shrimp nauplii (*Artemia* sp.) daily to avoid starvation and cannibalism (*A. bahia*). Temperature, pH, dissolved oxygen, and salinity were measured daily in one replicate of each concentration of the *A. bahia* and *M. beryllina* toxicity tests during the 96-hour exposure period. Summaries of water quality parameters measured during the toxicity tests are presented in Tables 4 (*A. bahia*) and 5 (*M. beryllina*). The number of live organisms in each test chamber were counted daily and recorded on the test data sheets. Copies of the *A. bahia* and *M. beryllina* acute toxicity test data sheets are included in Attachments III and IV, respectively.

#### 2.2.2 Data Analysis

Statistical analyses were performed on the water column test data according to USEPA/USACE (1998) guidance and using the ToxCalc statistical software package (Version 5.0, Tidepool Scientific Software). For the elutriate testing, an EC50 (median effective concentration) or LC50 (median lethal concentration) was calculated for each test species using the linear interpolation, Spearman-Karber, Trimmed Spearman-Karber, or probit method. Additionally, if normal development or survival in the 100 percent elutriate concentration was at least 10 percent lower than the dilution water control, then a statistical comparison (t-Test) was performed between the 100 percent elutriate concentration and the control. The t-test was based on the assumptions that the observations were independent and normally distributed as determined by the Shapiro-Wilk's test. The F-Test was used to test for homogeneity of variance. When the data did not meet the normality assumption, the nonparametric test, Wilcoxon's Two-Sample Test, was used to analyze the data. An arc sine (square root [Y]) transformation was performed on the survival percentages.

The results of the ammonia testing are summarized in Table 6. The results of the water column testing on the elutriate samples are presented in Tables 7 through 9, and summarized in Table 10.

#### 2.2.3 Reference Toxicant Testing

In conformance with EA's quality assurance/quality control program requirements, reference toxicant testing was performed by EA on *Mytilus* sp., *A. bahia* and *M. beryllina*. The reference toxicant tests consisted of a graded concentration series of a specific toxicant in water only tests. The results of the reference toxicant tests were compared to established control chart limits. Table 11 presents the results of the reference toxicant testing.

#### 2.3 ARCHIVES

Original data sheets, records, memoranda, notes, and computer printouts are archived at EA's Office in Hunt Valley, Maryland. These data will be retained for a period of 5 years unless a longer period of time is requested.

#### 3. RESULTS AND DISCUSSION

This bioassay study using elutriates prepared from the composited sediments collected the marinas located on the Kennebunk River in Kennebunkport, Maine, was designed and conducted to meet the requirements of the USEPA/USACE dredged material testing program and the CENAE protocol requirements. The results of these toxicity tests met the current NELAC standards, where applicable. A summary of the toxicity testing results can be found in Table 10.

#### 3.1 WATER COLUMN TOXICITY TESTING

In order to evaluate the toxicity of ammonia to the test species, separate toxicity tests were conducted in which the test organisms were exposed to a graded concentration of ammonia, administered as ammonium chloride (NH<sub>4</sub>Cl). The results of this ammonia study are summarized in Table 6. The 48-hour LC50 value for *Mytilus* sp. was 7.6 mg/L NH<sub>3</sub>-N, while the corresponding EC50 was 5.6 mg/L NH<sub>3</sub>-N. The ammonia 96-hour LC50 value for *Americamysis bahia* was 31.2 mg/L NH<sub>3</sub>-N, while the 96-hour LC50 value for *Menidia beryllina* was 19.7 mg/L NH<sub>3</sub>-N.

#### 3.1.1 Mytilus sp. Water Column Testing

The results of the *Mytilus* sp. toxicity tests conducted on the elutriate sample are presented in Table 7. Exposure to the sample indicated that the 48-hour LC50 value was >100 percent elutriate. Exposure to the sample did not produce an adverse effect on embryo development, with 48-hour EC50 value of >100 percent elutriate. Percent survival and normal development in 100 percent concentration of the elutriate was 90 and 86 percent, respectively, and was not significantly less (p=0.05) than the laboratory control. The percent survival and normal embryo development in the site water used to prepare the elutriate were 94 and 90 percent, respectively.

#### 3.1.2 Americamysis bahia Water Column Testing

Table 8 summarizes the results of the elutriate testing with *A. bahia*. The elutriate sample was not acutely toxic to *A. bahia*. The elutriate had a 96-hour LC50 value of >100 percent elutriate, and survival in the 100 percent test concentration was 90 percent. There was a minimum of 94 page 8

EA Report Number 9259

percent survival in the laboratory controls, and the site water had 96 percent survival at test termination.

#### 3.1.3 Menidia beryllina Water Column Testing

The *M. beryllina* water column test results are presented in Table 9. The elutriate sample was not acutely toxic to *M. beryllina*. The elutriate had a 96-hour LC50 value of >100 percent elutriate, and survival in the 100 percent test concentration was 88 percent. There was a minimum of 94 percent survival in the laboratory controls, and the site water had 82 percent survival at test termination.

#### 3.2 REFERENCE TOXICANT TESTS

The results of the reference toxicant tests are summarized in Table 11. All of the reference toxicant test results fell within the established laboratory control chart limits.

#### 4. REFERENCES CITED

- EA. 2022. EA Ecotoxicology Laboratory Quality Assurance and Standard Operating Procedures Manual. EA Manual ATS-102. Internal document prepared by EA's Ecotoxicology Laboratory, EA Engineering, Science, and Technology, Inc., PBC, Hunt Valley, Maryland.
- USEPA/USACE, 1991. Evaluation of Dredged Material Proposal for Ocean Disposal, Testing Manual (commonly called "The Green Book").
- USEPA/USACE. 1998. Evaluation of Dredged Material Proposed for Discharge in Waters of the U.S.-Inland Testing Manual. EPA/823/B-94/004. U.S. Environmental Protection Agency, Office of Water, Washington, D.C. and Department of the Army, U.S. Army Corps of Engineers, Washington, D.C.
- US EPA. 2002. Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms. Fifth Edition. EPA-821-R-02-012. U.S. Environmental Protection Agency, Office of Water, Washington, D.C.
- U.S. Army Corps of Engineers (USACE) New York District/U.S. Environmental Protection Agency (USEPA) Region 2. 2016. Guidance for Performing Tests on Dredged Material Proposed for Ocean Disposal. Regional Testing Manual. April.
- US EPA Region 1, CENAE. 2004. Regional Implementation Manual for Evaluation of Dredged Material Proposed for Disposal in New England Waters. September 2004.

# TABLE 1 SUMMARY OF COLLECTION AND RECEIPT INFORMATION FOR SEDIMENT AND SITEWATER SAMPLES

Sample	EA Accession	Co	ollection	Receipt		
Identification	Number	Time	Date	Time	Date	
10 Stations at 4 Marinas Mud	AT3-098	0900-1300	8 February 2023	1630	9 February 2023	
10 Stations at 4 Marinas Site Water	AT3-099	0900-1300	8 February 2023	1630	9 February 2023	

# TABLE 2 AMMONIA CONCENTRATIONS MEASURED ON ELUTRIATES PRIOR TO WATER COLUMN TOXICITY TESTING

		Ammonia (mg/L NH <sub>3</sub> -N)
Sediment Identification	EA Accession Number	(Total/Unionized) Elutriate
10 Stations at 4 Marinas Mud	AT3-098	2.2/0.05
10 Stations at 4 Marinas Site Water	AT3-099	<0.1/<0.1

TABLE 3 SUMMARY OF WATER QUALITY PARAMETERS MEASURED DURING ELUTRIATE BIOASSAY TESTING WITH Mytilus sp.

	EA		Range					
Sediment Sample Identification	Accession Number	Test Number	Temperature (°C)	рН	Dissolved Oxygen (mg/L)	Salinity (ppt)		
10 Stations at 4 Marinas Mud	AT3-098	TN-23-209	15.6 – 16.9	7.7 - 8.2	7.9 - 8.5	28.6 - 32.9		
10 Stations at 4 Marinas Site Water	AT3-099	TN-23-210	15.6 – 16.7	7.8 - 8.2	8.0 - 8.6	28.8 - 33.0		

TABLE 4 SUMMARY OF WATER QUALITY PARAMETERS MEASURED DURING ELUTRIATE BIOASSAY TESTING WITH Americamysis bahia

	EA			Range				
Sediment Sample Identification	Accession Number	Test Number	Temperature (°C)	рН	Dissolved Oxygen (mg/L)	Salinity (ppt)		
10 Stations at 4 Marinas Mud	AT3-098	TN-23-212	19.0 - 20.4	7.2 - 8.0	5.8 – 7.7	28.3 - 33.0		
10 Stations at 4 Marinas Site Water	AT3-099	TN-23-213	19.0 - 20.0	7.4 - 8.0	5.9 – 7.7	28.4 - 33.0		

TABLE 5 SUMMARY OF WATER QUALITY PARAMETERS MEASURED DURING ELUTRIATE BIOASSAY TESTING WITH Menidia beryllina

	EA			R	ange	
Sediment Sample Identification	Accession Number	Test Number	Temperature (°C)	- 1 nH		Salinity (ppt)
10 Stations at 4 Marinas Mud	AT3-098	TN-23-214	19.0 - 20.4	7.7 - 8.1	6.7 - 7.7	28.6 – 33.0
10 Stations at 4 Marinas Site Water	AT3-099	TN-23-215	19.0 - 20.3	7.8 - 8.0	6.7 - 7.9	28.7 - 33.0

# TABLE 6 RESULTS OF AMMONIA (NH4Cl) TOXICITY TESTING

			48-Hour Survival (%)							
			mg/L NH <sub>3</sub> -N							
Test Organism	Test Number	Lab Control	Lab Control 50 mg/L 10 mg/L 3.7 mg/L 1.5 mg/L 0.65 mg/L							
Mytilus sp.	TN-23-211	99	4	24	90	94	90	7.6		

			48-Hour Normal Development (%)						
			mg/L NH <sub>3</sub> -N						
Test Organism	Test Number	Lab Control	Lab Control 50 mg/L 10 mg/L 3.7 mg/L 1.5 mg/L 0.65 mg/L						
Mytilus sp.	TN-23-211	97	0	1	85	89	86	5.6	

			96-Hour Survival (%)						
					mg/L NH <sub>3</sub> -1	N		96-hour LC50	
Test Organism	Test Number	Lab Control	150 mg/L	87 mg/L	42 mg/L	21 mg/L	7.5 mg/L	(mg/L NH <sub>3</sub> -N)	
A. bahia	TN-23-202	90	0	0	10	80	80	31.2	
M. beryllina	TN-23-205	90	0	0	0	50	80	19.7	

# TABLE 7 RESULTS OF TOXICITY TESTING WITH Mytilus sp. ON ELUTRIATES

			48-Hour Survival (%)					
	EA Accession			Percent Elutriate			48-hour LC50	
Sediment Sample Identification	Number	Test Number	Lab Control	100%	50%	10%	(% elutriate)	
10 Stations at 4 Marinas Mud	AT3-098	TN-23-209	94	90	100	98	>100	
10 Stations at 4 Marinas Site Water	AT3-099	TN-23-210	93	94			>100	

			48-H	our Norma	al Embryo	Developme	ent (%)
	EA Accession			Per	cent Elutr	iate	48-hour EC50
Sediment Sample Identification	Number	Test Number	Lab Control	100%	50%	10%	(% elutriate)
10 Stations at 4 Marinas Mud	AT3-098	TN-23-209	91	86	99	94	>100
10 Stations at 4 Marinas Site Water	AT3-099	TN-23-210	90	90			>100

## TABLE 8 RESULTS OF TOXICITY TESTING WITH Americamysis bahia ON ELUTRIATES

				ģ	96-Hour Surv	ival (%)	
	EA Accession			Po	ercent Elutria	te	96-hour LC50
Sample Identification	Number	Test Number	Lab Control	100%	50%	10%	(% elutriate)
10 Stations at 4 Marinas Mud	AT3-098	TN-23-212	94	90	92	98	>100
10 Stations at 4 Marinas Site Water	AT3-099	TN-23-213	94	96			>100

## TABLE 9 RESULTS OF TOXICITY TESTING WITH Menidia beryllina ON ELUTRIATES

				9	96-Hour Sur	vival (%)	
	EA Accession			Per	cent Elutriat	e	061 1670
Sample Identification	Number	Test Number	Lab Control	100%	50%	10%	96-hour LC50 (% elutriate)
10 Stations at 4 Marinas Mud	AT3-098	TN-23-214	94	88	92	90	>100
10 Stations at 4 Marinas Site Water	AT3-099	TN-23-215	100	82 <sup>(a)</sup>			>100

<sup>(</sup>a) 100 percent elutriate treatment is significantly different (p=0.05) from the laboratory control

#### TABLE 10 SUMMARY OF RESULTS OF TOXICITY TESTING ON ELUTRIATES

	М	ytilus sp.	M	<i>lytilus</i> sp.	Amerio	camysis bahia	Meni	dia beryllina
Sample Identification	48-hour LC <sub>50</sub>	Statistical Difference	48-hour EC <sub>50</sub>	Statistical Difference	96-hour LC <sub>50</sub>	Statistical Difference	96-hour LC <sub>50</sub>	Statistical Difference
	(% elutriate)	100% vs. Control						
Standard Elutriates								
10 Stations at 4 Marinas Mud	>100	No	>100	No	>100	No	>100	No
10 Stations at 4 Marinas Site Water	>100	No	>100	No	>100	No	>100	Yes

## TABLE 11 RESULTS OF REFERENCE TOXICANT TESTING ON ACQUIRED TEST ORGANISMS

Test Species	Reference Toxicant	Test Endpoint	Acceptable Control Chart Limits
Mytilus sp.	Copper chloride (CuCl <sub>2</sub> )	48-Hour EC50: 5.1 μg/L Cu	2.2– 10.0 μg/L Cu
Americamysis bahia	Potassium chloride (KCl)	48-Hour LC50: 485 mg/L KCl	412 – 604 mg/L KCl
Menidia beryllina	Potassium chloride (KCl)	48-Hour LC50: 1,105 mg/L KCl	817 – 1,325 mg/L KCl

# ATTACHMENT I

Chain-of-Custody Records (2 pages)



#### ® EA Engineering, Science, and Technology

EA Ecotoxicology Laboratory



Sample Shi	pped By:	· _
Fed. Ex.	UPS	Other: Couri'er
Tracking #:		
		-

231 Schilling Circle Hunt Valley, Maryland 21031 Telephone: 410-584-7000 Fax: 410-584-1057

Client: ECO-ANALYSTS	, INC. Project No.:
NPDES Number:	Client Purchase Order Number:
City/State Collected:	KENNEBUNK RIVER, MAINE

#### PLEASE READ SAMPLING INSTRUCTIONS ON BACK OF FORM

Accession			Colle	ection	Sample Descriptio		·
Number (office use only)	Grab	Composite	Start Date/Time	End Date/Time	(including Site, Stati Number, and Outfall Nu	on mber)	Number/Volume of Container
AT3-018		х	2/8/23 0900	02/8/23 1300	10 Stations at 4 Marinas	Mud	5 Ten Gal Buckets
At3-099	X		77	11	п	Sikwater	u
	-						
					<del></del>	***	
			-				
Į.		ï					

Sampled By:	Date/Time	Received By:	Date/Time
Dustin Kach & Bud Brown	2/8/23 0900 - 1300	Dustin Kach	2/8/23 1300
Sampler's Printed Name:	Title:	Relinquished By:	Date/Time
Dustin Kach & Bud Brown	President		21/23 @ 11:37am
Relipquished By:	Date/Time Z)8/23 1/3 2	Received By Laboratory Puis Myl	Date/Time 2/9/23 /630

Was Sample Chilled During Collection? No

Comments:

#### Sample Collection Parameters

Visual Description:

Temperature (°C):

pH:

TRC (mg/L):

Other:

# **ATTACHMENT II**

Mytilus sp. 48-Hour Elutriate Toxicity Tests Data Sheets and Statistical Analyses (26 pages)



# TOXICITY TEST SET-UP BENCH SHEET

Project Number: <u>EA.TOX</u> Client: <u>Eco Analysts</u> QC Test Number: \_\_\_\_\_TN-23-209 TEST ORGANISM INFORMATION Common Name: BLUE MUSSEL Adults Isolated (Time, Date): \_\_\_\_\_ Scientific Name: <u>Mytilus sp.</u> Neonates Pulled & Fed (Time, Date): Lot Number: ME-097 Acclimation: \_\_<4ho\_\_\_\_ Age: 24hwg Source: ARO 29.0\_\_\_ppt Culture Water (T/S): \_ /6-0 °C **TEST INITIATION** <u>Date</u> Time **Initials** <u>Activity</u> 2115123 0905 Dilutions Made Test Vessels Filled Organisms Transferred **Head Counts TEST SET-UP** Sample Number: <u>AT3-098</u> Dilution Number: 30 ppt C.S. (LD3-189) Test Concentration Volume Test Material Final Volume Control  $0 \, \mathrm{ml}$ 100 ml 10 %  $10 \, \mathrm{ml}$ 50 % 50 ml 100 % 100 ml



# TOXICITY TEST DATA SHEET

Project Number:		Ę,	EA.TOX			H	TEST ORGANISM	RGA	MSIN							Beg	inning	Beginning Date:	_ ,	2115123	123		Time:	Time: 1620	g
Client: Eco Analysts	ıalysts					i	Cor	nmon	Common Name:	В	TUE	BLUE MUSSEL	EL		1	Enc	Ending Date:	ate:		2117123	173		Time:	1630	30
QC Test Number:	TN-23-209	-209				ı	Scie	entific	Scientific Name:		Mytilus sp.	ıs sp.					TES	TEST TYPE:	ΪĤ	Stati	Static / Flowthrough	Flow	throug		
Test Material:ELU	<u>ELUTRIATE</u>	TE				' !	TARGET VALUES	TVA	CUES										$\mathbb{R}_{\epsilon}$	newal	Renewal / Non-renewal	Non-r	enewa	<b></b>	
Accession Number:		AT3-098	860			1	Ten	Temp:	16		င်္ဂ	DO:		>4.0		_mg/L	ί.	Tes	Test Container:	ainer:		30 ml vial	vial		
Dilution Water:3(	30 PPT C.S	C.S.				'	pH;	pH: <u>6.0 - 9.0</u>	9,0		•	Salinity:	uty:_	30±3		_ppt		Tes	Test Volume:	me: _		10	10 ml		
Accession Number: LD3- 180	:: <u>LD:</u>	3-180				Pf	ıotope	riod:	Photoperiod: 16 l, 8 d	d		Ligh	Light Intensity: <u>50 - 100</u> fc	sity: <u>5</u>	<u>) - 100</u>	<u>)</u> fc		Te	Test Duration:	ition:	4	48 hours	rsi		
	Τ	-	Num ive On	Ē. ≒	-			Temp	≝	<b>   </b>		-	μH	i I			Diss	Dissolved Oxygen (mg/L)	)xygeı			Sal	inity (	(tdc	
Concentration Rep		0 2	24 4	48	72	96	0	24 4	48 72	2 96	0	24	48	72	96	0	24	48	72	96	0	24	24 48 72	72	96
Control			-			<u>\range</u>	15.6 16	164 165	<u>ν</u>	-	18	2.9	77			5.8	80	21			288	297 297	74.7		
10%						$\overline{\nabla}$	156 16	165 lb.6	6		8	28	77			2.50	<u>-</u>	80			29.7	29.3	78E		
50%						55	15.9 16.7	7 168	حن		80	28	77	-		<i>8</i> 4	28	7.9			30.7	30.9	2000		
100%	+					=  -	11.5 11.0	2 2	2		۵ څ	00	1			3	0	70			3		9 7		
							-		1		0					0	0	:			2.0	767	0.0		
:																		_							
		-										_			İ										
Meter Number						E	682 682	2 601			626	682 682	<u> </u>			586	139 289 289	(8)			682	129 289 280	150		
Time						<u>s</u>	1231	<i>\$</i> }			201	Syl (521 120)	- E			1027	1237	1231 HZ3			1027	CSH LEZI 1201	ন্ত		
Initials	├	_	_			€l	ļ	10 CL	P		Pa		4 A			14	B	£			F	£€	=7	_	

EPA Test Method: EPA 821-R-02-012 (CHECK ONE)

Ceriodaphnia: 2002.0 Magna/pulex: 2021.0

Americamysis: 2007.\_\_\_\_\_Cyprinodon: 2004.0\_\_\_\_\_

Menidia:2006.0 OTHER: X

> ATS-T01 12/02/08



### BIVALVE DEVELOPMENT TEST EMBRYO OBSERVATION DATA SHEET

Project Number:EA.TOX	<u>Test Species</u>
Client: <u>Eco Analysts</u>	Scientific Name: <u>Mytilus sp.</u>
QC Test Number: TN-23-209	Elutriate:
Initial number of embryos: 229	Accession Number: AT3-098
Embryos counted (date, initials):	Lot#: ME- 097

		T . 1		· · · · · · · · · · · · · · · · · · ·
Test		Total #		
Concentration	Replicate	Surviving/	# NT1	#
		Counted	Normal	Abnormal
Control	A	818	719	6
	В	707	203	4
	C	207	200	7
	D	901	195	Ce
	E	223	214	9
10%	A	216	204	19-
	В	794	710	14
·	C	318	209	9
	D	219	217	7
	E	227	217	10
50%	A	241	236	5
	В	296	216	10
	C	231	275	G
	D	257251	243	8
	E	537	223	9
100%	A	227	713	14
	В	184	177	7
	C	199	188	Vl
	D	187	181	Ĝ
	E	NE	300	11



### TOXICOLOGY LABORATORY CORRECTION BENCH SHEET

Project Number: <u>EA.TOX</u>
Client: Eco Analysts
QC Test Number: TN-23-209
Correction Explanations
(a) Technician Error-Mathematical
(b) Technician Error-Manual Data Recording
(c) Technician Error-Head Count Observation
(d) Technician Error-Overwrite
(e) Technician Error-Missing Data
(f) Technician Error-Lost Organism
(g) Technician Error-Transcription Error
(h) Technician Error-Other:
(i) Meter Malfunction



### TOXICOLOGY LABORATORY BENCH SHEET

Project Number: <u>EA.TOX</u>	
Client: <u>Eco Analysts</u>	
QC Test Number: TN-23-209	· · · · · · · · · · · · · · · · · · ·
Date/Time/Initials	Comments/Activity



## TOXICOLOGY LABORATORY BENCH SHEET - TESTING LOCATION

Project Number:	<u>EA.TOX</u>
Client: Eco Analysts	
QC Test Number: TN-23	-209

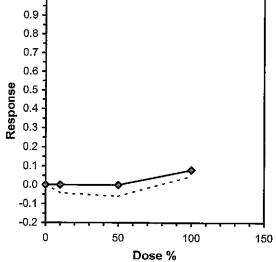
Day	Testing Location	Date	Time	Initials
0	51 51 51	Z115123 Z116123 Z117123	1620 1600 1454	Po
1	51	2116123	1600	F
2	51	2117123	1454	70
3				
4				
5				
6				
7				
8				
9				
10				
11				1 -
12				-
13				
14				
15				
16				
17				
18				
19				
20		-		
21				
22				
23				
24				
25				
26			, and the second	
27				
28				
29				
30				

Bivalve Larval Survival and Development Test-Proportion Alive										
Start Date: End Date: Sample Date:	2/15/2023 2/17/2023		Test ID: Lab ID: Protocol:	TN-23-209	)	Sample ID: Sample Type: Test Species:	Eco Analysts Elutriate MS-Mytilis species			
Comments: Conc-%	1	2	3	4	5	-	<del></del>			
Control	0.9732	0.9241	0.9241	0.8973	0.9955	<del>"</del>	<del></del>			
10	0.9643	1.0000	0.9732	0.9777	1.0000					
50	1.0000	1.0000	1.0000	1.0000	1.0000					
100	1.0000	0.8214	0.8884	0.8348	0.9420					

			Tra	Transform: Arcsin Square Root					1-Tailed	Isot	onic
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	Sum	Critical	Mean	N-Mean
Control	0.9429	1.0000	1.3477	1.2446	1.5039	7.849	5	<del>.</del>	<del></del> .	0.9753	1.0000
10	0.9830	1.0426	1.4565	1.3807	1.5374	5.163	5	35.50	17.00	0.9753	1.0000
50	1.0000	1.0606	1.5374	1.5374	1.5374	0.000	5	40.00	17.00	0.9753	1.0000
100	0.8973	0.9517	1.2764	1.1345	1.5374	12.898	5	23.00	17.00	0.8973	0.9200

Auxiliary Tests				Statistic	Critical	Skew	Kurt	
Shapiro-Wilk's Test indicates nor	mal distribu	ition (p > 0		0.92896	0.868	1.05644	1.66226	
Equality of variance cannot be co	nfirmed							
Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU	-	-	<del></del>	
Steel's Many-One Rank Test	100	>100	***	1		<del>"</del>	-,-,	

Point	%	\$D	95% CL(Exp)	Skew	
IC05	81.269			· · · · · · · · · · · · · · · · · · ·	·
IC10	>100				
IC15	>100			1.0	
IC20	>100			-	
IC25	>100			0.9	1
IC40	>100			0.8 -	
IC50	>100				
	·			0.6	
				ø o 5 1	



		t	Sivalve La	arval Surv	<u>iva</u> l and Deve	lopment Test-Propo	rtion Normal
	2/15/2023 2/17/2023	- !		TN-23-209		Sample ID: Sample Type: Test Species:	Eco Analysts Elutriate MS-Mytilis species
Conc-%	1	2	3	4	5		<del>-</del>
Control	0.9464	0.9063	0.8929	0.8705	0.9554		
10	0.9107	0.9375	0.9330	0.9464	0.9688		
50	1.0000	0.9643	1.0000	1.0000	0.9955		
100	0.9509	0.7902	0.8393	0.8080	0.8929		

		_	Tra	ansform:	Arcsin Sc	uare Root	<u> </u>		1-Tailed			
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD		
Control	0.9143	1.0000	1.2790	1.2027	1.3579	5,178	5				96	1120
10	0.9393	1.0273	1.3250	1.2674	1.3931	3.461	5	-0.988	2.230	0.1038	68	1120
50	0.9920	1.0850	1.4993	1.3807	1.5374	4.529	5	-4.733	2.230	0.1038	9	1120
100	0.8563	0.9365	1.1910	1.0950	1.3473	8.635	5	1.888	2.230	0.1038	•	
						0.000	J	1.000	2.230	0.1000	161	1120

				Statistic		Critical		Skew	Kurt
al distribu	ition (p > 0	0.01)		0.98103					0.0741
nces (p =	0.50)	•		2.3588		11.3449		0.20121	0.0741
NOEC	LOEC	ChV	TU	M\$Du	MSDp	MSB	MSE	F-Prob	df
100	>100		1	0.06577	0.07171	0.08409	0.00542	5.4E-05	3, 16
	nces (p = NOEC	nces (p = 0.50) NOEC LOEC	NOEC LOEC ChV	nces (p = 0.50)  NOEC LOEC ChV TU	al distribution (p > 0.01) 0.98103 nces (p = 0.50) 2.3588 NOEC LOEC ChV TU MSDu	al distribution (p > 0.01) 0.98103 nces (p = 0.50) 2.3588  NOEC LOEC ChV TU MSDu MSDp	al distribution (p > 0.01)       0.98103       0.868         nces (p = 0.50)       2.3588       11.3449         NOEC LOEC ChV       TU       MSDu       MSDp       MSB	al distribution (p > 0.01)       0.98103       0.868         nces (p = 0.50)       2.3588       11.3449         NOEC LOEC ChV       TU       MSDu       MSDp       MSB       MSE	al distribution (p > 0.01)       0.98103       0.868       0.26127         nces (p = 0.50)       2.3588       11.3449         NOEC LOEC ChV TU MSDu MSDp MSB MSE F-Prob



### TOXICITY TEST SET-UP BENCH SHEET

Project Number:	EA.TOX		
Client: <u>Eco Analy</u>	ysts		
QC Test Number:	TN-23-210		
· ·		TEST ORGANISM INFORMATION	
Common Name: _	BLUE MUSSEL	Adults Isolated (Time	e, Date):
Scientific Name: _	Mytilus sp.	Neonates Pulled & F	ed (Time, Date):
Lot Number: <u>M</u>	1B- 097	Acclimation:	CYho Age: <u>CYho</u>
Source:	ARO	Culture Water (T/S):	160 °C29.0ppt
		TEST INITIATION	
Date	Time	<u>Initials</u>	Activity
2115123	0967	F	Dilutions Made
	,		Test Vessels Filled
	1620	,	Organisms Transferred
$\mathcal{L}$			Head Counts
	1700		ricad Counts
		TEST SET-UP	
Committee Niversham	ATT 000	•	
Sample Number:	*		
Dilution Number: _	30 ppt C.S. (	LD3- <u>1</u> 82 )	
Test Concentra	ation ation	Volume Test Material	Final Volume
Control		0 ml	100 ml
Site Water (	(AT3-099)	100 ml	<b>↓</b>



# TOXICITY TEST DATA SHEET

Project Number:		EA TOX	X			ТЕСТ	ORG C	TEST ORGANISM	Ξ,							Reginning Date:	ning T	ato.	۲	\$21/SI1/C		<b>⊒</b> .	Ď.	J 6	
Client: Eco Analysts						0	ommo	Common Name:	ne:	BLI	ŒМ	BLUE MUSSEL				Endir	Ending Date:	;; 	211	2117123		Ti	me:	Time: 1630	
QC Test Number: TN-23-210	3-210				l	Σ.	cientii	Scientific Name:	ne: _	M	Mytilus sp.	sp.				. 1	TEST	TEST TYPE:		Static	. / I	Static / Flowthrough	rough		
Test Material: SITE WATER	\TER		į		ł	TARC	V LEE	TARGET VALUES	Š										Ren	ewal	_   <u>N</u>	Renewal / Non-renewal	lewa]		
Accession Number:	SEE	SEE BENCH SHEET	CH SI	HEET	-	∺	emp:	Temp:16		ိုင		DO: _	>4.0	0		_mg/L		Test (	Test Container:	ner:	30	30 ml vial	al		
Dilution Water:30 PPT C.S	C.S.					<b>'</b> D.	H:	pH: 6.0 - 9.0	.0			Salinity:	1	30±3		ppt		Test	Test Volume:	<u>.</u>		10 ml			
Accession Number: LD3- 180	3- 18	Ö			1	Photo	period	Photoperiod: 16 l, 8 d	8d		<b>د</b> ه	Light 1	Intensi	Light Intensity: <u>50 - 100</u> fc	- 100 f	G,		Test	Test Duration:	ion:	48	48 hours			
												:													
		Nu Live (	Number of Live Organisms	of isms			Te	Temperature (°C)	ure				pН			_	Dissol )	Dissolved Oxygen (mg/L)	cygen			Salin	ity (pj	¥)	
Concentration Rep	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24 48 72	48		96
Control						951	5.91	291			0.8	8-2	78			98	18	90			288 29.5		27.4		
Cita Water						11.1	1.1	h 7			0	27	75			91	4	2/			22 6 22 6		200		
(AT3-099)							-	*																	
										-															
	:																								
			, <b>-</b>																						
Meter Number						18T)	299	1089			289	U	189			139	682 682 681	189		3	] 289	9 180	(8)		
Time						8201	ma	SSM			8201	Ina	SSAL			8291	55hl (M21	5Sh		}	1 8201	124) 1453	Ś		
Initials						7	7	<del>4</del>			7	A	4			A.	4	Á			- 4	4	<u></u>		

EPA Test Method: EPA 821-R-02-012 (CHECK ONE)

Ceriodaphnia: 2002.0 Magna/pulex: 2021.0

Americamysis: 2007. \_\_\_\_\_ Cyprinodon: 2004.0 \_\_\_\_\_

<u>Menidia</u>:2006.0 OTHER: X

> ATS-T01 12/02/08



### BIVALVE DEVELOPMENT TEST EMBRYO OBSERVATION DATA SHEET

Project Number: <u>EA.TOX</u>	<u>Test Species</u>
Client: <u>Eco Analysts</u>	Scientific Name: <u>Mytilus sp</u> .
QC Test Number: TN-23-210	Elutriate:SITE WATER
Initial number of embryos: 129 Embryos counted (date, initials): 11075	Accession Number: <u>AT3-099</u> Lot#: <u>ME-</u> <u>097</u>

T		Total #	11	,,,
Test Concentration	Replicate	Surviving/ Counted	# Normal	# Abnormal
Control	A	208	200	8
Connor		500	2007	11
·	В	010	101	
	C	214	705	9
	D	270	213	7
	Е	143	187	6
Site Water	A	198	188	10
AT3-099	В	206	190	16
	С	2-15	211	4
	D	230	214	13
	Е	209	199	10
		•		
	<del>                                     </del>			
		l		



### TOXICOLOGY LABORATORY CORRECTION BENCH SHEET

Project Number: <u>EA.TOX</u>
Client: Eco Analysts
QC Test Number: TN-23-210
Correction Explanations
(a) Technician Error-Mathematical
(b) Technician Error-Manual Data Recording
(c) Technician Error-Head Count Observation
(d) Technician Error-Overwrite
(e) Technician Error-Missing Data
(f) Technician Error-Lost Organism
(g) Technician Error-Transcription Error
(h) Technician Error-Other:
(i) Meter Malfunction



### TOXICOLOGY LABORATORY BENCH SHEET

Project Number: <u>EA.TOX</u>	
Client: <u>Eco Analysts</u>	
QC Test Number: TN-23-210	<u> </u>
Date/Time/Initials	Comments/Activity



## TOXICOLOGY LABORATORY BENCH SHEET - TESTING LOCATION

Project Number:	EA.TOX
Client: <u>Ecc</u>	Analysts
QC Test Number:	TN-23-210

Day	Testing Location	Date	Time	Initials
0	51	2115123	1620	6
1	51 51	2116123	1241	To To
2	5)	2117173	1455	To
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				
21				
22				
23				
24	1 111111111			
25				
26				
27				
28				
29				
30				

			Bivalve	Larval Sur	vival and Dev	velopment Test-Propo	ortion Alive
Start Date: End Date: Sample Date: Comments:	2/15/2023 2/17/2023		Test ID: Lab ID: Protocol:	TN-23-210	)	Sample ID: Sample Type: Test Species:	Eco Analysts Site Water MS-Mytilis species
Conc-%	1	2	3	4	5		
Contro	l 0.9286	0.9464	0.9554	0.9821	0.8616		
100	0.8839	0.9196	0.9598	1.0000	0.9330		

		_	Tra	ansform:	Arcsin Sc	uare Root	t		1-Tailed		Isot	onic
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	M\$D	Mean	N-Mean
Control	0.9348	1.0000	1.3244	1.1896	1.4368	6.823	5				0.9371	1.0000
100	0.9393	1.0048	1.3444	1.2231	1.5374	8.920	5	-0.298	1.860	0.1249	0.9371	1.0000

Auxiliary Tests	Statistic		Critical	<del></del>	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.01)	0.95866		0.781		0.57472	0.24716
F-Test indicates equal variances (p = 0.60)	1.76119		23.1545			
Hypothesis Test (1-tail, 0.05)	MSDu	MSDp	MSB	MSE	F-Prob	df
Homoscedastic t Test indicates no significant differences	0.07214	0.0767	0.001	0.01127	0.77303	1, 8

			Line	ear Interpolation	n (200 Resamples)			
Point	%	SD	95% CL(Exp)	Skew				
C05	>100				·			
C10	>100							
C15	>100				1.0			
C20	>100				4			
C25	>100				0.9			
C40	>100				0.8			ľ
C50	>100				0.7			
					4			
					و 0.6 <del>-</del>			
					950.5 0.4 0.3			
					<b>ö</b> 0.4 <b>1</b>			ł
					₽ 0.3 .			
					°.5 ]			
					0.2 -			
					0.1			
					-			
					0.0		*	
					-0.1 <del> </del>			
					0	50	100	150
						Dos	se %	

		E	Bivalve La	arval Surv	ival and Deve	elopment Test-Propo	rtion Normal
Start Date: End Date: Sample Date: Comments:	2/15/2023 2/17/2023	!	Test ID: Lab ID: Protocol:	TN-23-210	)	Sample ID: Sample Type: Test Species:	Eco Analysts Site Water MS-Mytilis species
Conc-%	1	2	3	4	5	·	
Control	0.8929	0.8973	0.9152	0.9509	0.8348		
100	0.8393	0.8482	0.9420	0.9688	0.8884		

		_	Tra	ansform:	Arcsin Sc	uare Root	t	·	1-Tailed		Isot	onic
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD	Mean	N-Mean
Control	0.8982	1.0000	1.2514	1.1523	1.3473	5.629	5			**	0.8982	1.0000
100	0.8973	0.9990	1.2559	1.1583	1.3931	8.101	5	-0.083	1.860	0.1029	0.8973	0.9990

Auxiliary Tests	Statistic		Critical		Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.01)	0.93456		0.781		0.32136	-1.0127
F-Test indicates equal variances (p = 0.49)	2.08637		23.1545			
Hypothesis Test (1-tail, 0.05)	MSDu	MSDp	MSB	MSE	F-Prob	df
Homoscedastic t Test indicates no significant differences	0.0694	0.077	5.2E-05	0.00766	0.9362	1, 8

			Line	ear Interpolatio	n (200 Resamples)	-		
Point	%	SD	95% CL(Exp)	Skew	. ,			
C05	>100			·	4.			
C10	>100							
C15	>100				1.0			
C20	>100				4			
C25	>100				0.9 -			
C40	>100				0.8 -			
C50	>100				4			
			**	<del> </del>	0.7			
				•	<b>9</b> 0.6			
					<u>د مع</u>			
					<u>6</u> 0.5 1			
					Response 0.6 - 0.4			
					7			1
					0.3			
					0.2			
					۱,			
					0.1			
					0.0	· • • · · · ·	<del></del>	
					0	50	100	150
						Dos	se %	



### TOXICITY TEST SET-UP BENCH SHEET

Project Number: \_\_\_\_EA.TOX

Client: \_\_Eco Analysts

QC Test Number: \_\_\_TN-23-211

TEST ORGANISM INFORMATION

Common Name: BLUE MUSSEL Adults Isolated (Time, Date):

Scientific Name: Mytilus sp. Neonates Pulled & Fed (Time, Date):

Lot Number: ME-097 Acclimation: Culture Water (T/S): 16-0 °C 29-0 ppt

TEST INITIATION

| Date | Time | Initials | Activity |
| Test Vessels Filled |
| Granisms Transferred |
| Two | Head Counts |

TEST SET-UP

Sample Number: SP3-010 1 g/L NH<sub>3</sub>-N (0.383 g NH<sub>4</sub>Cl / 100 mg DI)

Dilution Number: 30 ppt C.S. (LD3-180)

Test Concentration Volume Test Material Final Volume CONTROL  $0 \, \mathrm{ml}$ 200 ml 0.65 mg/L $0.13 \, \mathrm{ml}$ 1.5 mg/L  $0.30 \, \text{ml}$ 3.7 mg/L $0.74 \, \mathrm{ml}$ 10.0 mg/L $2.0 \, ml$ 50.0 mg/L $10.0 \, \mathrm{ml}$ 



# ACUTE TOXICITY TEST DATA SHEET

Project Number:  Client: Eco Analysts  OC Test Number: TN.23	EA.TOX nalysts	TEST ORGANISM  Common Name:	BLUE MUSSEL	Beginning Date: Ending Date:	2/15/23 Time: 1620 2/17/23 Time: 1630
Test Material: 1 g/L NH3-N Accession Number: SP3-OIO	<u>g/L NH3-N</u> ber: <u>SP3-OIO</u>	TARGET VALUES  Temp:16±1°C	C DO:>4.0	mg/L Test Cc	Renewal / Non-renewal Test Container: 30 ml Vial
Dilution Water: 301	30 PPT C.S.	pH:6.0 - 9.0	Salinity:3 <u>0</u> ±3		
Accession Number: LD3- (80	LD3- (80	Photoperiod: 16 l, 8 d	Light Intensity: 50 - 100 fc		48 h
<del>-</del>	Number of Live Organisms	Temperature (°C)	Ha	Dissolved Oxygen	
Concentration Rep	0	0 24 48 72	72	96 0 24 48 7	72 96 0 24 48 72
Control		163 166 165	80 82 78	8.3 82 81	912 522 386
0.65 mg/L		I/a ) bala man	0,1 07 74	02	
		- F		0, 20 8	200 19.1 261
1.5 mg/L		991 6-91 0-011	87 82 79	83 87 90	28.6 29.1 286
3.7 mg/L		16017.6 166	62 28 28	8.2 82 8.8	28.6 29.1 284
10 mg/L		15.9 17.6 14.6	82 82 79	bl. 28 28	285 290 264
50 mg/L		160 169 165	8.2 82 79	83 81 79	27.7 283 780
deter Number		1,682 1,682 1,600	1,82,1687 1,801	(101 (67 (67	101 67 687
ime		15h1 hh21 5201	15th 1h21 Szar	LShi hh?! STM	15h hhal 5201
ditals		9 9 V	A. A. A.	A A A	4 4

EPA Test Method: EPA 821-R-02-012 (CHECK ONE)

Magna/pulex: 2021.0

Fathead: 2000.0\_ Trout: 2019.0\_\_\_

Americamysis: 2007.

Cyprinodon: 2004.0

<u>Menidia</u>:2006.0 ОТНЕК:\_\_\_\_\_X\_\_\_



### BIVALVE DEVELOPMENT TEST EMBRYO OBSERVATION DATA SHEET

Project Number: <u>EA.TOX</u>	Test Species
Client: <u>Eco Analysts</u>	Scientific Name: <u>Mytilus sp.</u>
QC Test Number: TN-23-211	Test Material: 1 g/L NH <sub>3</sub> -N
Initial number of embryos:	Accession Number: SP3-CIO
Embryos counted (date, initials): $\frac{4774}{}$	MD

· · · · · · · · · · · · · · · · · · ·		TD ( 1 ()	*	
Test		Total #		
1	Dominate	Surviving/	#	#
Concentration	Replicate	Counted	Normal	Abnormal
CONTROL	A	251 233	276	7
	В	J.38	231	1
	С	246	214	1)_
	D	209	201	8
	Е	205	278	5
0.65 mg/L	A	716	210	6
	В	196	186	10
	С	703	199	Ч
	D	199	19/	8
	Е	189	187	7
1.5 mg/L	A	207	199	8
	В	204	196	S
	C	216	206	10
	D	204	195	9
	Е	219	206	13
3.7 mg/L	A	307	188	14
	В	204	196	8
	C	701	187	14
	D:	204	193	11
	E	198	185	13



### BIVALVE DEVELOPMENT TEST EMBRYO OBSERVATION DATA SHEET

Project Number: <u>EA.TOX</u>	<u>Test Species</u>
Client: <u>Eco Analysts</u>	Scientific Name: <u>Mytilus sp.</u>
QC Test Number: TN-23-211	Test Material: 1 g/L NH3-N
Initial number of embryos:	Accession Number: SP3-010

Replicate A B	Surviving/ Counted	# Normal L	Abnormal
В	<u> </u>	L	10
	11.	L	58
I	Celf		42
С	62	O	67
D	39		38
Е	49	3	46
A	18		И
В	15	0	15
С	B	0	8
D	9	O	9
E	7	0	7
		<u>.</u>	
	E A B C D	D 39 E 49 A 18 B 15 C 8 D 9	D 39 1 E 49 3 A 18 1 B 16 0 C 8 0 D 9 0



### TOXICOLOGY LABORATORY CORRECTION BENCH SHEET

Project Number: <u>EA.TOX</u>
Client: Eco Analysts
QC Test Number: TN-23-211
Correction Explanations
(a) Technician Error-Mathematical
(b) Technician Error-Manual Data Recording
(c) Technician Error-Head Count Observation
(d) Technician Error-Overwrite
(e) Technician Error-Missing Data
(f) Technician Error-Lost Organism
(g) Technician Error-Transcription Error
(h) Technician Error-Other:
(i) Meter Malfunction



### TOXICOLOGY LABORATORY BENCH SHEET

Project Number: <u>EA.TO</u>	X
Client: Eco Analysts	· · · · · · · · · · · · · · · · · · ·
QC Test Number: TN-23-2	11
Date/Time/Initials	Comments/Activity



## TOXICOLOGY LABORATORY BENCH SHEET - TESTING LOCATION

Project Number:	EA.TOX
Client: <u>Eco Analysts</u>	<u>·</u>
QC Test Number: TN-23-	-211

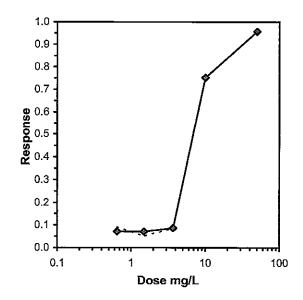
Day	Testing Location	Date	Time	Initials
0	<i>5</i> 1	2115123	1620 1244	To
1	51	2116123	1244	76
2	5(	2117123	1457	76
3				
4				
5				
6				
7				
8	·			
9				
10				
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23				
24				
25				
26				
27				
28				
29				
30				

			Bivalve L	.arval Sur	vival and Dev	elopment Test-Prope	ortion Alive	
Start Date:	2/15/2023		Test ID:	TN-23-211		Sample ID:	Eco Analysts	
End Date:	2/17/2023		Lab ID:			Sample Type:	Ammonia	
Sample Date:			Protocol:			Test Species:	MS-Mytilis species	
Comments:						•		
Conc-mg/L	1	2	3	4	5		<del></del>	
Control	1.0000	1.0000	1.0000	0.9330	1.0000	<u>"</u>	· · · · · · · · · · · · · · · · · · ·	
0.65	0.9643	0.8750	0.9063	0.8884	0.8438			
1.5	0.9241	0.9107	0.9643	0.9107	0.9777			
3.7	0.9018	0.9107	0.8973	0.9107	0.8839			
10	0.2634	0.2857	0.2768	0.1741	0.2188	•		
50	0.0536	0.0670	0.0357	0.0402	0.0089			

		_	Tra	Transform: Arcsin Square Root					1-Tailed			Total
Conc-mg/L	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD	Resp	Number
Control	0.9866	1.0000	1.4917	1.3090	1.5374	6.846	5				15	1120
*0.65	0.8955	0.9077	1.2489	1.1644	1.3807	6.520	5	5.473	2.360	0.1047	117	1120
*1.5	0.9375	0.9502	1.3256	1.2674	1.4208	5.339	5	3.744	2.360	0.1047	70	1120
*3.7	0.9009	0.9131	1.2509	1.2231	1.2674	1.470	5	5.427	2.360	0.1047	111	1120
*10	0.2438	0.2471	0.5148	0.4304	0.5639	10.834	5	22.015	2.360	0.1047	847	1120
*50	0.0411	0.0416	0.1964	0.0946	0.2618	32.284	5	29.191	2.360	0.1047	1074	1120

Auxiliary Tests		Statistic		Critical		Skew	Kurt			
Shapiro-Wilk's Test indicates nor	-	0.96664		0.9		-0.6622	1.23727			
Bartlett's Test indicates equal var	Bartlett's Test indicates equal variances (p = 0.14)						15.0863			
Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU	MSDu	MSDp	MSB	MSE	F-Prob	df
Dunnett's Test	<0.65	0.65			0.02716	0.02734	1.35376	0.00492	2.3E-20	5, 24

-					Trimmed Spearman-Karber
	Trim Level	EC50	95%	CL	
_	0.0%				· · · · · · · · · · · · · · · · · · ·
	5.0%				
	10.0%	7.4688	7.1647	7.7857	1.0 —
	20.0%	6.9359	6.6822	7.1993	1
	Auto-7.1%	7.6248	7.2938	7.9709	

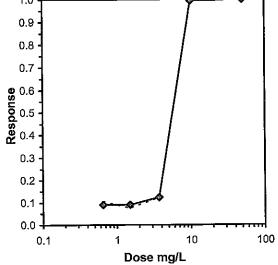


		E	Bivalve La	rval Survi	val and Dev	elopment Test-Propor	tion Normal	
Start Date: End Date: Sample Date: Comments:	2/15/2023 2/17/2023	1	Test ID: _ab ID: Protocol:	TN-23-211		Sample ID: Sample Type: Test Species:	Eco Analysts Ammonia MS-Mytilis species	
Conc-mg/L	1	2	3	4	5			
Control	1.0000	1.0000	0.9554	0.8973	0.9821	· · · · · · · · · · · · · · · · · · ·		
0.65	0.9375	0.8304	0.8884	0.8527	0.8125			
1.5	0.8884	0.8750	0.9196	0.8705	0.9196			
3.7	0.8393	0.8750	0.8348	0.8616	0.8259			
10	0.0045	0.0045	0.0000	0.0045	0.0134			
50	0.0045	0.0000	0.0000	0.0000	0.0000			

			Tra	Transform: Arcsin Square Root					1-Tailed	Number	Total
Conc-mg/L	Mean	N-Mean	Mean	Min	Max	CV%	N	Sum	Critical	Resp	<u>Number</u>
Control	0.9670	1.0000	1.4228	1.2446	1.5374	8.780	5			37	1120
*0.65	0.8643	0.8938	1.1989	1.1230	1.3181	6.489	5	16.00	16.00	152	1120
1.5	0.8946		1.2418	1.2027	1.2834	3.162	5	17.00	16.00	118	1120
*3.7	0.8473	0.8763	1.1700	1.1404	1.2094	2,443	5	15.00	16.00	171	1120
*10	0.0054		0.0700	0.0334	0.1160	42.155	5	15.00	16. <b>0</b> 0	1114	1120
*50	0.0009		0.0401	0.0334	0.0669	37.303	5	15.00	16.00	1119	1120

Auxiliary Tests					Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates nor	mal distribu	ition (p > 0	).01)		0.92351	0.9	-0.2971	2.44307
Bartlett's Test indicates unequal					19.8514	15.0863		
Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TÜ				
Steel's Many-One Rank Test	<0.65	0.65						

· · · · ·			····	Trimmed Spearman-Karber	
Trim Level	EC50	95%	CL		
0.0%		<del>-</del>			
5.0%					
10.0%	5.6340	5.4966	5.7749	1.0 —	**************************************
20.0%	5.6858	5.6127	5.7599	201	- 1
Auto-9.0%	5.5869	5.4508	5.7264	0.9	- 1
					- 1



### **ATTACHMENT III**

Americamysis bahia 96-Hour Elutriate Toxicity Tests Data Sheets and Statistical Analyses (14 pages)



### TOXICITY TEST SET-UP BENCH SHEET

Project Number:	EA.TOX							
Client: <u>Eco Anal</u>	ysts							
	TN-23-212_							
	TE	ST ORGANISM INFORM	ATION					
Common Name: _	OPOSSOM SHRIMP	Adults Isolate	Adults Isolated (Time, Date):					
Scientific Name: _	Americamysis bahia	Neonates Pull	Neonates Pulled & Fed (Time Date)					
Lot Number: A	B-1218	Acclimation:	241 Age: Solays					
Source:	ABS		r (T/S): 189 °C 27.6 ppt					
D /		TEST INITIATION						
<u>Date</u>	<u>Time</u>	<u>Initials</u>	Activity					
2/15/23	0840	ŞC.	Dilutions Made					
[			Test Vessels Filled					
	0951	SC	Organisms Transferred					
V	1049	B	Head Counts					
		TEST SET-UP						
Sample Number:	AT3-098							
	LD3-181 (30 ppt C							
Test Concentra	tion V	olume Test Material	E:1 \ 71					
	<u>.</u>	oranio i ost iviatoriai	<u>Final Volume</u>					
Control	e e	0  ml	1,000 ml					
10 %		100 ml						
50 %		$500  \mathrm{ml}$						
100 %		1,000 ml	<b>1</b>					
1,4		<i>:</i>	,					
	à							
	*							



# ACUTE TOXICITY TEST DATA SHEET

EPA Test Method: EPA 821-R-02-012 (CHECK ONE)

Ceriodaphnia: 2002.0 Magna/pulex: 2021.0

Fathead: 2000.0\_ Trout: 2019.0\_\_\_\_

Americamysis: 2007. X
Cyprinodon: 2004.0

Menidia:2006.0

(6)Z 7/15/63 ATS-T01 12/02/08



# ACUTE TOXICITY TEST DATA SHEET

Project Number: EA.TOX	TEST ORGANISM		Beginning Date: 2/5/2 3	ļ
Client: <u>Eco Analysts</u>	Common Name:	OPOSSUM SHRIMP	Ending Date: 2/19/23	Time: <u>0</u> 926
QC Test Number: TN-23-212	Scientific Name: _	Americamysis bahia	_ TEST TYPE: Static	/ Flo
Fest Material: ELUTRIATE	TARGET VALUES		Renewal	Renewal / Non-renewal
Accession Number: AT3-098	Temp:20±1	°C D0:≥4.0	mg/L Test Container: _	1-L BEAKER
Dilution Water:30 PPT C.S.	pH: 6.0 - 9.0	Salinity:30±3	ppt Test Volume:	200 ml
Accession Number: LD3- 181	Photoperiod: 16 l, 8 d	_ Light Intensity: <u>50</u>	- 100 fc Test Duration:	96 hours

				100%						50%	Concentration	
Ε	D	С	В	A		E	D	С	В	A	Rep	
10	10	10	10	10		10	10	10	10	10	0	
E	170	ر ا	70	10	,	=	ਠ	હ	ठ	16	24	Live
<u>2</u>	5	5	5	Ó		5	Ö	ರ	ō	10		Number of Live Organisms
D.	10 10	70	-9·	<del>-</del> ೨		00/20	8	10	Ö	90	48 72	of of
Q	6	Ω	Д.	-O		حد	0	Ç	2	Ql	96	
				ある						19:8	0	
				192						193	24	Ter
			_	DS.						8.10	48	Temperature (°C)
				<u>₹</u>						<b>17.7</b>	72	ure
				5.6						17.3	96	
				192 198 19.7 19.5 7.8 79						193 193 193 197 193 78 80 78	0	
										8.0	24	
				78							48	pН
				0						0.3	72	
				73						12,7	96	
				7/6						27	0	
				1 70						65	24	) Jissolv (t
				مي کيا						78°C	48	Dissolved Oxygen (mg/L)
										1.	72	ygen
				2/2						30%	96	
				<u>199</u> 1						31.13	0	
				2.93	_					123	24 .	Salini
				63						<b>%</b>	48	ty (рр
				5.0 73 7.664 6.2 6.7 7.3 329 SZ-9 31.6 B3.0 B3.0						5.6 7.3 7663 5.86.7 70 31.1 31.2 28.8 31.573.3	24 48 72 96	t)
				0,5						1,3	96	

EPA Test Method; EPA 821-R-02-012 (CHECK ONE)

Ceriodaphnia: 2002.0 Magna/pulex: 2021.0

Fathead: 2000.0\_ Trout: 2019.0\_

Americamysis: 2007. X
Cyprinodon: 2004.0

Menidia:2006.0 OTHER:



### TOXICOLOGY LABORATORY CORRECTION BENCH SHEET

Project Number: <u>EA.TOX</u>							
Client: Eco Analysts OC Test Number: TN 22-212							
QC Test Number: TN-23-212							
Correction Explanations							
(a) Technician Error-Mathematical							
(b) Technician Error-Manual Data Recording							
(c) Technician Error-Head Count Observation							
(d) Technician Error-Overwrite							
(e) Technician Error-Missing Data							
(f) Technician Error-Lost Organism							
(g) Technician Error-Transcription Error							
(h) Technician Error-Other:							
(i) Meter Malfunction							



### TOXICOLOGY LABOATORY BENCH SHEET

Project Number: <u>EA.TOX</u>		
Client: <u>Eco Analysts</u>		
QC Test Number: TN-23-212		
Date/Time/Initials	Comments/Activity	
2115/23 1127 86	no deed observed	



# TOXICOLOGY LABORATORY BENCH SHEET - TESTING LOCATION

Project Number:	EA.TOX
Client: <u>Eco Analysts</u>	
QC Test Number:TN-23	-212

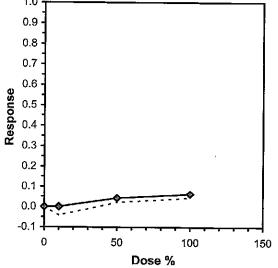
<u> </u>		<del></del>		
Day	Testing Location	Date	Time	Initials
0	513	2/15/23	0905	50
1	5B	2116123	0957	76
2	56	2/16/23 2/17/23	0959	GC
3	5B	418/23	0957	5C 6 6C J2
4	58	2/18/23	0737	JL
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30				

					Acute Test-9	6 Hr Survival	- <del></del>
	2/15/2023 2/19/2023		Test ID: Lab ID: Protocol:	TN-23-212	2	Sample ID: Sample Type: Test Species:	Eco Analysts Elutriate MY-Mysidopsis bahia
Conc-%	1	2	3	4	5		-
Control	1.0000	1.0000	0.9000	0.9000	0.9000		
10	1.0000	1.0000	0.9000	1.0000	1.0000		
50	1.0000	0.9000	0.8000	1.0000	0.9000		
100	0.9000	0.8000	0.9000	1.0000	0.9000		

		_	Tra	ansform:	Arcsin Sc	uare Root	t		1-Tailed		Isot	onic
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD	Mean	N-Mean
Control	0.9400	1.0000	1.3142	1.2490	1.4120	6,792	5	-			0.9600	1.0000
10	0.9800	1.0426	1.3794	1.2490	1.4120	5.284	5	-1.011	2.230	0.1437	0.9600	
50	0.9200	0.9787	1.2859	1,1071	1.4120	10.026	5	0.440	2.230	0.1437	0.9200	
100	0.9000	0.9574	1.2533	1.1071	1.4120	8.613	5	0.946	2.230	0.1437	0.9000	0.9375

Auxiliary Tests					Statistic	-	Critical		Skew	Kurt
Shapiro-Wilk's Test indicates nor	·	0.96751		0.868		-0.1392	-0.5638			
Bartlett's Test indicates equal variances (p = 0.74)					1.27199		11.3449			
Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU	MSDu	MSDp	MSB	MSE	F-Prob	df
Dunnett's Test	100	>100		1	0.08747	0.0935	0.01438	0.01039	0.28366	3, 16

			Line	ear Interpolation	(200 Resamples)	
Point	%	SD	95% CL(Exp)	Skew	• •	
IC05	70.000		· · · · · · · · · · · · · · · · · · ·	·-		
IC10	>100					
IC15	>100				1.0	
IC20	>100			•	· 4	
IC25	>100				0.9	
IC40	>100				0.8 -]	
IC50	>100				4	
	*		·	<del></del>	0.7 -	
					0.01	





Project Number: <u>EA.TOX</u>

### TOXICITY TEST SET-UP BENCH SHEET

Client: Eco Anal	lysts		
QC Test Number: _	TN-23-213		
	TEST ORGA	ANISM INFORMATION	
Common Name: _	OPOSSOM SHRIMP	Adults Isolated (Time, Date):	

TEST ORGAN	IISM INFORMATION
Common Name: <u>OPOSSOM_SHRIMP</u>	Adults Isolated (Time, Date):
Scientific Name: <u>Americamysis bahia</u> Lot Number: <u>AB- 1218</u> Source: ABS	Neonates Pulled & Fed (Time, Date):  Acclimation: 24h Age: 50aus  Culture Water (T/S): 18.9 °C 27.0 ppt

		TEST INITIATIO	N
<u>Date</u> 2/15/23	Time	<u>Initials</u>	<u>Activity</u>
2/15/23	09,28	8,5	Dilutions Made
	<b>V</b>		Test Vessels Filled
	0958	SC	Organisms Transferred
V	1037	√p	Head Counts

	TEST SET-UP	
Sample Number: AT3-099  Dilution Number: LD3-161		
Test Concentration	Volume Test Material	Final Volume
Control	0 ml	1,000 ml
AT3-099	1,000 ml	↓ ·



# ACUTE TOXICITY TEST DATA SHEET

	E,	A.TO			ı	EST (	ORGA	NISM		}	, 1 1	) } {	; ;		<sub>1</sub> B	eginnii 	ng Dat	-2	2/15	2/2/		Time:	3/8	7 8
N-23	-213				1	Sc	entific	Nam	9.	Ame	ricam	ysis b	thia		ı	H	XT TX	PE:	Sta	lic	Flov	vthrou	gh	
ATE					ı ⊣	'ARG	ET VA	LUES	<b>V</b> 2										Renew	'al /	Non-	renew		
	AT3-	.099			!	Te	mp: _	20±	<u> </u>	J <sub>°</sub> C	Ď	ب ا	>4.0		B	g/L	ı	est Co	ntaine		I-L	EAKE	₽ 	
PPT	C.S.				I	pН		.0 - 9.0		I	Sa	linity:	1	)±3	PE	Ĭ.	L	est Vc	lume:		2	00 ml		
	32/2				ļ	Ph	otoper	iod: <u>1</u>	61,8	a.	Ľ:	ght In	ensity	: <u>50 -</u> 1	00 fc		. 7	Cest D	uration		96 ho	IIS		
												'												
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		24	48	72	96	0	24	48	72	96	0				i I	0	24	1 i	1	0	24	48	72	96
						10,5			18.8	996	2,0				4.	177	S S				J. J.	386	122:	477.4
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	4	2	6	1	72	8			7 U	⊢	I١	<u> </u>	<u> </u>	7	/ح	<u> </u>	⊢	<u>ر</u>	7	15	41	7	7	يح
321-R-	02-012	(CHE	CK O	NE C	$c_{I\!\!\!\!/}^{\dagger}$																		- ×	ATS-T01
	Project Number:   Eco Analysts	Landysts   TN-23-213   RIATE   AT3   30 PPT C.S.   30 PPT C.S.   30 PPT C.S.   10   10   10   10   10   10   10   1	EATO EATO EATO EATO EATO EATO EATO EATO	EAT( 1-213 1-213 1-213 1-213 1-213 1-213 1-213 1-213 1-213 1-299 1-213 1	EAT( 1-213 1-213 1-213 1-213 1-213 1-213 1-213 1-213 1-213 1-299 1-213 1	BA.TOX  3.213  3.213  AT3-099  C.S.  Number of Live Organisms  0 24 48 72 96  10  0  0  0 0 9  10  0  0 0 9  10  0  0 0 9  10  0  0 0 9  10  0  0 0 9  10  0  0 0 9  10  0  0 0 9  10  0  0 0 10  0  10  0  0 0 10  0  10  0  0 0 10  0  10  0  0 0 10  0  10  0  0 0 10  0  10  0  0 0 10  0  10  0  0 0 10  0  10  0  0 0 10  0  10  0  0 0 10  0  10  0  0 0 10  0  10  0  0 0 10  0  10  0  0 0 10  0  10  0  0 0 10  0  10  0 0 0 7 9  10  0 0 0 0 7 9  10  0 0 0 0 7 9  10  0 0 0 0 7 9  10  0 0 0 0 7 9  10  0 0 0 0 7 9  10  0 0 0 0 7 9  10  0 0 0 0 7 9  10  0 0 0 0 7 9  10  0 0 0 0 7 9  10  0 0 0 0 7 9  10  0 0 0 0 7 9  10  0 0 0 0 7 9  10  0 0 0 0 0 7 9  10  0 0 0 0 0 7 9  10  0 0 0 0 0 7 9  10  0 0 0 0 0 7 9  10  0 0 0 0 0 7 9  10  0 0 0 0 0 7 9  10  0 0 0 0 0 7 9  10  0 0 0 0 0 7 9  10  0 0 0 0 0 0 7 9  10  0 0 0 0 0 0 7 9  10  0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	BA.TOX  3.213  3.213  AT3-099  C.S.  Number of Live Organisms  0 24 48 72 96  10  0  0  0 0 9  10  0  0 0 9  10  0  0 0 9  10  0  0 0 9  10  0  0 0 9  10  0  0 0 9  10  0  0 0 9  10  0  0 0 10  0  10  0  0 0 10  0  10  0  0 0 10  0  10  0  0 0 10  0  10  0  0 0 10  0  10  0  0 0 10  0  10  0  0 0 10  0  10  0  0 0 10  0  10  0  0 0 10  0  10  0  0 0 10  0  10  0  0 0 10  0  10  0  0 0 10  0  10  0  0 0 10  0  10  0 0 0 7 9  10  0 0 0 0 7 9  10  0 0 0 0 7 9  10  0 0 0 0 7 9  10  0 0 0 0 7 9  10  0 0 0 0 7 9  10  0 0 0 0 7 9  10  0 0 0 0 7 9  10  0 0 0 0 7 9  10  0 0 0 0 7 9  10  0 0 0 0 7 9  10  0 0 0 0 7 9  10  0 0 0 0 7 9  10  0 0 0 0 0 7 9  10  0 0 0 0 0 7 9  10  0 0 0 0 0 7 9  10  0 0 0 0 0 7 9  10  0 0 0 0 0 7 9  10  0 0 0 0 0 7 9  10  0 0 0 0 0 7 9  10  0 0 0 0 0 7 9  10  0 0 0 0 0 0 7 9  10  0 0 0 0 0 0 7 9  10  0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	EA.TOX  3.213  AT3-099  C.S.  Number of Live Organisms  0 24 48 72 96  10  0  0  0 0 9  10  0  0 0 0 9  10  0  0 0 0 9  10  0  0 0 0 9  10  0  0 0 0 9  10  0  0 0 0 9  10  0  0 0 0 9  10  0  0 0 0 9  10  0  0 0 0 9  10  0  0 0 0 9  10  0  0 0 0 9  10  0  0 0 0 9  10  0  0 0 0 9  10  0  0 0 0 9  10  0  0 0 0 9  10  0  0 0 0 9  10  0 0 0 0 9  10  0 0 0 0 9  10  0 0 0 0 0 0 0  10  0 0 0 0 0  10  0	EA.TOX  Common National Scientific National Sc	EA.TOX  Common National Scientific National Sc	Common Name:   Common Name:   Scientific Name:	Common Name: OPOSS   Scientific Name: Americal   Amer	Common Name: OPOSS   Scientific Name: Americal   Amer	EA.TOX	EA.TOX	EA.TOX	EA.TOX	EA.TOX	EA.TOX	EA.TOX	Test Organisms	Test Organisms	Test Organisms	PATOX   TEST ORGANISM   Deginning Date: 2   15   25   Time: (National Name: OPOSSUM SHRIMP   Ending Date: 2   17   23   Time: (National Name: OPOSSUM SHRIMP   Ending Date: 2   17   23   Time: (National Name: OPOSSUM SHRIMP   Ending Date: 2   17   27   23   Time: (National Name: OPOSSUM SHRIMP   Ending Date: 2   17   27   27   27   27   27   27

ATS-T01 12/02/08

<u>Kagna/pulex: 2002.0</u> Magna/pulex: 2021.0

Americamysis: 2007. X Cyprinodon: 2004.0

Menidia:2006.0
OTHER:



### TOXICOLOGY LABORATORY CORRECTION BENCH SHEET

Project Number: <u>EA.TOX</u>
Client: Eco Analysts
QC Test Number: TN-23-213
Correction Explanations
(a) Technician Error-Mathematical
(b) Technician Error-Manual Data Recording
(c) Technician Error-Head Count Observation
(d) Technician Error-Overwrite
(e) Technician Error-Missing Data
(f) Technician Error-Lost Organism
(g) Technician Error-Transcription Error
(h) Technician Error-Other:
(i) Meter Malfunction



### TOXICOLOGY LABOATORY BENCH SHEET

Project Number: <u>EA.TOX</u>	
Client: Eco Analysts	
QC Test Number: TN-23-213	
Date/Time/Initials	Comments/Activity
715/23 1130 80	no deed observed



## TOXICOLOGY LABORATORY BENCH SHEET - TESTING LOCATION

Project Number: _	EA.TOX
Client: <u>Eco</u>	Analysts
QC Test Number:	TN-23-213

Day	Testing Location	Date	Time	Initials
0	6A)			35
1	(a A	2115/23 2116123	0940 100 1018 10135	*
2	64 64 6A	2/17/23	1148	
3		2115/13	1935	GC
4	CA	2115113	 ও <sup>৭</sup> 3র্ম	T.
5		0,11,01	0,10	
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12			<del></del>	
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25				
26			-	
27			-	
28				
29				
30				

Ctort Det	0/45/0000				Acute Test-9	96 Hr Survival	
Start Date: End Date: Sample Date: Comments:	2/15/2023 2/19/2023		Test ID: Lab ID: Protocol:	TN-23-213	3	Sample ID: Sample Type: Test Species:	Eco Analysts Sitewater MY-Mysidopsis bahia
Conc-%	1	2	3	4	5		<del></del>
Control	1.0000	0.9000	0.9000	0.9000	1.0000	<u> </u>	<del></del>
100	0.9000	1.0000	0.9000	1.0000	1.0000		

•				ansform:	Arcsin Sc	uare Root			1-Tailed		leot	onic
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD	Mean	
Control 100	0.9400 0.9600	1.0000 1.0213	1.3142 1.3468	1.2490 1.2490	1.4120 1.4120	6.792 6.628	5 5	-0.577	1.860	0.1050	0.9500 0.9500	N-Mean 1.0000 1.0000

Auxiliary Tests	Ctatiatia		-			
Shapiro-Wilk's Test indicates normal distribution (p > 0.01)	Statistic		Critical		Skew	Kurt
E-Test indicates agust varies and the same (p > 0.01)	0.79894		0.781	· · · · · ·	0	-2,2768
F-Test indicates equal variances (p = 1.00)	1		23,1545		J	2.2100
Hypothesis Test (1-tail, 0.05)	MSDu	MSDp	MSB	MSE	F-Prob	-15
Homoscedastic t Test indicates no significant differences	0.06072					df
	0.00072	0.0649	0.00266	0.00797	0.57958	1, 8

			Line	ar Interpolation	(200 Resamples)	
<u>Point</u>	%	SD	95% CL(Exp)	Skew	( )	
C05	>100		· · · · · · · · · · · · · · · · · · ·			
C10	>100					
C15	>100				1.0	
C20	>100				1.0	
C25	>100				0.9	
C40	>100				0.8	<u> </u>
C50	>100				4	
			<del></del>	<del></del>	0.7 -	
					0.6	
					Response	İ
					8 - 1	
					<b>S</b> 0.4 -	
					<b>∞</b> <sub>0.3</sub> ]	
					0.2 -	
					0.1	

150

50

100

Dose %

### **ATTACHMENT IV**

Menidia beryllina 96-Hour Elutriate Toxicity Tests Data Sheets and Statistical Analyses (15 pages)



Project Number: <u>EA.TOX</u>

### TOXICITY TEST SET-UP BENCH SHEET

Client: <u>Eco Anal</u>	vsts		
QC Test Number: _	TN-23-214		
	TEST ORGAN	ISM INFORMATION	
Common None			
Common Name: _	INLAND SILVERSIDE	Adults Isolated (Time, Date):	

Common Name: <u>INLAND SILVERSIDE</u>	Adults Isolated (Time, Date):
Scientific Name: <u>Menidia beryllina</u> Lot Number: <u>MS- 330</u> Source: <u>A85</u>	Neonates Pulled & Fed (Time, Date):  Acclimation: 24h Age: 11 days  Culture Water (T/S): 200 oc 27.4 ppt
TECT	TINTITIATION

		TEST INITIATIO	N
<u>Date</u> 2/16/23	<u>Time</u>	<u>Initials</u>	Activity
2/16723	0840	<b>X</b>	Dilutions Made
	L	L	Test Vessels Filled
٥/.	1122	<b>ઉ</b> ૮	Organisms Transferred
	1155	GC_	Head Counts

	TEST SET-UP	
Sample Number: <u>AT3-098</u> Dilution Number: <u>LD3-</u>	(30 ppt C.S.)	
Test Concentration	Volume Test Material	Final Volume
Control	0 ml	1,000 ml
10 %	100 ml	
50 %	500 ml	·
100 %	1,000 ml	



# ACUTE TOXICITY TEST DATA SHEET

	Initials		Time	Meter Number						10%						CONTROL	Concentration			Accession Number:	Dilution Water:	Accession Number:	rest Material: ELUTRIATE	QC Test Number:	Client:	Number
						Ħ	D	C	В	A		B	D	C	В	Α	Kep		-	Vumber: _	30 F	Number:	LUIRIA	ř.	Eco Analysts	
	ج		ñ			10	10	10	10	10		10	10	10	10	10	٥		1		30 PPT C.S	A	- 1	TN-23-214	ysts	
<u> </u>	100	101 (Cal	7			7	5	ठ	٥	2		عر	70	0	10	10	24	Live	{	1.D3-1661		AT3-098		14		EA.TOX
576 PH 33	(S)	3	**************************************	in the second		D	වි	5	QĮ.	∞)		٥	10	01	වි	ð	48	Number of Live Organisms		8	2					TOX
캀	7	DX 1				ē	B	6	ڪو	A		ج-	0	0	9	ļο	72	of nisms	,							
	J1. K	1074 1010 1000 1014 1019 1040 1040 10403 1000		-		<b>E</b>	0	_0	رک	Δ		۵	0	6	<u>ک</u>	0	96							İ		İ
	<u> </u>	- S	\$ \\\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	182 182 182 183		<u> </u>			_	1110/61			_			0910,191	0			ਯੂ	jq.	Н	TARC	ζΩ	0	TEST
	3	200	) (	30 50 50 50						_		_					24	Ten	H	Photoperiod: 16 l. 8 d	pH:(	Temp:	TARGET VALUES	Scientific Name:	Common Name:	TEST ORGANISM
	GC 12	)[Q	(	<u>∑</u>		<u> </u>	_			J. 1 1/2 / 1/2 /		_				COC	48	Temperature (°C)		riod: 1	6.0 - 9.0	20±1	ALUE	ic Nan	n Nam	ANISA
		0 0	5	12 22							_	_	_	_		11.6 1	72	re	j	8.79	0	=	Σ2	<u>ਜ਼</u> 	ূ 	1
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			2	127 239 28/	2			_		21.0	_			+		777	24 2	<del></del>		tht Int	Salinity:	بر 		eryllin	SILVE	
	<u>ا</u> چ	101/9/10/1	5	<u>~</u>						20	_			+		ر ا		pΗ	- Criotity	ancitu	30±3	>4.0		a	RSID	
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ľ	21	<u>12</u> 2	000	20,00		_		_		7772				-	- 1	77	) 24	Dis			-	y/L		Ή	nding I	eginni
(	3		000	193						, , , , , , , , , , , , , , , , , , ,	_		_		-	<u>,</u>		Dissolved Oxygen	<b>—</b>	<del>.</del>	Ţ	T		TEST TYPE:	)ate:	Beginning Date:
ľ	2	000	784	50				+		1877		+					3 72	Oxyg	i est Duration:		Test Volume:	est Cor		Ή.	2/19	
	رچ	1040	Ś	(4)					-	74	+	_	+		7	72	96	en	anon:		ume:	Test Container;	enew.	Sta	Ending Date: UKA	213
{	2	B	S	3					7.11.7	3		-			112	Š		$\neg \uparrow$					al /	tie /		5/2
	J G 7 B J J J G 7 J J J	EL O	Cal par bar 600 125 cal 600 mg 600 122 1291	100				-	Ş	74 (320 20 20 1 9/1		_	+		0 40	7777 717 8 75 208290 281 200 200	24	2	96 hours		2(	1-L B	Renewal / Non-renewal	Static / Flowthrough		M
	3	1019	8	ŝ					00.0	र्व		+			00.0	18	24 48 72		Ir.S		200 ml	1-L BEAKER	renew	vthrou	Time	2115/23 Time: 1122
	ম :	2	28.6	3					7.5	200					1		72					Ħ	<u> </u>	바	Time: 1244	_
(	7	(% (%)	7						50,0	2/2					6.17	20	96								6	25

Ceriodaphnia: 2002.0 Magna/pulex: 2021.0

Fathead: 2000.0 Trout: 2019.0

Americamysis: 2007. Cyprinodon: 2004.0

Menidia:2006.0 X

ATS-T01 12/02/08

EPA Test Method: EPA 821-R-02-012 (CHECK ONE)



# ACUTE TOXICITY TEST DATA SHEET

Project Number: EA.TOX	TEST ORGANISM		Beginning Date: 2/5/2 3	3 Time: 1127
Client: Eco Analysts	Common Name: INLAN	INLAND SILVERSIDE	Ending Date: 1/19/1/3	1
QC Test Number: TN-23-214	Scientific Name: Menidia		TEST TYPE: Static	고
Test Material: ELUTRIATE	i			Renewal / Non-renewal
Accession Number: AT3-098	Temp:20±1°C	DO: <u>&gt;4.0</u> r	mg/L Test Container:	1-I, BEAKER
Dilution Water: 30 PPT C.S.	pH: 6.0 - 9.0	Salinity: 30±3 p	.ppt Test Volume:	200 ml
Accession Number: LD3- VS1	Photoperiod: 16 l, 8 d	Light Intensity: 50 - 100 fc	Test Duration:	96 hours

					100%						50%	Concentration	2
	E	D	С	В	Α		н	D	С	В	A	Rep	
	10	10	10	10	10		10	10	10	10	10	0	
	જ	þ	ol	S	9		2	ত	٩	5	٥	24	Liv
	لــ	۵		lo	ھ		۵	වි	X	රි	۵_	48	Number of Live Organisms
	J	7	10	10	F		9	O	حي	ठ	->	72	of nisms
		Ù	C	10	<u>~</u>		<u>-9</u>	10	20	76	-2	96	
					#30 150						13/8/1	0	
					Hb) 181						131	24	Ter
	_										19 H.D	48	Temperature (°C)
		_			15 82 9.6 Mar			_			1.7 P	72	ure
		_		_	2.0		_		_	_	196	96	
	_	_		_	\$			_			9887.761	0.	
-	_			. 1	!		-	_		_		24	
	_				200		-	_		$\dashv$	Z/ Z/		pH
		_	_		<u> </u>	_						72	
			_	-	<u> </u>						<u>a</u>	96	
-	_		_			$\dashv$	_			_		0	밁
	+			ç	2	+	-		_	_	<u>ئ</u>	24	Dissolved Oxygen (mg/L)
		+			7	_	_	_	+		2	18 7	d Oxy
-	_   .		_	<u> </u>	7	_	-	+	_		<u> </u>	2 96	gen
		+	$\dagger$	<u> </u>	4		.	+	+	- 9	2	0	-
			_	1	326						31.		so.
	$\dagger$	+		1	~			_	Ŧ		) ) (e	48	alinity
	_			- 1	230	_	_	1			31.2	24 48 72 96	(ppt)
				16.0	767267717300326312290278		_			1	8, 79 7,673 6,77,173 31,1310 299 312 212	96	

EPA Test Method: EPA 821-R-02-012 (CHECK ONE)

Ceriodaphnia: 2002.0 Magna/pulex: 2021.0

Americamysis: 2007. Cyprinodon: 2004.0

Menidia:2006.0 X



# TOXICOLOGY LABORATORY CORRECTION BENCH SHEET

Project Number: <u>EA.TOX</u>
Client: Eco Analysts
QC Test Number: TN-23-214
Correction Explanations
(a) Technician Error-Mathematical
(b) Technician Error-Manual Data Recording
(c) Technician Error-Head Count Observation
(d) Technician Error-Overwrite
(e) Technician Error-Missing Data
(f) Technician Error-Lost Organism
(g) Technician Error-Transcription Error
(h) Technician Error-Other:
(i) Meter Malfunction



## TOXICOLOGY LABORATORY BENCH SHEET

Project Number: <u>EA.TOX</u>	
Client: <u>Eco Analysts</u>	
QC Test Number: TN-23-214	
Date/Time/Initials	Comments/Activity
2/15/23 1310 80	ve pinsered and



# TOXICOLOGY LABORATORY BENCH SHEET - TESTING LOCATION

Project Number:EA.TOX	
Client: <u>Eco Analysts</u>	
QC Test Number: TN-23-214	_

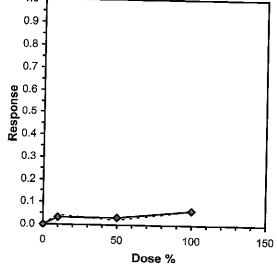
Γ_		<del></del>		
Day	Testing Location	Date	Time	Initials
0	57	2/15/23	0905	57
1	54	21/6/23	1055	7
2	5A 5A 5A 5A	2/15/23	1152	Ge
3	5/4	2/14/23	10/3	
4	SA	2119/13	1048	52
5		1 10	70,10	
6				
7				<del> </del>
8				
9				
10				
11				
12				
13				
14				
15				
16				
17				
18				<del></del>
19				
20				
21				
22				
23				
24				
25				
26				
27				
28				
29				
30				
	<del>_</del>			

					Acute Test-	96 Hr Survival	<del></del>
	2/15/2023 2/19/2023		Test ID: Lab ID: Protocol:	TN-23-214	4	Sample ID: Sample Type: Test Species:	Eco Analysts Elutriate MB-Menidia beryllina
Conc-%	1	2	3	4	5		<del></del>
Control	0.9000	0.9000	1.0000	1.0000	0.9000	<del></del>	<del></del>
10	0.8000	0.8000	0.9000	1.0000	1.0000		
50	0.9000	1.0000	0.8000	1.0000	0.9000		
100	0.8000	1.0000	1.0000	0.9000	0.7000		

			Tr	ansform:	Arcsin Sc	uare Root			1-Tailed		leat	onic
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	- t-Stat	Critical	MSD	Mean	N-Mean
Control 10 50 100	0.9400 0.9000 0.9200 0.8800	1.0000 0.9574 0.9787 0.9362	1.3142 1.2575 1.2859 1.2343	1.2490 1.1071 1.1071 0.9912	1.4120 1.4120 1.4120 1.4120	6.792 12.128 10.026 15.085	5 5 5 5	0.625 0.312 0.880	2.230 2.230 2.230	0.2026 0.2026 0.2026	0.9400 0.9100 0.9100 0.8800	1.0000 0.9681 0.9681 0.9362

Auxiliary Tests		<del></del>			04 4: 41					
Shaniro-Wilk's Tost indicates non					Statistic		Critical		Skew	Kurt
Shapiro-Wilk's Test indicates non	mai distribu	ition ( $p > 0$	).01)		0.93109	-	0.868		-0.1368	-1.2218
Bartlett's Test indicates equal var	iances (p =	<u>: 0</u> .59)			1.91346		11.3449		-0.1000	-1.2210
Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU	MSDu	MSDp	MSB			
Dunnett's Test	100	>100		<del></del> _				MSE	F-Prob	_ df
	.00	- 100		1	0.132	0.14109	0.00601	0.02063	0.83102	3, 16

Point	%	SD	95% CL(Exp)	ear Interpolation (200 Resamples) Skew	
IC05	78.333				
IC10	>100				
IC15	>100				
IC20	>100			1.0	<del></del>
IC25	>100			0.9	İ
IC40	>100			<u> </u>	
IC50	>100			0.8	
				<del></del> 0.7 -	
				+	
				<b>છ</b> 0.6 <b>-</b>	ł





## TOXICITY TEST SET-UP BENCH SHEET

Project Number:	EA.TOX_							
Client: <u>Eco Anal</u>	ysts							
QC Test Number:	TN-23-215							
	TI	EST ORGANISM INFORMA	TION					
Common Name: _	INLAND SILVERSI	DE Adults Isolated	(Time, Date):					
	Menid <u>ia beryllina</u>		Neonates Pulled & Fed (Time, Date):					
Lot Number: Nu	1S- 330		24h Age: 120ays					
Source: ABS		Culture Water	(T/S): 19.0 °C 27.4 ppt					
		TEST INITIATION						
<u>Date</u>	<u>Time</u>	<u>Initials</u>	Activity					
2/15/23	09.28	$\propto$	Dilutions Made					
1	4		Test Vessels Filled					
/	1103	SC	Organisms Transferred					
V	1151	GC.	Head Counts					
		TEST SET-UP						
Sample Number:	AT3-099							
Dilution Number:								
Diracon rumoor	1/1/3- / (1							
Test Concentra	ation	Volume Test Material	<u>Final Volume</u>					
Control		0 ml	1,000 ml					
			, <u> </u>					
AT3-099		1,000 ml	<b>↓</b>					

(b)



# ACUTE TOXICITY TEST DATA SHEET

EPA Test Method: EPA 821-R-02-012 (CHECK ONE)		Initials	Time	Meter Number						AT3-099			-			Control	Concentration			Accession Number: LD3-18	Dilution Water: _	Accession Number:	Test Material: SITE WATER	QC Test Number:	Client: E	Project Number:
EPA 821-						E	D	С	В	Α		Е	מ	C	В	Α	Rep			ımber:	30 P	ar:	TE WAT		Eco Analysts	
R-02-0	) ()	1154	<b>F</b>			10	10	10	10	10		10	10	10	10	10	0			LD3	30 PPT C.S	AT3	展	TN-23-215	/sts	
12 (CI	ج ا	4	1024			00		10	9	Q		c	01	0	0	70	24	Liv		8		AT3-099		15		EA.
ECK (	<u>5</u>		10/4			8	٩	Ø.	වි	Ø		0)	0	6	0	0	48	Number of Live Organisms								EA.TOX
ONE)	calsii.	$\mathbb{C} \mathcal{T}_{L}$	1678		,	~	-3	8	<b>~</b>	2		13	S	10	16	d)	72	r of nisms								
(Z)	1	30	1027		_	~	۵	۵				C	ō	0	(S)	ο	96									
7	,	) J. J. J. J. J. J. J. J. J. J. J. J. J. J	BUIL 1969 1040 1848 1027 BAP GREY 1044 6215 11114	83						OZ O		ï				191	0			ы	שי	Temp:	TAR	7.0	_	TEST
		7	(2)	682						5'51 O'S						193	24	Ter		hotope	pH:		3ET V	cientii	ommo	ORG
$\mathcal{Z}$		<u>E</u>	2	682 683 683 642 641						19.8 /9.1						9,0 193 199 185 20 38,0 80	48	Temperature (°C)		Photoperiod: 16 l, 8 d	6.0 - 9.0	20±1	TARGET VALUES	Scientific Name:	Common Name:	TEST ORGANISM
		52 JL 84	19715 h	12/6						197				į		183	72	ure		16 <i>l</i> , 8	.0	#1	Š	ne: _	ne:	<b>×</b>
	ļ	<u> </u>	DH C	5.						1, 2			_			603	96			d		c		Me	Z	
		کئ	OHD ers)	682 682 683 682						16 180 30						0,6	0			H	<b>2</b> 20	H		Menidia beryllina	INLAND SILVERSIDE	
				186			_								_		24			ight I	Salinity:	DO: _		beryll.	VIIS (	
		3	1504 OS25	92					-	7979				_		מל	48	pН		ntensit	[	>4.0		na	ERSI	
		オルルタ	1725													75	72			Light Intensity: 50 - 100 fc	30±3	0			DE	
		Ju	(Spd 030 11791)	189						<b>₹</b>						82	96	į		. 100 f						
		Z	<u> </u>	289/289	_					7						77	0			o.	ppt	mg/L		7	Endin,	Begin
		4	1							77						177	24	Dissolved Oxygen (mg/L)						TEST TYPE:	g Date	ning I
		ج	26/ heo)	1589					-	2			-			6,8 29 1	48	lved Ox (mg/L)		Test	Test	Test		ТҮРЕ	[a	ate:
		2	190	978					_	75		_				2		суgen		Test Duration:	Test Volume:	Test Container:	Ren		Ending Date: 4/14/12	Beginning Date: 215/23
		4	1024 0906	1/8						7 ]						$\mathbb{Z}$	96			ion: L	<u>.</u>	ner:	Renewal /	Static	E	2
	Í	A S	2	<u> </u>					{5		_				_	27	0			96		<u> </u>		_		W
	H		<i>P</i> (2/2)	1280	_					23						28	24	Salin		96 hours	200 ml	L BE	on-re	Flowt	-	 <b>⊢</b>
		3	1004 USES /1024	183687 6.81 (35/1985) (33/88)		-	_			777267757152888861757					ļ	29.6 29.8 38.7 30.279	48	Salinity (ppt)			ml	1-L BEAKER	Non-renewal	Flowthrough	Time:	Time:
ATS-T01		×	%z5 /	<u>199</u>						27			_			202	72	g.	İ					-	Cros	103
T01	ľ	کا	1200	681					1	77						9	96								7	~

"Ceriodaphnia: 2002.0 Magna/pulex: 2021.0

Fathead: 2000.0\_ Trout: 2019.0\_\_\_\_

Americamysis: 2007. Cyprinodon: 2004.0\_

Menidia:2006.0 OTHER:

×

ATS-T01 12/02/08



# TOXICOLOGY LABORATORY CORRECTION BENCH SHEET

Project Number: <u>EA.TOX</u>
Client: Eco Analysts
QC Test Number: TN-23-215
Correction Explanations
(a) Technician Error-Mathematical
(b) Technician Error-Manual Data Recording
(c) Technician Error-Head Count Observation
(d) Technician Error-Overwrite
(e) Technician Error-Missing Data
(f) Technician Error-Lost Organism
(g) Technician Error-Transcription Error
(h) Technician Error-Other:
(i) Meter Malfunction



## TOXICOLOGY LABORATORY BENCH SHEET

Project Number: <u>EA.TOX</u>	
Client: <u>Eco Analysts</u>	
QC Test Number: TN-23-215	
Date/Time/Initials	Comments/Activity
2115/23 1300 86	00 Cood abserted



# TOXICOLOGY LABORATORY BENCH SHEET - TESTING LOCATION

Project Number:	EA.TOX
Client: <u>Eco Ar</u>	alysts
QC Test Number:	TN-23-215

	<del>_</del> ,			
Day	Testing Location	Date	Time	Initials
0	(OA	2/15/73	0930	86
1	(e Å	2116123	1026	TP
2	6A	2(17/2)	1047	BC
3	64	2115123	0927	TP GC JZ
4	COA	2/19/13	1017	TZ.
5		1	, ,	
6				
7				
8		_		_
9				
10				
11			_	
12				
13				
14				
15				
16				
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21				
22				
23				
24				
25			_	
26				
27			<del>-</del>	
28				
29				
30				

					Acute Test-9	6 Hr Survival	
Start Date: End Date: Sample Date: Comments:	2/15/2023 2/19/2023		Test ID: Lab ID: Protocol:	TN-23-215	5	Sample ID: Sample Type: Test Species:	Eco Analysts Sitewater MB-Menidia beryllina
Conc-%	1	2	3	4	5		<u> </u>
Control	1.0000	1.0000	1.0000	1.0000	1.0000		
100	0.8000	0.8000	0.8000	0.9000	0.800		

			Tra	ansform:	Arcsin Sc	uare Root	<u> </u>	Rank	1-Tailed	Iso	tonic
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	Sum	Critical	Mean	N-Mean
Control	1.0000	1.0000	1.4120	1.4120	1.4120	0.000	5		-	1.0000	
*100	0.8200	0.8200	1.1355	1.1071	1.2490	5.588	5	15.00	19.00	0.8200	

Auxiliary Tests	Statistic	Critical	Skew Kurt
Shapiro-Wilk's Test indicates non-normal distribution (p <= 0.01) Equality of variance cannot be confirmed	0.62485	0.781	2.51558 7.15179
Hypothesis Test (1-tail, 0.05)			<del>_</del>

Wilcoxon Two-Sample Test indicates significant differences

				Linea	r Interpolation	1 (200 Resamples)	<u> </u>		
Point	%_	SD	95% CL	_(Exp)	Skew				
IC05*	27.778	3.324	23.333	40.476	1.3377				
IC10*	55.556	6.648	46.667	80.952	1.3377				
IC15*	83.333					1.0			
IC20	>100					1.0			
C25	>100					0.9 -			
C40	>100					0.8			
C50	>100					٥.٥ ]			
	IC estimate les	o trair tre	2 IOMOSE O	Jiioentiati	Jil	0.7 <b>-</b> <b>9</b> 0.6 <b>-</b>			
	io cominato ios	o trair tris	s lowest of	oncenti ati	511	- 6.0 <b>esponse</b> - 6.0 <b>es</b>			
	io communication	o tran tro	o lowest of	oneeng au	JI L	- 6.0 <b>Gesponse</b> - 6.0 <b>Gesponse</b> - 6.0 <b>Gesponse</b>			
	io communici		o lowest or	oneeng au	JI I	Response - 9.0 se - 9		~ <b>&amp;</b>	
	io communication		o lowest or	oneen a au	Jil	- 6.0 <b>Gesponse</b> - 6.0 <b>Gesponse</b> - 6.0 <b>Gesponse</b>			
			o lowest or	oneen a au	Jil	0.0 <b>Gesponse</b> 0.4 0.3 0.2		*	

Dose %

## ATTACHMENT V

Report Quality Assurance Records (2 pages)



## REPORT QUALITY ASSURANCE RECORD

	ent: <u>Eco Amalysts</u> hor: <u>Michael Chaner</u>	Project Number: EA Report Number: 97	A.TOX <b>≸</b> 9
	REPOR	RT CHECKLIST	
	<u>OA/QC ITEM</u>	<u>REVIEWER</u>	DATE
1.	Samples collected, transported, and received according to study plan requirements.	defle	8/1/25
2.	Samples prepared and processed according to study plan requirements.	miller	8/1/25
3.	Data collected using calibrated instruments and equipment.	Melle	_ 8/1/25
4.	Calculations checked: - Hand calculations checked	_ hufbran	aliles
	<ul> <li>Documented and verified statistical procedure used.</li> </ul>	Myline	2/1/27
5.	Data input/statistical analyses complete and correct.	Susan M Redefit	8/7/2023
6.	Reported results and facts checked against original sources.	for m Redelis	8/7/2023
7.	Data presented in figures and tables correct and in agreement with text.	Lus m Redels	8/7/2023
8.	Results reviewed for compliance with study plan requirements.	heph	8/4/25
		<u>AUTHOR</u>	D. 4 877
9. 10.	Commentary reviewed and resolved.  All study plan and quality assurance/control	_ buffle	DATE 8/1/23
:	requirements have been met and the report is approved	PROJECT MANAGER	8/9/23 DATE
		QUALITY CONTROL OFFICER	8/7/2023 DATE
		Jen In	818123

SENIOR TECHNICAL OFFICER

DATE

### **ATTACHMENT VI**

US Army Corps of Engineers Quality Assurance Checklist (2 pages)

Table II-8: Quality Control Summary for Biological Toxicity Testing only

Method Reference Numbers:

Modified Exercised 14 mileons.	The state of the s			
Quality Control (QC)	Acceptance Criteria*	Criteria Met?	List results outside criteria	Location of Kesuits
Element		Yes/No	(Cross-reference results table	(Retained at Lab or in
			in data report)	Data Package)
Test condition requirements for each species:				In Data Package
Temperature, Salinity, pH, D.O., Ammonia (Total, Un-ionized)	Test conditions within the requirements specified for each species	Yes	N/A	
Test species age	Age/health within guidelines for each species (Appendix V)	Yes	N/A	In Data Package
Bulk physical/chemical analyses (If Required? If so, required by the Sampling plan) or No	Required? If so, performed? Yes or No	N/A	N/A	In Data Package
Water column toxicity test:				In Data Package
Control mortality Control abnormality	<pre>≤ 10% mean ≤ 30% mussel/oyster; ≤ 40% clam larvae, ≤ 30% sea urchin larvae</pre>	Yes	N/A	
Sediment toxicity test: Control mortality	\( \le 10\% \) mean (no chamber > 20%)			In Data Package
Compliance with applicable test acceptability requirements in Table 11.3 (EPA 1994a)	See EPA (1994a) Section 9; Table 11.3	X/X	N/A	

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